Draft Environmental Impact Report

CAPITAL COMMERCE CENTER

McGovern Blvd. & Lunenburg Road, Lancaster, Massachusetts
Worcester County



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November 15, 2019 #W181228

TABLE OF CONTENTS

1. PROJECT DESCRIPTION 1
   Site Context and Zoning 1
   Site and Project History 2
   ENF Master Plan (Preferred Master Plan for ENF Filing) 3
   Detailed Summary of Project Changes 7
   Revised Preferred Master Plan 7
   Required Permitting 10
   Project Funding 11
2. ALTERNATIVES ANALYSIS 12
   Summary of Alternatives 12
   Quantitative Comparison of Alternatives 16
3. LAND ALTERATION 19
   Existing Conditions 19
   Open Space 19
   Site Clearing / Earthwork 20
   Ledge Removal 20
   Building and Impervious Coverage 20
4. WETLAND RESOURCE AREAS 22
   Existing Conditions 22
   Proposed Conditions 23
   Mitigation and Performance Standards 24
5. STORMWATER MANAGEMENT 25
   Existing Conditions 25
   Proposed Conditions 25
   Mitigation and Stormwater Management Standards 25
6. UTILITY & INFRASTRUCTURE 29
   Water Supply & Mitigation Strategies 29
   Wastewater Supply & Mitigation Strategies 30
   Other Utilities 31
7. TRANSPORTATION 32
   Project Description 32
   Chapter Summary 32

Existing Conditions 34
Future Conditions 48
Traffic Warrants 60
Traffic Operations Analysis 65
Parking 76
Mitigation Measures 78
Mitigation Implementation Thresholds 85
Conclusions 90
8. ENERGY, GREENHOUSE GAS EMISSIONS & AIR QUALITY 95
Mesoscale Air Quality Analysis 95
Greenhouse Gas Analysis 95
Draft Section 61 Findings 96
9. CONSTRUCTION IMPACTS 97
Construction Schedule and Hours 97
Construction Phasing and Mitigation Efforts 97
Temporary Construction Impacts 98
Summary of Construction Mitigation Efforts 98
10. MITIGATION SUMMARY 99
Land Alteration 99
Wetland Resource Areas 99
Stormwater Management 100
Water and Wastewater Supply 101
Transportation 101
Energy, Greenhouse Gas Emissions & Air Quality 101
Construction Control 102

LIST OF TABLES

Table 1.1: Preferred Master Plan - ENF 5
Table 1.2: Preferred Master Plan – DEIR 8
Table 2.1: Project Alternatives Comparison 17
Table 2.2: Project Alternative Impact Comparison 18
Table 3.1: Proposed Project Impacts 21
Table 5.1: Design Point Peak Runoff Rate Summary 27
Table 5.2: Rainfall Intensities 27
Table 7.1: Turning Movement Count Summary 40
Table 7.2: Existing Weekday Traffic Volume Summary 40
Table 7.3: Crash Data Summary 43
Table 7.4: Existing Stopping Sight Distance Measurements 48
Table 7.5: Existing Intersection Sight Distance Measurements 48
Table 7.6: Total New Trip Generation Summary by Land Use Code 57
Table 7.7: External Trip Generation Summary 58
Table 7.8: Trip Distribution Summary 60
Table 7.9: Level-of-Service Criteria for Unsignalized Intersections [(a)] 66
Table 7.10: Level-of-Service Criteria for Signalized Intersections [(a)] 67
Table 7.11: Level-of-Service Criteria for Roundabouts[(a,b)] 68
Table 7.12: Intersection Capacity and Queue Analysis Summary 72
Table 7.13: Town of Lancaster Zoning Parking Requirements 76
Table 7.14: Infrastructure Improvement Matrix 80
Table 10.1: Wetland Resource Area Mitigation 100

LIST OF APPENDICES

APPENDIX A: PROJECT MAPS

- USGS Site Location Map
- Existing Site Aerial Map
- Town of Lancaster Zoning Map
- Town of Lancaster Zoning Overlay Map
- Town of Lancaster Integrated Planning Overlay Districts (IPOD) Map
- MassGIS Areas of Critical Environmental Concern (ACEC) Map
- MassGIS Natural Heritage & Endangered Species (NHESP) Map
- MassGIS Wetland Map
- MassGIS Interim Wellhead Protection Area (IWPA) + Outstanding Resource Water (ORW) Map
- FEMA + MassGIS Flood Insurance Rate (FIRM) Maps
- Natural Resources Conservation Service (NRCS) Soil Map
- Impaired Waters Map
- Massachusetts Stressed Basins Map

APPENDIX B: EXISTING AND PROPOSED CONDITIONS PLANS

- Existing Conditions Plan (Prepared by Bohler Engineering, dated 5/15/19)
- Existing Conditions Plan – Aerial (Prepared by Bohler Engineering, dated 5/15/19)
- Preferred Master Plan (Prepared by Bohler Engineering, dated 10/22/19)
- Conceptual Utility Plan (Prepared by Bohler Engineering, dated 11/15/19)
- Conceptual Heat Map Exhibit (Prepared by Bohler Engineering, dated 11/15/19)

APPENDIX C: ALTERNATIVE PLANS

- Alternative Master Plan A (Prepared by Bohler Engineering, dated 10/22/19)
- Alternative Master Plan C (Prepared by Bohler Engineering, dated 10/22/19)
- Preferred Master Plan (Prepared by Bohler Engineering, dated 10/22/19)

Reduced Impact Alternative (Prepared by Bohler Engineering, dated 10/22/19)

APPENDIX D: WETLAND RESOURCE EVALUATION

- Wetland Resource Evaluation, McGovern Boulevard, Lancaster, MA (Prepared by EcoTec, Inc., dated 9/6/19)

APPENDIX E: DRAFT SECTION 61 FINDINGS

- MassDOT - Draft Letter of Commitment

APPENDIX F: TRAFFIC IMPACT AND ACCESS STUDY

- Turning Movement Counts (TMCs)

- Automatic Traffic Recorder (ATR) Counts
- Seasonal Adjustment Data
- Road Safety Audit (RSA)
- Crash History Data
- MassDOT Ambient Growth Data
- Site Trip Generation
- Site Trip Distribution
- Left-Turn Lane Warrants
- Traffic Signal Warrants
- Capacity and Queue Analysis
- Parking Calculations

APPENDIX G: GREENHOUSE GAS AND MESOSCALE ANLYSIS

- Greenhouse Gas and Mesoscale Analysis for Capital Commerce Center (Prepared by Tech Environmental, dated September 2019)

APPENDIX H: DRAINAGE REPORT

- Drainage Report for Capital Commerce Center (Prepared by Bohler Engineering, dated November 15, 2019)

APPENDIX I: DRAFT CONSTRUCTION MANAGENT PLAN

- Draft Construction Management Plan (Prepared by Bohler Engineering, dated November 15, 2019)

APPENDIX J: ENF CERTIFICATE AND COMMENTS

- Certificate on the ENF, dated July 9, 2019
- Department of Conservation and Recreation Comment Letter on the ENF, dated July 1, 2019
- Department of Energy Resources Comment Letter on the ENF, dated July 8, 2019
- MassDEP Comment Letter on the ENF, dated July 9, 2019
- MassDOT Comment Letter on the ENF, dated July 1, 2019
- Coded Comments
- Comment Responses

APPENDIX K: DEIR CIRCULATION LIST

1. PROJECT DESCRIPTION

Site Context and Zoning

The project site (hereinafter referred to as the "Site") is located off McGovern Boulevard and Lunenburg Road in the Town of Lancaster, Worcester County, Massachusetts. As shown on the Town Assessor's Maps, the Site is identified as:

Map No. 8, Lots	38, 38D, 38F, 38G, 38H, 39, 39A, 39B, 39C, 42 & 45;
Map No. 9, Lots	2, 5, 8A;
Map No. 13, Lots	2, 3, 4, 7, 8; and
Map No. 14, Lots	1, 2, 3, 3A, 3B, 4, 4A, 4B, 4C, 4D, 4F, 4GA, 4GB, 4H, 4I, 4J, 4K, 4L, 4M, 8, 8A, 8B, 9D, 11A, 12, 13, Parcels B-2, B-4, & 9.

The Site consists of approximately 471± acres of land and is bordered by woods, wetlands, and residences to the north, Route 190 to the west, woods, wetlands and the North Nashua River to the south, and Lunenburg Road and Kimball Farm to the east. A portion of the Site to the east was recently developed as part of the Lancaster Crossing development project with a Dunkin', Mobil Gas Station, and soccer fields (F.C. Stars Soccer Complex) with associated driveways, parking areas, utilities, and stormwater management systems. McGovern Boulevard was constructed as the main access point to the Site and to access the Lancaster Crossing development from Lunenburg Road. The existing JB Hunt Trucking facility remains in the eastern portion of the Site with access from Lunenburg Road. A portion of the Site to the west, located off Johnny Appleseed Lane, consists of an existing residence, horse barn, horse track, and associated parking areas and utilities, as well as undeveloped areas consisting of woods and fields. A small piece of land on the westernmost edge of the Site is located within the Town line in Leominster. The remaining portion of the overall Site consists of a gravel pit and gravel access roads, as well as undeveloped fields, woodland, and wetlands. A small parcel of land, located in the central portion of the Site, is land-locked and is not included as part of the Project.

The existing Site, originally under the ownership of one (1) entity, has since been subdivided and sold to five (5) additional ownership entities. Due to MEPA anti-segmentation provisions, all properties that originally made up the Site are included in the MEPA ENF filing even though the developer of the current proposal does not currently control all properties, nor do they intend to in the future. The Lancaster Crossing development project contains approximately 50± acres located in the eastern portion of the Site along Lunenburg Road, is proposed to be developed by a separate entity with commercial/retail/residential uses. The Dunkin', Mobil Gas Station, and soccer complex have already been constructed as part of this development project.

At the present time, it is understood that the community may not be fully supportive of the residential portion of the development at the level detailed. The Proponent is fully willing to remove or reduce the level of residential development and has only proposed the current level of residential development to meet current Town zoning requirements. The Proponent is working closely with the representatives from the Town to potentially eliminate or minimize this requirement and will bring forth and application to be heard at the May Town meeting. That said, the residential component has been included in the overall impact analysis to evaluate the

surrounding infrastructure if and/or when an appropriate time comes to introduce such a use, considering that it is the most significant use from an infrastructure perspective.

The Site is located within the Enterprise District, Retail Subdistrict A (EZ-A) and Residential Zoning District, which allows the development of various uses. The Site is also overlaid by the Integrated Planning Overlay District (IPOD-1). The IPOD-1 allows any use that is allowed by right or allowable by Special Permit in at last one (1) of the underlying zoning districts within which the Integrated Plan is located to also be allowed by right or allowable by Special Permit at any location within the Integrated Plan, including within underlying zoning districts where such use is not otherwise allowed. The IPOD-1 also requires that 25% of the overall development contains a residential component. Two (2) additional overlay districts, the Floodplain Overlay District and Water Resources Overlay District, encompass portions of the Site. The permitting previously existed to remove the subject parcel from the Water Resources Overlay District and the Proponent is in the process of getting this updated on the Town mapping.

Site and Project History

On October 31, 2016, North Lancaster Water LLC filed an ENF (EEA# 15604) with MEPA to modify an existing PWS Permit for potable water service to a Dunkin' facility proposed to be constructed at 1474 Lunenburg Road. The PWS, located on parcel L3 off Lunenburg Road (Map 14, Parcel 8A), was permitted in August 2010 and installed to service the former Lancaster Flea Market and Agway store on Lunenburg Road, but was never placed into service. During the 2016 permitting process, it was discovered the PWS is located within the Central Nashua River Valley ACEC. Due to the location of the well within the ACEC and the Dunkin' project requiring a state PWS permit, North Lancaster Water was required to file an ENF with MEPA.

On December 1, 2016, MEPA requested a "look back" analysis of the 50-acre commercial/retail development (Lancaster Crossing) which included the proposed Dunkin' facility. It was determined there was insufficient time to compile and distribute this information prior to the expiration of the comment period extension, therefore North Lancaster Water withdrew the ENF without prejudice on December 9, 2016.

On March 29, 2017, two applications were filed with MassDEP for PWS wells on parcels within the Lancaster Crossing development to service the Dunkin' and a proposed Mobil Gas Station. In addition, preliminary results of the "look back" analysis were provided and reviewed with MEPA and indicated that no MEPA thresholds would be exceeded. As a result, MEPA indicated the filing of a Request for an Advisory Opinion would be appropriate.

On June 19, 2017, the proponent issued a Request for an Advisory Opinion letter to MEPA requesting confirmation that the proposed Dunkin' and Mobil Gas Station is not subject to review under MEPA. Based on the information provided, MEPA issued an Advisory Opinion (AO) on July 26, 2019 indicating that the proposed project was not subject to MEPA review and the submission of an ENF was not required. However, the AO indicated that if development of any portion of the remainder of land now or formerly owned by North Lancaster Water is proposed in the next five (5) years of the AO, the proponent should consult with MEPA to determine whether it may be subject to MEPA review.

Based on MEPA's determination and anti-segmentation provisions, the property mentioned above has been included as part of the overall project Site included in this DEIR.

A review of the Massachusetts Cultural Resource Information System (MACRIS) indicated that there are no historic properties or areas located on or near the Site.

ENF Master Plan (Preferred Master Plan for ENF Filing)

The previous Preferred Master Plan (hereinafter referred to as the "ENF Master Plan") included in the ENF filing, depicted approximately 2,690,000 GSF of mixed uses on-site, along with associated access roadways, parking and circulation areas, stormwater management systems, and utility infrastructure. The Project generally included the construction of numerous industrial buildings including an automotive sales and service facility; single family, duplex and triplex units; multi-family apartments; a hotel; a new indoor sports facility; and retail space. The Site already contains recently constructed outdoor F.C. Stars Soccer Complex, a Dunkin', and Mobil Gas Station.

Primary access to the Site was intended to be via McGovern Boulevard from Lunenburg Road to the east. Access to the residential component to the west would be via Johnny Appleseed Lane and White Pond Road. For clarity, the Site is hereinafter described as the "eastern", "central", and "western" portions of the overall Project. The eastern portion currently consisted of the existing private way known as McGovern Boulevard, F.C. Stars Soccer Complex, Dunkin', and Mobil Gas Station, as well as the existing JB Hunt Trucking facility and undeveloped woodlands. The Proponent had proposed to demolish the trucking facility and construct additional retail properties as well as multi-family apartment buildings, a hotel, and a new indoor sports facility. Additional access driveways were proposed to access retail and residential uses directly from Lunenburg Road.

The central portion of the Site currently consists of existing gravel pits, gravel access roads and undeveloped woodlands and fields. The Proponent proposed to extend McGovern Boulevard approximately 4,200 LF in the westerly direction to provide access to multiple industrial buildings including the automotive sales and service facility proposed as part of the Project. A new wastewater treatment plant was proposed to be constructed to the south, and an existing 200,000-gallon concrete fire suppression tank located to the northeast on McGovern Hill was proposed to be maintained, if required.

The western portion of the Site currently consists of an existing cul-de-sac off Johnny Appleseed Lane, a residential property with equestrian facilities, and undeveloped woodlands and fields. The Proponent proposed to construct a residential development consisting of approximately 117 single family, duplex and triplex units. Access would be provided by Johnny Appleseed Lane to the west, and White Pond Road to the east. A small piece of land along the western edge of the Site is located in the Town of Leominster. Access to the Site from Johnny Appleseed Lane was to be provided through Leominster. No structures were proposed in Leominster.

The project was projected to be built out in several phases:

- Phase 1: Construction of the retail and recreational components already constructed, including Dunkin', Mobil Gas Station and F.C. Stars Soccer Complex;
- Phase 2: Construction of the primary access road (extension of McGovern Boulevard) concurrent with construction of the water line extension and wastewater treatment plant. This phase would likely include abandonment of the existing water and sewer infrastructure that currently serves Dunkin' and Mobil Gas, as well as connections to the new water infrastructure;
- Phase 3: Construction of the Automotive Sales and Service Facility (Use "F"), as well as industrial uses "B" & D";
- Future phases: as previously mentioned, subsequent phases will be determined based on market demand.

Refer to **Figure 1.1** for a rendering of the ENF Master Plan entitled "Preferred Master Plan – ENF", dated 5/29/2019, and for a description of proposed uses.

Table 1.1: Preferred Master Plan - ENF

Land Use	Building/ Structure	Description	Units / Keys	Floorplate (Sq. Ft.)	Stories	GSF	Surface Parking	Trailer Parking	Loading Docks
Industrial	A	Industrial Building		1,020,000	1	1,020,000	587	316	214
	B	Industrial Building		150,000	1	150,000	146		32
	C	Industrial Building		42,000	1	42,000	24		5
	D	Industrial Building		145,000	1	145,000	83		13
	E	Industrial Building		37,500	1	37,500	84		15
	F	Industrial Building		42,000	1	42,000	92		5
	G	Industrial Building		37,500	1	37,500	95		15
	H	Industrial Building		42,000	1	42,000	42		5
	I	Industrial Building		37,500	1	37,500	84		15
	J	Auto Sales & Service Facility		14,400	1	14,400	72		0
Residential	K	Single Family, Duplex & Triplex Units	117	128,700	2	257,400			
	L	Multi-Family Apartments	140	44,650	4	178,600	260		
	M	Multi-Family Apartments	160	50,000	4	200,000	270		
	N	Multi-Family Apartments	200	64,500	4	258,000	210		
120 Room Hotel	O	Hotel	120	16,000	4	64,000	120		
Recreation	P	Existing Soccer Fields		5,000	1	5,000	276		
	Q	Indoor Sports Facility		86,500	1	86,500	216		
Retail	R	Proposed Retail		65,700	1	65,700	418		
		Existing Retail		7,300	1	7,300	59		
Total			**737**	**2,035,850**		**2,690,000**	**3,146**	**316**	**319**



DEVELOPMENT SUMMARY

LAND USE	BUILDING/ STRUCTURE	DESCRIPTION	UNITS	FLOORPLATE (SQ. FT).	STORIES	G.S.F.	SURFACE PARKING	TRAILER PARKING	LOADING DOCKS
INDUSTRIAL	A			1,020,000	1	1,020,000	587	316	214
	B			150,000	1	150,000	146		32
	C			42,000	1	42,000	24		5
	D			145,000	1	145,000	83		13
	E			37,500	1	37,500	84		15
	F			42,000	1	42,000	92		5
	G			37,500	1	37,500	95		15
	H			42,000	1	42,000	42		5
	I			37,500	1	37,500	84		15
	J	AUTO SALES & SERVICE FACILITY		14,000	1	14,000	80		
RESIDENTIAL	K	SINGLE FAMILY, DUPLEX & TRIPLEX UNITS	117	128,700	2	257,400			
	L	MULTI-FAMILY APARTMENTS	140	44,650	4	178,600	260		
	M	MULTI-FAMILY APARTMENTS	160	50,000	4	200,000	270		
	N	MULTI-FAMILY APARTMENTS	200	64,500	4	258,000	210		
HOTEL	O		120	16,000	4	64,000	120		
RECREATIONAL	P	EXISTING SOCCER FIELDS		5000	1	5000	276		
	Q	INDOOR SPORTS FACILITY		86,500	1	86,500	216		
RETAIL	R	PROPOSED RETAIL		65,700	1	65,700	418		
		EXISTING RETAIL		7300	1	7300	59		
TOTAL:			737	2,035,850		2,690,000	3146	316	319

CAPITAL GROUP PROPERTIES

CAPITAL COMMERCE CENTER

LANCASTER, MA

PREFERRED MASTER PLAN - ENF

DATE: 05/29/2019
PROJECT #: W181016

BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

Detailed Summary of Project Changes

At the time of the ENF filing, the ENF Master Plan was in the early stages of development. The project continues to evolve, and minor modifications have been made in response to comments and to increase the potential for industrial development on the site.

- Building K, approximately 30,000 GSF, has been added directly adjacent to Building B
- Buildings E, F, G and H (formerly Buildings E, F, H and I) have been reconfigured to maximize warehouse and industrial footprints to meet market demands
- Former location of Building G has been eliminated to reduce resource area impacts
- Building J site plan has been adjusted per end-user requests, and to reduce resource area impacts
- Residential Buildings L and M have been shifted to the west to reduce resource area impacts
- A vehicle turnaround has been added to the area adjacent to Industrial Building A to facilitate emergency vehicle movements
- Trailhead parking has been added to the area just south of the Access Drive near Building G, with connections to surrounding trails to the north and south of the proposed project
- A portion of the vehicle storage area associated with building J has been eliminated to provide more buffer to resource areas.

Revised Preferred Master Plan

As currently proposed under the Revised Preferred Master Plan (hereinafter referred to as the "Project"), the Project is now assumed to consist of approximately 3,056,500 sf of mixed-use development (an increase from 2,690,000 sf), continuing to include industrial space, residential units, a hotel, recreation facilities retail in response to market demands and feedback gathered during the ENF process. Refer to **Figure 1.2** for a rendering of the Revised Preferred Master Plan entitled "Preferred Master Plan – DEIR", dated 10/22/2019, and refer to for a development summary of the revised building program. The Project is expected to include approximately 3,028± parking spaces which represents a slight decrease from the 3,146 spaces depicted in the ENF Master Plan. The number of trailer parking areas has remained the same (316), but the number of loading docks has increased from 319 to 355. A trail connection has been added along the main access drive through the site, to better connect and link to existing trails from the north and south of the project.

Table 1.2: Preferred Master Plan – DEIR

Land Use	Building/ Structure	Description	Units / Keys	Floorplate (Sq. Ft.)	Stories	GSF	Surface Parking	Trailer Parking	Loading Docks
Industrial	A	Industrial Building		1,020,000	1	1,020,000	587	316	214
	B	Industrial Building		150,000	1	150,000	116		32
	C	Industrial Building		42,000	1	42,000	62		5
	D	Industrial Building		145,600	1	145,600	84		13
	E	Industrial Building		100,000	1	100,000	56		25
	F	Industrial Building		70,800	1	70,800	84		26
	G	Industrial Building		37,500	1	37,500	68		14
	H	Industrial Building		37,500	1	37,500	38		15
	J	Auto Sales & Service Facility		14,400	1	14,400	72		0
	K	Industrial Building		30,000	1	30,000	32		11
Residential	I	Single Family, Duplex & Triplex Units	117	272,000	2	544,000			
	L	Multi-Family Apartments	140	44,650	4	178,600	260		
	M	Multi-Family Apartments	160	50,000	4	200,000	270		
	N	Multi-Family Apartments	200	64,400	4	257,600	210		
120 Room Hotel	O	Hotel	120	16,000	4	64,000	120		
Recreation	P	Existing Soccer Fields		5,000	1	5,000	276		
	Q	Indoor Sports Facility		86,400	1	86,400	216		
Retail	R	Proposed Retail		73,000	1	73,000	477		
Total			**737**	**2,259,250**		**3,056,400**	**3,028**	**316**	**355**

N

W E

S

DEVELOPMENT SUMMARY

LAND USE	BUILDING/ STRUCTURE	DESCRIPTION	RESIDENTIAL UNITS	FLOORPLATE (SQ. FT.)	STORIES	NON-RESIDENTIAL G.S.F.	RESIDENTIAL G.S.F.	SURFACE PARKING	TRAILER PARKING	LOADING DOCKS
INDUSTRIAL	A	INDUSTRIAL BUILDING		1,020,000	1	1,020,000		587	316	214
	B	INDUSTRIAL BUILDING		150,000	1	150,000		116		32
	C	INDUSTRIAL BUILDING		42,000	1	42,000		62		5
	D	INDUSTRIAL BUILDING		145,600	1	145,600		84		13
	E	INDUSTRIAL BUILDING		100,000	1	100,000		56		25
	F	INDUSTRIAL BUILDING		70,800	1	70,800		84		26
	G	INDUSTRIAL BUILDING		37,500	1	37,500		68		14
	H	INDUSTRIAL BUILDING		37,500	1	37,500		38		15
	J	AUTO SALES 7 SERVICE FACILITY		14,400	1	14,400		72		0
	K	INDUSTRIAL BUILDING		30,000	1	30,000		32		11
RESIDENTIAL	I	SINGLE FAMILY, DUPLEX & TRIPLEX UNITS	117	272,000	2		544,000			
	L	MULTI-FAMILY APARMTNETS	140	44,650	4		178,600	260		
	M	MULTI-FAMILY APARMTNETS	160	50,000	4		200,000	270		
	N	MULTI-FAMILY APARMTNETS	200	64,400	4		257,600	210		
120 ROOM HOTEL	O			16,000	4	64,000		120		
RECREATION	P	EXISTING SOCCER FIELDS		5,000	1	5,000		276		
	Q	INDOOR SPORTS FACILITY		86,400	1	86,500		216		
RETAIL	R	PROPOSED RETAIL		73,000	1	73,000		477		
TOTAL			617	2,259,250		1,876,300	1,180,200	3,028	316	355

CAPITAL GROUP PROPERTIES

CAPITAL COMMERCE CENTER

LANCASTER, MA

PREFERRED MASTER PLAN - DEIR

DATE: 10/22/2019
PROJECT #: W181016

BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

Required Permitting

Local Permits

- Approval of Integrated Plan by Special Permit – Lancaster Planning Board
    - An application for this Special Permit has been submitted to the Lancaster Planning Board at the time of the preparation of this DEIR.
- Site Plan Review – Lancaster Planning Board
- Special Permit for proposed uses – Lancaster Planning Board
- Order of Conditions – Lancaster Conservation Commission
- Order of Conditions – Lunenburg Conservation Commission

State Permits

- Water Distribution System Modification Permits (as needed) - Massachusetts Department of Environmental Protection (MassDEP)
- Individual Permit for Sewage Treatment Plant (BRP WP 79) – MassDEP
- Hydrogeologic Evaluation Report Approval (WP 83) – MassDEP
- Vehicular Access Permit - MassDOT

Federal Permits

- National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) - Environmental Protection Agency (EPA)
- Obstruction Evaluation / Airport Airspace Analysis (OE/AAA) – Federal Aviation Administration (FAA)

All future uses will be subject to Site Plan Approval by the Planning Board under applicable sections of the Lancaster By-Law. Waivers and/or Special Permits may potentially be required from the Planning Board and will be sought on an as needed basis and in conformance with the applicable Lancaster Regulations during the design and permitting phase of the proposed Project.

The Project entails work within 100 feet of wetland resources as well as direct alteration of wetland resource areas, therefore each individual use will be required to file a Notice of Intent (NOI) with the Lancaster Conservation Commission under the Massachusetts Department of Environmental Protection (MassDEP) Wetlands Protection Act (WPA). Wetland resource areas, impacts, and mitigation on the eastern portion of the Site were previously approved by the Lancaster Conservation Commission via multiple Notices of Intent applications for which Orders of Conditions were issued between Fall of 2013 and Spring of 2017. These permits generally include the following:

- DEP File #193-0503
  Date of Issue: 9/18/13 (with subsequent amendment and extension)
  For: F.C. Stars Soccer Complex

- DEP File #193-0504
  Date of Issue: 10/3/13 (with subsequent amendment)
  For: Mobil Gas Station

- DEP File #193-0531
  Date of Issue: 6/28/16
  For: F.C. Stars Club House

- DEP File #193-0542
  Date of Issue: 4/25/17
  For: Well Construction

- DEP File #193-0543
  Date of Issue: 4/25/17
  For: Well Construction / Water Line

Portions of the water main construction in Lunenburg will also require an NOI with the Lunenburg Conservation Commission.

The Project will also require filing a Notice of Intent (NOI) with the United States Environmental Protection Agency (US EPA), which will include construction period erosion and sedimentation controls as required by the National Pollutant Discharge Elimination System (NPDES) General Construction Permit (CGP) as well as a Multi-Sector General Permit (MSGP). A Stormwater Pollution Prevention Plan (SWPPP) will be prepared prior to the start of construction and will be implemented by the site contractor under the guidance and responsibility of the Projects Proponent.

When detailed MEP engineering for the Project has been completed, all necessary air quality permits will be obtained from MassDEP in compliance with 310 CMR 7.00. Most fuel burning equipment will likely be self-certified under the Environmental Result Program (ERP) regulations at 310 CMR 7.26.

Project Funding

The project as currently design is proposed to be entirely privately funded.

2. ALTERNATIVES ANALYSIS

The following section provides a description of development alternatives considered by the Proponent. As requested by the EEA Secretary's Certificate on the ENF, this section includes additional information and updates regarding the following:

- Consideration of a "By-Right" Alternative;
- Additional descriptions for Alternative Master Plans A and C
- Consideration of a "Reduced Impact" Alternative; and
- Tabular comparison of the alternatives along with supporting narratives.

Summary of Alternatives

No-Build Alternative

The "No-Build" alternative is not in line with the Town of Lancaster and the Montachusett Regional Planning Commission (MRPC) municipal and regional strategic framework Plans. Currently, much of the property is an active gravel pit and the site has been targeted as a priority economic development area by the Town for many years. Therefore, the No-Build Alternative would not benefit or work towards the region's economic benefits and would remain an active gravel pit.

By-Right Alternative

The "By-Right" alternative does not require any Special Permits or variances. The site is located within the Enterprise District, EZ-A Sub District, and Residential District. The site is approximately 158 developable acres in the residential zone, and approximately 234 developable acres in the Enterprise District, of which 45 acres is designated as EZ-A Sub District.

The Residential District requires lots to have a minimum area of two acres and a minimum frontage of 225 feet. The developable area of the site within the Residential District is approximately 158 acres. This would allow for approximately 79 single family homes with associated right-of-way, infrastructure, and Town services.

The portion of the site fronting Lunenburg Road would be developed under the EZ-A Sub District, allowing for approximately 335,000 SF of retail space. The remaining portion of the development would be developed under the Enterprise District as office space, allowing for approximately 1.6 million square feet of base floorplate for building area.

The Site is also located within the Town of Lancaster's Integrated Planning Overlay District (IPOD), which allows for flexibility of uses within mixed-use developments. This zone was established to encourage a better mix of uses in this regional economic development area. Development under the IPOD zoning requires a Special Permit from the Planning Board and is thus excluded from the By-Right Alternative and is contemplated as part of the Preferred Master Plan and Reduced Master Plan Alternative.

The By-Right development would not be economically feasible for the Proponent, nor the Town. The cost of the infrastructure and Town services required to serve nearly 80 new single-family

homes would exceed the potential tax revenue for the Town. Office space has not been identified as a major need for the Town. It would also lack a significant industrial component, which the Town and market has indicated a need for. It would not meet the Town's goal to create a priority economic development area that could otherwise be achieved with the IPOD zoning.

Alternative Master Plan A - Residential

In this Alternative, the majority of the Site was evaluated for residential development with some retail and recreational uses included in the eastern portion. As mentioned previously, the Town has expressed concern with this significant of a residential development due to fears of impacts to the community and impacts on Town services. Additionally, the Town and market have expressed a need for industrial development. As such, this Alternative is provided to show potential impacts and is not something the Proponent intends to proceed with. A plan entitled "Capital Commerce Center – Alternative Master Plan A", dated 9/17/19 and provided in **Appendix C**, depicts approximately 2.8M± GSF of various uses on-site. The conceptual plan identifies three (3) residential villages in the center of the Site that vary by density:

- Active Adult Land Bay proposes 4 (four) dwellings/acre;
    - 112 Total Units
        - 86 Single Family Units
        - 26 Duplex Units

- Village Land Bay proposes ten (10) dwellings/acre;
    - 267 Total Units
        - 40 Single Family Units
        - 52 Duplex Units
        - 175 Multi-family garden-style apartment units

- Point Line Land Bay proposes three (3) dwellings/acre
    - 228 Single family units
        - 70x130' lot sizes

In addition to the residential uses mentioned above in the center portion of the Site, the Site would also consist of single family, duplex and triplex units in the western portion of the Site, and existing outdoor soccer fields, an indoor sports facility, a hotel, multi-family apartment buildings, and retail properties in the eastern portion of the Site. The full build-out of Alternative A would result in approximately 252± acres of altered land and 83± acres of impervious coverage. Total vehicular trips generated by Alternative A is 19,640± trips per day on a weekday.

The project would require approximately 385,430 gallons per day (GPD) potable water demand and 385,430± GPD wastewater generation as calculated using Title V for the building program as described above. Approximately 3,500 SF of impacts to Bordering Vegetated Wetlands (BVW) are proposed as part of the Project, along with 5,250 SF of mitigation. Approximately 30,925 SF of impacts to Bordering Land Subject to Flooding (BLSF) are proposed as part of the Project, along with 30,925 SF of mitigation. Approximately 437,216 of impacts to Riverfront Area (RFA) are anticipated.

This alternative results in increased trip generation, potable water use, and sanitary sewer generation compared with the other alternatives.

Several comments from members of the public were concerned with the scale of the residential component in the ENF Preferred Alternative, noting that the proposed development could increase the population of Lancaster by almost 25 percent (refer to public comment 6-3 in **Appendix J**). Alternative Master Plan A proposes an even greater residential component.

Based on the limited economic benefits generated from a mostly-residential development plan and concerns from the Town and abutters with the scale of the residential development, the Proponent does not feel that Alternative A is a viable option to pursue.

Refer to **Appendix C** for a rendering of the Alternative Master Plan A entitled "Alternative Master Plan A", dated 10/22/19.

Alternative Master Plan B – Equestrian

In late 2018, the Site was evaluated for an equestrian facility. The alternative plan depicted approximately 1.7M± GSF of mixed uses on-site. The Project would propose a racetrack centrally located on-site, consisting of a track, clubhouse, barns, employee housing, maintenance facility, and associated parking and infrastructure. The Site would also consist of single family, duplex and triplex units in the western portion of the Site, and a hotel, multi-family housing, existing outdoor soccer fields, and retail properties in the eastern portion of the Site. This alternative master plan was not identified by MEPA staff as requiring additional analysis and the Proponent does not believe that it is economically feasible at this time.

Alternative Master Plan C – Industrial

The alternative master plan is similar to the Preferred Master Plan and depicts 3.9M± GSF of mixed uses on-site, with a greater focus on industrial uses. The plan proposes construction of new industrial buildings, single family duplex and triplex units, multi-family apartments, a hotel, existing outdoor soccer fields, a new indoor sports facility, and retail space. The full build-out of Alternative C would result in approximately 271± acres of altered land, and 162± acres of impervious coverage. Total vehicular trips generated by the Alternative is 18,610± trips per day on a weekday.

The project would require approximately 134,390 gallons per day (GPD) potable water demand and 134,390 GPD wastewater generation as calculated using Title V for the building program as described above. Approximately 3,500± SF of impacts to Bordering Vegetated Wetlands (BVW) are proposed as part of the Project, along with 5,250 SF of mitigation. Approximately 30,925 SF of impacts to Bordering Land Subject to Flooding (BLSF) are proposed as part of the Project, along with 30,925 SF of mitigation. Approximately 437,216 of impacts to Riverfront Area (RFA) are anticipated.

The Proponent determined that the Alternative C was not best suited for the development of the site as it removes the auto sales portion of the site. This use is a critical component of the development with a market and need in the State. As such, it is currently proposed in the first phase of the project. This component will provide significant portions of the infrastructure costs for the development of the roadway into the Site, which will support the future industrial uses.

Additionally, the Proponent does not believe that the market could support an additional 850,000 SF of industrial uses on the Site. Therefore, Alternative C is not a viable alternative.

Refer to **Appendix C** for a rendering of the Alternative Master Plan C entitled "Alternative Master Plan C", dated 10/22/19.

Reduced Impact Alternative

The Reduced Impact Alternative is similar to the DEIR Preferred Master Plan but depicts a reduction to 2.5M± GSF of mixed uses on-site by eliminating a significant portion of the residential units located primarily in the northwest corner of the property. (The Proponent does not control this portion of the Site, nor do they intend to in the future.) The plan proposes construction of new industrial buildings, single family duplex and triplex units, multi-family apartments, a hotel, existing outdoor soccer fields, a new indoor sports facility, and retail space. The full build-out of the Reduced Impact Alternative would result in approximately 230± acres of altered land, and 153± acres of impervious coverage. Total vehicular trips generated by the Alternative is 14,668± trips per day on a weekday.

The project would require approximately 120,365 gallons per day (GPD) potable water demand and 120,365 GPD wastewater generation as calculated using Title V for the building program as described above. Approximately 3,500 SF of impacts to Bordering Vegetated Wetlands (BVW) are proposed as part of the Project, along with 5,250± SF of mitigation. Approximately 30,925 SF of impacts to Bordering Land Subject to Flooding (BLSF) are proposed as part of the Project, along with 30,925 SF of mitigation. Approximately 313,532 of impacts to Riverfront Area (RFA) are anticipated, a reduction of approximately 124,000 SF from the Preferred Alternative due to the removal of the residential area in the northwest corner of the property.

Refer to **Appendix C** for a rendering of the Reduced Impact Alternative entitled "Reduced Impact Alternative", dated 10/22/19.

DEIR Preferred Master Plan

This site has been identified as a priority housing and economic development area in the Town of Lancaster, as indicated on a map developed by the Montachusett Regional Planning Commission (MRPC), and is therefore the focus of the project. Evaluation has been limited to this site only and no off-site property has been included in this assessment. The Town has targeted the area along Route 2 and Route 70 (Lunenburg Road) for economic development for many years. In 1990, the Town designated this area as an Economic Opportunity Area, and in the 2007 Town Master Plan labeled it as an Enterprise area. Since then, several initiatives have been introduced, such as the creation of two (2) mixed-use overlay districts identified as the Integrated Planning Overlay Districts (IPODs), and the designation of the Route 2 and 70 areas as Priority Development Sites in the Chapter 43D Expedited Permitting Program. The Town has also identified priority preservation areas located on and within proximity to the Site.

The Preferred Alternative proposes 3.0M± GSF of mixed uses on-site. The Project will include the construction of new industrial buildings, an automotive sales facility, single family duplex and triplex units, multi-family apartments, a hotel, existing outdoor soccer fields, a new indoor sports

facility, and retail space. This alternative has the most robust mix of uses, which have shown to be desirable and have the most demand in this market.

As described earlier in the report, the community may not be fully supportive of residential portion of the development at the level proposed. The Proponent is fully willing to remove or reduce the level of residential development and has proposed the current level of residential development to meet the current Town zoning requirements. The Proponent is working closely with the representatives from the Town to potentially eliminate or minimize this requirement and will bring forth an application to be heard at the May Town meeting. That said, the residential component has been included in the overall impact analysis to evaluate the surrounding infrastructure if and/or when an appropriate time comes to introduce such a use considering it is the most significant from an infrastructure component. Additionally, the Proponent will continue to work with the Town to determine the appropriate amount of residential and industrial uses for the property through the IPOD special permit approval process.

The construction of an on-site wastewater treatment plant is proposed to treat approximately 157,385± GPD sewer flow generated by the preferred alternative. A 2.5± mile water line extension is proposed From Lunenburg to service the approximately 157,385± GPD water service required on-site. The full build-out of the Preferred Alternative would result in approximately 275± acres of altered land and 173± acres of impervious coverage. Total vehicular trips generated by the Preferred Alternative is 17,630± trips per day on a weekday, the lowest of all the alternatives. The Proponent met with MassDOT and MassDEP on numerous occasions to introduce the Preferred Master Plan.

Approximately 3,500± SF of impacts to Bordering Vegetated Wetlands (BVW) are proposed as part of the Project, along with 5,250 SF of mitigation. Approximately 30,925 SF of impacts to Bordering Land Subject to Flooding (BLSF) are proposed as part of the Project, along with 30,925 SF of mitigation. Approximately 437,216 of impacts to Riverfront Area (RFA) are anticipated. The future impacts to RA and BLSF and proposed mitigation will be quantified further as the Master Plan evolves.

Refer to **Appendix C** for a rendering of the DEIR Preferred Master Plan entitled “Preferred Master Plan”, dated 10/22/19.

The Preferred Master Plan is considered the best use of the property by providing the maximum benefit to the Town of Lancaster. The Preferred Alternative proposes to limit environmental impacts while promoting economic growth, creating high-quality jobs, and providing various housing options. The DEIR Preferred Master Plan has therefore been determined to be the best use of the property.

Quantitative Comparison of Alternatives

Refer to **Table 2.1** for a comparison of project alternative uses and **Table 2.2** for a comparison of project alternative impacts. The Project is limited to this Site and considers no other property in Town due to the Proponent and the Town’s interests for development of the Site. It is the Town’s objective to develop this Site in a way that limits environmental impacts, promotes economic growth, facilitates respectful development, and creates high-quality jobs. The Project appears to

be the best use of the property and proposes a reduced alternative, providing an appropriate balance on the Town's goals and objectives and environmental impacts.

The impacts to wetland resources areas including Bordering Vegetated Wetlands (BVW), Bordering Land Subject to Flooding (BLSF), and Riverfront Area are largely the same between alternatives. The majority of the impacts to resource areas are due to the construction of the roadway, which remains the same between the alternatives. All resource area quantities include impacts from Phase 1, which was already constructed.

Table 2.1: Project Alternatives Comparison

Building Program / Use	Alternative*				
	No Build Alternative	**Alternative A**	**Alternative C**	**Reduced Impact Alternative**	**Preferred Alternative**
Gravel Pit Use (ac)	75±	-	-	-	-
Industrial Use (GSF)	-	-	2,503,400±	1,647,800±	1,647,800±
Residential Use (GSF)	-	2,118,000±	1,180,200±	636,200±	1,180,200±
Hotel Use (GSF)	-	64,000±	64,000±	64,000±	64,000±
Recreational Use (GSF)	5,000± (exist.)	91,500±	91,500±	86,500±	91,500±
Retail Use (GSF)	7,100± (exist.)	80,100±	80,100±	23,400±	80,100±
Total (GSF)	**12,100**±	**2.3M±**	**3.9M±**	**2.5M±**	**3.0M±**

Table 2.2: Project Alternative Impact Comparison

Project Impacts	Alternative*				
	No Build Alternative	**Alternative A**	**Alternative C**	**Reduced Impact Alternative**	**Preferred Alternative**
Total Building Program (GSF)	7,100± (exist.)	2.3M±	3.9M±	2.5M±	3.0M±
Total Impervious Coverage (Ac)	13±	83±	162±	153±	173±
Total Disturbed Land Area (Ac)	216±**	252±	271±	230±	275±
New Land Alteration (Ac)	-	36±	55±	14±	59±
Impacts to BVW (SF)	-	3,500± (impact) 5,250± (mitigation)	3,500± (impact) 5,250± (mitigation)	3,500± (impact) 5,250± (mitigation)	3,500± (impact) 5,250± (mitigation)
Impacts to BLSF (SF)	-	30,295± (impact) 30,295± (mitigation)	30,295± (impact) 30,295± (mitigation)	30,295± (impact) 30,295± (mitigation)	30,295± (impact) 30,295± (mitigation)
Impacts to RFA (SF)	-	437,216 ±	437,216 ±	313,532 ±	437,216 ±
Parking Spaces	353 (car) (exist.)	2,120± (car)	3,740± (car) 530± (trailer)	2,400± (car) 320± (trailer)	3,030± (car) 320± (trailer)
Total trips per day	6,356	19,640±	18,368±	14,668±	17,630±
Water Demand (GPD)	2,000± (exist.)	385,430±	134,390±	120,365±	157,385±
Wastewater Demand (GPD)	2,000± (exist.)	385,430±	134,390±	120,365±	157,385±

*Alternative B not determined by MEPA staff to require further analysis, and the developer does not believe it is economically feasible at this time

** 75± acres of existing disturbed land is an active gravel pit

3. LAND ALTERATION

Existing Conditions

The Site consists of approximately 471± acres of land and is bordered by woods, wetlands, and residences to the north, Route 190 to the west, woods, wetlands and the North Nashua River to the south, and Lunenburg Road and Kimball Farm to the east. A portion of the Site to the east was recently developed as part of the Lancaster Crossing development project with a Dunkin', Mobil Gas Station, and soccer fields (F.C. Stars Soccer Complex) with associated driveways, parking areas, utilities, and stormwater management systems. McGovern Boulevard was constructed as the main access point to the Site and to access the Lancaster Crossing development from Lunenburg Road. The existing JB Hunt Trucking facility remains in the eastern portion of the Site with access from Lunenburg Road. A portion of the Site to the west, located off Johnny Appleseed Lane, consists of an existing residence, horse barn, horse track, and associated parking areas and utilities, as well as undeveloped areas consisting of woods and fields. A small piece of land on the westernmost edge of the Site is located within the Town line in Leominster. The remaining portion of the overall Site consists of a gravel pit and gravel access roads, as well as undeveloped fields, woodland, and wetlands. A small parcel of land, located in the central portion of the Site, is land-locked and is not included as part of the Project.

The Site has considerable topographic relief with elevations ranging from a maximum of 514 feet to a minimum of 266 feet adjacent to wetlands. Slopes range from approximately 0.5±% to more than 70%. Development of the Site will involve earthwork efforts, including site clearing, earth excavation, ledge removal, stockpiling and removal of materials, and potential dewatering.

Open Space

The Site is located adjacent to the Lancaster State Forest and within the Central Nashua River Valley ACEC, which was designated to bring attention to and better protect the associated rivers, wetlands and ponds, and associated wildlife. The Site includes McGovern Brook, tributary streams, and priority wetlands. No impacts are proposed within designated open space areas and the Proponent will work with the Town of Lancaster to designate open space areas on the Site where feasible.

The regional plans discuss the preservation of open space, resource areas and protected areas. The vast network of wetland resource areas on-site limits the developable area on-site and will ensure significant wildlife habitats are protected as a result of the future build-out. In addition, the proposed Project will meet the open space requirements as required by the Town of Lancaster.

Within the Integrated Planning Overlay District, a minimum of 20% open space is required. Additionally, not less than 10% of the Integrated Plan area disturbed by development shall be devoted to pedestrian walks or plazas and landscaping. Subsequent plans to be submitted for local permits will meet or exceed the above Zoning requirements. The project as currently proposed will donate two parcels of land abutting the State forest, totaling 86.7 acres as open space.

Site Clearing / Earthwork

Approximately 216± acres (46%) of the existing Site is developed. The Project proposes to develop approximately an additional 59± acres, resulting in approximately 58% of the overall Site developed in the final build-out condition.

To accommodate the Project, tree clearing, stump removal, grubbing and excavation will be required at the start of construction. Topsoil will be stripped and stockpiled for re-use on-site and surplus quantities will be offered to local farmers.

Given the existing topographical relief across the Site, substantial earthwork is expected. The Project seeks to reduce the amount of material import or export on-site to the maximum extent practicable. A high-level cut/fill analysis was performed based on preliminary grades associated with the proposed Project and the project is anticipated to be in a generally balanced earthwork condition accounting for the various phases of the project. Refer to the Conceptual Heat Map Exhibit in **Appendix B**. It is noted that this analysis excludes the residential component located off Johnny Appleseed Lane. Currently the developer does not control this land, nor do they intend to at any point in the future. However, this area has been included in the master and alternative plans as requested by MEPA as part of the original scope for the project. Should this area be developed in the future it is likely that the earthwork would be evaluated on an individual basis with an overall intent of balancing the earthwork to the maximum extent practicable.

The earthwork analysis will continue to be refined as the design of the individual programs for each lot is developed with the overall goal of maintaining a generally balanced earthwork condition. Building foundation walls will act as retaining walls in locations adjacent to wetlands. Site retaining walls will be incorporated to raise roadway and parking lot grades as necessary. Where feasible, proposed elevations will be adjusted during Project build-out to balance the cut and fills to the maximum extent practicable. Areas that will require earthwork will be managed in accordance with all Local, State and Federal regulations.

The Proponent will strive to preserve the existing nature of the Site, and limits of construction will be minimized to the maximum extent practicable. Refer to the Construction Management Plan provided in **Appendix I** for further information regarding stripping and stockpiling of materials, as well as the Conceptual Heat Map Exhibit identifying areas of cut/fill on-site in **Appendix B.**

Ledge Removal

The majority of the existing land area is an active gravel pit and based upon existing soils information the amount of ledge to be encountered on site is anticipated to be minimal. Should ledge be encountered, removal will be managed in accordance with all Local, State and Federal regulations. Refer to **Appendix B** for the Construction Management Plan for more information.

Building and Impervious Coverage

The project currently consists of approximately 3,056,500 sf of mixed-use development including industrial space, residential units, a hotel, and recreation facilities. The buildings range in size from 15,000 GSF to 1,020,000 GSF, ranging in height from 1 to 4 stories. The total building coverage will be approximately 52± acres.

The Project is expected to include approximately 3,028± parking spaces which represents a slight decrease from the 3,146 spaces depicted in the ENF Master Plan. The number of trailer parking areas has remained the same (316), but the number of loading docks has increased from 319 to 355. A trail connection has been added along the main access drive through the site, to better connect and link to existing trails from the north and south of the project.

Based on the parking requirements for the Town of Lancaster, the Project will provide 3,028 parking spaces to accommodate the various uses. The project will result in approximately 108± acres of new impervious area consisting of roadways, parking spaces, drive aisles, pedestrian accommodations and other impervious areas. The Proponent will consider seeking relief for reduced width drive aisles from the Planning Board where safe/appropriate. Porous pavement, reserve parking, and compact parking spaces will also be considered on a case-by-case basis as a means to further reduce impervious areas on-site.

Refer to **Table 3.1** below for a comparison of proposed Project impacts compared to the existing Site conditions.

Table 3.1: Proposed Project Impacts

	Existing	Change	Total
Footprint of buildings	0.2± acres	51.8± acres	52± acres
Internal roadway areas / Parking and other paved areas	12.8± acres	108.2± acres	121± acres
Other altered areas	203± acres	-101± acres	102± acres
Undeveloped areas	255± acres	-59± acres	196± acres
Total: Project Site Acreage	**471± acres**	**0**	**471± acres**

4. WETLAND RESOURCE AREAS

Existing Conditions

The existing site consists largely of an active earth removal and processing facility and agricultural fields. The site contains wetland resource areas associated with White Pond, McGovern Brook and several of its tributary streams, as well as several isolated wetlands. The off-site water line route along roadways in Lunenburg and Leominster includes two, unnamed perennial streams and associated wetlands. Regulated resource areas on the project site include Bordering Vegetated Wetland and associated Buffer Zones, Inland Bank and associated Buffer Zones, Riverfront Area, Land Under Water, ponds (as defined in the Lancaster Wetland Bylaw), vernal pools with associated Vernal Pool Habitat and Bylaw 100-foot boundary extension from Mean Annual High Water, Bordering Land Subject to Flooding (FEMA-mapped 100-year floodplain Zone "A") with Bylaw 100-foot Buffer Zone to Bordering Land Subject to Flooding boundaries, Isolated Land Subject to Flooding and Isolated Vegetated Wetland. There are no Estimated or Priority Habitats of Rare Species present on the site. There is one Certified Vernal Pool present and located within wetland CD.

In 2018, EcoTec, Inc. delineated wetland resource areas and obtained an Order of Resource Area Delineation ("ORAD") under DEP File: CE 193-0554 for the 347-acre portion of the project site which is currently in use for earth removal and agriculture. The approved wetland boundaries and associated buffers are depicted on the project plans. During the course of review for the ORAD, it was noted that a farm pond/wash pond had been recently filled. This feature was noted on the approved plans as "Approximate Limits of Former Farm Pond/Wash Pond (to be mitigated). Area = 1,815± square feet.". An agreement was reached, with the Lancaster Conservation Commission, that mitigation for the fill in this area would be provided as part of any future project to be permitted on the site.

Wetlands associated with the proposed, off-site water line have not yet been delineated but are expected to be well-defined by the limits of disturbance associated with the existing public roadways. Wetlands associated with the Area K housing complex have not been recently delineated but are depicted in concept based on prior delineations and existing topography. This area is not under control of the Proponent and is not planned to be developed. It is included to address anti-segmentation requirements.

Wetland resource area impacts and mitigation associated with the existing portions of McGovern Boulevard were previously permitted and constructed (by others) under Orders of Conditions for DEP files #193-0503, #193-0504, #193-0531, #193-0542 and #193-0543 (as detailed in **Section 1**). Wetland-related work completed included a roadway crossing of McGovern Brook and an intermittent stream roadway crossing as well as associated wetland replication, referred to as Phase I.

For more information, refer to the Project Maps provided in **Appendix B**, the Existing Conditions Plan provided in **Appendix B**, and the "Wetland Resource Evaluation", prepared by EcoTec, Inc. provided in **Appendix D**.

Outstanding Resource Water (ORW)

One (1) certified vernal pool is located in the western portion of the site (Refer to the MassGIS NHESP Map in **Appendix A**). In addition, the North Nashua River, located south of the project Site, is considered a Class B Outstanding Resource Water.

Massachusetts Water Resources Commission Stressed Basins

Based on Figure 5: Stressed Basin Map, provided in a report entitled "Stressed Basins in Massachusetts", prepared by the Commonwealth of Massachusetts Water Resources Commission, dated December 13, 2001, flows from the site are located within the Nashua Watershed which is identified as a medium Stress Basin. Refer to **Appendix A**.

Federal Emergency Management Agency (FEMA)

According to the most recent Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA) and the MassGIS Online Mapping Tool (Oliver), portions of the Site to the north and east are located within Zone A: 1% Annual Chance of Flooding (100-year flood). A small portion of the Site along the southern perimeter is located within Zone AE: 1% Annual Chance of Flooding (100-year flood) and Zone X: Areas of 0.2% annual chance flood. Refer to the FEMA map provided in **Appendix A.**

Given the existing topography on the Site, all proposed buildings and associated site work are anticipated to be several feet above the floodplain elevation. As such, the development of the lots is not anticipated to impact the floodplain. The Project will be designed in full compliance with the Stormwater Management Standards and will meet or exceed the Standards.

Areas of Critical Environmental Concern (ACEC) / Rare Species

According to the latest addition of the Massachusetts Natural Heritage Atlas, 14th edition, there are no areas of Priority Habitats or Estimated Habitats located on the Site. The southern half of the site is located within the Central Nashua River Valley ACEC. Refer to the Natural Heritage & Endangered Species and ACEC Maps provided in **Appendix A**.

Proposed Conditions

Work on the Capital Commerce Park Project is proposed within the 100-foot Buffer Zone as well as Wetland Resource Areas including Bank, Bordering Land Subject to Flooding, Land Under Water and Riverfront Area, referred to as Phase II. A table summarizing Wetland Resource Area Impacts & Mitigation is included under **Section 10** (Mitigation Summary).

Tree clearing will be limited to areas outside the 100-foot Buffer Zones to wetlands, where possible. In areas where tree clearing cannot be avoided, it will be limited to areas outside the 25-foot Buffer Zone to wetlands. To our knowledge, there are no unique geologic formations on the project site. Existing, undisturbed wildlife corridors are limited to the northerly and southerly portions of the site and significant portions of them will be preserved, as depicted on the project plans.

Approximately 3,500 square feet of Bordering Vegetated Wetland will be impacted at the proposed widening of the existing intermittent stream crossing for McGovern Boulevard.

Work in Bank and Land Under Water is limited to upgrades of the existing intermittent and perennial stream crossings for McGovern Boulevard and to the farm pond/wash pond that was filled.

Work in Bordering Land Subject to Flooding is limited to the upgrade/widening of the existing Phase I roadway crossing of McGovern Boulevard at McGovern Brook. Approximately 15,000 square feet of Bordering Land Subject to Flooding will be impacted for this upgrade.

Approximately 394,982 square feet of Riverfront Area work is proposed associated with parking areas in the westerly part of the site, with the upgrade of the existing McGovern Brook crossing at McGovern Boulevard and with build-out of existing disturbed areas adjacent to McGovern Brook in Phase I. The proposed parking areas are within existing agricultural fields associated with the unnamed perennial stream in the westerly part of the site.

Mitigation and Performance Standards

The project will comply with the Wetlands Protection Act performance standards for all wetland resource areas as per 310 CMR 10.54 to 10.58.

No new stream crossings are proposed. The two existing stream crossings to be upgraded will comply with the stream crossing standards for replacement crossings including spanning the Bankfull width and providing the required openness ratio. Restoration of the stream channels will take place within the proposed stream culvert structures and will include restored Bank and Land Under Water at a minimum ratio of 1:1.

Bordering Vegetated Wetland to be impacted due to upgrade of the existing McGovern Boulevard intermittent stream crossing will be mitigated with a fully compliant wetland replication area at a minimum ratio of 1.5 (replicated) to 1 (impacted).

Work is proposed within two Riverfront Areas. This work will comply with the Inner Riparian Zone disturbance restrictions as well as the 10% threshold for Outer Riparian Zone disturbance. An alternatives analysis to justify work within the Outer Riparian Zone will be provided.

Work proposed within Bordering Land Subject to Flooding will meet requirements for compensatory storage and wildlife habitat restoration, where applicable.

The 1,815 square foot former farm pond/wash pond that was filled will be replicated in-kind and on-site at a minimum ratio of 1.5 (replicated) to 1 (impacted). No other impacts to wetland resource areas are proposed.

5. STORMWATER MANAGEMENT

Existing Conditions

The subject property (the "Site") contains approximately 471± acres of land and is bordered by woods, wetlands, and residences to the north, Route 190 to the west, woods, wetlands and the North Nashua River to the south, and Lunenburg Road and Kimball Farm to the east. A portion of the Site to the east was recently developed as part of the Lancaster Crossing development project with a Dunkin', Mobil Gas Station, and soccer fields with associated driveways, parking areas, utilities, and stormwater management systems. The existing JB Hunt Trucking facility remains in the eastern portion of the Site with access from Lunenburg Road. A portion of the Site to the west, located off Johnny Appleseed Lane, consists of an existing residence, horse barn, horse track, and associated parking areas and utilities, as well as undeveloped areas consisting of woods and fields. A small piece of land on the westernmost edge of the Site is located within the Town line in Leominster. The remaining portion of the overall Site consists of a gravel pit and gravel access roads, as well as undeveloped fields, woodland, and wetlands. A small parcel of land, located in the central portion of the Site, is land-locked and is not included as part of the Project.

Stormwater generated onsite flows overland to one of three (3) onsite wetland systems or the McGovern Brook. The two wetland systems to the south of the site flow offsite to the south and is associated with the Nashua River Watershed. The wetland system to the north of the site flow offsite to the start of the McGovern Brook. The McGovern Brook flows through the site and connects to the Nashua River to the south of the site. Runoff for the eastern portion of the site is collected by stormwater management systems associated with the recently constructed developments along Lunenburg Road. Elevations onsite range from a maximum of 420 feet at the western edge of the property to 280 feet at the southern end of the McGovern Brook. Slopes onsite range from approximately 30% to 1.0%.

Proposed Conditions

The Project will increase the amount of impervious area by approximately 160± acres. The resulting increase in runoff will be mitigated by the construction of surface and subsurface infiltration/detention basins. Stormwater runoff from paved surfaces will be collected in a series of deep-sump, hooded catch basins and conveyed to stormwater quality units for treatment prior to discharge to surface or subsurface infiltration/detention basins to provide water quality treatment, recharge, and peak rate attenuation. Stormwater runoff from buildings will be collected below grade and piped to surface or subsurface infiltration/detention basins to provide recharge and peak rate attenuation.

Mitigation and Stormwater Management Standards

The drainage system will be designed to meet or exceed MassDEP Stormwater Standards (the "Standards") and the Town of Lancaster Stormwater Management Rules & Regulations by attenuating runoff rates to less than the pre-development condition, providing 44% pre-treatment TSS removal prior to infiltration, providing a minimum 80% total TSS removal prior to discharge, retaining the volume of runoff equivalent to, or greater than, 1-inch multiplied by the total post-construction impervious surface area on the site, and promoting groundwater recharge. Additional

Best Management Practices (BMPs), such as deep-sump, hooded catch basins, proprietary stormwater quality units, and forebays, will be incorporated into the design to further enhance the systems treatment effectiveness.

Stormwater runoff will be treated for TSS removal using the combination of deep sump hooded catch basins, forebays, proprietary stormwater quality units and infiltration basins prior to discharge. The proposed drainage design will be consistent with maintaining natural drainage flow patterns to the extent practicable, and will utilize BMPs, including surface and subsurface infiltration/detention basin systems, to promote groundwater recharge and attenuate peak rates of runoff.

Low impact development (LID) techniques to be considered for use on the individual lots consist of raingardens, bioretention areas, tree box filters, porous pavement, water quality swales, and green roofs. These techniques will be considered on a case-by-case basis as appropriate and feasible due to site constraints (i.e. soil conditions, seasonal high groundwater, site availability, etc.) during the design and permitting stages of the Project.

The Project proposes to collect and treat all stormwater runoff generated by the site within on-site stormwater systems that will ultimately discharge to wetland areas, similar to existing Site conditions. There are no anticipated piped connections to off-site stormwater infrastructure. The Proponent will work with the Town of Lancaster to evaluate and mitigate any potential impacts to the existing stormwater infrastructure and to resource areas on and surrounding the Project site.

Stormwater Standards

The Proponent will demonstrate compliance will all applicable stormwater standards and the Lancaster Rules & Regulations as further described below.

Standard #1: No New Untreated Discharges: The Project will be designed so that proposed impervious areas shall be collected and passed through the proposed drainage systems for treatment prior to discharge. Therefore, there will be no new untreated discharges proposed as part of the Project.

Standard #2: Peak Rate Attenuation: The Project and associated proposed stormwater management systems will be designed so that post-development peak rates of runoff are below pre-development conditions for the 2-, 10-, 25- and 100-year storm events at all design points..

The stormwater management system proposed as part of the Project results in a reduction in peak rates of runoff from the Site when compared to pre-development conditions for the 2-, 10-, 25- and 100-year storm frequencies. The pre-development versus post-development peak discharge rate comparisons are contained in **Table 5.1** below.

Table 5.1: Design Point Peak Runoff Rate Summary

Point of Analysis	2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP1	3.30	2.09	**-1.21**	28.57	19.96	**-8.61**	53.09	36.41	**-16.68**	100.70	66.02	**-34.68**
DP2	6.14	0.00	**-6.14**	22.33	1.04	**-21.29**	33.22	1.94	**-31.28**	51.08	5.93	**-45.15**
DP3	16.65	5.86	**-10.79**	81.83	40.06	**-41.77**	132.66	71.51	**-61.15**	222.25	129.24	**-93.01**

Rainfall values used in the hydrologic model are provided in **Table 5.2** below and are derived from the Hydrology Handbook for Conservation Commissions prepared by MassDEP (TP-40 Maps).

Table 5.2: Rainfall Intensities

Frequency	2-year	10-year	25-year	100-year
Rainfall (inches)	3.00	4.50	5.30	6.50

Standard #3: Recharge: Proposed stormwater management systems will be designed to ensure that groundwater recharge is provided for the increase in impervious area associated with the Project. Recharge will be provided in accordance with the guidance provided in Volumes 2 & 3 of the Massachusetts Stormwater Handbook. Infiltration BMPs will be designed to drain completely within 72 hours of the end of the storm event, and drawdown calculations will be included in the associated Stormwater Reports prepared for the proposed Project. Soil testing will be performed at the locations of all infiltration BMPs to ensure adequate separation to estimated seasonal high groundwater (ESHGW) is provided in accordance with the Standards.

Standard #4: Water Quality: Pretreatment of stormwater runoff will be provided by a mix of deep-sump hooded catch basins, proprietary water quality units, and forebays prior to discharge into surface or subsurface stormwater detention/infiltration basins.

Water quality treatment will be provided within the proposed stormwater basins which will meet or exceed the required 1-inch water quality volume per the Standards. This volume will be retained below the lowest outlets within the basins. Water quality units will be sized to meet the required 1-inch water quality flow rate. Stormwater management systems will be designed to provide 44% TSS removal for pretreatment prior to infiltration, and a total of 80% minimum TSS removal prior to discharge.

Standard #5: Land Use with Higher Potential Pollutant Loads: The proposed Project involves "Land Uses with Higher Potential Pollutant Loads" because on-site vehicular trips per day are expected to exceed 1,000. Accordingly, the Project will provide 44% TSS removal prior to infiltration, and infiltration basins and proprietary treatment units will be designed for the 1-inch water quality volume.

Standard #6: Critical Areas: The Site contains critical areas; therefore, the stormwater management systems will be designed for the 1-inch water quality volume, will provide 44% TSS

removal prior to infiltration, and will provide a total of 80% TSS removal. Stormwater systems will be designed in accordance with Volume 2 of the Stormwater Handbook.

Standard #7: Redevelopment: The Project is considered a mix of new development and redevelopment; however, the Site will be designed as if it is a new development.

Standard #8: Construction Period Pollution Prevention and Erosion and Sedimentation Control: The proposed Project will provide construction period erosion and sedimentation controls including but not limited to construction exits, protection for stormwater inlets, protection around temporary material stock piles, and various other techniques as outlined in the Construction Management Plan provided in **Appendix I**. Portions of the Project that have not yet been designed or permitted are required to file a Notice of Intent (NOI) with the US EPA, and the Project is required to implement a Stormwater Pollution Prevention Plan (SWPPP) during the construction period. The SWPPP will be prepared prior to the start of construction and will be implemented by the site contractor under the guidance and responsibility of the Project's proponent.

Standard #9: Operation and Maintenance Plan (O&M Plan): An Operation and Maintenance (O&M) Plan will be provided as part of the associated Project filings. The O&M Plan will outline procedures and time tables for the long-term operation and maintenance of the proposed site stormwater management system, including initial inspections upon completion of construction, and periodic monitoring of the system components, in accordance with established practices and the manufacturer's recommendations. The O&M Plan will include a list of responsible parties for inspections and maintenance.

Standard #10: Prohibition of Illicit Discharges: The Proposed stormwater management systems will only convey allowable non-stormwater discharges (firefighting waters, irrigation, air conditioning condensates, etc.) and will not contain any illicit discharges from prohibited sources.

6. UTILITY & INFRASTRUCTURE

Water Supply & Mitigation Strategies

An existing PWS well is located in the eastern portion of the Site on Parcel L3, Lot 14-8A and permitted for 3,000 GPD withdrawal. The well was previously permitted for use at the former Lancaster Flea Market & Agway Store located off-site at 1340 Lunenburg Road, currently Nationwide Auto Recycling, but was never put into service.

A concrete water tank of approximately 200,000 gallons was constructed to the northeast in an area known as McGovern Hill. The tank provides the Nationwide Auto Recycling building, located off-site, with non-potable water via a 10-inch diameter underground water pipe that runs within the layout of McGovern Boulevard and adjacent to Lunenburg Road. Service connections have also been made to fire hydrants located in McGovern Boulevard and Lunenburg Road and are available for use by the Lancaster Fire Department. It should be noted that neither the Dunkin' or Mobil Gas Station properties require a fire suppression sprinkler system.

The recently constructed Dunkin' and Mobil Gas Station located in the eastern portion of the Site are serviced by individual Public Water Supply (PWS) wells located on Parcels 14-4H-1A (Lot 4G) and 14-4H-1B (Lot 4N), respectively. Both wells provide approximately 1,000± GPD potable water to the properties.

Three (3) soccer fields and associated parking lots were recently constructed in the eastern portion of the Site. There are no known water services to the soccer facilities.

The existing JB Hunt Trucking facility located in the eastern portion of the Site is serviced by a private water well.

The existing residence and horse barn/track located in the western portion of the Site are likely serviced by a private on-site well.

Hydrants were observed servicing the gravel operation in the central portion of the Site.

The project is estimated to generate approximately 157,385± gallons per day (GPD) of potable water demand. The Proponent conducted a feasibility study for development of an on-site public water supply, however it was determined that the yield was insufficient to satisfy the demand of the Project. For this reason, the Proponent investigated other potential water sources, and has executed a Memorandum of Understanding (MOU) with the Lunenburg water district to service the Project. An Intermunicipal Agreement is currently being developed under which the Town of Lancaster will purchase water from the Lunenburg water district. Luneburg will read the meters and bill Lancaster, who will in-turn bill individual users.

A 2.5± mile water line extension is proposed to extend from the connection point at the intersection of Leominster Shirley Road and Reservoir Road in Lunenburg to the north, to the Site at McGovern Boulevard off Lunenburg Road in Lancaster. The proponent will provide funds to design and construct the water main infrastructure needed to extend from Lunenburg to Lancaster. This will support the development and provide opportunity for future connection to all parcels of land along the 2.5-mile route. Water service to the existing Dunkin' and Mobil Gas Station uses is currently

provided via two (2) existing PWS wells located on the Site on the west side of McGovern Brook. Following the construction of the water line extension, these wells will be abandoned, and the properties will be serviced from the new water main.

As noted in the ENF Certificate, the Lancaster Water District (LWD) is authorized by MassDEP's Water Management Act (WMA) to withdraw an annual average volume of 0.54 million gallons per day (MGD). Actual withdrawals from 2016 through 2018 ranged from 0.51 to 0.54 MGD; therefore, LWD will need to increase its authorization for water withdrawal.

Also noted in the ENF Certificate, the LWD submitted a WMA Permit application on December 8, 2018 to increase its withdrawal volume and add a new wellfield. MassDEP issued approval of the wellfield site and the proposed pumping test on September 21, 2017. The pumping test was scheduled for late summer 2019 and has been completed at this time. The Town of Lunenburg will be compiling the testing information for submittal to DEP which will be reviewed concurrently with the WMA Permit application.

Buildings will incorporate fire suppression sprinkler systems, as required by the Massachusetts State Building Code. Efficient water-use strategies that will be considered to reduce overall potable water use on-site. These include but are not limited to the following:

- Use of drought tolerant plantings
- Minimal irrigation (if applicable) & techniques to reduce irrigation losses due to evaporation
- Installation of water conservation equipment on irrigation infrastructure
- Installation of low-flow plumbing fixtures
- Development/Implementation of maintenance and employee education programs

Wastewater Supply & Mitigation Strategies

On-site sewage disposal systems are assumed to handle 1,000± GPD sewer flow generated by the recently constructed Dunkin' and Mobil Gas Station located in the eastern portion of the Site.

Three (3) soccer fields and associated parking lots were recently constructed in the eastern portion of the Site. There are no known sewer services to the soccer facilities.

The existing JB Hunt Trucking facility located in the eastern portion of the Site is serviced by an on-site sewage disposal system.

The existing residence and horse barn/track located in the western portion of the Site are likely serviced by a private on-site septic system.

A wastewater treatment plant is proposed as part of the project to treat the approximately 157,385± GPD of sewer generated on-site and will service the entire Site. The existing septic systems currently servicing the existing Dunkin' and Mobil Gas Station properties will be abandoned, and both uses will be connected to the new system.

The Project will introduce new watertight sewer mains which will limit infiltration entering the sewer system. The Project will implement efficient water use strategies, as indicated in the Water

Supply section above, to reduce overall sewer discharges. By reducing water consumption, the project will reduce wastewater discharges. The project will discharge to the private on-site septic system and there are no anticipated impacts to municipal sewer systems.

Other Utilities

Other utilities (cable, TV, electric) will be extended to the Site from Lunenburg Road.

7. TRANSPORTATION

Project Description

This Chapter of the Draft Environmental Impact Report (DEIR) includes important updates to the transportation operational and safety analysis based on comments received on the Environmental Notification Form (ENF) from the Massachusetts Environmental Policy Act (MEPA) office, state agencies, municipalities, and other stakeholders. It considers the coordination that has occurred with the Proponent, the Town of Lancaster and City of Leominster, and the Massachusetts Department of Transportation (MassDOT) on the scope, construction phasing, and parking impacts associated with the Project. Furthermore, it provides clarity on the process to identify transportation impacts within, and provide mitigation for, both Town of Lancaster, City of Leominster, and MassDOT off-site infrastructure. This includes a DEIR scope conference call with the MassDOT Private-Public Development Unit (PPDU) and MassDOT District 3 office on Monday, August 5, 2019.

The DEIR provides detailed aspects supplementing the Traffic Impact, Access, and Parking Study, prepared using MassDOT and the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) standard guidelines, which outline the traffic related impacts and mitigation measured for all study area roadways and intersections. The comments received on the ENF demonstrate that the Capital Commerce Center site is situated in an ideal location when considering the ability to distribute the impacts of motor vehicle traffic and create an efficient and attractive opportunity for future walkers and bicyclists. This chapter provides further detail on the proposed improvements and operational measures that the Capital Commerce Center will employ to monitor traffic and parking facilities and reduce the reliance on automobile use by patrons, employees, and visitors.

Chapter Summary

Building Program and Access

The existing site includes several minor uses over the two distinct development zones. Within the development zone connected to McGovern Boulevard, the site includes the FC Stars outdoor soccer complex comprised of three (3) soccer fields, a 11,800 square foot (SF) J.B. Hunt Transport Services facility, a 2,300 SF Dunkin Donuts, 5,000 SF Mobil gas station with convenience market, and the soil / gravel yard for the New England Specialty Soils. Within the development zone connected to Johnny Appleseed Lane, the site includes one single-family dwelling and an equestrian field with stable operations. The aforementioned J.B. Hunt Transport Services is accessed via a separate full-access/egress driveway along Lunenburg Road, south of the adjacent Mobil Gas Station.

The Project consists of clearing much of the existing site; but retaining the existing three (3) outdoor soccer fields, Dunkin Donuts, and Mobil Gas Station. The proposed mixed-use development program includes constructing of a 1,567,500 square foot (SF) industrial park (319 loading docks), 117 single-family residential units, 500 multi-family residential units, a 120-room hotel; 65,700 SF of additional retail space (73,000 SF total with existing Dunkin Donuts and Mobil), and an 86,500 SF indoor soccer facility comprised of one (1) soccer field. The Project proposes to retain the access/egress to the site via McGovern Boulevard. The 117 single-family

residential units will be disconnected from the rest of the proposed land uses and be accessed/egressed via new roadway connections to/from Johnny Appleseed Lane [City of Leominster].

Parking

The existing site currently includes 353 off-street surface parking spaces to service the existing uses. Eighteen (18) of these spaces will be removed from the site. The Project looks to significantly increase the parking at the site and will provide 1,317 parking spaces to service the industrial park, 740 parking spaces to service the multi-family residential units, 120 parking spaces to service the hotel, 418 additional parking spaces to service the retail adjacent to Lunenburg Road, and an additional 216 parking spaces to service the indoor soccer facility. In total, the project will add 3,109 parking spaces to the site, including 316 tractor-trailer parking spaces to be provided within the industrial park.

Proposed Transportation Mitigation

The Proponent is committed to implement and construct transportation mitigation measures to improve both traffic operations and safety and address existing and future deficiencies for all users. This includes off-site roadway improvements along Main Street, McGovern Boulevard, Lunenburg Road, and the Route 2 Westbound (WB) Off-Ramp at Interchange 35. The proposed improvements will include, but are not limited to:

- Construction of a fully-actuated traffic signal at the intersection of Lunenburg Road / McGovern Boulevard (phased construction);
- Reconstructing / widening Lunenburg Road to provide turn lanes onto McGovern Boulevard;
- Construction of multimodal roadway accommodations that will enhance healthy transportation alternatives such as walking and bicycling along Lunenburg Road and McGovern Boulevard;
- Provide traffic signal timing optimization post-occupancy to two new traffic signals along Main Street being constructed as part of the upcoming MassDOT Project File No. 608779;
- Construct minor modifications to the Route 2 WB Interchange 35 off-ramp deceleration lane and roadway shoulder to extend queue storage.

The Proponent has also committed to several Transportation Demand Management (TDM) measures aimed to reduce single-occupancy vehicle (SOV) trips and overall vehicular traffic to/from the redevelopment site and better manage traffic generated by the proposed project. Finally, the Proponent has committed to implementing a Traffic Monitoring Plan (TMP), which is intended to monitor traffic operations and parking occupancy throughout the construction and for a period following completion of the Project. A detailed review of these mitigation measures is further defined in this Chapter.

Methodology

TEC has evaluated the traffic operations for the study area under existing and future conditions consistent with the *Transportation Impact Assessment (TIA) Guidelines* issued by MassDOT[1] and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports. The future planning horizon examines traffic operations under existing conditions (2019), as well as a 7-year planning horizon (2026) for traffic-volume projections; which includes an evaluation of the No-Build conditions (without the proposed project), Build conditions (with the proposed project), and Build with Mitigation conditions (with the proposed project and any proposed mitigation).

Existing Conditions

A comprehensive field inventory of existing traffic conditions on the study area corridors and intersections was conducted during various site visits by TEC staff from March 2019 through August 2019. The field investigations consisted of existing roadway geometrics, operating characteristics, study area safety concerns, and multi-modal accommodations. The study area was selected to contain the major roadways providing local access/egress to/from the project site.

Study Area Intersections

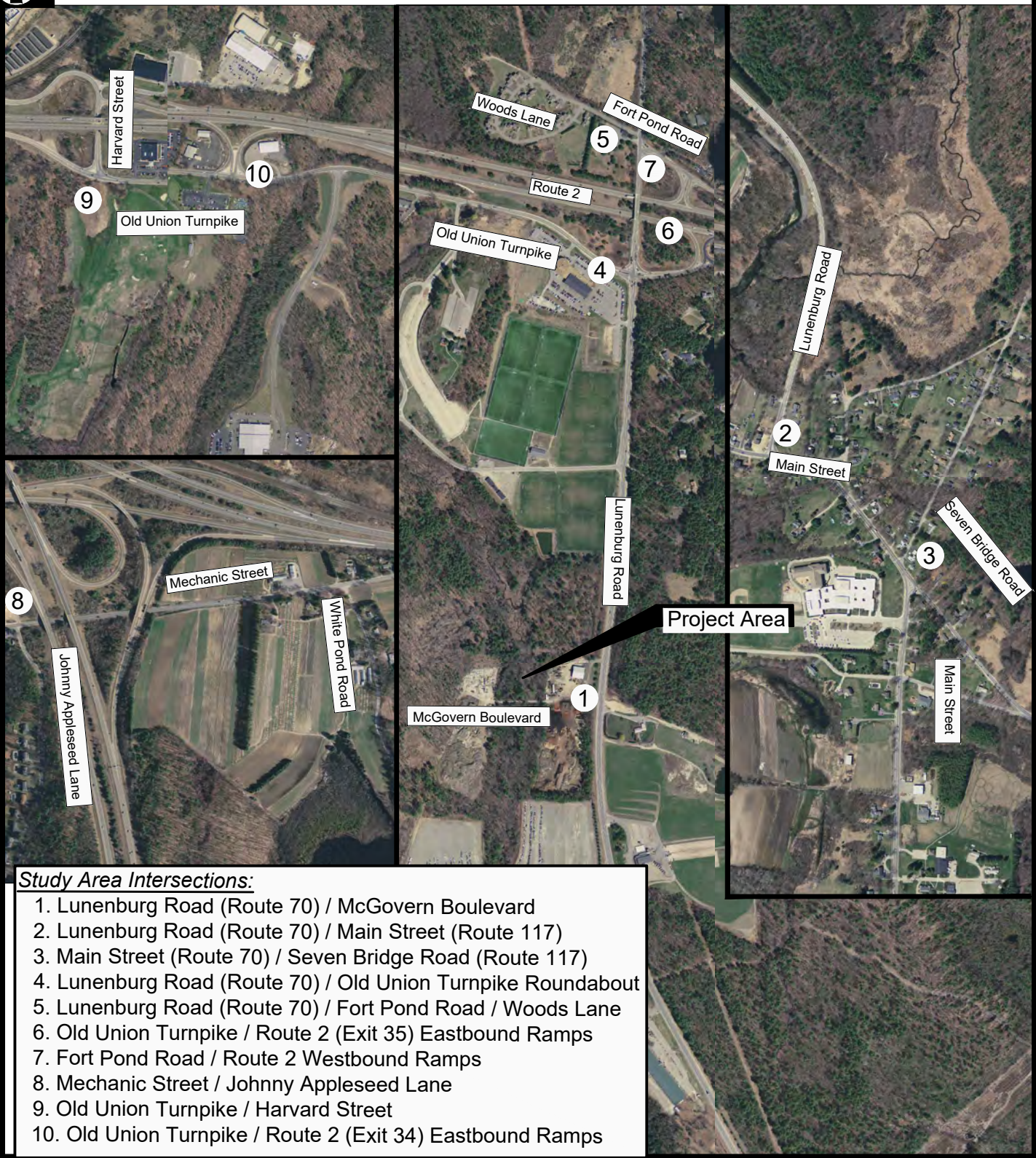
The study area was selected, and expanded through comments on the ENF, to contain the major roadways providing local access/egress to/from the project site. This includes an evaluation of intersection in which the site-generated trips increase the peak hour traffic volume by more than 5 percent and/or by more than 100 vehicles per hour per MassDOT's *TIA Guidelines* (Section 3.I.C). The following intersections were therefore evaluated as part of the study area:

1. Main Street (Route 70/117) / Seven Bridge Road (Route 117) / Shirley Road
2. Main Street (Route 70/117) / Lunenburg Road (Route 70)
3. Lunenburg Road (Route 70) / McGovern Boulevard
4. Lunenburg Road (Route 70) / Old Union Turnpike
5. Lunenburg Road (Route 70) / Woods Lane / Fort Pond Road
6. Old Union Turnpike / Route 2 (Exit 35) Eastbound Ramps
7. Fort Pond Road / Route 2 (Exit 35) Westbound Ramps
8. Mechanic Street / Johnny Appleseed Lane [City of Leominster]
9. Old Union Turnpike / Harvard Street
10. Old Union Turnpike / Route 2 (Exit 34) Eastbound Ramps

The study area intersections and project limits are shown graphically in **Figure 7.1**.

[1] *Transportation Impact Assessment (TIA) Guidelines*; Massachusetts Department of Transportation; March 13, 2014.

1" = 1000'



Study Area Intersections:

1. Lunenburg Road (Route 70) / McGovern Boulevard
2. Lunenburg Road (Route 70) / Main Street (Route 117)
3. Main Street (Route 70) / Seven Bridge Road (Route 117)
4. Lunenburg Road (Route 70) / Old Union Turnpike Roundabout
5. Lunenburg Road (Route 70) / Fort Pond Road / Woods Lane
6. Old Union Turnpike / Route 2 (Exit 35) Eastbound Ramps
7. Fort Pond Road / Route 2 Westbound Ramps
8. Mechanic Street / Johnny Appleseed Lane
9. Old Union Turnpike / Harvard Street
10. Old Union Turnpike / Route 2 (Exit 34) Eastbound Ramps

Figure 7.1

Project Location Map & Study Area Intersections

TEC
The Engineering Corp

TEC, Inc.
146 Dascomb Road
Andover, MA 01810

C:\Users\dhamzeh\appdata\local\temp\AcPublish_14012\T0852_ Locus Map.dwg 10/11/2019 9:54:18 AM

Geometry

The field inventory included collection of existing roadway geometrics, pedestrian and bicycle accommodations, traffic volumes, sight distances, and safety data for the existing study area. A description of the existing roadway and intersection inventory is provided below. Note that the intersection of Mechanic Street / White Pond Road has been removed from the study area.

Roadway - Lunenburg Road (Route 70)

Lunenburg Road, signed as MA State Route 70, is a north-south urban principal arterial roadway maintained by the Town of Lancaster. The roadway provides regional connection between the Town of Shirley to the north and Main Street (Route 70/117) to the south. In the vicinity of the project site, Lunenburg Road is approximately 44-feet wide with 10-foot shoulders. Directional flow along Lunenburg Road is separated by a double-yellow centerline. A posted/regulated speed along the corridor is 50 miles per hour (mph)[2] in the vicinity of McGovern Boulevard. Land uses along Lunenburg Road generally include light industrial and light commercial uses. There are no sidewalks or bicycle accommodations provided along Lunenburg Road.

Intersection - Main Street (Route 70/117) / Seven Bridge Road (Route 117)

Main Street intersects Seven Bridge Road to form a three-legged, stop-controlled intersection. The Main Street eastbound approach operates under free-flow conditions and consists of a general-purpose travel lane with a gentle channelized right-turn onto Main Street heading south which operates under free-flow conditions. The Main Street northbound approach operates under stop-control and consists of a single general-purpose travel lane. Directional flow along the Main Street northbound approach is separated by a raised asphalt median at the intersection and a painted double-yellow centerline. The Seven Bridge Road westbound approach operates under free-flow conditions and consists of a single general-purpose travel lane with directional flow separated by a double-yellow centerline. A continuous sidewalk, separated by a grass buffer, is provided along the southerly side of Main Street from the west and the westerly side of Main Street from the south. There are no crosswalks or bicycle accommodations provided at the intersection.

As part of the upcoming Main Street Improvement Project (MassDOT Project File No. 608779), a new fully-actuated traffic signal is proposed at this location. The Main Street eastbound approach will be widened to include a through lane and an exclusive right-turn lane. The Seven Bridge Road westbound approach will be widened to include an exclusive left-turn lane and a through lane. Bicycle lanes will be installed along Main Street northbound and a new shared-use path will be constructed along the southerly side of Main Street between Lunenburg Road and a point 275-feet south of Seven Bridge Road.

Main Street (Route 70/117) / Lunenburg Road (Route 70)

Lunenburg Road intersects Main Street to form a three-legged, stop-controlled intersection. The Lunenburg Road southbound approach operates under stop-control and consists of an exclusive left-turn lane and an exclusive right-turn lane with directional flow separated by a marked double-yellow centerline and a short divisional island on the approach. The Main Street eastbound and

[2] MassDOT Speed Regulation 619-A dated March 2, 1977

westbound approaches operate under free-flow conditions and consist of a single general-purpose travel lane with directional flow separated by a double-yellow centerline. A sidewalk, separated by a grass buffer, is provided along the southerly side of Main Street. There are no crosswalks or bicycle accommodations provided at the intersection.

As part of the upcoming Main Street Improvement Project (MassDOT Project File No. 608779), a new fully-actuated traffic signal is proposed at this location. The Main Street eastbound approach will be widened to include an exclusive left-turn lane and a through lane. The Main Street westbound approach will be widened to include a through lane and an exclusive right-turn lane and a through lane. The Lunenburg Road southbound approach will be widened to include exclusive left-turn and right-turn lanes. Bicycle lanes will be installed along Lunenburg Road southbound a new shared-use path will be constructed along the southerly side of Main Street between Lunenburg Road and a point 275-feet south of Seven Bridge Road.

Lunenburg Road (Route 70) / McGovern Boulevard

McGovern Boulevard intersections Lunenburg Road to form a three-legged, stop-controlled intersection. The McGovern Boulevard eastbound approach operates under stop-control and consists of a single general-purpose travel lane with directional flow separated by a raised landscaped median. The Lunenburg Road northbound and southbound approaches operate under free-flow conditions and consist of a single general-purpose travel lane with directional flow separated by a marked centerline. No pedestrian or bicycle accommodations are provided at this intersection. Although Lunenburg Road is a high-speed roadway, advanced warning signage with flashers noting: "Business District Ahead – Vehicles Entering & Exiting" is posted along both sides of Lunenburg Road approximately 2,000-feet from the intersection.

Lunenburg Road (Route 70) / Old Union Turnpike

Old Union Turnpike intersects Lunenburg Road to form a four-legged roundabout intersection. The intersection was reconstructed as a roundabout in 2013 as part of MassDOT Project File No. 605216 which created a significant amount of reserve capacity at the intersection. All four intersection approaches consist of a single general-purpose travel lane with directional flow separated by a splitter island. In addition, each approach enters the roundabout under yield-control. The roundabout's inscribed circle is approximately 130-feet in diameter and is comprised of a 17.5-foot travel lane and a 10-foot truck brick truck-apron. Crosswalks are provided across the eastbound and northbound approaches to the roundabout; however, sidewalks do not carry out past the immediately roundabout limits. There are no formal bicycle accommodations through the roundabout.

Lunenburg Road (Route 70) / Woods Lane / Fort Pond Road

Fort Pond Road and Woods Lane intersect Lunenburg Road to form a four-legged stop-controlled intersection. In addition to the standard roadway connections, the driveway to the Heart of New England Council Boy Scouts of America Service Center enters Lunenburg Road directly opposing Fort Pond Road. Woods Lane is offset to the north by approximately 100-feet. The Woods Lane eastbound approach is under stop-control and consists of a general-purpose travel lane with directional flow unmarked. The Fort Pond Road westbound approach is under stop-control and consists of an exclusive left-turn lane and a channelized through/right-turn lane with directional flow separated by a raised asphalt median. The Lunenburg northbound approach is

free-flowing and consists of shared left-turn/through lane and a channelized right-turn lane with directional flow separated by a marked centerline. The Lunenburg Road southbound approach is free-flowing and consists of a single general-purpose travel lane with directional flow separated by a marked centerline. No pedestrian or bicycle accommodations are provided at this intersection.

Old Union Turnpike / Route 2 Exit 35 Eastbound Ramps

The Route 2 Interchange 35 Eastbound (EB) Ramps intersect Old Union Turnpike to form a three-legged unsignalized intersection. The Route 2 EB Ramps southbound approach consists of an exclusive left-turn lane under stop-control and a channelized right-turn lane under yield-control. Directional flow along the ramps is separated by a raised landscaped median. The Old Union Turnpike eastbound approach is free-flowing and consists of a single general-purpose travel lane with directional flow separated by a marked centerline. The Old Union Turnpike westbound approach is free-flowing and consists of a through lane and a channelized right-turn lane under yield-control with directional flow separated by a marked centerline. There are no formal bicycle accommodations through the roundabout. MassDOT recently installed new 'Do Not Enter', 'One-Way', and 'Wrong Way' signage along the Route 2 EB Ramps as part of their recent Wrong Way Crash initiative.

Fort Pond Road / Route 2 Exit 35 Westbound Ramps

The Route 2 Interchange 35 Westbound (WB) Ramps intersect Fort Pond Road to form a three-legged unsignalized intersection. The Route 2 WB Ramps northbound approach consists of an exclusive left-turn lane under stop-control and a channelized right-turn lane under yield-control. Directional flow along the ramps is separated by a raised landscaped median. The Fort Pond Road eastbound approach is free-flowing and consists of a through lane and a channelized right-turn lane under yield-control with directional flow separated by a marked centerline. The Fort Pond Road westbound approach is free-flowing and consists of a single general-purpose travel lane with directional flow separated by a marked centerline. There are no formal bicycle accommodations through the roundabout. MassDOT recently installed new 'Do Not Enter', 'One-Way', and 'Wrong Way' signage along the Route 2 WB Ramps as part of their recent Wrong Way Crash initiative.

Mechanic Street / Johnny Appleseed Lane [City of Leominster]

Johnny Appleseed Lane intersects Mechanic Street to form a three-legged stop-controlled intersection. The Johnny Appleseed Lane northbound approach operates under stop-control and consists of a single general-purpose travel lane with directional flow unmarked. The Mechanic Street eastbound and westbound approaches are free-flowing and consists of single general-purpose travel lanes with directional flow separated by a marked centerline. Sight distance exiting Johnny Appleseed Lane is limited by the vegetation along the southerly side of Mechanic Street both east and west of the intersection. A sidewalk is present along both sides of Mechanic Street west of the intersection. There are currently no formal bicycle accommodations provided at this intersection.

Old Union Turnpike / Harvard Street

Harvard Street intersects with Old Union Turnpike to form a three-legged stop-controlled intersection. The Harvard Street southbound approach consists of an exclusive left turn lane under stop-control and a channelized right-turn lane under yield-control. Directional flow along Harvard Street is separated by a marked centerline. The Old Union Turnpike eastbound approach is free-flowing and consists of an exclusive left-turn lane and a through lane. The Old Union Turnpike westbound approach is free-flowing and consists of a single general-purpose travel lane. Directional flow along Old Union Turnpike is separated by a marked centerline. There are currently no formal pedestrian or bicycle accommodations provided at this intersection. Harvard Street, north of the intersection, provides access/egress to/from Route 2 WB via Exit 34.

Old Union Turnpike / Route 2 Exit 34 Eastbound Ramps

The Route 2 Interchange 34 EB Ramps intersect Old Union Turnpike to form a three-legged stop-controlled intersection. The Route 2 EB Ramps consist of an exclusive left turn lane under stop-control and a channelized right-turn lane under yield-control. Directional flow along the ramp is separated by a raised concrete median. The Old Union Turnpike eastbound approach is free-flowing and consists of an exclusive left-turn lane and a through lane. The Old Union Turnpike westbound approach is free-flowing and consists of a through travel lane and a channelized right-turn lane under yield-control. Directional flow along Old Union Turnpike is separated by a marked centerline. There are currently no formal pedestrian or bicycle accommodations provided at this intersection.

Existing Public Transportation Access

The Project is situated on the eastern edge of the Montachusett Regional Transit Authority (MART) region; however currently no service is provided in the vicinity of the site.

Existing Traffic Volumes

Traffic volume data for this report was obtained from Manual Turning Movement Counts (TMCs) and supplemented with Automatic Traffic Recorder (ATR) counts conducted at the study area intersections. The details of the data collection effort for this project are described below.

Turning Movement Counts

To establish existing traffic-volume conditions within the study area, manual TMCs were conducted at the study area intersections on multiple dates during the typical weekday and the typical Saturday including traffic volumes within the defined weekday morning (7:00 AM to 9:00 AM), weekday evening (4:00 PM to 6:00 PM), and Saturday midday (11:00 AM to 2:00 PM) peak periods. Areas schools were generally in regular session during the dates in which the weekday TMCs were collected. Saturday TMCs were conducted during late-summer when tourism and outdoor activities were generally at peak season. **Table 7.1** presents the date, time period, and nature of each TMC performed. A detailed summary of the TMCs partitioned into 15-minute intervals is provided in **Appendix F.1**.

Table 7.1: Turning Movement Count Summary

Intersection	Dates of Counts	
	Weekday	Saturday
Main Street / Seven Bridge Road / Shirley Road	12/19/2018	8/17/2019
Main Street / Lunenburg Road	12/19/2018	8/17/2019
Lunenburg Road / McGovern Boulevard	12/19/2018	8/17/2019
Lunenburg Road / Old Union Turnpike	12/19/2018	8/17/2019
Lunenburg Road / Woods Lane / Fort Pond Road	12/19/2018	8/17/2019
Old Union Turnpike / Route 2 Exit 35 EB Ramps	12/19/2018	8/17/2019
Fort Pond Road / Route 2 Exit 35 WB Ramps	12/19/2018	Not Collected
Mechanic Street / Johnny Appleseed Lane	4/25/2019	8/17/2019
Old Union Turnpike / Harvard Street	8/20/2019	8/17/2019
Old Union Turnpike / Route 2 Exit 34 EB Ramps	8/20/2019	8/17/2019

Automatic Traffic Recorder Counts

Automatic Traffic Recorder (ATR) counts were conducted concurrently with the TMCs from Tuesday, December 18, 2018 to Wednesday, December 19, 2018 to gather daily traffic-volume, vehicle classification, and speed data for the study area roadways during a continuous 48-hour time period. The ATR provided volume, speed, and classification data for Lunenburg Road, north of the Kimball Farm Driveway. A summary of the weekday ATR traffic data is presented in **Table 7.2**. A detailed summary of the ATR counts, partitioned into 15-minute intervals, are provided in **Appendix F.2**.

Table 7.2: Existing Weekday Traffic Volume Summary

Location	Weekday Traffic Volume[a]	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Traffic Volume[b]	K Factor[c]	Directional Distribution[d]	Traffic Volume	K Factor	Directional Distribution
Lunenburg Road, north of Kimball Farm Dwy	10,977	712	6.5	51.3% SB	1,022	9.3	62.7% NB

[a] Daily traffic expressed in vehicles per day
[b] Hourly traffic expressed in vehicles per hour
[c] Percent of daily traffic volumes which occurs during the peak hour
[d] Percent of peak-hour volume in the predominant direction of travel
NB = Northbound; SB = Southbound

Lunenburg Road, in the vicinity of McGovern Boulevard, carries approximately 11,000 vehicles per day (vpd) on an average weekday. Directional distribution along the roadway was roughly split 50-50 during the weekday morning peak hour and heavily weighted northbound in the weekday evening peak hour. Speed data indicates that the average speed and 85th percentile speed along Lunenburg Road northbound are 47 and 52 mph, respectively. The average speed and 85th percentile speed along Lunenburg Road southbound are 50 and 55 mph, respectively. This indicates that traffic along the corridor is generally travel at or in the immediately vicinity of the posted and regulated speed limit.

Seasonal Adjustment

In accordance with MassDOT standards, traffic volumes are typically adjusted to reflect average-month conditions for preparation of a traffic impact assessment. A review of historic traffic-volume counts collected by MassDOT at a permanent count station along Route 2 in Lancaster[3] indicated that traffic volumes in April and December are approximately 1.0 percent and 5.6 percent lower than average-month conditions, respectively. The traffic volumes at this location also indicate that traffic volumes in August are approximately 7.1 percent higher than average-month conditions. Therefore, the April 2019 and December 2018 traffic volumes were upwardly adjusted by 1.0 percent and 5.6 percent to reflect a conservative analysis scenario, respectively. August 2019 traffic counts were unadjusted to reflect a conservative analysis scenario. Although these counts are along a freeway roadway, Lunenburg Road through the study area generally operates consistent with commuter and tourist seasonal patterns.

As noted, December 2018 counts are present in the study area and represent a condition one-year in the past as compared to other traffic volumes in the study area. To analyze a comparative existing condition at these intersection locations, these 2018 traffic volumes were upwardly adjusted to reflect a 2019 condition. This was done by utilizing a 1.0 percent per year ambient growth rate over the one-year period. The growth rate is further described in the "Future Conditions" section of this Chapter. The compiled seasonal adjustment data is provided in Appendix F.3. The resulting 2019 Existing Condition weekday morning and weekday evening peak hour traffic volumes are shown graphically in **Figure 7.2**.

Safety Analysis and Review

A comprehensive traffic safety analysis was conducted for the study area intersections. The traffic safety analysis included the compilation and examination of study intersection crash data, a general safety review with consideration given to items on the MassDOT Safety Review Prompt List, and sight distance measurements. Details of each step in the traffic safety analysis are described in the following section.

Crash History and Data

Crash data for the study area intersections were compiled and analyzed for the most recent consecutive four-year period (2013-2016) of complete data on file from MassDOT. For the intersections along Main Street, historical crash information was acquired from the Main Street (Route 70/117) Improvements *Functional Design Report* (FDR)[4]. For the Route 2 Interchange 35 freeway off-ramp intersections and interchange with Old Union Turnpike and Fort Pond Road, individual crash reports were acquired from the MassDOT Traffic and Safety Engineering Section for 2014 through 2018. Therefore, the Route 2 freeway crash history as provided is for the interchange as a whole. The motor vehicle crash data was reviewed to determine if any crash trends exist within the study area. Summaries of the vehicle crash data and intersection crash rates are provided in **Table 7.3**.

[3] MassDOT Permanent Count Station 34 – Lancaster – Route 2 – west of Route 70
[4] *Functional Design Report – Main Street (Route 70/117) Improvements – Lancaster, MA*; prepared by TEC, Inc.; Revised April 1, 2019

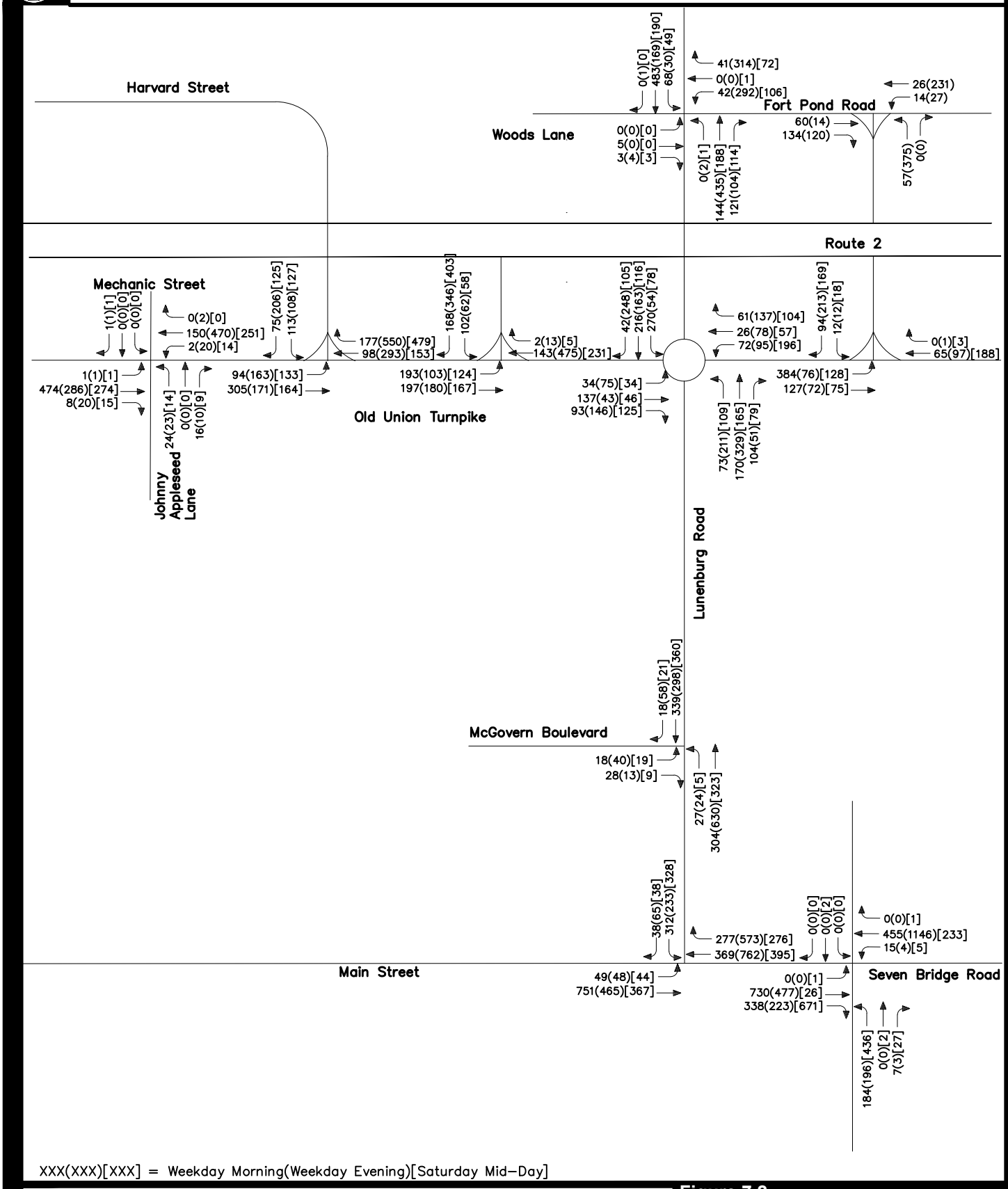


Figure 7.2

**2019 Existing Conditions
Weekday Morning, Weekday Evening, and Saturday Mid-Day
Peak Hour Traffic Volumes**

The Engineering Corp

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Table 7.3: Crash Data Summary

		Main Street / Seven Bridge Road / Shirley Road	Main Street / Lunenburg Road	Lunenburg Road / McGovern Boulevard	Lunenburg Road / Old Union Turnpike	Lunenburg Road / Woods Lane / Fort Pond Road
Crash Year:	2012	4	5	-	-	-
	2013	4	11	0	4	2
	2014	0	2	0	2	1
	2015	2	8	0	3	2
	2016	2	13	0	0	2
	TOTAL	**12**	**39**	**0**	**9**	**7**
Annual Average		***2.40***	***7.80***	***0.00***	***2.25***	***1.75***
Crash Rate (MEV):		***0.30***	***0.94***	***0.00***	***0.35***	***0.33***
Significant:		**No**	**Yes**	**No**	**No**	**No**
Type:	Angle	10	15	0	5	3
	Rear-end	0	12	0	1	3
	Sideswipe	1	0	0	0	0
	Single	0	10	0	2	1
	Head-On	1	1	0	0	0
	Ped / Bike	0	0	0	0	0
	Not Reported	0	1	0	1	0
	TOTAL	**12**	**39**	**0**	**9**	**7**
Surface Conditions:	Dry	7	26	0	8	7
	Wet	3	9	0	1	0
	Snow/Slush/Ice	0	4	0	0	0
	Other / Unknown	2	0	0	0	0
	TOTAL	**12**	**39**	**0**	**9**	**7**
Severity:	PDO	10	31	0	9	5
	Non-Fatal Injury	2	8	0	0	2
	Not Reported	0	0	0	0	0
	TOTAL	**12**	**39**	**0**	**9**	**7**
Day of Week:	Monday-Friday	11	28	0	6	3
	Saturday-Sunday	1	11	0	3	4
	TOTAL	**12**	**39**	**0**	**9**	**7**
Time of Day:	6:00AM-9:00AM	3	6	0	1	1
	9:00AM-3:00PM	2	13	0	2	1
	3:00PM-6:00PM	1	8	0	5	4
	6:00PM-6:00AM	5	12	0	1	1
	TOTAL	**12**	**39**	**0**	**9**	**7**

Table 7.3 - Crash Data Summary (Continued)

		Old Union Turnpike / Route 2 Exit 35 EB	Fort Pond Road / Route 2 Exit 35 WB	Mechanic Street / Johnny Appleseed Lane	Old Union Turnpike / Harvard Street	Old Union Turnpike / Route 2 Exit 34 EB [a]
Crash Year:	2012	-	-	-	-	-
	2013	-	-	0	1	2
	2014	0	0	1	3	6
	2015	1	0	3	0	3
	2016	0	0	1	3	9
	2017	1	0	-	-	-
	2018	3	1	-	-	-
	TOTAL	**5**	**1**	**5**	**7**	**20**
Annual Average		***1.00***	***0.20***	***1.25***	***1.75***	***5.00***
Crash Rate (MEV):		***0.58***	***0.07***	***0.38***	***1.08***	***0.30***
Significant:		**No**	**No**	**No**	**Yes**	**No**
Type:	Angle	2	1	0	4	7
	Rear-end	1	0	4	1	11
	Sideswipe	0	0	1	1	1
	Single	1	0	0	0	1
	Head-On	0	0	0	0	0
	Ped / Bike	1	0	0	0	0
	Not Reported	0	0	0	1	0
	TOTAL	**5**	**1**	**5**	**7**	**20**
Surface Conditions:	Dry	5	1	4	4	18
	Wet	0	0	0	3	2
	Snow/Slush/Ice	0	0	1	0	0
	Other / Unknown	0	0	0	0	0
	TOTAL	**5**	**1**	**5**	**7**	**20**
Severity:	PDO	2	0	4	6	16
	Non-Fatal Injury	3	1	1	1	4
	Not Reported	0	0	0	0	0
	TOTAL	**5**	**1**	**5**	**7**	**20**
Day of Week:	Monday-Friday	3	1	5	7	14
	Saturday-Sunday	2	0	0	0	6
	TOTAL	**5**	**1**	**5**	**7**	**20**
Time of Day:	6:00AM-9:00AM	2	0	0	0	2
	9:00AM-3:00PM	1	1	0	2	9
	3:00PM-6:00PM	1	0	1	5	7
	6:00PM-6:00AM	1	0	4	0	2
	TOTAL	**5**	**1**	**5**	**7**	**20**

[a] Includes all crashes involved along Exit 34 EB ramp

Highway Safety Improvement Plan Eligible

In August 2005, the transportation act entitled the "Safe, Accountable, Flexible, Efficient Transportation Act - A Legacy for Users" (SAFETEA-LU) was passed. This act provides guidance and funding for the implementation of a State Highway Safety Improvement Program (HSIP). As part of this program, all states are required to develop a Strategic Highway Safety Plan (SHSP). The MassDOT guidelines require a Road Safety Audit (RSA) to be conducted where HSIP-eligible crash clusters are present within the study area of a private development sphere of

influence, prior to finalizing the Massachusetts Environmental Policy Act (MEPA) process. An intersection is defined as HSIP-eligible if the intersection is within the top 5% of clusters in its respective Regional Planning Commission (RPC) boundaries based on Equivalent Property Damage Only (EPDO). EPDO rates crashes based on the collision severity.

Based on the MassDOT online crash cluster database, the Main Street / Lunenburg Road intersection is considered 2016 Highway Safety Improvement Plan (HSIP) eligible (current crash years of HSIP-eligibility). Previously noted in the ENF, the Route 2 Interchange 35 was also considered '2015' HSIP-eligible as current listings were not available at the time. Many freeway interchanges across the Commonwealth are noted as HSIP-eligible locations; however, this is generally the result of crashes being geocoded on the center of the interchange, as opposed to the specific crash location along a freeway segment, along the ramps, or other location of the interchange. At the time of the DEIR submittal, the interchange is no longer on the HSIP-eligible listing; however, TEC coordinated with MassDOT to complete an evaluation of the crash history at the interchange's surface intersection using individual crash reports and confirmed that the study area intersections were not HSIP-eligible. A letter confirming this was sent to MassDOT on September 13, 2019.

Prior to this MEPA review process, TEC and the City of Lancaster facilitated an RSA for the intersection of Main Street / Lunenburg Road in coordination with the MassDOT Traffic and Safety Engineering Section. An RSA, as defined by the FHWA, is the *formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team*. The RSA report for this location was published on May 27, 2017[5]. A copy of the RSA, as approved by MassDOT, is provided in **Appendix F.4**.

Crash Rate Worksheets

In addition to examining the number of crashes at the study area intersections, a crash rate was calculated to compare the occurrence of crashes to the volume of traffic passing through the intersection. The crash rate per million entering vehicles (MEV) was calculated using the evening peak hour volumes from the TMCs and a calculated K-factor obtained from the ATR counts to establish a daily intersection traffic volume. The crash rates at each of the study area intersections were compared to the statewide and district-wide averages published by MassDOT in June 2018 to determine the significance of the crash occurrence. The statewide average for unsignalized intersections is 0.57, and the District 3 average for unsignalized intersections is 0.61. A compilation of the MEV rate calculation worksheets and detailed crash data are provided in **Appendix F.5**.

Crash Data Summary

<u>*Main Street / Seven Bridge Road / Shirley Road*</u> - The Main Street (Route 70/117) / Seven Bridge Road (Route 117) intersection experienced less than three (2.4) crashes per year over the five-year study period, yielding a crash rate of 0.30 crashes per MEV. The crash rate for this intersection is significantly lower than the statewide and district-wide averages for unsignalized intersections. Approximately, 83 percent (10 of 12) of the crashes were angled crashes, and the remaining 17

[5] *Main Street (Route 117) / Lunenburg Road (Route 70) – Lancaster, Massachusetts - Road Safety Audit*; TEC, Inc.; Lawrence, Massachusetts; July 18, 2017

percent (2 of 10) of the crashes were equally distributed amongst sideswipe and head-on crashes. The reported crashes were heavily skewed toward the first half of the week, with 75 percent (9 of 12) of the crashes occurring Monday through Wednesday. Of the reported crashes, 42 percent (5 of 12) were attributed to "failure to yield right-of-way", 33 percent (4 of 12) were "inattention / distracted", 17 percent (2 of 12) were "visibility obstructed / glare" and the remaining 8 percent (1 of 12) were "erratic / aggressive / reckless driving".

Main Street / Lunenburg Road - The intersection of Main Street / Lunenburg Road experienced a total of 39 reported crashes (7.8 per year) at the intersection during the five-year study period. The crash rate for this intersection is significantly higher than the statewide and district-wide averages for unsignalized intersections, with 0.94 crashes per MEV. Approximately 40 percent of the crashes (15 of 39) were angled crashes, 30 percent (12 of 39) were rear-end crashes, 25 percent (10 of 39) were single vehicle crashes, and the remaining 5 percent (2 of 39) were equally distributed amongst head-on and other/not reported crashes at the intersection over the five-year study period. Of the reported crashes, 44 percent (17 of 39) were attributed to "inattention/distracted", 21 percent (8 of 39) were "failure to yield right-of-way" or "other /not reported". Further details related to crash history is provided in the RSA report.

Main Street / Old Union Turnpike - The intersection of Main Street / Old Union Turnpike experienced a total of nine (9) reported crashes (2.25 per year) at the intersection during the four-year study period. The crash rate for this intersection is significantly lower than the statewide and district-wide averages for unsignalized intersections, with 0.35 crashes per MEV. Five (5) of the crashes were angled crashes which is to be expected at a roundabout intersection. Additionally, all crashes were non-injury crashes as the impact of crashes at roundabouts is traditionally low impact. More than half of the crashes (5 of 9) occurred during the weekday evening peak hour.

Route 2 Interchange 35 - The Route 2 Interchange 35 and associated ramp network experienced 61 reported crashes (15.25 per year) during the four-year study period. The overwhelming majority of these crashes occurred on the freeway in the vicinity of the interchange with no effect or cause related to the surface intersection with Old Union Turnpike and Fort Pond Road. Individual crash reports were processed from the MassDOT Traffic and Safety Engineering Section for 2014 through 2018 in order to determine the crash history of the two surface intersections as part of the study area. The crash reports show that over the five-year period, only six (6) crashes occurred; five (5) at the intersection of Old Union Turnpike / Route 2 Exit 35 EB Ramps and one (1) at the intersection of Fort Pond Road / Route 2 Exit 35 WB Ramps. Each location experienced less than two crashes per year on average and therefore it was deemed that no notable crash trend exists for the five-year study period.

Old Union Turnpike / Route 2 EB Exit 34 Ramps – The intersection of Old Union Turnpike / Route 2 EB Exit 34 Ramps experienced twenty (20) reported crashes (5 per year) during the four-year study period. The examination included all crashes that involved the ramp in the crash description; therefore, it is likely that the surface intersection experienced much less crashes. Eleven (11) of the crashes were rear-end crashes which may be related to queuing along the ramp. Approximately one-third of the crashes occurred during the evening peak hour which is generally a time period of the highest level of ramp volume.

All other study area intersections experienced less than two crashes per year on average and therefore it was deemed that no notable crash trend exists for the four-year study period.

Sight Distance Measurements

TEC measured the available sight distances at the various stop-controlled approaches of the study area intersections. The available sight lines were compared to minimum requirements established by the American Association of State Highway and Transportation Officials (AASHTO).

Sight distance represents the length of roadway that is visible to a driver traveling within the roadway. Two types of sight distance are typically evaluated for driveways and intersections: stopping sight distance (SSD) and intersection sight distance (ISD). SSD is the minimum distance required for a driver traveling along a roadway to perceive an object in the roadway and stop safely in advance of the object when traveling on a wet pavement surface. SSD is measured from an eye height of 3.5-feet to an object height of 2-feet above the ground, which is equivalent to a driver viewing the taillight of a vehicle ahead. SSD is measured along the centerline of the travel lane approaching the driveway or intersection.

ISD represents the length of the roadway visible to a driver waiting to exit a driveway or minor street. Minimum ISD requirements are based on the distance required for a driver to exit a minor street onto a major street without requiring an approaching vehicle to reduce its speed from the design speed to less than 70 percent of the design speed. ISD is measured from an eye height of 3.5-feet to an object height of 3.5-feet and is measured from a distance 14.5-feet beyond the edge of the travel-way of the major roadway to represent a driver waiting to exit a driveway or minor roadway.

SSD is typically considered the critical sight distance, as it represents the minimum distance required for safe stopping, while ISD represents an acceptable speed reduction for approaching vehicles. The ISD, however, must be at least equal to the minimum required SSD in order to prevent a driver from entering the roadway when an approaching vehicle is too close to safely stop. The guidance provided by AASHTO states:

> *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."*

Table 7.4 and **Table 7.5** provide a summary of the available SSD and ISD at the intersection of Lunenburg Road / McGovern Boulevard, respectively.

Table 7.4: Existing Stopping Sight Distance Measurements

Approach / Direction	Operating Speed [a]	AASHTO Recommended Minimum	Measured Stopping Sight Distance
Lunenburg Road at McGovern Boulevard:			
Lunenburg Road northbound	52 MPH	455 FT	> 700 FT
Lunenburg Road southbound	55 MPH	495 FT	> 700 FT

[a] Operating speeds calculated as 85th percentile speed from ATR counts on December 18 through December 19, 2018

Table 7.5: Existing Intersection Sight Distance Measurements

Approach / Direction	Operating Speed [a]	AASHTO Desired Minimum [b]	AASHTO Recommended Minimum	Measured Intersection Sight Distance
Lunenburg Road at McGovern Boulevard:				
North of McGovern Boulevard	55 MPH	610 FT	495 FT	> 700 FT
South of McGovern Boulevard	52 MPH	575 FT	455 FT	> 700 FT

[a] Operating speeds calculated as 85th percentile speed from ATR counts on December 18 through December 19, 2018

[b] ISD calculated using time gap (t_g) at design speed of 6.5 seconds for passenger car left-turn

As shown in **Table 7.4** and **7.5**, the ISD and SSD at the intersection of Lunenburg Road / McGovern Boulevard are well in excess of AASHTO minimum recommendations.

Future Conditions

Traffic volumes in the study area were projected to the year 2026, which reflects an 8-year planning horizon from the planned date of submission for permitting. The traffic conditions for the year 2026, under No-Build conditions, were developed to document the operating conditions independent of the proposed project; including all existing traffic and new traffic resulting from background growth. Anticipated site-generated traffic volumes for the proposed redevelopment were superimposed upon the No-Build traffic networks to reflect the Build conditions with the proposed project.

Background Traffic Growth

Traffic growth is a function of the expected land development in the immediate area and the surrounding region. Several methods can be used to estimate this growth. Traffic engineers frequently employ an annual percentage increase in traffic growth, which is applied to all traffic volumes under study. The drawback to such a procedure is that some turning volumes may actually grow at either a greater or a lesser rate at particular intersections.

An alternative procedure identifies the location and type of planned development, estimates the traffic to be generated, and assigns it to the area roadway network. This procedure produces a more realistic estimate of growth for local traffic; however, the potential growth in population and development external to the study area are not accounted for in the traffic projections.

To provide a conservative analysis framework, both procedures were considered.

General Background Growth

Traffic-volume data compiled from the adjacent MassDOT temporary count stations[6,7,8] were reviewed to determine traffic growth trends. Based on the traffic-volume data, traffic-volumes in the area have been increasing at a rate of 0.6 percent per year since 2015. To provide a conservative analysis scenario, a 1.0 percent per year compounded annual background traffic growth rate was used to account for potential future traffic growth external to the study area and any presently unforeseen or unpermitted development. MassDOT historic count station data have been included in **Appendix F.6**.

Specific Developments by Others

TEC coordinated with the Town of Lancaster Community Development and Planning Department to identify nearby private and public development projects in the vicinity of the study area that are either in the planning process or were recently approved by the municipal Planning Board. After discussions with Town officials and a review of recently approved projects, there are no specific projects have been identified that are anticipated to contribute significant additional traffic volumes to the study area.

FC Soccer Complex

At the time of the TMCs in December 2018, no outdoor activities were being hosted at the FC Stars outdoor soccer complex. To provide a conservative analysis, site-generated trips were estimated for the three (3) existing outdoor soccer fields and superimposed on the seasonally adjusted 2026 No-Build traffic volumes to simulate a condition in which the soccer fields were in active season. To estimate the potential traffic volumes generated by the additional retail uses, TEC utilized standard trip rates published in the Institute of Transportation Engineers' (ITE) industry standard publication *Trip Generation, 10th Edition* for Land Use Code (LUC) 488 – Soccer Complex. The new traffic volumes were distributed along the roadway network based on a gravity model that incorporated population within a 7.5-mile radius. The resulting FC Soccer weekday morning and weekday evening peak-hour traffic-volume networks is illustrated in **Figure 7.3**.

[6] Temporary Count Station 3081 – Lancaster – Main Street – East of Otis Street
[7] Temporary Count Station 253426 – Lancaster – Main Street – South of Route 117
[8] Temporary Count Station 253425 – Lancaster – Lunenburg Road – North of Route 117

Not to Scale

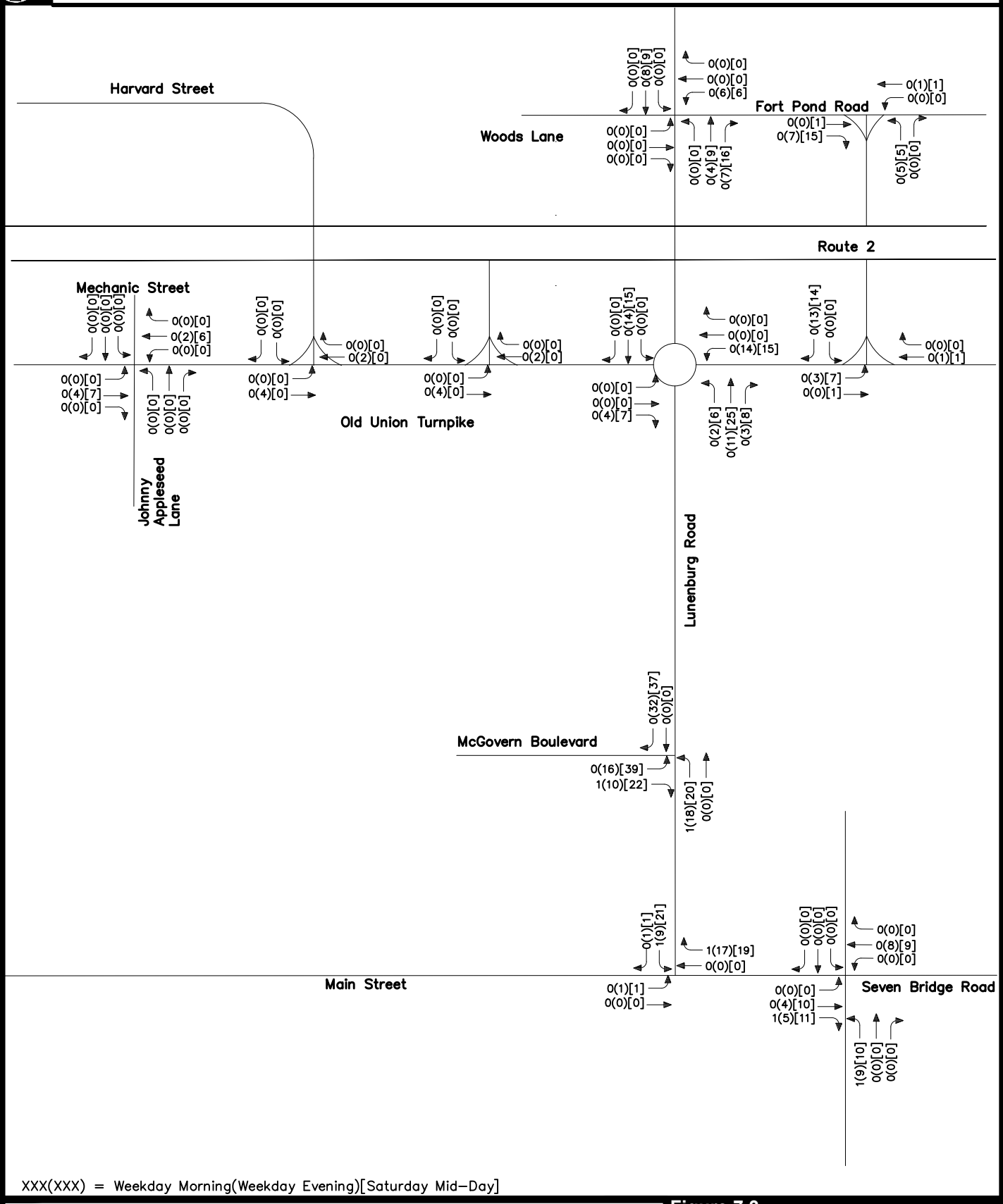


Figure 7.3

**FC Soccer Project (Existing) Trips
Weekday Morning, Weekday Evening,
and Saturday Mid-Day
Peak Hour Traffic Volumes**

The Engineering Corp

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Future Route 2 Interchange 35 Improvements

In February 2016, MassDOT, in coordination with TranSystems, prepared an alternatives analysis for improvements along several Route 2 interchanges east of Interstate 190[9] in Harvard and Lancaster, MA. The study identified five (5) Interchange 35 conceptual alternatives that would directly affect the study area of the Capital Commerce Center TIAPS. A brief description of each alternative is provided below:

- Alternative #1 – Relocates the Route 2 EB off-ramp west of the Route 70 overpass. This relocation places the ramp exit approximately 1,100 feet from the proposed Exit 34 on-ramp, which does not provide adequate distance for the Exit 34 acceleration lane. Accordingly, an auxiliary lane is provided between the two ramps. The ramp terminal is located on Old Union Turnpike approximately 400 feet west of the Route 70 roundabout. The Route 2 WB on-ramp is retained. The Route 2 WB on-ramp would be relocated west of the Route 70 Bridge with a terminal on Route 70 approximately opposite Fort Pond Road. This ramp relocation results in a 750-foot auxiliary lane between the ramp and the Johnny Appleseed Visitor Center exit. The Route 2 WB off-ramp is retained. The four-way intersection this ramp forms with Route 70 and Fort Pond Road includes installation of a traffic signal.

- Alternative #2 – Identical to Alternative #1 on the Route 2 EB side. On the westbound side, the alternative relocates the Route 2 WB off-ramp connecting directly to Route 70 in a half-diamond configuration. To enable Fort Pond Road to remain on its current alignment, this ramp is located tight to the Route 70 Bridge over Route 2. The Route 2 WB on-ramp terminal is located opposite the westbound off-ramp. The intersection of the relocated Route 2 WB ramps with Route 70 includes addition of a traffic signal. Locating this intersection near the bridge over Route 2 also improves vertical sight distance as it is placed closer to the apex of the crest vertical curve. The existing intersection of Fort Pond Road with Route 70 remains unsignalized and the intersection with Woods Lane remains in its existing configuration.

- Alternative #3 - This alternative maintains ramp and intersection configuration on the Route 2 WB side identical to Alternative #2. The Route 2 EB off-ramp is relocated to connect directly to Route 70. The ramp diverges from Route 2 in a similar fashion as under Alternatives #1 and #2 and forms an unsignalized T-intersection with Route 70 south of the bridge over Route 2.

- Alternative #4 – Similar to Alternative #1 except it replaces a signalized intersection of Route 70 and Fort Pond Road with a roundabout. Woods Lane is relocated to the north to provide separation from the roundabout. Due to space requirements, the roundabout further impacts the Boy Scouts of America property

[9] *Route 2 Interchange Improvements Alternatives Analysis; Harvard / Lancaster, MA*; prepared by TranSystems; February 2016.

and Woods Lane relocation requires minor right-of-way acquisition from the parcel located just to the north.

- Alternative #5 – This alternative eliminates the Route 2 EB off-ramp and combines it with the Exit 34 eastbound off-ramp. On the Route 2 WB side, this alternative could be identical to any of the alternatives described above.

At this time, each alternative presents a significantly superior condition in terms of traffic safety and/or traffic operations over the existing condition. Further investigation of the alternatives is still being considered by MassDOT for future projects. Based on recent discussions with MassDOT, no project has been identified at this interchange and it is expected that the design of any alternative, or programming on the Transportation Improvement Program (TIP) is still years away. The TIAPS does not assume that the improvements will be in place by the 2026 horizon year. Further discussion of traffic operations in relation to the project is summarized in the capacity and queue analysis section.

Future Route 2 Interchange 34 Improvements

The aforementioned TranSystems study described additional improvements at Interchange 34 that would directly affect the study area of the Capital Commerce Center TIAPS. Since the study, MassDOT has identified a project at Interchange 34 as MassDOT Project File No. 608832. The project will relocate the Interchange 34 EB ramps to the east with associated improvements to the acceleration and deceleration lanes. Along Old Union Turnpike, the new EB ramps will be extended and cause a realignment to the Old Union Turnpike corridor. The ramps will enter Old Union Turnpike opposite Quarry Road at a potential signalized intersection. The project is in the preliminary design phase and is planned to be funded through the 2023 TIP with construction expected to commence in the Spring of 2024. As the project is still in preliminary design and the future traffic control is not known to-date, the TIAPS does not assume that the improvements will be in place by the 2026 horizon year. Further discussion of traffic operations in relation to the project is summarized in the capacity and queue analysis section.

2026 No-Build Traffic Volumes

The 2026 No-Build weekday morning, weekday evening, and Saturday midday peak-hour traffic-volume networks were developed by applying the 1.0 percent per year compounded annual background traffic growth rate on the Existing Condition peak-hour traffic volumes over the 7-year design horizon (dependent on date of traffic count) and adding the projected traffic generated by the FC Soccer facility. The resulting 2026 No-Build weekday morning, weekday evening, and Saturday midday peak-hour traffic-volume networks are illustrated in **Figure 7.4**.

Not to Scale

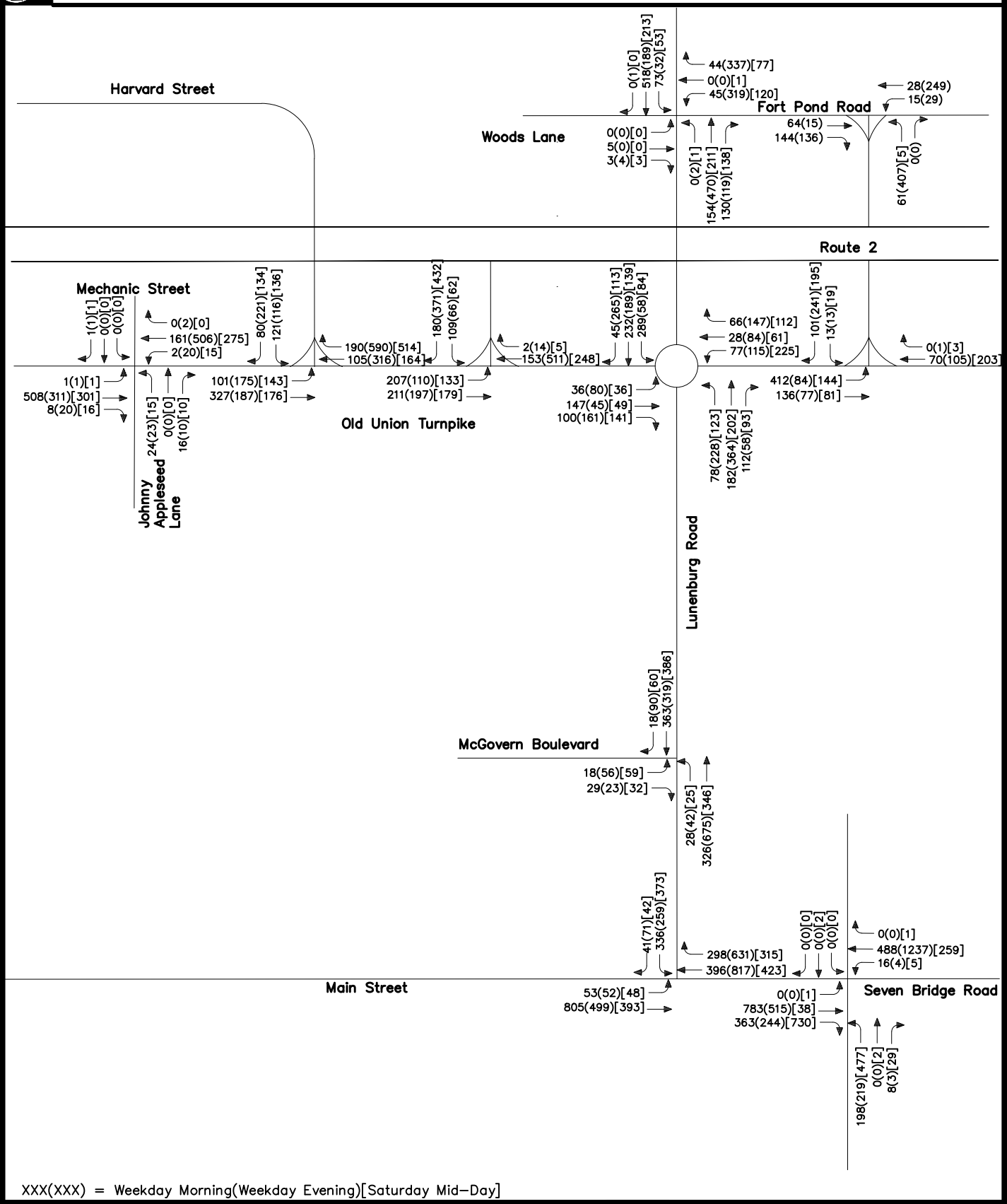


Figure 7.4

2026 No-Build Conditions
Weekday Morning, Weekday Evening, Saturday Mid-Day
Peak Hour Traffic Volumes

The Engineering Corp

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Site Generated Traffic

The Capital Commerce Center Project consists of clearing much of the existing site, but retaining the existing FC Stars soccer complex, Dunkin Donuts, and Mobil Gas Station. The proposed mixed-use development program includes constructing of a 1,567,500 SF industrial park (319 loading docks), 117 single-family residential units, 500 multi-family residential units, a 120-room hotel; 65,700 SF of additional retail space, and an 86,500 SF indoor soccer facility comprised of one soccer field. The Project proposes to retain the access/egress to the site via McGovern Boulevard. The 117 single-family residential units will be disconnected from the rest of the proposed land uses and be accessed/egressed via a new roadway connections to/from Johnny Appleseed Lane [City of Leominster].

TEC estimated the site-generated traffic based on industry standard trip rates published in the ITE publication, *Trip Generation, 10th Edition* for LUC 130 – Industrial Park, LUC 210 – Single-Family Housing (Detached), LUC 221 – Multifamily Housing (Mid-Rise) 310 – Hotel, LUC 488 – Soccer Complex, LUC 820 – Shopping Center.

LUC 820 – Shopping Center Average Rate vs. Fitted Curve

The DEIR document estimates site generated traffic to/from the retail uses on-site utilizing the 'average rate' equation for LUC 820 – Shopping Center as documented in the ITE publication, *Trip Generation, 10th Edition*. It is typical that retail land uses are evaluated using the publication's 'fitted curve' equation for MEPA project permitting. TEC has evaluated the land uses' trip generation based on size and scope of retail to be constructed as part of the site and the existing retail uses already in place. The project proposes 65,700 SF of additional retail space in addition to the recently constructed Dunkin Donuts and Mobil Gas Station. The remaining retail is not intended to be high-intensity similar to the namesake "Shopping Center" which generally assumes an integrated unit of shops, whereas the proposed project would result in several out parcels within a single parking field.

In previous editions of the ITE publication, a separate land use was established to umbrella over similar retail set-ups, LUC 826 – Specialty Retail Center. The land use code was defined as generally small strip shopping centers that contain a variety of retail shops in which the average weekday peak hour trip estimates were based on 60,000 to 69,000 SF of retail uses, similar to the proposed project. Based on standard trip rates published in the ITE publication, *Trip Generation, 9th Edition* (2012), LUC 826 – Specialty Retail Center, the 65,700 SF of additional retail on-site would be projected to generate 46 trips during the weekday morning peak hour and 180 new trips during the weekday evening peak hour. Each of these projected trip estimates is well below the 'average rate' equation result under the LUC 820 – Shopping Center (64 trips weekday morning and 250 trips weekday evening). It is TEC's engineering judgement that the 'average rate' equation for projections of traffic for the additional retail space on-site is a conservative and applicable standard to measure future volumes.

LUC 130 – Industrial Park Data Extraction

The ITE publication, *Trip Generation, 10th Edition* provides standard trip rates and equations for dozens of land uses. The data as provides typically denotes the number of trips versus a specific independent variable. It is not uncommon that the data as presented in the publication is modified to closely mimic the specific land use and type. For instance, if a development is in a rural area,

removing urbanized-related data. Or if data is provided for a land use on a large scale of building footprints, specific parts of the data can be extracted to provide a more accurate depiction of a specific development plan within a size range. In 2018, ITE released its online application version of the *Trip Generation, 10th Edition* publication. One of the several goals of the online application was to simplify the specific querying of data for engineers and planners to provide a more pointed and precise selection of land use data to individual development proposals. If specific data is extracted, it is important to provide justification for the extraction.

TEC has provided extracted site trip generation data under LUC 130 – Industrial Park for the weekday morning and weekday evening peak hours. *Trip Generation, 10th Edition* provides only an 'average rate' equation for these two time periods under this land use; however as typical industrial parks get larger, the data advocates that the 'average rate' equations significantly over estimate site traffic. For example, in the weekday morning and weekday evening peak hour, all industrial parks with more than 1,500,000 SF represented in the data have trip ends well less than the 'average rate' line. To moderate this significant overestimation, TEC queried only the data for industrial parks with more than 1,000,000 SF of gross floor area. This allows the trip generation for the weekday morning and weekday evening peak hours to be considerably more realistic in nature, while still being conservative to the ITE data points. This methodology was only conducted for the weekday morning and weekday evening peak hours as the weekday daily calculation is based upon a fitted curve and the Saturday daily and Saturday midday calculations provide too small of a sample size to justify extracted data points. The methodology utilized for this land use was approved by MassDOT. Worksheets directly from the ITE online application are included in Appendix F.7.

Existing Land Uses Trip Generation Credit

The existing site includes several minor uses over the two distinct development zones. Within the development zone connected to McGovern Boulevard, the site includes the FC Stars outdoor soccer complex comprised of three (3) soccer fields, a 11,800 SF J.B. Hunt Transport Services facility, a 2,300 SF Dunkin Donuts, a 5,000 SF Mobil gas station with convenience market, and the soil / gravel yard for the New England Specialty Soils. Within the development zone connected to Johnny Appleseed Lane, the site includes one single-family dwelling and an equestrian field with stable operations.

TEC previously noted that site generated traffic related to the FC Stars outdoor soccer complex was assessed as part of the No-Build scenario as the December 2018 traffic counts would not generate for traffic volumes at this facility because it is a seasonal operation. Traffic generated by the other existing land uses would be present in the December 2018 and April 2019 traffic counts.

The existing land uses to be removed from the site do not generate a substantial amount of traffic volumes throughout the course of typical weekday. For the 11,800 SF J.B. Hunt Transport Services facility, it is expected that approximately 58 vehicle trips access/egress the industrial facility on a typical weekday and from a driveway separated and unconnected to McGovern Boulevard and other site related traffic volumes. The single-family dwelling and equestrian field with stable operations would generate approximately ten (10) vehicle trips on a typical weekday. The soil / gravel yard for the New England Specialty Soils also generates a substantially low number of vehicle trips to/from the Project location. Trip generation credit has been taken for the 11,800 SF J.B. Hunt Transport Services facility. As the number of vehicles generated by the

equestrian field with stable operations, and the soil / gravel yard for the New England Specialty Soils are considerably low, no credit was taken for these uses as part of the peak hour traffic operations assessment.

Internal Capture

It is reasonable to expect that some site-generated trips to the site will be shared amongst multiple land uses. For example, someone traveling to the industrial park may choose to stay at the hotel within the Project site. More precisely, some site-generated trips to the site will be shared amongst the existing and separated proposed land uses. For example, someone travelling to the industrial park may decide to purchase gas at the Mobil Station or a coffee at Dunkin Donuts adjacent to the Project site. This internal capture can occur as the proposed mixed retail uses, the existing Mobil gas station, and the Dunkin Donuts provide direct access/egress to/from the proposed Project along McGovern Boulevard without exiting onto Lunenburg Road. As a result, a reduction in the overall external trips experienced at the site driveways can be anticipated as a result of multi-use, or shared, trips that include stops at more than one use on the site.

Although a large amount of sharing can occur it is likely that much of this internal capture will still be with new trips to the site as the trips that are currently, or potential will travel to/from the retail areas and uses would be established once the Project is constructed. Based on information contained in the industry standard ITE publication *Trip Generation Handbook, 3rd Edition*, multi-use trips were assigned for trip sharing amongst the hotel, industrial park, and the multi-family resident land uses only. Credit was not taken for internal capture between the proposed uses / existing land uses and the soccer complex. In addition, no credit was taken for internal capture between any on-site use and the single-family residences as these residential units are separated from the development and cannot be traversed internally. This provides an overall conservative analysis of site trip generation. The multi-use trip generation worksheets are included in **Appendix F.7**.

Pass-by Trips

Not all of the trips generated by the proposed mixed-use redevelopment will be new to the roadway network. Many of the trips generated by the proposed redevelopment are already present in the existing traffic flow passing by the site and may decide to visit the site on their way to another destination. For example, a driver travelling along Lunenburg Road on the way home from work in Fitchburg may stop at the on-site neighborhood retail and then continue their trip home. These vehicle trips are known as "pass-by" trips and are subtracted from the total trips to calculate the total primary (or "new") trips that affect the volume of traffic within the study area away from the site. Based on information contained in the industry standard ITE publication *Trip Generation Handbook, 3rd Edition*, approximately 26 to 34 percent of the general retail / shopping center site-generated traffic is expected to be pass-by traffic. TEC has confirmed that the number of pass-by trips estimated for the project is less than 15 percent of the adjacent street traffic per MassDOT standards.

Tables 7.6 and **7.7** provides a summary of the resulting trip generation estimate separated by LUC and the total trip generation separated by multi-use, transit, pass-by, and primary trips. The detailed trip generation calculation worksheets are provided in **Appendix F.7**.

Table 7.6: Total New Trip Generation Summary by Land Use Code

Time Period	Industrial Park (LUC 130)	Single Family Resident (LUC 210)	Multi-Family Resident (LUC 221)	Hotel (LUC 310)	NEW Soccer Complex (LUC 488)	General Retail (LUC 820)	Total Trips
Weekday Daily							
IN	1,963	601	1,362	464	36	1,240	**5,666**
OUT	1,963	601	1,362	464	36	1,240	**5,666**
TOTAL	3,926	1,202	2,724	928	72	2,480	**11,332**
Weekday Morning							
IN	371	22	43	32	1	40	**509**
OUT	99	66	123	22	1	24	**335**
TOTAL	470	88	166	54	2	64	**844**
Weekday Evening							
IN	90	74	127	33	9	120	**453**
OUT	318	44	81	31	5	130	**609**
TOTAL	408	118	208	64	14	250	**1,062**
Saturday Daily							
IN	1,990	569	969	430	203	1,515	**5,676**
OUT	1,990	569	969	430	203	1,515	**5,676**
TOTAL	3,980	1,138	1,938	860	406	3,030	**11,352**
Saturday Midday							
IN	221	63	106	49	18	154	**611**
OUT	469	53	111	39	20	142	**834**
TOTAL	690	116	217	88	38	296	**1,445**

Table 7.7: External Trip Generation Summary

Time Period	Total Trips [a]	Multi-Use Trip Credit	Existing Trip Credit	Pass-by Trips	External Primary Trips
Weekday Daily					
IN	**5,666**	469	29	**273**	**4,895**
OUT	**5,666**	469	29	**273**	**4,895**
TOTAL	**11,332**	938	58	**546**	**9,790**
Weekday Morning					
IN	**509**	37	7	**5**	**460**
OUT	**335**	37	1	**5**	**292**
TOTAL	**844**	74	8	**10**	**752**
Weekday Evening					
IN	**453**	77	1	**31**	**344**
OUT	**609**	77	7	**31**	**494**
TOTAL	**1,062**	154	8	**62**	**838**
Saturday Daily					
IN	**5,676**	529	12	**334**	**4,801**
OUT	**5,676**	529	12	**334**	**4,801**
TOTAL	**11,352**	1,058	24	**668**	**9,602**
Saturday Midday					
IN	**611**	37	2	**34**	**538**
OUT	**834**	37	2	**34**	**761**
TOTAL	**1,445**	74	4	**68**	**1,299**

[a] From Table 7.6

As shown in **Table 7.7**, the proposed mixed-use development is anticipated to generate 9,790 new vehicle trips during the average weekday, with 752 new vehicle trips (460 entering and 292 exiting) during the weekday morning peak hour and 838 new vehicle trips (344 entering and 494 exiting) during the weekday evening peak hour. A total of 9,602 new vehicle trips are anticipated during the average Saturday, with 1,299 new vehicle trips (538 entering and 761 exiting) during the Saturday midday peak hour. Because of the rural nature of the site, the mode split is anticipated to be very near 100-percent automobile.

Site Trip Distribution

The Project proposes to retain the access/egress to the site via McGovern Boulevard. The 117 single-family residential units will be disconnected from the rest of the proposed land uses and be accessed/egressed via new roadway connections to/from Johnny Appleseed Lane [City of Leominster].

Industrial Park Land Use

The distribution of industrial park site-generated traffic volumes was based on gravity models using 2009-2013 U.S. Census Bureau Journey-to-Work/Home data for the Town of Lancaster. The industrial park distribution models the commutes of workers to Lancaster from the top 25 residential cities and towns, which represent approximately 87 percent of total Lancaster

workforce. The top 87 percent of resident communities generally allow for an approximation of overall distribution of traffic. Additional communities at this level each contribute less than 0.70 percent of the Lancaster workforce each which is deemed to not change the distribution of traffic calculations significantly.

Residential Land Uses

The distribution of both the single-family and multi-family residential site-generated traffic volumes was based on gravity models using 2009-2013 U.S. Census Bureau Journey-to-Work/Home data for the Town of Lancaster. The residential distribution models the commutes of residents from Lancaster to the top 33 workforce cities and towns, which represent approximately 90 percent of total Lancaster residents. The top 90 percent of workforce communities generally allow for an approximation of overall distribution of traffic. Additional communities at this level each contribute less than 0.75 percent of the Lancaster residents each which is deemed to not change the distribution of traffic calculations significantly.

Note that the distribution for the single-family and multi-family residential areas within the site are different. This is due to the location of the access/egress to each of these residential areas. The single-family residential area is accessed via Mechanic Street within the City of Leominster while the multi-family residential area is accessed via McGovern Boulevard and Lunenburg Road. Although the roadway distribution is different, the overall community-by-community distribution percentages are equivalent and based upon the 2009-2013 U.S. Census Bureau Journey-to-Work/Home data for the Town of Lancaster.

Retail Land Use

The distribution of retail site-generated traffic volumes was based on a gravity model using 2017 U.S. Census Bureau estimated population data, location of competing opportunities, and travel time for the surrounding communities within a 7.5-mile radius of the Project site. The retail distribution models the commutes of residents from the Town of Lancaster and eleven (11) adjacent communities to/from the Project site after weighting each community based on total population.

Hotel Land Use

The site-generated traffic for the hotel land use was anticipated to generate trips an overwhelming majority of its trip generation to/from Route 2. This is based on the low level of nearby commercial land uses to generate hotel-type traffic in the immediate project vicinity as tourists and business travelers will primarily utilize Route 2 and I-190 to access the hotel. It is anticipated that 80 percent of hotel traffic will be generated to/from the north along Route 2, with the remaining 20 percent to/from the secondary roadways leading towards the site such as Lunenburg Road, Mechanic Street, and Seven Pond Road (to/from Interstate 495).

Soccer Complex Land Uses

The distribution of soccer complex site-generated traffic volumes was based on a gravity model using 2017 U.S. Census Bureau estimated population data for the surrounding communities within a 7.5-mile radius of the Project site. The soccer complex distribution models the commutes of

residents from the Town of Lancaster and eleven (11) adjacent communities to/from the Project site after weighting each community based on total population.

Trip Distribution Summary

The resulting primary trip distributions for the hotel, industrial park, residential units, and soccer complex are shown in **Table 7.8**. Trip distribution gravity models are included in **Appendix F.8**. The weekday morning and weekday evening site-generated traffic-volume networks are presented in **Figure 7.5**.

Table 7.8: Trip Distribution Summary

Direction	Industrial Park	Single Family	Multi Family	Hotel	Soccer Complex	Retail
Route 2 to/from east	6%	23%	12%	40%	11%	18%
Route 2 to/from west	42%	30%	23%	40%	25%	7%
Mechanic Street to/from west	8%	9%	2%	5%	10%	2%
Fort Pond Road to/from east	1%	1%	1%	0%	1%	1%
Old Union Tnpk to/from east	1%	1%	1%	0%	1%	1%
Route 117 to/from east	7%	21%	28%	5%	17%	23%
Route 117 to/from west	4%	0%	3%	0%	2%	5%
Route 70 to/from north	6%	2%	3%	5%	15%	28%
Route 70 to/from south	25%	13%	27%	5%	18%	15%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

2026 Build Traffic Volumes

The 2026 Build Condition traffic-volume networks consist of the 2026 No-Build traffic volumes with the addition of the site-generated traffic for the proposed redevelopment. The resulting 2026 Build weekday morning, weekday evening, and Saturday midday peak-hour traffic-volume networks are presented in **Figure 7.6**.

Traffic Warrants

Left-Turn Lane Warrants

A left-turn lane warrant analysis was conducted for the intersection of Lunenburg Road / McGovern Boulevard using hourly traffic volumes based on TMCs conducted in December 2018. The potential left-turn lane along Lunenburg Road northbound was analyzed under both unsignalized and signalized intersection conditions.

Not to Scale

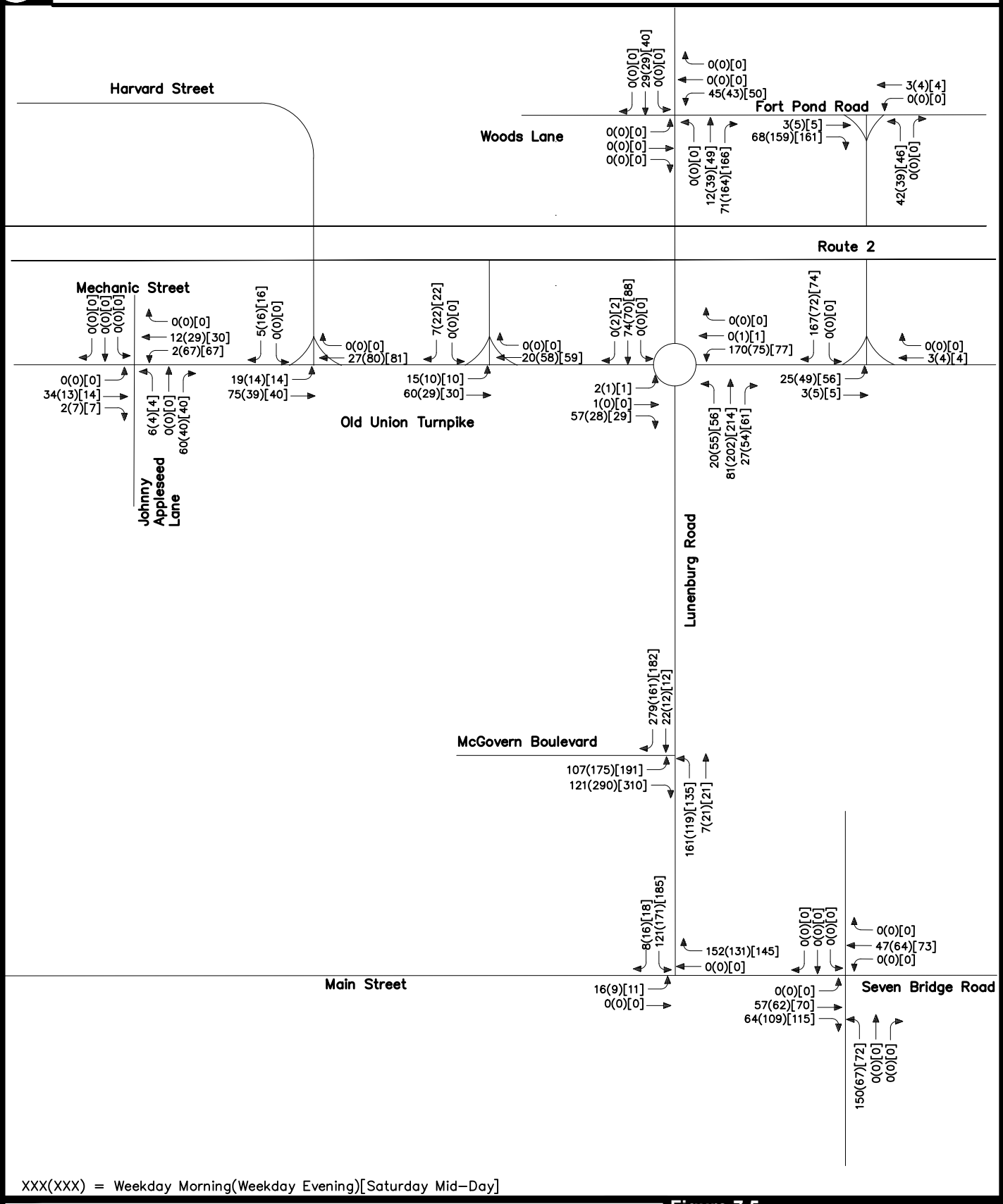


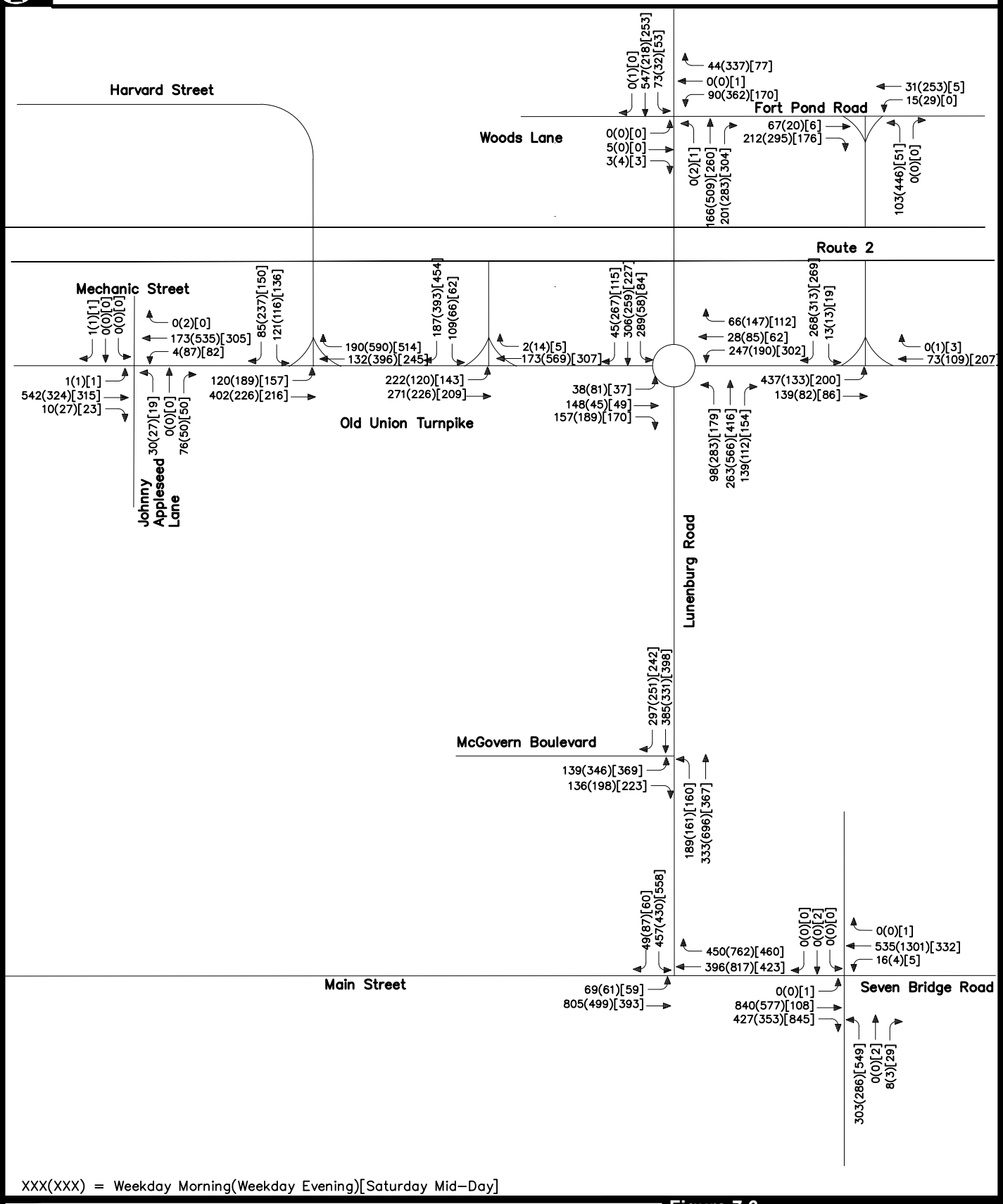
Figure 7.5

Site-Generated Traffic
Weekday Morning, Weekday Evening, and Saturday Mid-Day
Peak Hour Traffic Volumes

The Engineering Corp

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Not to Scale



XXX(XXX) = Weekday Morning(Weekday Evening)[Saturday Mid-Day]

Figure 7.6

2026 Build Conditions
Weekday Morning, Weekday Evening, Saturday Mid-Day
Peak Hour Traffic Volumes

TEC The Engineering Corp

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The *MassHighway Project Development and Design Guide*[10] define left-turn lane volume warrants at unsignalized and signalized intersections based on the Transportation Research Board's (TRB) publication, the *Highway Capacity Manual (HCM) 2010*[11]. The criteria are based on the operating speed of the roadway (50 mph posted), the opposing volume, and the percent of left-turning vehicles for the advancing vehicle volume. Based on both the signalized and unsignalized operating conditions on Lunenburg Road, the traffic volumes do warrant the construction of a left-turn lane on the Lunenburg Road northbound approach.

An excerpt from the *MassHighway Project Development and Design Guide* noting the criteria for the introduction of a left-turn lane by traffic volume is provided in **Appendix F.9**.

Traffic Signal Warrants

A traffic signal warrant analyses was conducted for the intersection of Lunenburg Road at McGovern Boulevard to document the warranting condition should a traffic signal be recommended as mitigation for the project. TEC performed the traffic signal warrant analyses based on criteria contained within the *Manual on Uniform Traffic Control Devices* (*MUTCD*)[12]. The *MUTCD* contains eight warrants for evaluating the need for installation of a traffic signal. The two multi-hour volume-related warrants were evaluated to determine whether a traffic signal is warranted at the four intersections described above. These warrants include:

- Warrant 1: Eight-Hour Vehicular Volume
- Warrant 2: Four-Hour Vehicular Volume
- Warrant 3: Peak-Hour Vehicular Volume

For the purposes of this analysis, TEC utilized 12-hour ATRs conducted at the subject intersection to assess the warranting condition over a typical weekday. Existing traffic exiting McGovern Boulevard was only programmed for the weekday morning and weekday evening peak hours as no ATR was available along this side-street.

Site-generated traffic volumes to be utilized in the traffic signal warrant analyses were assessed based on trip generation rates obtained in the ITE publication, *Trip Generation, 10th Edition*. As many hours during the day are not represented based on the ITE trip generation data, TEC projected site generated traffic onto the non-peak hours based on engineering judgement for each land use. For example, the residential land uses were projected to generate a small amount of traffic outside the commuter peak and lunch time periods.

Warrant Adjustments

85th Percentile Speed greater than 40 MPH - As noted in the ATR counts collected in December 2018, vehicle speeds along Lunenburg Road northbound and southbound entering the intersection were measured with an 85th percentile speed at or greater than 40 MPH during free-flow

[10] *MassHighway Project Development and Design Guide*, MassHighway (now Massachusetts Department of Transportation (MassDOT) – Highway Division); Boston, Massachusetts, 2006
[11] *Highway Capacity Manual 6th Edition*; Transportation Research Board; Washington, DC; 2016
[12] *Manual on Uniform Traffic Control Devices (MUTCD)* – Federal Highway Administration / U.S. DOT – 2009 Edition.

conditions. Therefore, the *MUTCD* notes that traffic volumes reductions in the 70% and 56% columns of Table 4C.1 of the *MUTCD* shall govern for use in the traffic signal warrant.

Right-Turn Side-Street Traffic Volumes - The McGovern Boulevard eastbound approach is proposed to consist of an exclusive left-turn lane and an exclusion right-turn lane. For this approach geometry, the *MUTCD* states:

> *"…engineering judgment and rationale should be applied to a street approach with one through/left-turn lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered." (MUTCD - Sect 4C.01 ¶10)*

Right-turns exiting the minor-street can generally be discounted at a traffic signal due to the lesser conflict seen between right-turns on minor-streets and major-street traffic. At the intersection of Lunenburg Road / McGovern Boulevard, a 100 percent reduction for right-turns was applied to the McGovern Boulevard eastbound approach based on the potential for a lesser vehicle conflict for right-turning vehicles and the presence of an exclusive right-turn lane.

Number of Lanes - As part of this traffic signal warrant analysis, the Lunenburg Road "major street" approach and the McGovern Boulevard "minor street" approach to the intersection were designated as one-lane approaches. The MUTCD provides guidance that states:

> *"Engineering judgment should also be used in applying various traffic signal warrants to cases where approaches consist of one lane plus one left-turn or right-turn lane. The site-specific traffic characteristics should dictate whether an approach is considered as one lane or two lanes. For example, for an approach with one lane for through and right-turning traffic plus a left-turn lane, if engineering judgment indicates that it should be considered a one-lane approach because the traffic using the left-turn lane is minor, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach. The approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles." (MUTCD Section 4C.01 ¶9)*

This paragraph generally states that engineering judgement shall be utilized in determination of number of travel lanes on the major and minor street. The Lunenburg Road northbound approach consists of "one" lane as the level of left-turning volume within an exclusive left-turn lane represents only 22 percent of the approach volume. In addition, as right-turns will not be evaluated along McGovern Boulevard, the McGovern Boulevard approach will be considered a one-lane approach within the traffic signal warrant calculations.

Warrant Results

Based on the existing traffic volumes and the addition of the projected site-generated trips for each proposed land use, the intersection of Lunenburg Road / McGovern Boulevard meets the criteria

for Warrant 1, Warrant 2, and Warrant 3. As a traffic signal is warranted and due to the operating and safety conditions of the intersection without a traffic signal in place, installation of a traffic signal at this intersection is recommended as part of the off-site corridor improvements along Lunenburg Road. The off-site mitigation section of this chapter defines the timing and scope of the traffic signal installation. The signal warrant analysis worksheets are included in **Appendix F.10**.

Traffic Operations Analysis

Measuring existing and future traffic volumes quantifies traffic flow within the study area. To assess quality of flow, roadway capacity and vehicle queue analyses were conducted under Existing, No-Build, Build, and Build with Mitigation traffic-volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

Methodology

Levels of Service

A primary result of capacity analyses is the assignment of level-of-service to traffic facilities under various traffic-flow conditions.[13] The concept of level-of-service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

Queue Length Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro 9.0™ intersection capacity analysis software which is also based upon the methodology and procedures presented in the *HCM 2010*. Synchro reports the 95th percentile queues for unsignalized intersections and both the 50th (average) and 95th percentile vehicle queues for signalized intersections, which are based on the number of vehicles that experience a delay of six (6) seconds or more at an intersection and is a function of the traffic signal timing; vehicle arrival patterns during the analysis period; and the saturation flow rate. The 50th percentile or average vehicle queue is the average number of vehicles that are projected to be delayed by six seconds or more at the intersection under study during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only five (5) percent of

[13] The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010

the time; or approximately three (3) minutes out of 60 minutes during the peak one hour of the day. During the remaining 57 minutes, the vehicle queue length will be less than the 95th percentile queue length.

Parameters for Traffic Impact Analysis

Unsignalized Intersections

The levels of service of two-way stop-controlled unsignalized intersections are determined by application of a procedure described in the *HCM 2010*. Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and stop signs. Control delay includes the effects of initial deceleration delay approaching a stop sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *HCM 2010*. **Table 7.9** summarizes the relationship between level of service and average control delay.

Table 7.9: Level-of-Service Criteria for Unsignalized Intersections [(a)]

Level of Service (v/c ≤ 1.0)	Level of Service (v/c > 1.0)	Average Control Delay (seconds per vehicle)	Description
A	F	≤10.0	LOS A represents a condition with little or no control delay to minor street traffic.
B	F	10.1 to 15.0	LOS B represents a condition with short control delays to minor street traffic.
C	F	15.1 to 25.0	LOS C represents a condition with average control delays to minor street traffic.
D	F	25.1 to 35.0	LOS D represents a condition with long control delays to minor street traffic.
E	F	35.1 to 50.0	LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
F	F	>50.0	LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with excessive control delays resulting.

[a] Source: *Highway Capacity Manual 2010*; Transportation Research Board; Washington D.C.; 2010; page 17-2

Signalized Intersections

LOS for signalized intersections is calculated using the operational analysis methodology of the *HCM 2010*. This method assesses the effects of signal type, timing, phasing, progression; vehicle mix; and geometrics on delay. LOS designations are based on the criterion of control or signal delay per vehicle. Control or signal delay can be related to driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay.

Table 7.10 summarizes the relationship between LOS and control delay. The tabulated control delay criterion may be applied in assigning LOS designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table 7.10: Level-of-Service Criteria for Signalized Intersections [a]

Level of Service (v/c ≤ 1.0)	Level of Service (v/c > 1.0)	Average Control Delay (seconds per vehicle)	Description
A	F	≤10.0	LOS A describes operations with very low control delay; most vehicles do not stop at all.
B	F	10.1 to 20.0	LOS B describes operations with relatively low control delay. However, more vehicles stop than LOS A.
C	F	20.1 to 35.0	LOS C describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	F	35.1 to 55.0	LOS D describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable, whereby motorists are not able to get through the signal on one cycle.
E	F	55.1 to 80.0	LOS E describes operations with high control delay values. Individual cycle failures are frequent occurrences.
F	F	>80.0	LOS F describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

[a] Source: *Highway Capacity Manual 2010*; Transportation Research Board; Washington D.C.; 2010

Roundabout Intersections

The capacity and queue analysis for the roundabout location was performed using the Sidra v7™ traffic capacity analysis software which is also based upon the methodology and procedures presented in the *HCM 6th Edition*. The levels-of-service of roundabouts are equivalent to the levels-of-service of unsignalized intersections and are determined by application of a procedure described in the *HCM 6th Edition*. Level-of-service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and stop-signs. Control delay includes the effects of initial deceleration delay approaching a stop-sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level-of-service at roundabout intersections are also given in the *HCM 6th Edition*. **Table 7.11** summarizes the relationship between level-of-service and average control delay.

Table 7.11: Level-of-Service Criteria for Roundabouts[a,b]

Level-of-Service (v/c < 1.0)	Level-of-Service (v/c ≥ 1.0)	Average Control Delay (seconds per vehicle)	Description
A	F	≤10.0	LOS A represents a condition with little or no control delay to minor street traffic.
B	F	10.1 to 15.0	LOS B represents a condition with short control delays to minor street traffic.
C	F	15.1 to 25.0	LOS C represents a condition with average control delays to minor street traffic.
D	F	25.1 to 35.0	LOS D represents a condition with long control delays to minor street traffic.
E	F	35.1 to 50.0	LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
F	F	>50.0	LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with excessive control delays resulting.

[a] Source: *Highway Capacity Manual 6th Edition*; Transportation Research Board; Washington D.C.; 2016

[b] Based on unsignalized intersection LOS

Traffic Impact Analysis Results

Level-of-service analyses were conducted for the 2019 Existing, 2026 No-Build, 2026 Build, and 2026 Build with Mitigation Conditions for the study area intersections. The results of the intersection capacity analysis are summarized in Table 7.12. The capacity analysis worksheets are provided in **Appendix F.11**.

Main Street / Seven Bridge Road

The intersection of Main Street / Seven Bridge Road / Shirley Road is to be reconstructed with a fully-actuated traffic signal as part of a separate project. The Main Street northbound movement at the intersection is anticipated to operate at LOS F during both the weekday morning, weekday evening, and Saturday midday peak period with the projection of site generated traffic volumes. Improvements are recommended and proposed at this intersection as part of Capital Commerce Center project's off-site mitigation, which includes re-timing the signal timings at the newly constructed traffic signals to accommodate the site-generated trips. With these improvements, all movements during the weekday morning and Saturday midday peak hours are expected to operate at acceptable levels of service (LOS D or better). During the weekday evening peak hour, the northbound approach will continue to operate at LOS F with a delay slightly above the LOS F threshold. In comparison, the approach will operate significantly better than existing conditions without the traffic signal in place. All other movements at this intersection during the weekday evening peak hour are expected to operate at acceptable levels of service (LOS D or better).

Main Street / Lunenburg Road

The intersection of Main Street / Lunenburg Road is to be reconstruction with a fully-actuated traffic signal as part of a separate project. The Lunenburg Road southbound movement at the intersection is anticipated to operate at LOS F during both the weekday morning, weekday evening, and Saturday midday peak period with the projection of site generated traffic volumes. Improvements are recommended and proposed at this intersection as part of Capital Commerce Center project's off-site mitigation, which includes re-timing the signal timings at the newly constructed traffic signals to accommodate the site-generated trips. With these improvements, all

movements during the weekday morning, weekday evening, and Saturday midday peak hours are expected to operate at acceptable levels of service (LOS D or better).

Lunenburg Road / McGovern Boulevard

With the additional site generated traffic and the existing geometric conditions in place, the McGovern Boulevard eastbound approach would operate at elevated levels-of-service. Improvements are recommended and proposed at this intersection as part of Capital Commerce Center project's off-site mitigation and will consist of full intersection reconstruction to provide turning lanes along Lunenburg Road and the installation of a traffic control signal. With these improvements, all movements during the weekday morning and evening peak hours are expected to operate at acceptable levels of service (LOS C or better) with volume-to-capacity (V/C) ratios well below 1.00 which indicates that the intersection can accommodate the additional demand created by the site.

Lunenburg Road / Old Union Turnpike

Specific traffic operational improvements are not proposed at the intersection of Lunenburg Road / Old Union Turnpike. The intersection of Lunenburg Road / Old Union Turnpike was recently reconstructed as a roundabout in 2013 to provide a substantial amount of new reserve capacity. Under 2026 Build Conditions, the Old Union Turnpike westbound approach is anticipated to operate at LOS E during the weekday evening peak period. This level of delay is only expected during this short time period of a typical weekday and is specifically dependent on the conservative level of site generated traffic allocated to the location. There are no practical means to mitigate project related impacts on this approach based on the short period of elevated levels-of-service. All other movements at this intersection are anticipated to operate at acceptable levels of service (LOS D or better) with V/C ratios well below 1.00 which indicates that the intersection can accommodate the additional demand created by the site.

Lunenburg Road / Fort Pond Road / Woods Lane

Specific traffic operational improvements are not proposed at the intersection of Lunenburg Road / Fort Pond Road / Woods Lane; however, interchange improvements along Route 2 are expected to change the characteristics of the intersection; including potential intersection relocation, as part of a future MassDOT project. For the purposes of this DEIR, no alternative for improvement has been identified and therefore the No-Build and Build scenarios assume the existing geometry and intersection control. Under both 2026 No-Build and Build Conditions, the Fort Pond Road westbound approach is anticipated to operate at elevated levels-of-service (LOS F) during the weekday evening peak period. This level of delay is only expected during this short time period of a typical weekday and is specifically dependent on the conservative level of site generated traffic allocated to the location. All other movements at this intersection are anticipated to operate at acceptable levels of service (LOS D or better) with V/C ratios well below 1.00 which indicates that the intersection can accommodate the additional demand created by the site. With the construction of any of the five improvement alternatives identified by MassDOT as part of the future project, traffic operations and safety at the intersection are anticipated to greatly improve.

In the event that improvements at this location are not completed by MassDOT prior to full-occupancy of the development, the Proponent will examine additional improvements based on the

phasing of the site. Site generated trip thresholds for mitigation at this location is described in the "Off-Site Mitigation" section of this chapter.

Old Union Turnpike / Route 2 EB Ramps [Exit 35]

Specific traffic operational improvements are not proposed at the intersection of Old Union Turnpike / Route 2 EB Interchange 35 Ramps; however, interchange improvements along Route 2 are expected to change the characteristics of the intersection as part of a future MassDOT project. All five interchange alternatives remove the Route 2 EB off-ramp movements and shift them to the west along either Old Union Turnpike or Route 70. These improvements are not anticipated to be completed prior to the 2026 horizon year; therefore, for the purposes of these TIAPS the No-Build and Build scenarios assume the existing geometry and intersection control. Under 2026 Build Conditions, all movements at the intersection are expected to operate at acceptable levels of service (LOS D or better) during all peak hour analysis scenarios with queues not extending in any significant length along the ramps.

Fort Pond Road / Route 2 WB Ramps [Exit 35]

Interchange improvements along Route 2 are expected to change the characteristics of the Fort Pond Road / Route 2 WB Interchange 35 Ramps intersection as part of a future MassDOT project. All five interchange alternatives modify the Route 2 WB ramps. Two (2) of the alternatives retain the Route 2 WB off-ramp condition along Fort Pond Road while moving the on-ramp condition to the west side of Route 70. These conditions would generally retain traffic operation conditions exiting the off-ramp. The other three (3) alternatives shift the on- and off-ramps into a diamond interchange pattern along Route 70; separating out the Fort Pond Road traffic volumes. These improvements are not anticipated to be completed prior to the 2026 horizon year; therefore, for the purposes of these TIAPS the No-Build and Build scenarios assume the existing geometry and intersection control.

Under 2026 Build Conditions, all movements at the intersection are expected to operate at acceptable levels of service (LOS D or better) during all peak hour analysis scenarios with exception of the Route 2 off-ramp left-turn movement with will operate at an elevated level-of-service (LOS E) during the weekday evening peak hour. Although the ramp will operate at an elevate level-of-service, the ramp approach will generally operate in a consistent manner as existing conditions as the additional traffic will also result in a more consistent flow of traffic.

As discussed with MassDOT, there are no practical off-site mitigation alternatives for this approach that would result in a reduction of LOS. The level of impact from the project and the traffic volumes along the ramp do not warrant a change in control at the intersection. Geometric improvements are recommended and proposed at this location as part of Capital Commerce Center project's off-site mitigation and will include a commitment to extend the queue storage and deceleration lane along the Route 2 WB Off-Ramp to ensure project related traffic does not conflict with Route 2 mainline volumes. This mitigation does not alter the results of the capacity and queue analysis.

Mechanic Street / Johnny Appleseed Lane / Memorial Park [City of Leominster]

Specific traffic operational improvements are not proposed at the intersection of Mechanic Street / Johnny Appleseed Lane / Memorial Park. Under 2026 Build Conditions, all movements at the intersection are expected to operate at acceptable levels of service (LOS D or better) during all peak hour analysis scenarios with V/C ratios well below 1.00 which indicates that the intersection can accommodate the additional demand created by the site.

Old Union Turnpike / Harvard Street

Under both the 2026 No-Build and Build Conditions, the Harvard Street southbound movement is anticipated to operate at elevated levels-of-service during the weekday evening and Saturday midday peak hours. An extended queue is only expected to be experienced during the weekday evening peak hour with an additional three (3) vehicles. Although the approach experiences LOS F conditions based on the Synchro™ analysis, this condition is not expected to be fully realized in a real-world scenario. The Old Union Turnpike westbound approach is currently wide and generally allows for right-turning traffic entering Harvard Street to do so within an unmarked, de facto channelized lane. When this condition is input into the Synchro™ analysis, the delay and LOS along Harvard Street drops by more than 60 percent. The project is only expected to add an additional 16 southbound vehicles during both the weekday evening and Saturday midday peak hours and all right-turn movements are under yield control.

Specific traffic operational improvements are not proposed at the intersection of Old Union Turnpike / Harvard Street. There are no practical mitigation alternatives for this intersection in the interim that would result in a reduction of LOS. The level of impact from the project and the traffic volumes along Harvard Street do not warrant a change in control at the intersection.

Old Union Turnpike / Route 2 EB Ramps [Exit 34]

Under 2026 Build Conditions, the Route 2 EB ramp southbound movement is anticipated to operate at elevated levels-of-service during both the weekday morning and weekday evening peak hour. Although the levels-of-service are elevated, the addition traffic from the Project is not anticipated to result in a significant increase in delay or extend vehicle queues by more than four (4) vehicles. This additional queue is only experienced during the weekday evening peak hour.

Specific traffic operational improvements are not proposed at the intersection of Old Union Turnpike / Route 2 EB Interchange 34 Ramps; however, interchange improvements along Route 2 are expected to change the characteristics of the intersection as part of MassDOT Project File 608832. These improvements are not anticipated to be completed prior to the 2026 horizon year; therefore, for the purposes of these TIAPS the No-Build and Build scenarios assume the existing geometry and intersection control. Concurrently, as the subject development is not expected to be fully built-out by the construction of the MassDOT project, the elevated level-of-service is not expected to be realized at this location. There are no practical mitigation alternatives for this intersection in the interim that would result in a reduction of LOS. The level of impact from the project and the traffic volumes along the ramp do not warrant a change in control at the intersection.

Table 7.12: Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	2019 Existing V/C[a]	2019 Existing Delay[b]	2019 Existing LOS[c]	2019 Existing Queue[d]	2026 No-Build V/C	2026 No-Build Delay	2026 No-Build LOS	2026 No-Build Queue	2026 Build V/C	2026 Build Delay	2026 Build LOS	2026 Build Queue	2026 Build w/ Mitigation V/C	2026 Build w/ Mitigation Delay	2026 Build w/ Mitigation LOS	2026 Build w/ Mitigation Queue
Main Street / Seven Bridge Road / Shirley Road																
Weekday Morning Peak Period																
Main Street EB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Main Street EBL/T	-	-	-	-	0.73	7.7	A	165/282	0.76	8.3	A	190/320	0.79	12.1	B	269/441
Main Street EBR	-	-	-	-	0.31	1.4	A	<25/<25	0.35	1.4	A	<25/<25	0.34	1.3	A	<25/<25
Seven Bridge Road WB	0.02	9.4	A	<25	-	-	-	-	-	-	-	-	-	-	-	-
Seven Bridge Road WBL	-	-	-	-	0.06	13.4	B	<25/<25	0.07	14.6	B	<25/<25	0.08	20.0	B	<25/<25
Seven Bridge Road WBT/R	-	-	-	-	0.46	5.4	A	76//124	0.48	5.3	A	87/137	0.50	7.2	A	123/190
Main Street NB	2.03	567.6	F	438	0.74	29.7	C	33/133	1.17	134.0	F	74/283	0.89	45.7	D	93/240
Shirley Road SB	0.00	0.0	A	<25	0.00	0.0	A	<25/<25	0.00	0.0	A	<25/<25	0.00	0.0	A	<25/<25
Overall Intersection	**-**	**-**	**-**	**-**	**0.48**	**8.4**	**A**	**-**	**0.54**	**24.6**	**C**	**-**	**0.54**	**13.7**	**B**	
Weekday Evening Peak Period																
Main Street EB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Main Street EBL/T	-	-	-	-	0.40	4.6	A	90/156	0.45	5.3	A	125/184	0.45	5.7	A	147/209
Main Street EBR	-	-	-	-	0.18	0.8	A	<25/<25	0.26	0.9	A	<25/<25	0.26	0.7	A	<25/<25
Seven Bridge Road WB	0.01	8.4	A	<25	-	-	-	-	-	-	-	-	-	-	-	-
Seven Bridge Road WBL	-	-	-	-	0.01	6.3	A	<25/<25	0.01	7.6	A	<25/<25	0.01	8.3	A	<25/<25
Seven Bridge Road WBT/R	-	-	-	-	0.95	23.4	C	544/1067	1.00	37.7	F	901/1156	0.99	36.1	D	1046/1306
Main Street NB	3.49	1264.6	F	555	0.86	57.6	E	88/167	1.05	106.9	F	135/271	1.02	104.8	F	167/309
Shirley Road SB	0.00	0.0	A	<25	0.00	0.0	A	<25/<25	0.00	0.0	A	<25/<25	0.00	0.00	A	<25/<25
Overall Intersection	**-**	**-**	**-**	**-**	**0.49**	**20.0**	**B**	**-**	**0.55**	**33.0**	**C**	**-**	**0.54**	**31.9**	**C**	**-**
Saturday Midday Peak Period																
Main Street EB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Main Street EBL/T	-	-	-	-	0.05	6.2	A	<25/<25	0.11	5.5	A	<25/47	0.18	13.8	B	29/69
Main Street EBR	-	-	-	-	0.78	6.3	A	<25/<25	0.85	8.8	A	<25/<25	0.85	10.6	B	<25/<25
Seven Bridge Road WB	0.01	7.3	A	<25	-	-	-	-	-	-	-	-	-	-	-	-
Seven Bridge Road WBL	-	-	-	-	0.01	6.4	A	<25/<25	0.02	5.9	A	<25/<25	0.02	14.9	B	<25/<25
Seven Bridge Road WBT/R	-	-	-	-	0.31	7.4	A	38/108	0.35	6.6	A	52/138	0.57	17.2	B	105/205
Main Street NB	1.63	325.4	F	835	1.81	400.5	F	99/375	2.48	705.1	F	160/473	0.99	51.5	D	156/452
Shirley Road SB	0.01	11.1	B	<25	0.38	43.4	D	<25/<25	0.39	49.0	D	<25/<25	0.39	48.9	D	<25/<25
Overall Intersection	**-**	**-**	**-**	**-**	**0.47**	**136.2**	**F**	**-**	**0.51**	**223.7**	**F**	**-**	**0.62**	**24.7**	**C**	**-**
Main Street / Lunenburg Road																
Weekday Morning Peak Period																
Main Street EB	0.06	9.2	A	<25	-	-	-	-	-	-	-	-	-	-	-	-
Main Street EBL	-	-	-	-	0.13	8.0	A	<25/<25	0.20	9.6	A	<25/27	0.21	11.2	B	<25/33
Main Street EBT	-	-	-	-	0.79	11.5	B	284/446	0.81	14.8	B	284/446	0.85	19.7	B	343/571
Main Street WB	0.00	0.0	A	<25	-	-	-	-	-	-	-	-	-	-	-	-
Main Street WBT	-	-	-	-	0.52	12.7	B	137/217	0.53	14.9	B	137/221	0.55	17.1	B	157//254
Main Street WBR	-	-	-	-	0.30	3.7	A	<25/<25	0.45	4.2	A	<25/<25	0.43	4.0	A	<25/<25
Lunenburg Road SBL	2.73	855.4	F	768	0.88	34.1	C	141/358	1.07	82.7	F	237/523	0.94	48.8	D	246/470
Lunenburg Road SBR	0.08	12.3	B	<25	0.09	15.7	B	<25/37	0.10	16.1	B	<25/42	0.00	15.6	B	<25/37
Overall Intersection	**-**	**-**	**-**	**-**	**0.49**	**14.5**	**B**	**-**	**0.55**	**26.4**	**C**	**-**	**0.55**	**21.7**	**C**	**-**
Weekday Evening Peak Period																
Main Street EB	0.10	13.2	B	<25	-	-	-	-	-	-	-	-	-	-	-	-
Main Street EBL	-	-	-	-	0.21	12.2	B	<25/,25	0.28	16.2	B	<25/<25	0.33	20.5	C	<25/32
Main Street EBT	-	-	-	-	0.41	5.3	A	124/182	0.43	7.3	A	124/182	0.47	10.1	B	170/250
Main Street WB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Main Street WBT	-	-	-	-	0.81	16.4	B	415/715	0.84	22.0	C	420/724	0.93	37.2	D	541/825
Main Street WBR	-	-	-	-	0.55	4.4	A	<25/<25	0.64	5.4	A	<25/42	0.65	5.5	A	<25/46
Lunenburg Road SBL	2.79	909.5	F	590	0.86	39.6	D	153/291	1.14	122.2	F	340/567	0.93	51.8	D	277/482
Lunenburg Road SBR	0.26	23.8	C	25	0.20	24.3	C	31/66	0.20	24.7	C	38/77	0.17	21.4	C	35/67
Overall Intersection	**-**	**-**	**-**	**-**	**0.56**	**13.5**	**B**	**-**	**0.62**	**330.7**	**C**	**-**	**0.62**	**254.6**	**C**	**-**

[a] Volume-to-capacity ratio,
[b] Delay expressed in seconds per vehicle (average)
[c] Level of service,
[d] 50th/95th Percentile Queue [95th Percentile Queue only for unsignalized intersections]

Table 7.12 – Intersection Capacity and Queue Analysis Summary (Continued)

Intersection / Lane Group	2019 Existing V/C[a]	2019 Existing Delay[b]	2019 Existing LOS[c]	2019 Existing Queue[d]	2026 No-Build V/C	2026 No-Build Delay	2026 No-Build LOS	2026 No-Build Queue	2026 Build V/C	2026 Build Delay	2026 Build LOS	2026 Build Queue	2026 Build w/ Mitigation V/C	2026 Build w/ Mitigation Delay	2026 Build w/ Mitigation LOS	2026 Build w/ Mitigation Queue
Main Street / Lunenburg Road																
Saturday Midday Peak Period																
Main Street EB	0.05	9.3	A	<25	-	-	-	-	-	-	-	-	-	-	-	-
Main Street EBL	-	-	-	-	0.13	8.5	A	<25/<25	0.19	11.2	B	<25/25	0.20	12.5	B	<25/29
Main Street EBT	-	-	-	-	0.41	7.0	A	89/144	0.43	9.8	A	89/143	0.45	11.1	B	108/168
Main Street WB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Main Street WBT	-	-	-	-	0.63	13.5	B	144/243	0.66	17.4	B	145/247	0.69	19.2	B	166/275
Main Street WBR	-	-	-	-	0.32	4.3	A	<25/<25	0.44	4.5	A	<25/<25	0.43	4.3	A	<25/<25
Lunenburg Road SBL	1.45	263.5	F	498	0.86	21.6	C	123/310	1.01	60.5	F	242/527	0.93	37.6	D	228/546
Lunenburg Road SBR	0.08	12.3	B	<25	0.09	11.9	B	<25/27	0.10	11.8	B	<25/36	0.09	11.3	B	<25/38
Overall Intersection	-	-	-	-	**0.41**	**11.8**	**B**	-	**0.48**	**24.8**	**C**	-	**0.48**	**18.9**	**B**	-
Lunenburg Road / McGovern Boulevard																
Weekday Morning Peak Period																
McGovern Boulevard EB	0.11	13.7	B	<25	0.12	14.3	B	<25	1.76	412.4	F	530	-	-	-	-
McGovern Boulevard EBL	-	-	-	-	-	-	-	-	-	-	-	-	0.71	18.2	B	39/97
McGovern Boulevard EBR	-	-	-	-	-	-	-	-	-	-	-	-	0.69	18.0	B	<25/38
Lunenburg Road NB	0.03	8.2	A	<25	0.03	8.3	A	<25	0.24	10.6	B	<25	-	-	-	-
Lunenburg Road NBL	-	-	-	-	-	-	-	-	-	-	-	-	0.40	7.1	A	<25/55
Lunenburg Road NBT	-	-	-	-	-	-	-	-	-	-	-	-	0.34	4.3	A	44/100
Lunenburg Road SB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lunenburg Road SBT	-	-	-	-	-	-	-	-	-	-	-	-	0.66	12.5	B	102/201
Lunenburg Road SBR	-	-	-	-	-	-	-	-	-	-	-	-	0.46	7.0	A	<25/<25
Overall Intersection	-	-	-	-	-	-	-	-	-	-	-	-	**0.48**	**9.9**	**A**	-
Weekday Evening Peak Period																
McGovern Boulevard EB	0.19	20.1	C	<25	0..33	25.9	D	35	4.47	1628.1	F	1510	-	-	-	-
McGovern Boulevard EBL	-	-	-	-	-	-	-	-	-	-	-	-	0.83	20.0	C	104/235
McGovern Boulevard EBR	-	-	-	-	-	-	-	-	-	-	-	-	0.54	15.8	B	<25/41
Lunenburg Road NB	0.02	8.1	A	<25	0.04	8.3	A	<25	0.17	9.4	A	<25	-	-	-	-
Lunenburg Road NBL	-	-	-	-	-	-	-	-	-	-	-	-	0.36	8.7	A	27/57
Lunenburg Road NBT	-	-	-	-	-	-	-	-	-	-	-	-	0.73	10.0	A	169/316
Lunenburg Road SB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lunenburg Road SBT	-	-	-	-	-	-	-	-	-	-	-	-	0.60	14.7	B	93/172
Lunenburg Road SBR	-	-	-	-	-	-	-	-	-	-	-	-	0.29	5.4	A	<25/<25
Overall Intersection	-	-	-	-	-	-	-	-	-	-	-	-	**0.55**	**12.5**	**B**	-
Saturday Midday Peak Period																
McGovern Boulevard EB	0.07	13.8	B	<25	0..35	17.5	C	25	3.58	1210.8	F	1545	-	-	-	-
McGovern Boulevard EBL	-	-	-	-	-	-	-	-	-	-	-	-	0.88	32.8	C	127/308
McGovern Boulevard EBR	-	-	-	-	-	-	-	-	-	-	-	-	0.59	17.3	B	<25/48
Lunenburg Road NB	0.01	8.1	A	<25	0.02	8.3	A	<25	0.20	10.1	B	<25	-	-	-	-
Lunenburg Road NBL	-	-	-	-	-	-	-	-	-	-	-	-	0.41	9.9	A	<25/47
Lunenburg Road NBT	-	-	-	-	-	-	-	-	-	-	-	-	0.40	7.2	A	64/110
Lunenburg Road SB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lunenburg Road SBT	-	-	-	-	-	-	-	-	-	-	-	-	0.71	16.5	B	123/208
Lunenburg Road SBR	-	-	-	-	-	-	-	-	-	-	-	-	0.29	5.2	A	<25/<25
Overall Intersection	-	-	-	-	-	-	-	-	-	-	-	-	**0.50**	**15.9**	**B**	-
Lunenburg Road / Old Union Turnpike																
Weekday Morning Peak Period																
Old Union Turnpike EB	0.38	9.8	A	49	0.43	11.3	B	62	0.67	23.0	C	128				
Old Union Turnpike WB	0.18	5.7	A	<25	0.20	6.0	A	<25	0.44	10.1	B	64		No Mitigation Proposed		
Lunenburg Road NB	0.47	11.0	B	75	0.53	12.8	B	99	0.69	18.5	C	201				
Lunenburg Road SB	0.50	9.0	A	84	0.56	10.3	B	100	0.76	19.9	C	313				

[a] Volume-to-capacity ratio,
[b] Delay expressed in seconds per vehicle (average)
[c] Level of service,
[d] 50th/95th Percentile Queue [95th Percentile Queue only for unsignalized intersections]

Table 7.12 – Intersection Capacity and Queue Analysis Summary (Continued)

Intersection / Lane Group	2019 Existing V/C[a]	2019 Existing Delay[b]	2019 Existing LOS[c]	2019 Existing Queue[d]	2026 No-Build V/C	2026 No-Build Delay	2026 No-Build LOS	2026 No-Build Queue	2026 Build V/C	2026 Build Delay	2026 Build LOS	2026 Build Queue	2026 Build w/ Mitigation V/C	2026 Build w/ Mitigation Delay	2026 Build w/ Mitigation LOS	2026 Build w/ Mitigation Queue
Lunenburg Road / Old Union Turnpike																
Weekday Evening Peak Period																
Old Union Turnpike EB	0.28	6.4	A	34	0.33	7.7	A	41	0.40	9.6	A	57				
Old Union Turnpike WB	0.45	11.4	B	67	0.56	15.2	C	99	0.85	39.9	E	239				
Lunenburg Road NB	0.53	9.2	A	94	0.63	11.6	B	137	0.88	25.2	D	871				
Lunenburg Road SB	0.53	11.1	B	106	0.66	15.5	C	190	0.81	26.3	D	311				
Saturday Midday Peak Period														No Mitigation Proposed		
Old Union Turnpike EB	0.25	6.9	A	28	0.29	7.7	A	33	0.34	8.6	A	40				
Old Union Turnpike WB	0.41	8.9	A	50	0.49	10.7	B	78	0.85	33.0	D	305				
Lunenburg Road NB	0.34	6.9	A	43	0.41	7.9	A	55	0.74	16.2	C	298				
Lunenburg Road SB	0.36	8.2	A	43	0.42	9.6	A	58	0.69	20.3	C	153				
Lunenburg Road / Fort Pond Road / Woods Lane																
Weekday Morning Peak Period																
Woods Lane EB	0.02	15.1	C	<25	0.03	15.9	C	<25	0.03	16.5	C	<25				
Fort Pond Road WBL	0.16	20.7	C	<25	0.19	22.9	C	<25	0.40	30.7	D	45				
Fort Pond Road WBT/R	0.05	9.3	A	<25	0.05	9.4	A	<25	0.05	9.5	A	<25				
Lunenburg Road NB	0.00	0.0	A	<25	0.00	0.00	A	<25	0.00	0.0	A	<25				
Lunenburg Road SB	0.05	7.6	A	<25	0.05	7.7	A	<25	0.05	7.7	A	<25				
Weekday Evening Peak Period																
Woods Lane EB	0.01	9.2	A	<25	0.01	9.4	A	<25	0.01	9.6	A	<25				
Fort Pond Road WBL	1.08	112.6	F	320	1.31	201.2	F	458	1.69	361.2	F	668				
Fort Pond Road WBT/R	0.62	20.8	C	105	0.70	25.4	D	138	0.74	29.3	D	155		No Mitigation Proposed		
Lunenburg Road NB	0.01	7.6	A	<25	0.01	7.6	A	<25	0.01	7.7	A	<25				
Lunenburg Road SB	0.03	8.7	A	<25	0.04	8.8	A	<25	0.04	9.0	A	<25				
Saturday Midday Peak Period																
Woods Lane EB	0.01	9.4	A	<25	0.01	9.6	A	<25	0.01	9.8	A	<25				
Fort Pond Road WBL	0.31	17.6	C	33	0.39	20.8	C	45	0.63	33.9	D	100				
Fort Pond Road WBT/R	0.11	10.1	B	<25	0.12	10.4	B	<25	0.13	10.8	B	<25				
Lunenburg Road NB	0.01	7.7	A	<25	0.01	7.7	A	<25	0.01	7.8	A	<25				
Lunenburg Road SB	0.05	7.9	A	<25	0.05	8.0	A	<25	0.05	8.1	A	<25				
Old Union Turnpike / Route 2 EB Ramps																
Weekday Morning Peak Period																
Old Union Turnpike EB	0.27	8.3	A	28	0.30	8.4	A	30	0.32	8.5	A	35				
Route 2 Ramp SBL	0.07	25.8	D	<25	0.09	29.1	D	<25	0.10	32.6	D	<25				
Route 2 Ramp SBR	0.10	9.2	A	<25	0.11	9.3	A	<25	0.30	10.5	B	33				
Weekday Evening Peak Period																
Old Union Turnpike EB	0.06	7.6	A	<25	0.07	7.7	A	<25	0.11	7.8	A	<25				
Route 2 Ramp SBL	0.02	11.3	B	<25	0.03	11.7	B	<25	0.04	13.4	B	<25		No Mitigation Proposed		
Route 2 Ramp SBR	0.27	10.3	B	28	0.32	10.7	B	33	0.41	11.6	B	50				
Saturday Midday Peak Period																
Old Union Turnpike EB	0.18	8.7	A	<25	0.13	8.3	A	<25	0.19	8.5	A	<25				
Route 2 Ramp SBL	0.11	20.0	C	<25	0.06	15.5	C	<25	0.08	18.9	C	<25				
Route 2 Ramp SBR	0.38	13.0	B	45	0.29	11.4	B	30	0.40	12.6	B	50				

[a] Volume-to-capacity ratio,
[b] Delay expressed in seconds per vehicle (average)
[c] Level of service,
[d] 50th/95th Percentile Queue [95th Percentile Queue only for unsignalized intersections]

Table 7.12 – Intersection Capacity and Queue Analysis Summary (Continued)

Intersection / Lane Group	2019 Existing V/C[a]	2019 Existing Delay[b]	2019 Existing LOS[c]	2019 Existing Queue[d]	2026 No-Build V/C	2026 No-Build Delay	2026 No-Build LOS	2026 No-Build Queue	2026 Build V/C	2026 Build Delay	2026 Build LOS	2026 Build Queue	2026 Build w/ Mitigation V/C	2026 Build w/ Mitigation Delay	2026 Build w/ Mitigation LOS	2026 Build w/ Mitigation Queue
Fort Pond Road / Route 2 WB Ramps																
Weekday Morning Peak Period																
Fort Pond Road WB	0.01	7.4	A	<25	0.01	7.4	A	<25	0.01	7.4	A	<25				
Route 2 Ramp NBL	0.08	9.6	A	<25	0.08	9.7	A	<25	0.15	10.1	B	<25				
Weekday Evening Peak Period														No Mitigation Proposed		
Fort Pond Road WB	0.02	7.4	A	<25	0.02	7.4	A	<25	0.02	7.4	A	<25				
Route 2 Ramp NBL	0.89	41.5	E	258	0.80	29.8	D	193	0.88	40.0	E	258				
Mechanic Street / Johnny Appleseed Lane																
Weekday Morning Peak Period																
Mechanic Street EB	0.01	7.5	A	<25	0.01	7.5	A	<25	0.01	7.6	A	<25				
Mechanic Street WB	0.01	9.3	A	<25	0.01	9.4	A	<25	0.01	9.6	A	<25				
Johnny Appleseed n NB	0.10	14.6	B	<25	0.11	15.3	C	<25	0.27	16.6	C	28				
Memorial Park SB	0.01	9.1	A	<25	0.01	9.1	A	<25	0.01	9.2	A	<25				
Weekday Evening Peak Period																
Mechanic Street EB	0.01	8.6	A	<25	0.01	8.7	A	<25	0.01	8.9	A	<25				
Mechanic Street WB	0.02	8.1	A	<25	0.02	8.2	A	<25	0.09	8.5	A	<25		No Mitigation Proposed		
Johnny Appleseed Ln NB	0.15	20.3	C	<25	0.17	22.9	C	<25	0.37	27.0	D	40				
Memorial Park SB	0.01	11.9	B	<25	0.01	12.4	B	<25	0.01	12.7	B	<25				
Saturday Midday Peak Period																
Mechanic Street EB	0.01	7.7	A	<25	0.00	7.8	A	<25	0.01	7.9	A	<25				
Mechanic Street WB	0.01	7.9	A	<25	0.01	7.9	A	<25	0.07	8.2	A	<25				
Johnny Appleseed Ln NB	0.05	12.5	B	<25	0.06	13.1	B	<25	0.15	13.6	B	<25				
Memorial Park SB	0.01	9.6	A	<25	0.01	9.8	A	<25	0.01	10.0	B	<25				
Old Union Turnpike / Harvard Street																
Weekday Morning Peak Period																
Mechanic Street EBL	0.09	8.2	A	<25	0.10	8.3	A	<25	0.12	8.4	A	<25				
Route 2 Ramp SBL	0.40	23.2	C	48	0.47	27.2	D	60	0.60	41.2	E	88				
Route 2 Ramp SBR	0.11	9.9	A	<25	0.12	10.1	B	<25	0.13	10.4	B	<25				
Weekday Morning Peak Period																
Mechanic Street EBL	0.28	12.3	B	30	0.31	12.9	B	33	0.38	14.8	B	45				
Route 2 Ramp SBL	1.00	144.6	F	175	1.20	218.7	F	218	1.84	514.7	F	305		No Mitigation Proposed		
Route 2 Ramp SBR	0.55	22.4	C	83	0.61	25.4	D	98	0.77	40.9	E	158				
Saturday Midday Peak Period																
Mechanic Street EBL	0.15	9.5	A	<25	0.16	9.8	A	<25	0.19	10.3	B	<25				
Route 2 Ramp SBL	0.46	27.9	D	58	0.54	34.4	D	75	0.70	56.1	F	110				
Route 2 Ramp SBR	0.20	12.0	B	<25	0.22	12.4	B	<25	0.28	13.9	B	28				
Old Union Turnpike / Route 2 EB Ramp																
Weekday Morning Peak Period																
Old Union Turnpike EBL	0.16	8.0	A	<25	0.17	8.1	A	<25	0.20	8.3	A	<25				
Route 2 Ramp SBL	0.44	28.6	D	55	0.53	35.0	E	70	0.64	50.0	F	93				
Route 2 Ramp SBR	0.23	10.4	B	<25	0.25	10.6	B	25	0.27	11.0	B	28				
Weekday Morning Peak Period																
Old Union Turnpike EBL	0.12	9.0	A	<25	0.13	9.3	A	<25	0.15	9.6	A	<25				
Route 2 Ramp SBL	0.32	27.8	D	33	0.38	33.3	D	43	0.47	44.0	E	55		No Mitigation Proposed		
Route 2 Ramp SBR	0.78	31.6	D	175	0.88	45.0	E	240	1.02	76.8	F	340				
Weekday Morning Peak Period																
Old Union Turnpike EBL	0.10	8.0	A	<25	0.11	8.1	A	<25	0.12	8.3	A	<25				
Route 2 Ramp SBL	0.16	16.4	C	<25	0.19	17.6	C	<25	0.22	20.6	C	<25				
Route 2 Ramp SBR	0.53	14.4	B	78	0.58	15.7	C	95	0.66	19.0	C	123				

[a] Volume-to-capacity ratio, [b] Delay expressed in seconds per vehicle (average)
[c] Level of service, [d] 50th/95th Percentile Queue [95th Percentile Queue only for unsignalized intersections]

Parking

The existing site currently includes 353 off-street surface parking spaces to service the existing uses. Of the existing uses that are to be retained, 335 spaces will be retained on-site. Eighteen (18) of these spaces will be removed from the site. The Project looks to significantly increase the parking at the site and will provide 1,317 parking spaces to service the industrial park, 740 parking spaces to service the multi-family residential units, 120 parking spaces to service the hotel, 418 additional parking spaces to service the retail adjacent to Lunenburg Road, and an additional 216 parking spaces to service the indoor soccer facility. In total, the project will add 3,109 parking spaces to the site including 316 tractor-trailer parking spaces to be provided within the industrial park.

Town of Lancaster Zoning By-laws

The Town of Lancaster Zoning By-Laws contains minimal off-street parking supply requirements for various land uses within the Town of Lancaster. The By-Law does not provide specific requirements for industrial or residential land uses. As Planning Board has not acted on this application, off-street parking requirements for the industrial and residential land uses were assumed based on standard rates from surrounding communities. Based on zoning regulations for the IPOD-1 district, a total off-street parking space level in excess of 4,001 parking spaces are required to serve the Project (Per Section §220-22.1) as noted in **Table 7.13**. Note that this total does not include requirements for the soccer fields as there is generally no capacity to the several outdoor fields.

Table 7.13: Town of Lancaster Zoning Parking Requirements

Land Use	Parking Requirements	Size	Required Spaces	Parking Provided
Existing Uses to be Retained				
Dunkin Donuts	Adequate spaces to accommodate patrons & employees	2,300 SF	--	31
Mobil Gas Station	1 space per 250 SF	5,000 SF	20	28
Soccer Complex	1 space / 3 PPL maximum occ.	N/A [Outdoor]	--	276
Proposed New Uses				
Industrial Park	No requirement - assume 1 space per 600 SF [a]	1,567,000 SF	2,611	1,633
Hotel	1 space / Room & 1 space / Employee	120 Rooms + 20 Shift Employees	140	120
Multi-Family Residential [b]	No requirement - assume 1.5 spaces per unit	500 units	750	740
Retail	1 space per 250 SF	65,700 SF	263	418
NEW Soccer Complex	1 space / 3 PPL maximum occupancy	N/A [Outdoor]	217	216
	Total Parking		**4,001 +**	**3,462**

[a] Zoning By-Law Section 220-22.1 notes that other permitted uses require adequate spaces to accommodate customer, patrons, and employees, as determined by the Planning Board – assume standard 1 space per 600 SF (standard for warehousing)

[b] Zoning By-Law Section 220-22.1 notes that other permitted uses require adequate spaces to accommodate customer, patrons, and employees, as determined by the Planning Board – assume standard 1.5 spaces per housing unit

Based on a parking supply of 3,462 spaces throughout the site, the proposed parking supply on-site will be well less than required to be in general conformance with the Town of Lancaster Zoning By-Laws and Regulations.

Institute of Transportation Engineers Parking Demand Estimate

The size and configuration of the Project site does not provide opportunity for shared parking between the several land uses. The peak parking demand generated by the proposed land uses was estimated based on the 'average' peak parking demand generation rates obtained from the ITE publication *Parking Generation, 5th Edition* for LUC 130 – Industrial Park, LUC 221 – Multifamily Housing (Mid-Rise), LUC 310 – Hotel, LUC 488 – Soccer Complex, and LUC 820 – Shopping Center. Detailed parking demand generation worksheets are included in Appendix F.12.

Industrial Park Parking

Based on the ITE publication *Parking Generation, 5th Edition*, the average peak parking demand for a 1,567,000 SF Industrial Park is 1,880 parked vehicles. The proposed project is proposed to include 1,317 vehicular parking spaces and 316 tractor-trailer parking spaces for a total of 1,633 parking spaces. Based on the empirical data, the site will provide approximately 13 percent less parking than the estimated demand. Similar to the Town of Lancaster Zoning By-Laws, the site will provide a significant amount less parking then generally warranted for an industrial park land use.

Single Family Housing Parking

There is no single-family housing peak parking demand data provided in the ITE publication *Parking Generation, 5th Edition*. This is directly related to the type of land use where single-family homes generally include a driveway and covered garage. The Proponent has designed this residential portion of the site with standard driveways and one-vehicle garages. Therefore, it can be estimated that each use will include two (2) individual parking spaces. There are no feasible opportunities to reduce the number of parking spaces within the single-family housing portion of the site.

Multifamily Housing Parking

Based on the ITE publication *Parking Generation, 5th Edition*, the average peak parking demand for 500 dwelling units of multifamily housing is 655 parked vehicles. The proposed project is proposed to include 740 vehicular parking spaces. Based on the empirical data, the site will provide approximately 13 percent more parking than the estimated demand. Although slightly larger than the estimated demand, the proposed parking is less than the Town of Lancaster Zoning By-Laws and is meant to accommodate visitor parking and resident parking in a more rural area were less transportation mode alternatives are supplied.

Hotel Parking

Based on the ITE publication *Parking Generation, 5th Edition*, the average peak parking demand for a 120-room hotel is 138 parked vehicles. The proposed project is proposed to include 120 parking spaces. Based on the empirical data, the site will provide approximately 15 percent less

parking than the estimated demand. There are no feasible opportunities to further reduce the number of parking spaces within the hotel portion of the site.

Soccer Complex

Based on the ITE publication *Parking Generation, 5th Edition*, the average peak parking demand for a 4-field soccer complex is 248 parked vehicles. The proposed project is proposed to include 216 new vehicular parking spaces in addition to the 276 existing parking spaces for the three (3) existing outdoor soccer fields. Generally, the 276 existing parking spaces support the three (3) outdoor fields while the new 216 parking spaces are directly related to the indoor soccer field facility. The parking supply for the indoor soccer field facility is sought based on known parking demand from the existing soccer fields when in use.

General Retail

Based on the ITE publication *Parking Generation, 5th Edition*, the average peak parking demand for 65,700 SF of general retail is 246 parked vehicles. The proposed project is proposed to include 418 new vehicular parking spaces in addition to the 59 existing parking spaces constructed for the existing Dunkin Donuts and Mobil Gas Station. The Proponent has sought to provide an elevated number of parking spaces in this area to accommodate different types of retail land uses which to date have not been identified.

Summary of ITE Parking Demand Calculations

Based on ITE parking demand calculations and including the existing parking provided for Dunkin Donuts and the Mobil gas Station, the project would demand 3,114 parking spaces, well below the number of spaces as required by zoning. The Proponent has sought to provide a parking supply that is generally in-line with ITE demand calculations while supporting the potential for a diverse tenant use at 3,462 spaces (3,109 new spaces). The proposed parking supply still represents a condition well below Town of Lancaster Zoning requirements.

Mitigation Measures

After evaluating the operations and safety of the study area roadways and intersections, the next step is to identify measures to improve the roadways and intersections based on existing and future deficiencies. The Project has impacts in the area immediately adjacent to the site and requires mitigation. The following section provides a summary of measures that are recommended to improve the existing and future operations and safety of the study area intersections. These recommended measures where noted in the previous capacity and queue analysis.

The Proponent has proposed a comprehensive transportation mitigation program in the vicinity of the site to improve vehicular, bicycle, and pedestrian operations and safety. The primary improvements include the reconstruction of the Lunenburg Road / McGovern Boulevard intersection. In addition, the Proponent seeks to significantly improve multi-modal accommodations for bicycles and pedestrians along McGovern Boulevard to service not only the Capital Commerce Center Project; but other existing and future developments in the vicinity of the Lunenburg Road intersection with McGovern Boulevard.

Off-Site Improvement Commitments

The Proponent is committed to implement off-site improvement measures to complement other improvement measures being implemented along the area roadways by the Town of Lancaster and MassDOT. **Table 7.14** provides a summary of the proposed off-site roadway and multi-modal improvements, including the functional classification and jurisdiction of the roadway, other impacts, timeline for construction, and the responsible party for the improvements.

Intersection Improvements

The Proponent has committed to the following intersection improvements at the intersection of Main Street / Seven Bridge Road:

- Modify traffic signal timings and parameters (traffic signal to be constructed as part of MassDOT Project No. 608779) post-occupancy (or at Master Plan occupancy milestone intervals) to accommodate the additional traffic flow from the Project site. The implementation of these improvements will be reviewed and coordinated with the Town of Lancaster whom will hold jurisdiction.

The Proponent has committed to the following intersection improvements at the intersection of Lunenburg Road / Main Street:

- Modify traffic signal timings and parameters (traffic signal to be constructed as part of MassDOT Project No. 608779) post-occupancy (or at Master Plan occupancy milestone intervals) to accommodate the additional traffic flow from the Project site. The implementation of these improvements will be reviewed and coordinated with the Town of Lancaster whom will hold jurisdiction; and

- Implement short-term, low-cost improvement measures at the intersections which were not included or superseded as part of MassDOT Project No. 608779; including the installation of advance speed reduction signage (W3-5) along Lunenburg Road southbound. All other short-term / low-cost measures have been incorporated by the current MassDOT project.

The Proponent has committed to the following intersection improvements at the intersection of Lunenburg Road / McGovern Boulevard:

- Construct a fully-actuated traffic signal. Provide new demand-based vehicular and bicycle detection as part of the new traffic signal, as well as providing accommodations for emergency-vehicle pre-emption and a protected pedestrian crossing;

- Widen McGovern Boulevard to provide two eastbound travel lanes including an exclusive left-turn lane and an exclusive right-turn lane;

Table 7.14: Infrastructure Improvement Matrix

Project Segment	Functional Classification	NHS Roadway	Jurisdiction	Responsible Party for Construction	ROW Impacts	Grading Impacts	Environmental Impacts	Construction Timeline
Main Street [MassDOT Project No. 608779]	Urban Principal Arterial	Yes	Town of Lancaster	MassDOT	Minor ROW Acquisitions	Minor grading impacts	No Environmental Impacts	2020
Lunenburg Road / Fort Pond Road – Temporary Traffic Signal	**Urban Principal Arterial**	**Yes**	**Town of Lancaster**	**Capital Group Properties**	**N/A**	**N/A**	**N/A**	**TBD (based on warrant)**
Main Street / Seven Bridge Road Intersection – Traffic Signal Optimization	**Urban Principal Arterial**	**Yes**	**Town of Lancaster**	**Capital Group Properties**	**N/A**	**N/A**	**N/A**	**TBD (Project Milestones)**
Main Street / Lunenburg Road Intersection – Traffic Signal Optimization	**Urban Principal Arterial**	**Yes**	**Town of Lancaster**	**Capital Group Properties**	**N/A**	**N/A**	**N/A**	**TBD (Project Milestones)**
Lunenburg Road / McGovern Boulevard Reconstruction (non above-ground traffic signal)	**Urban Principal Arterial**	**No**	**Town of Lancaster**	**Capital Group Properties**	**Minor ROW Impacts**	**Minor grading impacts**	**N/A**	**2020/2021**
Lunenburg Road / McGovern Boulevard Traffic Signal Activation	**Urban Principal Arterial**	**No**	**Town of Lancaster**	**Capital Group Properties**	**Minor ROW Impacts**	**Minor grading impacts**	**N/A**	**TBD (based on warrant)**
McGovern Boulevard	**Local**	**No**	**Town of Lancaster**	**Capital Group Properties**	**N/A**	**Minor grading impacts**	**N/A**	**Segmented During Master Plan Construction**
Route 2 Interchange 35 Improvements	Urban Minor Arterial / Freeway	Yes	MassDOT / Town of Lancaster	MassDOT	Significant ROW Impacts	Significant grading Impacts	Significant Environmental Impacts	TBD
Route 2 Interchange 34 Improvements	Urban Minor Arterial / Freeway	Yes	MassDOT / Town of Lancaster	MassDOT	Significant ROW Impacts	Significant grading Impacts	Significant Environmental Impacts	2023
Route 2 WB Interchange 35 Deceleration Lane Improvements	**Freeway**	**Yes**	**MassDOT**	**Capital Group Properties**	**N/A**	**Minor grading impacts**	**N/A**	**2020/2021**

- Widen the Lunenburg Road northbound approach to introduce an exclusive left-turn lane operating under protected-permitted signal phasing;

- Widen Lunenburg Road southbound approach to introduce an exclusive right-turn lane operating under permissive-overlap signal phasing;

- Provide Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) compliant pedestrian accommodations; including a crosswalk across McGovern Boulevard and Lunenburg Road, accessible ramps, and audio/vibratory pedestrian signal equipment;

- Construct new 5-foot sidewalks along each site of Lunenburg Road within the project limits; including a pedestrian connection to Kimball Farm;

- Maintain 5-foot minimum shoulders to accommodate bicycle access along each side of Lunenburg Road; and

- Reconstruct private commercial driveways immediately north of McGovern Boulevard to accommodate the widened roadway.

Improvements at the intersection of Lunenburg Road / McGovern Boulevard are graphically depicted in **Figure 7.7**.

Corridor Improvements (McGovern Boulevard)

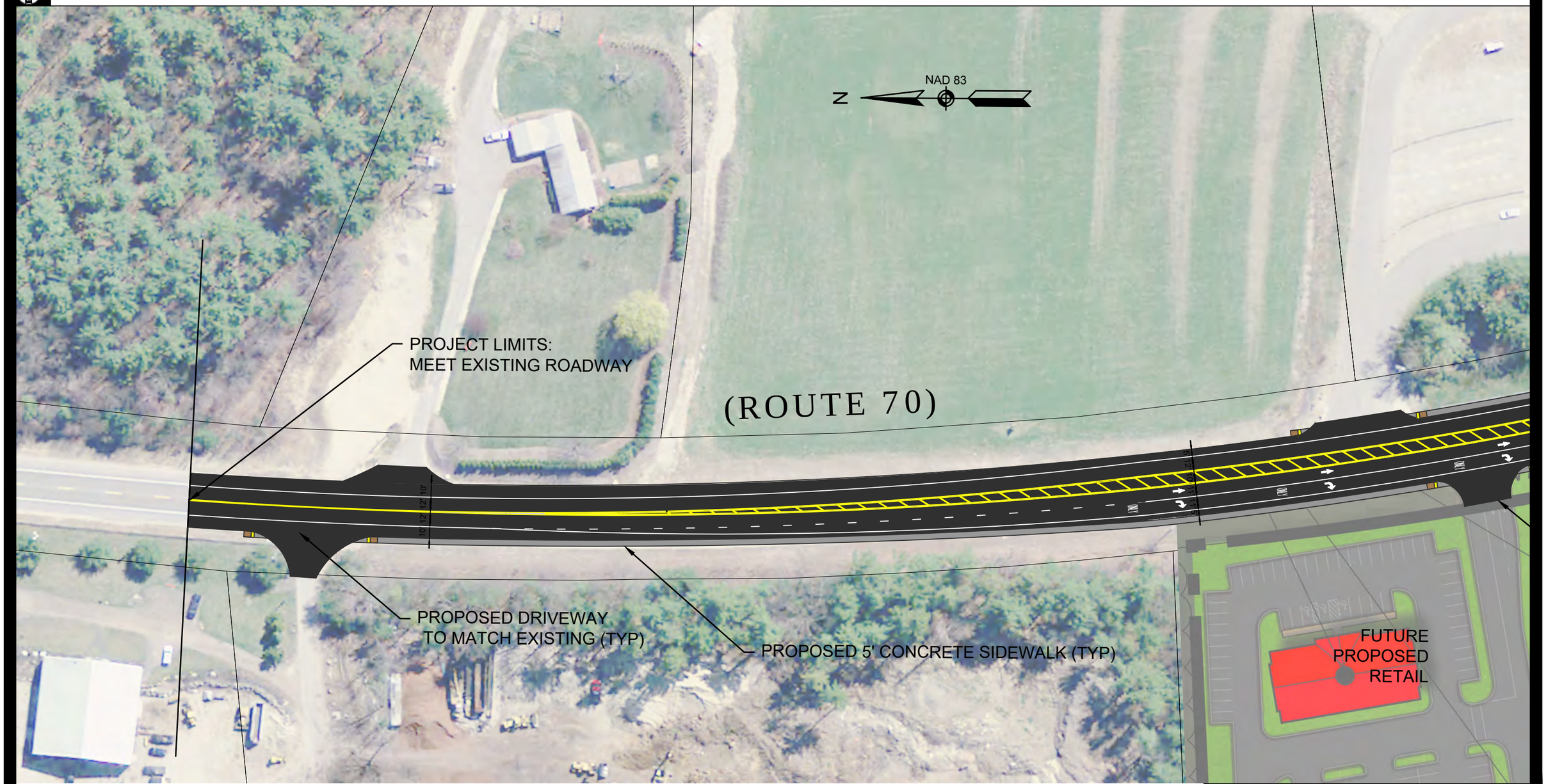
The Proponent has committed to corridor improvements along McGovern Boulevard to provide a consistent cross-section from Lunenburg Road through the IPOD-1 district and the site plan. The scope of these improvements would generally include the construction of sidewalks and bicycle lanes along each side of McGovern Boulevard. Specific improvements along the corridor have not been graphically depicted at this time. The Proponent is currently working with the Town of Lancaster on the final layout of the site based on programming within the IPOD-1 district. Final layout of on-site pedestrian and bicycle accommodations, internal site circulation, and other on-site transportation networks will be designed following this Town process. The FEIR will further describe and depict these transportation enhancements for the review of MEPA and MassDOT.

Freeway Improvements

The Proponent has committed to construct improvements along the Route 2 WB Off-Ramp at Interchange 35 as a temporary measure prior to full interchange reconstruction as part of an upcoming MassDOT Project. The construction will include the minor widening of pavement along the shoulder and marked deceleration lane for the Route 2 WB Off-Ramp in order to provide a consistent lane width and proper tapers to accommodate the 95th percentile queue for the stop-control movement along the ramp at Fort Pond Road. Improvements along the ramp will require issuance of a MassDOT Permit to Access State Highway and are defined in the attached Draft Section 61 Findings.

Improvements along the Route 2 WB Off-Ramp at Interchange 35 are graphically depicted in **Figure 7.8**.

Scale: 1" = 80'



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TEC
The Engineering Corp

Figure 7.7A

**Lunenburg Road / McGovern Boulevard
Intersection / Corridor Improvements
Lancaster, Massachusetts**

Scale: 1" = 80'

NAD 83

LUNENBURG ROAD (ROUTE 70)

PROPOSED 5' CONCRETE SIDEWALK (TYP)

ADD NEW RIGHT TURN LANE

PROVIDE A SHARED USE PATH CONNECTION TO KIMBALLS

PROPOSED NEW TRAFFIC SIGNAL

ADD NEW LEFT TURN LANE

END OF PROJECT

PROP MILL & OVERLAY

PROPOSED PAVEMENT MARKINGS (TYP)

PROPERTY LINE

MEET ENTRANCE TO EXISTING SITE

FUTURE PROPOSED RETAIL

ADA COMPLIANT WHEELCHAIR RAMP (TYP)

PROVIDE TWO LANES ON MCGOVERN BOULEVARD

PROPOSED 5' CONCRETE SIDEWALK (TYP)

MEET ENTRANCE TO EXISTING SITE

EXISTING RETAIL

McGOVERN BLVD

EXISTING GAS STATION

FUTURE PROPOSED DEVELOPMENT

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TEC The Engineering Corp

Figure 7.7B

Lunenburg Road / McGovern Boulevard Intersection / Corridor Improvements Lancaster, Massachusetts

Scale: 1" = 50'



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TEC
The Engineering Corp

Figure 7.8

Route 2 WB Exit 35 Storage & Deceleration Improvements
Lancaster, Massachusetts

Pedestrian Accommodations

The Proponent will construct a five-foot sidewalk along each side of McGovern Boulevard to provide connectivity between land uses on the site and Lunenburg Road. This includes connectivity to the several retail parcels previously constructed (Dunkin Donuts and Mobil Station), future retail as programmed for the parcels on the west side of Lunenburg Road, and the existing Kimball Farm along the east side of Lunenburg Road. Additional pedestrian crossings will be provided across McGovern Boulevard within the site. Final layout of on-site pedestrian and bicycle accommodations, internal site circulation, and other on-site transportation networks will be designed following the IPOD-1 district Town process. The FEIR will further describe and depict these transportation enhancements for the review of MEPA and MassDOT.

The Proponent has also committed to construct new 5-foot sidewalks along each site of Lunenburg Road within the intersection reconstruction project limits; including a pedestrian connection to Kimball Farm under traffic signal control.

Separate from the mitigation as noted above, the Proponent is continuing discussions with the Town of Lancaster on the potential construction of a shared-use path as opposed to separate pedestrian and bicycle accommodations. These discussions are ongoing, and an update will be provided in the FEIR.

Bicycle Accommodations

The Proponent is committed to construct bicycle accommodations along McGovern Boulevard to provide connectivity between land uses on the site and Lunenburg Road. These bicycle accommodations will be in the form of 5-foot bicycle lanes and supplemented with MUTCD-compliant bicycle signage. In addition, bicycle racks will be provided on-site at various locations to promote the use of bicycle travel. Final layout of on-site pedestrian and bicycle accommodations, internal site circulation, and other on-site transportation networks will be designed following the IPOD-1 district Town process. The FEIR will further describe and depict these transportation enhancements for the review of MEPA and MassDOT.

The Proponent is also committed to bicycle improvements along Lunenburg Road. The improvements along Lunenburg Road are generally short in nature and are along a high-speed arterial with wide-shoulders. Within the reconstruction intersection zone, the Proponent will maintain 5-foot minimum shoulders to accommodate bicycle access along each side of Lunenburg Road.

Public Transportation Accommodations

Prior to submission of the DEIR, the Proponent has reached out to MART on the feasibility of extending service along MART Bus Route 8 to/from its current terminus at Orchard Hill Park (Target / Kohl's). Orchard Hill Park is situated on the northerly side of Route 2 Interchange 34 approximately 2 miles from the proposed Capital Commerce Center. Based on the initial discussions, MART can accommodate adding additional services if demand is projected. Extension of service, if applicable, must be requested from the Town of Lancaster Board of Selectman with Proponent related contribution towards the service to a point where ridership builds up to fully justify the service. The Proponent will continue discussions with MART following submittal of the DEIR.

Mitigation Implementation Thresholds

At this time, the project is in very early stages of phasing development and, therefore, the overall phasing sequence has not yet been determined. The Master Plan full build-out of each building will ultimately be dictated by market demand as individual tenants, buyers, or builders are identified and secured by the Proponent. As described in the ENF and other chapters of this DEIR, there are several components of the Master Plan that have already been constructed, such as the Mobil Gas Station, Dunkin Donuts, and FC Stars Soccer Complex.

As the order of the Master Plan's build-out is dependent on market demand for individual tenants, buyers, or builders, certain portions of the mitigation for the Project is also intended to be phased to meet the demands of the site and surrounding community. The following section describes the order for construction of off-site transportation mitigation and a description of the methodology utilized to determine the process.

Main Street Traffic Signal Optimization & Lunenburg Road Signage

The optimization of signal timings to practical effect is dependent on specific construction milestones over the course of the Master Plan's full-build out. The Proponent has committed to coordinate with the Town of Lancaster to implement traffic signal timing optimization at the intersection of Main Street / Seven Bridge Road / Shirley Road and Main Street / Lunenburg Road at agreed upon construction milestones through post-occupancy. These milestones may be directly related to Town feedback on traffic operations during the full build-out period.

Prior to issuance of the first occupancy permit, the Proponent has committed construct advance signage along Lunenburg Road southbound in advance of Main Street as identified in the previous RSA.

Lunenburg Road / McGovern Boulevard Intersection Improvements

Prior to issuance of the first occupancy permit, the Proponent has committed to construct all mitigation improvements at the intersection of Lunenburg Road / McGovern Boulevard with the exception of the above-ground traffic signal infrastructure. This includes all roadway widening for Lunenburg Road, the modified cross-section of McGovern Boulevard, turning lanes and bicycle accommodations, all sidewalks and accessible ramps, and all subsurface traffic signal components (conduits, handholes, and foundations). The Proponent has committed to construct and install the above-ground traffic signal infrastructure prior to an imminent building-occupancy where site generated trips reach a level where McGovern Boulevard left-turning trips exiting the site equals 45 new vehicles based on trip projections provided in this DEIR. This level of trips correlates to traffic at the intersection; including existing traffic, satisfying the adjacent street peak hour traffic thresholds of MUTCD traffic signal warrants for Warrant 2 (four-hour traffic volumes). As the Master Plan build-out phasing is currently unknown, the level of traffic generated by the site will dictate when MUTCD traffic signal warrants are satisfied.

McGovern Boulevard

The Proponent has committed to reconstruct McGovern Boulevard from the existing FC Stars Soccer driveway connection to Lunenburg Road prior to issuance of the first occupancy permit. For other portions of the Master Plan west of this location, the Proponent is committed to construct

each segment of McGovern Boulevard as needed based on building footprint location. Therefore, each new segment will advance further west into the Master Plan up to the site driveway location of the subject building prior to occupancy of said building.

Lunenburg Road / Fort Pond Road / Woods Lane

It is expected that the full build-out of the Master Plan will be completed over many years and will most likely not be completed prior to construction of MassDOT's improvements at Route 2 Interchange 35. Each alternative outlined by MassDOT would greatly enhance traffic operations and safety both with and without the Master Plan related traffic volumes.

The Proponent is committed to implement a TMP, which is intended to monitor traffic operations throughout the construction and for a period following completion of the Project. The scope of the TMP will be developed in coordination with MassDOT and will include providing traffic counts at the intersection of Lunenburg Road / Fort Pond Road / Woods Lane. Upon each implementation of the monitoring program, the Proponent will verify traffic operation conditions at this location as compared to the existing and projected conditions noted in this DEIR to determine the Project's impact on the intersection.

In the event that improvements at this location are not completed by MassDOT prior to full-occupancy of the development, the Proponent has committed to construct an interim / temporary traffic signal, without additional roadway widening, at the intersection of Lunenburg Road / Fort Pond Road prior to an imminent building-occupancy where Fort Pond Road left-turning site generated trips equals 22 new vehicles in the weekday evening peak hour (period of increased delay) based on trip projections provided in this DEIR. This level of trips correlates to 5% of total movement traffic at the intersection. The temporary traffic signal will be dependent on the satisfying MUTCD traffic signal warrants. The mitigation measure is meant to be an interim measure to mitigate both existing and future traffic operations prior to the improvements being sought by MassDOT at Interchange 35. As the Master Plan build-out phasing is currently unknown, the level of traffic generated by the site will dictate when MUTCD traffic signal warrants are satisfied.

Transportation Demand Management Measures

The Proponent has commitment to research and provide a dynamic TDM program in order to reduce SOV trips to/from the site. A full compilation of TDM measures have not been identified to-date; but will be further evaluated by the Proponent during the MEPA review. At this time, the Proponent is committed to provide the following TDM measures:

Parking Measures

- Preferential Parking - Provide preferential parking for rideshare, carpool, and hybrid vehicles at locations throughout the site's parking areas in close proximity to major entranceways. The designated spaces will be monitored to ensure that the license plates of those employees parking in the spots each day match the registrations of participants. Employees will only be allowed to use these spaces on the days that they are carpooling;

- Electric Vehicle Stations – Provide electric vehicle charging stations at locations throughout the site's parking areas in close proximity to major entranceways;

- Provide Tractor-trailer Parking On-Site – The site will include parking spaces for tractor-trailers to be stored on-site. As an industrial park complex, this will minimize the need for tractor trailers, which create higher levels of emissions, to make additional site trips to/from a separate location to park when unneeded as part of the day-to-day commerce; and

- Reduced Parking Supply – The Proponent is committed to reducing the parking supply by providing minimal number of parking spaces below Town of Lancaster Zoning requirements to a level of the demand need only.

Bicycle and Pedestrian Measures

- Pedestrian Signal Equipment – Install new pedestrian signal equipment at the intersection of Lunenburg Road / McGovern Boulevard;

- Sidewalk Connectivity - Provide connectivity of sidewalk infrastructure along McGovern Boulevard to land uses within the site and along Lunenburg Road within the construction limits;

- Bicycle Accommodations - Provide striping improvements for bicycle lanes along McGovern Boulevard and Lunenburg Road with complementary bike signs. Construction of a graded platform along the westerly side of Lunenburg for future / potential shared-use path.

- ADA/AAB Compliance in Vicinity of Site - Provide ADA/AAB improvements at curb ramps near the site;

- Bicycle Racks - Provide secure, weather protected, long-term bicycle parking for employees at designated locations within the site. Provide bicycle racks for short-term users at several locations on-site; and

- Employee Shower Facilities - Coordinate with tenants to provide showers for employees who commute by walking or biking.

Other Measures

- Employee Transportation Coordinator (ETC) – An ETC will be provided on-site to oversee, implement, monitor, and evaluate TDM measures, employed or funded by the Proponent. The ETC will be responsible for managing rideshare and carpool programs, as well as distributing information to employees to encourage alternative means of transportation. The ETC will be responsible for posting and distributing announcements, holding promotional events to encourage rideshare, bicycling, and walking;

- NuRide – The ETC will actively register employees with NuRide, as requested, to encourage ride-sharing and "green" trips. The ETC, with NuRide, will develop an employee rideshare program to encourage employees to seek alternatives to driving to work alone;

- Vanpool and Carpool – The Proponent, and the ETC, will encourage vanpool and carpooling participation through marketing, events and vanpool formation meetings. The ETC will implement a ride-matching program to assist employees in finding appropriate carpool matches. The ETC will contact employees to determine if they receive their match-lists, review the lists with them and see if they have contacted anyone on the list or would like assistance in contacting people;

- Guaranteed Ride Home Program – The ETC will be responsible for providing all employees who carpool, bicycle, or walk to work with an emergency ride home. This program eliminates the fear of being stranded on days that the employees are ridesharing or having to walk or bicycle in inclement weather conditions;

- Flex Hours - Encourage tenants within the mixed-use development to provide flexible hours to employees;

- Direct Deposit for Employees - Encourage tenants within the mixed-use development to provide direct deposit to reduce employee trips to/from the site;

- Site Amenities – The site includes several on-site amenities; such as Dunkin Donuts, Mobil Gas Station, and other future retail space currently not constructed. This location will assist in reducing vehicular demand and increase multi-use trips, which include: parking capacity sized to meet minimum local requirements without providing excessive parking;

- Promotional Events and Activities – The ETC will be responsible for organizing promotional events and activities to encourage rideshare and alternative transportation means. In addition, the ETC will distribute brochures to all new employees and residents during, and post posters and bulletins on various subjects from carpooling to the Guaranteed Ride Home program throughout the site; and

- Traffic Monitoring Program – The Proponent is committed to implement a TMP, which is intended to monitor traffic operations and parking occupancy throughout the construction and for a period following completion of the Project. The scope of the EMP will be developed in coordination with MassDOT, and will include providing traffic counts, TDM compliance, and parking information to the MassDOT District 3 office and the Town of Lancaster.

Transportation Monitoring Program

The Proponent is committed to implementing a TMP, which is intended to monitor traffic operations, parking occupancy, public transportation utilization, and pedestrian / bicycle use for a period following completion of the Project. The TMP will include providing traffic count information to the MassDOT District 3 office and the Town of Lancaster for use of tracking site-

generated trips. The intent of the monitoring program is to ensure that the Project impacts are consistent with those predicted in the Project's permitting process, evaluate the effectiveness of the TDM measures in meeting the mode share targets, and assess the need for additional off-site improvements or TDM measures.

The MassDOT / Town of Lancaster monitoring program will include evaluation of the following:

- Traffic operations at the intersections of:
    - Main Street / Lunenburg Road
    - Lunenburg Road / McGovern Boulevard
    - Lunenburg Road / Old Union Turnpike
    - Lunenburg Road / Fort Pond Road / Woods Lane
- Adequacy of the constructed parking supply; and
- Effectiveness of TDM measures

As part of the monitoring program, the Proponent will complete the following tasks annually for five years following occupancy of the proposed mixed-use development:

- Collect manual Turning Movement Counts (TMCs) during the weekday morning (7:00 AM to 9:00 AM) and weekday evening (4:00 to 6:00 PM) peak periods at the following intersections;
    - Main Street / Lunenburg Road
    - Lunenburg Road / McGovern Boulevard
    - Lunenburg Road / Old Union Turnpike
    - Lunenburg Road / Fort Pond Road / Woods Lane
- Collect ATR data for a continuous 72-hour period along Lunenburg Road and McGovern Boulevard;
- Collect parking demand counts during the peak parking demand periods for the weekday evening (4:00 to 6:00 PM) peak period;
- Complete an employee travel survey to gage employee travel patterns and mode share;
- Compare the TMCs collected above with those projected within the future DEIR/FEIR prepared for the Project to determine whether the total vehicles entering each intersection exceeds the volumes projected;

- Perform a capacity and queuing analysis using Synchro analysis software to evaluate the traffic operations at each of the intersections listed above and compare to the operations projected in the future DEIR/FEIR prepared for the Project;

- Assess whether additional improvements are necessary at any of the study intersections and identify measures to improve operations and/or reduce vehicular traffic volumes. The need for mitigation will be conditioned upon exceeding the total projected traffic volume through an intersection by more than 10 percent or exceeding the projected overall intersection delay by more than 20 percent;

- Assess whether the constructed parking supply is adequate for the parking demand as observed; and

- Prepare a memorandum summarizing the results of the TMCs, ATRs, parking demand counts and the Synchro analysis for submission to MassDOT and the Town of Lancaster.

The monitoring program will occur on an annual basis beginning six months after issuance of the first occupancy permit and continuing for five years following full occupancy of the project. The monitoring program may be suspended at any time upon agreement with MassDOT and the Town of Lancaster that the Project has sufficiently provided evidence that the upper limits of vehicle delay and trip projection would not be feasibly satisfied. The monitoring program may also be suspended if five years have passed since the issuance of an occupancy permit for the project and will recommence should an additional occupancy permit be issued.

Conclusions

TEC has examined the potential traffic impacts associated with the proposed Capital Commerce Center in Lancaster, Massachusetts on the study area roadways and intersections. The following is a summary of the results and conclusions of this effort:

- The existing site includes several minor uses over the two distinct development zones. Within the development zone connected to McGovern Boulevard, the site includes the FC Stars outdoor soccer complex comprised of three (3) soccer fields, a 11,800 SF J.B. Hunt Transport Services facility, a 2,300 SF Dunkin Donuts, 5,000 SF Mobil gas station with convenience market, and the soil / gravel yard for the New England Specialty Soils. Within the development zone connected to Johnny Appleseed Lane, the site includes one single-family dwelling and an equestrian field with stable operations;

- The Project consists of clearing much of the existing site; but retaining the existing FC Stars soccer complex, Dunkin Donuts, and Mobil Gas Station. The proposed mixed-use development program includes constructing of a 1,567,500 SF industrial park (319 loading docks), 117 single-family residential units, 500 multi-family residential units, a 120-room hotel; 65,700 SF of additional retail space (73,000 SF total with existing Dunkin Donuts and Mobil), and an 86,500 SF indoor soccer facility comprised of one soccer field;

- The Project proposes to retain the access/egress to the site via McGovern Boulevard. The 117 single-family residential units will be disconnected from the rest of the proposed land uses and be accessed/egressed via new roadway connections to/from Johnny Appleseed Lane [City of Leominster];

- The Project looks to significantly increase the parking at the site to accommodate demand and will provide 1,317 parking spaces to service the industrial park, 740 parking spaces to service the multi-family residential units, 120 parking spaces to service the hotel, 418 additional parking spaces to service the retail adjacent to Lunenburg Road, and an additional 216 parking spaces to service the indoor soccer facility. In total, the project will add 3,109 parking spaces to the site including 316 tractor-trailer parking spaces to be provided within the industrial park;

- The Route 2 Interchange 35 and associated ramp network has experienced a significant number of crashes; however, an overwhelming majority of these crashes occurred on the freeway in the vicinity of the interchange with no effect or cause related to the surface intersection with Old Union Turnpike and Fort Pond Road. Individual crash reports were processed from the MassDOT Traffic and Safety Engineering Section for 2014 through 2018 in order to determine the crash history of the two surface intersections as part of the study area. An evaluation of these reports indicates that the surface intersections at the ramps at not HSIP-eligible;

- The intersection sight distance (ISD) and stopping sight distance (SSD) at the intersection of Lunenburg Road / McGovern Boulevard are well in excess of AASHTO minimum recommendations;

- Separate from the Project, MassDOT is currently evaluating alternatives for reconstruction of several Route 2 interchanges in Harvard and Lancaster, MA.

- MassDOT has identified a project at Interchange 34 (MassDOT Project File No. 608832) which is planned to be funded through the 2023 TIP and construction is expected to commence in the Spring of 2024. Improvements at Interchange 35 have been evaluated; however, are not expected to be constructed by the 2026 design horizon included in this DEIR.

- The proposed mixed-use development is anticipated to generate approximately 9,790 new vehicle trips during the average weekday, with 752 new vehicle trips (460 entering and 292 exiting) during the weekday morning peak hour and 838 new vehicle trips (344 entering and 494 exiting) during the weekday evening peak hour. Approximately 9,602 new vehicle trips are anticipated during the average Saturday, with 1,299 new vehicle trips (538 entering and 761 exiting) during the Saturday midday peak hour. Because of the rural nature of the site, the mode split is anticipated to be very near 100-percent automobile;

- Based on both the signalized and unsignalized operating conditions on Lunenburg Road, the traffic volumes warrant the construction of a left-turn lane on the

Lunenburg Road northbound approach at its intersection with McGovern Boulevard;

- Based on the existing traffic volumes and the addition of the projected site-generated trips for each proposed land use, the intersection of Lunenburg Road / McGovern Boulevard meets the criteria for Traffic Signal Warrant 1, Warrant 2, and Warrant 3. As a traffic signal is warranted and due to the operating and safety conditions of the intersection without a traffic signal in place, installation of a traffic signal at this intersection is recommended as part of the off-site corridor improvements along Lunenburg Road;

- Operational improvements are recommended and proposed at the intersection of Main Street / Seven Bridge Road / Shirley Road including re-timing the new signal timings to accommodate the site-generated trips. With these improvements, all movements during the weekday morning peak hour are expected to operate at acceptable levels of service (LOS D or better). During the weekday evening peak hour, the approach will continue to operate at LOS F with a delay slightly above the LOS F threshold;

- Operational improvements are recommended and proposed at the intersection of Main Street / Lunenburg Road including re-timing the new signal timings to accommodate the site-generated trips. With these improvements, all movements during the weekday morning and evening peak hours are expected to operate at acceptable levels of service (LOS D or better);

- Geometric and signalization improvements are recommended and proposed at the intersection of Lunenburg Road / McGovern Boulevard including slight widening to accommodate axillary turn-lanes and construction of a fully-actuated traffic signal. With these improvements, all movements during the weekday morning and evening peak hours are expected to operate at acceptable levels of service (LOS C or better). Full traffic signal implementation will not be installed by the Proponent until the level of site traffic is elevated to an MUTCD warranted condition;

- The intersection of Lunenburg Road / Old Union Turnpike was recently reconstructed as a roundabout in 2013 to provide a substantial amount of new reserve capacity. Under 2026 Build Conditions, the Old Union Turnpike westbound approach is anticipated to operate at LOS E during the weekday evening peak period. This level of delay is only expected during this short time period of a typical weekday and is specifically dependent on the conservative level of site generated traffic allocated to the location;

- Under both 2026 No-Build and Build Conditions, the Fort Pond Road westbound approach is anticipated to operate at an elevated level-of-service during the weekday evening peak period at its intersection with Lunenburg Road. This level of delay is only expected during this short time period of a typical weekday and is specifically dependent on the conservative level of site generated traffic allocated to the location. Improvements related to the future MassDOT Interchange

alternatives along the several Route 2 interchanges are anticipated to improve operations and safety at this intersection with and without the site generated traffic. In the event that improvements at this location are not completed by MassDOT prior to full-occupancy of the development, the Proponent is committed to work with the Town of Lancaster to examine interim intersection improvements based on the level of impact of the Project.

- Under 2026 Build Conditions, all movements at the intersection of Fort Pond Road / Route 2 WB Exit 35 Ramps are expected to operate at acceptable levels of service (LOS D or better) during all peak hour analysis scenarios with exception of the Route 2 off-ramp left-turn movement which will operate at an elevated level-of-service during the weekday evening peak hour. Although the ramp will operate at an elevate level-of-service, the ramp approach will generally operate in a consistent manner as existing conditions as the additional traffic will also result in a more consistent flow of traffic. Improvements related to the future MassDOT Interchange alternatives along the several Route 2 interchanges are anticipated to improve operations and safety at this intersection with and without the site generated traffic;

- The project's off-site mitigation and will include a commitment to extend the queue storage and deceleration lane along the Route 2 WB Off-Ramp to ensure project related traffic does not conflict with Route 2 mainline volumes;

- Under both the 2026 No-Build and Build Conditions, the Harvard Street southbound movement is anticipated to operate at elevated levels-of-service during the weekday evening and Saturday midday peak hours at its intersection with Old Union Turnpike. Although the approach experiences LOS F conditions based on the Synchro™ analysis, this condition is not expected to be fully realized in a real-world scenario. The Old Union Turnpike westbound approach is currently wide and generally allows for right-turning traffic entering Harvard Street to do so within an unmarked, de facto channelized lane. When this condition is input into the Synchro™ analysis, the delay and LOS along Harvard Street drops by more than 60 percent. The project is only expected to add an additional 16 southbound vehicles during both the weekday evening and Saturday midday peak hours; all right-turn movements under yield control.

- Under 2026 Build Conditions, the Route 2 EB Exit 34 ramp southbound movement is anticipated to operate at elevated levels-of-service during both the weekday morning and weekday evening peak hour at Old Union Turnpike. Although the levels-of-service are elevated, the addition traffic from the Project is not anticipated to result in a significant increase in delay or extended vehicle queues by more than four (4) vehicles. Interchange improvements along Route 2 are expected to change the characteristics of the intersection as part of MassDOT Project File 608832 and improve traffic operations overall at the location.

- The Proponent has proposed an off-site transportation mitigation program along Lunenburg Road, McGovern Boulevard, and Main Street to improve vehicular,

bicycle, and pedestrian operations and safety. The primary improvements include the installation of a new traffic signal at the intersection of Lunenburg Road / McGovern Boulevard. In addition, the Proponent seeks to significantly improve accommodations for bicycles and pedestrians along Lunenburg Road and McGovern Boulevard to service not only the Capital Commence Center; but other existing developments in the vicinity.

- The Proponent has commitment to research and provide a dynamic and extensive TDM program in order to reduce SOV trips to/from the site and promote multi-modal travel. A full compilation of TDM measures have been identified and include provisions to reduce on-site parking, increase pedestrian and bicycle travel, promote transit use to/from the site, and decrease the impacts of vehicle emissions.

In conclusion, with implementation of the proposed improvements, the anticipated traffic generated by the Capital Commence Center Project can be safely and efficiently accommodated within the study area corridors and intersections. The Proponent has committed to work hand-and-hand with the Town of Lancaster to implement the robust transportation mitigation program.

8. ENERGY, GREENHOUSE GAS EMISSIONS & AIR QUALITY

Mesoscale Air Quality Analysis

A mesoscale air quality analysis was performed for the Project. Mesoscale emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) were calculated for four scenarios: 2019 Existing, 2026 No-Build, 2026 Full Build and 2026 Full Build with Mitigation. This analysis used the US Environmental Protection Agency (EPA) MOVES2014 Mobile Source Emission Factor Model, and followed the Massachusetts Department of Environmental Protection (DEP) guideline for mesoscale analyses. The mesoscale analysis predicts that the emissions of VOC and NOx in the project study area for the 2026 Full Build cases will be larger than the emissions for the 2026 No-Build case, and the Project will mitigate potential air quality impacts by committing to a number of transportation demand management (TDM) measures (see **Appendix G**, the Greenhouse Gas and Mesoscale Report, Section 2.4). The TDM measures will improve traffic operations, reduce project generated vehicle trips, and reduce project-related motor vehicle air pollutant emissions. These mitigation measures will result in small reductions in VOC and NOx emissions compared to the 2026 Full Build case. The proposed TDM measures constitute all reasonable and feasible traffic mitigation measures for the Project.

Greenhouse Gas Analysis

A greenhouse gas (GHG) emissions analysis was performed for the Project, consistent with the EOEEA "Greenhouse Gas Emissions Policy and Protocol" (May 5, 2010; the "GHG Policy"). The Project is a mixed-use industrial, commercial and residential development. While one of the industrial buildings, having 1 million sf of interior space, is clearly planned for warehouse space, the other industrial buildings lend themselves to either manufacturing or warehousing, and these were conservatively modeled as light manufacturing space. The site was previously developed as a sand and gravel pit, and currently houses multiple industrial uses. For the portion of the site with tree cover, a loss of carbon sequestration analysis is included in the GHG analysis.

The GHG Policy requires a project to quantify carbon dioxide (CO2) emissions and identify measures to avoid, minimize or mitigate such emissions, quantifying the effect of proposed mitigation in terms of energy savings and emissions reduction. For the commercial development, CO2 emissions were quantified for: (1) the Base Case corresponding to the 9th Edition of the Massachusetts Building Code that includes the 2015 IECC and ASHRAE 90.1-2013, with Section C406.1 code-options 1 and 2, and (2) the Mitigation Alternative, which includes all energy saving measures. Lancaster has adopted the Stretch Code. Since three industrial buildings are over 100,000 sf in size, this report includes a demonstration that the Mitigation Alternative complies with the Stretch Code (780 CMR Appendix AA, Section AA103.2), requiring building energy use to be at least 10% below ASHRAE 90.1-2013 Appendix G.

For the residential development, CO2 emissions were quantified for: (1) the Base Case corresponding to the 9th Edition of the Massachusetts Building Code that includes the 2015 IECC plus the requirements of Energy STAR Certified Homes v3.1, and (2) the Mitigation Alternative, which includes all energy saving measures. Details of the energy and CO2 modeling are found in **Appendix G**, the Greenhouse Gas and Mesoscale Report, Section 4.0.

The Proponent will construct core and shell buildings for the industrial and commercial tenants, and will provide fully finished buildings for the residential tenants. A draft outline for the Tenant Manual is found in **Appendix G**, the Greenhouse Gas and Mesoscale Report, Section 4.6.

The Proponent commits to the CO_2 reduction presented below, but retains the flexibility to achieve this goal using energy efficiency measures that may be refined at the stage of detailed design. The Mitigation Alternative will reduce CO_2 emissions (for stationary sources) by 14.2% compared to the Base Case. Transportation Demand Management (TDM) measures for this project will reduce Project-related motor vehicle CO2 emissions by 2%. The net reduction of the Project's total CO_2 emissions (stationary sources plus transportation) is 11.0% compared to the Base Case. The three industrial buildings over 100,000 sf in size comply with the Stretch Code requirement for an energy use reduction of at least 10% relative to the ASHRAE 90.1-2013 Appendix G baseline.

Draft Section 61 Findings

At the completion of construction, the Proponent will provide a certification to the MEPA Office, signed by an appropriate professional. The certification will identify either of the following: 1) all of the energy efficiency mitigation measures adopted by the Project as part of the Mitigation Alternative have been implemented; or 2) an equivalent set of energy efficiency mitigation measures, which together are designed to achieve the same percentage reduction in CO2 emissions as the Mitigation Alternative, when compared to the Base Case, based on the same modeling assumptions in this report, have been adopted.

9. CONSTRUCTION IMPACTS

Construction Schedule and Hours

Construction of the Project is expected to commence in the Spring of 2020. Final completion of construction will depend upon market conditions and ultimate end user buildout. However, this schedule is subject to change based on market conditions and other factors that that cannot be anticipated at this time.

Hours of construction will be consistent with those required by the Town of Lancaster.

Construction Phasing and Mitigation Efforts

As is typical for a project of this scale, the build-out will occur in multiple phases over several years. At this time, the project is in very early stages of design development and, therefore, the overall phasing sequence has not yet been determined. The build-out will ultimately be dictated by market demand as individual tenants, buyers, or builders are identified and secured by the proponent.

There are several components of the Master Plan that have already been constructed. These components were initially permitted as stand-alone projects, but as requested by MEPA during informal meetings, are now retroactively included in the overall Master Plan and MEPA filings so that their cumulative impacts can be considered and quantified. These components include the following uses along with the associated access, utility and drainage infrastructure:

- Dunkin'
- Mobil Gas Station
- F.C. Stars Soccer Complex

The proponent has executed a purchase and sales agreement for the Automotive Sales and Service

Facility (Use "F" on the Preferred Master Plan) and is currently in discussions with potential suitors for buildings "B" and "D". It is likely that these components of the Master Plan will be constructed in advance of other uses. Based on this, the proponent anticipates the following phasing sequence:

- Phase 1 was the construction of the existing retailers, including Dunkin', Mobil Gas Station, and the F.C. Stars Soccer Complex along with the associated access, utility and drainage infrastructure.

- Phase 2 will involve the construction of the McGovern Boulevard extension with associated pedestrian accommodations, utility and stormwater infrastructure, lighting, and landscaping. Land disturbance will be limited only as required for the construction of the roadway and the borrow areas required.

- Phase 3 will involve the construction of the automotive sale and service facility as well as industrial uses "B" and "D" with associated access, utility and stormwater infrastructure, and lighting.

- Future phases will consist of the construction of the individual lots along with associated driveways, pedestrian accommodations, utility and stormwater infrastructure, and landscaping. The timing for construction of each lot will vary depending upon the final needs of end users. It is anticipated that the residential component within the City of Leominster would be the last phase of construction.

Temporary Construction Impacts

Project impacts during construction will be confined within the property boundary and adjacent roadways for utility connections and access. Temporary construction impacts include, but are not limited to, site mobilization, clearing and grubbing, earthwork, material stockpiling, stormwater runoff and erosion control, dewatering and ledge removal (if required), soil stabilization for earth disturbing activities, construction noise and emissions, solid waste management, sanitary waste management, anti-tracking controls, construction traffic and parking, and construction access.

Summary of Construction Mitigation Efforts

The Proponent will take the following reasonable efforts to minimize impacts associated with construction efforts:

- Minimize amount of land disturbance at one time
- Installation and Maintenance of Erosion and Sedimentation controls
- Soil Stabilization Measures for earth disturbing activities
- Anti-tracking controls for dirt/mud/dust generated on-site
- Properly maintain construction equipment
- Noise control
- Dust suppression/air quality control

The proposed work will be constructed in accordance with standard best management practices including keeping the amount of land disturbed at one time to the minimum needed in order to avoid environmental impacts. The Project will also be subject to a National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) and a Multi-Sector General Permit (MSGP) and will have a Stormwater Pollution Prevention Plan (SWPPP) that will be utilized to minimize construction related impacts.

Refer to the Construction Management Plan (CMP) provided in **Appendix I** for more information on the mitigation efforts mentioned above, as well as additional information relating to construction schedule, methodology, impacts, and commitments.

10. MITIGATION SUMMARY

A summary of the mitigation efforts proposed as part of the Project are included below. Refer to the associated Sections of the DEIR for more detailed discussions of each project element and proposals for mitigation.

Land Alteration

The following measures will be implemented to mitigate the impacts associated with land alteration as part of the Project:

- Donation of two off-site parcels of land totaling 86.7 acres as open space;
- Providing an anticipated additional 80 acres of open space within the IPOD development;
- Reserve or land bank parking is not specified as being allowed in the underlying zoning for the project. The IPOD overlay district does allow for a "Minimum number of spaces, or as may be modified by special permit under that section". The proponent will work with the Town during the permitting process to identify areas if and where land banked parking may be feasible and allowed;
- Incorporate retaining wall systems to minimize off-grading;
- Minimizing the area of open earth at any given time; and
- Stabilization of open areas immediately upon establishment of final grades.

Wetland Resource Areas

In accordance with the Wetlands Protection Act Regulations at 310 CMR 10.00, mitigation is proposed, where required, for all wetland resource areas proposed to be altered. **Table 10.1**, below summarizes project impact and mitigation areas. The table includes Phase I impacts already initiated/completed as well as Phase II impacts associated with Capital Commerce Center and access through the Phase I roadway crossing McGovern Brook. Mitigation will be provided in the forms of wetland replication, compensatory flood storage and wildlife habitat enhancements, as necessary.

Table 10.1: Wetland Resource Area Mitigation

	Phase I (Constructed)	Phase II (Proposed)	Mitigation Proposed
Bordering Vegetated Wetland	0	3,500 SF	5,250 SF (1.5 mitigated : 1 impacted)
Bank	0	0	0
Isolated Land Subject to Flooding	0	0	0
Land Under Water	0	1,815 SF (Farm/Wash Pond)	2,800 SF (1.5 mitigated : 1 impacted)
Bordering Land Subject to Flooding	15,295 SF (Original McGovern Brook Crossing)	15,000 SF (Widening McGovern Brook Crossing)	15,295 from Phase I under previous OOC 15,000 SF for Phase II
Riverfront Area (Inner Riparian)	19,644 SF (temporary)	McGovern Brook: 114,676 SF Westerly Stream: 0 SF	Phase I temporary disturbance noted as previously disturbed and no mitigation required
Riverfront Area (Outer Riparian)	22,590 SF (permanent)	McGovern Brook: 270, SF Westerly Stream: 10,200 s.f.	53,561 from Phase 1 under previous OOCs

Stormwater Management

The Project is designed to meet the Town of Lancaster Stormwater Management Rules and Regulations and the MassDEP Stormwater Standards as described below:

- The proposed drainage design will be consistent with maintaining natural drainage flow patterns to the extent practicable;
- Stormwater runoff will be treated for TSS removal using a mix of deep-sump, hooded catch basins, proprietary stormwater quality units, and forebays prior to infiltration or discharge;
- Stormwater management systems will be designed to provide 44% TSS removal for pretreatment prior to infiltration, and a total of 80% minimum TSS removal prior to discharge across the site;
- Surface and subsurface detention systems will be designed to promote groundwater recharge and retain the 1-inch water quality volume for the total impervious cover proposed onsite;
- Stormwater management systems will be designed to attenuate peak rates of runoff for the 2-, 10-, 25- and 100-year, 24-hour design storms;
- Low impact development (LID) techniques such as raingardens, bioretention areas, tree box filters, porous pavement, water quality swales, and green roofs will be considered for use on the individual lots on a case-by-case basis as appropriate and feasible due to site constraints during the design and permitting stages of the Project; and
- The Project is considered a mix of new development and redevelopment; however, the Site will be designed as if it is a new development.

Water and Wastewater Supply

The Proponent will work with the Town and end-users to ensure that efficient water use strategies are implemented to reduce overall potable water use on-site and wastewater generation, and to ensure that the necessary water supply is available. Mitigation strategies proposed by the Proponent for water use and wastewater generation are as follows:

- Efficient water use strategies that will be considered to reduce overall portable water use on-site are listed below:
  - Use of drought tolerant plantings;
  - Reduced irrigation & techniques to reduce irrigation losses due to evaporation;
  - Installation of water conservation equipment on irrigation infrastructure;
  - Installation of low-flow plumbing fixtures; and
  - Development/Implementation of maintenance and employee education programs.
- The Project will introduce new watertight sewer mains which will limit infiltration entering the proposed sewer system.
- The Project will implement efficient water use strategies, as indicated above, to reduce overall sewer discharges. By reducing water consumption, the project will reduce wastewater discharges.
- The project will discharge to the private on-site treatment plant and there are no anticipated impacts to municipal sewer systems

Transportation

Mitigation measures are discussed in **Section 7** of this report. These include (a) traffic monitoring; (b) pedestrian and bicycle accommodations; (c) a transportation demand management (TDM) program to enhance traffic operations and travel safety; and (d) off-site improvements. A draft Section 61 Finding is included in **Appendix G**.

A summary of proposed mitigation actions and schedule is provided in **Table 7.14**, and as described in the in the Traffic Impact and Access Study include **Appendix F.**

Energy, Greenhouse Gas Emissions & Air Quality

GHG emissions are reduced by the following building design and operational energy efficiency measures (EEMs):

- Using higher efficiency than Code building envelope (roof and wall insulation);
- Installing cool roofs with a light-colored material;
- Using higher efficiency than Code heating and cooling systems;
- Using higher efficiency than Code domestic hot water systems;
- Interior and exterior lighting systems with a lower light power density than Code;

- Sealing, insulating, and testing HVAC supply ducts;
- Energy management systems;
- Using Energy STAR electric appliances, where possible;
- Providing Solar-ready roof space on the building roofs for possible third-party PV systems.

Construction Control

- Hours of construction will be limited to Monday through Saturday 7:00 am to 7:00 pm. NO construction activities will occur on Sundays and holidays;
- Construction fencing will be installed around all construction areas prior to the commencement of work. Access to the site will be closed at the end of each work-day;
- Erosion Control Best Management Practices will be implemented and maintained on the site at all times during construction;
- Dust control will be implemented via water trucks and covering of stockpile areas.
- Stone construction entrances will be implemented to minimize soil tracking onto area roadways;
- Regular street sweeping will be conducted to remove any sediment that is deposited on local roadway adjacent to the site.
- Designated construction entrances will be established with appropriate warning signage;
- The Project will be constructed in phases to limit the amount of open earth at any given time;
- Open soils areas will be stabilized immediately upon establishment of final grades;
- Construction noise will be minimized to the extent possible. Construction Vehicles will not be allowed to warm up prior to designated construction hours.
- Noise generating equipment such as earth processing will be located as far as possible from sensitive receptors;
- The contractor will adhere to the Stormwater Pollution Prevention Plan(s) to be prepared for the Project;
- Construction materials including demolition debris will be recycled to the maximum extent possible;
- Where required, blasting will be conducted under strict adherence to State guidelines and as directed by the State Fire Marshall.

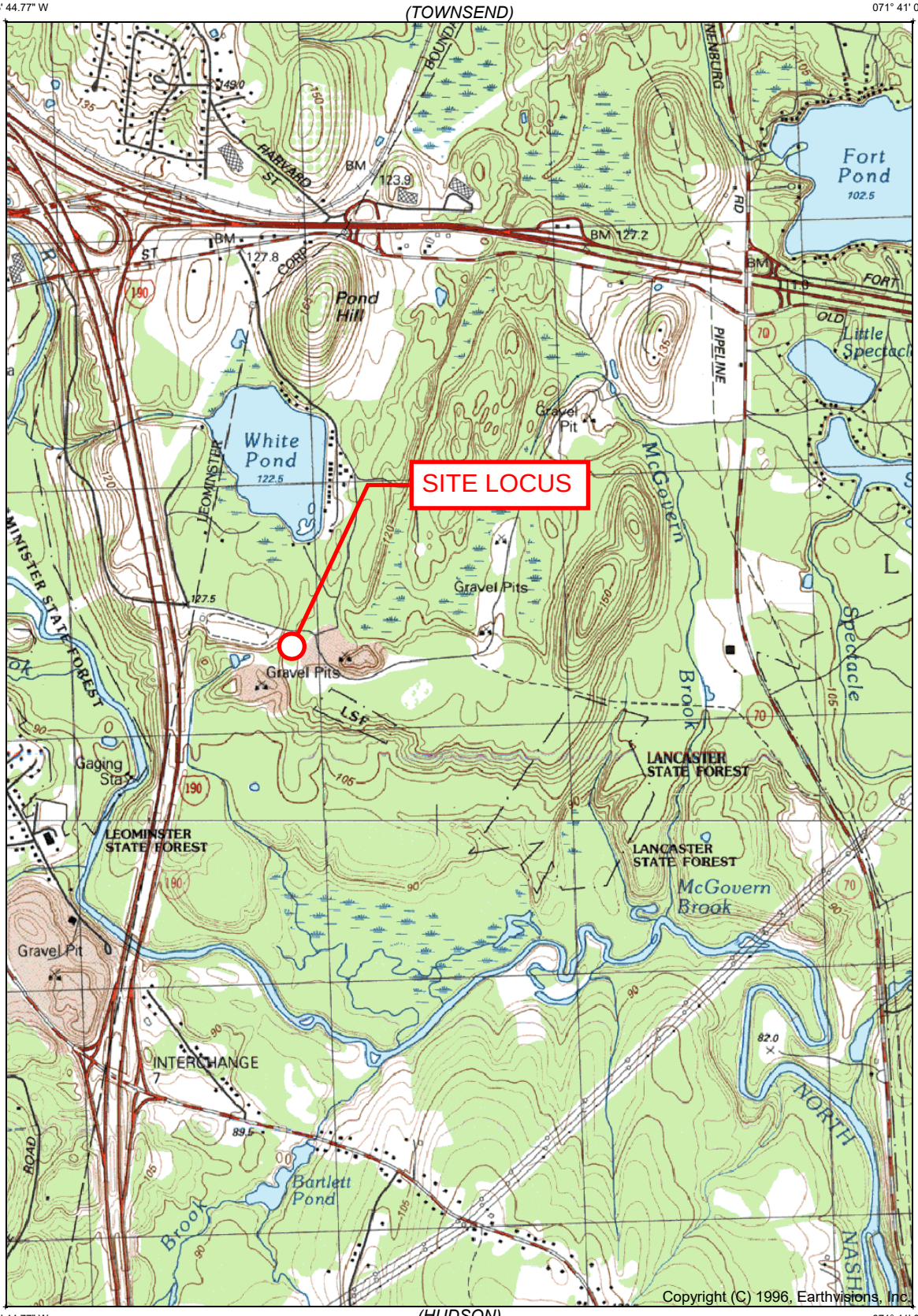
APPENDIX A: PROJECT MAPS

- USGS Site Location Map
- Existing Site Aerial Map
- Town of Lancaster Zoning Map
- Town of Lancaster Zoning Overlay Map
- Town of Lancaster Integrated Planning Overlay Districts (IPOD) Map
- MassGIS Areas of Critical Environmental Concern (ACEC) Map
- MassGIS Natural Heritage & Endangered Species (NHESP) Map
- MassGIS Wetland Map
- MassGIS Interim Wellhead Protection Area (IWPA) + Outstanding Resource Water (ORW) Map
- FEMA + MassGIS Flood Insurance Rate (FIRM) Maps
- Natural Resources Conservation Service (NRCS) Soil Map
- Impaired Waters Map
- Massachusetts Stressed Basins Map

(ASHBURNHAM) (TOWNSEND) (LOWELL)

071° 43' 44.77" W
042° 31' 44.44" N

071° 41' 04.33" W
042° 31' 44.44" N



(FITCHBURG) (BILLERICA)

042° 28' 56.87" N
071° 43' 44.77" W

(HUDSON)

042° 28' 56.87" N
071° 41' 04.33" W

(STERLING) (MAYNARD)

Declination

MN GN

GN 1.82° W
MN 14.81° W

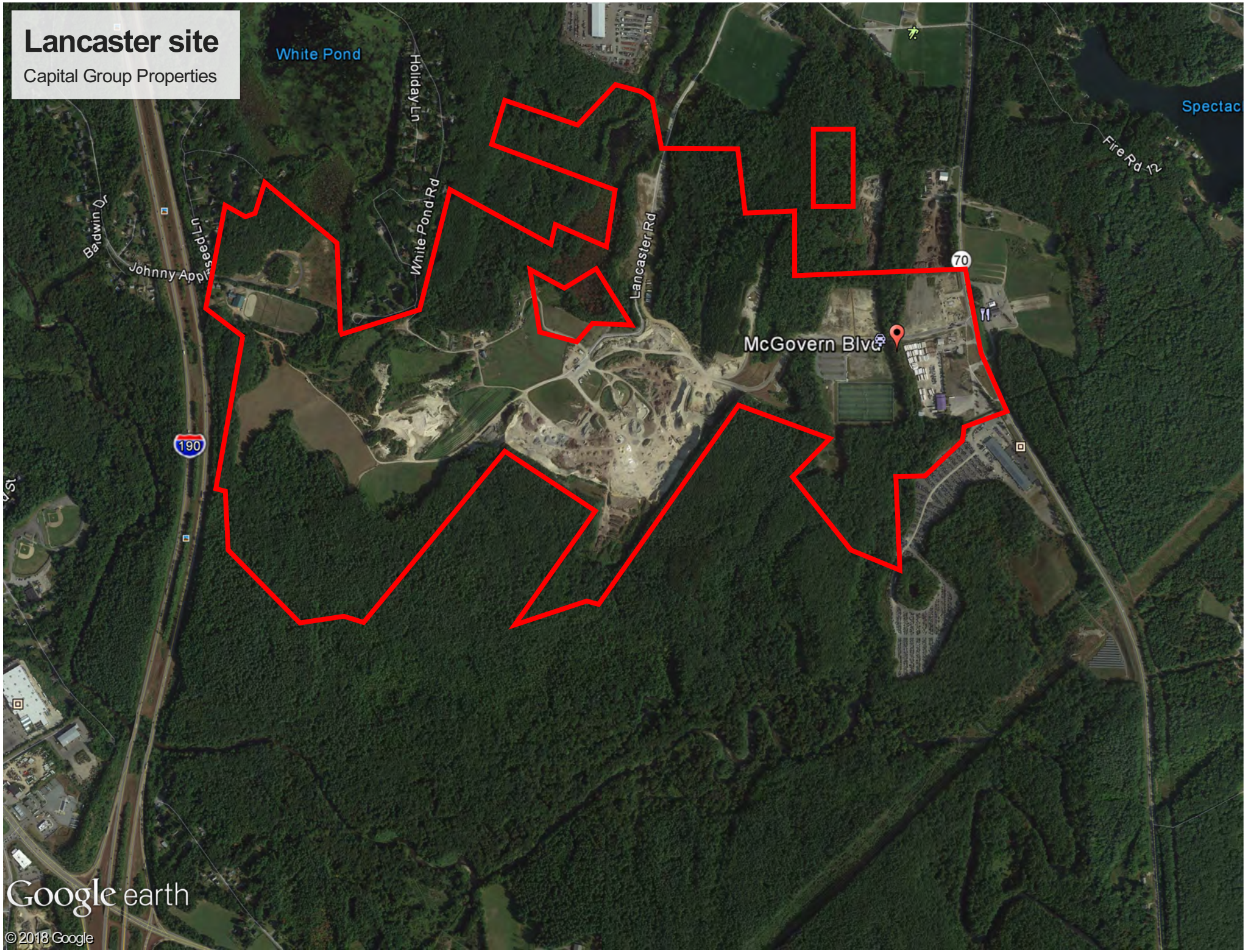
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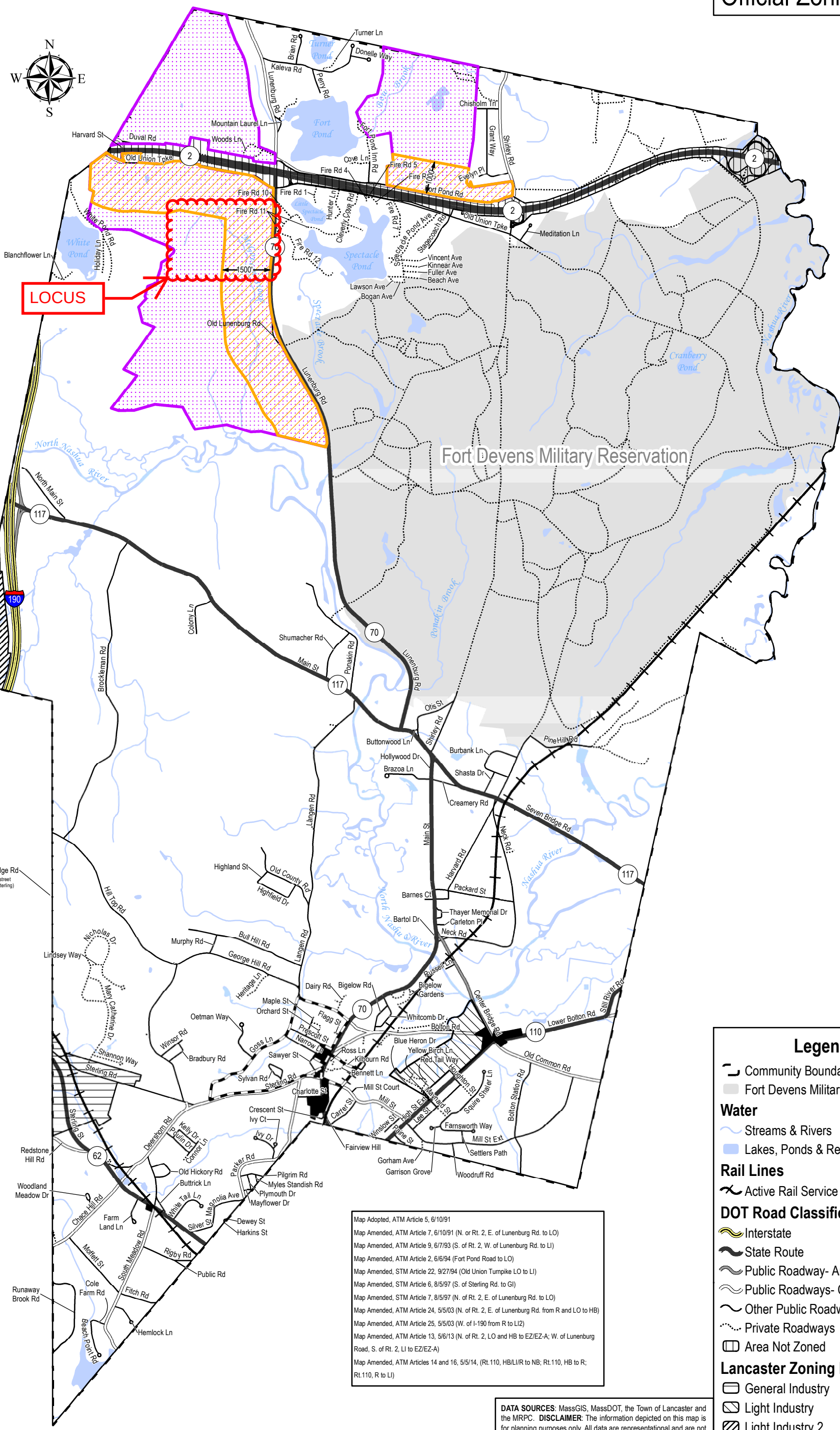
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CONTOUR INTERVAL 3 METERS
NATIONAL GEODETIC VERTICAL DATUM 1929


Lancaster site
Capital Group Properties
White Pond
Holiday Ln
White Pond Rd
Lancaster Rd
Fire Rd 12
Baldwin Dr
Johnny Appleseed Ln
McGovern Blvd
70
190
Google earth
© 2018 Google

Lancaster, MA: Official Zoning Map



Map Adopted, ATM Article 5, 6/10/91

Map Amended, ATM Article 7, 6/10/91 (N. or Rt. 2, E. of Lunenburg Rd. to LO)

Map Amended, ATM Article 9, 6/7/93 (S. of Rt. 2, W. of Lunenburg Rd. to LI)

Map Amended, ATM Article 2, 6/6/94 (Fort Pond Road to LO)

Map Amended, STM Article 22, 9/27/94 (Old Union Turnpike LO to LI)

Map Amended, STM Article 6, 8/5/97 (S. of Sterling Rd. to GI)

Map Amended, STM Article 7, 8/5/97 (N. of Rt. 2, E. of Lunenburg Rd. to LO)

Map Amended, ATM Article 24, 5/5/03 (N. of Rt. 2, E. of Lunenburg Rd. from R and LO to HB)

Map Amended, ATM Article 25, 5/5/03 (W. of I-190 from R to LI2)

Map Amended, ATM Article 13, 5/6/13 (N. of Rt. 2, LO and HB to EZ/EZ-A; W. of Lunenburg Road, S. of Rt. 2, LI to EZ/EZ-A)

Map Amended, ATM Articles 14 and 16, 5/5/14, (Rt.110, HB/LI/R to NB; Rt.110, HB to R; Rt.110, R to LI)

* The EZ-A Retail Subdistrict extends from the highway sideline for the distance shown on the map.

DATA SOURCES: MassGIS, MassDOT, the Town of Lancaster and the MRPC. **DISCLAIMER**: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, August 2014
1427R Water Street
Fitchburg, MA 01420
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Legend

- Community Boundaries
- Fort Devens Military Reservation

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

Rail Lines
- Active Rail Service

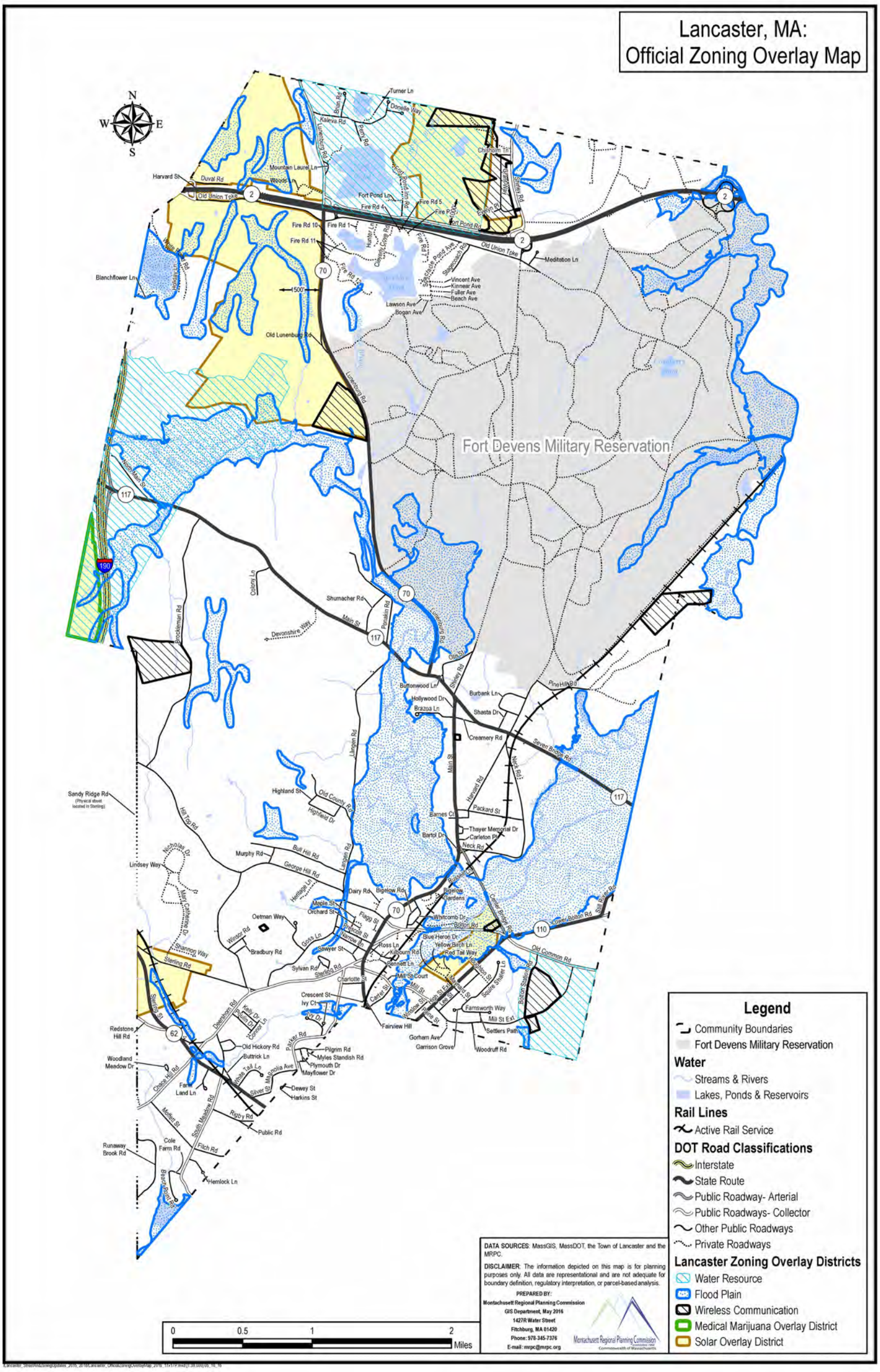
DOT Road Classifications
- Interstate
- State Route
- Public Roadway- Arterial
- Public Roadways- Collector
- Other Public Roadways
- Private Roadways
- Area Not Zoned

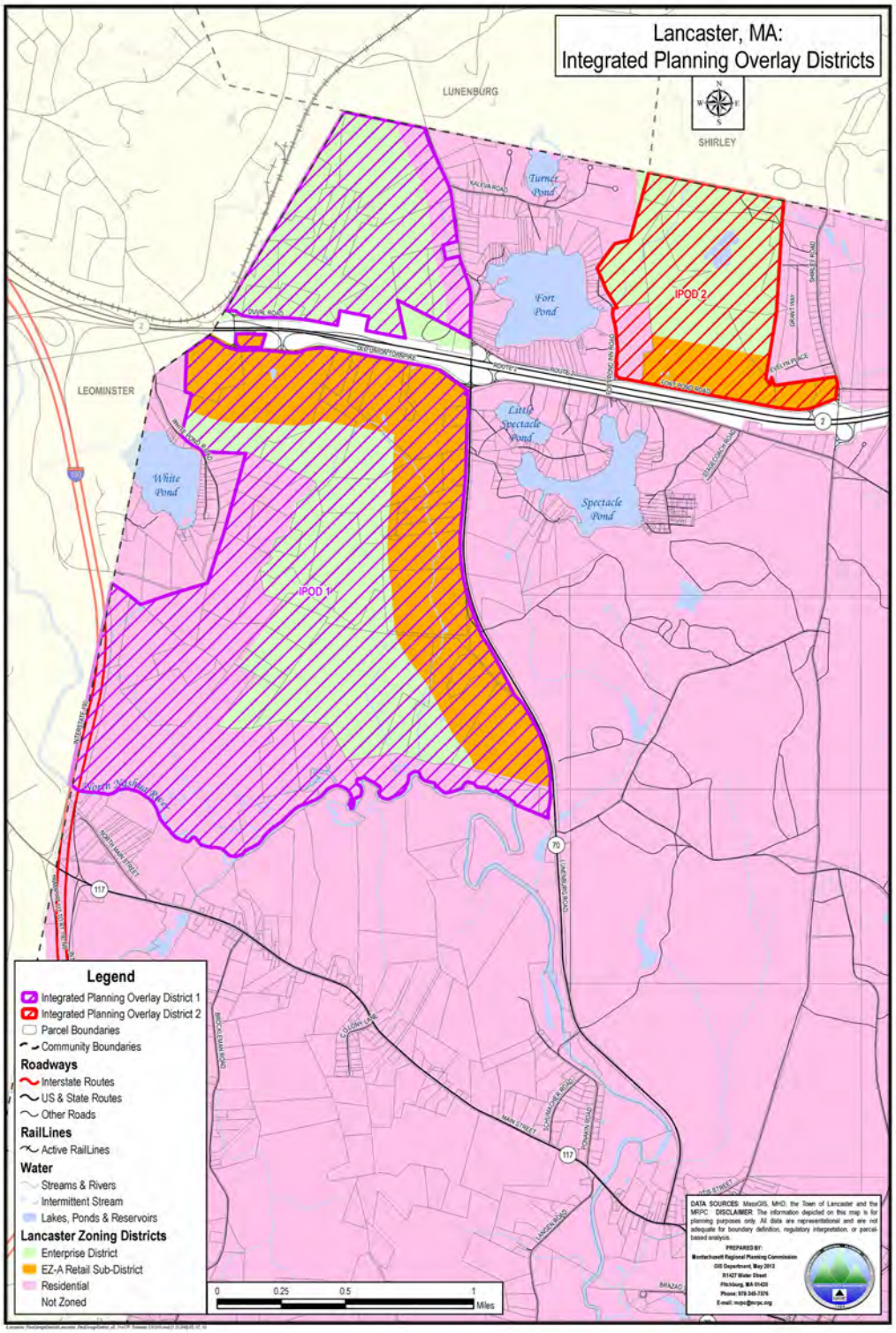
Lancaster Zoning Districts
- General Industry
- Light Industry
- Light Industry 2
- Neighborhood Business
- Residential
- Residential- Multi Family Permitted
- Enterprise District
- EZ-A Retail Sub-District*

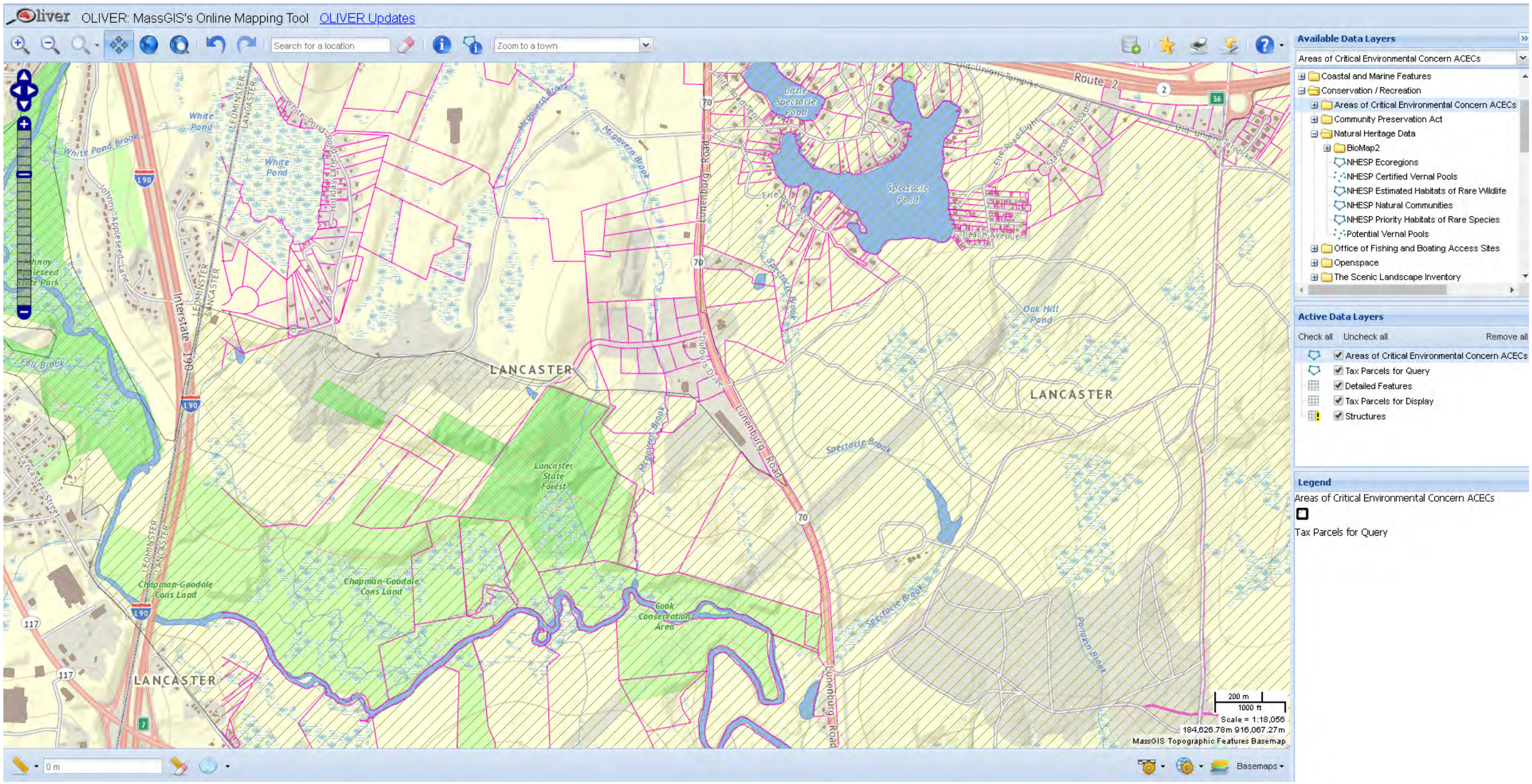
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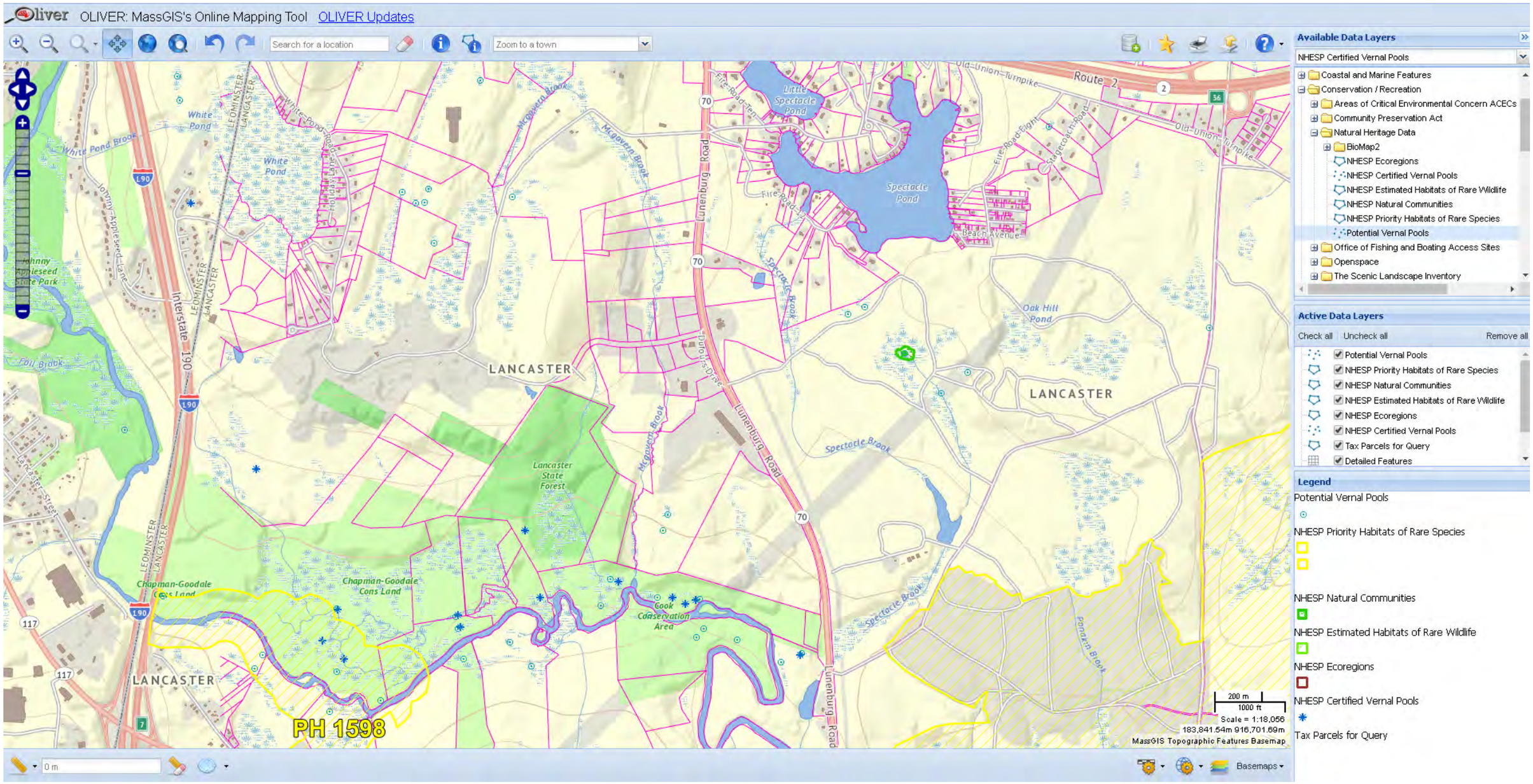
220 Attachment 3

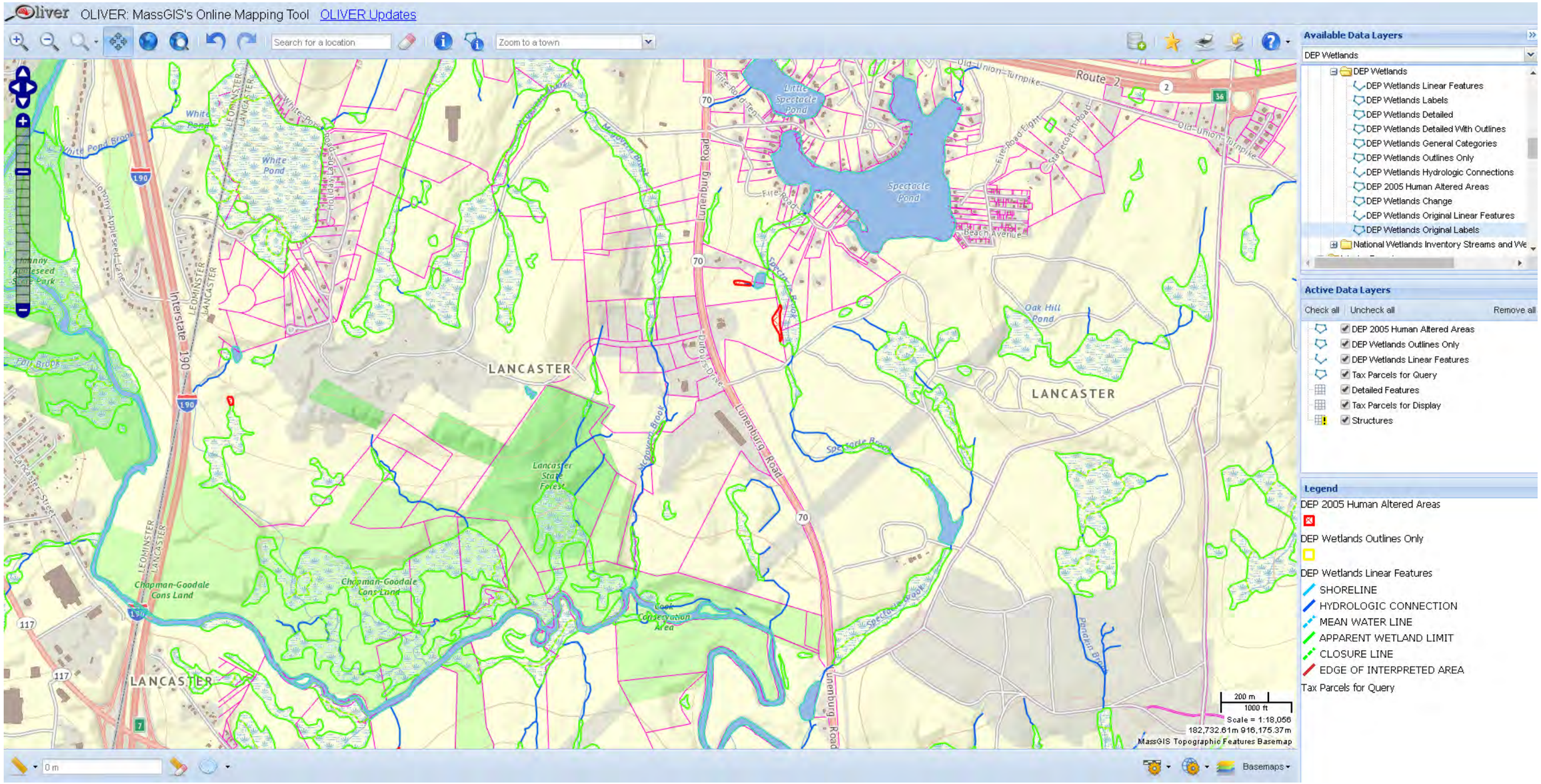
Town of Lancaster
Official Zoning Overlay Map
[Amended 5-5-2014 by Art. 17; 5-2-2016 ATM by Art. 17]

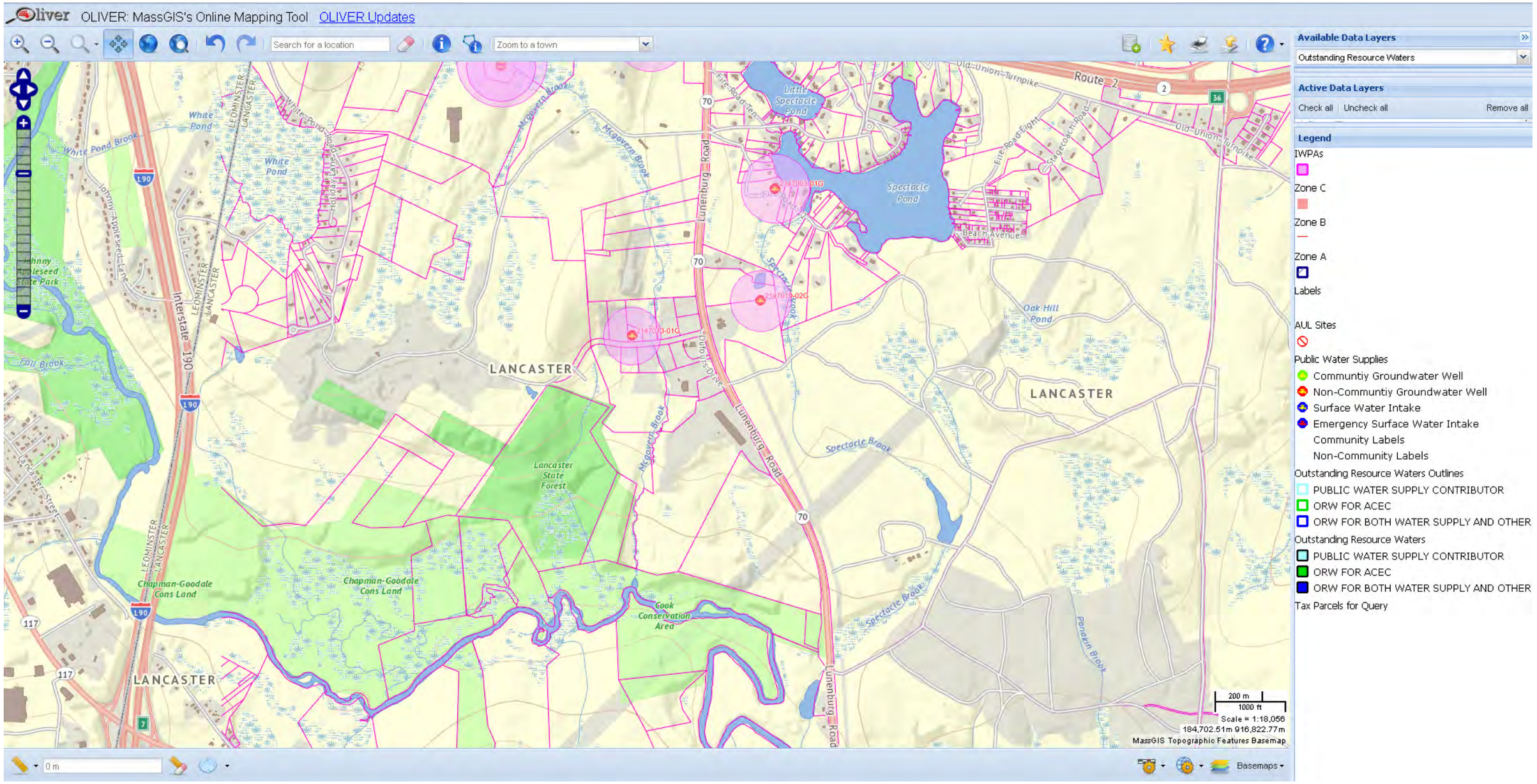



Lancaster, MA:
Integrated Planning Overlay Districts
LUNENBURG
SHIRLEY
LEOMINSTER
Turnet Pond
Fort Pond
Little Spectacle Pond
Spectacle Pond
White Pond
IPOD 1
IPOD 2
North Nashua River
Legend
Integrated Planning Overlay District 1
Integrated Planning Overlay District 2
Parcel Boundaries
Community Boundaries
Roadways
Interstate Routes
US & State Routes
Other Roads
RailLines
Active RailLines
Water
Streams & Rivers
Intermittent Stream
Lakes, Ponds & Reservoirs
Lancaster Zoning Districts
Enterprise District
EZ-A Retail Sub-District
Residential
Not Zoned
0
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0.5
1
Miles


OLIVER: MassGIS's Online Mapping Tool
OLIVER Updates
Search for a location
Zoom to a town
Available Data Layers
Areas of Critical Environmental Concern ACECs
Coastal and Marine Features
Conservation / Recreation
Areas of Critical Environmental Concern ACECs
Community Preservation Act
Natural Heritage Data
BioMap2
NHESP Ecoregions
NHESP Certified Vernal Pools
NHESP Estimated Habitats of Rare Wildlife
NHESP Natural Communities
NHESP Priority Habitats of Rare Species
Potential Vernal Pools
Office of Fishing and Boating Access Sites
Openspace
The Scenic Landscape Inventory
Active Data Layers
Check all
Uncheck all
Remove all
Areas of Critical Environmental Concern ACECs
Tax Parcels for Query
Detailed Features
Tax Parcels for Display
Structures
Legend
Areas of Critical Environmental Concern ACECs
Tax Parcels for Query
LANCASTER
Route_2
Spectacle Pond
Little Spectacle Pond
Oak Hill Pond
Lancaster State Forest
Chapman-Goodale Cons Land
Cook Conservation Area
White Pond
White Pond Brook
McGovern Brook
Spectacle Brook
Pompan Brook
Fay Brook
Lunenburg Road
Interstate 190
Johnny Appleseed Lane
Johnny Appleseed State Park
200 m
1000 ft
Scale = 1:18,056
184,626.78m 916,067.27m
MassGIS Topographic Features Basemap
Basemaps


OLIVER: MassGIS's Online Mapping Tool
OLIVER Updates
Search for a location
Zoom to a town
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NHESP Certified Vernal Pools
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LANCASTER
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Little Spectacle Pond
White Pond
Lancaster State Forest
Chapman-Goodale Cons Land
Cook Conservation Area
Johnny Appleseed State Park
Oak Hill Pond
Lunenburg Road
Old Union Turnpike
Route 2
Interstate 190
Spectacle Brook
McGovern Brook
White Pond Brook
Foil Brook
Pondapin Brook
PH 1598
200 m
1000 ft
Scale = 1:18,056
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MassGIS Topographic Features Basemap
Basemaps


OLIVER: MassGIS's Online Mapping Tool
OLIVER Updates
Search for a location
Zoom to a town
Available Data Layers
DEP Wetlands
DEP Wetlands Linear Features
DEP Wetlands Labels
DEP Wetlands Detailed
DEP Wetlands Detailed With Outlines
DEP Wetlands General Categories
DEP Wetlands Outlines Only
DEP Wetlands Hydrologic Connections
DEP 2005 Human Altered Areas
DEP Wetlands Change
DEP Wetlands Original Linear Features
DEP Wetlands Original Labels
National Wetlands Inventory Streams and We
Active Data Layers
Check all
Uncheck all
Remove all
DEP 2005 Human Altered Areas
DEP Wetlands Outlines Only
DEP Wetlands Linear Features
Tax Parcels for Query
Detailed Features
Tax Parcels for Display
Structures
Legend
DEP 2005 Human Altered Areas
DEP Wetlands Outlines Only
DEP Wetlands Linear Features
SHORELINE
HYDROLOGIC CONNECTION
MEAN WATER LINE
APPARENT WETLAND LIMIT
CLOSURE LINE
EDGE OF INTERPRETED AREA
Tax Parcels for Query
LANCASTER
Interstate 190
Lunenburg Road
Route 2
Old Union Turnpike
Spectacle Pond
Little Spectacle Pond
Oak Hill Pond
White Pond
Lancaster State Forest
Chapman-Goodale Cons Land
Cook Conservation Area
Johnny Appleseed Scenic Park
200 m
1000 ft
Scale = 1:18,056
182,732.61m 916,175.37m
MassGIS Topographic Features Basemap
Basemaps


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Search for a location
Zoom to a town
Available Data Layers
Outstanding Resource Waters
Active Data Layers
Check all | Uncheck all
Remove all
Legend
IWPAs
Zone C
Zone B
Zone A
Labels
AUL Sites
Public Water Supplies
Communtiy Groundwater Well
Non-Communtiy Groundwater Well
Surface Water Intake
Emergency Surface Water Intake
Community Labels
Non-Community Labels
Outstanding Resource Waters Outlines
PUBLIC WATER SUPPLY CONTRIBUTOR
ORW FOR ACEC
ORW FOR BOTH WATER SUPPLY AND OTHER
Outstanding Resource Waters
PUBLIC WATER SUPPLY CONTRIBUTOR
ORW FOR ACEC
ORW FOR BOTH WATER SUPPLY AND OTHER
Tax Parcels for Query
LANCASTER
Route 2
Old Union Turnpike
Lunenburg Road
Interstate 190
Spectacle Pond
Little Spectacle Pond
Oak Hill Pond
White Pond
White Pond Brook
McGovern Brook
Spectacle Brook
Fall Brook
Johnny Appleseed State Park
Lancaster State Forest
Chapman-Goodale Cons Land
Gook Conservation Area
Ponakin Brook
Beach Avenue
Fire Road Ten
Fire Road Eight
Stagecoach Road
Holden Lane
Prospect Street
LEOMINSTER
LANCASTER
200 m
1000 ft
Scale = 1:18,056
184,702.51m 916,822.77m
MassGIS Topographic Features Basemap
0 m
Basemaps

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Massachusetts State Plane Mainland Zone (FIPS zone 2001). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

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The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

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If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% Annual Chance Floodplain Boundary
	0.2% Annual Chance Floodplain Boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
	Culvert
	Bridge
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
4989000 M	1000-meter ticks: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection
4980 000m N	1000-meter Universal Transverse Mercator grid values, zone 19N
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
July 4, 2011

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

PANEL 0289E

FIRM

FLOOD INSURANCE RATE MAP

WORCESTER COUNTY, MASSACHUSETTS (ALL JURISDICTIONS)

PANEL 289 OF 1075

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LANCASTER, TOWN OF	250312	0289	E
LEOMINSTER, CITY OF	250314	0289	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25027C0289E

EFFECTIVE DATE
JULY 4, 2011

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Massachusetts State Plane Mainland Zone (FIPS zone 2001). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from digital orthophotography. Base map files were provided in digital format by Massachusetts Geographic Information Systems (MassGIS). Ortho imagery was produced at a scale of 1:5,000. Aerial photography is dated April 2005.

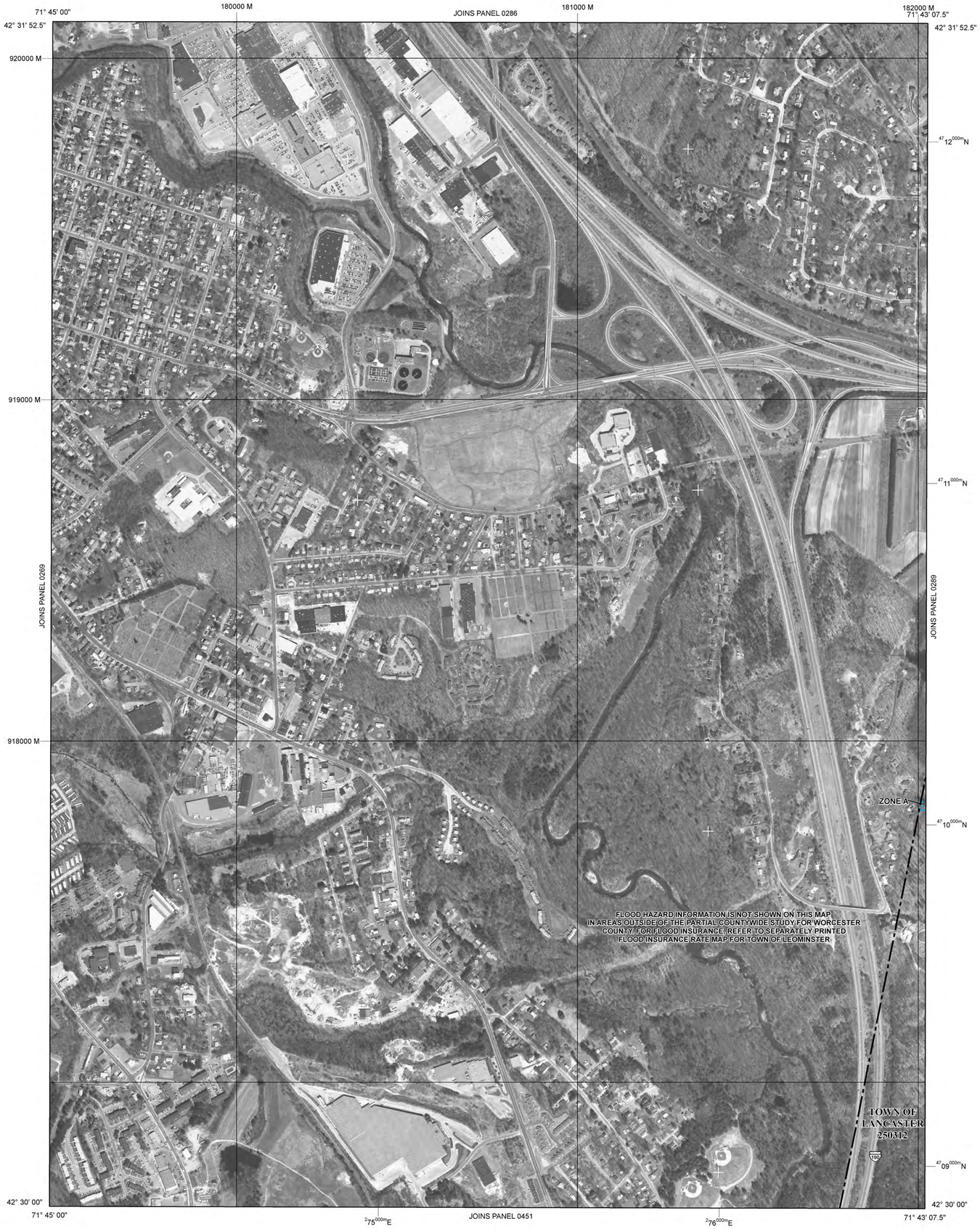
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LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4989000 M — 1000-meter ticks: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection
- 4880 000mN — 1000-meter Universal Transverse Mercator grid values, zone 19N
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
July 4, 2011

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0288E

FIRM

FLOOD INSURANCE RATE MAP

WORCESTER COUNTY, MASSACHUSETTS
(ALL JURISDICTIONS)

PANEL 288 OF 1075
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LANCASTER, TOWN OF	250312	0288	E
LEOMINSTER, CITY OF	250314	0288	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25027C0288E
EFFECTIVE DATE
JULY 4, 2011

Federal Emergency Management Agency

NOTES TO USERS

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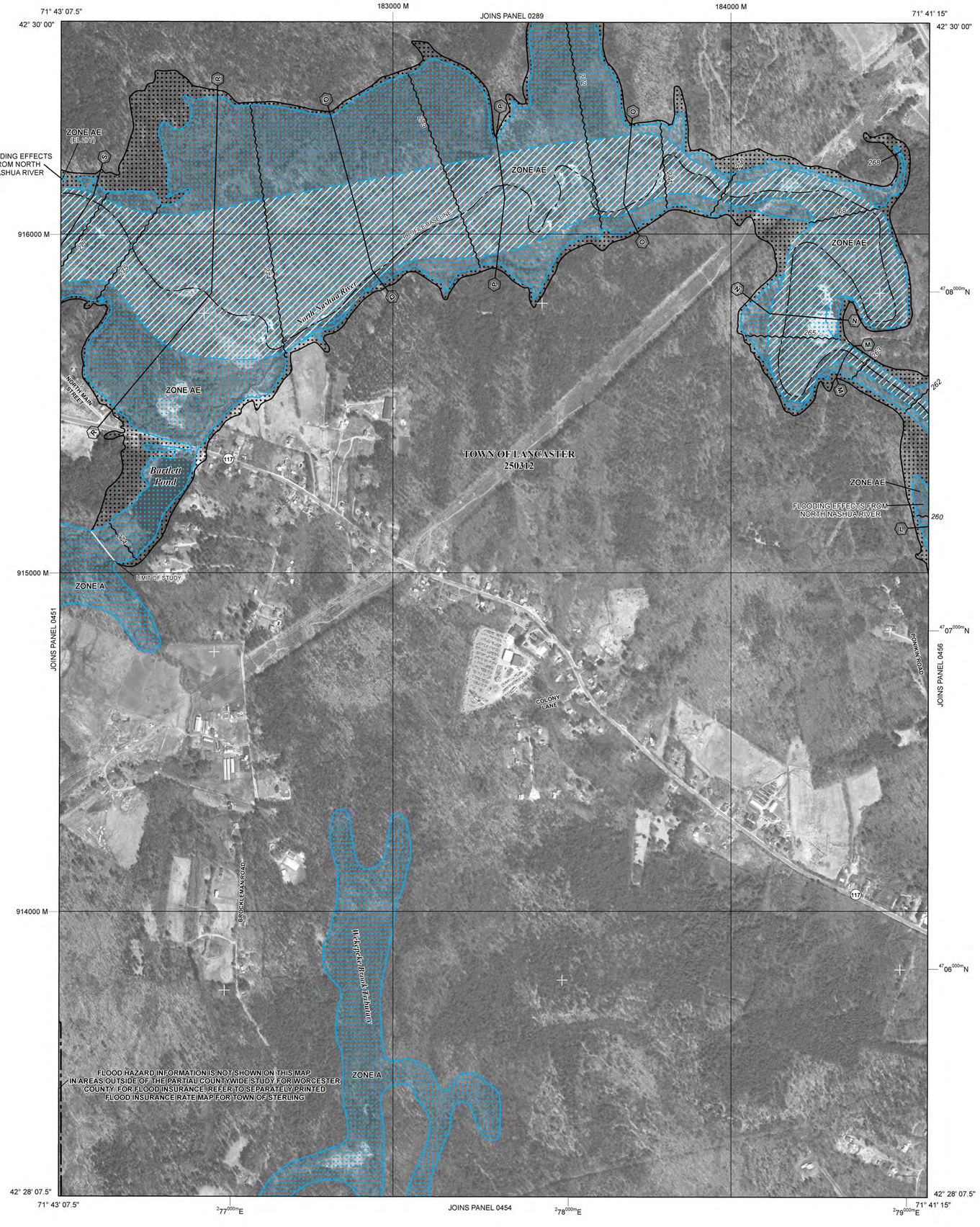
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LEGEND

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ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

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OTHERWISE PROTECTED AREAS (OPAs)

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- Floodway boundary
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- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
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- Culvert
- Bridge
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- 4980000mN — 1000-meter Universal Transverse Mercator grid values, zone 19N
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
July 4, 2011

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0452E

FIRM

FLOOD INSURANCE RATE MAP

WORCESTER COUNTY, MASSACHUSETTS (ALL JURISDICTIONS)

PANEL 452 OF 1075
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

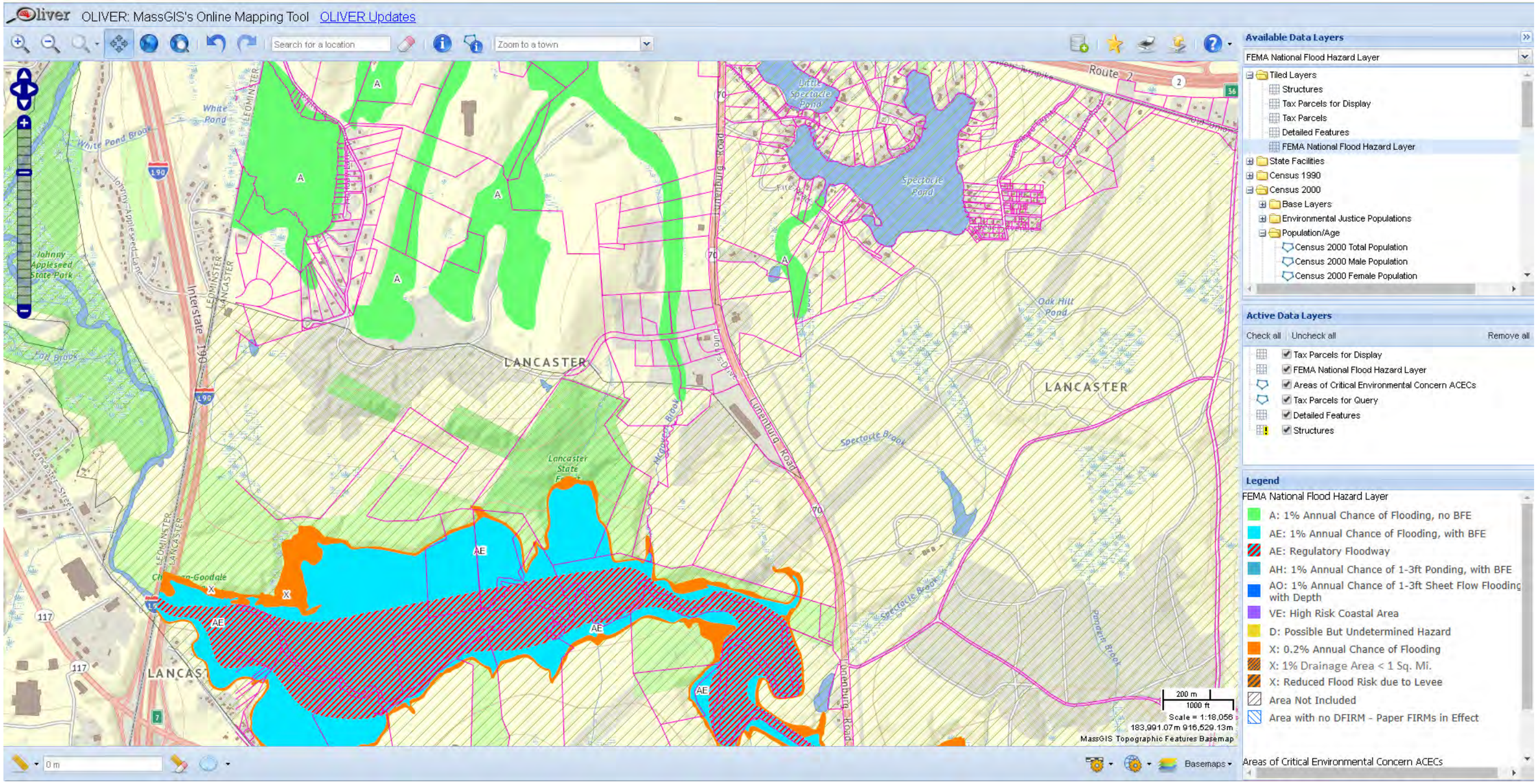
COMMUNITY	NUMBER	PANEL	SUFFIX
LANCASTER, TOWN OF	250312	0452	E
STERLING, TOWN OF	250336	0452	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25027C0452E

EFFECTIVE DATE
JULY 4, 2011

Federal Emergency Management Agency


OLIVER: MassGIS's Online Mapping Tool
OLIVER Updates
Search for a location
Zoom to a town
Available Data Layers
FEMA National Flood Hazard Layer
Tiled Layers
Structures
Tax Parcels for Display
Tax Parcels
Detailed Features
FEMA National Flood Hazard Layer
State Facilities
Census 1990
Census 2000
Base Layers
Environmental Justice Populations
Population/Age
Census 2000 Total Population
Census 2000 Male Population
Census 2000 Female Population
Active Data Layers
Check all
Uncheck all
Remove all
Tax Parcels for Display
FEMA National Flood Hazard Layer
Areas of Critical Environmental Concern ACECs
Tax Parcels for Query
Detailed Features
Structures
Legend
FEMA National Flood Hazard Layer
A: 1% Annual Chance of Flooding, no BFE
AE: 1% Annual Chance of Flooding, with BFE
AE: Regulatory Floodway
AH: 1% Annual Chance of 1-3ft Ponding, with BFE
AO: 1% Annual Chance of 1-3ft Sheet Flow Flooding with Depth
VE: High Risk Coastal Area
D: Possible But Undetermined Hazard
X: 0.2% Annual Chance of Flooding
X: 1% Drainage Area < 1 Sq. Mi.
X: Reduced Flood Risk due to Levee
Area Not Included
Area with no DFIRM - Paper FIRMs in Effect
Areas of Critical Environmental Concern ACECs
LANCASTER
Route 2
Spectacle Pond
Little Spectacle Pond
Oak Hill Pond
White Pond
White Pond Brook
Johnny Appleseed State Park
Interstate 190
Lunenburg Road
Spectacle Brook
Scale = 1:18,056
183,991.07m 916,529.13m
MassGIS Topographic Features Basemap
Basemaps

Hydrologic Soil Group—Worcester County, Massachusetts, Northeastern Part
(W181228 Lancaster)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 13, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		1.5	0.2%
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	A/D	54.8	6.3%
31A	Walpole sandy loam, 0 to 3 percent slopes	B/D	7.0	0.8%
52A	Freetown muck, 0 to 1 percent slopes	B/D	47.4	5.5%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	D	11.7	1.3%
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	B	16.4	1.9%
245A	Hinckley loamy sand, 0 to 3 percent slopes	A	91.1	10.5%
245B	Hinckley loamy sand, 3 to 8 percent slopes	A	109.8	12.6%
245C	Hinckley loamy sand, 8 to 15 percent slopes	A	21.7	2.5%
245D	Hinckley loamy sand, 15 to 25 percent slopes	A	17.1	2.0%
245E	Hinckley loamy sand, 25 to 35 percent slopes	A	80.2	9.2%
249A	Deerfield loamy fine sand, 0 to 3 percent slopes	A	3.5	0.4%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	A	13.8	1.6%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	26.1	3.0%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	A	5.7	0.7%
254D	Merrimac fine sandy loam, 15 to 25 percent slopes	A	4.3	0.5%
255A	Windsor loamy sand, 0 to 3 percent slopes	A	58.1	6.7%
255B	Windsor loamy sand, 3 to 8 percent slopes	A	34.9	4.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
255C	Windsor loamy sand, 8 to 15 percent slopes	A	19.7	2.3%
255D	Windsor loamy sand, 15 to 25 percent slopes	A	5.6	0.6%
260A	Sudbury fine sandy loam, 0 to 3 percent slopes	B	28.3	3.3%
262A	Quonset loamy sand, 0 to 3 percent slopes	A	14.9	1.7%
262B	Quonset loamy sand, 3 to 8 percent slopes	A	5.4	0.6%
276A	Ninigret fine sandy loam, 0 to 3 percent slopes	C	0.3	0.0%
306D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	C	10.9	1.3%
307E	Paxton fine sandy loam, 25 to 35 percent slopes, extremely stony	C	40.7	4.7%
311B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	C/D	8.3	1.0%
311C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	C/D	11.9	1.4%
323B	Poquonock loamy sand, 3 to 8 percent slopes, very stony	A	41.2	4.7%
600	Pits, gravel		68.8	7.9%
651	Udorthents, smoothed		7.3	0.8%
Totals for Area of Interest			**868.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

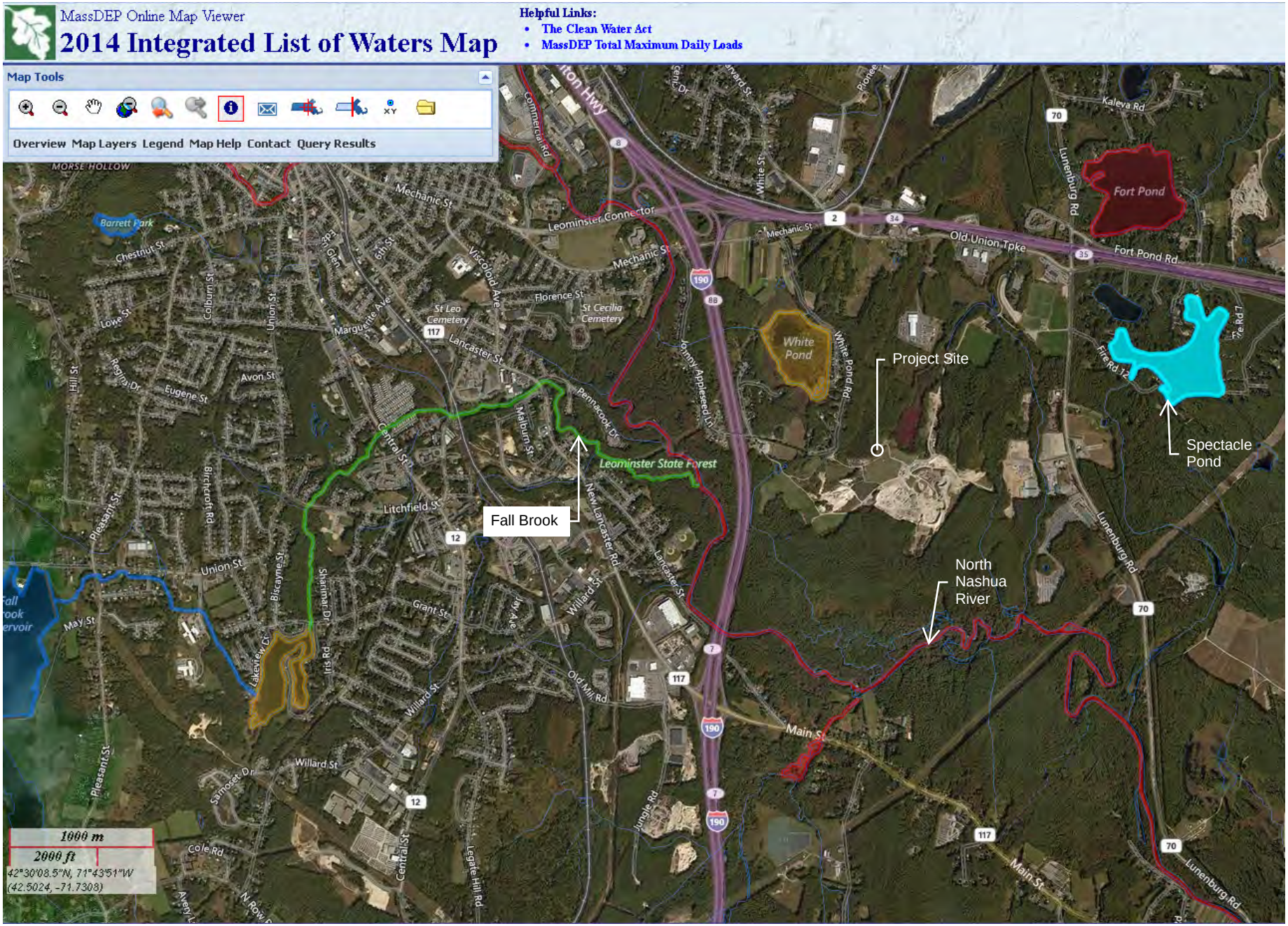
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher


MassDEP Online Map Viewer
2014 Integrated List of Waters Map
Helpful Links:
The Clean Water Act
MassDEP Total Maximum Daily Loads
Map Tools
Overview Map Layers Legend Map Help Contact Query Results
Project Site
Spectacle Pond
Fall Brook
North Nashua River
Fort Pond
White Pond
Leominster State Forest
Leominster Connector
Mechanic St
Old Union Tpke
Fort Pond Rd
Lunenburg Rd
Lancaster St
Litchfield St
Willard St
Main St
Union St
Central St
Pennecook Dr
Florence St
Barrett Park
St Leo Cemetery
St Cecilia Cemetery
1000 m
2000 ft
42°30'08.5"N, 71°43'51"W
(42.5024, -71.7308)

Massachusetts Stressed Basins

LOCUS

Map Legend

- Major Basin Divides
- Major Streams
- Major Ponds
- Municipal Boundaries
- State Boundary
- Coastline

Deval Patrick
Governor
Ian Bowles
Secretary of Energy and Environmental Affairs

MASS GIS
Office of Geographic and Environmental Information

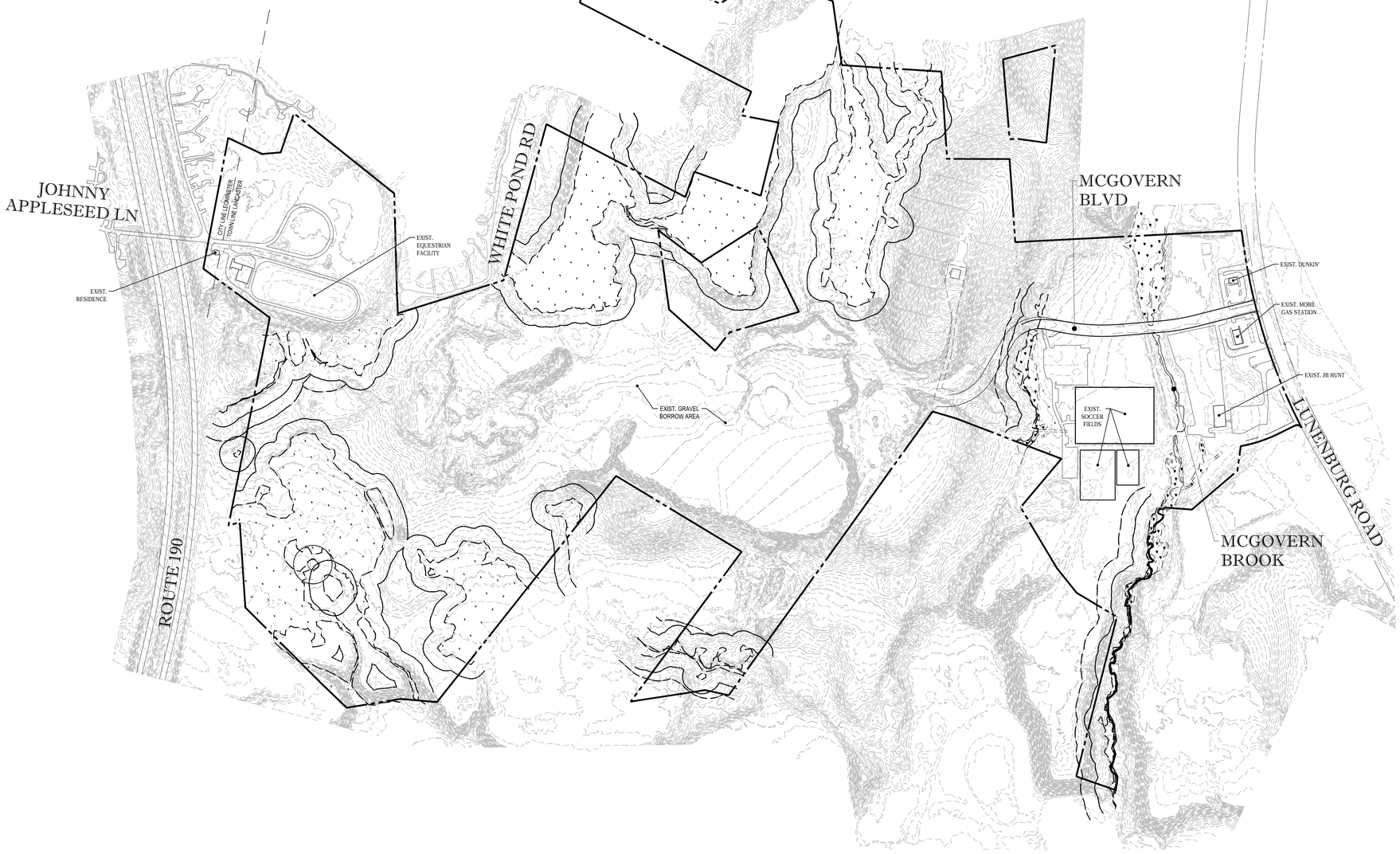
Stressed Flow Basins

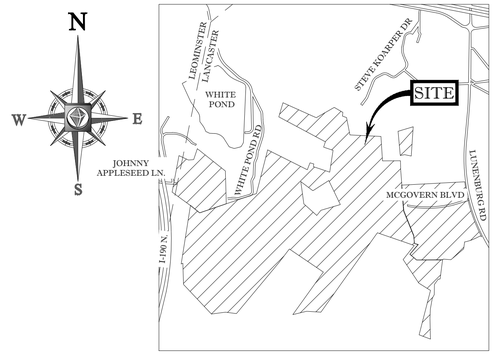
- HIGH
- MEDIUM
- LOW

Based on 2001 WRC Stressed Basin Report with updated data

APPENDIX B: EXISTING AND PROPOSED CONDITIONS PLANS

- Existing Conditions Plan (Prepared by Bohler Engineering, dated 5/15/19)
- Existing Conditions Plan – Aerial (Prepared by Bohler Engineering, dated 5/15/19)
- Preferred Master Plan (Prepared by Bohler Engineering, dated 10/22/19)
- Conceptual Utility Plan (Prepared by Bohler Engineering, dated 11/15/19)
- Conceptual Heat Map Exhibit (Prepared by Bohler Engineering, dated 11/15/19)





LOCUS MAP
(NOT TO SCALE)

400 200 100 0 400
1"= 400'

P:\18W\181228\Permitting\Application_Submissions\MEPA\03-ENF\CAD Files\W181228-ENF.dwg, Ex. Conditions, 10/6/2014, 4:28:00 PM, cdeacon, \\MADRAWING3\Sh-Copy-Blk, ---, 1:1

BOHLER ENGINEERING

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING LANDSCAPE ARCHITECTURE
TRANSPORTATION PLANNING PROGRAM MANAGEMENT TRAFFIC ENGINEERING

- UPSTATE NEW YORK
- NEW ENGLAND
- BOSTON, MA
- ROCHESTER, NY
- NEW YORK METRO
- NORTHERN NEW JERSEY
- SOUTHERN NEW JERSEY
- PHILADELPHIA, PA
- PITTSBURGH, PA
- HARRISBURG, PA
- SOUTHEASTERN, PA
- REHOBOTH BEACH, DE
- BALTIMORE, MD
- SOUTHERN MARYLAND
- NORTHERN VIRGINIA
- RICHMOND, VIRGINIA
- RALEIGH, NC
- WASHINGTON, DC
- CHARLOTTE, NC
- ATLANTA, GA
- TAMPA, FL
- ORLANDO, FLORIDA
- DALLAS, TX

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REVISIONS

REV	DATE	COMMENT	BY
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15			

PRELIMINARY

PROJECT No.:	W181228
DRAWN BY:	CMC
CHECKED BY:	MJD/JAK
DATE:	05/15/19
SCALE:	AS NOTED
CAD I.D.:	W181228-ENF

PROJECT:
SITE DEVELOPMENT PLANS
FOR

CAPITAL GROUP PROPERTIES

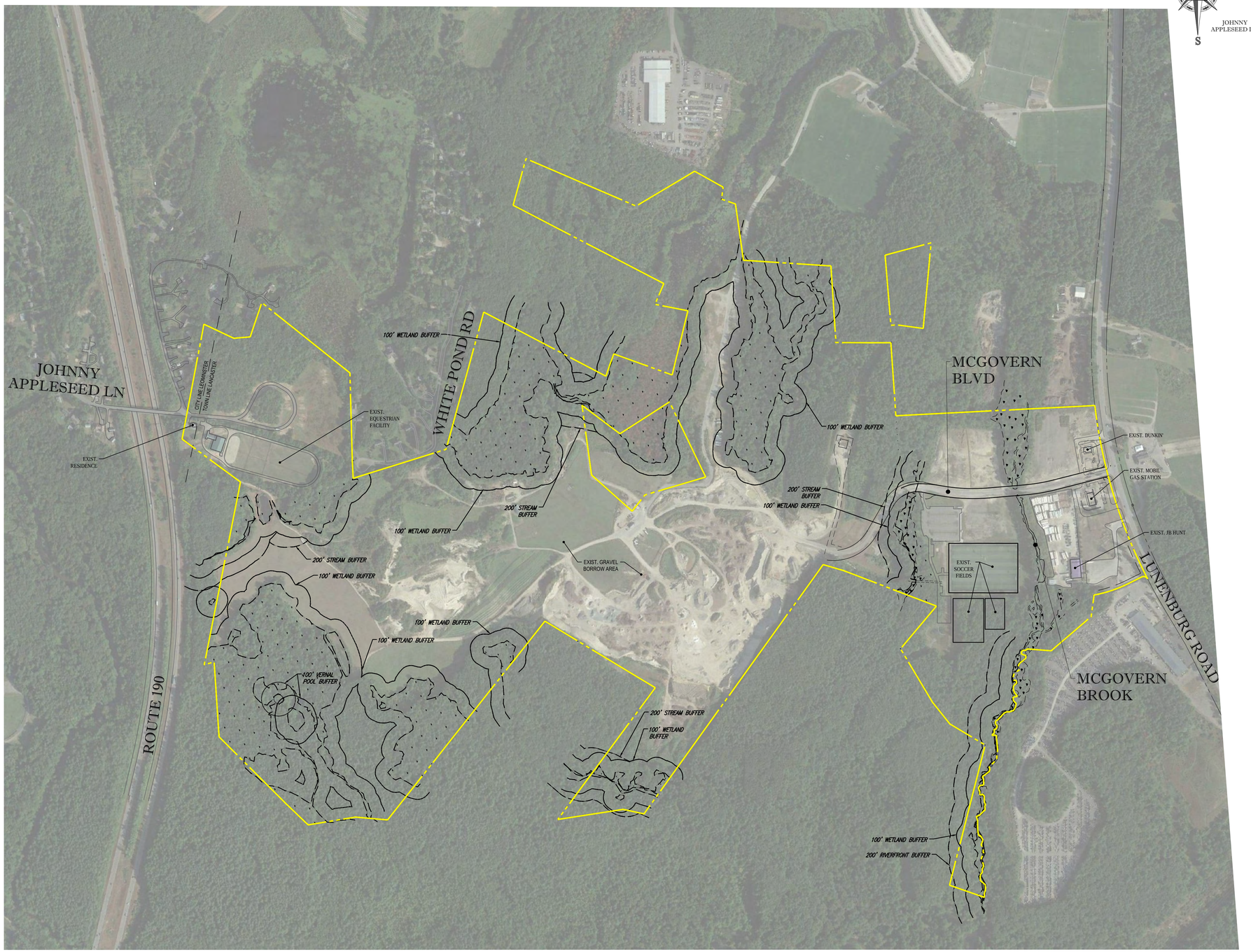
LOCATION OF SITE
MCGOVERN BOULEVARD
TOWN OF LANCASTER
WORCESTER COUNTY,
MASSACHUSETTS

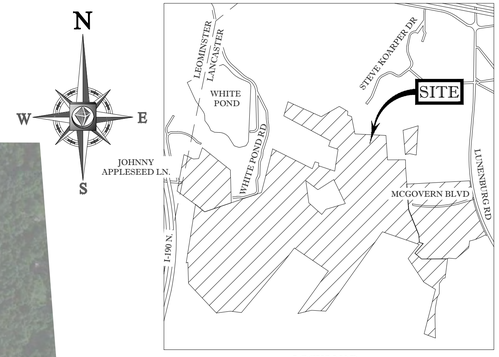
BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
Phone: (508) 480-9900
Fax: (508) 480-9080
www.BohlerEngineering.com

SHEET TITLE:
EXISTING CONDITIONS PLAN

SHEET NUMBER:
1
OF 2

EX 0 - 05/15/2019





LOCUS MAP
(NOT TO SCALE)

400 200 100 0 400
1"= 400'

BOHLER ENGINEERING
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING LANDSCAPE ARCHITECTURE
TRANSPORTATION PLANNING PROGRAM MANAGEMENT PERMITTING SERVICES
◆ UPSTATE NEW YORK ◆ SOUTHERN NEW JERSEY ◆ BALTIMORE, MD ◆ CHARLOTTE, NC
◆ NEW ENGLAND ◆ PHILADELPHIA, PA ◆ SOUTHERN MARYLAND ◆ ATLANTA, GA
◆ BOSTON, MA ◆ PITTSBURGH, PA ◆ NORTHERN VIRGINIA ◆ TAMPA, FL
◆ RHODE ISLAND ◆ HARRISBURG, PA ◆ RICHMOND, VIRGINIA ◆ ORLANDO, FLORIDA
◆ NEW YORK METRO ◆ SOUTHEASTERN, PA ◆ RALEIGH, NC ◆ DALLAS, TX
◆ NORTHERN NEW JERSEY ◆ REHOBOTH BEACH, DE ◆ WASHINGTON, DC
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REVISIONS

REV	DATE	COMMENT	BY
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3			
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12			
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15			

PRELIMINARY

PROJECT No.:	W181228
DRAWN BY:	CMC
CHECKED BY:	MJD/JAK
DATE:	05/15/19
SCALE:	AS NOTED
CAD I.D.:	W181228-ENF

PROJECT:
SITE DEVELOPMENT PLANS
FOR

CAPITAL GROUP PROPERTIES

LOCATION OF SITE
MCGOVERN BOULEVARD
TOWN OF LANCASTER
WORCESTER COUNTY,
MASSACHUSETTS

BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
Phone: (508) 480-9900
Fax: (508) 480-9080
www.BohlerEngineering.com

SHEET TITLE:
EXISTING CONDITIONS AERIAL PLAN

SHEET NUMBER:
2
OF 2

EX 0 - 05/15/2019

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DEVELOPMENT SUMMARY

LAND USE	BUILDING / STRUCTURE	DESCRIPTION	RESIDENTIAL UNITS	FLOORPLATE (SQ. FT.)	STORIES	NON-RESIDENTIAL G.S.F.	RESIDENTIAL G.S.F.	SURFACE PARKING	TRAILER PARKING	LOADING DOCKS
INDUSTRIAL	A	INDUSTRIAL BUILDING		1,020,000	1	1,020,000		587	316	214
	B	INDUSTRIAL BUILDING		150,000	1	150,000		116		32
	C	INDUSTRIAL BUILDING		42,000	1	42,000		62		5
	D	INDUSTRIAL BUILDING		145,600	1	145,600		84		13
	E	INDUSTRIAL BUILDING		100,000	1	100,000		56		25
	F	INDUSTRIAL BUILDING		70,800	1	70,800		84		26
	G	INDUSTRIAL BUILDING		37,500	1	37,500		68		14
	H	INDUSTRIAL BUILDING		37,500	1	37,500		38		15
	J	AUTO SALES 7 SERVICE FACILITY		14,400	1	14,400		72		0
	K	INDUSTRIAL BUILDING		30,000	1	30,000		32		11
RESIDENTIAL	I	SINGLE FAMILY, DUPLEX & TRIPLEX UNITS	117	272,000	2		544,000			
	L	MULTI-FAMILY APARMTNETS	140	44,650	4		178,600	260		
	M	MULTI-FAMILY APARMTNETS	160	50,000	4		200,000	270		
	N	MULTI-FAMILY APARMTNETS	200	64,400	4		257,600	210		
120 ROOM HOTEL	O			16,000	4	64,000		120		
RECREATION	P	EXISTING SOCCER FIELDS		5,000	1	5,000		276		
	Q	INDOOR SPORTS FACILITY		86,400	1	86,500		216		
RETAIL	R	PROPOSED RETAIL		73,000	1	73,000		477		
TOTAL			617	2,259,250		1,876,300	1,180,200	3,028	316	355



CAPITAL COMMERCE CENTER

LANCASTER, MA

PREFERRED MASTER PLAN

SCALE: 1" = 250'
DATE: 10/22/2019
PROJECT #: W181016

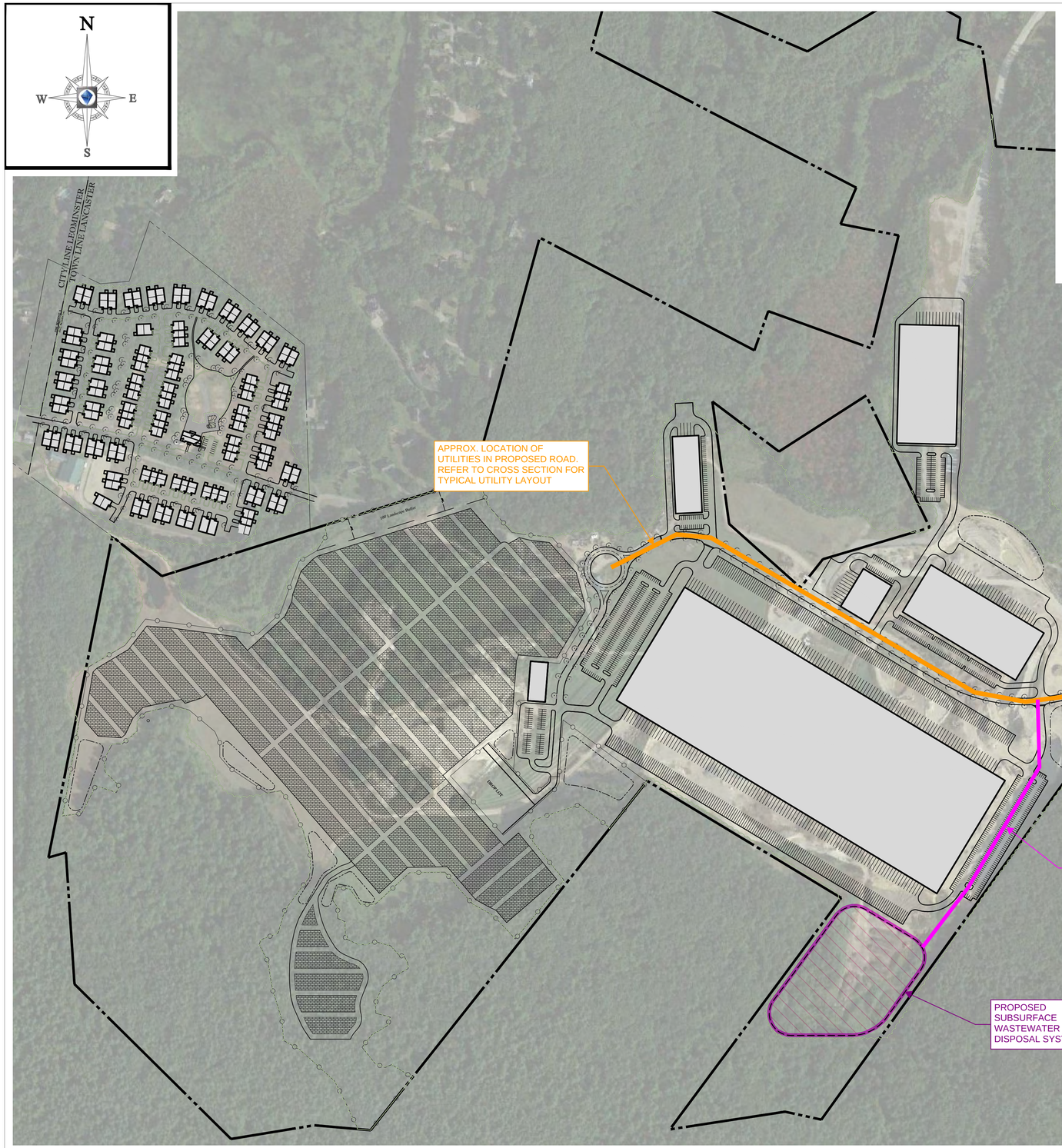
CAPITAL GROUP PROPERTIES

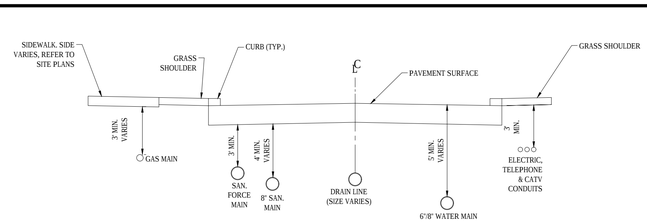
BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

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NOTE: CROSS SECTION TO SHOW RELATIVE LOCATIONS OF UTILITIES AND IS NOT INTENDED TO REPRESENT FINAL DESIGN OF ROADWAY CROSS SECTION

TYPICAL UTILITY LAYOUT WITHIN PROPOSED ROADWAY

N.T.S.

CAPITAL GROUP PROPERTIES

CAPITAL COMMERCE CENTER

LANCASTER, MA

CONCEPTUAL UTILITY PLAN

SCALE: 1" = 250'
DATE: 11/15/2019
PROJECT #: W181228

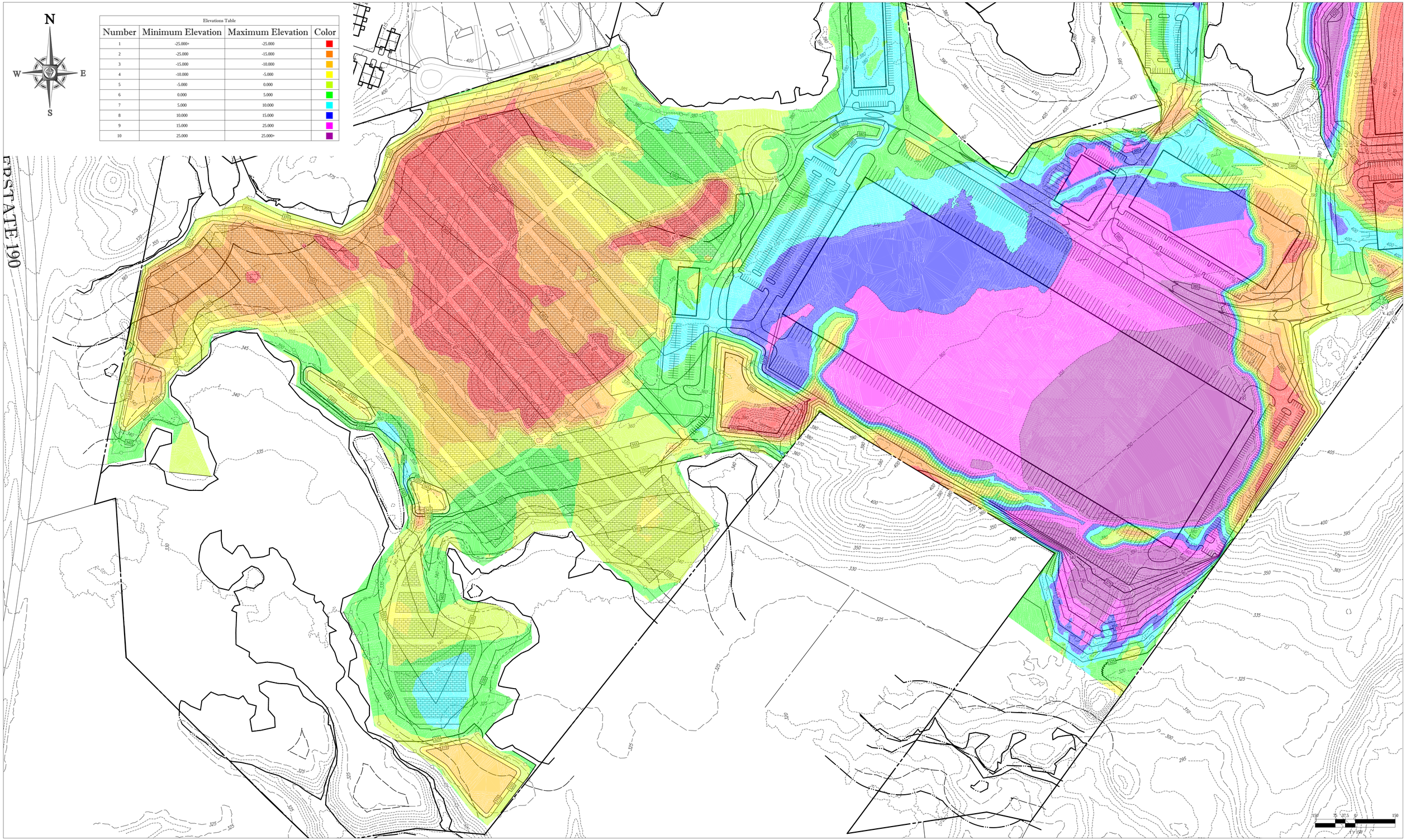
BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

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Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-25.000+	-25.000	
2	-25.000	-15.000	
3	-15.000	-10.000	
4	-10.000	-5.000	
5	-5.000	0.000	
6	0.000	5.000	
7	5.000	10.000	
8	10.000	15.000	
9	15.000	25.000	
10	25.000	25.000+	



CAPITAL GROUP PROPERTIES

CAPITAL COMMERCE CENTER

LANCASTER, MA

CONCEPTUAL HEAT MAP EXHIBIT (1 OF 3)

SCALE: 1" = 150'
DATE: 11/15/2019
PROJECT #: W181228

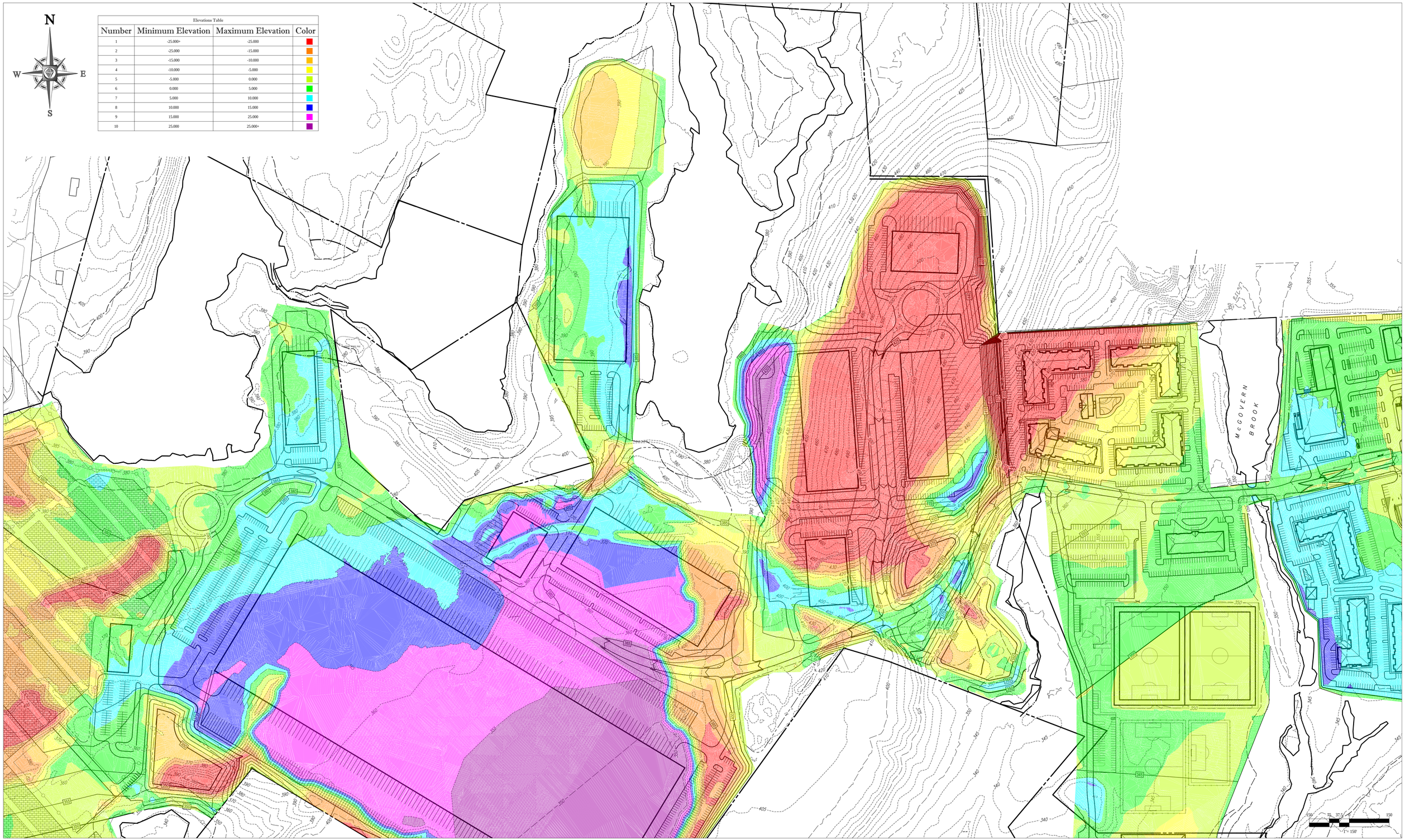
BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

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Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-25.000+	-25.000	
2	-25.000	-15.000	
3	-15.000	-10.000	
4	-10.000	-5.000	
5	-5.000	0.000	
6	0.000	5.000	
7	5.000	10.000	
8	10.000	15.000	
9	15.000	25.000	
10	25.000	25.000+	



CAPITAL GROUP PROPERTIES

CAPITAL COMMERCE CENTER

LANCASTER, MA

CONCEPTUAL HEAT MAP EXHIBIT (2 OF 3)

SCALE: 1" = 150'
DATE: 11/15/2019
PROJECT #: W181228

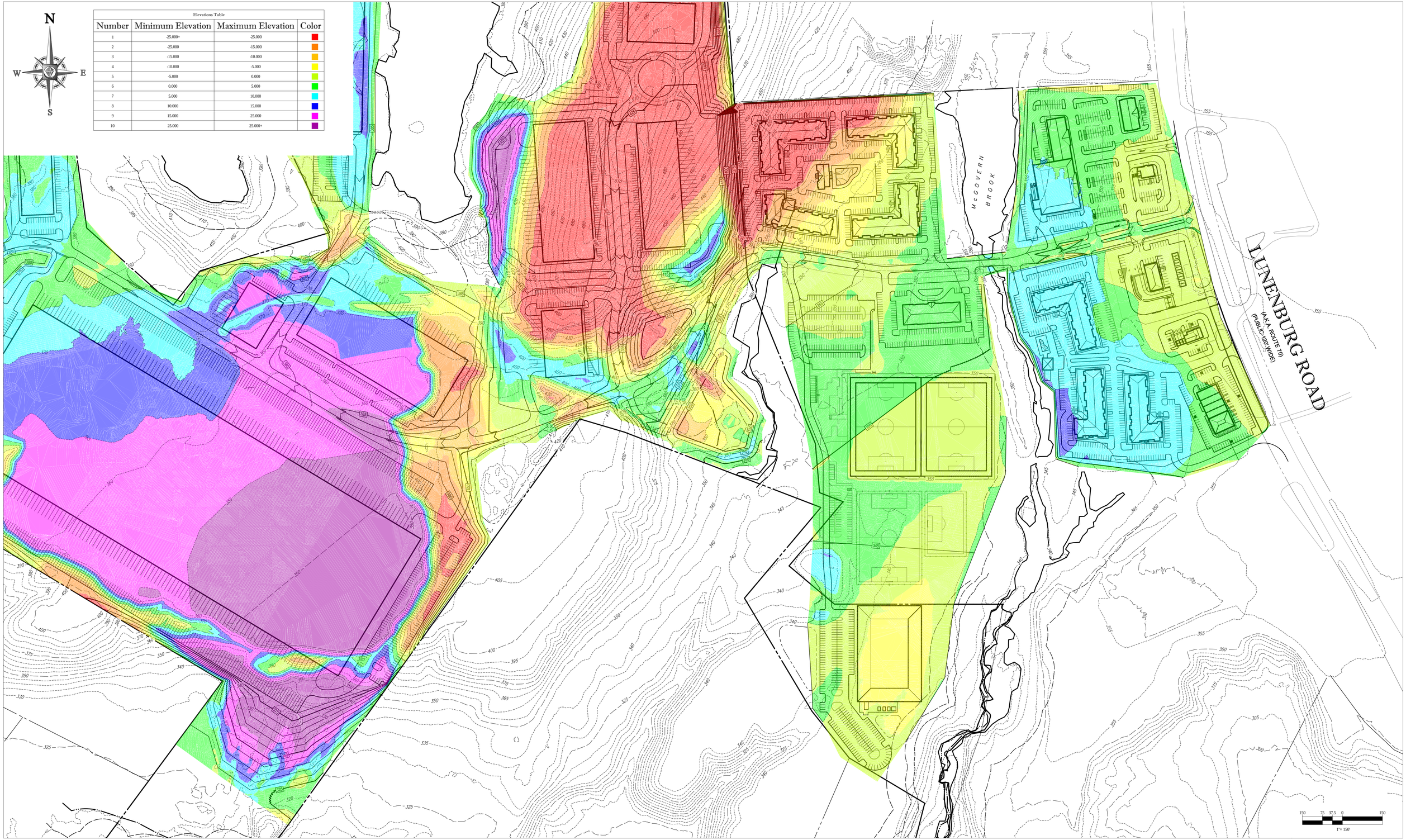
BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

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Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-25.000+	-25.000	
2	-25.000	-15.000	
3	-15.000	-10.000	
4	-10.000	-5.000	
5	-5.000	0.000	
6	0.000	5.000	
7	5.000	10.000	
8	10.000	15.000	
9	15.000	25.000	
10	25.000	25.000+	



CAPITAL GROUP PROPERTIES

CAPITAL COMMERCE CENTER

LANCASTER, MA

CONCEPTUAL HEAT MAP EXHIBIT (3 OF 3)

SCALE: 1" = 150'
DATE: 11/15/2019
PROJECT #: W181228

BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

APPENDIX C: ALTERNATIVE PLANS

- Alternative Master Plan A (Prepared by Bohler Engineering, dated 10/22/19)
- Alternative Master Plan C (Prepared by Bohler Engineering, dated 10/22/19)
- Preferred Master Plan (Prepared by Bohler Engineering, dated 10/22/19)
- Reduced Impact Alternative (Prepared by Bohler Engineering, dated 10/22/19)

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DEVELOPMENT SUMMARY

LAND USE	BUILDING / STRUCTURE	DESCRIPTION	RESIDENTIAL UNITS	FLOORPLATE (SQ. FT.)	STORIES	NON-RESIDENTIAL G.S.F.	RESIDENTIAL G.S.F.	SURFACE PARKING	TRAILER PARKING	LOADING DOCKS
INDUSTRIAL	A	INDUSTRIAL BUILDING		1,020,000	1	1,020,000		587	316	214
	B	INDUSTRIAL BUILDING		150,000	1	150,000		116		32
	C	INDUSTRIAL BUILDING		42,000	1	42,000		62		5
	D	INDUSTRIAL BUILDING		145,600	1	145,600		84		13
	E	INDUSTRIAL BUILDING		100,000	1	100,000		56		25
	F	INDUSTRIAL BUILDING		70,800	1	70,800		84		26
	G	INDUSTRIAL BUILDING		37,500	1	37,500		68		14
	H	INDUSTRIAL BUILDING		37,500	1	37,500		38		15
	J	AUTO SALES 7 SERVICE FACILITY		14,400	1	14,400		72		0
	K	INDUSTRIAL BUILDING		30,000	1	30,000		32		11
RESIDENTIAL	I	SINGLE FAMILY, DUPLEX & TRIPLEX UNITS	117	272,000	2		544,000			
	L	MULTI-FAMILY APARMTNETS	140	44,650	4		178,600	260		
	M	MULTI-FAMILY APARMTNETS	160	50,000	4		200,000	270		
	N	MULTI-FAMILY APARMTNETS	200	64,400	4		257,600	210		
120 ROOM HOTEL	O			16,000	4	64,000		120		
RECREATION	P	EXISTING SOCCER FIELDS		5,000	1	5,000		276		
	Q	INDOOR SPORTS FACILITY		86,400	1	86,500		216		
RETAIL	R	PROPOSED RETAIL		73,000	1	73,000		477		
TOTAL			617	2,259,250		1,876,300	1,180,200	3,028	316	355



CAPITAL COMMERCE CENTER

LANCASTER, MA

PREFERRED MASTER PLAN

SCALE: 1" = 250'
DATE: 10/22/2019
PROJECT #: W181016

CAPITAL GROUP PROPERTIES

BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

DEVELOPMENT SUMMARY

LAND USE	BUILDING / STRUCTURE	DESCRIPTION	RESIDENTIAL UNITS	FLOORPLATE (SQ. FT.)	STORIES	NON-RESIDENTIAL G.S.F.	RESIDENTIAL G.S.F.	SURFACE PARKING	TRAILER PARKING	LOADING DOCKS
INDUSTRIAL	A	INDUSTRIAL BUILDING		1,020,000	1	1,020,000		587	316	214
	B	INDUSTRIAL BUILDING		150,000	1	150,000		116		32
	C	INDUSTRIAL BUILDING		42,000	1	42,000		62		5
	D	INDUSTRIAL BUILDING		145,600	1	145,600		84		13
	E	INDUSTRIAL BUILDING		100,000	1	100,000		56		25
	F	INDUSTRIAL BUILDING		70,800	1	70,800		84		26
	G	INDUSTRIAL BUILDING		37,500	1	37,500		68		14
	H	INDUSTRIAL BUILDING		37,500	1	37,500		38		15
	J	AUTO SALES & SERVICE FACILITY		14,400	1	14,400		72		0
	K	INDUSTRIAL BUILDING		30,000	1	30,000		32		11
RESIDENTIAL	L	MULTI-FAMILY APARMTNETS	140	44,650	4		178,600	260		
	M	MULTI-FAMILY APARMTNETS	160	50,000	4		200,000	270		
	N	MULTI-FAMILY APARMTNETS	200	64,400	4		257,600	210		
120 ROOM HOTEL	O	HOTEL		16,000	4	64,000		120		
RECREATION	Q	INDOOR SPORTS FACILITY		86,400	1	86,500		212		
RETAIL	R	PROPOSED RETAIL		16,300	1	16,300		126		
TOTAL			500	1,925,550		1,814,600	636,200	2,397	316	355

TOTAL RESIDENTIAL G.S.F = 636,200

TOTAL RESIDENTIAL BASED ON PERCENTAGE OF G.S.F.= 25.96%



CAPITAL COMMERCE CENTER

LANCASTER, MA

REDUCED IMPACT ALTERNATIVE

SCALE: 1" = 250'
DATE: 10/22/2019
PROJECT #: W181016

CAPITAL GROUP PROPERTIES

BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

N

W E

S

DEVELOPMENT SUMMARY

LAND USE	BUILDING/ STRUCTURE	DESCRIPTION	RESIDENTIAL UNITS	FLOORPLATE (SQ. FT.)	STORIES	G.S.F.	SURFACE PARKING
RESIDENTIAL	I	SINGLE FAMILY, DUPLEX & TRIPLEX UNITS	117	272,000	2	544,000	0
	L	MULTI-FAMILY APARMTNETS	140	44,650	4	178,600	260
	M	MULTI-FAMILY APARMTNETS	160	50,000	4	200,000	270
	N	MULTI-FAMILY APARMTNETS	200	64,400	4	257,600	210
	S	ACTIVE ADULT	110	1,500	1	165,000	0
	T	VILLAGE	249	1,200-1,500	4	432,300	288
	U	SINGLE FAMILY	227	1,500	4	340,500	0
120 ROOM HOTEL	O			16,000	4	64,000	120
RECREATION	P	EXISTING SOCCER FIELDS		5,000	1	5,000	276
	Q	INDOOR SPORTS FACILITY		86,400	1	86,500	216
RETAIL	R	PROPOSED RETAIL		73,000	1	73,000	477
TOTAL			1203	614,450		2,346,500	2,117

JOHNNY APPLESEED LANE

INTERSTATE 190

WHITE POND ROAD

I

100' RIVERFRONT AREA

200' RIVERFRONT AREA

ACTIVE ADULT LAND BAY
86-138 DWELLING UNIT RANGE
(MIX OF CARRIAGE AND DETACHED PRODUCT)

POINT LINE LAND BAY
196-235 DWELLING UNIT RANGE
(ASSUMES 70' x 130' LOT)

VILLAGE LAND BAY
249-299 DWELLING UNIT RANGE
(PRODUCT MIX SIMILAR TO WESTBOROUGH VILLAGE)

VERNAL POOL

100' VERNAL POOL BUFFER

WWTF
+/- 3.5 Ac

L

M

R

O

P

EXISTING SOCCER FIELDS

N

Q

EXISTING INDOOR FACILITY

JEGOVER BLVD

LUNENBURG ROAD

(F.K.A. ROUTE 117)
PUBLIC (40' WIDE)

250 125 0 250

1"= 250'

CAPITAL COMMERCE CENTER

LANCASTER, MA

ALTERNATIVE MASTER PLAN A

SCALE: 1" = 250'
DATE: 10/22/2019
PROJECT #: W181016

CAPITAL GROUP PROPERTIES

BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

DEVELOPMENT SUMMARY

LAND USE	BUILDING/ STRUCTURE	DESCRIPTION	RESIDENTIAL UNITS	FLOORPLATE (SQ. FT.)	STORIES	NON-RESIDENTIAL G.S.F.	RESIDENTIAL G.S.F.	SURFACE PARKING	TRAILER PARKING	LOADING DOCKS
INDUSTRIAL	A			1,020,000	1	1,020,000		587	316	214
	B			150,000	1	150,000		116		32
	C			42,000	1	42,000		62		5
	D			145,600	1	145,600		84		13
	E			100,000	1	100,000		56		25
	F			70,800	1	70,800		84		26
	G			37,500	1	37,500		68		14
	H			37,500	1	37,500		38		15
	K			30,000	1	30,000		32		11
	S			720,000	1	720,000		454	212	144
	T			150,000	1	150,000		332		32
RESIDENTIAL	I	SINGLE FAMILY, DUPLEX & TRIPLEX UNITS	117	272,000	2		544,000			
	L	MULTI-FAMILY APARMTNETS	140	44,650	4		178,600	260		
	M	MULTI-FAMILY APARMTNETS	160	50,000	4		200,000	270		
	N	MULTI-FAMILY APARMTNETS	200	64,400	4		257,600	210		
120 ROOM HOTEL	O			16,000	4	64,000		120		
RECREATION	P	EXISTING SOCCER FIELDS		5,000	1	5,000		276		
	Q	INDOOR SPORTS FACILITY		86,400	1	86,500		216		
RETAIL	R	PROPOSED RETAIL		73,000	1	73,000		477		
TOTAL			617	3,114,850		2,731,900	1,180,200	3,742	528	531



CAPITAL COMMERCE CENTER

LANCASTER, MA

ALTERNATIVE MASTER PLAN C

SCALE: 1" = 250'
DATE: 10/22/2019
PROJECT #: W181016

CAPITAL GROUP PROPERTIES

BOHLER ENGINEERING
352 TURNPIKE ROAD
SOUTHBOROUGH, MA
Phone: (508) 480-9900

APPENDIX D: WETLAND RESOURCE EVALUATION

- Wetland Resource Evaluation, McGovern Boulevard, Lancaster, MA (Prepared by EcoTec, Inc., dated 9/6/19)

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES
102 Grove Street
Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

September 6, 2018

Daniel Ruiz
Capital Group Properties
259 Turnpike Road, Suite 100
Southborough, MA 01772

RE: Wetland Resource Evaluation, McGovern Boulevard, Lancaster, MA

Dear Danny:

Between April 1 and May 2, 2018, EcoTec, Inc. inspected the above-referenced property for the presence of wetland resources as defined by: (1) the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40; the "Act") and its implementing regulations (310 CMR 10.00 *et seq.*; the "Regulations"); and (2) the U.S. Clean Water Act (i.e., Section 404 and 401 wetlands). Paul McManus, PWS; Scott Morrison, PWS and Arthur Allen, CPSS, CWS conducted the inspections.

The subject site consists of a 347-acre parcel located between the west end of McGovern Boulevard and Route I-190. The upland portions of the site are a combination of active and reclaimed gravel mine and wooded areas. The wetland resources observed on the site are described below.

Methodology

The site was inspected, and areas suspected to qualify as wetland resources were identified. The boundary of Bordering Vegetated Wetlands or, in the absence of Bordering Vegetated Wetlands, Bank was delineated in the field in accordance with the definitions set forth in the regulations at 310 CMR 10.55(2)(c) and 310 CMR 10.54(2). Section 10.55(2)(c) states that "The boundary of Bordering Vegetated Wetlands is the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist." Section 10.54(2)(c) states that "The upper boundary of Bank is the first observable break in the slope or the mean annual flood level, whichever is lower." The methodology used to delineate Bordering Vegetated Wetlands is further described in: (1) the BVW Policy "*BVW: Bordering Vegetated Wetlands Delineation Criteria and Methodology*," issued March 1, 1995; and (2) "*Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act: A Handbook*," produced by the Massachusetts Department of Environmental Protection, dated March 1995. The plant taxonomy used in this report is based on the *National List of Plant Species that Occur in Wetlands: Massachusetts* (Fish and Wildlife Service, U.S. Department of the Interior, 1988). Federal wetlands were

presumed to have boundaries conterminous with the delineated Bordering Vegetated Wetlands and Bank. Four sets of DEP Bordering Vegetated Wetland Delineation Field Data Forms completed for observation plots located in the wetlands and uplands near flags AA-12, AD-71, AO-7 and BB-14 are attached. The table below provides the Flag Numbers, Flag Type, and Wetland Types and Locations for the delineated wetland resources.

Flag Numbers	Flag Type	Wetland Types and Locations
AA-1 to AA-26	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the westerly portion of the site that is associated with mapped perennial stream "RB".
AB-1 to AB-17	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the westerly portion of the site that is associated with a pond. Drains to wetland AA via a PVC culvert.
AC-1 to AC-43	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the westerly portion of the site that is associated with groundwater seepage and a pond. Drains to wetland AB via an undetermined connection.
AD-1 to AD-87	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the southwesterly portion of the site that is associated with groundwater seepage and seasonal ponding areas.
AE-1 to AE-26 (Connect AE-1 to AE-26)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the westerly portion of the site that is associated with a pond.
AF-1 to AF-25	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the southerly portion of the site that is associated with groundwater seepage and an unmapped, intermittent stream.
AG-1 to AG-8 (AG-8 connects to AD-1)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the southerly portion of the site that is associated with an unmapped, intermittent stream.
AH-1 to AH-25 (Flag AH-25 connects to CB-34)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the southwesterly portion of the site that is associated with an unmapped, intermittent stream.
AJ-1 to AJ-70	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the southerly portion of the site that is associated with an unmapped, intermittent stream.
AK-1 to AK-9 (Flag AK-1 connects to CA-30 and AK-9 connects to CB-1)	Orange Flags	Edge of Wetland at toe of fill slope in mapped DEP "Wetland Change" area (westerly portion of site).
AL-1 to AL-8 (Connect AL-1 to AL-8)	Blue Flags	Boundary of Isolated Vegetated Wetland under the Bylaw and/or US Clean Water Act located in the westerly portion of the site and associated with a seasonal ponding area.
AM-1 to AM-17 (Connect to AM-1 to AM-17)	Blue Flags	Boundary of Isolated Vegetated Wetland/Isolated Land Subject to Flooding and Certified Vernal Pool

		located in the southwesterly portion of the site.
AN-1 to AN-13	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the easterly portion of the site that is associated with an unmapped, intermittent stream draining to a culvert under a gravel roadway.
AO-1 to AO-40	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the easterly portion of the site that is associated with an unmapped, intermittent stream draining from a culvert under a gravel roadway. Culvert between flags AO-32 and AO-33.
AP-1 to AP-4	Blue Flags	Intermittent stream Bank (no Bordering Wetland) located in the easterly portion of the site that is associated with an unmapped, intermittent stream at narrow property "neck".
AR-1 to AR-18	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the southerly portion of the site that is associated with unmapped, intermittent stream "L".
AS-1 to AS-9 (Connect AS-1 to AS-9)	Blue Flags	Boundary of Isolated Vegetated Wetland under the Bylaw and/or US Clean Water Act located in the southerly portion of the site and associated with a seasonal ponding area.
BA-1 to BA-48	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the northerly portion of the site that is associated with an unmapped, intermittent stream.
BB-1 to BB-210	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the northerly portion of the site that is associated with an unmapped, intermittent stream.
BC-1 to BC-85	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the northerly portion of the site that is associated with an unmapped, intermittent stream.
BD-1 to BD-132 (BD-132 connects to DD-43)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the northerly portion of the site that is associated with an unmapped, intermittent stream.
BE-1 to BE-102	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the easterly portion of the site that is associated with McGovern Brook, a mapped perennial stream.
CA-1 to CA-30 (Connect CA-30 to AK-1)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the westerly portion of the site that is associated with groundwater seepage and an unmapped, intermittent stream.
CB-1 to CB-34 (Connect CB-1 to AK-9 and connect CB-34 to AH-25)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the westerly portion of the site that is associated with groundwater seepage and an unmapped, intermittent stream.
CC-1 to CC-33 (Connect CC-33 to CD-83)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the westerly portion of the site that is associated with high groundwater and an unmapped,

		intermittent stream.
CD-1 to CD-83 (Connect CD-83 to CC-33)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the westerly portion of the site that is associated with high groundwater and an unmapped, intermittent stream.
CE-1 to CE-57 (Connect CE-1 to CE-57)	Blue Flags	Boundary of Bordering Vegetated Wetlands surrounding an upland "island" located in the westerly portion of the site that is associated with high groundwater and unmapped, intermittent streams.
DA-1 to DA-66	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the northerly portion of the site that is associated with an unmapped, intermittent stream.
DB-1 to DB-12	Red Flags	Intermittent stream Bank on north side of stream in northerly portion of site. Stream within wetland BB/DA.
DC-1 to DC-12	Red Flags	Intermittent stream Bank on south side of stream in northerly portion of site. Stream within wetland BB/DA.
DD-1 to DD-43 (DD-43 connects to BD-132)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the northerly portion of the site that is associated with an unmapped, intermittent stream.
K-1 to K-15 (K-1 connects to K-15)	Red Flags	Intermittent stream Bank in westerly portion of site. Stream within wetland AC.
L-1 to L-9 (L-1 connects to LL-8)	Red Flags	Intermittent stream Bank on north side of stream in southerly portion of site. Stream within wetland AJ.
LL-1 to LL-8 (LL-8 connecst to L-1)	Red Flags	Intermittent stream Bank on north side of stream in southerly portion of site. Stream within wetland AJ
M-1 to M-113	Red Flags	Mean Annual High-water Line (MAHWL) of McGovern Brook (a mapped perennial stream) located in the easterly portion of the site (within wetland AA). Brook within wetland BE.
RB-1 to RB-21	Red Flags	Mean Annual High-water Line (MAHWL) of mapped perennial stream located in the westerly portion of the site. Stream within wetland AA.

Findings

The above-referenced Bordering Vegetated Wetlands are associated with intermittent and perennial streams and a pond. Plant species observed include Plant species observed include red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), gray birch (*Betula populifolia*), swamp tupelo (*Nyssa sylvatica*), and American elm (*Ulmus americana*) trees and/or saplings; poison ivy (*Toxicodendron radicans*) and common greenbrier (*Smilax rotundifolia*) climbing woody vines; highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), arrow-wood (*Viburnum dentatum*), withe-rod (*Viburnum cassinoides*), northern spicebush (*Lindera benzoin*), swamp rose (*Rosa palustris*), speckled alder (*Alnus rugosa*), silky dogwood (*Cornus amomum*), maleberry (*Lyonia ligustrina*), fetter-bush (*Leucothoe racemosa*),

glossy buckthorn (*Rhamnus frangula*), sweet pepper-bush (*Clethra alnifolia*), swamp azalea (*Rhododendron viscosum*), and American elderberry (*Sambucus canadensis*) shrubs; and sheep-laurel (*Kalmia angustifolia*), bristly blackberry (*Rubus hispidus*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), sensitive fern (*Onoclea sensibilis*), subarctic lady fern (*Athyrium filix-femina*), marsh fern (*Thelypteris thelypteroides*), Massachusetts fern (*Thelypteris simulata*), spinulose woodfern (*Dryopteris spinulosa*), skunk-cabbage (*Symplocarpus foetidus*), swamp Jack-in-the-pulpit (*Arisaema triphyllum*), Alaska goldthread (*Coptis trifolia*), spotted touch-me-not (*Impatiens capensis*), shining clubmoss (*Lycopodium lucidulum*), and sphagnum moss (*Sphagnum sp*.) ground cover. Evidence of wetland hydrology, including hydric soils, high groundwater, saturated soils, pore linings, evidence of flooding, and drainage patterns, was observed within the delineated wetland. The Bordering Vegetated wetlands border intermittent and perennial streams; accordingly, these vegetated wetlands would be regulated as Bordering Vegetated Wetlands, the intermittent streams would be regulated as Bank and the perennial streams would be regulated as Bank and Land Under Water under the Act. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands and Bank under the Act.

The isolated vegetated wetlands are associated with seasonal ponding areas. Plant species observed are similar to those noted above. Hydric soils and other evidence of wetland hydrology, including seasonal ponding, high groundwater, saturated soils, pore linings, and evidence of flooding, were observed within the delineated wetlands. These wetlands do not border a creek, stream, river, pond, or lake; accordingly, they would not be regulated as Bordering Vegetated Wetlands under the Act. Section 10.57(2)(b)1. states that "Isolated Land Subject to Flooding is an isolated depression or closed basin without an inlet or an outlet. It is an area that at least once per year confines standing water to a volume of at least ¼ acre-feet and to an average depth of at least six inches." Engineering calculations should be performed in accordance with 310 CMR 10.57(2)(b) and the ILSF Definition Policy issued January 25, 1985 and revised March 1, 1995 to determine if any of these areas meet the definition of Isolated Land Subject to Flooding under the Act. If the calculations demonstrate that these areas qualify, they would be regulated as Isolated Land Subject to Flooding under the Act. Section 10.57(2)(b)3. states that "The boundary of Isolated Land Subject to Flooding is the perimeter of the largest observed or recorded volume of water confined in said area. In the event of a conflict of opinion regarding the extent of water confined in an Isolated Land Subject to Flooding, the applicant may submit an opinion by a registered professional engineer, supported by engineering calculations, as to the probable extent of said water." If these areas do not qualify as Isolated Land Subject to Flooding, they would not be subject to jurisdiction under the Act. Isolated Land Subject to Flooding does not have a 100-foot Buffer Zone under the Act. Depending upon the proximity of these areas to a Bordering Vegetated Wetlands, these areas may be subject to jurisdiction as federal wetlands. Federal wetlands do not have a Buffer Zone.

Bordering Land Subject to Flooding is an area that floods due to a rise in floodwaters from a bordering waterway or water body. Where flood studies have been completed, the boundary of Bordering Land Subject to Flooding is based upon flood profile data prepared by the National

Flood Insurance Program. Section 10.57(2)(a)3. states that "The boundary of Bordering Land Subject to Flooding is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm." The project engineer should evaluate the most recent National Flood Insurance Program flood profile data to determine the extent of Bordering Land Subject to Flooding on the site. Bordering Land Subject to Flooding would occur in areas where the 100-year flood elevation is located outside of or upgradient of the delineated Bordering Vegetated Wetlands or Bank boundary. Bordering Land Subject to Flooding does not have a Buffer Zone under the Act.

The Massachusetts Rivers Protection Act amended the Act to establish an additional wetland resource area: Riverfront Area. Based upon a review of the current USGS Map (attached), McGovern Brook and an unnamed stream on the site are shown as perennial. Streams that are shown as perennial on the current USGS map are designated perennial under the Massachusetts Wetlands Protection Act regulations. Unless this perennial designation is overcome, Riverfront Area is presumed to extend 200 feet horizontally upgradient from the mean annual high-water line of the stream. Section 10.58(2)(a)2. states that the "Mean annual high-water line of a river is the line that is apparent from visible markings or changes in the character of soils or vegetation due to prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. Field indicators of bankfull conditions shall be used to determine the mean annual high-water line. Bankfull field indicators include but are not limited to: changes in slope, changes in vegetation, stain lines, top of pointbars, changes in bank materials, or bank undercuts." Section 10.58(2)(a)2.a. states that "In most rivers, the first observable break in slope is coincident with bankfull conditions and the mean annual high-water line." The mean annual high-water line of the streams were delineated in the field as noted above, based upon the above-referenced regulation. Furthermore, based upon a review of the current USGS Map and observations made during the site inspection, there are no other mapped perennial streams located on or within 200 feet of the site. Accordingly, except as noted above, Riverfront Area would not occur on the site. Riverfront Area does not have a Buffer Zone under the Act, but may overlap other wetland resources and their Buffer Zones.

The Regulations require that no project may be permitted that will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures set forth at 310 CMR 10.59. Based upon a review of the *Massachusetts Natural Heritage Atlas*, 14th edition, Priority Habitats and Estimated Habitats from the NHESP Interactive Viewer, valid from August 1, 2017, and Certified Vernal Pools from MassGIS, the site is not located within an Estimated Habitat [for use with the Act and Regulations (310 CMR 10.00 *et seq*.)] or a Priority Habitat [for use with Massachusetts Endangered Species Act (M.G.L. Ch. 131A; "MESA") and regulations (321 CMR 10.00 *et seq*.; the "MESA Regulations")]. However, one Certified Vernal Pool is located on the site. A copy of this map is attached.

The reader should be aware that the regulatory authority for determining wetland jurisdiction rests with local, state, and federal authorities. A brief description of my experience and qualifications is attached. If you have any questions, please feel free to contact me at any time.

Cordially,
ECOTEC, INC.



Arthur Allen, CWS, CPSS
Vice President

Attachments (5, 23 pages)

AA/Wetland/LancasterMcGovern Wetland Report

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES
102 Grove Street
Worcester, MA 01605-2629
508-752-9666 / Fax: 508-752-9494

Arthur Allen, CPSS, CWS, CESSWI
Vice President
Soil & Wetland Scientist

Arthur Allen is the Vice President of EcoTec, Inc. and has been a senior environmental scientist there since 1995. His work with EcoTec has involved wetland delineation, wildlife habitat evaluation, environmental permitting (federal, state and local), environmental monitoring, expert testimony, peer reviews, contaminated site assessment and the description, mapping and interpretation of soils. His clients have included private landowners, developers, major corporations and regulatory agencies. Prior to joining EcoTec, Mr. Allen mapped and interpreted soils in Franklin County, MA for the U.S.D.A. Natural Resources Conservation Service (formerly Soil Conservation Service) and was a research soil scientist at Harvard University's Harvard Forest. Since 1994, Mr. Allen has assisted the Massachusetts Department of Environmental Protection and the Massachusetts Association of Conservation Commissions as an instructor in the interpretation of soils for wetland delineation and for the Title V Soil Evaluator program.

Mr. Allen has a civil service rating as a soil scientist, an undergraduate degree in Natural Resource Studies and a graduate certificate in Soil Studies. His work on the Franklin County soil survey involved interpretation of landscape-soil-water relationships, classifying soils and drainage, and determining use and limitation of the soil units that he delineated. As a soil scientist at the Harvard Forest, Mr. Allen was involved in identifying the legacies of historical land-use in modern soil and vegetation at a number of study sites across southern New England. He has a working knowledge of the chemical and physical properties of soil and water and how these properties interact with the plants that grow on a given site. While at Harvard Forest he authored and presented several papers describing his research results which were later published. In addition to his aforementioned experience, Mr. Allen was previously employed by the Trustees of Reservations as a land manager and by the Town of North Andover, MA as a conservation commission intern.

Education:
1993-Graduate Certificate in Soil Studies, University of New Hampshire
1982-Bachelor of Science in Natural Resource Studies, University of Massachusetts

Professional Affiliations:
Certified Professional Soil Scientist (ARCPACS CPSS #22529)
New Hampshire Certified Wetland Scientist (#19)
Registered Professional Soil Scientist – Society of Soil Scientists of SNE [Board Member (2000-2006)]
Certified Erosion, Sediment & Stormwater Inspector (#965)
Massachusetts Approved Soil Evaluator (#13764)
Massachusetts Arborists Association-Certified Arborist (1982 – 1998)
New England Hydric Soils Technical Committee member
Massachusetts Association of Conservation Commissions member
Society of Wetland Scientists member

Refereed Publications:
Soil Science and Survey at Harvard Forest. A.Allen. *In*: Soil Survey Horizons. Vol. 36, No. 4, 1995, pp. 133-142.
Controlling Site to Evaluate History: Vegetation Patterns of a New England Sand Plain. G.Motzkin, D.Foster, A.Allen, J.Harrod, & R.Boone. *In*: Ecological Monographs 66(3), 1996, pp. 345-365.
Vegetation Patterns in Heterogeneous Landscapes: The Importance of History and Environment. G.Motzkin, P.Wilson, D.R.Foster & A.Allen. In: Journal of Vegetation Science 10, 1999, pp. 903-920.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section I. Vegetation | Number: TP-U | Transect # AA-12 | Date of Delin: 4/18/2018

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree							
Sapling	black cherry	Prunus serotina	20	40.0	YES	FACU	
	willow	salix sp.	20	40.0	YES	FACW	*
	white birch	Betula papyrifera	10	20.0	YES	FACU	
Shrub	witch hazel	Hamamelis virginiana	20	66.7	YES	FAC-	
	red maple	Acer rubrum	5	16.7	NO	FAC	*
	glossy buckthorn	Rhamnus frangula	5	16.7	NO	FAC	*
Ground	black raspberry	Rubus occidentalis	30	100.0	YES	NL	
Vine							

Vegetation Conclusions

Number of dominant wetland indicator plants **1** | Number of dominant non-wetland indicator plants **4**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? NO

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant	Prepared by: EcoTec, Inc	Project Location: McGovern Blvd., Lancaster	DEP File #
Section II. Indicators of Hydrology	Number: TP-U	Transect # AA-12	Date of Delin: 4/18/2018

1. Soil Survey

Is there a published soil survey for this site?

- title/date
- map number
- soil type mapped
- hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
A/Bw	0-10	10YR 3/3 & 10 YR 5/6	
Ab	10-16	10YR 3/3	

Remarks: Litter 2"; sand

3. Other

Conclusion: Is the soil hydric? No

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☐ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☐	☑
Wetland hydrology present:		
Hydric soil present	☐	☑
Other indicators of hydrology present	☐	☑
Sample Location is in a BVW	☐	☑

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section I. Vegetation | Number: TP-W | Transect # AA-12 | Date of Delin: 4/18/2018

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree							
Sapling	gray birch	Betula populifolia	20	40.0	YES	FAC	*
	black cherry	Prunus serotina	20	40.0	YES	FACU	
	red maple	Acer rubrum	10	20.0	YES	FAC	*
Shrub	American elderberry	Sambucus canadensis	20	66.7	YES	FACW-	*
	chokeberry	Aronia prunifolia	10	33.3	YES	FACW	*
Ground							
Vine	fox grape	Vitis labrusca	10	100.0	YES	FACU	

Vegetation Conclusions

Number of dominant wetland indicator plants **4** | Number of dominant non-wetland indicator plants **2**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? YES

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section II. Indicators of Hydrology | Number: TP-W | Transect # AA-12 | Date of Delin: 4/18/2018

1. Soil Survey

Is there a published soil survey for this site?

title/date

map number

soil type mapped

hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
Oa	3-0		
A	0-4	10YR 2/1	
Eg	4-8	7.5YR 4/2	20% 10YR 2/2
Bs	8-14	7.5YR 4/4	

Remarks: Litter 2"
A - mucky sand
Eg & Bs - sand

3. Other

Conclusion: Is the soil hydric?

Yes

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☑ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☑	☐
Wetland hydrology present:		
Hydric soil present	☑	☐
Other indicators of hydrology present	☑	☐
Sample Location is in a BVW	☑	☐

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section I. Vegetation | Number: TP-U | Transect # AD-71 | Date of Delin: 4/25/2018

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	white pine	Pinus strobus	70	70.0	YES	FACU	
	red maple	Acer rubrum	30	30.0	YES	FAC	*
Sapling	red maple	Acer rubrum	10	33.3	YES	FAC	*
	white oak	Quercus alba	10	33.3	YES	FACU-	
	white pine	Pinus strobus	10	33.3	YES	FACU	
Shrub	white oak	Quercus alba	10	50.0	YES	FACU-	
	white pine	Pinus strobus	5	25.0	YES	FACU	
	beaked hazelnut	Corylus cornuta	5	25.0	YES	FACU-	
Ground	wintergreen/teaberry	Gaultheria procumbens	15	75.0	YES	FACU	
	tree clubmoss	Lycopodium obscurum	5	25.0	YES	FACU	
Vine							

Vegetation Conclusions

Number of dominant wetland indicator plants **2** | Number of dominant non-wetland indicator plants **8**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? NO

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant		Prepared by: EcoTec, Inc	Project Location: McGovern Blvd., Lancaster	DEP File #
Section II. Indicators of Hydrology	Number: TP-U		Transect # AD-71	Date of Delin: 4/25/2018

1. Soil Survey

Is there a published soil survey for this site?

title/date

map number

soil type mapped

hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
O	2-0		
A	0-10	10YR 3/2	
Bw	10-18	10YR 5/6	

Remarks: Litter 2"
loamy fine sand

3. Other

Conclusion: Is the soil hydric?

No

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☐ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☐	☑
Wetland hydrology present:		
Hydric soil present	☐	☑
Other indicators of hydrology present	☐	☑
Sample Location is in a BVW	☐	☑

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section I. Vegetation | Number: TP-W | Transect # AD-71 | Date of Delin: 4/25/2018

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	red maple	Acer rubrum	80	80.0	YES	FAC	*
	white oak	Quercus alba	10	10.0	NO	FACU-	
	white pine	Pinus strobus	10	10.0	NO	FACU	
Sapling	red maple	Acer rubrum	10	100.0	YES	FAC	*
Shrub	highbush blueberry	Vaccinium corymbosum	20	50.0	YES	FACW-	*
	maleberry	Lyonia ligustrina	10	25.0	YES	FACW	*
	chokeberry	Aronia prunifolia	10	25.0	YES	FACW	*
Ground							
Vine							

Vegetation Conclusions

Number of dominant wetland indicator plants **5** | Number of dominant non-wetland indicator plants **0**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? YES

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant		Prepared by: EcoTec, Inc	Project Location: McGovern Blvd., Lancaster	DEP File #
Section II. Indicators of Hydrology	Number: TP-W		Transect # AD-71	Date of Delin: 4/25/2018

1. Soil Survey

Is there a published soil survey for this site?

- title/date
- map number
- soil type mapped
- hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
Oa	3-0		
A	0-6	10YR 2/1	
Bg	6-15	10YR 6/2	10% 7.5YR 4/4

Remarks: Litter 2"
A - mucky loamy sand
Bg - loamy sand

3. Other

Conclusion: Is the soil hydric?

Yes

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☑ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☑ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☑	☐
Wetland hydrology present:		
Hydric soil present	☑	☐
Other indicators of hydrology present	☑	☐
Sample Location is in a BVW	☑	☐

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section I. Vegetation | Number: TP-U | Transect # AO-7 | Date of Delin: 5/2/2018

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	red oak	Quercus rubra	50	50.0	YES	FACU-	
	red maple	Acer rubrum	20	20.0	YES	FAC	*
	white oak	Quercus alba	20	20.0	YES	FACU-	
	white pine	Pinus strobus	10	10.0	NO	FACU	
Sapling	shagbark hickory	Carya ovata	10	50.0	YES	FACU-	
	white pine	Pinus strobus	10	50.0	YES	FACU	
Shrub	witch hazel	Hamamelis virginiana	40	100.0	YES	FAC-	
Ground							
Vine							

Vegetation Conclusions

Number of dominant wetland indicator plants **1** | Number of dominant non-wetland indicator plants **5**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? NO

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section II. Indicators of Hydrology | Number: TP-U | Transect # AO-7 | Date of Delin: 5/2/2018

1. Soil Survey

Is there a published soil survey for this site?

title/date

map number

soil type mapped

hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
O	2-0		
A	0-6	10YR 2/2	
Bw	6-15	10YR 4/6	

Remarks: Litter 1"; loamy sands

3. Other

Conclusion: Is the soil hydric? No

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☐ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☐	☑
Wetland hydrology present:		
Hydric soil present	☐	☑
Other indicators of hydrology present	☐	☑
Sample Location is in a BVW	☐	☑

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section I. Vegetation | Number: TP-W | Transect # AO-7 | Date of Delin: 5/2/2018

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	red maple	Acer rubrum	20	40.0	YES	FAC	*
	red oak	Quercus rubra	20	40.0	YES	FACU-	
	white pine	Pinus strobus	10	20.0	YES	FACU	
Sapling	red maple	Acer rubrum	10	50.0	YES	FAC	*
	sassafras	Sassafras albidum	10	50.0	YES	FACU-	
Shrub	witch hazel	Hamamelis virginiana	10	66.7	YES	FAC-	
	white pine	Pinus strobus	5	33.3	YES	FACU	
Ground	cinnamon fern	Osmunda cinnamomea	30	60.0	YES	FACW	*
	goldthread	Coptis trifolia	10	20.0	YES	FACW	*
	sphagnum moss	Sphagnum sp.	10	20.0	YES	FACW	*
Vine							

Vegetation Conclusions

Number of dominant wetland indicator plants **5** | Number of dominant non-wetland indicator plants **5**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? YES

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant		Prepared by: EcoTec, Inc	Project Location: McGovern Blvd., Lancaster	DEP File #
Section II. Indicators of Hydrology	Number: TP-W		Transect # AO-7	Date of Delin: 5/2/2018

1. Soil Survey

Is there a published soil survey for this site?

title/date

map number

soil type mapped

hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
O	2-0		
A	0-8	10YR 2/1	
Bg	8-16	10YR 5/2	5% 10YR 4/6

Remarks: Litter 2"
A - mucky sand
Bg - sand

3. Other

Conclusion: Is the soil hydric? Yes

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☑ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☑	☐
Wetland hydrology present:		
Hydric soil present	☑	☐
Other indicators of hydrology present	☑	☐
Sample Location is in a BVW	☑	☐

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section I. Vegetation | Number: TP-U | Transect # BB-14 | Date of Delin: 5/2/2018

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	white oak	Quercus alba	40	40.0	YES	FACU-	
	red maple	Acer rubrum	40	40.0	YES	FAC	*
	white birch	Betula papyrifera	20	20.0	YES	FACU	
Sapling	black cherry	Prunus serotina	10	50.0	YES	FACU	
	white pine	Pinus strobus	10	50.0	YES	FACU	
Shrub	highbush blueberry	Vaccinium corymbosum	20	66.7	YES	FACW-	*
	white pine	Pinus strobus	10	33.3	YES	FACU	
Ground	wintergreen/teaberry	Gaultheria procumbens	10	66.7	YES	FACU	
	Canada mayflower	Maianthemum canadense	5	33.3	YES	FAC-	
Vine							

Vegetation Conclusions

Number of dominant wetland indicator plants **2** | Number of dominant non-wetland indicator plants **7**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? NO

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant	Prepared by: EcoTec, Inc	Project Location: McGovern Blvd., Lancaster	DEP File #
Section II. Indicators of Hydrology	Number: TP-U	Transect # BB-14	Date of Delin: 5/2/2018

1. Soil Survey

Is there a published soil survey for this site?

- title/date
- map number
- soil type mapped
- hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
O	1-0		
A	0-4	10YR 2/2	
Bw	4-15	7.5YR 4/6	

Remarks: Litter 2"; loamy sands

3. Other

Conclusion: Is the soil hydric?

No

Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☐ Depth to free water in observation hole
- ☐ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☐	☑
Wetland hydrology present:		
Hydric soil present	☐	☑
Other indicators of hydrology present	☐	☑
Sample Location is in a BVW	☐	☑

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant | Prepared by: EcoTec, Inc | Project Location: McGovern Blvd., Lancaster | DEP File #

Section I. Vegetation | Number: TP-W | Transect # BB-14 | Date of Delin: 5/2/2018

A. Sample layer and plant species (Enter largest to smallest % cover by layer)			Percent Cover (or basal area)	Percent Dominance	Dominant Plant?	Wetland Indicator Category	
Tree	red maple	Acer rubrum	100	100.0	YES	FAC	*
Sapling							
Shrub	highbush blueberry	Vaccinium corymbosum	40	100.0	YES	FACW-	*
Ground	cinnamon fern	Osmunda cinnamomea	20	50.0	YES	FACW	*
	sheep laurel	Kalmia angustifolia	10	25.0	YES	FAC	*
	goldthread	Coptis trifolia	5	12.5	NO	FACW	*
	starflower	Trientalis borealis	5	12.5	NO	FAC	*
Vine							

Vegetation Conclusions

Number of dominant wetland indicator plants **4** | Number of dominant non-wetland indicator plants **0**

Is the number of dominant wetland plants equal or greater than the number of dominant non-wetland plants? YES

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Form

Applicant		Prepared by: EcoTec, Inc	Project Location: McGovern Blvd., Lancaster	DEP File #
Section II. Indicators of Hydrology	Number: TP-W		Transect # BB-14	Date of Delin: 5/2/2018

1. Soil Survey

Is there a published soil survey for this site?

- title/date
- map number
- soil type mapped
- hydric soil inclusions

Are field observarions consistent with soil survey?

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottle Color
Oa	3-0		
A	0-12	10YR 2/1	
Bg	12-16	10YR 4/2	10% 10YR 4/6

Remarks: Litter 2"
A - mucky sand
Bg - sand

3. Other

Conclusion: Is the soil hydric?

Yes

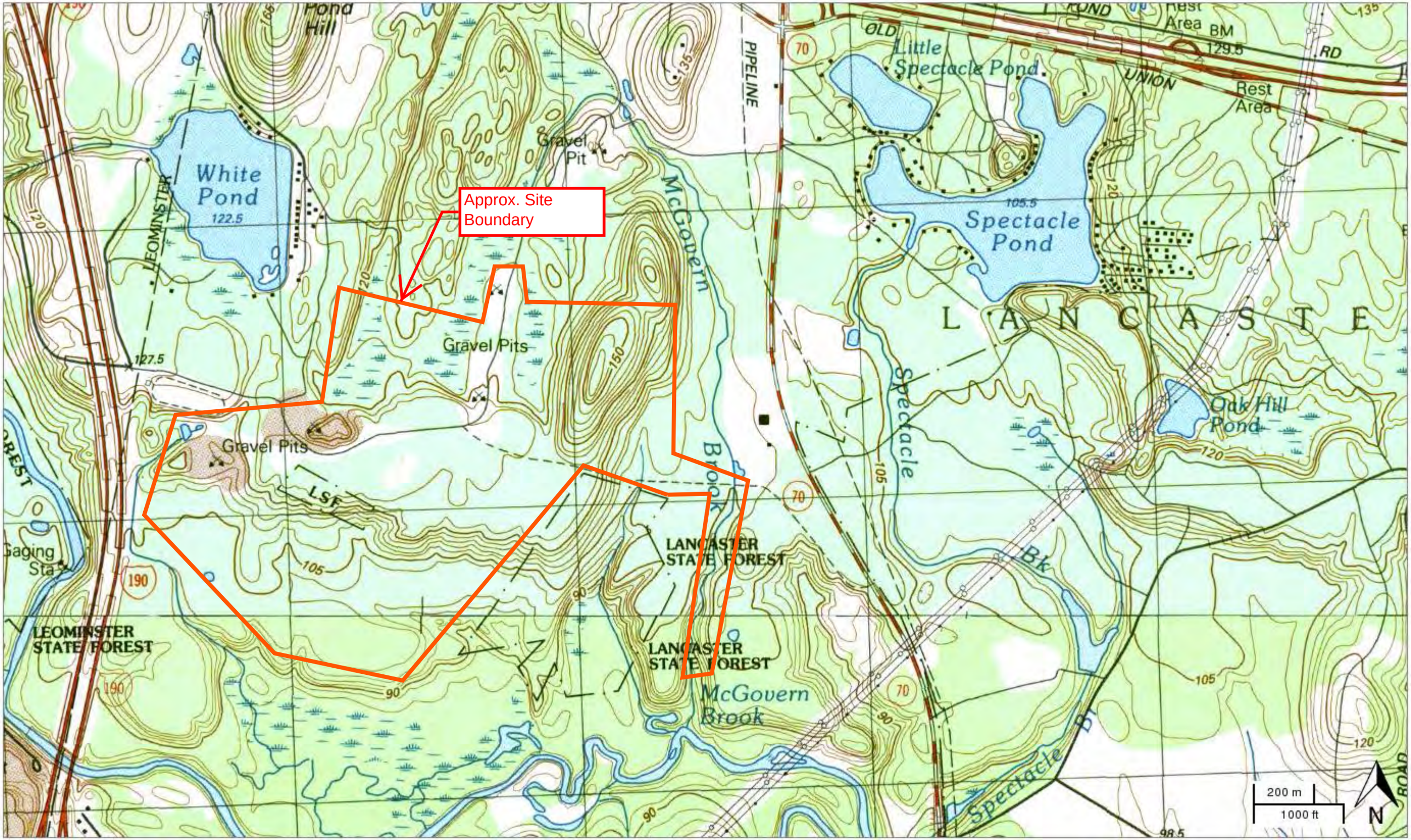
Other Indicators of hydrology (check all that apply):

- ☐ Site Inundated
- ☑ Depth to free water in observation hole 6"
- ☑ Depth to soil saturation in observation hole
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment Deposits
- ☐ Drainage patterns in BVWs
- ☐ Oxidized rhizospheres
- ☐ Water stained leaves
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☑	☐
Wetland hydrology present:		
Hydric soil present	☑	☐
Other indicators of hydrology present	☑	☐
Sample Location is in a BVW	☑	☐

USGS


Approx. Site Boundary
White Pond
122.5
Gravel Pit
Gravel Pits
Gravel Pits
LSF
LEOMINSTER STATE FOREST
LANCASTER STATE FOREST
LANCASTER STATE FOREST
McGovern Brook
Spectacle Pond
105.5
Little Spectacle Pond
Oak Hill Pond
Rest Area
Rest Area
BM 129.5
PIPELINE
McGOVERN
OLD UNION
RD
Spectacle Brook
Spectacle Bk
Spectacle Bk
Gaging Sta
Pond Hill
LANCASTER
127.5
200 m
1000 ft
N

National Flood Hazard Layer FIRMette

FEMA



Feet

0 250 500 1,000 1,500 2,000

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/16/2018 at 12:41:19 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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National Flood Hazard Layer FIRMette

FEMA

42°30'28.45"N

71°42'35.82"W



71°41'58.36"W

42°30'1.92"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards

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National Flood Hazard Layer FIRMette

FEMA

42°30'28.05"N

71°43'3.82"W



71°42'26.37"W

42°30'1.53"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/16/2018 at 12:39:59 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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National Flood Hazard Layer FIRMette

FEMA

42°30'36.94"N

71°42'24.97"W



71°41'47.52"W

42°30'10.41"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

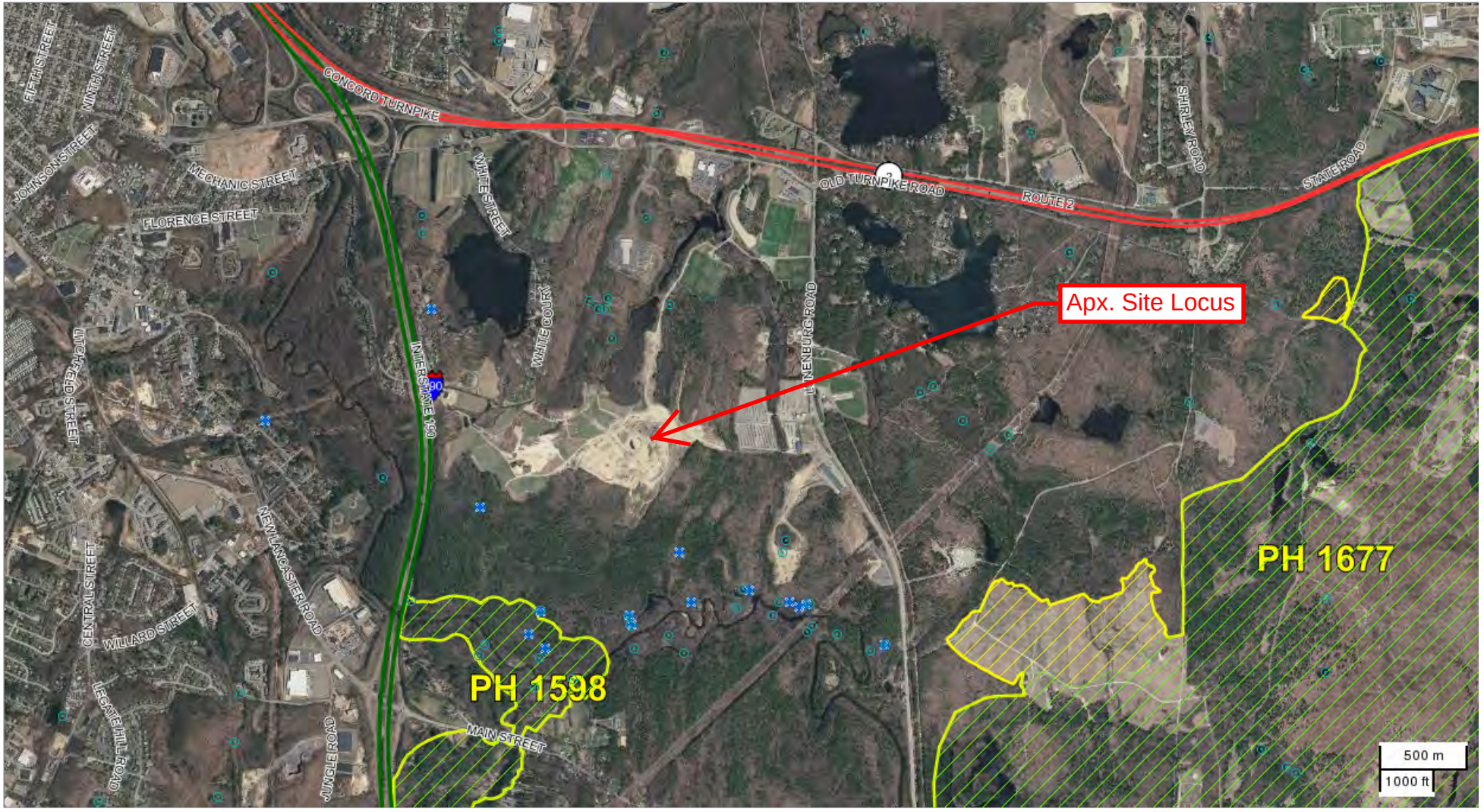
N

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/16/2018 at 12:43:14 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: base map imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Natural Heritage Atlas Online Data Viewer Output 4.16.18 - McGovern Blvd, Lancaster



APPENDIX E: DRAFT SECTION 61 FINDINGS

- MassDOT - Draft Letter of Commitment

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
DRAFT FINDING PURSUANT TO
M.G.L. CHAPTER 30, SECTION 61

PROJECT NAME: Capital Commerce Center

PROJECT LOCATION: Lancaster, Massachusetts

PROJECT PROPONENT: Capital Group Properties

EEA NUMBER: 16043

I. Project Description

The Project consists of a mixed-use development on a 471-acre site located in Lancaster and Leominster. The Project consists of clearing much of the existing site; but retaining the existing three (3) soccer fields, Dunkin Donuts, and Mobil Gas Station. The proposed mixed-use development program includes constructing of a 1,567,500 square foot (SF) industrial park (319 loading docks), 117 single-family residential units, 500 multi-family residential units, a 120-room hotel; 65,700 SF of additional retail space (73,000 SF total with existing Dunkin Donuts and Mobil), and an 86,500 SF indoor soccer facility comprised of one (1) soccer field. The Project proposes to retain the access/egress to the site via McGovern Boulevard. The 117 single-family residential units will be disconnected from the rest of the proposed land uses and be accessed/egressed via new roadway connections to/from Johnny Appleseed Lane [City of Leominster].

The Project looks to significantly increase the parking at the site and will provide 1,317 parking spaces to service the industrial park, 740 parking spaces to service the multi-family residential units, 120 parking spaces to service the hotel, 418 additional parking spaces to service the retail adjacent to Lunenburg Road, and an additional 216 parking spaces to service the indoor soccer facility. In total, the project will add 3,109 parking spaces to the site including 316 tractor-trailer parking spaces will be provided within the industrial park.

The project Proponent will apply to the Massachusetts Department of Transportation (MassDOT) for a Vehicular Permit to Access State Highway under M.G.L. Chapter 81, Section 21 for indirect access to Route 2, under MassDOT jurisdiction, which is approximately ¾-miles north of the site's primary access/egress at McGovern Boulevard.

II. MEPA History

The Proponent prepared and submitted, pursuant to M.G.L. Ch 30, Section 61 and 62A-H of the Massachusetts Environmental Policy Act (MEPA) and its implementing regulations (301 CMR 11.00) and Environmental Notification Form (June 10, 2019)[1] and a Draft Environmental Impact Report (To Be Submitted), both of which analyze the environmental impacts of the full build project.

[1] Dates in parenthesis refer to when notice of availability for public review was published in The Environmental Monitor for the respective environmental disclosure document

MassDOT has reviewed and commented on the above MEPA submissions and has considered the comments of various parties on the ENF and DEIR in connection with the permit application to be submitted by the Proponent. This Section 61 Finding is based upon information disclosed and discussed in the MEPA review process.

III. Overall Project Traffic Impacts

Full build occupancy of the mixed-use project is expected to generate approximately 11,274 new unadjusted vehicle trips[2] during the average weekday; including 836 vehicle trips (502 entering and 334 exiting) during the weekday morning peak hour and 1,054 vehicle trips (452 entering and 602 exiting) during the weekday evening peak hour. Full build occupancy of the mixed-use project is expected to generate approximately 11,328 new unadjusted vehicle trips during the average Saturday; including 1,441 vehicle trips (609 entering and 832 exiting) during the Saturday midday peak hour. MassDOT has assessed the impacts of this anticipated traffic load on the surrounding regional transportation network based upon the information set forth in the EENF and DEIR.

In the absence of mitigating highway improvements, the project-related traffic would be expected to have generally detrimental operational and safety impacts in a number of primary areas. These include:

- Old Union Turnpike / Route 2 (Exit 35) Eastbound Ramps
- Fort Pond Road / Route 2 (Exit 35) Westbound Ramps
- Old Union Turnpike / Route 2 (Exit 34) Eastbound Ramps

The specific traffic impacts at each of these locations and the mitigation measures required to address them are detailed in Parts IV and V of this Section 61 Finding.

IV. Specific Project Impacts and Mitigation Measures

MassDOT has analyzed the operational and safety impacts in the affected state highway areas due to the proposed Project and has determined that the mitigation measures outlined below are required to mitigate or minimize these traffic impacts of this project. Based on discussions with MassDOT, the Project Proponent has committed to undertake the following mitigation measures in cooperation with the identified parties.

Any proposed mitigation measures within the State Highway Layout, as well as internal circulation, should be consistent with a Complete Streets design approach that provides adequate and safe accommodation for all roadway users, including pedestrians, bicyclists, and public transit riders. Guidance on Complete Streets design guidelines is included in the MassDOT *Project Development and Design Guide*. Where these criteria cannot be met, the Proponent should provide the justification as to the reason why, and should work closely with the MassDOT Highway Division to obtain a design waiver for those elements of infrastructure under MassDOT's jurisdiction.

[2] Technical terms used in this Finding are as defined in the Transportation Research Board Highway Capacity Manual (2010).

Old Union Turnpike / Route 2 EB Exit 35 Ramps Intersection

For the 2026 No-Build scenario, AM Weekday/PM Weekday/Saturday peak hour level of service (LOS) on the side-street movement of this unsignalized intersection will be at Levels D/B/C (Average Delay = 25.8/11.3/20.0 seconds). For the 2026 Build without traffic mitigation scenario, AM Weekday/PM Weekday/Saturday peak hour LOS on the side-street movement of this unsignalized intersection will be at Levels D/B/C (Average Delay = 29.1/11.7/15.5 seconds). The 2026 Build with traffic mitigation scenario indicates that the AM Weekday/PM Weekday/Saturday peak hour LOS on the side-street movement of this unsignalized intersection will be at Levels D/B/C (Average Delay = 32.6/13.4/18.9 seconds).

There is no off-site mitigation proposed at this intersection location.

Fort Pond Road / Route 2 WB Exit 35 Ramps Intersection

For the 2026 No-Build scenario, AM Weekday/PM Weekday peak hour LOS on the side-street movement of this unsignalized intersection will be at Levels A/E (Average Delay = 9.6/41.5 seconds). For the 2026 Build without traffic mitigation scenario, AM Weekday/PM Weekday peak hour LOS on the side-street movement of this unsignalized intersection will be at Levels A/D (Average Delay = 9.7/29.8 seconds). The 2026 Build with traffic mitigation scenario indicates that the AM Weekday/PM Weekday peak hour LOS on the side-street movement of this unsignalized intersection will be at Levels B/E (Average Delay = 10.1/40.0 seconds).

Prior to site occupancy, the Proponent will reconstruct the Route 2 WB off-ramp storage and deceleration lane to provide a consistent cross-section and provide 600-feet of lane prior to the off-ramp radius.

Old Union Turnpike / Route 2 EB Exit 34 Ramps Intersection

For the 2026 No-Build scenario, AM Weekday/PM Weekday/Saturday peak hour LOS on the side-street movement of this unsignalized intersection will be at Levels D/D/C (Average Delay = 28.6/31.6/16.4 seconds). For the 2026 Build without traffic mitigation scenario, AM Weekday/PM Weekday/Saturday peak hour LOS on the side-street movement of this unsignalized intersection will be at Levels E/E/C (Average Delay = 35.0/45.0/17.6 seconds). The 2026 Build with traffic mitigation scenario indicates that the AM Weekday/PM Weekday/Saturday peak hour LOS on the side-street movement of this unsignalized intersection will be at Levels F/F/C (Average Delay = 50.0/76.8/20.6 seconds).

There are no other feasible means to avoid or minimize the project's traffic impacts at this location that the Proponent could be required to implement. MassDOT, as part of Project File No. 608832 are anticipated to relocate the ramp intersection and provide additional traffic control measures to improvement operations and safety.

VI. Other Mitigation Measures

Intersection Improvements

The Proponent has committed to the following intersection improvements at the intersection of Main Street / Seven Bridge Road (Town jurisdiction):

- Modify traffic signal timings and parameters (traffic signal to be constructed as part of MassDOT Project No. 608779) post-occupancy (or at Master Plan occupancy milestone intervals) to accommodate the additional traffic flow from the Project site. The implementation of these improvements will be reviewed and coordinated with the Town of Lancaster whom will hold jurisdiction.

The Proponent has committed to the following intersection improvements at the intersection of Lunenburg Road / Main Street (Town jurisdiction):

- Modify traffic signal timings and parameters (traffic signal to be constructed as part of MassDOT Project No. 608779) post-occupancy (or at Master Plan occupancy milestone intervals) to accommodate the additional traffic flow from the Project site. The implementation of these improvements will be reviewed and coordinated with the Town of Lancaster whom will hold jurisdiction; and

- Implement short-term, low-cost improvement measures at the intersections which were not included or superseded as part of MassDOT Project No. 608779; including the installation of advance speed reduction signage (W3-5) along Lunenburg Road southbound. All other short-term / low-cost measures have been incorporated by the current MassDOT project.

The Proponent has committed to the following intersection improvements at the intersection of Lunenburg Road / McGovern Boulevard (Town jurisdiction):

- Construct a fully-actuated traffic signal. Provide new demand-based vehicular and bicycle detection as part of the new traffic signal, as well as providing accommodations for emergency-vehicle pre-emption and a protected pedestrian crossing;

- Widen McGovern Boulevard to provide two eastbound travel lanes including an exclusive left-turn lane and an exclusive right turn-lane;

- Widen the Lunenburg Road northbound approach to introduce an exclusive left-turn lane operating under protected-permitted signal phasing;

- Widen Lunenburg Road southbound approach to introduce an exclusive right-turn lane operating under permissive-overlap signal phasing;

- Provide Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) compliant pedestrian accommodations; including a crosswalk across McGovern Boulevard and Lunenburg Road, accessible ramps, and audio/vibratory pedestrian signal equipment;

- Construct new 5-foot sidewalks along each site of Lunenburg Road within the project limits; including a pedestrian connection to Kimball's Farm;

- Maintain 5-foot minimum shoulders to accommodate bicycle access along each side of Lunenburg Road; and

- Reconstruct private commercial driveways immediately north of McGovern Boulevard to accommodate the widened roadway.

Corridor Improvements (McGovern Boulevard)

The Proponent has committed to corridor improvements along McGovern Boulevard (Town jurisdiction) to provide a consistent cross-section from Lunenburg Road through the IPOD-1 district and the site plan. The scope of these improvements would generally include the construction of sidewalks and bicycle lanes along each side of McGovern Boulevard.

Pedestrian Accommodations

The Proponent will construct a five-foot sidewalk along each side of McGovern Boulevard to provide connectivity between land uses on the site and Lunenburg Road. This includes connectivity to the several retail parcels previously construction (Dunkin Donuts and Mobil Station), future retail as programmed for the parcels on the west side of Lunenburg Road, and the existing Kimball's Farms along the east side of Lunenburg Road. Additional pedestrian crossings will be provided across McGovern Boulevard within the site.

The Proponent has also committed to construct new 5-foot sidewalks along each site of Lunenburg Road within the intersection reconstruction project limits; including a pedestrian connection to Kimball's Farm under traffic signal control.

Bicycle Accommodations

The Proponent is committed to constructed bicycle accommodations along McGovern Boulevard to provide connectivity between land uses on the site and Lunenburg Road. These bicycle accommodations will be in the form of 5-foot bicycle lanes and supplemented with MUTCD-compliant bicycle signage. In addition, bicycle racks will be provided on-site at various locations to promote the use of bicycle travel.

The Proponent is also committed to bicycle improvements along Lunenburg Road. The improvements along Lunenburg Road are generally short in nature and are along a high-speed arterial with wide-shoulders. Within the reconstruction intersection zone, the Proponent will maintain 5-foot minimum shoulders to accommodate bicycle access along each side of Lunenburg Road.

Transportation Demand Management Measures

The Proponent will develop and conduct TDM measures aimed at reducing site trip generation. These TDM measures shall include, but not be limited to:

- Designation of a full-time on-site Transportation Coordinator to oversee the TDM program;

- Seek partnership with NuRide to encourage ride-sharing and "green" trips. The ETC, with NuRide, will develop an employee rideshare program to encourage employees to seek alternatives to driving to work alone;
- Implement a ride-matching program to assist employees in finding appropriate carpool matches;
- Provide all employees who carpool, bicycle, or walk to work with an emergency a guaranteed ride home;
- Organize promotional events and activities to encourage rideshare and alternative transportation means;
- Distribute brochures to all new employees during orientation, and post posters and bulletins on various subjects from carpooling to the Guaranteed Ride Home program throughout the site;
- Promote direct deposit for employees where possible;
- Encourage tenants within the mixed-use development to provide flexible hours to employees;
- Provide preferential parking for rideshare, carpool, and hybrid vehicles at locations throughout the site's parking areas in close proximity to major entranceways;
- Provide electric vehicle charging stations at locations throughout the site's parking areas in close proximity to major entranceways;
- The site will include parking spaces for tractor-trailers to be stored on-site. As an industrial park complex, this will minimize the need for tractor trailers, which create higher levels of emissions, to make additional site trips to/from a separate location to park when unneeded as part of the day-to-day commerce;
- The Proponent is committed to reducing the parking supply by providing minimal number of parking spaces below Town of Lancaster Zoning requirements to a level of the demand need only;
- Provide an internal sidewalk and bicycle network to provide connectivity from Lunenburg Road throughout the site;
- Provide secure, weather protected, long-term bicycle parking for employees at designated locations within the site. Provide bicycle racks for short-term users at several locations on-site; and
- Coordinate with tenants to provide showers for employees who commute by walking or biking.

Agreements and Layout Alterations

Prior to any site occupancy, the Proponent will submit to the MassDOT Boston and District 4 Offices any layout alteration plans, land damage agreements, and any other agreements necessary for or resulting from the implementation of the mitigation measures detailed in this Section 61 Finding.

Transportation Monitoring Program

The Proponent will conduct a traffic monitoring program beginning six months after issuance of the first occupancy permit and continuing for five years following full occupancy of the project. The monitoring program may be suspended at any time upon agreement with MassDOT and the Town of Lancaster that the Project has sufficiently provided evidence that the upper limits of vehicle delay and trip projection would not be feasibly satisfied. The monitoring program may also be suspended if five years have passed since the issuance of an occupancy permit for the project and will recommence should an additional occupancy permit be issued. The monitoring program will include the following:

- Collect manual Turning Movement Counts (TMCs) during the weekday morning (7:00 AM to 9:00 AM) and weekday evening (4:00 to 6:00 PM) peak periods at the following intersections;
    - Main Street / Lunenburg Road
    - Lunenburg Road / McGovern Boulevard
    - Lunenburg Road / Old Union Turnpike
    - Lunenburg Road / Fort Pond Road / Woods Lane
- Collect ATR data for a continuous 72-hour period along Lunenburg Road and McGovern Boulevard;
- Collect parking demand counts during the peak parking demand periods for the weekday evening (4:00 to 6:00 PM) peak periods;
- Complete an employee travel survey to gage employee travel patterns and mode share;
- Compare the TMCs collected above with those projected within the future DEIR/FEIR prepared for the Project to determine whether the total vehicles entering each intersection exceeds the volumes projected;
- Perform a capacity and queuing analysis using Synchro analysis software to evaluate the traffic operations at each of the intersections listed above and compare to the operations projected in the future DEIR/FEIR prepared for the Project;
- Assess whether additional improvements are necessary at any of the study intersections and identify measures to improve operations and/or reduce vehicular traffic volumes. The need for mitigation will be conditioned upon exceeding the total projected traffic volume through an intersection by more than 10 percent or exceeding the projected overall intersection delay by more than 20 percent;
- Assess whether the constructed parking supply is adequate for the parking demand as observed; and
- Prepare a memorandum summarizing the results of the TMCs, ATRs, parking demand counts and the Synchro analysis for submission to MassDOT and the Town of Lancaster.

The Proponent will monitor the TDM program on an annual basis and prepare a TDM Report to update efforts to reduce site trip generation through employee programs and the use of alternate modes of transportation. The goal of the monitoring program will be to evaluate the assumptions made in the Traffic Impact Analysis and identify effectiveness of the Project mitigation measures and TDM program.

The Proponent should consult with the MassDOT's Public/Private Development Unit (PPDU) and the District 3 Office in order to confirm a detailed scope of work for conduct of the traffic monitoring program at each location.

VII. Air Quality & GHG Emissions

In accordance with the MEPA "Greenhouse Gas Emissions Policy and Protocol," the Proponent will provide a certification to the MEPA Office signed by an appropriate professional stating that all transportation and non-transportation greenhouse gas (GHG) mitigation measures described in the EENF / DEIR, or measures providing comparable mitigation, have been incorporated into the project. These measures are expected to reduce transportation-related emissions of carbon dioxide (CO_2) by 2.0 percent.

VIII. Other Mitigation Measures

For the reasons stated above, MassDOT hereby finds that, with implementation of the mitigation measures described above, all practical means and measures will be taken to avoid or minimize adverse traffic and related impacts to the environment resulting from the Capital Commerce Center Project. Appropriate conditions consistent with is amended Section 61 Finding will be included in the Permit to Access State Highway to be issued by MassDOT in order to describe more fully and ensure implementation of these measures.

_____ _____

DATE Jonathan L. Gulliver
Administrator

APPENDIX F: TRAFFIC IMPACT AND ACCESS STUDY

- Turning Movement Counts (TMCs)
- Automatic Traffic Recorder (ATR) Counts
- Seasonal Adjustment Data
- Road Safety Audit (RSA)
- Crash History Data
- MassDOT Ambient Growth Data
- Site Trip Generation
- Site Trip Distribution
- Left-Turn Lane Warrants
- Traffic Signal Warrants
- Capacity and Queue Analysis
- Parking Calculations

Appendix F.1

Turning Movement Counts (TMCs)

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	8	78	0	86	49	7	1	57	5	2	0	7	150
7:15 AM	3	78	0	81	68	8	0	76	5	4	0	9	166
7:30 AM	3	72	0	75	85	7	0	92	13	6	0	19	186
7:45 AM	7	74	0	81	67	7	0	74	8	4	0	12	167
Total	21	302	0	323	269	29	1	299	31	16	0	47	669
8:00 AM	5	94	0	99	65	5	0	70	2	4	0	6	175
8:15 AM	3	50	0	53	67	7	0	74	2	3	0	5	132
8:30 AM	6	61	0	67	77	13	0	90	3	7	0	10	167
8:45 AM	5	67	0	72	54	5	0	59	5	6	0	11	142
Total	19	272	0	291	263	30	0	293	12	20	0	32	616
Grand Total	40	574	0	614	532	59	1	592	43	36	0	79	1285
Approach %	6.5	93.5	0.0		89.9	10.0	0.2		54.4	45.6	0.0		
Total %	3.1	44.7	0.0	47.8	41.4	4.6	0.1	46.1	3.3	2.8	0.0	6.1	
Exiting Leg Total				568				618				99	1285
Cars	33	544	0	577	479	53	1	533	38	28	0	66	1176
% Cars	82.5	94.8	0.0	94.0	90.0	89.8	100.0	90.0	88.4	77.8	0.0	83.5	91.5
Exiting Leg Total				507				583				86	1176
Heavy Vehicles	7	30	0	37	53	6	0	59	5	8	0	13	109
% Heavy Vehicles	17.5	5.2	0.0	6.0	10.0	10.2	0.0	10.0	11.6	22.2	0.0	16.5	8.5
Exiting Leg Total				61				35				13	109

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	3	78	0	81	68	8	0	76	5	4	0	9	166
7:30 AM	3	72	0	75	85	7	0	92	13	6	0	19	186
7:45 AM	7	74	0	81	67	7	0	74	8	4	0	12	167
8:00 AM	5	94	0	99	65	5	0	70	2	4	0	6	175
Total Volume	18	318	0	336	285	27	0	312	28	18	0	46	694
% Approach Total	5.4	94.6	0.0		91.3	8.7	0.0		60.9	39.1	0.0		
PHF	0.643	0.846	0.000	0.848	0.838	0.844	0.000	0.848	0.538	0.750	0.000	0.605	0.933
Cars	15	300	0	315	256	25	0	281	23	12	0	35	631
Cars %	83.3	94.3	0.0	93.8	89.8	92.6	0.0	90.1	82.1	66.7	0.0	76.1	90.9
Heavy Vehicles	3	18	0	21	29	2	0	31	5	6	0	11	63
Heavy Vehicles %	16.7	5.7	0.0	6.3	10.2	7.4	0.0	9.9	17.9	33.3	0.0	23.9	9.1
Cars Enter Leg	15	300	0	315	256	25	0	281	23	12	0	35	631
Heavy Enter Leg	3	18	0	21	29	2	0	31	5	6	0	11	63
Total Entering Leg	18	318	0	336	285	27	0	312	28	18	0	46	694
Cars Exiting Leg				268				323				40	631
Heavy Exiting Leg				35				23				5	63
Total Exiting Leg				303				346				45	694

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars-Combined (Motorcycles, Cars, Light Goods)**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	5	75	0	80	42	7	1	50	5	2	0	7	137
7:15 AM	2	75	0	77	59	6	0	65	4	3	0	7	149
7:30 AM	3	70	0	73	76	7	0	83	9	2	0	11	167
7:45 AM	6	70	0	76	64	7	0	71	8	4	0	12	159
Total	16	290	0	306	241	27	1	269	26	11	0	37	612
8:00 AM	4	85	0	89	57	5	0	62	2	3	0	5	156
8:15 AM	2	49	0	51	60	6	0	66	2	3	0	5	122
8:30 AM	6	56	0	62	72	13	0	85	3	6	0	9	156
8:45 AM	5	64	0	69	49	2	0	51	5	5	0	10	130
Total	17	254	0	271	238	26	0	264	12	17	0	29	564
Grand Total	33	544	0	577	479	53	1	533	38	28	0	66	1176
Approach %	5.7	94.3	0.0		89.9	9.9	0.2		57.6	42.4	0.0		
Total %	2.8	46.3	0.0	49.1	40.7	4.5	0.1	45.3	3.2	2.4	0.0	5.6	
Exiting Leg Total				507				583				86	1176

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	2	75	0	77	59	6	0	65	4	3	0	7	149
7:30 AM	3	70	0	73	76	7	0	83	9	2	0	11	167
7:45 AM	6	70	0	76	64	7	0	71	8	4	0	12	159
8:00 AM	4	85	0	89	57	5	0	62	2	3	0	5	156
Total Volume	15	300	0	315	256	25	0	281	23	12	0	35	631
% Approach Total	4.8	95.2	0.0		91.1	8.9	0.0		65.7	34.3	0.0		
PHF	0.625	0.882	0.000	0.885	0.842	0.893	0.000	0.846	0.639	0.750	0.000	0.729	0.945
Entering Leg	15	300	0	315	256	25	0	281	23	12	0	35	631
Exiting Leg				268				323				40	631
Total				583				604				75	1262

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
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46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	3	3	0	6	7	0	0	7	0	0	0	0	13
7:15 AM	1	3	0	4	9	2	0	11	1	1	0	2	17
7:30 AM	0	2	0	2	9	0	0	9	4	4	0	8	19
7:45 AM	1	4	0	5	3	0	0	3	0	0	0	0	8
Total	5	12	0	17	28	2	0	30	5	5	0	10	57
8:00 AM	1	9	0	10	8	0	0	8	0	1	0	1	19
8:15 AM	1	1	0	2	7	1	0	8	0	0	0	0	10
8:30 AM	0	5	0	5	5	0	0	5	0	1	0	1	11
8:45 AM	0	3	0	3	5	3	0	8	0	1	0	1	12
Total	2	18	0	20	25	4	0	29	0	3	0	3	52
Grand Total	7	30	0	37	53	6	0	59	5	8	0	13	109
Approach %	18.9	81.1	0.0		89.8	10.2	0.0		38.5	61.5	0.0		
Total %	6.4	27.5	0.0	33.9	48.6	5.5	0.0	54.1	4.6	7.3	0.0	11.9	
Exiting Leg Total				61				35				13	109
Buses	0	4	0	4	2	0	0	2	0	1	0	1	7
% Buses	0.0	13.3	0.0	10.8	3.8	0.0	0.0	3.4	0.0	12.5	0.0	7.7	6.4
Exiting Leg Total				3				4				0	7
Single-Unit Trucks	5	21	0	26	41	4	0	45	2	5	0	7	78
% Single-Unit	71.4	70.0	0.0	70.3	77.4	66.7	0.0	76.3	40.0	62.5	0.0	53.8	71.6
Exiting Leg Total				46				23				9	78
Articulated Trucks	2	5	0	7	10	2	0	12	3	2	0	5	24
% Articulated	28.6	16.7	0.0	18.9	18.9	33.3	0.0	20.3	60.0	25.0	0.0	38.5	22.0
Exiting Leg Total				12				8				4	24

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	1	3	0	4	9	2	0	11	1	1	0	2	17
7:30 AM	0	2	0	2	9	0	0	9	4	4	0	8	19
7:45 AM	1	4	0	5	3	0	0	3	0	0	0	0	8
8:00 AM	1	9	0	10	8	0	0	8	0	1	0	1	19
Total Volume	3	18	0	21	29	2	0	31	5	6	0	11	63
% Approach Total	14.3	85.7	0.0		93.5	6.5	0.0		45.5	54.5	0.0		
PHF	0.750	0.500	0.000	0.525	0.806	0.250	0.000	0.705	0.313	0.375	0.000	0.344	0.829
Buses	0	3	0	3	2	0	0	2	0	1	0	1	6
Buses %	0.0	16.7	0.0	14.3	6.9	0.0	0.0	6.5	0.0	16.7	0.0	9.1	9.5
Single-Unit Trucks	1	10	0	11	22	2	0	24	2	4	0	6	41
Single-Unit %	33.3	55.6	0.0	52.4	75.9	100.0	0.0	77.4	40.0	66.7	0.0	54.5	65.1
Articulated Trucks	2	5	0	7	5	0	0	5	3	1	0	4	16
Articulated %	66.7	27.8	0.0	33.3	17.2	0.0	0.0	16.1	60.0	16.7	0.0	36.4	25.4
Buses	0	3	0	3	2	0	0	2	0	1	0	1	6
Single-Unit Trucks	1	10	0	11	22	2	0	24	2	4	0	6	41
Articulated Trucks	2	5	0	7	5	0	0	5	3	1	0	4	16
Total Entering Leg	3	18	0	21	29	2	0	31	5	6	0	11	63
Buses				3				3				0	6
Single-Unit Trucks				26				12				3	41
Articulated Trucks				6				8				2	16
Total Exiting Leg				35				23				5	63

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	5	65	0	70	41	6	1	48	3	2	0	5	123
7:15 AM	2	66	0	68	54	6	0	60	1	3	0	4	132
7:30 AM	3	55	0	58	70	5	0	75	8	2	0	10	143
7:45 AM	5	60	0	65	51	7	0	58	8	2	0	10	133
Total	15	246	0	261	216	24	1	241	20	9	0	29	531
8:00 AM	4	72	0	76	45	4	0	49	2	1	0	3	128
8:15 AM	2	43	0	45	56	5	0	61	2	3	0	5	111
8:30 AM	3	52	0	55	68	13	0	81	3	5	0	8	144
8:45 AM	4	62	0	66	46	2	0	48	5	5	0	10	124
Total	13	229	0	242	215	24	0	239	12	14	0	26	507
Grand Total	28	475	0	503	431	48	1	480	32	23	0	55	1038
Approach %	5.6	94.4	0.0		89.8	10.0	0.2		58.2	41.8	0.0		
Total %	2.7	45.8	0.0	48.5	41.5	4.6	0.1	46.2	3.1	2.2	0.0	5.3	
Exiting Leg Total				454				508				76	1038

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	2	66	0	68	54	6	0	60	1	3	0	4	132
7:30 AM	3	55	0	58	70	5	0	75	8	2	0	10	143
7:45 AM	5	60	0	65	51	7	0	58	8	2	0	10	133
8:00 AM	4	72	0	76	45	4	0	49	2	1	0	3	128
Total Volume	14	253	0	267	220	22	0	242	19	8	0	27	536
% Approach Total	5.2	94.8	0.0		90.9	9.1	0.0		70.4	29.6	0.0		
PHF	0.700	0.878	0.000	0.878	0.786	0.786	0.000	0.807	0.594	0.667	0.000	0.675	0.937
Entering Leg	14	253	0	267	220	22	0	242	19	8	0	27	536
Exiting Leg				228				272				36	536
Total				495				514				63	1072

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Light Goods Vehicle**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	10	0	10	1	1	0	2	2	0	0	2	14
7:15 AM	0	9	0	9	5	0	0	5	3	0	0	3	17
7:30 AM	0	15	0	15	6	2	0	8	1	0	0	1	24
7:45 AM	1	10	0	11	13	0	0	13	0	2	0	2	26
Total	1	44	0	45	25	3	0	28	6	2	0	8	81
8:00 AM	0	13	0	13	12	1	0	13	0	2	0	2	28
8:15 AM	0	6	0	6	4	1	0	5	0	0	0	0	11
8:30 AM	3	4	0	7	4	0	0	4	0	1	0	1	12
8:45 AM	1	2	0	3	3	0	0	3	0	0	0	0	6
Total	4	25	0	29	23	2	0	25	0	3	0	3	57
Grand Total	5	69	0	74	48	5	0	53	6	5	0	11	138
Approach %	6.8	93.2	0.0		90.6	9.4	0.0		54.5	45.5	0.0		
Total %	3.6	50.0	0.0	53.6	34.8	3.6	0.0	38.4	4.3	3.6	0.0	8.0	
Exiting Leg Total				53				75				10	138

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	0	9	0	9	5	0	0	5	3	0	0	3	17
7:30 AM	0	15	0	15	6	2	0	8	1	0	0	1	24
7:45 AM	1	10	0	11	13	0	0	13	0	2	0	2	26
8:00 AM	0	13	0	13	12	1	0	13	0	2	0	2	28
Total Volume	1	47	0	48	36	3	0	39	4	4	0	8	95
% Approach Total	2.1	97.9	0.0		92.3	7.7	0.0		50.0	50.0	0.0		
PHF	0.250	0.783	0.000	0.800	0.692	0.375	0.000	0.750	0.333	0.500	0.000	0.667	0.848
Entering Leg	1	47	0	48	36	3	0	39	4	4	0	8	95
Exiting Leg				40				51				4	95
Total				88				90				12	190

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
7:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	2	0	2	2	0	0	2	0	0	0	0	4
8:00 AM	0	2	0	2	0	0	0	0	0	1	0	1	3
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	2	0	0	0	0	0	1	0	1	3
Grand Total	0	4	0	4	2	0	0	2	0	1	0	1	7
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
Total %	0.0	57.1	0.0	57.1	28.6	0.0	0.0	28.6	0.0	14.3	0.0	14.3	
Exiting Leg Total				3				4				0	7

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
8:00 AM	0	2	0	2	0	0	0	0	0	1	0	1	3
Total Volume	0	3	0	3	2	0	0	2	0	1	0	1	6
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.375	0.000	0.375	0.500	0.000	0.000	0.500	0.000	0.250	0.000	0.250	0.500
Entering Leg	0	3	0	3	2	0	0	2	0	1	0	1	6
Exiting Leg				3				3				0	6
Total				6				5				1	12

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	3	2	0	5	5	0	0	5	0	0	0	0	10
7:15 AM	1	1	0	2	8	2	0	10	0	1	0	1	13
7:30 AM	0	1	0	1	7	0	0	7	2	3	0	5	13
7:45 AM	0	3	0	3	1	0	0	1	0	0	0	0	4
Total	4	7	0	11	21	2	0	23	2	4	0	6	40
8:00 AM	0	5	0	5	6	0	0	6	0	0	0	0	11
8:15 AM	1	1	0	2	6	1	0	7	0	0	0	0	9
8:30 AM	0	5	0	5	4	0	0	4	0	0	0	0	9
8:45 AM	0	3	0	3	4	1	0	5	0	1	0	1	9
Total	1	14	0	15	20	2	0	22	0	1	0	1	38
Grand Total	5	21	0	26	41	4	0	45	2	5	0	7	78
Approach %	19.2	80.8	0.0		91.1	8.9	0.0		28.6	71.4	0.0		
Total %	6.4	26.9	0.0	33.3	52.6	5.1	0.0	57.7	2.6	6.4	0.0	9.0	
Exiting Leg Total				46				23				9	78

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	1	1	0	2	8	2	0	10	0	1	0	1	13
7:30 AM	0	1	0	1	7	0	0	7	2	3	0	5	13
7:45 AM	0	3	0	3	1	0	0	1	0	0	0	0	4
8:00 AM	0	5	0	5	6	0	0	6	0	0	0	0	11
Total Volume	1	10	0	11	22	2	0	24	2	4	0	6	41
% Approach Total	9.1	90.9	0.0		91.7	8.3	0.0		33.3	66.7	0.0		
PHF	0.250	0.500	0.000	0.550	0.688	0.250	0.000	0.600	0.250	0.333	0.000	0.300	0.788
Entering Leg	1	10	0	11	22	2	0	24	2	4	0	6	41
Exiting Leg				26				12				3	41
Total				37				36				9	82

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Articulated Trucks**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
7:15 AM	0	1	0	1	1	0	0	1	1	0	0	1	3
7:30 AM	0	1	0	1	1	0	0	1	2	1	0	3	5
7:45 AM	1	1	0	2	1	0	0	1	0	0	0	0	3
Total	1	3	0	4	5	0	0	5	3	1	0	4	13
8:00 AM	1	2	0	3	2	0	0	2	0	0	0	0	5
8:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
8:30 AM	0	0	0	0	1	0	0	1	0	1	0	1	2
8:45 AM	0	0	0	0	1	2	0	3	0	0	0	0	3
Total	1	2	0	3	5	2	0	7	0	1	0	1	11
Grand Total	2	5	0	7	10	2	0	12	3	2	0	5	24
Approach %	28.6	71.4	0.0		83.3	16.7	0.0		60.0	40.0	0.0		
Total %	8.3	20.8	0.0	29.2	41.7	8.3	0.0	50.0	12.5	8.3	0.0	20.8	
Exiting Leg Total				12				8				4	24

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
7:15 AM	0	1	0	1	1	0	0	1	1	0	0	1	3
7:30 AM	0	1	0	1	1	0	0	1	2	1	0	3	5
7:45 AM	1	1	0	2	1	0	0	1	0	0	0	0	3
8:00 AM	1	2	0	3	2	0	0	2	0	0	0	0	5
Total Volume	2	5	0	7	5	0	0	5	3	1	0	4	16
% Approach Total	28.6	71.4	0.0		100.0	0.0	0.0		75.0	25.0	0.0		
PHF	0.500	0.625	0.000	0.583	0.625	0.000	0.000	0.625	0.375	0.250	0.000	0.333	0.800
Entering Leg	2	5	0	7	5	0	0	5	3	1	0	4	16
Exiting Leg				6				8				2	16
Total				13				13				6	32

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 A**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	19	84	0	103	114	5	0	119	1	6	0	7	229
4:15 PM	30	66	0	96	137	11	0	148	4	15	0	19	263
4:30 PM	15	66	0	81	157	3	0	160	5	17	0	22	263
4:45 PM	6	68	0	74	161	3	0	164	3	5	0	8	246
Total	70	284	0	354	569	22	0	591	13	43	0	56	1001
5:00 PM	7	79	0	86	136	7	0	143	1	3	0	4	233
5:15 PM	6	76	0	82	144	4	0	148	3	1	0	4	234
5:30 PM	16	73	0	89	117	3	0	120	1	4	0	5	214
5:45 PM	33	52	0	85	111	12	0	123	3	16	0	19	227
Total	62	280	0	342	508	26	0	534	8	24	0	32	908
Grand Total	132	564	0	696	1077	48	0	1125	21	67	0	88	1909
Approach %	19.0	81.0	0.0		95.7	4.3	0.0		23.9	76.1	0.0		
Total %	6.9	29.5	0.0	36.5	56.4	2.5	0.0	58.9	1.1	3.5	0.0	4.6	
Exiting Leg Total				1144				585				180	1909
Cars	131	530	0	661	1058	48	0	1106	21	67	0	88	1855
% Cars	99.2	94.0	0.0	95.0	98.2	100.0	0.0	98.3	100.0	100.0	0.0	100.0	97.2
Exiting Leg Total				1125				551				179	1855
Heavy Vehicles	1	34	0	35	19	0	0	19	0	0	0	0	54
% Heavy Vehicles	0.8	6.0	0.0	5.0	1.8	0.0	0.0	1.7	0.0	0.0	0.0	0.0	2.8
Exiting Leg Total				19				34				1	54

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:15 PM	30	66	0	96	137	11	0	148	4	15	0	19	263
4:30 PM	15	66	0	81	157	3	0	160	5	17	0	22	263
4:45 PM	6	68	0	74	161	3	0	164	3	5	0	8	246
5:00 PM	7	79	0	86	136	7	0	143	1	3	0	4	233
Total Volume	58	279	0	337	591	24	0	615	13	40	0	53	1005
% Approach Total	17.2	82.8	0.0		96.1	3.9	0.0		24.5	75.5	0.0		
PHF	0.483	0.883	0.000	0.878	0.918	0.545	0.000	0.938	0.650	0.588	0.000	0.602	0.955
Cars	58	261	0	319	577	24	0	601	13	40	0	53	973
Cars %	100.0	93.5	0.0	94.7	97.6	100.0	0.0	97.7	100.0	100.0	0.0	100.0	96.8
Heavy Vehicles	0	18	0	18	14	0	0	14	0	0	0	0	32
Heavy Vehicles %	0.0	6.5	0.0	5.3	2.4	0.0	0.0	2.3	0.0	0.0	0.0	0.0	3.2
Cars Enter Leg	58	261	0	319	577	24	0	601	13	40	0	53	973
Heavy Enter Leg	0	18	0	18	14	0	0	14	0	0	0	0	32
Total Entering Leg	58	279	0	337	591	24	0	615	13	40	0	53	1005
Cars Exiting Leg				617				274				82	973
Heavy Exiting Leg				14				18				0	32
Total Exiting Leg				631				292				82	1005

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars-Combined (Motorcycles, Cars, Light Goods)**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	18	79	0	97	111	5	0	116	1	6	0	7	220
4:15 PM	30	62	0	92	133	11	0	144	4	15	0	19	255
4:30 PM	15	61	0	76	153	3	0	156	5	17	0	22	254
4:45 PM	6	64	0	70	160	3	0	163	3	5	0	8	241
Total	69	266	0	335	557	22	0	579	13	43	0	56	970
5:00 PM	7	74	0	81	131	7	0	138	1	3	0	4	223
5:15 PM	6	70	0	76	143	4	0	147	3	1	0	4	227
5:30 PM	16	70	0	86	117	3	0	120	1	4	0	5	211
5:45 PM	33	50	0	83	110	12	0	122	3	16	0	19	224
Total	62	264	0	326	501	26	0	527	8	24	0	32	885
Grand Total	131	530	0	661	1058	48	0	1106	21	67	0	88	1855
Approach %	19.8	80.2	0.0		95.7	4.3	0.0		23.9	76.1	0.0		
Total %	7.1	28.6	0.0	35.6	57.0	2.6	0.0	59.6	1.1	3.6	0.0	4.7	
Exiting Leg Total				1125				551				179	1855

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:15 PM	30	62	0	92	133	11	0	144	4	15	0	19	255
4:30 PM	15	61	0	76	153	3	0	156	5	17	0	22	254
4:45 PM	6	64	0	70	160	3	0	163	3	5	0	8	241
5:00 PM	7	74	0	81	131	7	0	138	1	3	0	4	223
Total Volume	58	261	0	319	577	24	0	601	13	40	0	53	973
% Approach Total	18.2	81.8	0.0		96.0	4.0	0.0		24.5	75.5	0.0		
PHF	0.483	0.882	0.000	0.867	0.902	0.545	0.000	0.922	0.650	0.588	0.000	0.602	0.954
Entering Leg	58	261	0	319	577	24	0	601	13	40	0	53	973
Exiting Leg				617				274				82	973
Total				936				875				135	1946

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	1	5	0	6	3	0	0	3	0	0	0	0	9
4:15 PM	0	4	0	4	4	0	0	4	0	0	0	0	8
4:30 PM	0	5	0	5	4	0	0	4	0	0	0	0	9
4:45 PM	0	4	0	4	1	0	0	1	0	0	0	0	5
Total	1	18	0	19	12	0	0	12	0	0	0	0	31
5:00 PM	0	5	0	5	5	0	0	5	0	0	0	0	10
5:15 PM	0	6	0	6	1	0	0	1	0	0	0	0	7
5:30 PM	0	3	0	3	0	0	0	0	0	0	0	0	3
5:45 PM	0	2	0	2	1	0	0	1	0	0	0	0	3
Total	0	16	0	16	7	0	0	7	0	0	0	0	23
Grand Total	1	34	0	35	19	0	0	19	0	0	0	0	54
Approach %	2.9	97.1	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	1.9	63.0	0.0	64.8	35.2	0.0	0.0	35.2	0.0	0.0	0.0	0.0	
Exiting Leg Total				19				34				1	54
Buses	0	2	0	2	3	0	0	3	0	0	0	0	5
% Buses	0.0	5.9	0.0	5.7	15.8	0.0	0.0	15.8	0.0	0.0	0.0	0.0	9.3
Exiting Leg Total				3				2				0	5
Single-Unit Trucks	1	26	0	27	10	0	0	10	0	0	0	0	37
% Single-Unit	100.0	76.5	0.0	77.1	52.6	0.0	0.0	52.6	0.0	0.0	0.0	0.0	68.5
Exiting Leg Total				10				26				1	37
Articulated Trucks	0	6	0	6	6	0	0	6	0	0	0	0	12
% Articulated	0.0	17.6	0.0	17.1	31.6	0.0	0.0	31.6	0.0	0.0	0.0	0.0	22.2
Exiting Leg Total				6				6				0	12

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:15 PM	0	4	0	4	4	0	0	4	0	0	0	0	8
4:30 PM	0	5	0	5	4	0	0	4	0	0	0	0	9
4:45 PM	0	4	0	4	1	0	0	1	0	0	0	0	5
5:00 PM	0	5	0	5	5	0	0	5	0	0	0	0	10
Total Volume	0	18	0	18	14	0	0	14	0	0	0	0	32
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.900	0.000	0.900	0.700	0.000	0.000	0.700	0.000	0.000	0.000	0.000	0.800
Buses	0	1	0	1	3	0	0	3	0	0	0	0	4
Buses %	0.0	5.6	0.0	5.6	21.4	0.0	0.0	21.4	0.0	0.0	0.0	0.0	12.5
Single-Unit Trucks	0	14	0	14	6	0	0	6	0	0	0	0	20
Single-Unit %	0.0	77.8	0.0	77.8	42.9	0.0	0.0	42.9	0.0	0.0	0.0	0.0	62.5
Articulated Trucks	0	3	0	3	5	0	0	5	0	0	0	0	8
Articulated %	0.0	16.7	0.0	16.7	35.7	0.0	0.0	35.7	0.0	0.0	0.0	0.0	25.0
Buses	0	1	0	1	3	0	0	3	0	0	0	0	4
Single-Unit Trucks	0	14	0	14	6	0	0	6	0	0	0	0	20
Articulated Trucks	0	3	0	3	5	0	0	5	0	0	0	0	8
Total Entering Leg	0	18	0	18	14	0	0	14	0	0	0	0	32
Buses				3				1				0	4
Single-Unit Trucks				6				14				0	20
Articulated Trucks				5				3				0	8
Total Exiting Leg				14				18				0	32

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	18	63	0	81	88	5	0	93	0	5	0	5	179
4:15 PM	25	52	0	77	117	7	0	124	4	13	0	17	218
4:30 PM	13	53	0	66	135	3	0	138	4	17	0	21	225
4:45 PM	4	55	0	59	141	1	0	142	2	4	0	6	207
Total	60	223	0	283	481	16	0	497	10	39	0	49	829
5:00 PM	6	68	0	74	115	7	0	122	1	2	0	3	199
5:15 PM	5	62	0	67	119	2	0	121	3	1	0	4	192
5:30 PM	15	59	0	74	103	2	0	105	0	3	0	3	182
5:45 PM	32	45	0	77	103	11	0	114	3	14	0	17	208
Total	58	234	0	292	440	22	0	462	7	20	0	27	781
Grand Total	118	457	0	575	921	38	0	959	17	59	0	76	1610
Approach %	20.5	79.5	0.0		96.0	4.0	0.0		22.4	77.6	0.0		
Total %	7.3	28.4	0.0	35.7	57.2	2.4	0.0	59.6	1.1	3.7	0.0	4.7	
Exiting Leg Total				980				474				156	1610

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:15 PM	25	52	0	77	117	7	0	124	4	13	0	17	218
4:30 PM	13	53	0	66	135	3	0	138	4	17	0	21	225
4:45 PM	4	55	0	59	141	1	0	142	2	4	0	6	207
5:00 PM	6	68	0	74	115	7	0	122	1	2	0	3	199
Total Volume	48	228	0	276	508	18	0	526	11	36	0	47	849
% Approach Total	17.4	82.6	0.0		96.6	3.4	0.0		23.4	76.6	0.0		
PHF	0.480	0.838	0.000	0.896	0.901	0.643	0.000	0.926	0.688	0.529	0.000	0.560	0.943
Entering Leg	48	228	0	276	508	18	0	526	11	36	0	47	849
Exiting Leg				544				239				66	849
Total				820				765				113	1698

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Light Goods Vehicle**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	0	16	0	16	23	0	0	23	1	1	0	2	41
4:15 PM	5	10	0	15	16	4	0	20	0	2	0	2	37
4:30 PM	2	8	0	10	18	0	0	18	1	0	0	1	29
4:45 PM	2	9	0	11	19	2	0	21	1	1	0	2	34
Total	9	43	0	52	76	6	0	82	3	4	0	7	141
5:00 PM	1	6	0	7	16	0	0	16	0	1	0	1	24
5:15 PM	1	8	0	9	24	2	0	26	0	0	0	0	35
5:30 PM	1	11	0	12	14	1	0	15	1	1	0	2	29
5:45 PM	1	5	0	6	7	1	0	8	0	2	0	2	16
Total	4	30	0	34	61	4	0	65	1	4	0	5	104
Grand Total	13	73	0	86	137	10	0	147	4	8	0	12	245
Approach %	15.1	84.9	0.0		93.2	6.8	0.0		33.3	66.7	0.0		
Total %	5.3	29.8	0.0	35.1	55.9	4.1	0.0	60.0	1.6	3.3	0.0	4.9	
Exiting Leg Total				145				77				23	245

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	0	16	0	16	23	0	0	23	1	1	0	2	41
4:15 PM	5	10	0	15	16	4	0	20	0	2	0	2	37
4:30 PM	2	8	0	10	18	0	0	18	1	0	0	1	29
4:45 PM	2	9	0	11	19	2	0	21	1	1	0	2	34
Total Volume	9	43	0	52	76	6	0	82	3	4	0	7	141
% Approach Total	17.3	82.7	0.0		92.7	7.3	0.0		42.9	57.1	0.0		
PHF	0.450	0.672	0.000	0.813	0.826	0.375	0.000	0.891	0.750	0.500	0.000	0.875	0.860
Entering Leg	9	43	0	52	76	6	0	82	3	4	0	7	141
Exiting Leg				80				46				15	141
Total				132				128				22	282

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
4:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	1	0	1	3	0	0	3	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	2	0	2	3	0	0	3	0	0	0	0	5
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	40.0	0.0	40.0	60.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				3				2				0	5

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
4:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	1	3	0	0	3	0	0	0	0	4
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.375	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	1	0	1	3	0	0	3	0	0	0	0	4
Exiting Leg				3				1				0	4
Total				4				4				0	8

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	1	5	0	6	3	0	0	3	0	0	0	0	9
4:15 PM	0	4	0	4	1	0	0	1	0	0	0	0	5
4:30 PM	0	4	0	4	1	0	0	1	0	0	0	0	5
4:45 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
Total	1	15	0	16	5	0	0	5	0	0	0	0	21
5:00 PM	0	4	0	4	4	0	0	4	0	0	0	0	8
5:15 PM	0	3	0	3	0	0	0	0	0	0	0	0	3
5:30 PM	0	3	0	3	0	0	0	0	0	0	0	0	3
5:45 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
Total	0	11	0	11	5	0	0	5	0	0	0	0	16
Grand Total	1	26	0	27	10	0	0	10	0	0	0	0	37
Approach %	3.7	96.3	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	2.7	70.3	0.0	73.0	27.0	0.0	0.0	27.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				10				26				1	37

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	1	5	0	6	3	0	0	3	0	0	0	0	9
4:15 PM	0	4	0	4	1	0	0	1	0	0	0	0	5
4:30 PM	0	4	0	4	1	0	0	1	0	0	0	0	5
4:45 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
Total Volume	1	15	0	16	5	0	0	5	0	0	0	0	21
% Approach Total	6.3	93.8	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.250	0.750	0.000	0.667	0.417	0.000	0.000	0.417	0.000	0.000	0.000	0.000	0.583
Entering Leg	1	15	0	16	5	0	0	5	0	0	0	0	21
Exiting Leg				5				15				1	21
Total				21				20				1	42

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Articulated Trucks**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
4:30 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
4:45 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
Total	0	2	0	2	4	0	0	4	0	0	0	0	6
5:00 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
5:15 PM	0	2	0	2	1	0	0	1	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	4	0	4	2	0	0	2	0	0	0	0	6
Grand Total	0	6	0	6	6	0	0	6	0	0	0	0	12
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	50.0	0.0	50.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				6				6				0	12

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
4:30 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
4:45 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
5:00 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
5:15 PM	0	2	0	2	1	0	0	1	0	0	0	0	3
Total Volume	0	5	0	5	4	0	0	4	0	0	0	0	9
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.625	0.000	0.625	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.750
Entering Leg	0	5	0	5	4	0	0	4	0	0	0	0	9
Exiting Leg				4				5				0	9
Total				9				9				0	18

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 AA**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Pedestrians

	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	5	0	71	0	76	46	50	0	0	96	0	0	0	0	0	0	206	7	0	213	385
7:15 AM	6	0	72	0	78	64	82	0	0	146	0	0	0	0	0	0	219	8	0	227	451
7:30 AM	8	0	71	0	79	81	98	0	0	179	0	0	0	0	0	0	166	15	0	181	439
7:45 AM	12	0	78	0	90	59	81	0	0	140	0	0	0	0	0	0	161	10	0	171	401
Total	31	0	292	0	323	250	311	0	0	561	0	0	0	0	0	0	752	40	0	792	1676
8:00 AM	10	0	72	0	82	55	85	0	0	140	0	0	0	0	0	0	158	13	0	171	393
8:15 AM	9	0	74	1	84	67	66	0	0	133	0	0	0	0	0	0	132	11	0	143	360
8:30 AM	2	0	60	0	62	73	92	0	0	165	0	0	0	0	0	0	112	6	0	118	345
8:45 AM	4	0	63	0	67	56	89	0	0	145	0	0	0	0	0	0	122	14	0	136	348
Total	25	0	269	1	295	251	332	0	0	583	0	0	0	0	0	0	524	44	0	568	1446
Grand Total	56	0	561	1	618	501	643	0	0	1144	0	0	0	0	0	0	1276	84	0	1360	3122
Approach %	9.1	0.0	90.8	0.2		43.8	56.2	0.0	0.0		0.0	0.0	0.0	0.0		0.0	93.8	6.2	0.0		
Total %	1.8	0.0	18.0	0.0	19.8	16.0	20.6	0.0	0.0	36.6	0.0	0.0	0.0	0.0	0.0	0.0	40.9	2.7	0.0	43.6	
Exiting Leg Total					586					1837					0					699	3122
Cars	53	0	527	1	581	469	579	0	0	1048	0	0	0	0	0	0	1228	83	0	1311	2940
% Cars	94.6	0.0	93.9	100.0	94.0	93.6	90.0	0.0	0.0	91.6	0.0	0.0	0.0	0.0	0.0	0.0	96.2	98.8	0.0	96.4	94.2
Exiting Leg Total					553					1755					0					632	2940
Heavy Vehicles	3	0	34	0	37	32	64	0	0	96	0	0	0	0	0	0	48	1	0	49	182
% Heavy Vehicles	5.4	0.0	6.1	0.0	6.0	6.4	10.0	0.0	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	3.8	1.2	0.0	3.6	5.8
Exiting Leg Total					33					82					0					67	182

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	6	0	72	0	78	64	82	0	0	146	0	0	0	0	0	0	219	8	0	227	451
7:30 AM	8	0	71	0	79	81	98	0	0	179	0	0	0	0	0	0	166	15	0	181	439
7:45 AM	12	0	78	0	90	59	81	0	0	140	0	0	0	0	0	0	161	10	0	171	401
8:00 AM	10	0	72	0	82	55	85	0	0	140	0	0	0	0	0	0	158	13	0	171	393
Total Volume	36	0	293	0	329	259	346	0	0	605	0	0	0	0	0	0	704	46	0	750	1684
% Approach Total	10.9	0.0	89.1	0.0		42.8	57.2	0.0	0.0		0.0	0.0	0.0	0.0		0.0	93.9	6.1	0.0		
PHF	0.750	0.000	0.939	0.000	0.914	0.799	0.883	0.000	0.000	0.845	0.000	0.000	0.000	0.000	0.000	0.000	0.804	0.767	0.000	0.826	0.933
Cars	35	0	270	0	305	243	324	0	0	567	0	0	0	0	0	0	677	45	0	722	1594
Cars %	97.2	0.0	92.2	0.0	92.7	93.8	93.6	0.0	0.0	93.7	0.0	0.0	0.0	0.0	0.0	0.0	96.2	97.8	0.0	96.3	94.7
Heavy Vehicles	1	0	23	0	24	16	22	0	0	38	0	0	0	0	0	0	27	1	0	28	90
Heavy Vehicles %	2.8	0.0	7.8	0.0	7.3	6.2	6.4	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	3.8	2.2	0.0	3.7	5.3
Cars Enter Leg	35	0	270	0	305	243	324	0	0	567	0	0	0	0	0	0	677	45	0	722	1594
Heavy Enter Leg	1	0	23	0	24	16	22	0	0	38	0	0	0	0	0	0	27	1	0	28	90
Total Entering Leg	36	0	293	0	329	259	346	0	0	605	0	0	0	0	0	0	704	46	0	750	1684
Cars Exiting Leg					288					947					0					359	1594
Heavy Exiting Leg					17					50					0					23	90
Total Exiting Leg					305					997					0					382	1684

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars-Combined (Motorcycles, Cars, Light Goods)

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	5	0	70	0	75	44	45	0	0	89	0	0	0	0	0	0	203	7	0	210	374
7:15 AM	6	0	68	0	74	63	78	0	0	141	0	0	0	0	0	0	210	7	0	217	432
7:30 AM	8	0	64	0	72	73	88	0	0	161	0	0	0	0	0	0	161	15	0	176	409
7:45 AM	12	0	72	0	84	57	80	0	0	137	0	0	0	0	0	0	157	10	0	167	388
Total	31	0	274	0	305	237	291	0	0	528	0	0	0	0	0	0	731	39	0	770	1603
8:00 AM	9	0	66	0	75	50	78	0	0	128	0	0	0	0	0	0	149	13	0	162	365
8:15 AM	8	0	71	1	80	63	56	0	0	119	0	0	0	0	0	0	125	11	0	136	335
8:30 AM	1	0	55	0	56	71	79	0	0	150	0	0	0	0	0	0	106	6	0	112	318
8:45 AM	4	0	61	0	65	48	75	0	0	123	0	0	0	0	0	0	117	14	0	131	319
Total	22	0	253	1	276	232	288	0	0	520	0	0	0	0	0	0	497	44	0	541	1337
Grand Total	53	0	527	1	581	469	579	0	0	1048	0	0	0	0	0	0	1228	83	0	1311	2940
Approach %	9.1	0.0	90.7	0.2		44.8	55.2	0.0	0.0		0.0	0.0	0.0	0.0		0.0	93.7	6.3	0.0		
Total %	1.8	0.0	17.9	0.0	19.8	16.0	19.7	0.0	0.0	35.6	0.0	0.0	0.0	0.0	0.0	0.0	41.8	2.8	0.0	44.6	
Exiting Leg Total					553					1755					0					632	2940

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	5	0	70	0	75	44	45	0	0	89	0	0	0	0	0	0	203	7	0	210	374
7:15 AM	6	0	68	0	74	63	78	0	0	141	0	0	0	0	0	0	210	7	0	217	432
7:30 AM	8	0	64	0	72	73	88	0	0	161	0	0	0	0	0	0	161	15	0	176	409
7:45 AM	12	0	72	0	84	57	80	0	0	137	0	0	0	0	0	0	157	10	0	167	388
Total Volume	31	0	274	0	305	237	291	0	0	528	0	0	0	0	0	0	731	39	0	770	1603
% Approach Total	10.2	0.0	89.8	0.0		44.9	55.1	0.0	0.0		0.0	0.0	0.0	0.0		0.0	94.9	5.1	0.0		
PHF	0.646	0.000	0.951	0.000	0.908	0.812	0.827	0.000	0.000	0.820	0.000	0.000	0.000	0.000	0.000	0.000	0.870	0.650	0.000	0.887	0.928
Entering Leg	31	0	274	0	305	237	291	0	0	528	0	0	0	0	0	0	731	39	0	770	1603
Exiting Leg					276					1005					0					322	1603
Total					581					1533					0					1092	3206

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	1	0	1	2	5	0	0	7	0	0	0	0	0	0	3	0	0	3	11
7:15 AM	0	0	4	0	4	1	4	0	0	5	0	0	0	0	0	0	9	1	0	10	19
7:30 AM	0	0	7	0	7	8	10	0	0	18	0	0	0	0	0	0	5	0	0	5	30
7:45 AM	0	0	6	0	6	2	1	0	0	3	0	0	0	0	0	0	4	0	0	4	13
Total	0	0	18	0	18	13	20	0	0	33	0	0	0	0	0	0	21	1	0	22	73
8:00 AM	1	0	6	0	7	5	7	0	0	12	0	0	0	0	0	0	9	0	0	9	28
8:15 AM	1	0	3	0	4	4	10	0	0	14	0	0	0	0	0	0	7	0	0	7	25
8:30 AM	1	0	5	0	6	2	13	0	0	15	0	0	0	0	0	0	6	0	0	6	27
8:45 AM	0	0	2	0	2	8	14	0	0	22	0	0	0	0	0	0	5	0	0	5	29
Total	3	0	16	0	19	19	44	0	0	63	0	0	0	0	0	0	27	0	0	27	109
Grand Total	3	0	34	0	37	32	64	0	0	96	0	0	0	0	0	0	48	1	0	49	182
Approach %	8.1	0.0	91.9	0.0		33.3	66.7	0.0	0.0		0.0	0.0	0.0	0.0		0.0	98.0	2.0	0.0		
Total %	1.6	0.0	18.7	0.0	20.3	17.6	35.2	0.0	0.0	52.7	0.0	0.0	0.0	0.0	0.0	0.0	26.4	0.5	0.0	26.9	
Exiting Leg Total					33					82					0					67	182
Buses	1	0	3	0	4	2	22	0	0	24	0	0	0	0	0	0	6	0	0	6	34
% Buses	33.3	0.0	8.8	0.0	10.8	6.3	34.4	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	12.2	18.7
Exiting Leg Total					2					9					0					23	34
Single-Unit Trucks	2	0	22	0	24	21	25	0	0	46	0	0	0	0	0	0	35	1	0	36	106
% Single-Unit	66.7	0.0	64.7	0.0	64.9	65.6	39.1	0.0	0.0	47.9	0.0	0.0	0.0	0.0	0.0	0.0	72.9	100.0	0.0	73.5	58.2
Exiting Leg Total					22					57					0					27	106
Articulated Trucks	0	0	9	0	9	9	17	0	0	26	0	0	0	0	0	0	7	0	0	7	42
% Articulated	0.0	0.0	26.5	0.0	24.3	28.1	26.6	0.0	0.0	27.1	0.0	0.0	0.0	0.0	0.0	0.0	14.6	0.0	0.0	14.3	23.1
Exiting Leg Total					9					16					0					17	42

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	1	0	6	0	7	5	7	0	0	12	0	0	0	0	0	0	9	0	0	9	28
8:15 AM	1	0	3	0	4	4	10	0	0	14	0	0	0	0	0	0	7	0	0	7	25
8:30 AM	1	0	5	0	6	2	13	0	0	15	0	0	0	0	0	0	6	0	0	6	27
8:45 AM	0	0	2	0	2	8	14	0	0	22	0	0	0	0	0	0	5	0	0	5	29
Total Volume	3	0	16	0	19	19	44	0	0	63	0	0	0	0	0	0	27	0	0	27	109
% Approach Total	15.8	0.0	84.2	0.0		30.2	69.8	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.750	0.000	0.667	0.000	0.679	0.594	0.786	0.000	0.000	0.716	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.750	0.940
Buses	1	0	1	0	2	0	20	0	0	20	0	0	0	0	0	0	2	0	0	2	24
Buses %	33.3	0.0	6.3	0.0	10.5	0.0	45.5	0.0	0.0	31.7	0.0	0.0	0.0	0.0	0.0	0.0	7.4	0.0	0.0	7.4	22.0
Single-Unit Trucks	2	0	12	0	14	13	16	0	0	29	0	0	0	0	0	0	23	0	0	23	66
Single-Unit %	66.7	0.0	75.0	0.0	73.7	68.4	36.4	0.0	0.0	46.0	0.0	0.0	0.0	0.0	0.0	0.0	85.2	0.0	0.0	85.2	60.6
Articulated Trucks	0	0	3	0	3	6	8	0	0	14	0	0	0	0	0	0	2	0	0	2	19
Articulated %	0.0	0.0	18.8	0.0	15.8	31.6	18.2	0.0	0.0	22.2	0.0	0.0	0.0	0.0	0.0	0.0	7.4	0.0	0.0	7.4	17.4
Buses	1	0	1	0	2	0	20	0	0	20	0	0	0	0	0	0	2	0	0	2	24
Single-Unit Trucks	2	0	12	0	14	13	16	0	0	29	0	0	0	0	0	0	23	0	0	23	66
Articulated Trucks	0	0	3	0	3	6	8	0	0	14	0	0	0	0	0	0	2	0	0	2	19
Total Entering Leg	3	0	16	0	19	19	44	0	0	63	0	0	0	0	0	0	27	0	0	27	109
Buses					0					3					0					21	24
Single-Unit Trucks					13					35					0					18	66
Articulated Trucks					6					5					0					8	19
Total Exiting Leg					19					43					0					47	109

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	58	0	62	43	33	0	0	76	0	0	0	0	0	0	171	7	0	178	316
7:15 AM	6	0	59	0	65	55	68	0	0	123	0	0	0	0	0	0	193	6	0	199	387
7:30 AM	7	0	52	0	59	58	68	0	0	126	0	0	0	0	0	0	136	13	0	149	334
7:45 AM	10	0	61	0	71	43	72	0	0	115	0	0	0	0	0	0	137	8	0	145	331
Total	27	0	230	0	257	199	241	0	0	440	0	0	0	0	0	0	637	34	0	671	1368
8:00 AM	8	0	55	0	63	39	61	0	0	100	0	0	0	0	0	0	131	12	0	143	306
8:15 AM	6	0	62	1	69	57	46	0	0	103	0	0	0	0	0	0	111	10	0	121	293
8:30 AM	1	0	47	0	48	68	66	0	0	134	0	0	0	0	0	0	86	5	0	91	273
8:45 AM	4	0	53	0	57	42	64	0	0	106	0	0	0	0	0	0	98	13	0	111	274
Total	19	0	217	1	237	206	237	0	0	443	0	0	0	0	0	0	426	40	0	466	1146
Grand Total	46	0	447	1	494	405	478	0	0	883	0	0	0	0	0	0	1063	74	0	1137	2514
Approach %	9.3	0.0	90.5	0.2		45.9	54.1	0.0	0.0		0.0	0.0	0.0	0.0		0.0	93.5	6.5	0.0		
Total %	1.8	0.0	17.8	0.0	19.6	16.1	19.0	0.0	0.0	35.1	0.0	0.0	0.0	0.0	0.0	0.0	42.3	2.9	0.0	45.2	
Exiting Leg Total					480					1510					0					524	2514

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	58	0	62	43	33	0	0	76	0	0	0	0	0	0	171	7	0	178	316
7:15 AM	6	0	59	0	65	55	68	0	0	123	0	0	0	0	0	0	193	6	0	199	387
7:30 AM	7	0	52	0	59	58	68	0	0	126	0	0	0	0	0	0	136	13	0	149	334
7:45 AM	10	0	61	0	71	43	72	0	0	115	0	0	0	0	0	0	137	8	0	145	331
Total Volume	27	0	230	0	257	199	241	0	0	440	0	0	0	0	0	0	637	34	0	671	1368
% Approach Total	10.5	0.0	89.5	0.0		45.2	54.8	0.0	0.0		0.0	0.0	0.0	0.0		0.0	94.9	5.1	0.0		
PHF	0.675	0.000	0.943	0.000	0.905	0.858	0.837	0.000	0.000	0.873	0.000	0.000	0.000	0.000	0.000	0.000	0.825	0.654	0.000	0.843	0.884
Entering Leg	27	0	230	0	257	199	241	0	0	440	0	0	0	0	0	0	637	34	0	671	1368
Exiting Leg					233					867					0					268	1368
Total					490					1307					0					939	2736

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Light Goods Vehicle

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	0	12	0	13	1	12	0	0	13	0	0	0	0	0	0	32	0	0	32	58
7:15 AM	0	0	9	0	9	8	10	0	0	18	0	0	0	0	0	0	17	1	0	18	45
7:30 AM	1	0	12	0	13	15	20	0	0	35	0	0	0	0	0	0	25	2	0	27	75
7:45 AM	2	0	11	0	13	14	8	0	0	22	0	0	0	0	0	0	20	2	0	22	57
Total	4	0	44	0	48	38	50	0	0	88	0	0	0	0	0	0	94	5	0	99	235
8:00 AM	1	0	11	0	12	11	17	0	0	28	0	0	0	0	0	0	18	1	0	19	59
8:15 AM	2	0	9	0	11	6	10	0	0	16	0	0	0	0	0	0	14	1	0	15	42
8:30 AM	0	0	8	0	8	3	13	0	0	16	0	0	0	0	0	0	20	1	0	21	45
8:45 AM	0	0	8	0	8	6	11	0	0	17	0	0	0	0	0	0	19	1	0	20	45
Total	3	0	36	0	39	26	51	0	0	77	0	0	0	0	0	0	71	4	0	75	191
Grand Total	7	0	80	0	87	64	101	0	0	165	0	0	0	0	0	0	165	9	0	174	426
Approach %	8.0	0.0	92.0	0.0		38.8	61.2	0.0	0.0		0.0	0.0	0.0	0.0		0.0	94.8	5.2	0.0		
Total %	1.6	0.0	18.8	0.0	20.4	15.0	23.7	0.0	0.0	38.7	0.0	0.0	0.0	0.0	0.0	0.0	38.7	2.1	0.0	40.8	
Exiting Leg Total					73					245					0					108	426

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	0	0	9	0	9	8	10	0	0	18	0	0	0	0	0	0	17	1	0	18	45
7:30 AM	1	0	12	0	13	15	20	0	0	35	0	0	0	0	0	0	25	2	0	27	75
7:45 AM	2	0	11	0	13	14	8	0	0	22	0	0	0	0	0	0	20	2	0	22	57
8:00 AM	1	0	11	0	12	11	17	0	0	28	0	0	0	0	0	0	18	1	0	19	59
Total Volume	4	0	43	0	47	48	55	0	0	103	0	0	0	0	0	0	80	6	0	86	236
% Approach Total	8.5	0.0	91.5	0.0		46.6	53.4	0.0	0.0		0.0	0.0	0.0	0.0		0.0	93.0	7.0	0.0		
PHF	0.500	0.000	0.896	0.000	0.904	0.800	0.688	0.000	0.000	0.736	0.000	0.000	0.000	0.000	0.000	0.000	0.800	0.750	0.000	0.796	0.787
Entering Leg	4	0	43	0	47	48	55	0	0	103	0	0	0	0	0	0	80	6	0	86	236
Exiting Leg					54					123					0					59	236
Total					101					226					0					145	472

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	5
7:30 AM	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	0	1	0	0	1	4
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	2	0	2	2	2	0	0	4	0	0	0	0	0	0	4	0	0	4	10
8:00 AM	1	0	1	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	5
8:30 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	1	0	0	1	10
8:45 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Total	1	0	1	0	2	0	20	0	0	20	0	0	0	0	0	0	2	0	0	2	24
Grand Total	1	0	3	0	4	2	22	0	0	24	0	0	0	0	0	0	6	0	0	6	34
Approach %	25.0	0.0	75.0	0.0		8.3	91.7	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	2.9	0.0	8.8	0.0	11.8	5.9	64.7	0.0	0.0	70.6	0.0	0.0	0.0	0.0	0.0	0.0	17.6	0.0	0.0	17.6	
Exiting Leg Total					2					9					0					23	34

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	1	0	1	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	5
8:30 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	1	0	0	1	10
8:45 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Total Volume	1	0	1	0	2	0	20	0	0	20	0	0	0	0	0	0	2	0	0	2	24
% Approach Total	50.0	0.0	50.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.250	0.000	0.250	0.000	0.250	0.000	0.556	0.000	0.000	0.556	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.600
Entering Leg	1	0	1	0	2	0	20	0	0	20	0	0	0	0	0	0	2	0	0	2	24
Exiting Leg					0					3					0					21	24
Total					2					23					0					23	48

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	1	0	1	2	2	0	0	4	0	0	0	0	0	0	2	0	0	2	7
7:15 AM	0	0	2	0	2	1	2	0	0	3	0	0	0	0	0	0	5	1	0	6	11
7:30 AM	0	0	3	0	3	5	5	0	0	10	0	0	0	0	0	0	2	0	0	2	15
7:45 AM	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	7
Total	0	0	10	0	10	8	9	0	0	17	0	0	0	0	0	0	12	1	0	13	40
8:00 AM	0	0	3	0	3	5	5	0	0	10	0	0	0	0	0	0	8	0	0	8	21
8:15 AM	1	0	2	0	3	3	4	0	0	7	0	0	0	0	0	0	6	0	0	6	16
8:30 AM	1	0	5	0	6	2	3	0	0	5	0	0	0	0	0	0	4	0	0	4	15
8:45 AM	0	0	2	0	2	3	4	0	0	7	0	0	0	0	0	0	5	0	0	5	14
Total	2	0	12	0	14	13	16	0	0	29	0	0	0	0	0	0	23	0	0	23	66
Grand Total	2	0	22	0	24	21	25	0	0	46	0	0	0	0	0	0	35	1	0	36	106
Approach %	8.3	0.0	91.7	0.0		45.7	54.3	0.0	0.0		0.0	0.0	0.0	0.0		0.0	97.2	2.8	0.0		
Total %	1.9	0.0	20.8	0.0	22.6	19.8	23.6	0.0	0.0	43.4	0.0	0.0	0.0	0.0	0.0	0.0	33.0	0.9	0.0	34.0	
Exiting Leg Total					22					57					0					27	106

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	3	0	3	5	5	0	0	10	0	0	0	0	0	0	8	0	0	8	21
8:15 AM	1	0	2	0	3	3	4	0	0	7	0	0	0	0	0	0	6	0	0	6	16
8:30 AM	1	0	5	0	6	2	3	0	0	5	0	0	0	0	0	0	4	0	0	4	15
8:45 AM	0	0	2	0	2	3	4	0	0	7	0	0	0	0	0	0	5	0	0	5	14
Total Volume	2	0	12	0	14	13	16	0	0	29	0	0	0	0	0	0	23	0	0	23	66
% Approach Total	14.3	0.0	85.7	0.0		44.8	55.2	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.500	0.000	0.600	0.000	0.583	0.650	0.800	0.000	0.000	0.725	0.000	0.000	0.000	0.000	0.000	0.000	0.719	0.000	0.000	0.719	0.786
Entering Leg	2	0	12	0	14	13	16	0	0	29	0	0	0	0	0	0	23	0	0	23	66
Exiting Leg					13					35					0					18	66
Total					27					64					0					41	132

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
7:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
7:30 AM	0	0	4	0	4	1	4	0	0	5	0	0	0	0	0	0	2	0	0	2	11
7:45 AM	0	0	2	0	2	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	5
Total	0	0	6	0	6	3	9	0	0	12	0	0	0	0	0	0	5	0	0	5	23
8:00 AM	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	4
8:15 AM	0	0	1	0	1	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
8:45 AM	0	0	0	0	0	5	4	0	0	9	0	0	0	0	0	0	0	0	0	0	9
Total	0	0	3	0	3	6	8	0	0	14	0	0	0	0	0	0	2	0	0	2	19
Grand Total	0	0	9	0	9	9	17	0	0	26	0	0	0	0	0	0	7	0	0	7	42
Approach %	0.0	0.0	100.0	0.0		34.6	65.4	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	21.4	0.0	21.4	21.4	40.5	0.0	0.0	61.9	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	16.7	
Exiting Leg Total					9					16					0					17	42

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:30 AM	0	0	4	0	4	1	4	0	0	5	0	0	0	0	0	0	2	0	0	2	11
7:45 AM	0	0	2	0	2	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	5
8:00 AM	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	4
8:15 AM	0	0	1	0	1	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	0	9	0	9	4	8	0	0	12	0	0	0	0	0	0	3	0	0	3	24
% Approach Total	0.0	0.0	100.0	0.0		33.3	66.7	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.563	0.000	0.563	0.500	0.500	0.000	0.000	0.600	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375	0.545
Entering Leg	0	0	9	0	9	4	8	0	0	12	0	0	0	0	0	0	3	0	0	3	24
Exiting Leg					4					12					0					8	24
Total					13					24					0					11	48

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North							Main Street (Route 70/117) from East							Driveway from South							Main Street (Route 117) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North							Main Street (Route 70/117) from East							Driveway from South							Main Street (Route 117) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 B**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Pedestrians**

	Lunenburg Road (Route 70) from North							Main Street (Route 70/117) from East							Driveway from South							Main Street (Route 117) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	3
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	33.3	66.7		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33.3	66.7	100	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							3							0	3

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North							Main Street (Route 70/117) from East							Driveway from South							Main Street (Route 117) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
Exiting Leg							0							0							2							0	2
Total							0							0							4							0	4

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	13	0	49	0	62	106	217	0	0	323	0	0	0	0	0	0	114	8	0	122	507
4:15 PM	18	0	54	0	72	150	187	0	0	337	0	0	0	0	0	0	111	11	0	122	531
4:30 PM	17	0	56	0	73	148	165	0	0	313	0	0	0	0	0	0	113	16	0	129	515
4:45 PM	13	0	60	0	73	133	145	0	0	278	0	0	0	0	0	0	98	10	0	108	459
Total	61	0	219	0	280	537	714	0	0	1251	0	0	0	0	0	0	436	45	0	481	2012
5:00 PM	21	0	56	0	77	123	156	0	0	279	0	0	0	0	0	0	105	9	0	114	470
5:15 PM	11	0	50	0	61	134	188	0	0	322	0	0	0	0	0	0	99	18	0	117	500
5:30 PM	22	0	69	0	91	111	173	0	0	284	0	0	0	0	0	0	96	3	0	99	474
5:45 PM	13	0	52	0	65	106	153	0	0	259	0	0	0	0	0	0	97	9	0	106	430
Total	67	0	227	0	294	474	670	0	0	1144	0	0	0	0	0	0	397	39	0	436	1874
Grand Total	128	0	446	0	574	1011	1384	0	0	2395	0	0	0	0	0	0	833	84	0	917	3886
Approach %	22.3	0.0	77.7	0.0		42.2	57.8	0.0	0.0		0.0	0.0	0.0	0.0		0.0	90.8	9.2	0.0		
Total %	3.3	0.0	11.5	0.0	14.8	26.0	35.6	0.0	0.0	61.6	0.0	0.0	0.0	0.0	0.0	0.0	21.4	2.2	0.0	23.6	
Exiting Leg Total					1095					1279					0					1512	3886
Cars	127	0	439	0	566	1003	1358	0	0	2361	0	0	0	0	0	0	806	84	0	890	3817
% Cars	99.2	0.0	98.4	0.0	98.6	99.2	98.1	0.0	0.0	98.6	0.0	0.0	0.0	0.0	0.0	0.0	96.8	100.0	0.0	97.1	98.2
Exiting Leg Total					1087					1245					0					1485	3817
Heavy Vehicles	1	0	7	0	8	8	26	0	0	34	0	0	0	0	0	0	27	0	0	27	69
% Heavy Vehicles	0.8	0.0	1.6	0.0	1.4	0.8	1.9	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	2.9	1.8
Exiting Leg Total					8					34					0					27	69

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	13	0	49	0	62	106	217	0	0	323	0	0	0	0	0	0	114	8	0	122	507
4:15 PM	18	0	54	0	72	150	187	0	0	337	0	0	0	0	0	0	111	11	0	122	531
4:30 PM	17	0	56	0	73	148	165	0	0	313	0	0	0	0	0	0	113	16	0	129	515
4:45 PM	13	0	60	0	73	133	145	0	0	278	0	0	0	0	0	0	98	10	0	108	459
Total Volume	61	0	219	0	280	537	714	0	0	1251	0	0	0	0	0	0	436	45	0	481	2012
% Approach Total	21.8	0.0	78.2	0.0		42.9	57.1	0.0	0.0		0.0	0.0	0.0	0.0		0.0	90.6	9.4	0.0		
PHF	0.847	0.000	0.913	0.000	0.959	0.895	0.823	0.000	0.000	0.928	0.000	0.000	0.000	0.000	0.000	0.000	0.956	0.703	0.000	0.932	0.947
Cars	61	0	214	0	275	531	696	0	0	1227	0	0	0	0	0	0	421	45	0	466	1968
Cars %	100.0	0.0	97.7	0.0	98.2	98.9	97.5	0.0	0.0	98.1	0.0	0.0	0.0	0.0	0.0	0.0	96.6	100.0	0.0	96.9	97.8
Heavy Vehicles	0	0	5	0	5	6	18	0	0	24	0	0	0	0	0	0	15	0	0	15	44
Heavy Vehicles %	0.0	0.0	2.3	0.0	1.8	1.1	2.5	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	3.1	2.2
Cars Enter Leg	61	0	214	0	275	531	696	0	0	1227	0	0	0	0	0	0	421	45	0	466	1968
Heavy Enter Leg	0	0	5	0	5	6	18	0	0	24	0	0	0	0	0	0	15	0	0	15	44
Total Entering Leg	61	0	219	0	280	537	714	0	0	1251	0	0	0	0	0	0	436	45	0	481	2012
Cars Exiting Leg					576					635					0					757	1968
Heavy Exiting Leg					6					20					0					18	44
Total Exiting Leg					582					655					0					775	2012

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars-Combined (Motorcycles, Cars, Light Goods)

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	13	0	47	0	60	105	210	0	0	315	0	0	0	0	0	0	110	8	0	118	493
4:15 PM	18	0	54	0	72	150	183	0	0	333	0	0	0	0	0	0	109	11	0	120	525
4:30 PM	17	0	55	0	72	145	160	0	0	305	0	0	0	0	0	0	109	16	0	125	502
4:45 PM	13	0	58	0	71	131	143	0	0	274	0	0	0	0	0	0	93	10	0	103	448
Total	61	0	214	0	275	531	696	0	0	1227	0	0	0	0	0	0	421	45	0	466	1968
5:00 PM	21	0	55	0	76	122	154	0	0	276	0	0	0	0	0	0	101	9	0	110	462
5:15 PM	11	0	50	0	61	133	187	0	0	320	0	0	0	0	0	0	96	18	0	114	495
5:30 PM	21	0	69	0	90	111	171	0	0	282	0	0	0	0	0	0	93	3	0	96	468
5:45 PM	13	0	51	0	64	106	150	0	0	256	0	0	0	0	0	0	95	9	0	104	424
Total	66	0	225	0	291	472	662	0	0	1134	0	0	0	0	0	0	385	39	0	424	1849
Grand Total	127	0	439	0	566	1003	1358	0	0	2361	0	0	0	0	0	0	806	84	0	890	3817
Approach %	22.4	0.0	77.6	0.0		42.5	57.5	0.0	0.0		0.0	0.0	0.0	0.0		0.0	90.6	9.4	0.0		
Total %	3.3	0.0	11.5	0.0	14.8	26.3	35.6	0.0	0.0	61.9	0.0	0.0	0.0	0.0	0.0	0.0	21.1	2.2	0.0	23.3	
Exiting Leg Total					1087					1245					0					1485	3817

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	13	0	47	0	60	105	210	0	0	315	0	0	0	0	0	0	110	8	0	118	493
4:15 PM	18	0	54	0	72	150	183	0	0	333	0	0	0	0	0	0	109	11	0	120	525
4:30 PM	17	0	55	0	72	145	160	0	0	305	0	0	0	0	0	0	109	16	0	125	502
4:45 PM	13	0	58	0	71	131	143	0	0	274	0	0	0	0	0	0	93	10	0	103	448
Total Volume	61	0	214	0	275	531	696	0	0	1227	0	0	0	0	0	0	421	45	0	466	1968
% Approach Total	22.2	0.0	77.8	0.0		43.3	56.7	0.0	0.0		0.0	0.0	0.0	0.0		0.0	90.3	9.7	0.0		
PHF	0.847	0.000	0.922	0.000	0.955	0.885	0.829	0.000	0.000	0.921	0.000	0.000	0.000	0.000	0.000	0.000	0.957	0.703	0.000	0.932	0.937
Entering Leg	61	0	214	0	275	531	696	0	0	1227	0	0	0	0	0	0	421	45	0	466	1968
Exiting Leg					576					635					0					757	1968
Total					851					1862					0					1223	3936

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	2	0	2	1	7	0	0	8	0	0	0	0	0	0	4	0	0	4	14
4:15 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
4:30 PM	0	0	1	0	1	3	5	0	0	8	0	0	0	0	0	0	4	0	0	4	13
4:45 PM	0	0	2	0	2	2	2	0	0	4	0	0	0	0	0	0	5	0	0	5	11
Total	0	0	5	0	5	6	18	0	0	24	0	0	0	0	0	0	15	0	0	15	44
5:00 PM	0	0	1	0	1	1	2	0	0	3	0	0	0	0	0	0	4	0	0	4	8
5:15 PM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	3	0	0	3	5
5:30 PM	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	6
5:45 PM	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	6
Total	1	0	2	0	3	2	8	0	0	10	0	0	0	0	0	0	12	0	0	12	25
Grand Total	1	0	7	0	8	8	26	0	0	34	0	0	0	0	0	0	27	0	0	27	69
Approach %	12.5	0.0	87.5	0.0		23.5	76.5	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	1.4	0.0	10.1	0.0	11.6	11.6	37.7	0.0	0.0	49.3	0.0	0.0	0.0	0.0	0.0	0.0	39.1	0.0	0.0	39.1	
Exiting Leg Total					8					34					0					27	69
Buses	0	0	1	0	1	3	9	0	0	12	0	0	0	0	0	0	4	0	0	4	17
% Buses	0.0	0.0	14.3	0.0	12.5	37.5	34.6	0.0	0.0	35.3	0.0	0.0	0.0	0.0	0.0	0.0	14.8	0.0	0.0	14.8	24.6
Exiting Leg Total					3					5					0					9	17
Single-Unit Trucks	1	0	6	0	7	4	13	0	0	17	0	0	0	0	0	0	19	0	0	19	43
% Single-Unit	100.0	0.0	85.7	0.0	87.5	50.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	70.4	0.0	0.0	70.4	62.3
Exiting Leg Total					4					25					0					14	43
Articulated Trucks	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	0	4	0	0	4	9
% Articulated	0.0	0.0	0.0	0.0	0.0	12.5	15.4	0.0	0.0	14.7	0.0	0.0	0.0	0.0	0.0	0.0	14.8	0.0	0.0	14.8	13.0
Exiting Leg Total					1					4					0					4	9

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	2	0	2	1	7	0	0	8	0	0	0	0	0	0	4	0	0	4	14
4:15 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
4:30 PM	0	0	1	0	1	3	5	0	0	8	0	0	0	0	0	0	4	0	0	4	13
4:45 PM	0	0	2	0	2	2	2	0	0	4	0	0	0	0	0	0	5	0	0	5	11
Total Volume	0	0	5	0	5	6	18	0	0	24	0	0	0	0	0	0	15	0	0	15	44
% Approach Total	0.0	0.0	100.0	0.0		25.0	75.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.625	0.000	0.625	0.500	0.643	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.750	0.786
Buses	0	0	1	0	1	3	7	0	0	10	0	0	0	0	0	0	3	0	0	3	14
Buses %	0.0	0.0	20.0	0.0	20.0	50.0	38.9	0.0	0.0	41.7	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	31.8
Single-Unit Trucks	0	0	4	0	4	3	8	0	0	11	0	0	0	0	0	0	9	0	0	9	24
Single-Unit %	0.0	0.0	80.0	0.0	80.0	50.0	44.4	0.0	0.0	45.8	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0	60.0	54.5
Articulated Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	13.6
Buses	0	0	1	0	1	3	7	0	0	10	0	0	0	0	0	0	3	0	0	3	14
Single-Unit Trucks	0	0	4	0	4	3	8	0	0	11	0	0	0	0	0	0	9	0	0	9	24
Articulated Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
Total Entering Leg	0	0	5	0	5	6	18	0	0	24	0	0	0	0	0	0	15	0	0	15	44
Buses					3					4					0					7	14
Single-Unit Trucks					3					13					0					8	24
Articulated Trucks					0					3					0					3	6
Total Exiting Leg					6					20					0					18	44

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	9	0	38	0	47	80	174	0	0	254	0	0	0	0	0	0	99	7	0	106	407
4:15 PM	16	0	45	0	61	128	149	0	0	277	0	0	0	0	0	0	88	10	0	98	436
4:30 PM	16	0	43	0	59	130	138	0	0	268	0	0	0	0	0	0	96	13	0	109	436
4:45 PM	10	0	47	0	57	122	116	0	0	238	0	0	0	0	0	0	84	8	0	92	387
Total	51	0	173	0	224	460	577	0	0	1037	0	0	0	0	0	0	367	38	0	405	1666
5:00 PM	20	0	47	0	67	119	144	0	0	263	0	0	0	0	0	0	88	7	0	95	425
5:15 PM	10	0	42	0	52	131	174	0	0	305	0	0	0	0	0	0	84	15	0	99	456
5:30 PM	17	0	57	0	74	107	155	0	0	262	0	0	0	0	0	0	86	3	0	89	425
5:45 PM	11	0	44	0	55	103	140	0	0	243	0	0	0	0	0	0	86	9	0	95	393
Total	58	0	190	0	248	460	613	0	0	1073	0	0	0	0	0	0	344	34	0	378	1699
Grand Total	109	0	363	0	472	920	1190	0	0	2110	0	0	0	0	0	0	711	72	0	783	3365
Approach %	23.1	0.0	76.9	0.0		43.6	56.4	0.0	0.0		0.0	0.0	0.0	0.0		0.0	90.8	9.2	0.0		
Total %	3.2	0.0	10.8	0.0	14.0	27.3	35.4	0.0	0.0	62.7	0.0	0.0	0.0	0.0	0.0	0.0	21.1	2.1	0.0	23.3	
Exiting Leg Total					992					1074					0					1299	3365

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	16	0	43	0	59	130	138	0	0	268	0	0	0	0	0	0	96	13	0	109	436
4:45 PM	10	0	47	0	57	122	116	0	0	238	0	0	0	0	0	0	84	8	0	92	387
5:00 PM	20	0	47	0	67	119	144	0	0	263	0	0	0	0	0	0	88	7	0	95	425
5:15 PM	10	0	42	0	52	131	174	0	0	305	0	0	0	0	0	0	84	15	0	99	456
Total Volume	56	0	179	0	235	502	572	0	0	1074	0	0	0	0	0	0	352	43	0	395	1704
% Approach Total	23.8	0.0	76.2	0.0		46.7	53.3	0.0	0.0		0.0	0.0	0.0	0.0		0.0	89.1	10.9	0.0		
PHF	0.700	0.000	0.952	0.000	0.877	0.958	0.822	0.000	0.000	0.880	0.000	0.000	0.000	0.000	0.000	0.000	0.917	0.717	0.000	0.906	0.934
Entering Leg	56	0	179	0	235	502	572	0	0	1074	0	0	0	0	0	0	352	43	0	395	1704
Exiting Leg					545					531					0					628	1704
Total					780					1605					0					1023	3408

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Light Goods Vehicle**

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	4	0	9	0	13	25	36	0	0	61	0	0	0	0	0	0	11	1	0	12	86
4:15 PM	2	0	9	0	11	22	34	0	0	56	0	0	0	0	0	0	21	1	0	22	89
4:30 PM	1	0	12	0	13	15	22	0	0	37	0	0	0	0	0	0	13	3	0	16	66
4:45 PM	3	0	11	0	14	9	27	0	0	36	0	0	0	0	0	0	9	2	0	11	61
Total	10	0	41	0	51	71	119	0	0	190	0	0	0	0	0	0	54	7	0	61	302
5:00 PM	1	0	8	0	9	3	10	0	0	13	0	0	0	0	0	0	13	2	0	15	37
5:15 PM	1	0	8	0	9	2	13	0	0	15	0	0	0	0	0	0	12	3	0	15	39
5:30 PM	4	0	12	0	16	4	16	0	0	20	0	0	0	0	0	0	7	0	0	7	43
5:45 PM	2	0	7	0	9	3	10	0	0	13	0	0	0	0	0	0	9	0	0	9	31
Total	8	0	35	0	43	12	49	0	0	61	0	0	0	0	0	0	41	5	0	46	150
Grand Total	18	0	76	0	94	83	168	0	0	251	0	0	0	0	0	0	95	12	0	107	452
Approach %	19.1	0.0	80.9	0.0		33.1	66.9	0.0	0.0		0.0	0.0	0.0	0.0		0.0	88.8	11.2	0.0		
Total %	4.0	0.0	16.8	0.0	20.8	18.4	37.2	0.0	0.0	55.5	0.0	0.0	0.0	0.0	0.0	0.0	21.0	2.7	0.0	23.7	
Exiting Leg Total					95					171					0					186	452

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	4	0	9	0	13	25	36	0	0	61	0	0	0	0	0	0	11	1	0	12	86
4:15 PM	2	0	9	0	11	22	34	0	0	56	0	0	0	0	0	0	21	1	0	22	89
4:30 PM	1	0	12	0	13	15	22	0	0	37	0	0	0	0	0	0	13	3	0	16	66
4:45 PM	3	0	11	0	14	9	27	0	0	36	0	0	0	0	0	0	9	2	0	11	61
Total Volume	10	0	41	0	51	71	119	0	0	190	0	0	0	0	0	0	54	7	0	61	302
% Approach Total	19.6	0.0	80.4	0.0		37.4	62.6	0.0	0.0		0.0	0.0	0.0	0.0		0.0	88.5	11.5	0.0		
PHF	0.625	0.000	0.854	0.000	0.911	0.710	0.826	0.000	0.000	0.779	0.000	0.000	0.000	0.000	0.000	0.000	0.643	0.583	0.000	0.693	0.848
Entering Leg	10	0	41	0	51	71	119	0	0	190	0	0	0	0	0	0	54	7	0	61	302
Exiting Leg					78					95					0					129	302
Total					129					285					0					190	604

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	0	2	0	0	2	8
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
4:30 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	1	0	1	3	7	0	0	10	0	0	0	0	0	0	3	0	0	3	14
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Grand Total	0	0	1	0	1	3	9	0	0	12	0	0	0	0	0	0	4	0	0	4	17
Approach %	0.0	0.0	100.0	0.0		25.0	75.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	5.9	0.0	5.9	17.6	52.9	0.0	0.0	70.6	0.0	0.0	0.0	0.0	0.0	0.0	23.5	0.0	0.0	23.5	
Exiting Leg Total					3					5					0					9	17

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	0	2	0	0	2	8
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
4:30 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	1	0	1	3	7	0	0	10	0	0	0	0	0	0	3	0	0	3	14
% Approach Total	0.0	0.0	100.0	0.0		30.0	70.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.250	0.000	0.250	0.375	0.350	0.000	0.000	0.417	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375	0.438
Entering Leg	0	0	1	0	1	3	7	0	0	10	0	0	0	0	0	0	3	0	0	3	14
Exiting Leg					3					4					0					7	14
Total					4					14					0					10	28

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	2	0	2	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	5
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
4:30 PM	0	0	1	0	1	1	3	0	0	4	0	0	0	0	0	0	4	0	0	4	9
4:45 PM	0	0	1	0	1	2	1	0	0	3	0	0	0	0	0	0	3	0	0	3	7
Total	0	0	4	0	4	3	8	0	0	11	0	0	0	0	0	0	9	0	0	9	24
5:00 PM	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	0	4	0	0	4	7
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:30 PM	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	5
5:45 PM	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	5
Total	1	0	2	0	3	1	5	0	0	6	0	0	0	0	0	0	10	0	0	10	19
Grand Total	1	0	6	0	7	4	13	0	0	17	0	0	0	0	0	0	19	0	0	19	43
Approach %	14.3	0.0	85.7	0.0		23.5	76.5	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	2.3	0.0	14.0	0.0	16.3	9.3	30.2	0.0	0.0	39.5	0.0	0.0	0.0	0.0	0.0	0.0	44.2	0.0	0.0	44.2	
Exiting Leg Total					4					25					0					14	43

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
4:30 PM	0	0	1	0	1	1	3	0	0	4	0	0	0	0	0	0	4	0	0	4	9
4:45 PM	0	0	1	0	1	2	1	0	0	3	0	0	0	0	0	0	3	0	0	3	7
5:00 PM	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	0	4	0	0	4	7
Total Volume	0	0	3	0	3	4	7	0	0	11	0	0	0	0	0	0	12	0	0	12	26
% Approach Total	0.0	0.0	100.0	0.0		36.4	63.6	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.750	0.000	0.750	0.500	0.583	0.000	0.000	0.688	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.750	0.722
Entering Leg	0	0	3	0	3	4	7	0	0	11	0	0	0	0	0	0	12	0	0	12	26
Exiting Leg					4					15					0					7	26
Total					7					26					0					19	52

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Grand Total	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	0	4	0	0	4	9
Approach %	0.0	0.0	0.0	0.0		20.0	80.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	11.1	44.4	0.0	0.0	55.6	0.0	0.0	0.0	0.0	0.0	0.0	44.4	0.0	0.0	44.4	
Exiting Leg Total					1					4					0					4	9

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Lunenburg Road (Route 70) from North					Main Street (Route 70/117) from East					Driveway from South					Main Street (Route 117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total Volume	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	3	0	0	3	7
% Approach Total	0.0	0.0	0.0	0.0		25.0	75.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.250	0.375	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375	0.583
Entering Leg	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	3	0	0	3	7
Exiting Leg					1					3					0					3	7
Total					1					7					0					6	14

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North							Main Street (Route 70/117) from East							Driveway from South							Main Street (Route 117) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North							Main Street (Route 70/117) from East							Driveway from South							Main Street (Route 117) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 BB**
Location: **N: Lunenburg Road (Route 70) S: Driveway**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North							Main Street (Route 70/117) from East							Driveway from South							Main Street (Route 117) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	100	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							1							0	1

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North							Main Street (Route 70/117) from East							Driveway from South							Main Street (Route 117) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
Exiting Leg							0							0							1							0	1
Total							0							0							2							0	2

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	84	0	0	84	1	1	29	0	31	50	235	0	0	285	400
7:15 AM	0	0	1	0	1	0	102	3	0	105	1	0	37	0	38	96	196	1	0	293	437
7:30 AM	2	2	0	0	4	1	127	5	0	133	3	0	61	0	64	77	157	0	0	234	435
7:45 AM	0	1	1	0	2	1	98	1	0	100	1	0	34	0	35	82	159	1	0	242	379
Total	2	3	2	0	7	2	411	9	0	422	6	1	161	0	168	305	747	2	0	1054	1651
8:00 AM	0	1	0	0	1	0	97	5	0	102	2	0	40	0	42	58	171	0	0	229	374
8:15 AM	2	2	0	0	4	0	84	2	0	86	3	0	53	0	56	65	141	0	0	206	352
8:30 AM	0	1	0	0	1	0	112	2	0	114	3	0	48	0	51	49	127	0	0	176	342
8:45 AM	0	0	1	0	1	1	97	0	0	98	2	0	41	0	43	70	113	0	0	183	325
Total	2	4	1	0	7	1	390	9	0	400	10	0	182	0	192	242	552	0	0	794	1393
Grand Total	4	7	3	0	14	3	801	18	0	822	16	1	343	0	360	547	1299	2	0	1848	3044
Approach %	28.6	50.0	21.4	0.0		0.4	97.4	2.2	0.0		4.4	0.3	95.3	0.0		29.6	70.3	0.1	0.0		
Total %	0.1	0.2	0.1	0.0	0.5	0.1	26.3	0.6	0.0	27.0	0.5	0.0	11.3	0.0	11.8	18.0	42.7	0.1	0.0	60.7	
Exiting Leg Total					6					1318					572					1148	3044
Cars	4	6	3	0	13	3	725	17	0	745	16	1	320	0	337	526	1230	2	0	1758	2853
% Cars	100.0	85.7	100.0	0.0	92.9	100.0	90.5	94.4	0.0	90.6	100.0	100.0	93.3	0.0	93.6	96.2	94.7	100.0	0.0	95.1	93.7
Exiting Leg Total					6					1249					549					1049	2853
Heavy Vehicles	0	1	0	0	1	0	76	1	0	77	0	0	23	0	23	21	69	0	0	90	191
% Heavy Vehicles	0.0	14.3	0.0	0.0	7.1	0.0	9.5	5.6	0.0	9.4	0.0	0.0	6.7	0.0	6.4	3.8	5.3	0.0	0.0	4.9	6.3
Exiting Leg Total					0					69					23					99	191

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	84	0	0	84	1	1	29	0	31	50	235	0	0	285	400
7:15 AM	0	0	1	0	1	0	102	3	0	105	1	0	37	0	38	96	196	1	0	293	437
7:30 AM	2	2	0	0	4	1	127	5	0	133	3	0	61	0	64	77	157	0	0	234	435
7:45 AM	0	1	1	0	2	1	98	1	0	100	1	0	34	0	35	82	159	1	0	242	379
Total Volume	2	3	2	0	7	2	411	9	0	422	6	1	161	0	168	305	747	2	0	1054	1651
% Approach Total	28.6	42.9	28.6	0.0		0.5	97.4	2.1	0.0		3.6	0.6	95.8	0.0		28.9	70.9	0.2	0.0		
PHF	0.250	0.375	0.500	0.000	0.438	0.500	0.809	0.450	0.000	0.793	0.500	0.250	0.660	0.000	0.656	0.794	0.795	0.500	0.000	0.899	0.945
Cars	2	3	2	0	7	2	382	9	0	393	6	1	153	0	160	296	711	2	0	1009	1569
Cars %	100.0	100.0	100.0	0.0	100.0	100.0	92.9	100.0	0.0	93.1	100.0	100.0	95.0	0.0	95.2	97.0	95.2	100.0	0.0	95.7	95.0
Heavy Vehicles	0	0	0	0	0	0	29	0	0	29	0	0	8	0	8	9	36	0	0	45	82
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	6.9	0.0	0.0	5.0	0.0	4.8	3.0	4.8	0.0	0.0	4.3	5.0
Cars Enter Leg	2	3	2	0	7	2	382	9	0	393	6	1	153	0	160	296	711	2	0	1009	1569
Heavy Enter Leg	0	0	0	0	0	0	29	0	0	29	0	0	8	0	8	9	36	0	0	45	82
Total Entering Leg	2	3	2	0	7	2	411	9	0	422	6	1	161	0	168	305	747	2	0	1054	1651
Cars Exiting Leg					5					719					308					537	1569
Heavy Exiting Leg					0					36					9					37	82
Total Exiting Leg					5					755					317					574	1651

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars-Combined (Motorcycles, Cars, Light Goods)

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	76	0	0	76	1	1	28	0	30	48	231	0	0	279	385
7:15 AM	0	0	1	0	1	0	98	3	0	101	1	0	35	0	36	92	187	1	0	280	418
7:30 AM	2	2	0	0	4	1	113	5	0	119	3	0	58	0	61	75	144	0	0	219	403
7:45 AM	0	1	1	0	2	1	95	1	0	97	1	0	32	0	33	81	149	1	0	231	363
Total	2	3	2	0	7	2	382	9	0	393	6	1	153	0	160	296	711	2	0	1009	1569
8:00 AM	0	1	0	0	1	0	91	5	0	96	2	0	35	0	37	56	159	0	0	215	349
8:15 AM	2	1	0	0	3	0	75	2	0	77	3	0	48	0	51	60	135	0	0	195	326
8:30 AM	0	1	0	0	1	0	99	1	0	100	3	0	45	0	48	47	118	0	0	165	314
8:45 AM	0	0	1	0	1	1	78	0	0	79	2	0	39	0	41	67	107	0	0	174	295
Total	2	3	1	0	6	1	343	8	0	352	10	0	167	0	177	230	519	0	0	749	1284
Grand Total	4	6	3	0	13	3	725	17	0	745	16	1	320	0	337	526	1230	2	0	1758	2853
Approach %	30.8	46.2	23.1	0.0		0.4	97.3	2.3	0.0		4.7	0.3	95.0	0.0		29.9	70.0	0.1	0.0		
Total %	0.1	0.2	0.1	0.0	0.5	0.1	25.4	0.6	0.0	26.1	0.6	0.0	11.2	0.0	11.8	18.4	43.1	0.1	0.0	61.6	
Exiting Leg Total					6					1249					549					1049	2853

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	76	0	0	76	1	1	28	0	30	48	231	0	0	279	385
7:15 AM	0	0	1	0	1	0	98	3	0	101	1	0	35	0	36	92	187	1	0	280	418
7:30 AM	2	2	0	0	4	1	113	5	0	119	3	0	58	0	61	75	144	0	0	219	403
7:45 AM	0	1	1	0	2	1	95	1	0	97	1	0	32	0	33	81	149	1	0	231	363
Total Volume	2	3	2	0	7	2	382	9	0	393	6	1	153	0	160	296	711	2	0	1009	1569
% Approach Total	28.6	42.9	28.6	0.0		0.5	97.2	2.3	0.0		3.8	0.6	95.6	0.0		29.3	70.5	0.2	0.0		
PHF	0.250	0.375	0.500	0.000	0.438	0.500	0.845	0.450	0.000	0.826	0.500	0.250	0.659	0.000	0.656	0.804	0.769	0.500	0.000	0.901	0.938
Entering Leg	2	3	2	0	7	2	382	9	0	393	6	1	153	0	160	296	711	2	0	1009	1569
Exiting Leg					5					719					308					537	1569
Total					12					1112					468					1546	3138

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	8	0	0	8	0	0	1	0	1	2	4	0	0	6	15
7:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	2	0	2	4	9	0	0	13	19
7:30 AM	0	0	0	0	0	0	14	0	0	14	0	0	3	0	3	2	13	0	0	15	32
7:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	1	10	0	0	11	16
Total	0	0	0	0	0	0	29	0	0	29	0	0	8	0	8	9	36	0	0	45	82
8:00 AM	0	0	0	0	0	0	6	0	0	6	0	0	5	0	5	2	12	0	0	14	25
8:15 AM	0	1	0	0	1	0	9	0	0	9	0	0	5	0	5	5	6	0	0	11	26
8:30 AM	0	0	0	0	0	0	13	1	0	14	0	0	3	0	3	2	9	0	0	11	28
8:45 AM	0	0	0	0	0	0	19	0	0	19	0	0	2	0	2	3	6	0	0	9	30
Total	0	1	0	0	1	0	47	1	0	48	0	0	15	0	15	12	33	0	0	45	109
Grand Total	0	1	0	0	1	0	76	1	0	77	0	0	23	0	23	21	69	0	0	90	191
Approach %	0.0	100.0	0.0	0.0		0.0	98.7	1.3	0.0		0.0	0.0	100.0	0.0		23.3	76.7	0.0	0.0		
Total %	0.0	0.5	0.0	0.0	0.5	0.0	39.8	0.5	0.0	40.3	0.0	0.0	12.0	0.0	12.0	11.0	36.1	0.0	0.0	47.1	
Exiting Leg Total					0					69					23					99	191
Buses	0	1	0	0	1	0	14	0	0	14	0	0	11	0	11	5	3	0	0	8	34
% Buses	0.0	100.0	0.0	0.0	100.0	0.0	18.4	0.0	0.0	18.2	0.0	0.0	47.8	0.0	47.8	23.8	4.3	0.0	0.0	8.9	17.8
Exiting Leg Total					0					3					6					25	34
Single-Unit Trucks	0	0	0	0	0	0	36	1	0	37	0	0	12	0	12	13	53	0	0	66	115
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	47.4	100.0	0.0	48.1	0.0	0.0	52.2	0.0	52.2	61.9	76.8	0.0	0.0	73.3	60.2
Exiting Leg Total					0					53					14					48	115
Articulated Trucks	0	0	0	0	0	0	26	0	0	26	0	0	0	0	0	3	13	0	0	16	42
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	34.2	0.0	0.0	33.8	0.0	0.0	0.0	0.0	0.0	14.3	18.8	0.0	0.0	17.8	22.0
Exiting Leg Total					0					13					3					26	42

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	6	0	0	6	0	0	5	0	5	2	12	0	0	14	25
8:15 AM	0	1	0	0	1	0	9	0	0	9	0	0	5	0	5	5	6	0	0	11	26
8:30 AM	0	0	0	0	0	0	13	1	0	14	0	0	3	0	3	2	9	0	0	11	28
8:45 AM	0	0	0	0	0	0	19	0	0	19	0	0	2	0	2	3	6	0	0	9	30
Total Volume	0	1	0	0	1	0	47	1	0	48	0	0	15	0	15	12	33	0	0	45	109
% Approach Total	0.0	100.0	0.0	0.0		0.0	97.9	2.1	0.0		0.0	0.0	100.0	0.0		26.7	73.3	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.250	0.000	0.618	0.250	0.000	0.632	0.000	0.000	0.750	0.000	0.750	0.600	0.688	0.000	0.000	0.804	0.908
Buses	0	1	0	0	1	0	13	0	0	13	0	0	8	0	8	2	0	0	0	2	24
Buses %	0.0	100.0	0.0	0.0	100.0	0.0	27.7	0.0	0.0	27.1	0.0	0.0	53.3	0.0	53.3	16.7	0.0	0.0	0.0	4.4	22.0
Single-Unit Trucks	0	0	0	0	0	0	20	1	0	21	0	0	7	0	7	9	29	0	0	38	66
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	42.6	100.0	0.0	43.8	0.0	0.0	46.7	0.0	46.7	75.0	87.9	0.0	0.0	84.4	60.6
Articulated Trucks	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	1	4	0	0	5	19
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	29.8	0.0	0.0	29.2	0.0	0.0	0.0	0.0	0.0	8.3	12.1	0.0	0.0	11.1	17.4
Buses	0	1	0	0	1	0	13	0	0	13	0	0	8	0	8	2	0	0	0	2	24
Single-Unit Trucks	0	0	0	0	0	0	20	1	0	21	0	0	7	0	7	9	29	0	0	38	66
Articulated Trucks	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	1	4	0	0	5	19
Total Entering Leg	0	1	0	0	1	0	47	1	0	48	0	0	15	0	15	12	33	0	0	45	109
Buses					0					0					3					21	24
Single-Unit Trucks					0					29					10					27	66
Articulated Trucks					0					4					1					14	19
Total Exiting Leg					0					33					14					62	109

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	57	0	0	57	0	0	26	0	26	43	193	0	0	236	319
7:15 AM	0	0	0	0	0	0	84	3	0	87	1	0	30	0	31	87	170	1	0	258	376
7:30 AM	1	2	0	0	3	0	86	5	0	91	3	0	45	0	48	69	115	0	0	184	326
7:45 AM	0	1	1	0	2	1	82	1	0	84	1	0	26	0	27	68	132	1	0	201	314
Total	1	3	1	0	5	1	309	9	0	319	5	0	127	0	132	267	610	2	0	879	1335
8:00 AM	0	1	0	0	1	0	69	5	0	74	2	0	30	0	32	51	140	0	0	191	298
8:15 AM	1	1	0	0	2	0	61	1	0	62	3	0	45	0	48	53	119	0	0	172	284
8:30 AM	0	1	0	0	1	0	87	1	0	88	2	0	42	0	44	38	99	0	0	137	270
8:45 AM	0	0	1	0	1	1	68	0	0	69	2	0	33	0	35	59	89	0	0	148	253
Total	1	3	1	0	5	1	285	7	0	293	9	0	150	0	159	201	447	0	0	648	1105
Grand Total	2	6	2	0	10	2	594	16	0	612	14	0	277	0	291	468	1057	2	0	1527	2440
Approach %	20.0	60.0	20.0	0.0		0.3	97.1	2.6	0.0		4.8	0.0	95.2	0.0		30.6	69.2	0.1	0.0		
Total %	0.1	0.2	0.1	0.0	0.4	0.1	24.3	0.7	0.0	25.1	0.6	0.0	11.4	0.0	11.9	19.2	43.3	0.1	0.0	62.6	
Exiting Leg Total					4					1073					490					873	2440

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	57	0	0	57	0	0	26	0	26	43	193	0	0	236	319
7:15 AM	0	0	0	0	0	0	84	3	0	87	1	0	30	0	31	87	170	1	0	258	376
7:30 AM	1	2	0	0	3	0	86	5	0	91	3	0	45	0	48	69	115	0	0	184	326
7:45 AM	0	1	1	0	2	1	82	1	0	84	1	0	26	0	27	68	132	1	0	201	314
Total Volume	1	3	1	0	5	1	309	9	0	319	5	0	127	0	132	267	610	2	0	879	1335
% Approach Total	20.0	60.0	20.0	0.0		0.3	96.9	2.8	0.0		3.8	0.0	96.2	0.0		30.4	69.4	0.2	0.0		
PHF	0.250	0.375	0.250	0.000	0.417	0.250	0.898	0.450	0.000	0.876	0.417	0.000	0.706	0.000	0.688	0.767	0.790	0.500	0.000	0.852	0.888
Entering Leg	1	3	1	0	5	1	309	9	0	319	5	0	127	0	132	267	610	2	0	879	1335
Exiting Leg					3					616					279					437	1335
Total					8					935					411					1316	2670

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Light Goods Vehicle

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	19	0	0	19	1	1	2	0	4	5	38	0	0	43	66
7:15 AM	0	0	1	0	1	0	14	0	0	14	0	0	5	0	5	5	17	0	0	22	42
7:30 AM	1	0	0	0	1	1	27	0	0	28	0	0	13	0	13	6	29	0	0	35	77
7:45 AM	0	0	0	0	0	0	13	0	0	13	0	0	6	0	6	13	17	0	0	30	49
Total	1	0	1	0	2	1	73	0	0	74	1	1	26	0	28	29	101	0	0	130	234
8:00 AM	0	0	0	0	0	0	22	0	0	22	0	0	5	0	5	5	19	0	0	24	51
8:15 AM	1	0	0	0	1	0	14	1	0	15	0	0	3	0	3	7	16	0	0	23	42
8:30 AM	0	0	0	0	0	0	12	0	0	12	1	0	3	0	4	9	19	0	0	28	44
8:45 AM	0	0	0	0	0	0	10	0	0	10	0	0	6	0	6	8	18	0	0	26	42
Total	1	0	0	0	1	0	58	1	0	59	1	0	17	0	18	29	72	0	0	101	179
Grand Total	2	0	1	0	3	1	131	1	0	133	2	1	43	0	46	58	173	0	0	231	413
Approach %	66.7	0.0	33.3	0.0		0.8	98.5	0.8	0.0		4.3	2.2	93.5	0.0		25.1	74.9	0.0	0.0		
Total %	0.5	0.0	0.2	0.0	0.7	0.2	31.7	0.2	0.0	32.2	0.5	0.2	10.4	0.0	11.1	14.0	41.9	0.0	0.0	55.9	
Exiting Leg Total					2					176					59					176	413

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	19	0	0	19	1	1	2	0	4	5	38	0	0	43	66
7:15 AM	0	0	1	0	1	0	14	0	0	14	0	0	5	0	5	5	17	0	0	22	42
7:30 AM	1	0	0	0	1	1	27	0	0	28	0	0	13	0	13	6	29	0	0	35	77
7:45 AM	0	0	0	0	0	0	13	0	0	13	0	0	6	0	6	13	17	0	0	30	49
Total Volume	1	0	1	0	2	1	73	0	0	74	1	1	26	0	28	29	101	0	0	130	234
% Approach Total	50.0	0.0	50.0	0.0		1.4	98.6	0.0	0.0		3.6	3.6	92.9	0.0		22.3	77.7	0.0	0.0		
PHF	0.250	0.000	0.250	0.000	0.500	0.250	0.676	0.000	0.000	0.661	0.250	0.250	0.500	0.000	0.538	0.558	0.664	0.000	0.000	0.756	0.760
Entering Leg	1	0	1	0	2	1	73	0	0	74	1	1	26	0	28	29	101	0	0	130	234
Exiting Leg					2					103					29					100	234
Total					4					177					57					230	468

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	2	2	0	0	4	6
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	3
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	3	0	3	3	3	0	0	6	10
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
8:15 AM	0	1	0	0	1	0	1	0	0	1	0	0	4	0	4	1	0	0	0	1	7
8:30 AM	0	0	0	0	0	0	6	0	0	6	0	0	3	0	3	1	0	0	0	1	10
8:45 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Total	0	1	0	0	1	0	13	0	0	13	0	0	8	0	8	2	0	0	0	2	24
Grand Total	0	1	0	0	1	0	14	0	0	14	0	0	11	0	11	5	3	0	0	8	34
Approach %	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		62.5	37.5	0.0	0.0		
Total %	0.0	2.9	0.0	0.0	2.9	0.0	41.2	0.0	0.0	41.2	0.0	0.0	32.4	0.0	32.4	14.7	8.8	0.0	0.0	23.5	
Exiting Leg Total					0					3					6					25	34

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
8:15 AM	0	1	0	0	1	0	1	0	0	1	0	0	4	0	4	1	0	0	0	1	7
8:30 AM	0	0	0	0	0	0	6	0	0	6	0	0	3	0	3	1	0	0	0	1	10
8:45 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Total Volume	0	1	0	0	1	0	13	0	0	13	0	0	8	0	8	2	0	0	0	2	24
% Approach Total	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.250	0.000	0.542	0.000	0.000	0.542	0.000	0.000	0.500	0.000	0.500	0.500	0.000	0.000	0.000	0.500	0.600
Entering Leg	0	1	0	0	1	0	13	0	0	13	0	0	8	0	8	2	0	0	0	2	24
Exiting Leg					0					0					3					21	24
Total					1					13					11					23	48

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Single-Unit Trucks

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	2	4	0	0	6	12
7:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	1	6	0	0	7	10
7:30 AM	0	0	0	0	0	0	8	0	0	8	0	0	1	0	1	0	7	0	0	7	16
7:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	1	7	0	0	8	11
Total	0	0	0	0	0	0	16	0	0	16	0	0	5	0	5	4	24	0	0	28	49
8:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	4	0	4	2	9	0	0	11	20
8:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	3	6	0	0	9	15
8:30 AM	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	1	8	0	0	9	15
8:45 AM	0	0	0	0	0	0	5	0	0	5	0	0	2	0	2	3	6	0	0	9	16
Total	0	0	0	0	0	0	20	1	0	21	0	0	7	0	7	9	29	0	0	38	66
Grand Total	0	0	0	0	0	0	36	1	0	37	0	0	12	0	12	13	53	0	0	66	115
Approach %	0.0	0.0	0.0	0.0		0.0	97.3	2.7	0.0		0.0	0.0	100.0	0.0		19.7	80.3	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	31.3	0.9	0.0	32.2	0.0	0.0	10.4	0.0	10.4	11.3	46.1	0.0	0.0	57.4	
Exiting Leg Total					0					53					14					48	115

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	4	0	4	2	9	0	0	11	20
8:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	3	6	0	0	9	15
8:30 AM	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	1	8	0	0	9	15
8:45 AM	0	0	0	0	0	0	5	0	0	5	0	0	2	0	2	3	6	0	0	9	16
Total Volume	0	0	0	0	0	0	20	1	0	21	0	0	7	0	7	9	29	0	0	38	66
% Approach Total	0.0	0.0	0.0	0.0		0.0	95.2	4.8	0.0		0.0	0.0	100.0	0.0		23.7	76.3	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.250	0.000	0.875	0.000	0.000	0.438	0.000	0.438	0.750	0.806	0.000	0.000	0.864	0.825
Entering Leg	0	0	0	0	0	0	20	1	0	21	0	0	7	0	7	9	29	0	0	38	66
Exiting Leg					0					29					10					27	66
Total					0					50					17					65	132

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
7:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	3
7:30 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	1	6	0	0	7	13
7:45 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
Total	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	2	9	0	0	11	23
8:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
8:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	0	0	0	1	4
8:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
8:45 AM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	8
Total	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	1	4	0	0	5	19
Grand Total	0	0	0	0	0	0	26	0	0	26	0	0	0	0	0	3	13	0	0	16	42
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		18.8	81.3	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	61.9	0.0	0.0	61.9	0.0	0.0	0.0	0.0	0.0	7.1	31.0	0.0	0.0	38.1	
Exiting Leg Total					0					13					3					26	42

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:30 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	1	6	0	0	7	13
7:45 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
8:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
8:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	0	0	0	1	4
Total Volume	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	2	11	0	0	13	25
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		15.4	84.6	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.500	0.458	0.000	0.000	0.464	0.481
Entering Leg	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	2	11	0	0	13	25
Exiting Leg					0					11					2					12	25
Total					0					23					2					25	50

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70/117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70/117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 C**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70/117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	5	5
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	40	60		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	60	100	
Exiting Leg Total							0							0							0							5	5

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70/117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4	4
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	50.0	50.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.500	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4	4
Exiting Leg							0							0							0							4	4
Total							0							0							0							8	8

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	1	278	0	0	279	1	0	50	0	51	48	119	0	0	167	497
4:15 PM	0	0	0	0	0	0	294	2	0	296	0	0	44	0	44	63	102	0	0	165	505
4:30 PM	0	0	0	0	0	0	277	1	0	278	1	0	35	0	36	46	120	0	0	166	480
4:45 PM	1	0	0	0	1	0	225	1	0	226	1	0	55	0	56	52	106	1	0	159	442
Total	1	0	0	0	1	1	1074	4	0	1079	3	0	184	0	187	209	447	1	0	657	1924
5:00 PM	1	0	0	0	1	0	242	1	0	243	0	2	42	0	44	54	107	1	0	162	450
5:15 PM	1	2	0	0	3	3	280	0	0	283	1	0	40	0	41	38	107	1	0	146	473
5:30 PM	0	0	0	0	0	1	252	2	0	255	0	0	37	0	37	46	117	0	0	163	455
5:45 PM	0	0	0	0	0	0	208	0	0	208	0	0	45	0	45	50	98	1	0	149	402
Total	2	2	0	0	4	4	982	3	0	989	1	2	164	0	167	188	429	3	0	620	1780
Grand Total	3	2	0	0	5	5	2056	7	0	2068	4	2	348	0	354	397	876	4	0	1277	3704
Approach %	60.0	40.0	0.0	0.0		0.2	99.4	0.3	0.0		1.1	0.6	98.3	0.0		31.1	68.6	0.3	0.0		
Total %	0.1	0.1	0.0	0.0	0.1	0.1	55.5	0.2	0.0	55.8	0.1	0.1	9.4	0.0	9.6	10.7	23.7	0.1	0.0	34.5	
Exiting Leg Total					11					880					406					2407	3704
Cars	3	2	0	0	5	5	2021	7	0	2033	4	2	344	0	350	392	849	4	0	1245	3633
% Cars	100.0	100.0	0.0	0.0	100.0	100.0	98.3	100.0	0.0	98.3	100.0	100.0	98.9	0.0	98.9	98.7	96.9	100.0	0.0	97.5	98.1
Exiting Leg Total					11					853					401					2368	3633
Heavy Vehicles	0	0	0	0	0	0	35	0	0	35	0	0	4	0	4	5	27	0	0	32	71
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	1.7	0.0	0.0	1.1	0.0	1.1	1.3	3.1	0.0	0.0	2.5	1.9
Exiting Leg Total					0					27					5					39	71

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	1	278	0	0	279	1	0	50	0	51	48	119	0	0	167	497
4:15 PM	0	0	0	0	0	0	294	2	0	296	0	0	44	0	44	63	102	0	0	165	505
4:30 PM	0	0	0	0	0	0	277	1	0	278	1	0	35	0	36	46	120	0	0	166	480
4:45 PM	1	0	0	0	1	0	225	1	0	226	1	0	55	0	56	52	106	1	0	159	442
Total Volume	1	0	0	0	1	1	1074	4	0	1079	3	0	184	0	187	209	447	1	0	657	1924
% Approach Total	100.0	0.0	0.0	0.0		0.1	99.5	0.4	0.0		1.6	0.0	98.4	0.0		31.8	68.0	0.2	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.250	0.913	0.500	0.000	0.911	0.750	0.000	0.836	0.000	0.835	0.829	0.931	0.250	0.000	0.984	0.952
Cars	1	0	0	0	1	1	1051	4	0	1056	3	0	181	0	184	205	432	1	0	638	1879
Cars %	100.0	0.0	0.0	0.0	100.0	100.0	97.9	100.0	0.0	97.9	100.0	0.0	98.4	0.0	98.4	98.1	96.6	100.0	0.0	97.1	97.7
Heavy Vehicles	0	0	0	0	0	0	23	0	0	23	0	0	3	0	3	4	15	0	0	19	45
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	2.1	0.0	0.0	1.6	0.0	1.6	1.9	3.4	0.0	0.0	2.9	2.3
Cars Enter Leg	1	0	0	0	1	1	1051	4	0	1056	3	0	181	0	184	205	432	1	0	638	1879
Heavy Enter Leg	0	0	0	0	0	0	23	0	0	23	0	0	3	0	3	4	15	0	0	19	45
Total Entering Leg	1	0	0	0	1	1	1074	4	0	1079	3	0	184	0	187	209	447	1	0	657	1924
Cars Exiting Leg					2					435					209					1233	1879
Heavy Exiting Leg					0					15					4					26	45
Total Exiting Leg					2					450					213					1259	1924

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars-Combined (Motorcycles, Cars, Light Goods)**

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	1	268	0	0	269	1	0	50	0	51	46	115	0	0	161	481
4:15 PM	0	0	0	0	0	0	290	2	0	292	0	0	43	0	43	63	100	0	0	163	498
4:30 PM	0	0	0	0	0	0	270	1	0	271	1	0	35	0	36	45	116	0	0	161	468
4:45 PM	1	0	0	0	1	0	223	1	0	224	1	0	53	0	54	51	101	1	0	153	432
Total	1	0	0	0	1	1	1051	4	0	1056	3	0	181	0	184	205	432	1	0	638	1879
5:00 PM	1	0	0	0	1	0	235	1	0	236	0	2	42	0	44	54	102	1	0	157	438
5:15 PM	1	2	0	0	3	3	279	0	0	282	1	0	40	0	41	37	105	1	0	143	469
5:30 PM	0	0	0	0	0	1	251	2	0	254	0	0	37	0	37	46	114	0	0	160	451
5:45 PM	0	0	0	0	0	0	205	0	0	205	0	0	44	0	44	50	96	1	0	147	396
Total	2	2	0	0	4	4	970	3	0	977	1	2	163	0	166	187	417	3	0	607	1754
Grand Total	3	2	0	0	5	5	2021	7	0	2033	4	2	344	0	350	392	849	4	0	1245	3633
Approach %	60.0	40.0	0.0	0.0		0.2	99.4	0.3	0.0		1.1	0.6	98.3	0.0		31.5	68.2	0.3	0.0		
Total %	0.1	0.1	0.0	0.0	0.1	0.1	55.6	0.2	0.0	56.0	0.1	0.1	9.5	0.0	9.6	10.8	23.4	0.1	0.0	34.3	
Exiting Leg Total					11					853					401					2368	3633

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	1	268	0	0	269	1	0	50	0	51	46	115	0	0	161	481
4:15 PM	0	0	0	0	0	0	290	2	0	292	0	0	43	0	43	63	100	0	0	163	498
4:30 PM	0	0	0	0	0	0	270	1	0	271	1	0	35	0	36	45	116	0	0	161	468
4:45 PM	1	0	0	0	1	0	223	1	0	224	1	0	53	0	54	51	101	1	0	153	432
Total Volume	1	0	0	0	1	1	1051	4	0	1056	3	0	181	0	184	205	432	1	0	638	1879
% Approach Total	100.0	0.0	0.0	0.0		0.1	99.5	0.4	0.0		1.6	0.0	98.4	0.0		32.1	67.7	0.2	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.250	0.906	0.500	0.000	0.904	0.750	0.000	0.854	0.000	0.852	0.813	0.931	0.250	0.000	0.979	0.943
Entering Leg	1	0	0	0	1	1	1051	4	0	1056	3	0	181	0	184	205	432	1	0	638	1879
Exiting Leg					2					435					209					1233	1879
Total					3					1491					393					1871	3758

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	2	4	0	0	6	16
4:15 PM	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	0	2	0	0	2	7
4:30 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	1	4	0	0	5	12
4:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	2	0	2	1	5	0	0	6	10
Total	0	0	0	0	0	0	23	0	0	23	0	0	3	0	3	4	15	0	0	19	45
5:00 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	2	0	0	3	4
5:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
5:45 PM	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	0	2	0	0	2	6
Total	0	0	0	0	0	0	12	0	0	12	0	0	1	0	1	1	12	0	0	13	26
Grand Total	0	0	0	0	0	0	35	0	0	35	0	0	4	0	4	5	27	0	0	32	71
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		15.6	84.4	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	49.3	0.0	0.0	49.3	0.0	0.0	5.6	0.0	5.6	7.0	38.0	0.0	0.0	45.1	
Exiting Leg Total					0					27					5					39	71
Buses	0	0	0	0	0	0	12	0	0	12	0	0	1	0	1	4	1	0	0	5	18
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	34.3	0.0	0.0	34.3	0.0	0.0	25.0	0.0	25.0	80.0	3.7	0.0	0.0	15.6	25.4
Exiting Leg Total					0					1					4					13	18
Single-Unit Trucks	0	0	0	0	0	0	17	0	0	17	0	0	3	0	3	1	22	0	0	23	43
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	48.6	0.0	0.0	48.6	0.0	0.0	75.0	0.0	75.0	20.0	81.5	0.0	0.0	71.9	60.6
Exiting Leg Total					0					22					1					20	43
Articulated Trucks	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	17.1	0.0	0.0	17.1	0.0	0.0	0.0	0.0	0.0	0.0	14.8	0.0	0.0	12.5	14.1
Exiting Leg Total					0					4					0					6	10

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	2	4	0	0	6	16
4:15 PM	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	0	2	0	0	2	7
4:30 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	1	4	0	0	5	12
4:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	2	0	2	1	5	0	0	6	10
Total Volume	0	0	0	0	0	0	23	0	0	23	0	0	3	0	3	4	15	0	0	19	45
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		21.1	78.9	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.575	0.000	0.000	0.575	0.000	0.000	0.375	0.000	0.375	0.500	0.750	0.000	0.000	0.792	0.703
Buses	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	3	1	0	0	4	14
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	39.1	0.0	0.0	39.1	0.0	0.0	33.3	0.0	33.3	75.0	6.7	0.0	0.0	21.1	31.1
Single-Unit Trucks	0	0	0	0	0	0	11	0	0	11	0	0	2	0	2	1	11	0	0	12	25
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	47.8	0.0	0.0	47.8	0.0	0.0	66.7	0.0	66.7	25.0	73.3	0.0	0.0	63.2	55.6
Articulated Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	13.0	0.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	15.8	13.3
Buses	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	3	1	0	0	4	14
Single-Unit Trucks	0	0	0	0	0	0	11	0	0	11	0	0	2	0	2	1	11	0	0	12	25
Articulated Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
Total Entering Leg	0	0	0	0	0	0	23	0	0	23	0	0	3	0	3	4	15	0	0	19	45
Buses					0					1					3					10	14
Single-Unit Trucks					0					11					1					13	25
Articulated Trucks					0					3					0					3	6
Total Exiting Leg					0					15					4					26	45

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	1	218	0	0	219	1	0	45	0	46	43	100	0	0	143	408
4:15 PM	0	0	0	0	0	0	240	0	0	240	0	0	39	0	39	55	83	0	0	138	417
4:30 PM	0	0	0	0	0	0	232	1	0	233	1	0	32	0	33	41	97	0	0	138	404
4:45 PM	1	0	0	0	1	0	211	1	0	212	1	0	46	0	47	49	87	0	0	136	396
Total	1	0	0	0	1	1	901	2	0	904	3	0	162	0	165	188	367	0	0	555	1625
5:00 PM	1	0	0	0	1	0	215	0	0	215	0	1	39	0	40	54	94	0	0	148	404
5:15 PM	1	2	0	0	3	3	251	0	0	254	1	0	39	0	40	35	91	1	0	127	424
5:30 PM	0	0	0	0	0	1	235	2	0	238	0	0	32	0	32	43	102	0	0	145	415
5:45 PM	0	0	0	0	0	0	195	0	0	195	0	0	41	0	41	47	88	1	0	136	372
Total	2	2	0	0	4	4	896	2	0	902	1	1	151	0	153	179	375	2	0	556	1615
Grand Total	3	2	0	0	5	5	1797	4	0	1806	4	1	313	0	318	367	742	2	0	1111	3240
Approach %	60.0	40.0	0.0	0.0		0.3	99.5	0.2	0.0		1.3	0.3	98.4	0.0		33.0	66.8	0.2	0.0		
Total %	0.1	0.1	0.0	0.0	0.2	0.2	55.5	0.1	0.0	55.7	0.1	0.0	9.7	0.0	9.8	11.3	22.9	0.1	0.0	34.3	
Exiting Leg Total					8					746					373					2113	3240

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:45 PM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:45 PM	1	0	0	0	1	0	211	1	0	212	1	0	46	0	47	49	87	0	0	136	396
5:00 PM	1	0	0	0	1	0	215	0	0	215	0	1	39	0	40	54	94	0	0	148	404
5:15 PM	1	2	0	0	3	3	251	0	0	254	1	0	39	0	40	35	91	1	0	127	424
5:30 PM	0	0	0	0	0	1	235	2	0	238	0	0	32	0	32	43	102	0	0	145	415
Total Volume	3	2	0	0	5	4	912	3	0	919	2	1	156	0	159	181	374	1	0	556	1639
% Approach Total	60.0	40.0	0.0	0.0		0.4	99.2	0.3	0.0		1.3	0.6	98.1	0.0		32.6	67.3	0.2	0.0		
PHF	0.750	0.250	0.000	0.000	0.417	0.333	0.908	0.375	0.000	0.905	0.500	0.250	0.848	0.000	0.846	0.838	0.917	0.250	0.000	0.939	0.966
Entering Leg	3	2	0	0	5	4	912	3	0	919	2	1	156	0	159	181	374	1	0	556	1639
Exiting Leg					6					376					186					1071	1639
Total					11					1295					345					1627	3278

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Light Goods Vehicle

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	50	0	0	50	0	0	5	0	5	3	15	0	0	18	73
4:15 PM	0	0	0	0	0	0	50	2	0	52	0	0	4	0	4	8	17	0	0	25	81
4:30 PM	0	0	0	0	0	0	38	0	0	38	0	0	3	0	3	4	19	0	0	23	64
4:45 PM	0	0	0	0	0	0	12	0	0	12	0	0	7	0	7	2	14	1	0	17	36
Total	0	0	0	0	0	0	150	2	0	152	0	0	19	0	19	17	65	1	0	83	254
5:00 PM	0	0	0	0	0	0	20	1	0	21	0	1	3	0	4	0	8	1	0	9	34
5:15 PM	0	0	0	0	0	0	28	0	0	28	0	0	1	0	1	2	14	0	0	16	45
5:30 PM	0	0	0	0	0	0	16	0	0	16	0	0	5	0	5	3	12	0	0	15	36
5:45 PM	0	0	0	0	0	0	10	0	0	10	0	0	3	0	3	3	8	0	0	11	24
Total	0	0	0	0	0	0	74	1	0	75	0	1	12	0	13	8	42	1	0	51	139
Grand Total	0	0	0	0	0	0	224	3	0	227	0	1	31	0	32	25	107	2	0	134	393
Approach %	0.0	0.0	0.0	0.0		0.0	98.7	1.3	0.0		0.0	3.1	96.9	0.0		18.7	79.9	1.5	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	57.0	0.8	0.0	57.8	0.0	0.3	7.9	0.0	8.1	6.4	27.2	0.5	0.0	34.1	
Exiting Leg Total					3					107					28					255	393

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70/117) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	50	0	0	50	0	0	5	0	5	3	15	0	0	18	73
4:15 PM	0	0	0	0	0	0	50	2	0	52	0	0	4	0	4	8	17	0	0	25	81
4:30 PM	0	0	0	0	0	0	38	0	0	38	0	0	3	0	3	4	19	0	0	23	64
4:45 PM	0	0	0	0	0	0	12	0	0	12	0	0	7	0	7	2	14	1	0	17	36
Total Volume	0	0	0	0	0	0	150	2	0	152	0	0	19	0	19	17	65	1	0	83	254
% Approach Total	0.0	0.0	0.0	0.0		0.0	98.7	1.3	0.0		0.0	0.0	100.0	0.0		20.5	78.3	1.2	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.250	0.000	0.731	0.000	0.000	0.679	0.000	0.679	0.531	0.855	0.250	0.000	0.830	0.784
Entering Leg	0	0	0	0	0	0	150	2	0	152	0	0	19	0	19	17	65	1	0	83	254
Exiting Leg					1					65					19					169	254
Total					1					217					38					252	508

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Shirley Road (from North)					Seven Bridge Road (Route 117) (from East)					Main Street (Route 70) (from South)					Main Street (Route 70/117) (from West)					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	2	0	0	0	2	8
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	1	0	0	1	4
4:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	3	1	0	0	4	14
5:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	0	0	0	1	4
Grand Total	0	0	0	0	0	0	12	0	0	12	0	0	1	0	1	4	1	0	0	5	18
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		80.0	20.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	66.7	0.0	0.0	5.6	0.0	5.6	22.2	5.6	0.0	0.0	27.8	
Exiting Leg Total					0					1					4					13	18

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Shirley Road (from North)					Seven Bridge Road (Route 117) (from East)					Main Street (Route 70) (from South)					Main Street (Route 70/117) (from West)					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	2	0	0	0	2	8
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	1	0	0	1	4
4:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total Volume	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	3	1	0	0	4	14
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		75.0	25.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375	0.000	0.000	0.250	0.000	0.250	0.375	0.250	0.000	0.000	0.500	0.438
Entering Leg	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	3	1	0	0	4	14
Exiting Leg					0					1					3					10	14
Total					0					10					4					14	28

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Single-Unit Trucks

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
4:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	4	0	0	5	9
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	0	3	0	0	3	6
Total	0	0	0	0	0	0	11	0	0	11	0	0	2	0	2	1	11	0	0	12	25
5:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	8
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
5:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	2	0	0	2	5
Total	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	0	11	0	0	11	18
Grand Total	0	0	0	0	0	0	17	0	0	17	0	0	3	0	3	1	22	0	0	23	43
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		4.3	95.7	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	39.5	0.0	0.0	39.5	0.0	0.0	7.0	0.0	7.0	2.3	51.2	0.0	0.0	53.5	
Exiting Leg Total					0					22					1					20	43

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
4:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	4	0	0	5	9
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	0	3	0	0	3	6
5:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	8
Total Volume	0	0	0	0	0	0	10	0	0	10	0	0	2	0	2	1	13	0	0	14	26
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		7.1	92.9	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.625	0.000	0.000	0.250	0.000	0.250	0.250	0.650	0.000	0.000	0.700	0.722
Entering Leg	0	0	0	0	0	0	10	0	0	10	0	0	2	0	2	1	13	0	0	14	26
Exiting Leg					0					13					1					12	26
Total					0					23					3					26	52

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
5:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
Grand Total	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	40.0	
Exiting Leg Total					0					4					0					6	10

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70/117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
5:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	8
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375	0.667
Entering Leg	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	8
Exiting Leg					0					3					0					5	8
Total					0					8					0					8	16

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70/117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70/117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 CC**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70/117)**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70/117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	
Exiting Leg Total							0							0							0						2	2

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70/117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Exiting Leg							0							0							0						2	2
Total							0							0							0						4	4

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	7	3	0	10	0	13	0	13	26	10	0	36	59
7:15 AM	4	1	0	5	0	13	0	13	32	11	0	43	61
7:30 AM	8	7	0	15	0	7	0	7	34	17	0	51	73
7:45 AM	6	2	0	8	0	20	0	20	30	17	0	47	75
Total	25	13	0	38	0	53	0	53	122	55	0	177	268
8:00 AM	6	2	0	8	0	14	0	14	23	5	0	28	50
8:15 AM	4	1	0	5	0	11	0	11	29	6	0	35	51
8:30 AM	5	3	0	8	0	18	0	18	35	3	0	38	64
8:45 AM	6	3	0	9	0	18	0	18	27	5	0	32	59
Total	21	9	0	30	0	61	0	61	114	19	0	133	224
Grand Total	46	22	0	68	0	114	0	114	236	74	0	310	492
Approach %	67.6	32.4	0.0		0.0	100.0	0.0		76.1	23.9	0.0		
Total %	9.3	4.5	0.0	13.8	0.0	23.2	0.0	23.2	48.0	15.0	0.0	63.0	
Exiting Leg Total				74				258				160	492
Cars	37	22	0	59	0	101	0	101	222	64	0	286	446
% Cars	80.4	100.0	0.0	86.8	0.0	88.6	0.0	88.6	94.1	86.5	0.0	92.3	90.7
Exiting Leg Total				64				244				138	446
Heavy Vehicles	9	0	0	9	0	13	0	13	14	10	0	24	46
% Heavy Vehicles	19.6	0.0	0.0	13.2	0.0	11.4	0.0	11.4	5.9	13.5	0.0	7.7	9.3
Exiting Leg Total				10				14				22	46

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	7	3	0	10	0	13	0	13	26	10	0	36	59
7:15 AM	4	1	0	5	0	13	0	13	32	11	0	43	61
7:30 AM	8	7	0	15	0	7	0	7	34	17	0	51	73
7:45 AM	6	2	0	8	0	20	0	20	30	17	0	47	75
Total Volume	25	13	0	38	0	53	0	53	122	55	0	177	268
% Approach Total	65.8	34.2	0.0		0.0	100.0	0.0		68.9	31.1	0.0		
PHF	0.781	0.464	0.000	0.633	0.000	0.663	0.000	0.663	0.897	0.809	0.000	0.868	0.893
Cars	22	13	0	35	0	49	0	49	119	48	0	167	251
Cars %	88.0	100.0	0.0	92.1	0.0	92.5	0.0	92.5	97.5	87.3	0.0	94.4	93.7
Heavy Vehicles	3	0	0	3	0	4	0	4	3	7	0	10	17
Heavy Vehicles %	12.0	0.0	0.0	7.9	0.0	7.5	0.0	7.5	2.5	12.7	0.0	5.6	6.3
Cars Enter Leg	22	13	0	35	0	49	0	49	119	48	0	167	251
Heavy Enter Leg	3	0	0	3	0	4	0	4	3	7	0	10	17
Total Entering Leg	25	13	0	38	0	53	0	53	122	55	0	177	268
Cars Exiting Leg				48				132				71	251
Heavy Exiting Leg				7				3				7	17
Total Exiting Leg				55				135				78	268

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars-Combined (Motorcycles, Cars, Light Goods)**

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	6	3	0	9	0	11	0	11	25	8	0	33	53
7:15 AM	4	1	0	5	0	12	0	12	31	9	0	40	57
7:30 AM	8	7	0	15	0	7	0	7	33	16	0	49	71
7:45 AM	4	2	0	6	0	19	0	19	30	15	0	45	70
Total	22	13	0	35	0	49	0	49	119	48	0	167	251
8:00 AM	3	2	0	5	0	13	0	13	19	4	0	23	41
8:15 AM	3	1	0	4	0	9	0	9	27	5	0	32	45
8:30 AM	3	3	0	6	0	14	0	14	33	3	0	36	56
8:45 AM	6	3	0	9	0	16	0	16	24	4	0	28	53
Total	15	9	0	24	0	52	0	52	103	16	0	119	195
Grand Total	37	22	0	59	0	101	0	101	222	64	0	286	446
Approach %	62.7	37.3	0.0		0.0	100.0	0.0		77.6	22.4	0.0		
Total %	8.3	4.9	0.0	13.2	0.0	22.6	0.0	22.6	49.8	14.3	0.0	64.1	
Exiting Leg Total				64				244				138	446

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	6	3	0	9	0	11	0	11	25	8	0	33	53
7:15 AM	4	1	0	5	0	12	0	12	31	9	0	40	57
7:30 AM	8	7	0	15	0	7	0	7	33	16	0	49	71
7:45 AM	4	2	0	6	0	19	0	19	30	15	0	45	70
Total Volume	22	13	0	35	0	49	0	49	119	48	0	167	251
% Approach Total	62.9	37.1	0.0		0.0	100.0	0.0		71.3	28.7	0.0		
PHF	0.688	0.464	0.000	0.583	0.000	0.645	0.000	0.645	0.902	0.750	0.000	0.852	0.884
Entering Leg	22	13	0	35	0	49	0	49	119	48	0	167	251
Exiting Leg				48				132				71	251
Total				83				181				238	502

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	1	0	0	1	0	2	0	2	1	2	0	3	6
7:15 AM	0	0	0	0	0	1	0	1	1	2	0	3	4
7:30 AM	0	0	0	0	0	0	0	0	1	1	0	2	2
7:45 AM	2	0	0	2	0	1	0	1	0	2	0	2	5
Total	3	0	0	3	0	4	0	4	3	7	0	10	17
8:00 AM	3	0	0	3	0	1	0	1	4	1	0	5	9
8:15 AM	1	0	0	1	0	2	0	2	2	1	0	3	6
8:30 AM	2	0	0	2	0	4	0	4	2	0	0	2	8
8:45 AM	0	0	0	0	0	2	0	2	3	1	0	4	6
Total	6	0	0	6	0	9	0	9	11	3	0	14	29
Grand Total	9	0	0	9	0	13	0	13	14	10	0	24	46
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		58.3	41.7	0.0		
Total %	19.6	0.0	0.0	19.6	0.0	28.3	0.0	28.3	30.4	21.7	0.0	52.2	
Exiting Leg Total				10				14				22	46
Buses	2	0	0	2	0	0	0	0	0	0	0	0	2
% Buses	22.2	0.0	0.0	22.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3
Exiting Leg Total				0				0				2	2
Single-Unit Trucks	4	0	0	4	0	8	0	8	12	7	0	19	31
% Single-Unit	44.4	0.0	0.0	44.4	0.0	61.5	0.0	61.5	85.7	70.0	0.0	79.2	67.4
Exiting Leg Total				7				12				12	31
Articulated Trucks	3	0	0	3	0	5	0	5	2	3	0	5	13
% Articulated	33.3	0.0	0.0	33.3	0.0	38.5	0.0	38.5	14.3	30.0	0.0	20.8	28.3
Exiting Leg Total				3				2				8	13

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	3	0	0	3	0	1	0	1	4	1	0	5	9
8:15 AM	1	0	0	1	0	2	0	2	2	1	0	3	6
8:30 AM	2	0	0	2	0	4	0	4	2	0	0	2	8
8:45 AM	0	0	0	0	0	2	0	2	3	1	0	4	6
Total Volume	6	0	0	6	0	9	0	9	11	3	0	14	29
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		78.6	21.4	0.0		
PHF	0.500	0.000	0.000	0.500	0.000	0.563	0.000	0.563	0.688	0.750	0.000	0.700	0.806
Buses	1	0	0	1	0	0	0	0	0	0	0	0	1
Buses %	16.7	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
Single-Unit Trucks	4	0	0	4	0	5	0	5	9	1	0	10	19
Single-Unit %	66.7	0.0	0.0	66.7	0.0	55.6	0.0	55.6	81.8	33.3	0.0	71.4	65.5
Articulated Trucks	1	0	0	1	0	4	0	4	2	2	0	4	9
Articulated %	16.7	0.0	0.0	16.7	0.0	44.4	0.0	44.4	18.2	66.7	0.0	28.6	31.0
Buses	1	0	0	1	0	0	0	0	0	0	0	0	1
Single-Unit Trucks	4	0	0	4	0	5	0	5	9	1	0	10	19
Articulated Trucks	1	0	0	1	0	4	0	4	2	2	0	4	9
Total Entering Leg	6	0	0	6	0	9	0	9	11	3	0	14	29
Buses				0				0				1	1
Single-Unit Trucks				1				9				9	19
Articulated Trucks				2				2				5	9
Total Exiting Leg				3				11				15	29

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	6	3	0	9	0	7	0	7	22	6	0	28	44
7:15 AM	4	1	0	5	0	9	0	9	27	5	0	32	46
7:30 AM	8	5	0	13	0	5	0	5	26	11	0	37	55
7:45 AM	1	2	0	3	0	12	0	12	26	6	0	32	47
Total	19	11	0	30	0	33	0	33	101	28	0	129	192
8:00 AM	3	1	0	4	0	10	0	10	16	2	0	18	32
8:15 AM	3	1	0	4	0	5	0	5	24	4	0	28	37
8:30 AM	3	1	0	4	0	10	0	10	32	2	0	34	48
8:45 AM	5	0	0	5	0	10	0	10	20	2	0	22	37
Total	14	3	0	17	0	35	0	35	92	10	0	102	154
Grand Total	33	14	0	47	0	68	0	68	193	38	0	231	346
Approach %	70.2	29.8	0.0		0.0	100.0	0.0		83.5	16.5	0.0		
Total %	9.5	4.0	0.0	13.6	0.0	19.7	0.0	19.7	55.8	11.0	0.0	66.8	
Exiting Leg Total				38				207				101	346

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	6	3	0	9	0	7	0	7	22	6	0	28	44
7:15 AM	4	1	0	5	0	9	0	9	27	5	0	32	46
7:30 AM	8	5	0	13	0	5	0	5	26	11	0	37	55
7:45 AM	1	2	0	3	0	12	0	12	26	6	0	32	47
Total Volume	19	11	0	30	0	33	0	33	101	28	0	129	192
% Approach Total	63.3	36.7	0.0		0.0	100.0	0.0		78.3	21.7	0.0		
PHF	0.594	0.550	0.000	0.577	0.000	0.688	0.000	0.688	0.935	0.636	0.000	0.872	0.873
Entering Leg	19	11	0	30	0	33	0	33	101	28	0	129	192
Exiting Leg				28				112				52	192
Total				58				145				181	384

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Light Goods Vehicle**

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	4	0	4	3	2	0	5	9
7:15 AM	0	0	0	0	0	3	0	3	4	4	0	8	11
7:30 AM	0	2	0	2	0	2	0	2	7	5	0	12	16
7:45 AM	3	0	0	3	0	7	0	7	4	9	0	13	23
Total	3	2	0	5	0	16	0	16	18	20	0	38	59
8:00 AM	0	1	0	1	0	3	0	3	3	2	0	5	9
8:15 AM	0	0	0	0	0	4	0	4	3	1	0	4	8
8:30 AM	0	2	0	2	0	4	0	4	1	1	0	2	8
8:45 AM	1	3	0	4	0	6	0	6	4	2	0	6	16
Total	1	6	0	7	0	17	0	17	11	6	0	17	41
Grand Total	4	8	0	12	0	33	0	33	29	26	0	55	100
Approach %	33.3	66.7	0.0		0.0	100.0	0.0		52.7	47.3	0.0		
Total %	4.0	8.0	0.0	12.0	0.0	33.0	0.0	33.0	29.0	26.0	0.0	55.0	
Exiting Leg Total				26				37				37	100

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	4	0	4	3	2	0	5	9
7:15 AM	0	0	0	0	0	3	0	3	4	4	0	8	11
7:30 AM	0	2	0	2	0	2	0	2	7	5	0	12	16
7:45 AM	3	0	0	3	0	7	0	7	4	9	0	13	23
Total Volume	3	2	0	5	0	16	0	16	18	20	0	38	59
% Approach Total	60.0	40.0	0.0		0.0	100.0	0.0		47.4	52.6	0.0		
PHF	0.250	0.250	0.000	0.417	0.000	0.571	0.000	0.571	0.643	0.556	0.000	0.731	0.641
Entering Leg	3	2	0	5	0	16	0	16	18	20	0	38	59
Exiting Leg				20				20				19	59
Total				25				36				57	118

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	0	0	0	0	0	0	1
8:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	0	0	0	0	0	0	1
Grand Total	2	0	0	2	0	0	0	0	0	0	0	0	2
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				2	2

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	1
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	1	0	0	1	0	0	0	0	0	0	0	0	1
Exiting Leg				0				0				1	1
Total				1				0				1	2

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	1	0	1	1	2	0	3	4
7:15 AM	0	0	0	0	0	1	0	1	1	2	0	3	4
7:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:45 AM	0	0	0	0	0	1	0	1	0	2	0	2	3
Total	0	0	0	0	0	3	0	3	3	6	0	9	12
8:00 AM	2	0	0	2	0	1	0	1	2	0	0	2	5
8:15 AM	1	0	0	1	0	1	0	1	2	0	0	2	4
8:30 AM	1	0	0	1	0	2	0	2	2	0	0	2	5
8:45 AM	0	0	0	0	0	1	0	1	3	1	0	4	5
Total	4	0	0	4	0	5	0	5	9	1	0	10	19
Grand Total	4	0	0	4	0	8	0	8	12	7	0	19	31
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		63.2	36.8	0.0		
Total %	12.9	0.0	0.0	12.9	0.0	25.8	0.0	25.8	38.7	22.6	0.0	61.3	
Exiting Leg Total				7				12				12	31

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	2	0	0	2	0	1	0	1	2	0	0	2	5
8:15 AM	1	0	0	1	0	1	0	1	2	0	0	2	4
8:30 AM	1	0	0	1	0	2	0	2	2	0	0	2	5
8:45 AM	0	0	0	0	0	1	0	1	3	1	0	4	5
Total Volume	4	0	0	4	0	5	0	5	9	1	0	10	19
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		90.0	10.0	0.0		
PHF	0.500	0.000	0.000	0.500	0.000	0.625	0.000	0.625	0.750	0.250	0.000	0.625	0.950
Entering Leg	4	0	0	4	0	5	0	5	9	1	0	10	19
Exiting Leg				1				9				9	19
Total				5				14				19	38

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
7:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
Total	2	0	0	2	0	1	0	1	0	1	0	1	4
8:00 AM	0	0	0	0	0	0	0	0	2	1	0	3	3
8:15 AM	0	0	0	0	0	1	0	1	0	1	0	1	2
8:30 AM	1	0	0	1	0	2	0	2	0	0	0	0	3
8:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	1	0	0	1	0	4	0	4	2	2	0	4	9
Grand Total	3	0	0	3	0	5	0	5	2	3	0	5	13
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		40.0	60.0	0.0		
Total %	23.1	0.0	0.0	23.1	0.0	38.5	0.0	38.5	15.4	23.1	0.0	38.5	
Exiting Leg Total				3				2				8	13

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	2	1	0	3	3
8:15 AM	0	0	0	0	0	1	0	1	0	1	0	1	2
8:30 AM	1	0	0	1	0	2	0	2	0	0	0	0	3
Total Volume	3	0	0	3	0	3	0	3	2	2	0	4	10
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		50.0	50.0	0.0		
PHF	0.375	0.000	0.000	0.375	0.000	0.375	0.000	0.375	0.250	0.500	0.000	0.333	0.833
Entering Leg	3	0	0	3	0	3	0	3	2	2	0	4	10
Exiting Leg				2				2				6	10
Total				5				5				10	20

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Fort Pond Road						Route 2 WB Ramps						Fort Pond Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Fort Pond Road						Route 2 WB Ramps						Fort Pond Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 D**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Fort Pond Road						Route 2 WB Ramps						Fort Pond Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Fort Pond Road						Route 2 WB Ramps						Fort Pond Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	25	11	0	36	0	54	0	54	32	6	0	38	128
4:15 PM	28	8	0	36	0	58	0	58	49	5	0	54	148
4:30 PM	33	1	0	34	0	44	0	44	40	6	0	46	124
4:45 PM	25	5	0	30	0	57	0	57	41	2	0	43	130
Total	111	25	0	136	0	213	0	213	162	19	0	181	530
5:00 PM	25	10	0	35	0	53	0	53	34	5	0	39	127
5:15 PM	17	4	0	21	0	75	0	75	34	0	0	34	130
5:30 PM	66	5	0	71	0	121	0	121	19	5	0	24	216
5:45 PM	109	7	0	116	0	102	0	102	26	3	0	29	247
Total	217	26	0	243	0	351	0	351	113	13	0	126	720
Grand Total	328	51	0	379	0	564	0	564	275	32	0	307	1250
Approach %	86.5	13.5	0.0		0.0	100.0	0.0		89.6	10.4	0.0		
Total %	26.2	4.1	0.0	30.3	0.0	45.1	0.0	45.1	22.0	2.6	0.0	24.6	
Exiting Leg Total				32				326				892	1250
Cars	319	47	0	366	0	545	0	545	264	27	0	291	1202
% Cars	97.3	92.2	0.0	96.6	0.0	96.6	0.0	96.6	96.0	84.4	0.0	94.8	96.2
Exiting Leg Total				27				311				864	1202
Heavy Vehicles	9	4	0	13	0	19	0	19	11	5	0	16	48
% Heavy Vehicles	2.7	7.8	0.0	3.4	0.0	3.4	0.0	3.4	4.0	15.6	0.0	5.2	3.8
Exiting Leg Total				5				15				28	48

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
5:00 PM	25	10	0	35	0	53	0	53	34	5	0	39	127
5:15 PM	17	4	0	21	0	75	0	75	34	0	0	34	130
5:30 PM	66	5	0	71	0	121	0	121	19	5	0	24	216
5:45 PM	109	7	0	116	0	102	0	102	26	3	0	29	247
Total Volume	217	26	0	243	0	351	0	351	113	13	0	126	720
% Approach Total	89.3	10.7	0.0		0.0	100.0	0.0		89.7	10.3	0.0		
PHF	0.498	0.650	0.000	0.524	0.000	0.725	0.000	0.725	0.831	0.650	0.000	0.808	0.729
Cars	212	24	0	236	0	341	0	341	108	12	0	120	697
Cars %	97.7	92.3	0.0	97.1	0.0	97.2	0.0	97.2	95.6	92.3	0.0	95.2	96.8
Heavy Vehicles	5	2	0	7	0	10	0	10	5	1	0	6	23
Heavy Vehicles %	2.3	7.7	0.0	2.9	0.0	2.8	0.0	2.8	4.4	7.7	0.0	4.8	3.2
Cars Enter Leg	212	24	0	236	0	341	0	341	108	12	0	120	697
Heavy Enter Leg	5	2	0	7	0	10	0	10	5	1	0	6	23
Total Entering Leg	217	26	0	243	0	351	0	351	113	13	0	126	720
Cars Exiting Leg				12				132				553	697
Heavy Exiting Leg				1				7				15	23
Total Exiting Leg				13				139				568	720

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars-Combined (Motorcycles, Cars, Light Goods)**

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	24	11	0	35	0	49	0	49	28	5	0	33	117
4:15 PM	26	6	0	32	0	56	0	56	49	3	0	52	140
4:30 PM	32	1	0	33	0	43	0	43	38	5	0	43	119
4:45 PM	25	5	0	30	0	56	0	56	41	2	0	43	129
Total	107	23	0	130	0	204	0	204	156	15	0	171	505
5:00 PM	23	10	0	33	0	51	0	51	32	5	0	37	121
5:15 PM	17	2	0	19	0	70	0	70	34	0	0	34	123
5:30 PM	65	5	0	70	0	120	0	120	18	4	0	22	212
5:45 PM	107	7	0	114	0	100	0	100	24	3	0	27	241
Total	212	24	0	236	0	341	0	341	108	12	0	120	697
Grand Total	319	47	0	366	0	545	0	545	264	27	0	291	1202
Approach %	87.2	12.8	0.0		0.0	100.0	0.0		90.7	9.3	0.0		
Total %	26.5	3.9	0.0	30.4	0.0	45.3	0.0	45.3	22.0	2.2	0.0	24.2	
Exiting Leg Total				27				311				864	1202

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
5:00 PM	23	10	0	33	0	51	0	51	32	5	0	37	121
5:15 PM	17	2	0	19	0	70	0	70	34	0	0	34	123
5:30 PM	65	5	0	70	0	120	0	120	18	4	0	22	212
5:45 PM	107	7	0	114	0	100	0	100	24	3	0	27	241
Total Volume	212	24	0	236	0	341	0	341	108	12	0	120	697
% Approach Total	89.8	10.2	0.0		0.0	100.0	0.0		90.0	10.0	0.0		
PHF	0.495	0.600	0.000	0.518	0.000	0.710	0.000	0.710	0.794	0.600	0.000	0.811	0.723
Entering Leg	212	24	0	236	0	341	0	341	108	12	0	120	697
Exiting Leg				12				132				553	697
Total				248				473				673	1394

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	1	0	0	1	0	5	0	5	4	1	0	5	11
4:15 PM	2	2	0	4	0	2	0	2	0	2	0	2	8
4:30 PM	1	0	0	1	0	1	0	1	2	1	0	3	5
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	4	2	0	6	0	9	0	9	6	4	0	10	25
5:00 PM	2	0	0	2	0	2	0	2	2	0	0	2	6
5:15 PM	0	2	0	2	0	5	0	5	0	0	0	0	7
5:30 PM	1	0	0	1	0	1	0	1	1	1	0	2	4
5:45 PM	2	0	0	2	0	2	0	2	2	0	0	2	6
Total	5	2	0	7	0	10	0	10	5	1	0	6	23
Grand Total	9	4	0	13	0	19	0	19	11	5	0	16	48
Approach %	69.2	30.8	0.0		0.0	100.0	0.0		68.8	31.3	0.0		
Total %	18.8	8.3	0.0	27.1	0.0	39.6	0.0	39.6	22.9	10.4	0.0	33.3	
Exiting Leg Total				5				15				28	48
Buses	1	0	0	1	0	1	0	1	1	1	0	2	4
% Buses	11.1	0.0	0.0	7.7	0.0	5.3	0.0	5.3	9.1	20.0	0.0	12.5	8.3
Exiting Leg Total				1				1				2	4
Single-Unit Trucks	8	2	0	10	0	13	0	13	6	2	0	8	31
% Single-Unit	88.9	50.0	0.0	76.9	0.0	68.4	0.0	68.4	54.5	40.0	0.0	50.0	64.6
Exiting Leg Total				2				8				21	31
Articulated Trucks	0	2	0	2	0	5	0	5	4	2	0	6	13
% Articulated	0.0	50.0	0.0	15.4	0.0	26.3	0.0	26.3	36.4	40.0	0.0	37.5	27.1
Exiting Leg Total				2				6				5	13

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Fort Pond Road				Route 2 WB Ramps				Fort Pond Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	1	0	0	1	0	5	0	5	4	1	0	5	11
4:15 PM	2	2	0	4	0	2	0	2	0	2	0	2	8
4:30 PM	1	0	0	1	0	1	0	1	2	1	0	3	5
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	4	2	0	6	0	9	0	9	6	4	0	10	25
% Approach Total	66.7	33.3	0.0		0.0	100.0	0.0		60.0	40.0	0.0		
PHF	0.500	0.250	0.000	0.375	0.000	0.450	0.000	0.450	0.375	0.500	0.000	0.500	0.568
Buses	1	0	0	1	0	1	0	1	1	1	0	2	4
Buses %	25.0	0.0	0.0	16.7	0.0	11.1	0.0	11.1	16.7	25.0	0.0	20.0	16.0
Single-Unit Trucks	3	1	0	4	0	7	0	7	3	1	0	4	15
Single-Unit %	75.0	50.0	0.0	66.7	0.0	77.8	0.0	77.8	50.0	25.0	0.0	40.0	60.0
Articulated Trucks	0	1	0	1	0	1	0	1	2	2	0	4	6
Articulated %	0.0	50.0	0.0	16.7	0.0	11.1	0.0	11.1	33.3	50.0	0.0	40.0	24.0
Buses	1	0	0	1	0	1	0	1	1	1	0	2	4
Single-Unit Trucks	3	1	0	4	0	7	0	7	3	1	0	4	15
Articulated Trucks	0	1	0	1	0	1	0	1	2	2	0	4	6
Total Entering Leg	4	2	0	6	0	9	0	9	6	4	0	10	25
Buses				1				1				2	4
Single-Unit Trucks				1				4				10	15
Articulated Trucks				2				3				1	6
Total Exiting Leg				4				8				13	25

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	20	10	0	30	0	37	0	37	19	3	0	22	89
4:15 PM	22	5	0	27	0	45	0	45	41	1	0	42	114
4:30 PM	30	1	0	31	0	32	0	32	30	5	0	35	98
4:45 PM	24	3	0	27	0	44	0	44	34	2	0	36	107
Total	96	19	0	115	0	158	0	158	124	11	0	135	408
5:00 PM	22	9	0	31	0	49	0	49	32	5	0	37	117
5:15 PM	16	2	0	18	0	62	0	62	34	0	0	34	114
5:30 PM	51	4	0	55	0	108	0	108	17	2	0	19	182
5:45 PM	96	6	0	102	0	87	0	87	21	3	0	24	213
Total	185	21	0	206	0	306	0	306	104	10	0	114	626
Grand Total	281	40	0	321	0	464	0	464	228	21	0	249	1034
Approach %	87.5	12.5	0.0		0.0	100.0	0.0		91.6	8.4	0.0		
Total %	27.2	3.9	0.0	31.0	0.0	44.9	0.0	44.9	22.1	2.0	0.0	24.1	
Exiting Leg Total				21				268				745	1034

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
5:00 PM	22	9	0	31	0	49	0	49	32	5	0	37	117
5:15 PM	16	2	0	18	0	62	0	62	34	0	0	34	114
5:30 PM	51	4	0	55	0	108	0	108	17	2	0	19	182
5:45 PM	96	6	0	102	0	87	0	87	21	3	0	24	213
Total Volume	185	21	0	206	0	306	0	306	104	10	0	114	626
% Approach Total	89.8	10.2	0.0		0.0	100.0	0.0		91.2	8.8	0.0		
PHF	0.482	0.583	0.000	0.505	0.000	0.708	0.000	0.708	0.765	0.500	0.000	0.770	0.735
Entering Leg	185	21	0	206	0	306	0	306	104	10	0	114	626
Exiting Leg				10				125				491	626
Total				216				431				605	1252

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Light Goods Vehicle**

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	4	1	0	5	0	12	0	12	9	2	0	11	28
4:15 PM	4	1	0	5	0	11	0	11	8	2	0	10	26
4:30 PM	2	0	0	2	0	11	0	11	8	0	0	8	21
4:45 PM	1	2	0	3	0	12	0	12	7	0	0	7	22
Total	11	4	0	15	0	46	0	46	32	4	0	36	97
5:00 PM	1	1	0	2	0	2	0	2	0	0	0	0	4
5:15 PM	1	0	0	1	0	8	0	8	0	0	0	0	9
5:30 PM	14	1	0	15	0	12	0	12	1	2	0	3	30
5:45 PM	11	1	0	12	0	13	0	13	3	0	0	3	28
Total	27	3	0	30	0	35	0	35	4	2	0	6	71
Grand Total	38	7	0	45	0	81	0	81	36	6	0	42	168
Approach %	84.4	15.6	0.0		0.0	100.0	0.0		85.7	14.3	0.0		
Total %	22.6	4.2	0.0	26.8	0.0	48.2	0.0	48.2	21.4	3.6	0.0	25.0	
Exiting Leg Total				6				43				119	168

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	4	1	0	5	0	12	0	12	9	2	0	11	28
4:15 PM	4	1	0	5	0	11	0	11	8	2	0	10	26
4:30 PM	2	0	0	2	0	11	0	11	8	0	0	8	21
4:45 PM	1	2	0	3	0	12	0	12	7	0	0	7	22
Total Volume	11	4	0	15	0	46	0	46	32	4	0	36	97
% Approach Total	73.3	26.7	0.0		0.0	100.0	0.0		88.9	11.1	0.0		
PHF	0.688	0.500	0.000	0.750	0.000	0.958	0.000	0.958	0.889	0.500	0.000	0.818	0.866
Entering Leg	11	4	0	15	0	46	0	46	32	4	0	36	97
Exiting Leg				4				36				57	97
Total				19				82				93	194

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
4:30 PM	1	0	0	1	0	0	0	0	1	0	0	1	2
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	1	0	0	1	0	1	0	1	1	1	0	2	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	1	0	1	0	1	1	1	0	2	4
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		50.0	50.0	0.0		
Total %	25.0	0.0	0.0	25.0	0.0	25.0	0.0	25.0	25.0	25.0	0.0	50.0	
Exiting Leg Total				1				1				2	4

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
4:30 PM	1	0	0	1	0	0	0	0	1	0	0	1	2
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	1	0	0	1	0	1	0	1	1	1	0	2	4
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		50.0	50.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.250	0.250	0.000	0.500	0.500
Entering Leg	1	0	0	1	0	1	0	1	1	1	0	2	4
Exiting Leg				1				1				2	4
Total				2				2				4	8

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Single-Unit Trucks

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	1	0	0	1	0	5	0	5	3	0	0	3	9
4:15 PM	2	1	0	3	0	2	0	2	0	1	0	1	6
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	1	0	4	0	7	0	7	3	1	0	4	15
5:00 PM	2	0	0	2	0	2	0	2	2	0	0	2	6
5:15 PM	0	1	0	1	0	2	0	2	0	0	0	0	3
5:30 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
5:45 PM	2	0	0	2	0	2	0	2	1	0	0	1	5
Total	5	1	0	6	0	6	0	6	3	1	0	4	16
Grand Total	8	2	0	10	0	13	0	13	6	2	0	8	31
Approach %	80.0	20.0	0.0		0.0	100.0	0.0		75.0	25.0	0.0		
Total %	25.8	6.5	0.0	32.3	0.0	41.9	0.0	41.9	19.4	6.5	0.0	25.8	
Exiting Leg Total				2				8				21	31

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
5:00 PM	2	0	0	2	0	2	0	2	2	0	0	2	6
5:15 PM	0	1	0	1	0	2	0	2	0	0	0	0	3
5:30 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
5:45 PM	2	0	0	2	0	2	0	2	1	0	0	1	5
Total Volume	5	1	0	6	0	6	0	6	3	1	0	4	16
% Approach Total	83.3	16.7	0.0		0.0	100.0	0.0		75.0	25.0	0.0		
PHF	0.625	0.250	0.000	0.750	0.000	0.750	0.000	0.750	0.375	0.250	0.000	0.500	0.667
Entering Leg	5	1	0	6	0	6	0	6	3	1	0	4	16
Exiting Leg				1				4				11	16
Total				7				10				15	32

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	1	1	0	2	2
4:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	1	0	1	1	1	0	2	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	1	0	1	2	2	0	4	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	1	0	3	0	3	0	0	0	0	4
5:30 PM	0	0	0	0	0	1	0	1	1	0	0	1	2
5:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	1	0	1	0	4	0	4	2	0	0	2	7
Grand Total	0	2	0	2	0	5	0	5	4	2	0	6	13
Approach %	0.0	100.0	0.0		0.0	100.0	0.0		66.7	33.3	0.0		
Total %	0.0	15.4	0.0	15.4	0.0	38.5	0.0	38.5	30.8	15.4	0.0	46.2	
Exiting Leg Total				2				6				5	13

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Fort Pond Road from East				Route 2 WB Ramps from South				Fort Pond Road from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
4:30 PM	0	0	0	0	0	1	0	1	1	1	0	2	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	1	0	3	0	3	0	0	0	0	4
Total Volume	0	1	0	1	0	4	0	4	1	1	0	2	7
% Approach Total	0.0	100.0	0.0		0.0	100.0	0.0		50.0	50.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.000	0.333	0.000	0.333	0.250	0.250	0.000	0.250	0.438
Entering Leg	0	1	0	1	0	4	0	4	1	1	0	2	7
Exiting Leg				1				2				4	7
Total				2				6				6	14

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Bicycles (on Roadway and Crosswalks)

	Fort Pond Road						Route 2 WB Ramps						Fort Pond Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Fort Pond Road						Route 2 WB Ramps						Fort Pond Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 DD**
Location: **S: Route 2 WB Ramps**
Location: **E: Fort Pond Road W: Fort Pond Road**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Fort Pond Road						Route 2 WB Ramps						Fort Pond Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Fort Pond Road						Route 2 WB Ramps						Fort Pond Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	7	52	64	0	123	14	9	28	0	51	25	22	14	0	61	20	24	6	0	50	285
7:15 AM	10	39	73	0	122	13	7	10	0	30	20	43	18	0	81	33	37	9	0	79	312
7:30 AM	11	55	60	0	126	12	6	11	0	29	28	56	18	0	102	16	32	5	0	53	310
7:45 AM	12	54	54	0	120	18	3	18	0	39	24	38	18	1	81	18	34	12	0	64	304
Total	40	200	251	0	491	57	25	67	0	149	97	159	68	1	325	87	127	32	0	246	1211
8:00 AM	17	65	46	0	128	13	5	27	0	45	22	30	28	0	80	25	20	10	1	56	309
8:15 AM	12	30	46	0	88	7	8	17	0	32	26	38	12	0	76	17	14	9	1	41	237
8:30 AM	11	31	25	0	67	14	12	23	0	49	24	39	29	0	92	17	8	5	0	30	238
8:45 AM	17	30	18	0	65	18	13	32	0	63	18	30	22	0	70	28	11	1	0	40	238
Total	57	156	135	0	348	52	38	99	0	189	90	137	91	0	318	87	53	25	2	167	1022
Grand Total	97	356	386	0	839	109	63	166	0	338	187	296	159	1	643	174	180	57	2	413	2233
Approach %	11.6	42.4	46.0	0.0		32.2	18.6	49.1	0.0		29.1	46.0	24.7	0.2		42.1	43.6	13.8	0.5		
Total %	4.3	15.9	17.3	0.0	37.6	4.9	2.8	7.4	0.0	15.1	8.4	13.3	7.1	0.0	28.8	7.8	8.1	2.6	0.1	18.5	
Exiting Leg Total					462					753					697					321	2233
Cars	90	336	373	0	799	93	63	155	0	311	159	275	149	1	584	167	176	54	2	399	2093
% Cars	92.8	94.4	96.6	0.0	95.2	85.3	100.0	93.4	0.0	92.0	85.0	92.9	93.7	100.0	90.8	96.0	97.8	94.7	100.0	96.6	93.7
Exiting Leg Total					422					708					659					304	2093
Heavy Vehicles	7	20	13	0	40	16	0	11	0	27	28	21	10	0	59	7	4	3	0	14	140
% Heavy Vehicles	7.2	5.6	3.4	0.0	4.8	14.7	0.0	6.6	0.0	8.0	15.0	7.1	6.3	0.0	9.2	4.0	2.2	5.3	0.0	3.4	6.3
Exiting Leg Total					40					45					38					17	140

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	10	39	73	0	122	13	7	10	0	30	20	43	18	0	81	33	37	9	0	79	312
7:30 AM	11	55	60	0	126	12	6	11	0	29	28	56	18	0	102	16	32	5	0	53	310
7:45 AM	12	54	54	0	120	18	3	18	0	39	24	38	18	1	81	18	34	12	0	64	304
8:00 AM	17	65	46	0	128	13	5	27	0	45	22	30	28	0	80	25	20	10	1	56	309
Total Volume	50	213	233	0	496	56	21	66	0	143	94	167	82	1	344	92	123	36	1	252	1235
% Approach Total	10.1	42.9	47.0	0.0		39.2	14.7	46.2	0.0		27.3	48.5	23.8	0.3		36.5	48.8	14.3	0.4		
PHF	0.735	0.819	0.798	0.000	0.969	0.778	0.750	0.611	0.000	0.794	0.839	0.746	0.732	0.250	0.843	0.697	0.831	0.750	0.250	0.797	0.990
Cars	48	201	224	0	473	47	21	60	0	128	79	154	76	1	310	88	119	33	1	241	1152
Cars %	96.0	94.4	96.1	0.0	95.4	83.9	100.0	90.9	0.0	89.5	84.0	92.2	92.7	100.0	90.1	95.7	96.7	91.7	100.0	95.6	93.3
Heavy Vehicles	2	12	9	0	23	9	0	6	0	15	15	13	6	0	34	4	4	3	0	11	83
Heavy Vehicles %	4.0	5.6	3.9	0.0	4.6	16.1	0.0	9.1	0.0	10.5	16.0	7.8	7.3	0.0	9.9	4.3	3.3	8.3	0.0	4.4	6.7
Cars Enter Leg	48	201	224	0	473	47	21	60	0	128	79	154	76	1	310	88	119	33	1	241	1152
Heavy Enter Leg	2	12	9	0	23	9	0	6	0	15	15	13	6	0	34	4	4	3	0	11	83
Total Entering Leg	50	213	233	0	496	56	21	66	0	143	94	167	82	1	344	92	123	36	1	252	1235
Cars Exiting Leg					234					422					350					146	1152
Heavy Exiting Leg					25					28					22					8	83
Total Exiting Leg					259					450					372					154	1235

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars-Combined (Motorcycles, Cars, Light Goods)

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	5	51	61	0	117	12	9	26	0	47	20	19	14	0	53	19	24	6	0	49	266
7:15 AM	9	38	70	0	117	11	7	9	0	27	13	42	17	0	72	31	36	7	0	74	290
7:30 AM	11	52	56	0	119	10	6	10	0	26	21	51	16	0	88	16	32	5	0	53	286
7:45 AM	11	51	53	0	115	15	3	16	0	34	23	36	17	1	77	18	32	12	0	62	288
Total	36	192	240	0	468	48	25	61	0	134	77	148	64	1	290	84	124	30	0	238	1130
8:00 AM	17	60	45	0	122	11	5	25	0	41	22	25	26	0	73	23	19	9	1	52	288
8:15 AM	11	28	46	0	85	7	8	16	0	31	22	37	12	0	71	17	14	9	1	41	228
8:30 AM	9	27	24	0	60	12	12	23	0	47	20	37	28	0	85	16	8	5	0	29	221
8:45 AM	17	29	18	0	64	15	13	30	0	58	18	28	19	0	65	27	11	1	0	39	226
Total	54	144	133	0	331	45	38	94	0	177	82	127	85	0	294	83	52	24	2	161	963
Grand Total	90	336	373	0	799	93	63	155	0	311	159	275	149	1	584	167	176	54	2	399	2093
Approach %	11.3	42.1	46.7	0.0		29.9	20.3	49.8	0.0		27.2	47.1	25.5	0.2		41.9	44.1	13.5	0.5		
Total %	4.3	16.1	17.8	0.0	38.2	4.4	3.0	7.4	0.0	14.9	7.6	13.1	7.1	0.0	27.9	8.0	8.4	2.6	0.1	19.1	
Exiting Leg Total					422					708					659					304	2093

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	9	38	70	0	117	11	7	9	0	27	13	42	17	0	72	31	36	7	0	74	290
7:30 AM	11	52	56	0	119	10	6	10	0	26	21	51	16	0	88	16	32	5	0	53	286
7:45 AM	11	51	53	0	115	15	3	16	0	34	23	36	17	1	77	18	32	12	0	62	288
8:00 AM	17	60	45	0	122	11	5	25	0	41	22	25	26	0	73	23	19	9	1	52	288
Total Volume	48	201	224	0	473	47	21	60	0	128	79	154	76	1	310	88	119	33	1	241	1152
% Approach Total	10.1	42.5	47.4	0.0		36.7	16.4	46.9	0.0		25.5	49.7	24.5	0.3		36.5	49.4	13.7	0.4		
PHF	0.706	0.838	0.800	0.000	0.969	0.783	0.750	0.600	0.000	0.780	0.859	0.755	0.731	0.250	0.881	0.710	0.826	0.688	0.250	0.814	0.993
Entering Leg	48	201	224	0	473	47	21	60	0	128	79	154	76	1	310	88	119	33	1	241	1152
Exiting Leg					234					422					350					146	1152
Total					707					550					660					387	2304

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	2	1	3	0	6	2	0	2	0	4	5	3	0	0	8	1	0	0	0	1	19
7:15 AM	1	1	3	0	5	2	0	1	0	3	7	1	1	0	9	2	1	2	0	5	22
7:30 AM	0	3	4	0	7	2	0	1	0	3	7	5	2	0	14	0	0	0	0	0	24
7:45 AM	1	3	1	0	5	3	0	2	0	5	1	2	1	0	4	0	2	0	0	2	16
Total	4	8	11	0	23	9	0	6	0	15	20	11	4	0	35	3	3	2	0	8	81
8:00 AM	0	5	1	0	6	2	0	2	0	4	0	5	2	0	7	2	1	1	0	4	21
8:15 AM	1	2	0	0	3	0	0	1	0	1	4	1	0	0	5	0	0	0	0	0	9
8:30 AM	2	4	1	0	7	2	0	0	0	2	4	2	1	0	7	1	0	0	0	1	17
8:45 AM	0	1	0	0	1	3	0	2	0	5	0	2	3	0	5	1	0	0	0	1	12
Total	3	12	2	0	17	7	0	5	0	12	8	10	6	0	24	4	1	1	0	6	59
Grand Total	7	20	13	0	40	16	0	11	0	27	28	21	10	0	59	7	4	3	0	14	140
Approach %	17.5	50.0	32.5	0.0		59.3	0.0	40.7	0.0		47.5	35.6	16.9	0.0		50.0	28.6	21.4	0.0		
Total %	5.0	14.3	9.3	0.0	28.6	11.4	0.0	7.9	0.0	19.3	20.0	15.0	7.1	0.0	42.1	5.0	2.9	2.1	0.0	10.0	
Exiting Leg Total					40					45					38					17	140
Buses	3	1	0	0	4	0	0	1	0	1	1	1	1	0	3	3	1	0	0	4	12
% Buses	42.9	5.0	0.0	0.0	10.0	0.0	0.0	9.1	0.0	3.7	3.6	4.8	10.0	0.0	5.1	42.9	25.0	0.0	0.0	28.6	8.6
Exiting Leg Total					1					2					5					4	12
Single-Unit Trucks	1	13	10	0	24	12	0	9	0	21	22	16	3	0	41	1	3	3	0	7	93
% Single-Unit	14.3	65.0	76.9	0.0	60.0	75.0	0.0	81.8	0.0	77.8	78.6	76.2	30.0	0.0	69.5	14.3	75.0	100.0	0.0	50.0	66.4
Exiting Leg Total					31					35					23					4	93
Articulated Trucks	3	6	3	0	12	4	0	1	0	5	5	4	6	0	15	3	0	0	0	3	35
% Articulated	42.9	30.0	23.1	0.0	30.0	25.0	0.0	9.1	0.0	18.5	17.9	19.0	60.0	0.0	25.4	42.9	0.0	0.0	0.0	21.4	25.0
Exiting Leg Total					8					8					10					9	35

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	1	1	3	0	5	2	0	1	0	3	7	1	1	0	9	2	1	2	0	5	22
7:30 AM	0	3	4	0	7	2	0	1	0	3	7	5	2	0	14	0	0	0	0	0	24
7:45 AM	1	3	1	0	5	3	0	2	0	5	1	2	1	0	4	0	2	0	0	2	16
8:00 AM	0	5	1	0	6	2	0	2	0	4	0	5	2	0	7	2	1	1	0	4	21
Total Volume	2	12	9	0	23	9	0	6	0	15	15	13	6	0	34	4	4	3	0	11	83
% Approach Total	8.7	52.2	39.1	0.0		60.0	0.0	40.0	0.0		44.1	38.2	17.6	0.0		36.4	36.4	27.3	0.0		
PHF	0.500	0.600	0.563	0.000	0.821	0.750	0.000	0.750	0.000	0.750	0.536	0.650	0.750	0.000	0.607	0.500	0.500	0.375	0.000	0.550	0.865
Buses	1	1	0	0	2	0	0	1	0	1	1	1	1	0	3	2	1	0	0	3	9
Buses %	50.0	8.3	0.0	0.0	8.7	0.0	0.0	16.7	0.0	6.7	6.7	7.7	16.7	0.0	8.8	50.0	25.0	0.0	0.0	27.3	10.8
Single-Unit Trucks	0	6	8	0	14	7	0	4	0	11	11	10	2	0	23	0	3	3	0	6	54
Single-Unit %	0.0	50.0	88.9	0.0	60.9	77.8	0.0	66.7	0.0	73.3	73.3	76.9	33.3	0.0	67.6	0.0	75.0	100.0	0.0	54.5	65.1
Articulated Trucks	1	5	1	0	7	2	0	1	0	3	3	2	3	0	8	2	0	0	0	2	20
Articulated %	50.0	41.7	11.1	0.0	30.4	22.2	0.0	16.7	0.0	20.0	20.0	15.4	50.0	0.0	23.5	50.0	0.0	0.0	0.0	18.2	24.1
Buses	1	1	0	0	2	0	0	1	0	1	1	1	1	0	3	2	1	0	0	3	9
Single-Unit Trucks	0	6	8	0	14	7	0	4	0	11	11	10	2	0	23	0	3	3	0	6	54
Articulated Trucks	1	5	1	0	7	2	0	1	0	3	3	2	3	0	8	2	0	0	0	2	20
Total Entering Leg	2	12	9	0	23	9	0	6	0	15	15	13	6	0	34	4	4	3	0	11	83
Buses					1					2					4					2	9
Single-Unit Trucks					20					22					10					2	54
Articulated Trucks					4					4					8					4	20
Total Exiting Leg					25					28					22					8	83

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	3	43	52	0	98	7	7	22	0	36	20	14	14	0	48	17	21	4	0	42	224
7:15 AM	7	32	59	0	98	8	4	6	0	18	10	37	15	0	62	27	30	6	0	63	241
7:30 AM	11	41	46	0	98	5	5	8	0	18	18	41	15	0	74	14	28	4	0	46	236
7:45 AM	9	43	46	0	98	13	1	13	0	27	20	26	11	1	58	17	28	9	0	54	237
Total	30	159	203	0	392	33	17	49	0	99	68	118	55	1	242	75	107	23	0	205	938
8:00 AM	14	47	36	0	97	10	4	22	0	36	16	21	20	0	57	18	15	8	0	41	231
8:15 AM	10	24	38	0	72	4	7	14	0	25	18	34	11	0	63	16	10	4	0	30	190
8:30 AM	5	22	20	0	47	9	12	20	0	41	19	35	25	0	79	13	7	4	0	24	191
8:45 AM	12	24	13	0	49	14	12	23	0	49	17	25	16	0	58	24	11	0	0	35	191
Total	41	117	107	0	265	37	35	79	0	151	70	115	72	0	257	71	43	16	0	130	803
Grand Total	71	276	310	0	657	70	52	128	0	250	138	233	127	1	499	146	150	39	0	335	1741
Approach %	10.8	42.0	47.2	0.0		28.0	20.8	51.2	0.0		27.7	46.7	25.5	0.2		43.6	44.8	11.6	0.0		
Total %	4.1	15.9	17.8	0.0	37.7	4.0	3.0	7.4	0.0	14.4	7.9	13.4	7.3	0.1	28.7	8.4	8.6	2.2	0.0	19.2	
Exiting Leg Total					342					598					551					250	1741

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	7	32	59	0	98	8	4	6	0	18	10	37	15	0	62	27	30	6	0	63	241
7:30 AM	11	41	46	0	98	5	5	8	0	18	18	41	15	0	74	14	28	4	0	46	236
7:45 AM	9	43	46	0	98	13	1	13	0	27	20	26	11	1	58	17	28	9	0	54	237
8:00 AM	14	47	36	0	97	10	4	22	0	36	16	21	20	0	57	18	15	8	0	41	231
Total Volume	41	163	187	0	391	36	14	49	0	99	64	125	61	1	251	76	101	27	0	204	945
% Approach Total	10.5	41.7	47.8	0.0		36.4	14.1	49.5	0.0		25.5	49.8	24.3	0.4		37.3	49.5	13.2	0.0		
PHF	0.732	0.867	0.792	0.000	0.997	0.692	0.700	0.557	0.000	0.688	0.800	0.762	0.763	0.250	0.848	0.704	0.842	0.750	0.000	0.810	0.980
Entering Leg	41	163	187	0	391	36	14	49	0	99	64	125	61	1	251	76	101	27	0	204	945
Exiting Leg					188					352					289					116	945
Total					579					451					540					320	1890

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Light Goods Vehicle

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	2	8	9	0	19	5	2	4	0	11	0	5	0	0	5	2	3	2	0	7	42
7:15 AM	2	6	11	0	19	3	3	3	0	9	3	5	2	0	10	4	6	1	0	11	49
7:30 AM	0	11	10	0	21	5	1	2	0	8	3	10	1	0	14	2	4	1	0	7	50
7:45 AM	2	8	7	0	17	2	2	3	0	7	3	10	6	0	19	1	4	3	0	8	51
Total	6	33	37	0	76	15	8	12	0	35	9	30	9	0	48	9	17	7	0	33	192
8:00 AM	3	13	9	0	25	1	1	3	0	5	6	4	6	0	16	5	4	1	1	11	57
8:15 AM	1	4	8	0	13	3	1	2	0	6	4	3	1	0	8	1	4	5	1	11	38
8:30 AM	4	5	4	0	13	3	0	3	0	6	1	2	3	0	6	3	1	1	0	5	30
8:45 AM	5	5	5	0	15	1	1	7	0	9	1	3	3	0	7	3	0	1	0	4	35
Total	13	27	26	0	66	8	3	15	0	26	12	12	13	0	37	12	9	8	2	31	160
Grand Total	19	60	63	0	142	23	11	27	0	61	21	42	22	0	85	21	26	15	2	64	352
Approach %	13.4	42.3	44.4	0.0		37.7	18.0	44.3	0.0		24.7	49.4	25.9	0.0		32.8	40.6	23.4	3.1		
Total %	5.4	17.0	17.9	0.0	40.3	6.5	3.1	7.7	0.0	17.3	6.0	11.9	6.3	0.0	24.1	6.0	7.4	4.3	0.6	18.2	
Exiting Leg Total					80					110					108					54	352

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	2	6	11	0	19	3	3	3	0	9	3	5	2	0	10	4	6	1	0	11	49
7:30 AM	0	11	10	0	21	5	1	2	0	8	3	10	1	0	14	2	4	1	0	7	50
7:45 AM	2	8	7	0	17	2	2	3	0	7	3	10	6	0	19	1	4	3	0	8	51
8:00 AM	3	13	9	0	25	1	1	3	0	5	6	4	6	0	16	5	4	1	1	11	57
Total Volume	7	38	37	0	82	11	7	11	0	29	15	29	15	0	59	12	18	6	1	37	207
% Approach Total	8.5	46.3	45.1	0.0		37.9	24.1	37.9	0.0		25.4	49.2	25.4	0.0		32.4	48.6	16.2	2.7		
PHF	0.583	0.731	0.841	0.000	0.820	0.550	0.583	0.917	0.000	0.806	0.625	0.725	0.625	0.000	0.776	0.600	0.750	0.500	0.250	0.841	0.908
Entering Leg	7	38	37	0	82	11	7	11	0	29	15	29	15	0	59	12	18	6	1	37	207
Exiting Leg					46					70					61					30	207
Total					128					99					120					67	414

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
7:30 AM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
7:45 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
Total	3	0	0	0	3	0	0	1	0	1	1	1	0	0	2	2	1	0	0	3	9
8:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	3
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	3
Grand Total	3	1	0	0	4	0	0	1	0	1	1	1	1	0	3	3	1	0	0	4	12
Approach %	75.0	25.0	0.0	0.0		0.0	0.0	100.0	0.0		33.3	33.3	33.3	0.0		75.0	25.0	0.0	0.0		
Total %	25.0	8.3	0.0	0.0	33.3	0.0	0.0	8.3	0.0	8.3	8.3	8.3	8.3	0.0	25.0	25.0	8.3	0.0	0.0	33.3	
Exiting Leg Total					1					2					5					4	12

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
7:30 AM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
7:45 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
Total Volume	3	0	0	0	3	0	0	1	0	1	1	1	0	0	2	2	1	0	0	3	9
% Approach Total	100.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		50.0	50.0	0.0	0.0		66.7	33.3	0.0	0.0		
PHF	0.375	0.000	0.000	0.000	0.375	0.000	0.000	0.250	0.000	0.250	0.250	0.250	0.000	0.000	0.500	0.500	0.250	0.000	0.000	0.375	0.750
Entering Leg	3	0	0	0	3	0	0	1	0	1	1	1	0	0	2	2	1	0	0	3	9
Exiting Leg					1					2					3					3	9
Total					4					3					5					6	18

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	2	0	2	2	0	2	0	4	4	2	0	0	6	0	0	0	0	0	12
7:15 AM	0	0	2	0	2	2	0	1	0	3	5	1	1	0	7	0	0	2	0	2	14
7:30 AM	0	2	4	0	6	1	0	0	0	1	6	4	1	0	11	0	0	0	0	0	18
7:45 AM	0	1	1	0	2	3	0	1	0	4	0	1	0	0	1	0	2	0	0	2	9
Total	0	3	9	0	12	8	0	4	0	12	15	8	2	0	25	0	2	2	0	4	53
8:00 AM	0	3	1	0	4	1	0	2	0	3	0	4	0	0	4	0	1	1	0	2	13
8:15 AM	0	2	0	0	2	0	0	1	0	1	4	0	0	0	4	0	0	0	0	0	7
8:30 AM	1	4	0	0	5	1	0	0	0	1	3	2	0	0	5	0	0	0	0	0	11
8:45 AM	0	1	0	0	1	2	0	2	0	4	0	2	1	0	3	1	0	0	0	1	9
Total	1	10	1	0	12	4	0	5	0	9	7	8	1	0	16	1	1	1	0	3	40
Grand Total	1	13	10	0	24	12	0	9	0	21	22	16	3	0	41	1	3	3	0	7	93
Approach %	4.2	54.2	41.7	0.0		57.1	0.0	42.9	0.0		53.7	39.0	7.3	0.0		14.3	42.9	42.9	0.0		
Total %	1.1	14.0	10.8	0.0	25.8	12.9	0.0	9.7	0.0	22.6	23.7	17.2	3.2	0.0	44.1	1.1	3.2	3.2	0.0	7.5	
Exiting Leg Total					31					35					23					4	93

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	0	0	2	0	2	2	0	1	0	3	5	1	1	0	7	0	0	2	0	2	14
7:30 AM	0	2	4	0	6	1	0	0	0	1	6	4	1	0	11	0	0	0	0	0	18
7:45 AM	0	1	1	0	2	3	0	1	0	4	0	1	0	0	1	0	2	0	0	2	9
8:00 AM	0	3	1	0	4	1	0	2	0	3	0	4	0	0	4	0	1	1	0	2	13
Total Volume	0	6	8	0	14	7	0	4	0	11	11	10	2	0	23	0	3	3	0	6	54
% Approach Total	0.0	42.9	57.1	0.0		63.6	0.0	36.4	0.0		47.8	43.5	8.7	0.0		0.0	50.0	50.0	0.0		
PHF	0.000	0.500	0.500	0.000	0.583	0.583	0.000	0.500	0.000	0.688	0.458	0.625	0.500	0.000	0.523	0.000	0.375	0.375	0.000	0.750	0.750
Entering Leg	0	6	8	0	14	7	0	4	0	11	11	10	2	0	23	0	3	3	0	6	54
Exiting Leg					20					22					10					2	54
Total					34					33					33					8	108

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	1	1	0	2	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	4
7:15 AM	1	1	1	0	3	0	0	0	0	0	2	0	0	0	2	1	0	0	0	1	6
7:30 AM	0	1	0	0	1	1	0	0	0	1	1	0	1	0	2	0	0	0	0	0	4
7:45 AM	0	2	0	0	2	0	0	1	0	1	0	1	1	0	2	0	0	0	0	0	5
Total	1	5	2	0	8	1	0	1	0	2	4	2	2	0	8	1	0	0	0	1	19
8:00 AM	0	1	0	0	1	1	0	0	0	1	0	1	1	0	2	1	0	0	0	1	5
8:15 AM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
8:30 AM	1	0	1	0	2	1	0	0	0	1	1	0	1	0	2	1	0	0	0	1	6
8:45 AM	0	0	0	0	0	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	3
Total	2	1	1	0	4	3	0	0	0	3	1	2	4	0	7	2	0	0	0	2	16
Grand Total	3	6	3	0	12	4	0	1	0	5	5	4	6	0	15	3	0	0	0	3	35
Approach %	25.0	50.0	25.0	0.0		80.0	0.0	20.0	0.0		33.3	26.7	40.0	0.0		100.0	0.0	0.0	0.0		
Total %	8.6	17.1	8.6	0.0	34.3	11.4	0.0	2.9	0.0	14.3	14.3	11.4	17.1	0.0	42.9	8.6	0.0	0.0	0.0	8.6	
Exiting Leg Total					8					8					10					9	35

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	1	1	1	0	3	0	0	0	0	0	2	0	0	0	2	1	0	0	0	1	6
7:30 AM	0	1	0	0	1	1	0	0	0	1	1	0	1	0	2	0	0	0	0	0	4
7:45 AM	0	2	0	0	2	0	0	1	0	1	0	1	1	0	2	0	0	0	0	0	5
8:00 AM	0	1	0	0	1	1	0	0	0	1	0	1	1	0	2	1	0	0	0	1	5
Total Volume	1	5	1	0	7	2	0	1	0	3	3	2	3	0	8	2	0	0	0	2	20
% Approach Total	14.3	71.4	14.3	0.0		66.7	0.0	33.3	0.0		37.5	25.0	37.5	0.0		100.0	0.0	0.0	0.0		
PHF	0.250	0.625	0.250	0.000	0.583	0.500	0.000	0.250	0.000	0.750	0.375	0.500	0.750	0.000	1.000	0.500	0.000	0.000	0.000	0.500	0.833
Entering Leg	1	5	1	0	7	2	0	1	0	3	3	2	3	0	8	2	0	0	0	2	20
Exiting Leg					4					4					8					4	20
Total					11					7					16					6	40

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 E**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	42	46	20	0	108	27	19	31	0	77	17	63	54	0	134	28	11	8	0	47	366
4:15 PM	28	53	11	0	92	22	23	24	0	69	17	85	53	0	155	31	13	14	1	59	375
4:30 PM	33	30	12	0	75	27	20	28	0	75	18	99	60	0	177	22	14	9	0	45	372
4:45 PM	22	34	10	1	67	27	20	18	0	65	14	100	54	0	168	28	12	9	0	49	349
Total	125	163	53	1	342	103	82	101	0	286	66	347	221	0	634	109	50	40	1	200	1462
5:00 PM	19	30	15	0	64	39	19	28	0	86	12	90	44	0	146	46	16	20	1	83	379
5:15 PM	28	35	13	0	76	35	28	14	0	77	17	84	51	0	152	39	9	23	1	72	377
5:30 PM	70	45	11	0	126	31	13	24	0	68	10	69	51	0	130	22	11	16	2	51	375
5:45 PM	105	36	9	0	150	23	13	23	0	59	8	64	52	1	125	30	5	11	2	48	382
Total	222	146	48	0	416	128	73	89	0	290	47	307	198	1	553	137	41	70	6	254	1513
Grand Total	347	309	101	1	758	231	155	190	0	576	113	654	419	1	1187	246	91	110	7	454	2975
Approach %	45.8	40.8	13.3	0.1		40.1	26.9	33.0	0.0		9.5	55.1	35.3	0.1		54.2	20.0	24.2	1.5		
Total %	11.7	10.4	3.4	0.0	25.5	7.8	5.2	6.4	0.0	19.4	3.8	22.0	14.1	0.0	39.9	8.3	3.1	3.7	0.2	15.3	
Exiting Leg Total					996					305					746					928	2975
Cars	343	288	98	1	730	215	153	182	0	550	107	647	413	1	1168	242	90	110	7	449	2897
% Cars	98.8	93.2	97.0	100.0	96.3	93.1	98.7	95.8	0.0	95.5	94.7	98.9	98.6	100.0	98.4	98.4	98.9	100.0	100.0	98.9	97.4
Exiting Leg Total					973					295					713					916	2897
Heavy Vehicles	4	21	3	0	28	16	2	8	0	26	6	7	6	0	19	4	1	0	0	5	78
% Heavy Vehicles	1.2	6.8	3.0	0.0	3.7	6.9	1.3	4.2	0.0	4.5	5.3	1.1	1.4	0.0	1.6	1.6	1.1	0.0	0.0	1.1	2.6
Exiting Leg Total					23					10					33					12	78

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	19	30	15	0	64	39	19	28	0	86	12	90	44	0	146	46	16	20	1	83	379
5:15 PM	28	35	13	0	76	35	28	14	0	77	17	84	51	0	152	39	9	23	1	72	377
5:30 PM	70	45	11	0	126	31	13	24	0	68	10	69	51	0	130	22	11	16	2	51	375
5:45 PM	105	36	9	0	150	23	13	23	0	59	8	64	52	1	125	30	5	11	2	48	382
Total Volume	222	146	48	0	416	128	73	89	0	290	47	307	198	1	553	137	41	70	6	254	1513
% Approach Total	53.4	35.1	11.5	0.0		44.1	25.2	30.7	0.0		8.5	55.5	35.8	0.2		53.9	16.1	27.6	2.4		
PHF	0.529	0.811	0.800	0.000	0.693	0.821	0.652	0.795	0.000	0.843	0.691	0.853	0.952	0.250	0.910	0.745	0.641	0.761	0.750	0.765	0.990
Cars	219	133	47	0	399	119	72	88	0	279	45	305	196	1	547	137	41	70	6	254	1479
Cars %	98.6	91.1	97.9	0.0	95.9	93.0	98.6	98.9	0.0	96.2	95.7	99.3	99.0	100.0	98.9	100.0	100.0	100.0	100.0	100.0	97.8
Heavy Vehicles	3	13	1	0	17	9	1	1	0	11	2	2	2	0	6	0	0	0	0	0	34
Heavy Vehicles %	1.4	8.9	2.1	0.0	4.1	7.0	1.4	1.1	0.0	3.8	4.3	0.7	1.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	2.2
Cars Enter Leg	219	133	47	0	399	119	72	88	0	279	45	305	196	1	547	137	41	70	6	254	1479
Heavy Enter Leg	3	13	1	0	17	9	1	1	0	11	2	2	2	0	6	0	0	0	0	0	34
Total Entering Leg	222	146	48	0	416	128	73	89	0	290	47	307	198	1	553	137	41	70	6	254	1513
Cars Exiting Leg					494					133					359					493	1479
Heavy Exiting Leg					11					3					14					6	34
Total Exiting Leg					505					136					373					499	1513

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars-Combined (Motorcycles, Cars, Light Goods)

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	42	42	19	0	103	24	19	29	0	72	17	61	53	0	131	28	10	8	0	46	352
4:15 PM	28	51	11	0	90	21	22	23	0	66	14	84	52	0	150	30	13	14	1	58	364
4:30 PM	33	29	11	0	73	24	20	25	0	69	17	98	59	0	174	21	14	9	0	44	360
4:45 PM	21	33	10	1	65	27	20	17	0	64	14	99	53	0	166	26	12	9	0	47	342
Total	124	155	51	1	331	96	81	94	0	271	62	342	217	0	621	105	49	40	1	195	1418
5:00 PM	19	27	14	0	60	38	19	27	0	84	11	88	43	0	142	46	16	20	1	83	369
5:15 PM	28	29	13	0	70	33	28	14	0	75	17	84	50	0	151	39	9	23	1	72	368
5:30 PM	69	43	11	0	123	25	13	24	0	62	10	69	51	0	130	22	11	16	2	51	366
5:45 PM	103	34	9	0	146	23	12	23	0	58	7	64	52	1	124	30	5	11	2	48	376
Total	219	133	47	0	399	119	72	88	0	279	45	305	196	1	547	137	41	70	6	254	1479
Grand Total	343	288	98	1	730	215	153	182	0	550	107	647	413	1	1168	242	90	110	7	449	2897
Approach %	47.0	39.5	13.4	0.1		39.1	27.8	33.1	0.0		9.2	55.4	35.4	0.1		53.9	20.0	24.5	1.6		
Total %	11.8	9.9	3.4	0.0	25.2	7.4	5.3	6.3	0.0	19.0	3.7	22.3	14.3	0.0	40.3	8.4	3.1	3.8	0.2	15.5	
Exiting Leg Total					973					295					713					916	2897

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	19	27	14	0	60	38	19	27	0	84	11	88	43	0	142	46	16	20	1	83	369
5:15 PM	28	29	13	0	70	33	28	14	0	75	17	84	50	0	151	39	9	23	1	72	368
5:30 PM	69	43	11	0	123	25	13	24	0	62	10	69	51	0	130	22	11	16	2	51	366
5:45 PM	103	34	9	0	146	23	12	23	0	58	7	64	52	1	124	30	5	11	2	48	376
Total Volume	219	133	47	0	399	119	72	88	0	279	45	305	196	1	547	137	41	70	6	254	1479
% Approach Total	54.9	33.3	11.8	0.0		42.7	25.8	31.5	0.0		8.2	55.8	35.8	0.2		53.9	16.1	27.6	2.4		
PHF	0.532	0.773	0.839	0.000	0.683	0.783	0.643	0.815	0.000	0.830	0.662	0.866	0.942	0.250	0.906	0.745	0.641	0.761	0.750	0.765	0.983
Entering Leg	219	133	47	0	399	119	72	88	0	279	45	305	196	1	547	137	41	70	6	254	1479
Exiting Leg					494					133					359					493	1479
Total					893					412					906					747	2958

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	4	1	0	5	3	0	2	0	5	0	2	1	0	3	0	1	0	0	1	14
4:15 PM	0	2	0	0	2	1	1	1	0	3	3	1	1	0	5	1	0	0	0	1	11
4:30 PM	0	1	1	0	2	3	0	3	0	6	1	1	1	0	3	1	0	0	0	1	12
4:45 PM	1	1	0	0	2	0	0	1	0	1	0	1	1	0	2	2	0	0	0	2	7
Total	1	8	2	0	11	7	1	7	0	15	4	5	4	0	13	4	1	0	0	5	44
5:00 PM	0	3	1	0	4	1	0	1	0	2	1	2	1	0	4	0	0	0	0	0	10
5:15 PM	0	6	0	0	6	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	9
5:30 PM	1	2	0	0	3	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	9
5:45 PM	2	2	0	0	4	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	6
Total	3	13	1	0	17	9	1	1	0	11	2	2	2	0	6	0	0	0	0	0	34
Grand Total	4	21	3	0	28	16	2	8	0	26	6	7	6	0	19	4	1	0	0	5	78
Approach %	14.3	75.0	10.7	0.0		61.5	7.7	30.8	0.0		31.6	36.8	31.6	0.0		80.0	20.0	0.0	0.0		
Total %	5.1	26.9	3.8	0.0	35.9	20.5	2.6	10.3	0.0	33.3	7.7	9.0	7.7	0.0	24.4	5.1	1.3	0.0	0.0	6.4	
Exiting Leg Total					23					10					33					12	78
Buses	1	1	0	0	2	7	0	0	0	7	0	1	2	0	3	0	0	0	0	0	12
% Buses	25.0	4.8	0.0	0.0	7.1	43.8	0.0	0.0	0.0	26.9	0.0	14.3	33.3	0.0	15.8	0.0	0.0	0.0	0.0	0.0	15.4
Exiting Leg Total					8					0					1					3	12
Single-Unit Trucks	2	16	2	0	20	5	2	7	0	14	3	6	2	0	11	3	1	0	0	4	49
% Single-Unit	50.0	76.2	66.7	0.0	71.4	31.3	100.0	87.5	0.0	53.8	50.0	85.7	33.3	0.0	57.9	75.0	100.0	0.0	0.0	80.0	62.8
Exiting Leg Total					11					6					26					6	49
Articulated Trucks	1	4	1	0	6	4	0	1	0	5	3	0	2	0	5	1	0	0	0	1	17
% Articulated	25.0	19.0	33.3	0.0	21.4	25.0	0.0	12.5	0.0	19.2	50.0	0.0	33.3	0.0	26.3	25.0	0.0	0.0	0.0	20.0	21.8
Exiting Leg Total					4					4					6					3	17

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	4	1	0	5	3	0	2	0	5	0	2	1	0	3	0	1	0	0	1	14
4:15 PM	0	2	0	0	2	1	1	1	0	3	3	1	1	0	5	1	0	0	0	1	11
4:30 PM	0	1	1	0	2	3	0	3	0	6	1	1	1	0	3	1	0	0	0	1	12
4:45 PM	1	1	0	0	2	0	0	1	0	1	0	1	1	0	2	2	0	0	0	2	7
Total Volume	1	8	2	0	11	7	1	7	0	15	4	5	4	0	13	4	1	0	0	5	44
% Approach Total	9.1	72.7	18.2	0.0		46.7	6.7	46.7	0.0		30.8	38.5	30.8	0.0		80.0	20.0	0.0	0.0		
PHF	0.250	0.500	0.500	0.000	0.550	0.583	0.250	0.583	0.000	0.625	0.333	0.625	1.000	0.000	0.650	0.500	0.250	0.000	0.000	0.625	0.786
Buses	0	1	0	0	1	0	0	0	0	0	0	1	2	0	3	0	0	0	0	0	4
Buses %	0.0	12.5	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	20.0	50.0	0.0	23.1	0.0	0.0	0.0	0.0	0.0	9.1
Single-Unit Trucks	0	6	1	0	7	4	1	6	0	11	1	4	1	0	6	3	1	0	0	4	28
Single-Unit %	0.0	75.0	50.0	0.0	63.6	57.1	100.0	85.7	0.0	73.3	25.0	80.0	25.0	0.0	46.2	75.0	100.0	0.0	0.0	80.0	63.6
Articulated Trucks	1	1	1	0	3	3	0	1	0	4	3	0	1	0	4	1	0	0	0	1	12
Articulated %	100.0	12.5	50.0	0.0	27.3	42.9	0.0	14.3	0.0	26.7	75.0	0.0	25.0	0.0	30.8	25.0	0.0	0.0	0.0	20.0	27.3
Buses	0	1	0	0	1	0	0	0	0	0	0	1	2	0	3	0	0	0	0	0	4
Single-Unit Trucks	0	6	1	0	7	4	1	6	0	11	1	4	1	0	6	3	1	0	0	4	28
Articulated Trucks	1	1	1	0	3	3	0	1	0	4	3	0	1	0	4	1	0	0	0	1	12
Total Entering Leg	1	8	2	0	11	7	1	7	0	15	4	5	4	0	13	4	1	0	0	5	44
Buses					1					0					1					2	4
Single-Unit Trucks					8					3					15					2	28
Articulated Trucks					3					4					3					2	12
Total Exiting Leg					12					7					19					6	44

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	40	32	14	0	86	21	14	25	0	60	14	45	43	0	102	24	7	8	0	39	287
4:15 PM	26	43	10	0	79	19	21	20	0	60	9	66	49	0	124	25	9	13	0	47	310
4:30 PM	30	24	8	0	62	19	17	21	0	57	13	79	51	0	143	18	11	8	0	37	299
4:45 PM	21	24	8	1	54	25	20	13	0	58	11	82	49	0	142	22	11	7	0	40	294
Total	117	123	40	1	281	84	72	79	0	235	47	272	192	0	511	89	38	36	0	163	1190
5:00 PM	19	22	12	0	53	36	18	23	0	77	6	78	39	0	123	40	13	16	1	70	323
5:15 PM	27	22	11	0	60	32	27	12	0	71	16	73	43	0	132	33	8	17	1	59	322
5:30 PM	68	33	9	0	110	23	11	21	0	55	8	62	47	0	117	20	10	12	2	44	326
5:45 PM	103	29	8	0	140	21	10	21	0	52	7	59	50	1	117	30	5	7	2	44	353
Total	217	106	40	0	363	112	66	77	0	255	37	272	179	1	489	123	36	52	6	217	1324
Grand Total	334	229	80	1	644	196	138	156	0	490	84	544	371	1	1000	212	74	88	6	380	2514
Approach %	51.9	35.6	12.4	0.2		40.0	28.2	31.8	0.0		8.4	54.4	37.1	0.1		55.8	19.5	23.2	1.6		
Total %	13.3	9.1	3.2	0.0	25.6	7.8	5.5	6.2	0.0	19.5	3.3	21.6	14.8	0.0	39.8	8.4	2.9	3.5	0.2	15.1	
Exiting Leg Total					829					238					598					849	2514

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	19	22	12	0	53	36	18	23	0	77	6	78	39	0	123	40	13	16	1	70	323
5:15 PM	27	22	11	0	60	32	27	12	0	71	16	73	43	0	132	33	8	17	1	59	322
5:30 PM	68	33	9	0	110	23	11	21	0	55	8	62	47	0	117	20	10	12	2	44	326
5:45 PM	103	29	8	0	140	21	10	21	0	52	7	59	50	1	117	30	5	7	2	44	353
Total Volume	217	106	40	0	363	112	66	77	0	255	37	272	179	1	489	123	36	52	6	217	1324
% Approach Total	59.8	29.2	11.0	0.0		43.9	25.9	30.2	0.0		7.6	55.6	36.6	0.2		56.7	16.6	24.0	2.8		
PHF	0.527	0.803	0.833	0.000	0.648	0.778	0.611	0.837	0.000	0.828	0.578	0.872	0.895	0.250	0.926	0.769	0.692	0.765	0.750	0.775	0.938
Entering Leg	217	106	40	0	363	112	66	77	0	255	37	272	179	1	489	123	36	52	6	217	1324
Exiting Leg					436					113					307					468	1324
Total					799					368					796					685	2648

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Light Goods Vehicle

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	2	10	5	0	17	3	5	4	0	12	3	16	10	0	29	4	3	0	0	7	65
4:15 PM	2	8	1	0	11	2	1	3	0	6	5	18	3	0	26	5	4	1	1	11	54
4:30 PM	3	5	3	0	11	5	3	4	0	12	4	19	8	0	31	3	3	1	0	7	61
4:45 PM	0	9	2	0	11	2	0	4	0	6	3	17	4	0	24	4	1	2	0	7	48
Total	7	32	11	0	50	12	9	15	0	36	15	70	25	0	110	16	11	4	1	32	228
5:00 PM	0	5	2	0	7	2	1	4	0	7	5	10	4	0	19	6	3	4	0	13	46
5:15 PM	1	7	2	0	10	1	1	2	0	4	1	11	7	0	19	6	1	6	0	13	46
5:30 PM	1	10	2	0	13	1	2	3	0	6	2	7	4	0	13	2	1	4	0	7	39
5:45 PM	0	5	1	0	6	2	2	2	0	6	0	5	2	0	7	0	0	4	0	4	23
Total	2	27	7	0	36	6	6	11	0	23	8	33	17	0	58	14	5	18	0	37	154
Grand Total	9	59	18	0	86	18	15	26	0	59	23	103	42	0	168	30	16	22	1	69	382
Approach %	10.5	68.6	20.9	0.0		30.5	25.4	44.1	0.0		13.7	61.3	25.0	0.0		43.5	23.2	31.9	1.4		
Total %	2.4	15.4	4.7	0.0	22.5	4.7	3.9	6.8	0.0	15.4	6.0	27.0	11.0	0.0	44.0	7.9	4.2	5.8	0.3	18.1	
Exiting Leg Total					143					57					115					67	382

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	2	10	5	0	17	3	5	4	0	12	3	16	10	0	29	4	3	0	0	7	65
4:15 PM	2	8	1	0	11	2	1	3	0	6	5	18	3	0	26	5	4	1	1	11	54
4:30 PM	3	5	3	0	11	5	3	4	0	12	4	19	8	0	31	3	3	1	0	7	61
4:45 PM	0	9	2	0	11	2	0	4	0	6	3	17	4	0	24	4	1	2	0	7	48
Total Volume	7	32	11	0	50	12	9	15	0	36	15	70	25	0	110	16	11	4	1	32	228
% Approach Total	14.0	64.0	22.0	0.0		33.3	25.0	41.7	0.0		13.6	63.6	22.7	0.0		50.0	34.4	12.5	3.1		
PHF	0.583	0.800	0.550	0.000	0.735	0.600	0.450	0.938	0.000	0.750	0.750	0.921	0.625	0.000	0.887	0.800	0.688	0.500	0.250	0.727	0.877
Entering Leg	7	32	11	0	50	12	9	15	0	36	15	70	25	0	110	16	11	4	1	32	228
Exiting Leg					86					37					63					42	228
Total					136					73					173					74	456

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	2
4:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	0	0	0	1	2	0	3	0	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
5:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	1	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	8
Grand Total	1	1	0	0	2	7	0	0	0	7	0	1	2	0	3	0	0	0	0	0	12
Approach %	50.0	50.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	33.3	66.7	0.0		0.0	0.0	0.0	0.0		
Total %	8.3	8.3	0.0	0.0	16.7	58.3	0.0	0.0	0.0	58.3	0.0	8.3	16.7	0.0	25.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					8					0					1					3	12

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:45 PM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Total Volume	0	1	0	0	1	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	8
% Approach Total	0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.250	0.292	0.000	0.000	0.000	0.292	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333
Entering Leg	0	1	0	0	1	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	8
Exiting Leg					7					0					1					0	8
Total					8					7					1					0	16

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	4	1	0	5	2	0	2	0	4	0	2	1	0	3	0	1	0	0	1	13
4:15 PM	0	2	0	0	2	1	1	1	0	3	1	1	0	0	2	1	0	0	0	1	8
4:30 PM	0	0	0	0	0	1	0	3	0	4	0	0	0	0	0	1	0	0	0	1	5
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	2
Total	0	6	1	0	7	4	1	6	0	11	1	4	1	0	6	3	1	0	0	4	28
5:00 PM	0	3	1	0	4	0	0	1	0	1	1	2	1	0	4	0	0	0	0	0	9
5:15 PM	0	4	0	0	4	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5
5:30 PM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:45 PM	1	1	0	0	2	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	4
Total	2	10	1	0	13	1	1	1	0	3	2	2	1	0	5	0	0	0	0	0	21
Grand Total	2	16	2	0	20	5	2	7	0	14	3	6	2	0	11	3	1	0	0	4	49
Approach %	10.0	80.0	10.0	0.0		35.7	14.3	50.0	0.0		27.3	54.5	18.2	0.0		75.0	25.0	0.0	0.0		
Total %	4.1	32.7	4.1	0.0	40.8	10.2	4.1	14.3	0.0	28.6	6.1	12.2	4.1	0.0	22.4	6.1	2.0	0.0	0.0	8.2	
Exiting Leg Total					11					6					26					6	49

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	4	1	0	5	2	0	2	0	4	0	2	1	0	3	0	1	0	0	1	13
4:15 PM	0	2	0	0	2	1	1	1	0	3	1	1	0	0	2	1	0	0	0	1	8
4:30 PM	0	0	0	0	0	1	0	3	0	4	0	0	0	0	0	1	0	0	0	1	5
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	2
Total Volume	0	6	1	0	7	4	1	6	0	11	1	4	1	0	6	3	1	0	0	4	28
% Approach Total	0.0	85.7	14.3	0.0		36.4	9.1	54.5	0.0		16.7	66.7	16.7	0.0		75.0	25.0	0.0	0.0		
PHF	0.000	0.375	0.250	0.000	0.350	0.500	0.250	0.500	0.000	0.688	0.250	0.500	0.250	0.000	0.500	0.750	0.250	0.000	0.000	1.000	0.538
Entering Leg	0	6	1	0	7	4	1	6	0	11	1	4	1	0	6	3	1	0	0	4	28
Exiting Leg					8					3					15					2	28
Total					15					14					21					6	56

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
4:30 PM	0	1	1	0	2	2	0	0	0	2	1	0	0	0	1	0	0	0	0	0	5
4:45 PM	1	0	0	0	1	0	0	1	0	1	0	0	1	0	1	1	0	0	0	1	4
Total	1	1	1	0	3	3	0	1	0	4	3	0	1	0	4	1	0	0	0	1	12
5:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	2	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	3	0	0	3	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	5
Grand Total	1	4	1	0	6	4	0	1	0	5	3	0	2	0	5	1	0	0	0	1	17
Approach %	16.7	66.7	16.7	0.0		80.0	0.0	20.0	0.0		60.0	0.0	40.0	0.0		100.0	0.0	0.0	0.0		
Total %	5.9	23.5	5.9	0.0	35.3	23.5	0.0	5.9	0.0	29.4	17.6	0.0	11.8	0.0	29.4	5.9	0.0	0.0	0.0	5.9	
Exiting Leg Total					4					4					6					3	17

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	0	1	1	0	2	2	0	0	0	2	1	0	0	0	1	0	0	0	0	0	5
4:45 PM	1	0	0	0	1	0	0	1	0	1	0	0	1	0	1	1	0	0	0	1	4
5:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	2	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3
Total Volume	1	3	1	0	5	3	0	1	0	4	1	0	2	0	3	1	0	0	0	1	13
% Approach Total	20.0	60.0	20.0	0.0		75.0	0.0	25.0	0.0		33.3	0.0	66.7	0.0		100.0	0.0	0.0	0.0		
PHF	0.250	0.375	0.250	0.000	0.625	0.375	0.000	0.250	0.000	0.500	0.250	0.000	0.500	0.000	0.750	0.250	0.000	0.000	0.000	0.250	0.650
Entering Leg	1	3	1	0	5	3	0	1	0	4	1	0	2	0	3	1	0	0	0	1	13
Exiting Leg					3					2					5					3	13
Total					8					6					8					4	26

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							1							0							0							0	1

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg							1							0							0							0	1
Total							1							1							0							0	2

PDI File #: **186634 EE**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	117	21	0	138	10	0	10	0	20	15	27	0	0	42	2	0	0	0	2	202
7:15 AM	0	115	14	0	129	10	0	7	0	17	29	36	0	0	65	0	2	0	0	2	213
7:30 AM	0	118	18	0	136	5	0	9	0	14	34	34	0	0	68	1	2	0	0	3	221
7:45 AM	0	103	10	0	113	13	0	13	0	26	36	35	0	0	71	0	1	0	0	1	211
Total	0	453	63	0	516	38	0	39	0	77	114	132	0	0	246	3	5	0	0	8	847
8:00 AM	0	105	6	0	111	6	0	14	0	20	22	28	1	0	51	0	0	0	0	0	182
8:15 AM	0	77	15	0	92	10	0	5	0	15	20	33	0	0	53	0	0	0	0	0	160
8:30 AM	1	54	11	0	66	11	0	10	0	21	27	30	0	0	57	1	0	0	0	1	145
8:45 AM	0	50	7	0	57	11	0	15	0	26	25	22	2	0	49	0	0	0	0	0	132
Total	1	286	39	0	326	38	0	44	0	82	94	113	3	0	210	1	0	0	0	1	619
Grand Total	1	739	102	0	842	76	0	83	0	159	208	245	3	0	456	4	5	0	0	9	1466
Approach %	0.1	87.8	12.1	0.0		47.8	0.0	52.2	0.0		45.6	53.7	0.7	0.0		44.4	55.6	0.0	0.0		
Total %	0.1	50.4	7.0	0.0	57.4	5.2	0.0	5.7	0.0	10.8	14.2	16.7	0.2	0.0	31.1	0.3	0.3	0.0	0.0	0.6	
Exiting Leg Total					321					315					826					4	1466
Cars	1	710	98	0	809	65	0	71	0	136	189	224	3	0	416	4	5	0	0	9	1370
% Cars	100.0	96.1	96.1	0.0	96.1	85.5	0.0	85.5	0.0	85.5	90.9	91.4	100.0	0.0	91.2	100.0	100.0	0.0	0.0	100.0	93.5
Exiting Leg Total					289					292					785					4	1370
Heavy Vehicles	0	29	4	0	33	11	0	12	0	23	19	21	0	0	40	0	0	0	0	0	96
% Heavy Vehicles	0.0	3.9	3.9	0.0	3.9	14.5	0.0	14.5	0.0	14.5	9.1	8.6	0.0	0.0	8.8	0.0	0.0	0.0	0.0	0.0	6.5
Exiting Leg Total					32					23					41					0	96

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	117	21	0	138	10	0	10	0	20	15	27	0	0	42	2	0	0	0	2	202
7:15 AM	0	115	14	0	129	10	0	7	0	17	29	36	0	0	65	0	2	0	0	2	213
7:30 AM	0	118	18	0	136	5	0	9	0	14	34	34	0	0	68	1	2	0	0	3	221
7:45 AM	0	103	10	0	113	13	0	13	0	26	36	35	0	0	71	0	1	0	0	1	211
Total Volume	0	453	63	0	516	38	0	39	0	77	114	132	0	0	246	3	5	0	0	8	847
% Approach Total	0.0	87.8	12.2	0.0		49.4	0.0	50.6	0.0		46.3	53.7	0.0	0.0		37.5	62.5	0.0	0.0		
PHF	0.000	0.960	0.750	0.000	0.935	0.731	0.000	0.750	0.000	0.740	0.792	0.917	0.000	0.000	0.866	0.375	0.625	0.000	0.000	0.667	0.958
Cars	0	433	62	0	495	34	0	35	0	69	105	119	0	0	224	3	5	0	0	8	796
Cars %	0.0	95.6	98.4	0.0	95.9	89.5	0.0	89.7	0.0	89.6	92.1	90.2	0.0	0.0	91.1	100.0	100.0	0.0	0.0	100.0	94.0
Heavy Vehicles	0	20	1	0	21	4	0	4	0	8	9	13	0	0	22	0	0	0	0	0	51
Heavy Vehicles %	0.0	4.4	1.6	0.0	4.1	10.5	0.0	10.3	0.0	10.4	7.9	9.8	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	6.0
Cars Enter Leg	0	433	62	0	495	34	0	35	0	69	105	119	0	0	224	3	5	0	0	8	796
Heavy Enter Leg	0	20	1	0	21	4	0	4	0	8	9	13	0	0	22	0	0	0	0	0	51
Total Entering Leg	0	453	63	0	516	38	0	39	0	77	114	132	0	0	246	3	5	0	0	8	847
Cars Exiting Leg					153					172					471					0	796
Heavy Exiting Leg					17					10					24					0	51
Total Exiting Leg					170					182					495					0	847

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars-Combined (Motorcycles, Cars, Light Goods)**

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	111	20	0	131	8	0	9	0	17	13	24	0	0	37	2	0	0	0	2	187
7:15 AM	0	111	14	0	125	9	0	7	0	16	26	34	0	0	60	0	2	0	0	2	203
7:30 AM	0	112	18	0	130	5	0	9	0	14	32	30	0	0	62	1	2	0	0	3	209
7:45 AM	0	99	10	0	109	12	0	10	0	22	34	31	0	0	65	0	1	0	0	1	197
Total	0	433	62	0	495	34	0	35	0	69	105	119	0	0	224	3	5	0	0	8	796
8:00 AM	0	103	4	0	107	6	0	10	0	16	19	23	1	0	43	0	0	0	0	0	166
8:15 AM	0	76	14	0	90	9	0	3	0	12	18	33	0	0	51	0	0	0	0	0	153
8:30 AM	1	49	11	0	61	7	0	8	0	15	25	28	0	0	53	1	0	0	0	1	130
8:45 AM	0	49	7	0	56	9	0	15	0	24	22	21	2	0	45	0	0	0	0	0	125
Total	1	277	36	0	314	31	0	36	0	67	84	105	3	0	192	1	0	0	0	1	574
Grand Total	1	710	98	0	809	65	0	71	0	136	189	224	3	0	416	4	5	0	0	9	1370
Approach %	0.1	87.8	12.1	0.0		47.8	0.0	52.2	0.0		45.4	53.8	0.7	0.0		44.4	55.6	0.0	0.0		
Total %	0.1	51.8	7.2	0.0	59.1	4.7	0.0	5.2	0.0	9.9	13.8	16.4	0.2	0.0	30.4	0.3	0.4	0.0	0.0	0.7	
Exiting Leg Total					289					292					785					4	1370

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	111	20	0	131	8	0	9	0	17	13	24	0	0	37	2	0	0	0	2	187
7:15 AM	0	111	14	0	125	9	0	7	0	16	26	34	0	0	60	0	2	0	0	2	203
7:30 AM	0	112	18	0	130	5	0	9	0	14	32	30	0	0	62	1	2	0	0	3	209
7:45 AM	0	99	10	0	109	12	0	10	0	22	34	31	0	0	65	0	1	0	0	1	197
Total Volume	0	433	62	0	495	34	0	35	0	69	105	119	0	0	224	3	5	0	0	8	796
% Approach Total	0.0	87.5	12.5	0.0		49.3	0.0	50.7	0.0		46.9	53.1	0.0	0.0		37.5	62.5	0.0	0.0		
PHF	0.000	0.967	0.775	0.000	0.945	0.708	0.000	0.875	0.000	0.784	0.772	0.875	0.000	0.000	0.862	0.375	0.625	0.000	0.000	0.667	0.952
Entering Leg	0	433	62	0	495	34	0	35	0	69	105	119	0	0	224	3	5	0	0	8	796
Exiting Leg					153					172					471					0	796
Total					648					241					695					8	1592

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	6	1	0	7	2	0	1	0	3	2	3	0	0	5	0	0	0	0	0	15
7:15 AM	0	4	0	0	4	1	0	0	0	1	3	2	0	0	5	0	0	0	0	0	10
7:30 AM	0	6	0	0	6	0	0	0	0	0	2	4	0	0	6	0	0	0	0	0	12
7:45 AM	0	4	0	0	4	1	0	3	0	4	2	4	0	0	6	0	0	0	0	0	14
Total	0	20	1	0	21	4	0	4	0	8	9	13	0	0	22	0	0	0	0	0	51
8:00 AM	0	2	2	0	4	0	0	4	0	4	3	5	0	0	8	0	0	0	0	0	16
8:15 AM	0	1	1	0	2	1	0	2	0	3	2	0	0	0	2	0	0	0	0	0	7
8:30 AM	0	5	0	0	5	4	0	2	0	6	2	2	0	0	4	0	0	0	0	0	15
8:45 AM	0	1	0	0	1	2	0	0	0	2	3	1	0	0	4	0	0	0	0	0	7
Total	0	9	3	0	12	7	0	8	0	15	10	8	0	0	18	0	0	0	0	0	45
Grand Total	0	29	4	0	33	11	0	12	0	23	19	21	0	0	40	0	0	0	0	0	96
Approach %	0.0	87.9	12.1	0.0		47.8	0.0	52.2	0.0		47.5	52.5	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	30.2	4.2	0.0	34.4	11.5	0.0	12.5	0.0	24.0	19.8	21.9	0.0	0.0	41.7	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					32					23					41					0	96
Buses	0	3	0	0	3	1	0	1	0	2	0	1	0	0	1	0	0	0	0	0	6
% Buses	0.0	10.3	0.0	0.0	9.1	9.1	0.0	8.3	0.0	8.7	0.0	4.8	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	6.3
Exiting Leg Total					2					0					4					0	6
Single-Unit Trucks	0	21	3	0	24	7	0	6	0	13	15	16	0	0	31	0	0	0	0	0	68
% Single-Unit	0.0	72.4	75.0	0.0	72.7	63.6	0.0	50.0	0.0	56.5	78.9	76.2	0.0	0.0	77.5	0.0	0.0	0.0	0.0	0.0	70.8
Exiting Leg Total					23					18					27					0	68
Articulated Trucks	0	5	1	0	6	3	0	5	0	8	4	4	0	0	8	0	0	0	0	0	22
% Articulated	0.0	17.2	25.0	0.0	18.2	27.3	0.0	41.7	0.0	34.8	21.1	19.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	22.9
Exiting Leg Total					7					5					10					0	22

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	0	4	0	0	4	1	0	0	0	1	3	2	0	0	5	0	0	0	0	0	10
7:30 AM	0	6	0	0	6	0	0	0	0	0	2	4	0	0	6	0	0	0	0	0	12
7:45 AM	0	4	0	0	4	1	0	3	0	4	2	4	0	0	6	0	0	0	0	0	14
8:00 AM	0	2	2	0	4	0	0	4	0	4	3	5	0	0	8	0	0	0	0	0	16
Total Volume	0	16	2	0	18	2	0	7	0	9	10	15	0	0	25	0	0	0	0	0	52
% Approach Total	0.0	88.9	11.1	0.0		22.2	0.0	77.8	0.0		40.0	60.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.667	0.250	0.000	0.750	0.500	0.000	0.438	0.000	0.563	0.833	0.750	0.000	0.000	0.781	0.000	0.000	0.000	0.000	0.000	0.813
Buses	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3
Buses %	0.0	6.3	0.0	0.0	5.6	0.0	0.0	14.3	0.0	11.1	0.0	6.7	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	5.8
Single-Unit Trucks	0	11	1	0	12	2	0	4	0	6	7	13	0	0	20	0	0	0	0	0	38
Single-Unit %	0.0	68.8	50.0	0.0	66.7	100.0	0.0	57.1	0.0	66.7	70.0	86.7	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0	73.1
Articulated Trucks	0	4	1	0	5	0	0	2	0	2	3	1	0	0	4	0	0	0	0	0	11
Articulated %	0.0	25.0	50.0	0.0	27.8	0.0	0.0	28.6	0.0	22.2	30.0	6.7	0.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0	21.2
Buses	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3
Single-Unit Trucks	0	11	1	0	12	2	0	4	0	6	7	13	0	0	20	0	0	0	0	0	38
Articulated Trucks	0	4	1	0	5	0	0	2	0	2	3	1	0	0	4	0	0	0	0	0	11
Total Entering Leg	0	16	2	0	18	2	0	7	0	9	10	15	0	0	25	0	0	0	0	0	52
Buses					1					0					2					0	3
Single-Unit Trucks					15					8					15					0	38
Articulated Trucks					1					4					6					0	11
Total Exiting Leg					17					12					23					0	52

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	91	17	0	108	6	0	7	0	13	9	16	0	0	25	2	0	0	0	2	148
7:15 AM	0	93	11	0	104	7	0	6	0	13	21	25	0	0	46	0	2	0	0	2	165
7:30 AM	0	89	15	0	104	4	0	9	0	13	24	24	0	0	48	1	2	0	0	3	168
7:45 AM	0	91	5	0	96	9	0	5	0	14	27	26	0	0	53	0	0	0	0	0	163
Total	0	364	48	0	412	26	0	27	0	53	81	91	0	0	172	3	4	0	0	7	644
8:00 AM	0	78	3	0	81	5	0	8	0	13	14	20	1	0	35	0	0	0	0	0	129
8:15 AM	0	63	11	0	74	6	0	2	0	8	16	25	0	0	41	0	0	0	0	0	123
8:30 AM	1	39	9	0	49	5	0	6	0	11	25	20	0	0	45	1	0	0	0	1	106
8:45 AM	0	38	4	0	42	3	0	14	0	17	18	18	2	0	38	0	0	0	0	0	97
Total	1	218	27	0	246	19	0	30	0	49	73	83	3	0	159	1	0	0	0	1	455
Grand Total	1	582	75	0	658	45	0	57	0	102	154	174	3	0	331	4	4	0	0	8	1099
Approach %	0.2	88.4	11.4	0.0		44.1	0.0	55.9	0.0		46.5	52.6	0.9	0.0		50.0	50.0	0.0	0.0		
Total %	0.1	53.0	6.8	0.0	59.9	4.1	0.0	5.2	0.0	9.3	14.0	15.8	0.3	0.0	30.1	0.4	0.4	0.0	0.0	0.7	
Exiting Leg Total					219					233					643					4	1099

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	91	17	0	108	6	0	7	0	13	9	16	0	0	25	2	0	0	0	2	148
7:15 AM	0	93	11	0	104	7	0	6	0	13	21	25	0	0	46	0	2	0	0	2	165
7:30 AM	0	89	15	0	104	4	0	9	0	13	24	24	0	0	48	1	2	0	0	3	168
7:45 AM	0	91	5	0	96	9	0	5	0	14	27	26	0	0	53	0	0	0	0	0	163
Total Volume	0	364	48	0	412	26	0	27	0	53	81	91	0	0	172	3	4	0	0	7	644
% Approach Total	0.0	88.3	11.7	0.0		49.1	0.0	50.9	0.0		47.1	52.9	0.0	0.0		42.9	57.1	0.0	0.0		
PHF	0.000	0.978	0.706	0.000	0.954	0.722	0.000	0.750	0.000	0.946	0.750	0.875	0.000	0.000	0.811	0.375	0.500	0.000	0.000	0.583	0.958
Entering Leg	0	364	48	0	412	26	0	27	0	53	81	91	0	0	172	3	4	0	0	7	644
Exiting Leg					117					133					394					0	644
Total					529					186					566					7	1288

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Light Goods Vehicle**

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	20	3	0	23	2	0	2	0	4	4	8	0	0	12	0	0	0	0	0	39
7:15 AM	0	18	3	0	21	2	0	1	0	3	5	9	0	0	14	0	0	0	0	0	38
7:30 AM	0	23	3	0	26	1	0	0	0	1	8	6	0	0	14	0	0	0	0	0	41
7:45 AM	0	8	5	0	13	3	0	5	0	8	7	5	0	0	12	0	1	0	0	1	34
Total	0	69	14	0	83	8	0	8	0	16	24	28	0	0	52	0	1	0	0	1	152
8:00 AM	0	25	1	0	26	1	0	2	0	3	5	3	0	0	8	0	0	0	0	0	37
8:15 AM	0	13	3	0	16	3	0	1	0	4	2	8	0	0	10	0	0	0	0	0	30
8:30 AM	0	10	2	0	12	2	0	2	0	4	0	8	0	0	8	0	0	0	0	0	24
8:45 AM	0	11	3	0	14	6	0	1	0	7	4	3	0	0	7	0	0	0	0	0	28
Total	0	59	9	0	68	12	0	6	0	18	11	22	0	0	33	0	0	0	0	0	119
Grand Total	0	128	23	0	151	20	0	14	0	34	35	50	0	0	85	0	1	0	0	1	271
Approach %	0.0	84.8	15.2	0.0		58.8	0.0	41.2	0.0		41.2	58.8	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	47.2	8.5	0.0	55.7	7.4	0.0	5.2	0.0	12.5	12.9	18.5	0.0	0.0	31.4	0.0	0.4	0.0	0.0	0.4	
Exiting Leg Total					70					59					142					0	271

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	20	3	0	23	2	0	2	0	4	4	8	0	0	12	0	0	0	0	0	39
7:15 AM	0	18	3	0	21	2	0	1	0	3	5	9	0	0	14	0	0	0	0	0	38
7:30 AM	0	23	3	0	26	1	0	0	0	1	8	6	0	0	14	0	0	0	0	0	41
7:45 AM	0	8	5	0	13	3	0	5	0	8	7	5	0	0	12	0	1	0	0	1	34
Total Volume	0	69	14	0	83	8	0	8	0	16	24	28	0	0	52	0	1	0	0	1	152
% Approach Total	0.0	83.1	16.9	0.0		50.0	0.0	50.0	0.0		46.2	53.8	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.750	0.700	0.000	0.798	0.667	0.000	0.400	0.000	0.500	0.750	0.778	0.000	0.000	0.929	0.000	0.250	0.000	0.000	0.250	0.927
Entering Leg	0	69	14	0	83	8	0	8	0	16	24	28	0	0	52	0	1	0	0	1	152
Exiting Leg					36					39					77					0	152
Total					119					55					129					1	304

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Buses

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	2	0	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
7:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	3	0	0	3	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	5
8:00 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	3	0	0	3	1	0	1	0	2	0	1	0	0	1	0	0	0	0	0	6
Approach %	0.0	100.0	0.0	0.0		50.0	0.0	50.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	50.0	0.0	0.0	50.0	16.7	0.0	16.7	0.0	33.3	0.0	16.7	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					2					0					4					0	6

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	2	0	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
7:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	3	0	0	3	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	5
% Approach Total	0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.375	0.000	0.000	0.375	0.250	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.417
Entering Leg	0	3	0	0	3	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	5
Exiting Leg					2					0					3					0	5
Total					5					1					4					0	10

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	3	1	0	4	1	0	0	0	1	2	2	0	0	4	0	0	0	0	0	9
7:15 AM	0	2	0	0	2	1	0	0	0	1	3	2	0	0	5	0	0	0	0	0	8
7:30 AM	0	5	0	0	5	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	9
7:45 AM	0	3	0	0	3	1	0	1	0	2	2	3	0	0	5	0	0	0	0	0	10
Total	0	13	1	0	14	3	0	1	0	4	8	10	0	0	18	0	0	0	0	0	36
8:00 AM	0	1	1	0	2	0	0	3	0	3	1	5	0	0	6	0	0	0	0	0	11
8:15 AM	0	1	1	0	2	1	0	1	0	2	1	0	0	0	1	0	0	0	0	0	5
8:30 AM	0	5	0	0	5	2	0	1	0	3	2	1	0	0	3	0	0	0	0	0	11
8:45 AM	0	1	0	0	1	1	0	0	0	1	3	0	0	0	3	0	0	0	0	0	5
Total	0	8	2	0	10	4	0	5	0	9	7	6	0	0	13	0	0	0	0	0	32
Grand Total	0	21	3	0	24	7	0	6	0	13	15	16	0	0	31	0	0	0	0	0	68
Approach %	0.0	87.5	12.5	0.0		53.8	0.0	46.2	0.0		48.4	51.6	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	30.9	4.4	0.0	35.3	10.3	0.0	8.8	0.0	19.1	22.1	23.5	0.0	0.0	45.6	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					23					18					27					0	68

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	0	2	0	0	2	1	0	0	0	1	3	2	0	0	5	0	0	0	0	0	8
7:30 AM	0	5	0	0	5	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	9
7:45 AM	0	3	0	0	3	1	0	1	0	2	2	3	0	0	5	0	0	0	0	0	10
8:00 AM	0	1	1	0	2	0	0	3	0	3	1	5	0	0	6	0	0	0	0	0	11
Total Volume	0	11	1	0	12	2	0	4	0	6	7	13	0	0	20	0	0	0	0	0	38
% Approach Total	0.0	91.7	8.3	0.0		33.3	0.0	66.7	0.0		35.0	65.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.550	0.250	0.000	0.600	0.500	0.000	0.333	0.000	0.500	0.583	0.650	0.000	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.864
Entering Leg	0	11	1	0	12	2	0	4	0	6	7	13	0	0	20	0	0	0	0	0	38
Exiting Leg					15					8					15					0	38
Total					27					14					35					0	76

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3
7:15 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:30 AM	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	3
Total	0	4	0	0	4	0	0	3	0	3	1	2	0	0	3	0	0	0	0	0	10
8:00 AM	0	1	1	0	2	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	4
8:15 AM	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	2	0	1	0	3	0	1	0	0	1	0	0	0	0	0	4
8:45 AM	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	2
Total	0	1	1	0	2	3	0	2	0	5	3	2	0	0	5	0	0	0	0	0	12
Grand Total	0	5	1	0	6	3	0	5	0	8	4	4	0	0	8	0	0	0	0	0	22
Approach %	0.0	83.3	16.7	0.0		37.5	0.0	62.5	0.0		50.0	50.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	22.7	4.5	0.0	27.3	13.6	0.0	22.7	0.0	36.4	18.2	18.2	0.0	0.0	36.4	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					7					5					10					0	22

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:45 AM	0	0	0	0	0	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	3
8:00 AM	0	1	1	0	2	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	4
8:15 AM	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	2	0	1	0	3	0	1	0	0	1	0	0	0	0	0	4
Total Volume	0	1	1	0	2	2	0	4	0	6	3	2	0	0	5	0	0	0	0	0	13
% Approach Total	0.0	50.0	50.0	0.0		33.3	0.0	66.7	0.0		60.0	40.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.250	0.000	0.250	0.250	0.000	0.500	0.000	0.500	0.375	0.500	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.813
Entering Leg	0	1	1	0	2	2	0	4	0	6	3	2	0	0	5	0	0	0	0	0	13
Exiting Leg					4					4					5					0	13
Total					6					10					10					0	26

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North							Fort Pond Road from East							Lunenburg Road (Route 70) from South							Woods Lane from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North							Fort Pond Road from East							Lunenburg Road (Route 70) from South							Woods Lane from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North							Fort Pond Road from East							Lunenburg Road (Route 70) from South							Woods Lane from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Lunenburg Road (Route 70) from North							Fort Pond Road from East							Lunenburg Road (Route 70) from South							Woods Lane from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	60	11	0	71	32	1	44	0	77	28	75	0	0	103	0	0	0	0	0	251
4:15 PM	0	50	13	0	63	46	1	41	0	88	43	78	0	0	121	1	0	0	0	1	273
4:30 PM	0	43	7	0	50	44	0	32	0	76	38	97	0	0	135	1	0	1	0	2	263
4:45 PM	0	38	3	0	41	55	0	28	0	83	40	96	0	0	136	0	0	0	0	0	260
Total	0	191	34	0	225	177	2	145	0	324	149	346	0	0	495	2	0	1	0	3	1047
5:00 PM	1	39	7	0	47	48	0	29	0	77	33	116	0	0	149	2	0	0	0	2	275
5:15 PM	0	38	6	0	44	49	0	37	0	86	28	113	1	0	142	1	0	0	0	1	273
5:30 PM	0	43	7	0	50	98	0	80	0	178	16	101	1	0	118	1	0	0	0	1	347
5:45 PM	0	38	8	0	46	91	0	119	0	210	20	78	0	0	98	0	0	0	0	0	354
Total	1	158	28	0	187	286	0	265	0	551	97	408	2	0	507	4	0	0	0	4	1249
Grand Total	1	349	62	0	412	463	2	410	0	875	246	754	2	0	1002	6	0	1	0	7	2296
Approach %	0.2	84.7	15.0	0.0		52.9	0.2	46.9	0.0		24.6	75.2	0.2	0.0		85.7	0.0	14.3	0.0		
Total %	0.0	15.2	2.7	0.0	17.9	20.2	0.1	17.9	0.0	38.1	10.7	32.8	0.1	0.0	43.6	0.3	0.0	0.0	0.0	0.3	
Exiting Leg Total					1218					308					765					5	2296
Cars	1	345	53	0	399	455	2	389	0	846	239	741	2	0	982	6	0	1	0	7	2234
% Cars	100.0	98.9	85.5	0.0	96.8	98.3	100.0	94.9	0.0	96.7	97.2	98.3	100.0	0.0	98.0	100.0	0.0	100.0	0.0	100.0	97.3
Exiting Leg Total					1197					292					740					5	2234
Heavy Vehicles	0	4	9	0	13	8	0	21	0	29	7	13	0	0	20	0	0	0	0	0	62
% Heavy Vehicles	0.0	1.1	14.5	0.0	3.2	1.7	0.0	5.1	0.0	3.3	2.8	1.7	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.7
Exiting Leg Total					21					16					25					0	62

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	1	39	7	0	47	48	0	29	0	77	33	116	0	0	149	2	0	0	0	2	275
5:15 PM	0	38	6	0	44	49	0	37	0	86	28	113	1	0	142	1	0	0	0	1	273
5:30 PM	0	43	7	0	50	98	0	80	0	178	16	101	1	0	118	1	0	0	0	1	347
5:45 PM	0	38	8	0	46	91	0	119	0	210	20	78	0	0	98	0	0	0	0	0	354
Total Volume	1	158	28	0	187	286	0	265	0	551	97	408	2	0	507	4	0	0	0	4	1249
% Approach Total	0.5	84.5	15.0	0.0		51.9	0.0	48.1	0.0		19.1	80.5	0.4	0.0		100.0	0.0	0.0	0.0		
PHF	0.250	0.919	0.875	0.000	0.935	0.730	0.000	0.557	0.000	0.656	0.735	0.879	0.500	0.000	0.851	0.500	0.000	0.000	0.000	0.500	0.882
Cars	1	157	24	0	182	283	0	252	0	535	95	402	2	0	499	4	0	0	0	4	1220
Cars %	100.0	99.4	85.7	0.0	97.3	99.0	0.0	95.1	0.0	97.1	97.9	98.5	100.0	0.0	98.4	100.0	0.0	0.0	0.0	100.0	97.7
Heavy Vehicles	0	1	4	0	5	3	0	13	0	16	2	6	0	0	8	0	0	0	0	0	29
Heavy Vehicles %	0.0	0.6	14.3	0.0	2.7	1.0	0.0	4.9	0.0	2.9	2.1	1.5	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	2.3
Cars Enter Leg	1	157	24	0	182	283	0	252	0	535	95	402	2	0	499	4	0	0	0	4	1220
Heavy Enter Leg	0	1	4	0	5	3	0	13	0	16	2	6	0	0	8	0	0	0	0	0	29
Total Entering Leg	1	158	28	0	187	286	0	265	0	551	97	408	2	0	507	4	0	0	0	4	1249
Cars Exiting Leg					685					119					413					3	1220
Heavy Exiting Leg					9					6					14					0	29
Total Exiting Leg					694					125					427					3	1249

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars-Combined (Motorcycles, Cars, Light Goods)**

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	59	8	0	67	30	1	40	0	71	26	73	0	0	99	0	0	0	0	0	237
4:15 PM	0	50	12	0	62	44	1	39	0	84	42	77	0	0	119	1	0	0	0	1	266
4:30 PM	0	42	6	0	48	44	0	31	0	75	36	94	0	0	130	1	0	1	0	2	255
4:45 PM	0	37	3	0	40	54	0	27	0	81	40	95	0	0	135	0	0	0	0	0	256
Total	0	188	29	0	217	172	2	137	0	311	144	339	0	0	483	2	0	1	0	3	1014
5:00 PM	1	38	7	0	46	48	0	25	0	73	32	113	0	0	145	2	0	0	0	2	266
5:15 PM	0	38	6	0	44	48	0	32	0	80	28	112	1	0	141	1	0	0	0	1	266
5:30 PM	0	43	5	0	48	98	0	78	0	176	16	99	1	0	116	1	0	0	0	1	341
5:45 PM	0	38	6	0	44	89	0	117	0	206	19	78	0	0	97	0	0	0	0	0	347
Total	1	157	24	0	182	283	0	252	0	535	95	402	2	0	499	4	0	0	0	4	1220
Grand Total	1	345	53	0	399	455	2	389	0	846	239	741	2	0	982	6	0	1	0	7	2234
Approach %	0.3	86.5	13.3	0.0		53.8	0.2	46.0	0.0		24.3	75.5	0.2	0.0		85.7	0.0	14.3	0.0		
Total %	0.0	15.4	2.4	0.0	17.9	20.4	0.1	17.4	0.0	37.9	10.7	33.2	0.1	0.0	44.0	0.3	0.0	0.0	0.0	0.3	
Exiting Leg Total					1197					292					740					5	2234

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	1	38	7	0	46	48	0	25	0	73	32	113	0	0	145	2	0	0	0	2	266
5:15 PM	0	38	6	0	44	48	0	32	0	80	28	112	1	0	141	1	0	0	0	1	266
5:30 PM	0	43	5	0	48	98	0	78	0	176	16	99	1	0	116	1	0	0	0	1	341
5:45 PM	0	38	6	0	44	89	0	117	0	206	19	78	0	0	97	0	0	0	0	0	347
Total Volume	1	157	24	0	182	283	0	252	0	535	95	402	2	0	499	4	0	0	0	4	1220
% Approach Total	0.5	86.3	13.2	0.0		52.9	0.0	47.1	0.0		19.0	80.6	0.4	0.0		100.0	0.0	0.0	0.0		
PHF	0.250	0.913	0.857	0.000	0.948	0.722	0.000	0.538	0.000	0.649	0.742	0.889	0.500	0.000	0.860	0.500	0.000	0.000	0.000	0.500	0.879
Entering Leg	1	157	24	0	182	283	0	252	0	535	95	402	2	0	499	4	0	0	0	4	1220
Exiting Leg					685					119					413					3	1220
Total					867					654					912					7	2440

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	1	3	0	4	2	0	4	0	6	2	2	0	0	4	0	0	0	0	0	14
4:15 PM	0	0	1	0	1	2	0	2	0	4	1	1	0	0	2	0	0	0	0	0	7
4:30 PM	0	1	1	0	2	0	0	1	0	1	2	3	0	0	5	0	0	0	0	0	8
4:45 PM	0	1	0	0	1	1	0	1	0	2	0	1	0	0	1	0	0	0	0	0	4
Total	0	3	5	0	8	5	0	8	0	13	5	7	0	0	12	0	0	0	0	0	33
5:00 PM	0	1	0	0	1	0	0	4	0	4	1	3	0	0	4	0	0	0	0	0	9
5:15 PM	0	0	0	0	0	1	0	5	0	6	0	1	0	0	1	0	0	0	0	0	7
5:30 PM	0	0	2	0	2	0	0	2	0	2	0	2	0	0	2	0	0	0	0	0	6
5:45 PM	0	0	2	0	2	2	0	2	0	4	1	0	0	0	1	0	0	0	0	0	7
Total	0	1	4	0	5	3	0	13	0	16	2	6	0	0	8	0	0	0	0	0	29
Grand Total	0	4	9	0	13	8	0	21	0	29	7	13	0	0	20	0	0	0	0	0	62
Approach %	0.0	30.8	69.2	0.0		27.6	0.0	72.4	0.0		35.0	65.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	6.5	14.5	0.0	21.0	12.9	0.0	33.9	0.0	46.8	11.3	21.0	0.0	0.0	32.3	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					21					16					25					0	62
Buses	0	0	1	0	1	2	0	0	0	2	1	1	0	0	2	0	0	0	0	0	5
% Buses	0.0	0.0	11.1	0.0	7.7	25.0	0.0	0.0	0.0	6.9	14.3	7.7	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	8.1
Exiting Leg Total					3					2					0					0	5
Single-Unit Trucks	0	2	4	0	6	5	0	17	0	22	4	9	0	0	13	0	0	0	0	0	41
% Single-Unit	0.0	50.0	44.4	0.0	46.2	62.5	0.0	81.0	0.0	75.9	57.1	69.2	0.0	0.0	65.0	0.0	0.0	0.0	0.0	0.0	66.1
Exiting Leg Total					14					8					19					0	41
Articulated Trucks	0	2	4	0	6	1	0	4	0	5	2	3	0	0	5	0	0	0	0	0	16
% Articulated	0.0	50.0	44.4	0.0	46.2	12.5	0.0	19.0	0.0	17.2	28.6	23.1	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	25.8
Exiting Leg Total					4					6					6					0	16

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	1	3	0	4	2	0	4	0	6	2	2	0	0	4	0	0	0	0	0	14
4:15 PM	0	0	1	0	1	2	0	2	0	4	1	1	0	0	2	0	0	0	0	0	7
4:30 PM	0	1	1	0	2	0	0	1	0	1	2	3	0	0	5	0	0	0	0	0	8
4:45 PM	0	1	0	0	1	1	0	1	0	2	0	1	0	0	1	0	0	0	0	0	4
Total Volume	0	3	5	0	8	5	0	8	0	13	5	7	0	0	12	0	0	0	0	0	33
% Approach Total	0.0	37.5	62.5	0.0		38.5	0.0	61.5	0.0		41.7	58.3	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.750	0.417	0.000	0.500	0.625	0.000	0.500	0.000	0.542	0.625	0.583	0.000	0.000	0.600	0.000	0.000	0.000	0.000	0.000	0.589
Buses	0	0	0	0	0	2	0	0	0	2	1	0	0	0	1	0	0	0	0	0	3
Buses %	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	15.4	20.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0	9.1
Single-Unit Trucks	0	1	3	0	4	3	0	7	0	10	2	6	0	0	8	0	0	0	0	0	22
Single-Unit %	0.0	33.3	60.0	0.0	50.0	60.0	0.0	87.5	0.0	76.9	40.0	85.7	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	66.7
Articulated Trucks	0	2	2	0	4	0	0	1	0	1	2	1	0	0	3	0	0	0	0	0	8
Articulated %	0.0	66.7	40.0	0.0	50.0	0.0	0.0	12.5	0.0	7.7	40.0	14.3	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	24.2
Buses	0	0	0	0	0	2	0	0	0	2	1	0	0	0	1	0	0	0	0	0	3
Single-Unit Trucks	0	1	3	0	4	3	0	7	0	10	2	6	0	0	8	0	0	0	0	0	22
Articulated Trucks	0	2	2	0	4	0	0	1	0	1	2	1	0	0	3	0	0	0	0	0	8
Total Entering Leg	0	3	5	0	8	5	0	8	0	13	5	7	0	0	12	0	0	0	0	0	33
Buses					2					1					0					0	3
Single-Unit Trucks					9					5					8					0	22
Articulated Trucks					1					4					3					0	8
Total Exiting Leg					12					10					11					0	33

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	45	6	0	51	23	1	35	0	59	16	58	0	0	74	0	0	0	0	0	184
4:15 PM	0	43	10	0	53	35	1	35	0	71	34	67	0	0	101	1	0	0	0	1	226
4:30 PM	0	33	4	0	37	35	0	29	0	64	31	73	0	0	104	1	0	1	0	2	207
4:45 PM	0	35	1	0	36	42	0	21	0	63	33	75	0	0	108	0	0	0	0	0	207
Total	0	156	21	0	177	135	2	120	0	257	114	273	0	0	387	2	0	1	0	3	824
5:00 PM	1	36	6	0	43	42	0	23	0	65	31	109	0	0	140	2	0	0	0	2	250
5:15 PM	0	36	6	0	42	41	0	29	0	70	27	107	1	0	135	1	0	0	0	1	248
5:30 PM	0	41	3	0	44	78	0	67	0	145	15	88	1	0	104	1	0	0	0	1	294
5:45 PM	0	37	5	0	42	69	0	111	0	180	19	75	0	0	94	0	0	0	0	0	316
Total	1	150	20	0	171	230	0	230	0	460	92	379	2	0	473	4	0	0	0	4	1108
Grand Total	1	306	41	0	348	365	2	350	0	717	206	652	2	0	860	6	0	1	0	7	1932
Approach %	0.3	87.9	11.8	0.0		50.9	0.3	48.8	0.0		24.0	75.8	0.2	0.0		85.7	0.0	14.3	0.0		
Total %	0.1	15.8	2.1	0.0	18.0	18.9	0.1	18.1	0.0	37.1	10.7	33.7	0.1	0.0	44.5	0.3	0.0	0.1	0.0	0.4	
Exiting Leg Total					1018					247					662					5	1932

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	1	36	6	0	43	42	0	23	0	65	31	109	0	0	140	2	0	0	0	2	250
5:15 PM	0	36	6	0	42	41	0	29	0	70	27	107	1	0	135	1	0	0	0	1	248
5:30 PM	0	41	3	0	44	78	0	67	0	145	15	88	1	0	104	1	0	0	0	1	294
5:45 PM	0	37	5	0	42	69	0	111	0	180	19	75	0	0	94	0	0	0	0	0	316
Total Volume	1	150	20	0	171	230	0	230	0	460	92	379	2	0	473	4	0	0	0	4	1108
% Approach Total	0.6	87.7	11.7	0.0		50.0	0.0	50.0	0.0		19.5	80.1	0.4	0.0		100.0	0.0	0.0	0.0		
PHF	0.250	0.915	0.833	0.000	0.972	0.737	0.000	0.518	0.000	0.639	0.742	0.869	0.500	0.000	0.845	0.500	0.000	0.000	0.000	0.500	0.877
Entering Leg	1	150	20	0	171	230	0	230	0	460	92	379	2	0	473	4	0	0	0	4	1108
Exiting Leg					609					112					384					3	1108
Total					780					572					857					7	2216

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Light Goods Vehicle

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	14	2	0	16	7	0	5	0	12	10	15	0	0	25	0	0	0	0	0	53
4:15 PM	0	7	2	0	9	9	0	4	0	13	8	10	0	0	18	0	0	0	0	0	40
4:30 PM	0	9	2	0	11	9	0	2	0	11	5	21	0	0	26	0	0	0	0	0	48
4:45 PM	0	2	2	0	4	12	0	6	0	18	7	20	0	0	27	0	0	0	0	0	49
Total	0	32	8	0	40	37	0	17	0	54	30	66	0	0	96	0	0	0	0	0	190
5:00 PM	0	2	1	0	3	6	0	2	0	8	1	4	0	0	5	0	0	0	0	0	16
5:15 PM	0	2	0	0	2	7	0	3	0	10	1	5	0	0	6	0	0	0	0	0	18
5:30 PM	0	2	2	0	4	20	0	11	0	31	1	11	0	0	12	0	0	0	0	0	47
5:45 PM	0	1	1	0	2	20	0	6	0	26	0	3	0	0	3	0	0	0	0	0	31
Total	0	7	4	0	11	53	0	22	0	75	3	23	0	0	26	0	0	0	0	0	112
Grand Total	0	39	12	0	51	90	0	39	0	129	33	89	0	0	122	0	0	0	0	0	302
Approach %	0.0	76.5	23.5	0.0		69.8	0.0	30.2	0.0		27.0	73.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	12.9	4.0	0.0	16.9	29.8	0.0	12.9	0.0	42.7	10.9	29.5	0.0	0.0	40.4	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					179					45					78					0	302

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	14	2	0	16	7	0	5	0	12	10	15	0	0	25	0	0	0	0	0	53
4:15 PM	0	7	2	0	9	9	0	4	0	13	8	10	0	0	18	0	0	0	0	0	40
4:30 PM	0	9	2	0	11	9	0	2	0	11	5	21	0	0	26	0	0	0	0	0	48
4:45 PM	0	2	2	0	4	12	0	6	0	18	7	20	0	0	27	0	0	0	0	0	49
Total Volume	0	32	8	0	40	37	0	17	0	54	30	66	0	0	96	0	0	0	0	0	190
% Approach Total	0.0	80.0	20.0	0.0		68.5	0.0	31.5	0.0		31.3	68.8	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.571	1.000	0.000	0.625	0.771	0.000	0.708	0.000	0.750	0.750	0.786	0.000	0.000	0.889	0.000	0.000	0.000	0.000	0.000	0.896
Entering Leg	0	32	8	0	40	37	0	17	0	54	30	66	0	0	96	0	0	0	0	0	190
Exiting Leg					103					38					49					0	190
Total					143					92					145					0	380

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	2	0	0	0	2	1	0	0	0	1	0	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Grand Total	0	0	1	0	1	2	0	0	0	2	1	1	0	0	2	0	0	0	0	0	5
Approach %	0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		50.0	50.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	20.0	0.0	20.0	40.0	0.0	0.0	0.0	40.0	20.0	20.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					3					2					0					0	5

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	2	0	0	0	2	1	0	0	0	1	0	0	0	0	0	3
% Approach Total	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.750
Entering Leg	0	0	0	0	0	2	0	0	0	2	1	0	0	0	1	0	0	0	0	0	3
Exiting Leg					2					1					0					0	3
Total					2					3					1					0	6

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Single-Unit Trucks

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	1	2	0	3	2	0	4	0	6	1	2	0	0	3	0	0	0	0	0	12
4:15 PM	0	0	1	0	1	1	0	2	0	3	1	1	0	0	2	0	0	0	0	0	6
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
Total	0	1	3	0	4	3	0	7	0	10	2	6	0	0	8	0	0	0	0	0	22
5:00 PM	0	1	0	0	1	0	0	4	0	4	1	2	0	0	3	0	0	0	0	0	8
5:15 PM	0	0	0	0	0	0	0	3	0	3	0	1	0	0	1	0	0	0	0	0	4
5:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	1	0	1	2	0	2	0	4	1	0	0	0	1	0	0	0	0	0	6
Total	0	1	1	0	2	2	0	10	0	12	2	3	0	0	5	0	0	0	0	0	19
Grand Total	0	2	4	0	6	5	0	17	0	22	4	9	0	0	13	0	0	0	0	0	41
Approach %	0.0	33.3	66.7	0.0		22.7	0.0	77.3	0.0		30.8	69.2	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	4.9	9.8	0.0	14.6	12.2	0.0	41.5	0.0	53.7	9.8	22.0	0.0	0.0	31.7	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					14					8					19					0	41

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	1	2	0	3	2	0	4	0	6	1	2	0	0	3	0	0	0	0	0	12
4:15 PM	0	0	1	0	1	1	0	2	0	3	1	1	0	0	2	0	0	0	0	0	6
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
Total Volume	0	1	3	0	4	3	0	7	0	10	2	6	0	0	8	0	0	0	0	0	22
% Approach Total	0.0	25.0	75.0	0.0		30.0	0.0	70.0	0.0		25.0	75.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.375	0.000	0.333	0.375	0.000	0.438	0.000	0.417	0.500	0.750	0.000	0.000	0.667	0.000	0.000	0.000	0.000	0.000	0.458
Entering Leg	0	1	3	0	4	3	0	7	0	10	2	6	0	0	8	0	0	0	0	0	22
Exiting Leg					9					5					8					0	22
Total					13					15					16					0	44

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	1	0	2	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	5
4:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	2	0	4	0	0	1	0	1	2	1	0	0	3	0	0	0	0	0	8
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	1	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3
5:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	2	0	2	1	0	3	0	4	0	2	0	0	2	0	0	0	0	0	8
Grand Total	0	2	4	0	6	1	0	4	0	5	2	3	0	0	5	0	0	0	0	0	16
Approach %	0.0	33.3	66.7	0.0		20.0	0.0	80.0	0.0		40.0	60.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	12.5	25.0	0.0	37.5	6.3	0.0	25.0	0.0	31.3	12.5	18.8	0.0	0.0	31.3	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					4					6					6					0	16

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Lunenburg Road (Route 70) from North					Fort Pond Road from East					Lunenburg Road (Route 70) from South					Woods Lane from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	0	1	1	0	2	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	5
4:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	2	1	0	3	1	0	3	0	4	1	2	0	0	3	0	0	0	0	0	10
% Approach Total	0.0	66.7	33.3	0.0		25.0	0.0	75.0	0.0		33.3	66.7	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.500	0.250	0.000	0.375	0.250	0.000	0.375	0.000	0.333	0.250	0.500	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	2	1	0	3	1	0	3	0	4	1	2	0	0	3	0	0	0	0	0	10
Exiting Leg					3					2					5					0	10
Total					6					6					8					0	20

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North							Fort Pond Road from East							Lunenburg Road (Route 70) from South							Woods Lane from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North							Fort Pond Road from East							Lunenburg Road (Route 70) from South							Woods Lane from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 FF**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North							Fort Pond Road from East							Lunenburg Road (Route 70) from South							Woods Lane from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Lunenburg Road (Route 70) from North							Fort Pond Road from East							Lunenburg Road (Route 70) from South							Woods Lane from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	27	4	0	31	0	23	0	23	26	91	0	117	171
7:15 AM	13	1	0	14	0	16	0	16	33	98	0	131	161
7:30 AM	20	4	1	25	0	11	0	11	30	90	0	120	156
7:45 AM	28	2	0	30	0	11	0	11	30	81	0	111	152
Total	88	11	1	100	0	61	0	61	119	360	0	479	640
8:00 AM	28	3	0	31	0	18	0	18	24	67	0	91	140
8:15 AM	19	2	0	21	0	13	0	13	21	63	0	84	118
8:30 AM	31	2	0	33	0	19	0	19	11	44	0	55	107
8:45 AM	48	3	0	51	1	18	0	19	10	38	0	48	118
Total	126	10	0	136	1	68	0	69	66	212	0	278	483
Grand Total	214	21	1	236	1	129	0	130	185	572	0	757	1123
Approach %	90.7	8.9	0.4		0.8	99.2	0.0		24.4	75.6	0.0		
Total %	19.1	1.9	0.1	21.0	0.1	11.5	0.0	11.6	16.5	50.9	0.0	67.4	
Exiting Leg Total				574				206				343	1123
Cars	186	21	1	208	1	127	0	128	180	532	0	712	1048
% Cars	86.9	100.0	100.0	88.1	100.0	98.4	0.0	98.5	97.3	93.0	0.0	94.1	93.3
Exiting Leg Total				534				201				313	1048
Heavy Vehicles	28	0	0	28	0	2	0	2	5	40	0	45	75
% Heavy Vehicles	13.1	0.0	0.0	11.9	0.0	1.6	0.0	1.5	2.7	7.0	0.0	5.9	6.7
Exiting Leg Total				40				5				30	75

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	27	4	0	31	0	23	0	23	26	91	0	117	171
7:15 AM	13	1	0	14	0	16	0	16	33	98	0	131	161
7:30 AM	20	4	1	25	0	11	0	11	30	90	0	120	156
7:45 AM	28	2	0	30	0	11	0	11	30	81	0	111	152
Total Volume	88	11	1	100	0	61	0	61	119	360	0	479	640
% Approach Total	88.0	11.0	1.0		0.0	100.0	0.0		24.8	75.2	0.0		
PHF	0.786	0.688	0.250	0.806	0.000	0.663	0.000	0.663	0.902	0.918	0.000	0.914	0.936
Cars	73	11	1	85	0	60	0	60	114	332	0	446	591
Cars %	83.0	100.0	100.0	85.0	0.0	98.4	0.0	98.4	95.8	92.2	0.0	93.1	92.3
Heavy Vehicles	15	0	0	15	0	1	0	1	5	28	0	33	49
Heavy Vehicles %	17.0	0.0	0.0	15.0	0.0	1.6	0.0	1.6	4.2	7.8	0.0	6.9	7.7
Cars Enter Leg	73	11	1	85	0	60	0	60	114	332	0	446	591
Heavy Enter Leg	15	0	0	15	0	1	0	1	5	28	0	33	49
Total Entering Leg	88	11	1	100	0	61	0	61	119	360	0	479	640
Cars Exiting Leg				333				125				133	591
Heavy Exiting Leg				28				5				16	49
Total Exiting Leg				361				130				149	640

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars-Combined (Motorcycles, Cars, Light Goods)**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	23	4	0	27	0	22	0	22	25	85	0	110	159
7:15 AM	11	1	0	12	0	16	0	16	31	89	0	120	148
7:30 AM	15	4	1	20	0	11	0	11	30	79	0	109	140
7:45 AM	24	2	0	26	0	11	0	11	28	79	0	107	144
Total	73	11	1	85	0	60	0	60	114	332	0	446	591
8:00 AM	24	3	0	27	0	18	0	18	24	65	0	89	134
8:15 AM	17	2	0	19	0	13	0	13	21	59	0	80	112
8:30 AM	29	2	0	31	0	19	0	19	11	38	0	49	99
8:45 AM	43	3	0	46	1	17	0	18	10	38	0	48	112
Total	113	10	0	123	1	67	0	68	66	200	0	266	457
Grand Total	186	21	1	208	1	127	0	128	180	532	0	712	1048
Approach %	89.4	10.1	0.5		0.8	99.2	0.0		25.3	74.7	0.0		
Total %	17.7	2.0	0.1	19.8	0.1	12.1	0.0	12.2	17.2	50.8	0.0	67.9	
Exiting Leg Total				534				201				313	1048

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	23	4	0	27	0	22	0	22	25	85	0	110	159
7:15 AM	11	1	0	12	0	16	0	16	31	89	0	120	148
7:30 AM	15	4	1	20	0	11	0	11	30	79	0	109	140
7:45 AM	24	2	0	26	0	11	0	11	28	79	0	107	144
Total Volume	73	11	1	85	0	60	0	60	114	332	0	446	591
% Approach Total	85.9	12.9	1.2		0.0	100.0	0.0		25.6	74.4	0.0		
PHF	0.760	0.688	0.250	0.787	0.000	0.682	0.000	0.682	0.919	0.933	0.000	0.929	0.929
Entering Leg	73	11	1	85	0	60	0	60	114	332	0	446	591
Exiting Leg				333				125				133	591
Total				418				185				579	1182

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	0	4	0	1	0	1	1	6	0	7	12
7:15 AM	2	0	0	2	0	0	0	0	2	9	0	11	13
7:30 AM	5	0	0	5	0	0	0	0	0	11	0	11	16
7:45 AM	4	0	0	4	0	0	0	0	2	2	0	4	8
Total	15	0	0	15	0	1	0	1	5	28	0	33	49
8:00 AM	4	0	0	4	0	0	0	0	0	2	0	2	6
8:15 AM	2	0	0	2	0	0	0	0	0	4	0	4	6
8:30 AM	2	0	0	2	0	0	0	0	0	6	0	6	8
8:45 AM	5	0	0	5	0	1	0	1	0	0	0	0	6
Total	13	0	0	13	0	1	0	1	0	12	0	12	26
Grand Total	28	0	0	28	0	2	0	2	5	40	0	45	75
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		11.1	88.9	0.0		
Total %	37.3	0.0	0.0	37.3	0.0	2.7	0.0	2.7	6.7	53.3	0.0	60.0	
Exiting Leg Total				40				5				30	75
Buses	1	0	0	1	0	0	0	0	2	1	0	3	4
% Buses	3.6	0.0	0.0	3.6	0.0	0.0	0.0	0.0	40.0	2.5	0.0	6.7	5.3
Exiting Leg Total				1				2				1	4
Single-Unit Trucks	21	0	0	21	0	2	0	2	3	32	0	35	58
% Single-Unit	75.0	0.0	0.0	75.0	0.0	100.0	0.0	100.0	60.0	80.0	0.0	77.8	77.3
Exiting Leg Total				32				3				23	58
Articulated Trucks	6	0	0	6	0	0	0	0	0	7	0	7	13
% Articulated	21.4	0.0	0.0	21.4	0.0	0.0	0.0	0.0	0.0	17.5	0.0	15.6	17.3
Exiting Leg Total				7				0				6	13

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	0	4	0	1	0	1	1	6	0	7	12
7:15 AM	2	0	0	2	0	0	0	0	2	9	0	11	13
7:30 AM	5	0	0	5	0	0	0	0	0	11	0	11	16
7:45 AM	4	0	0	4	0	0	0	0	2	2	0	4	8
Total Volume	15	0	0	15	0	1	0	1	5	28	0	33	49
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		15.2	84.8	0.0		
PHF	0.750	0.000	0.000	0.750	0.000	0.250	0.000	0.250	0.625	0.636	0.000	0.750	0.766
Buses	1	0	0	1	0	0	0	0	2	0	0	2	3
Buses %	6.7	0.0	0.0	6.7	0.0	0.0	0.0	0.0	40.0	0.0	0.0	6.1	6.1
Single-Unit Trucks	11	0	0	11	0	1	0	1	3	23	0	26	38
Single-Unit %	73.3	0.0	0.0	73.3	0.0	100.0	0.0	100.0	60.0	82.1	0.0	78.8	77.6
Articulated Trucks	3	0	0	3	0	0	0	0	0	5	0	5	8
Articulated %	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	17.9	0.0	15.2	16.3
Buses	1	0	0	1	0	0	0	0	2	0	0	2	3
Single-Unit Trucks	11	0	0	11	0	1	0	1	3	23	0	26	38
Articulated Trucks	3	0	0	3	0	0	0	0	0	5	0	5	8
Total Entering Leg	15	0	0	15	0	1	0	1	5	28	0	33	49
Buses				0				2				1	3
Single-Unit Trucks				23				3				12	38
Articulated Trucks				5				0				3	8
Total Exiting Leg				28				5				16	49

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	14	2	0	16	0	19	0	19	22	72	0	94	129
7:15 AM	5	1	0	6	0	10	0	10	26	74	0	100	116
7:30 AM	10	3	1	14	0	9	0	9	26	67	0	93	116
7:45 AM	20	2	0	22	0	8	0	8	22	73	0	95	125
Total	49	8	1	58	0	46	0	46	96	286	0	382	486
8:00 AM	22	3	0	25	0	15	0	15	20	51	0	71	111
8:15 AM	13	1	0	14	0	12	0	12	16	48	0	64	90
8:30 AM	25	2	0	27	0	18	0	18	10	33	0	43	88
8:45 AM	38	2	0	40	1	14	0	15	9	34	0	43	98
Total	98	8	0	106	1	59	0	60	55	166	0	221	387
Grand Total	147	16	1	164	1	105	0	106	151	452	0	603	873
Approach %	89.6	9.8	0.6		0.9	99.1	0.0		25.0	75.0	0.0		
Total %	16.8	1.8	0.1	18.8	0.1	12.0	0.0	12.1	17.3	51.8	0.0	69.1	
Exiting Leg Total				454				167				252	873

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	14	2	0	16	0	19	0	19	22	72	0	94	129
7:15 AM	5	1	0	6	0	10	0	10	26	74	0	100	116
7:30 AM	10	3	1	14	0	9	0	9	26	67	0	93	116
7:45 AM	20	2	0	22	0	8	0	8	22	73	0	95	125
Total Volume	49	8	1	58	0	46	0	46	96	286	0	382	486
% Approach Total	84.5	13.8	1.7		0.0	100.0	0.0		25.1	74.9	0.0		
PHF	0.613	0.667	0.250	0.659	0.000	0.605	0.000	0.605	0.923	0.966	0.000	0.955	0.942
Entering Leg	49	8	1	58	0	46	0	46	96	286	0	382	486
Exiting Leg				287				104				95	486
Total				345				150				477	972

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Light Goods Vehicle**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	9	2	0	11	0	3	0	3	3	13	0	16	30
7:15 AM	6	0	0	6	0	6	0	6	5	15	0	20	32
7:30 AM	5	1	0	6	0	2	0	2	4	12	0	16	24
7:45 AM	4	0	0	4	0	3	0	3	6	6	0	12	19
Total	24	3	0	27	0	14	0	14	18	46	0	64	105
8:00 AM	2	0	0	2	0	3	0	3	4	14	0	18	23
8:15 AM	4	1	0	5	0	1	0	1	5	11	0	16	22
8:30 AM	4	0	0	4	0	1	0	1	1	5	0	6	11
8:45 AM	5	1	0	6	0	3	0	3	1	4	0	5	14
Total	15	2	0	17	0	8	0	8	11	34	0	45	70
Grand Total	39	5	0	44	0	22	0	22	29	80	0	109	175
Approach %	88.6	11.4	0.0		0.0	100.0	0.0		26.6	73.4	0.0		
Total %	22.3	2.9	0.0	25.1	0.0	12.6	0.0	12.6	16.6	45.7	0.0	62.3	
Exiting Leg Total				80				34				61	175

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	9	2	0	11	0	3	0	3	3	13	0	16	30
7:15 AM	6	0	0	6	0	6	0	6	5	15	0	20	32
7:30 AM	5	1	0	6	0	2	0	2	4	12	0	16	24
7:45 AM	4	0	0	4	0	3	0	3	6	6	0	12	19
Total Volume	24	3	0	27	0	14	0	14	18	46	0	64	105
% Approach Total	88.9	11.1	0.0		0.0	100.0	0.0		28.1	71.9	0.0		
PHF	0.667	0.375	0.000	0.614	0.000	0.583	0.000	0.583	0.750	0.767	0.000	0.800	0.820
Entering Leg	24	3	0	27	0	14	0	14	18	46	0	64	105
Exiting Leg				46				21				38	105
Total				73				35				102	210

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	1	0	0	1	0	0	0	0	2	0	0	2	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	1	0	0	1	0	0	0	0	2	1	0	3	4
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		66.7	33.3	0.0		
Total %	25.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	50.0	25.0	0.0	75.0	
Exiting Leg Total				1				2				1	4

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	1	0	0	1	0	0	0	0	2	0	0	2	3
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		100.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.750
Entering Leg	1	0	0	1	0	0	0	0	2	0	0	2	3
Exiting Leg				0				2				1	3
Total				1				2				3	6

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	0	4	0	1	0	1	1	5	0	6	11
7:15 AM	1	0	0	1	0	0	0	0	1	6	0	7	8
7:30 AM	3	0	0	3	0	0	0	0	0	10	0	10	13
7:45 AM	3	0	0	3	0	0	0	0	1	2	0	3	6
Total	11	0	0	11	0	1	0	1	3	23	0	26	38
8:00 AM	3	0	0	3	0	0	0	0	0	2	0	2	5
8:15 AM	2	0	0	2	0	0	0	0	0	4	0	4	6
8:30 AM	1	0	0	1	0	0	0	0	0	3	0	3	4
8:45 AM	4	0	0	4	0	1	0	1	0	0	0	0	5
Total	10	0	0	10	0	1	0	1	0	9	0	9	20
Grand Total	21	0	0	21	0	2	0	2	3	32	0	35	58
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		8.6	91.4	0.0		
Total %	36.2	0.0	0.0	36.2	0.0	3.4	0.0	3.4	5.2	55.2	0.0	60.3	
Exiting Leg Total				32				3				23	58

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	4	0	0	4	0	1	0	1	1	5	0	6	11
7:15 AM	1	0	0	1	0	0	0	0	1	6	0	7	8
7:30 AM	3	0	0	3	0	0	0	0	0	10	0	10	13
7:45 AM	3	0	0	3	0	0	0	0	1	2	0	3	6
Total Volume	11	0	0	11	0	1	0	1	3	23	0	26	38
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		11.5	88.5	0.0		
PHF	0.688	0.000	0.000	0.688	0.000	0.250	0.000	0.250	0.750	0.575	0.000	0.650	0.731
Entering Leg	11	0	0	11	0	1	0	1	3	23	0	26	38
Exiting Leg				23				3				12	38
Total				34				4				38	76

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
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Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
7:15 AM	1	0	0	1	0	0	0	0	0	3	0	3	4
7:30 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
7:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	3	0	0	3	0	0	0	0	0	5	0	5	8
8:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
8:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	3	0	0	3	0	0	0	0	0	2	0	2	5
Grand Total	6	0	0	6	0	0	0	0	0	7	0	7	13
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	46.2	0.0	0.0	46.2	0.0	0.0	0.0	0.0	0.0	53.8	0.0	53.8	
Exiting Leg Total				7				0				6	13

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
7:15 AM	1	0	0	1	0	0	0	0	0	3	0	3	4
7:30 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
7:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	3	0	0	3	0	0	0	0	0	5	0	5	8
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.750	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.417	0.000	0.417	0.500
Entering Leg	3	0	0	3	0	0	0	0	0	5	0	5	8
Exiting Leg				5				0				3	8
Total				8				0				8	16

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Route 2 EB Ramps						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 G**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Pedestrians

	Route 2 EB Ramps						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	48	6	0	54	1	31	0	32	22	27	0	49	135
4:15 PM	40	3	0	43	1	29	0	30	14	27	0	41	114
4:30 PM	50	3	0	53	0	21	0	21	24	21	0	45	119
4:45 PM	42	5	0	47	0	22	0	22	14	22	0	36	105
Total	180	17	0	197	2	103	0	105	74	97	0	171	473
5:00 PM	56	3	0	59	0	29	0	29	20	22	0	42	130
5:15 PM	53	3	0	56	1	27	0	28	24	15	0	39	123
5:30 PM	46	2	0	48	0	19	0	19	13	20	0	33	100
5:45 PM	43	3	0	46	0	15	0	15	9	13	0	22	83
Total	198	11	0	209	1	90	0	91	66	70	0	136	436
Grand Total	378	28	0	406	3	193	0	196	140	167	0	307	909
Approach %	93.1	6.9	0.0		1.5	98.5	0.0		45.6	54.4	0.0		
Total %	41.6	3.1	0.0	44.7	0.3	21.2	0.0	21.6	15.4	18.4	0.0	33.8	
Exiting Leg Total				170				168				571	909
Cars	361	28	0	389	3	189	0	192	137	157	0	294	875
% Cars	95.5	100.0	0.0	95.8	100.0	97.9	0.0	98.0	97.9	94.0	0.0	95.8	96.3
Exiting Leg Total				160				165				550	875
Heavy Vehicles	17	0	0	17	0	4	0	4	3	10	0	13	34
% Heavy Vehicles	4.5	0.0	0.0	4.2	0.0	2.1	0.0	2.0	2.1	6.0	0.0	4.2	3.7
Exiting Leg Total				10				3				21	34

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:30 PM	50	3	0	53	0	21	0	21	24	21	0	45	119
4:45 PM	42	5	0	47	0	22	0	22	14	22	0	36	105
5:00 PM	56	3	0	59	0	29	0	29	20	22	0	42	130
5:15 PM	53	3	0	56	1	27	0	28	24	15	0	39	123
Total Volume	201	14	0	215	1	99	0	100	82	80	0	162	477
% Approach Total	93.5	6.5	0.0		1.0	99.0	0.0		50.6	49.4	0.0		
PHF	0.897	0.700	0.000	0.911	0.250	0.853	0.000	0.862	0.854	0.909	0.000	0.900	0.917
Cars	190	14	0	204	1	99	0	100	80	75	0	155	459
Cars %	94.5	100.0	0.0	94.9	100.0	100.0	0.0	100.0	97.6	93.8	0.0	95.7	96.2
Heavy Vehicles	11	0	0	11	0	0	0	0	2	5	0	7	18
Heavy Vehicles %	5.5	0.0	0.0	5.1	0.0	0.0	0.0	0.0	2.4	6.3	0.0	4.3	3.8
Cars Enter Leg	190	14	0	204	1	99	0	100	80	75	0	155	459
Heavy Enter Leg	11	0	0	11	0	0	0	0	2	5	0	7	18
Total Entering Leg	201	14	0	215	1	99	0	100	82	80	0	162	477
Cars Exiting Leg				76				94				289	459
Heavy Exiting Leg				5				2				11	18
Total Exiting Leg				81				96				300	477

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars-Combined (Motorcycles, Cars, Light Goods)**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	45	6	0	51	1	29	0	30	22	25	0	47	128
4:15 PM	38	3	0	41	1	28	0	29	14	24	0	38	108
4:30 PM	44	3	0	47	0	21	0	21	24	18	0	42	110
4:45 PM	41	5	0	46	0	22	0	22	14	22	0	36	104
Total	168	17	0	185	2	100	0	102	74	89	0	163	450
5:00 PM	54	3	0	57	0	29	0	29	19	20	0	39	125
5:15 PM	51	3	0	54	1	27	0	28	23	15	0	38	120
5:30 PM	45	2	0	47	0	19	0	19	13	20	0	33	99
5:45 PM	43	3	0	46	0	14	0	14	8	13	0	21	81
Total	193	11	0	204	1	89	0	90	63	68	0	131	425
Grand Total	361	28	0	389	3	189	0	192	137	157	0	294	875
Approach %	92.8	7.2	0.0		1.6	98.4	0.0		46.6	53.4	0.0		
Total %	41.3	3.2	0.0	44.5	0.3	21.6	0.0	21.9	15.7	17.9	0.0	33.6	
Exiting Leg Total				160				165				550	875

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:30 PM	44	3	0	47	0	21	0	21	24	18	0	42	110
4:45 PM	41	5	0	46	0	22	0	22	14	22	0	36	104
5:00 PM	54	3	0	57	0	29	0	29	19	20	0	39	125
5:15 PM	51	3	0	54	1	27	0	28	23	15	0	38	120
Total Volume	190	14	0	204	1	99	0	100	80	75	0	155	459
% Approach Total	93.1	6.9	0.0		1.0	99.0	0.0		51.6	48.4	0.0		
PHF	0.880	0.700	0.000	0.895	0.250	0.853	0.000	0.862	0.833	0.852	0.000	0.923	0.918
Entering Leg	190	14	0	204	1	99	0	100	80	75	0	155	459
Exiting Leg				76				94				289	459
Total				280				194				444	918

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	3	0	0	3	0	2	0	2	0	2	0	2	7
4:15 PM	2	0	0	2	0	1	0	1	0	3	0	3	6
4:30 PM	6	0	0	6	0	0	0	0	0	3	0	3	9
4:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	12	0	0	12	0	3	0	3	0	8	0	8	23
5:00 PM	2	0	0	2	0	0	0	0	1	2	0	3	5
5:15 PM	2	0	0	2	0	0	0	0	1	0	0	1	3
5:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	1	0	1	1	0	0	1	2
Total	5	0	0	5	0	1	0	1	3	2	0	5	11
Grand Total	17	0	0	17	0	4	0	4	3	10	0	13	34
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		23.1	76.9	0.0		
Total %	50.0	0.0	0.0	50.0	0.0	11.8	0.0	11.8	8.8	29.4	0.0	38.2	
Exiting Leg Total				10				3				21	34
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total				0				0				0	0
Single-Unit Trucks	11	0	0	11	0	4	0	4	3	6	0	9	24
% Single-Unit	64.7	0.0	0.0	64.7	0.0	100.0	0.0	100.0	100.0	60.0	0.0	69.2	70.6
Exiting Leg Total				6				3				15	24
Articulated Trucks	6	0	0	6	0	0	0	0	0	4	0	4	10
% Articulated	35.3	0.0	0.0	35.3	0.0	0.0	0.0	0.0	0.0	40.0	0.0	30.8	29.4
Exiting Leg Total				4				0				6	10

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	3	0	0	3	0	2	0	2	0	2	0	2	7
4:15 PM	2	0	0	2	0	1	0	1	0	3	0	3	6
4:30 PM	6	0	0	6	0	0	0	0	0	3	0	3	9
4:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	12	0	0	12	0	3	0	3	0	8	0	8	23
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		0.0	100.0	0.0		
PHF	0.500	0.000	0.000	0.500	0.000	0.375	0.000	0.375	0.000	0.667	0.000	0.667	0.639
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	8	0	0	8	0	3	0	3	0	4	0	4	15
Single-Unit %	66.7	0.0	0.0	66.7	0.0	100.0	0.0	100.0	0.0	50.0	0.0	50.0	65.2
Articulated Trucks	4	0	0	4	0	0	0	0	0	4	0	4	8
Articulated %	33.3	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	34.8
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	8	0	0	8	0	3	0	3	0	4	0	4	15
Articulated Trucks	4	0	0	4	0	0	0	0	0	4	0	4	8
Total Entering Leg	12	0	0	12	0	3	0	3	0	8	0	8	23
Buses				0				0				0	0
Single-Unit Trucks				4				0				11	15
Articulated Trucks				4				0				4	8
Total Exiting Leg				8				0				15	23

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	39	6	0	45	1	23	0	24	19	18	0	37	106
4:15 PM	33	2	0	35	1	26	0	27	9	20	0	29	91
4:30 PM	38	3	0	41	0	16	0	16	18	15	0	33	90
4:45 PM	38	5	0	43	0	19	0	19	12	19	0	31	93
Total	148	16	0	164	2	84	0	86	58	72	0	130	380
5:00 PM	54	2	0	56	0	21	0	21	13	19	0	32	109
5:15 PM	51	2	0	53	1	24	0	25	18	14	0	32	110
5:30 PM	43	1	0	44	0	14	0	14	8	19	0	27	85
5:45 PM	42	2	0	44	0	10	0	10	7	13	0	20	74
Total	190	7	0	197	1	69	0	70	46	65	0	111	378
Grand Total	338	23	0	361	3	153	0	156	104	137	0	241	758
Approach %	93.6	6.4	0.0		1.9	98.1	0.0		43.2	56.8	0.0		
Total %	44.6	3.0	0.0	47.6	0.4	20.2	0.0	20.6	13.7	18.1	0.0	31.8	
Exiting Leg Total				140				127				491	758

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:30 PM	38	3	0	41	0	16	0	16	18	15	0	33	90
4:45 PM	38	5	0	43	0	19	0	19	12	19	0	31	93
5:00 PM	54	2	0	56	0	21	0	21	13	19	0	32	109
5:15 PM	51	2	0	53	1	24	0	25	18	14	0	32	110
Total Volume	181	12	0	193	1	80	0	81	61	67	0	128	402
% Approach Total	93.8	6.2	0.0		1.2	98.8	0.0		47.7	52.3	0.0		
PHF	0.838	0.600	0.000	0.862	0.250	0.833	0.000	0.810	0.847	0.882	0.000	0.970	0.914
Entering Leg	181	12	0	193	1	80	0	81	61	67	0	128	402
Exiting Leg				68				73				261	402
Total				261				154				389	804

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Light Goods Vehicle**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	6	0	0	6	0	6	0	6	3	7	0	10	22
4:15 PM	5	1	0	6	0	2	0	2	5	4	0	9	17
4:30 PM	6	0	0	6	0	5	0	5	6	3	0	9	20
4:45 PM	3	0	0	3	0	3	0	3	2	3	0	5	11
Total	20	1	0	21	0	16	0	16	16	17	0	33	70
5:00 PM	0	1	0	1	0	8	0	8	6	1	0	7	16
5:15 PM	0	1	0	1	0	3	0	3	5	1	0	6	10
5:30 PM	2	1	0	3	0	5	0	5	5	1	0	6	14
5:45 PM	1	1	0	2	0	4	0	4	1	0	0	1	7
Total	3	4	0	7	0	20	0	20	17	3	0	20	47
Grand Total	23	5	0	28	0	36	0	36	33	20	0	53	117
Approach %	82.1	17.9	0.0		0.0	100.0	0.0		62.3	37.7	0.0		
Total %	19.7	4.3	0.0	23.9	0.0	30.8	0.0	30.8	28.2	17.1	0.0	45.3	
Exiting Leg Total				20				38				59	117

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	6	0	0	6	0	6	0	6	3	7	0	10	22
4:15 PM	5	1	0	6	0	2	0	2	5	4	0	9	17
4:30 PM	6	0	0	6	0	5	0	5	6	3	0	9	20
4:45 PM	3	0	0	3	0	3	0	3	2	3	0	5	11
Total Volume	20	1	0	21	0	16	0	16	16	17	0	33	70
% Approach Total	95.2	4.8	0.0		0.0	100.0	0.0		48.5	51.5	0.0		
PHF	0.833	0.250	0.000	0.875	0.000	0.667	0.000	0.667	0.667	0.607	0.000	0.825	0.795
Entering Leg	20	1	0	21	0	16	0	16	16	17	0	33	70
Exiting Leg				17				17				36	70
Total				38				33				69	140

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg				0				0				0	0
Total				0				0				0	0

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Single-Unit Trucks

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	2	0	0	2	0	2	0	2	0	2	0	2	6
4:15 PM	2	0	0	2	0	1	0	1	0	1	0	1	4
4:30 PM	4	0	0	4	0	0	0	0	0	1	0	1	5
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	8	0	0	8	0	3	0	3	0	4	0	4	15
5:00 PM	1	0	0	1	0	0	0	0	1	2	0	3	4
5:15 PM	2	0	0	2	0	0	0	0	1	0	0	1	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	1	0	1	1	0	0	1	2
Total	3	0	0	3	0	1	0	1	3	2	0	5	9
Grand Total	11	0	0	11	0	4	0	4	3	6	0	9	24
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		33.3	66.7	0.0		
Total %	45.8	0.0	0.0	45.8	0.0	16.7	0.0	16.7	12.5	25.0	0.0	37.5	
Exiting Leg Total				6				3				15	24

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	2	0	0	2	0	2	0	2	0	2	0	2	6
4:15 PM	2	0	0	2	0	1	0	1	0	1	0	1	4
4:30 PM	4	0	0	4	0	0	0	0	0	1	0	1	5
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	8	0	0	8	0	3	0	3	0	4	0	4	15
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		0.0	100.0	0.0		
PHF	0.500	0.000	0.000	0.500	0.000	0.375	0.000	0.375	0.000	0.500	0.000	0.500	0.625
Entering Leg	8	0	0	8	0	3	0	3	0	4	0	4	15
Exiting Leg				4				0				11	15
Total				12				3				15	30

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	2
4:30 PM	2	0	0	2	0	0	0	0	0	2	0	2	4
4:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	4	0	0	4	0	0	0	0	0	4	0	4	8
5:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	2	0	0	0	0	0	0	0	0	2
Grand Total	6	0	0	6	0	0	0	0	0	4	0	4	10
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	60.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	40.0	
Exiting Leg Total				4				0				6	10

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	2
4:30 PM	2	0	0	2	0	0	0	0	0	2	0	2	4
4:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	4	0	0	4	0	0	0	0	0	4	0	4	8
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.500
Entering Leg	4	0	0	4	0	0	0	0	0	4	0	4	8
Exiting Leg				4				0				4	8
Total				8				0				8	16

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Bicycles (on Roadway and Crosswalks)

	Route 2 EB Ramps						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **186634 GG**
Location: **N: Route 2 EB Ramps**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/ L. Oltman**
Site Code: **T0852**
Count Date: **Wednesday, December 19, 2018**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Pedestrians**

	Route 2 EB Ramps						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **196895 B**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	26	1	0	27	4	0	9	0	13	3	113	0	0	116	156
7:15 AM	1	0	0	0	1	0	28	0	0	28	2	0	3	0	5	2	123	1	0	126	160
7:30 AM	0	0	0	0	0	0	39	0	0	39	6	0	8	0	14	1	119	0	0	120	173
7:45 AM	0	0	0	0	0	0	56	1	0	57	4	0	4	0	8	2	114	0	0	116	181
Total	1	0	0	0	1	0	149	2	0	151	16	0	24	0	40	8	469	1	0	478	670
8:00 AM	0	0	0	0	0	0	37	0	0	37	4	0	4	0	8	0	85	0	0	85	130
8:15 AM	1	0	0	0	1	0	45	0	0	45	1	0	5	0	6	2	86	1	0	89	141
8:30 AM	0	0	0	0	0	0	53	0	0	53	5	0	6	0	11	1	57	0	0	58	122
8:45 AM	0	0	0	0	0	0	62	0	0	62	3	0	3	0	6	1	69	0	0	70	138
Total	1	0	0	0	1	0	197	0	0	197	13	0	18	0	31	4	297	1	0	302	531
Grand Total	2	0	0	0	2	0	346	2	0	348	29	0	42	0	71	12	766	2	0	780	1201
Approach %	100.0	0.0	0.0	0.0		0.0	99.4	0.6	0.0		40.8	0.0	59.2	0.0		1.5	98.2	0.3	0.0		
Total %	0.2	0.0	0.0	0.0	0.2	0.0	28.8	0.2	0.0	29.0	2.4	0.0	3.5	0.0	5.9	1.0	63.8	0.2	0.0	64.9	
Exiting Leg Total					2					795					14					390	1201
Cars	2	0	0	0	2	0	331	1	0	332	27	0	37	0	64	9	748	2	0	759	1157
% Cars	100.0	0.0	0.0	0.0	100.0	0.0	95.7	50.0	0.0	95.4	93.1	0.0	88.1	0.0	90.1	75.0	97.7	100.0	0.0	97.3	96.3
Exiting Leg Total					2					775					10					370	1157
Heavy Vehicles	0	0	0	0	0	0	15	1	0	16	2	0	5	0	7	3	18	0	0	21	44
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	4.3	50.0	0.0	4.6	6.9	0.0	11.9	0.0	9.9	25.0	2.3	0.0	0.0	2.7	3.7
Exiting Leg Total					0					20					4					20	44

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	26	1	0	27	4	0	9	0	13	3	113	0	0	116	156
7:15 AM	1	0	0	0	1	0	28	0	0	28	2	0	3	0	5	2	123	1	0	126	160
7:30 AM	0	0	0	0	0	0	39	0	0	39	6	0	8	0	14	1	119	0	0	120	173
7:45 AM	0	0	0	0	0	0	56	1	0	57	4	0	4	0	8	2	114	0	0	116	181
Total Volume	1	0	0	0	1	0	149	2	0	151	16	0	24	0	40	8	469	1	0	478	670
% Approach Total	100.0	0.0	0.0	0.0		0.0	98.7	1.3	0.0		40.0	0.0	60.0	0.0		1.7	98.1	0.2	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.665	0.500	0.000	0.662	0.667	0.000	0.667	0.000	0.714	0.667	0.953	0.250	0.000	0.948	0.925
Cars	1	0	0	0	1	0	140	1	0	141	15	0	23	0	38	7	459	1	0	467	647
Cars %	100.0	0.0	0.0	0.0	100.0	0.0	94.0	50.0	0.0	93.4	93.8	0.0	95.8	0.0	95.0	87.5	97.9	100.0	0.0	97.7	96.6
Heavy Vehicles	0	0	0	0	0	0	9	1	0	10	1	0	1	0	2	1	10	0	0	11	23
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	6.0	50.0	0.0	6.6	6.3	0.0	4.2	0.0	5.0	12.5	2.1	0.0	0.0	2.3	3.4
Cars Enter Leg	1	0	0	0	1	0	140	1	0	141	15	0	23	0	38	7	459	1	0	467	647
Heavy Enter Leg	0	0	0	0	0	0	9	1	0	10	1	0	1	0	2	1	10	0	0	11	23
Total Entering Leg	1	0	0	0	1	0	149	2	0	151	16	0	24	0	40	8	469	1	0	478	670
Cars Exiting Leg					1					474					8					164	647
Heavy Exiting Leg					0					11					2					10	23
Total Exiting Leg					1					485					10					174	670

PDI File #: **196895 B**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	23	1	0	24	3	0	8	0	11	2	110	0	0	112	147
7:15 AM	1	0	0	0	1	0	26	0	0	26	2	0	3	0	5	2	122	1	0	125	157
7:30 AM	0	0	0	0	0	0	38	0	0	38	6	0	8	0	14	1	115	0	0	116	168
7:45 AM	0	0	0	0	0	0	53	0	0	53	4	0	4	0	8	2	112	0	0	114	175
Total	1	0	0	0	1	0	140	1	0	141	15	0	23	0	38	7	459	1	0	467	647
8:00 AM	0	0	0	0	0	0	36	0	0	36	4	0	3	0	7	0	83	0	0	83	126
8:15 AM	1	0	0	0	1	0	44	0	0	44	1	0	5	0	6	1	83	1	0	85	136
8:30 AM	0	0	0	0	0	0	49	0	0	49	4	0	4	0	8	0	56	0	0	56	113
8:45 AM	0	0	0	0	0	0	62	0	0	62	3	0	2	0	5	1	67	0	0	68	135
Total	1	0	0	0	1	0	191	0	0	191	12	0	14	0	26	2	289	1	0	292	510
Grand Total	2	0	0	0	2	0	331	1	0	332	27	0	37	0	64	9	748	2	0	759	1157
Approach %	100.0	0.0	0.0	0.0		0.0	99.7	0.3	0.0		42.2	0.0	57.8	0.0		1.2	98.6	0.3	0.0		
Total %	0.2	0.0	0.0	0.0	0.2	0.0	28.6	0.1	0.0	28.7	2.3	0.0	3.2	0.0	5.5	0.8	64.6	0.2	0.0	65.6	
Exiting Leg Total					2					775					10					370	1157

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	23	1	0	24	3	0	8	0	11	2	110	0	0	112	147
7:15 AM	1	0	0	0	1	0	26	0	0	26	2	0	3	0	5	2	122	1	0	125	157
7:30 AM	0	0	0	0	0	0	38	0	0	38	6	0	8	0	14	1	115	0	0	116	168
7:45 AM	0	0	0	0	0	0	53	0	0	53	4	0	4	0	8	2	112	0	0	114	175
Total Volume	1	0	0	0	1	0	140	1	0	141	15	0	23	0	38	7	459	1	0	467	647
% Approach Total	100.0	0.0	0.0	0.0		0.0	99.3	0.7	0.0		39.5	0.0	60.5	0.0		1.5	98.3	0.2	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.660	0.250	0.000	0.665	0.625	0.000	0.719	0.000	0.679	0.875	0.941	0.250	0.000	0.934	0.924
Entering Leg	1	0	0	0	1	0	140	1	0	141	15	0	23	0	38	7	459	1	0	467	647
Exiting Leg					1					474					8					164	647
Total					2					615					46					631	1294

PDI File #: **196895 B**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	3	0	0	3	1	0	1	0	2	1	3	0	0	4	9
7:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
7:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	5
7:45 AM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	2	0	0	2	6
Total	0	0	0	0	0	0	9	1	0	10	1	0	1	0	2	1	10	0	0	11	23
8:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	2	0	0	2	4
8:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	3	0	0	4	5
8:30 AM	0	0	0	0	0	0	4	0	0	4	1	0	2	0	3	1	1	0	0	2	9
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	2	3
Total	0	0	0	0	0	0	6	0	0	6	1	0	4	0	5	2	8	0	0	10	21
Grand Total	0	0	0	0	0	0	15	1	0	16	2	0	5	0	7	3	18	0	0	21	44
Approach %	0.0	0.0	0.0	0.0		0.0	93.8	6.3	0.0		28.6	0.0	71.4	0.0		14.3	85.7	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	34.1	2.3	0.0	36.4	4.5	0.0	11.4	0.0	15.9	6.8	40.9	0.0	0.0	47.7	
Exiting Leg Total					0					20					4					20	44
Buses	0	0	0	0	0	0	4	0	0	4	1	0	4	0	5	3	6	0	0	9	18
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	26.7	0.0	0.0	25.0	50.0	0.0	80.0	0.0	71.4	100.0	33.3	0.0	0.0	42.9	40.9
Exiting Leg Total					0					7					3					8	18
Single-Unit Trucks	0	0	0	0	0	0	9	1	0	10	1	0	1	0	2	0	8	0	0	8	20
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	60.0	100.0	0.0	62.5	50.0	0.0	20.0	0.0	28.6	0.0	44.4	0.0	0.0	38.1	45.5
Exiting Leg Total					0					9					1					10	20
Articulated Trucks	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	22.2	0.0	0.0	19.0	13.6
Exiting Leg Total					0					4					0					2	6

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:45 AM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	2	0	0	2	6
8:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	2	0	0	2	4
8:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	3	0	0	4	5
8:30 AM	0	0	0	0	0	0	4	0	0	4	1	0	2	0	3	1	1	0	0	2	9
Total Volume	0	0	0	0	0	0	9	1	0	10	1	0	3	0	4	2	8	0	0	10	24
% Approach Total	0.0	0.0	0.0	0.0		0.0	90.0	10.0	0.0		25.0	0.0	75.0	0.0		20.0	80.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.563	0.250	0.000	0.625	0.250	0.000	0.375	0.000	0.333	0.500	0.667	0.000	0.000	0.625	0.667
Buses	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	2	4	0	0	6	11
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	30.0	0.0	0.0	66.7	0.0	50.0	100.0	50.0	0.0	0.0	60.0	45.8
Single-Unit Trucks	0	0	0	0	0	0	5	1	0	6	1	0	1	0	2	0	3	0	0	3	11
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	55.6	100.0	0.0	60.0	100.0	0.0	33.3	0.0	50.0	0.0	37.5	0.0	0.0	30.0	45.8
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	10.0	8.3
Buses	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	2	4	0	0	6	11
Single-Unit Trucks	0	0	0	0	0	0	5	1	0	6	1	0	1	0	2	0	3	0	0	3	11
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total Entering Leg	0	0	0	0	0	0	9	1	0	10	1	0	3	0	4	2	8	0	0	10	24
Buses					0					4					2					5	11
Single-Unit Trucks					0					4					1					6	11
Articulated Trucks					0					1					0					1	2
Total Exiting Leg					0					9					3					12	24

PDI File #: **196895 B**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	1	1	0	0	2	4
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
7:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	0	2	0	0	2	1	0	1	0	2	1	4	0	0	5	9
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
8:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	3
8:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	1	0	0	0	1	4
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	3	0	3	2	2	0	0	4	9
Grand Total	0	0	0	0	0	0	4	0	0	4	1	0	4	0	5	3	6	0	0	9	18
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		20.0	0.0	80.0	0.0		33.3	66.7	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	22.2	0.0	0.0	22.2	5.6	0.0	22.2	0.0	27.8	16.7	33.3	0.0	0.0	50.0	
Exiting Leg Total					0					7					3					8	18

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
8:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	3
8:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	1	0	0	0	1	4
Total Volume	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	2	4	0	0	6	11
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		33.3	66.7	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.750	0.000	0.000	0.250	0.000	0.250	0.500	0.500	0.000	0.000	0.750	0.688
Entering Leg	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	2	4	0	0	6	11
Exiting Leg					0					4					2					5	11
Total					0					7					4					11	22

PDI File #: **196895 B**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Single-Unit Trucks

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
7:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7:45 AM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	0	3	0	0	3	10
8:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
8:30 AM	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	1	0	0	1	4
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	0	3	0	0	3	1	0	1	0	2	0	5	0	0	5	10
Grand Total	0	0	0	0	0	0	9	1	0	10	1	0	1	0	2	0	8	0	0	8	20
Approach %	0.0	0.0	0.0	0.0		0.0	90.0	10.0	0.0		50.0	0.0	50.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	45.0	5.0	0.0	50.0	5.0	0.0	5.0	0.0	10.0	0.0	40.0	0.0	0.0	40.0	
Exiting Leg Total					0					9					1					10	20

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:45 AM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	3
8:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
8:30 AM	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	1	0	0	1	4
Total Volume	0	0	0	0	0	0	5	1	0	6	1	0	1	0	2	0	3	0	0	3	11
% Approach Total	0.0	0.0	0.0	0.0		0.0	83.3	16.7	0.0		50.0	0.0	50.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.250	0.000	0.500	0.250	0.000	0.250	0.000	0.500	0.000	0.375	0.000	0.000	0.375	0.688
Entering Leg	0	0	0	0	0	0	5	1	0	6	1	0	1	0	2	0	3	0	0	3	11
Exiting Leg					0					4					1					6	11
Total					0					10					3					9	22

PDI File #: **196895 B**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Grand Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	66.7	
Exiting Leg Total					0					4					0					2	6

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375	0.500
Entering Leg	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
Exiting Leg					0					3					0					1	4
Total					0					4					0					4	8

PDI File #: **196895 B**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **196895 B**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
Approach %	0	0	0	0	0	0		0	0	0	0	0	100		0	0	0	0	0	100		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	50	50	0	0	0	0	0	50	50	0	0	0	0	0	0	0	
Exiting Leg Total							0							1							1							0	2

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
Exiting Leg							0							0							1							0	1
Total							0							0							2							0	2

PDI File #: **196895 BB**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Driveway					Mechanic Street					Johnny Appleseed Lane					Mechanic Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	89	4	0	93	2	0	6	0	8	10	72	0	0	82	183
4:15 PM	1	0	0	0	1	1	83	3	0	87	4	0	4	0	8	3	51	0	0	54	150
4:30 PM	0	0	0	0	0	0	103	4	0	107	2	0	3	0	5	3	73	0	0	76	188
4:45 PM	1	0	0	0	1	0	111	1	0	112	3	0	8	0	11	8	58	0	0	66	190
Total	2	0	0	0	2	1	386	12	0	399	11	0	21	0	32	24	254	0	0	278	711
5:00 PM	0	0	0	0	0	0	131	13	0	144	3	0	4	0	7	4	99	0	0	103	254
5:15 PM	0	0	0	0	0	2	120	2	0	124	2	0	8	0	10	5	53	1	0	59	193
5:30 PM	0	0	2	0	2	0	90	4	0	94	2	0	8	0	10	7	57	0	0	64	170
5:45 PM	0	0	0	0	0	0	97	6	1	104	1	0	4	0	5	6	64	0	0	70	179
Total	0	0	2	0	2	2	438	25	1	466	8	0	24	0	32	22	273	1	0	296	796
Grand Total	2	0	2	0	4	3	824	37	1	865	19	0	45	0	64	46	527	1	0	574	1507
Approach %	50.0	0.0	50.0	0.0		0.3	95.3	4.3	0.1		29.7	0.0	70.3	0.0		8.0	91.8	0.2	0.0		
Total %	0.1	0.0	0.1	0.0	0.3	0.2	54.7	2.5	0.1	57.4	1.3	0.0	3.0	0.0	4.2	3.1	35.0	0.1	0.0	38.1	
Exiting Leg Total					4					549					83					871	1507
Cars	2	0	2	0	4	3	814	37	1	855	19	0	43	0	62	44	515	1	0	560	1481
% Cars	100.0	0.0	100.0	0.0	100.0	100.0	98.8	100.0	100.0	98.8	100.0	0.0	95.6	0.0	96.9	95.7	97.7	100.0	0.0	97.6	98.3
Exiting Leg Total					4					537					81					859	1481
Heavy Vehicles	0	0	0	0	0	0	10	0	0	10	0	0	2	0	2	2	12	0	0	14	26
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2	0.0	0.0	4.4	0.0	3.1	4.3	2.3	0.0	0.0	2.4	1.7
Exiting Leg Total					0					12					2					12	26

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Driveway					Mechanic Street					Johnny Appleseed Lane					Mechanic Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	0	0	0	0	0	0	103	4	0	107	2	0	3	0	5	3	73	0	0	76	188
4:45 PM	1	0	0	0	1	0	111	1	0	112	3	0	8	0	11	8	58	0	0	66	190
5:00 PM	0	0	0	0	0	0	131	13	0	144	3	0	4	0	7	4	99	0	0	103	254
5:15 PM	0	0	0	0	0	2	120	2	0	124	2	0	8	0	10	5	53	1	0	59	193
Total Volume	1	0	0	0	1	2	465	20	0	487	10	0	23	0	33	20	283	1	0	304	825
% Approach Total	100.0	0.0	0.0	0.0		0.4	95.5	4.1	0.0		30.3	0.0	69.7	0.0		6.6	93.1	0.3	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.250	0.887	0.385	0.000	0.845	0.833	0.000	0.719	0.000	0.750	0.625	0.715	0.250	0.000	0.738	0.812
Cars	1	0	0	0	1	2	459	20	0	481	10	0	22	0	32	19	278	1	0	298	812
Cars %	100.0	0.0	0.0	0.0	100.0	100.0	98.7	100.0	0.0	98.8	100.0	0.0	95.7	0.0	97.0	95.0	98.2	100.0	0.0	98.0	98.4
Heavy Vehicles	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	1	5	0	0	6	13
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	1.2	0.0	0.0	4.3	0.0	3.0	5.0	1.8	0.0	0.0	2.0	1.6
Cars Enter Leg	1	0	0	0	1	2	459	20	0	481	10	0	22	0	32	19	278	1	0	298	812
Heavy Enter Leg	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	1	5	0	0	6	13
Total Entering Leg	1	0	0	0	1	2	465	20	0	487	10	0	23	0	33	20	283	1	0	304	825
Cars Exiting Leg					3					288					39					482	812
Heavy Exiting Leg					0					5					1					7	13
Total Exiting Leg					3					293					40					489	825

PDI File #: **196895 BB**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Driveway					Mechanic Street					Johnny Appleseed Lane					Mechanic Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	85	4	0	89	2	0	5	0	7	9	69	0	0	78	174
4:15 PM	1	0	0	0	1	1	83	3	0	87	4	0	4	0	8	3	48	0	0	51	147
4:30 PM	0	0	0	0	0	0	101	4	0	105	2	0	3	0	5	3	71	0	0	74	184
4:45 PM	1	0	0	0	1	0	109	1	0	110	3	0	7	0	10	7	57	0	0	64	185
Total	2	0	0	0	2	1	378	12	0	391	11	0	19	0	30	22	245	0	0	267	690
5:00 PM	0	0	0	0	0	0	130	13	0	143	3	0	4	0	7	4	98	0	0	102	252
5:15 PM	0	0	0	0	0	2	119	2	0	123	2	0	8	0	10	5	52	1	0	58	191
5:30 PM	0	0	2	0	2	0	90	4	0	94	2	0	8	0	10	7	57	0	0	64	170
5:45 PM	0	0	0	0	0	0	97	6	1	104	1	0	4	0	5	6	63	0	0	69	178
Total	0	0	2	0	2	2	436	25	1	464	8	0	24	0	32	22	270	1	0	293	791
Grand Total	2	0	2	0	4	3	814	37	1	855	19	0	43	0	62	44	515	1	0	560	1481
Approach %	50.0	0.0	50.0	0.0		0.4	95.2	4.3	0.1		30.6	0.0	69.4	0.0		7.9	92.0	0.2	0.0		
Total %	0.1	0.0	0.1	0.0	0.3	0.2	55.0	2.5	0.1	57.7	1.3	0.0	2.9	0.0	4.2	3.0	34.8	0.1	0.0	37.8	
Exiting Leg Total					4					537					81					859	1481

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Driveway					Mechanic Street					Johnny Appleseed Lane					Mechanic Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	0	0	0	0	0	0	101	4	0	105	2	0	3	0	5	3	71	0	0	74	184
4:45 PM	1	0	0	0	1	0	109	1	0	110	3	0	7	0	10	7	57	0	0	64	185
5:00 PM	0	0	0	0	0	0	130	13	0	143	3	0	4	0	7	4	98	0	0	102	252
5:15 PM	0	0	0	0	0	2	119	2	0	123	2	0	8	0	10	5	52	1	0	58	191
Total Volume	1	0	0	0	1	2	459	20	0	481	10	0	22	0	32	19	278	1	0	298	812
% Approach Total	100.0	0.0	0.0	0.0		0.4	95.4	4.2	0.0		31.3	0.0	68.8	0.0		6.4	93.3	0.3	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.250	0.883	0.385	0.000	0.841	0.833	0.000	0.688	0.000	0.800	0.679	0.709	0.250	0.000	0.730	0.806
Entering Leg	1	0	0	0	1	2	459	20	0	481	10	0	22	0	32	19	278	1	0	298	812
Exiting Leg					3					288					39					482	812
Total					4					769					71					780	1624

PDI File #: **196895 BB**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	1	3	0	0	4	9
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
4:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
4:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	1	1	0	0	2	5
Total	0	0	0	0	0	0	8	0	0	8	0	0	2	0	2	2	9	0	0	11	21
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
Grand Total	0	0	0	0	0	0	10	0	0	10	0	0	2	0	2	2	12	0	0	14	26
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		14.3	85.7	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	38.5	0.0	0.0	38.5	0.0	0.0	7.7	0.0	7.7	7.7	46.2	0.0	0.0	53.8	
Exiting Leg Total					0					12					2					12	26
Buses	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	0	7	0	0	7	11
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	0.0	0.0	50.0	0.0	50.0	0.0	58.3	0.0	0.0	50.0	42.3
Exiting Leg Total					0					7					0					4	11
Single-Unit Trucks	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	2	5	0	0	7	14
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0	60.0	0.0	0.0	50.0	0.0	50.0	100.0	41.7	0.0	0.0	50.0	53.8
Exiting Leg Total					0					5					2					7	14
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
Exiting Leg Total					0					0					0					1	1

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	1	3	0	0	4	9
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
4:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
4:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	1	1	0	0	2	5
Total Volume	0	0	0	0	0	0	8	0	0	8	0	0	2	0	2	2	9	0	0	11	21
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		18.2	81.8	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.500	0.500	0.750	0.000	0.000	0.688	0.583
Buses	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	5	0	0	5	8
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	25.0	0.0	0.0	50.0	0.0	50.0	0.0	55.6	0.0	0.0	45.5	38.1
Single-Unit Trucks	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	2	4	0	0	6	12
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	62.5	0.0	0.0	62.5	0.0	0.0	50.0	0.0	50.0	100.0	44.4	0.0	0.0	54.5	57.1
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8
Buses	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	5	0	0	5	8
Single-Unit Trucks	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	2	4	0	0	6	12
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Entering Leg	0	0	0	0	0	0	8	0	0	8	0	0	2	0	2	2	9	0	0	11	21
Buses					0					5					0					3	8
Single-Unit Trucks					0					4					2					6	12
Articulated Trucks					0					0					0					1	1
Total Exiting Leg					0					9					2					10	21

PDI File #: **196895 BB**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	1	0	0	1	4
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	5	0	0	5	8
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Grand Total	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	0	7	0	0	7	11
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	27.3	0.0	0.0	27.3	0.0	0.0	9.1	0.0	9.1	0.0	63.6	0.0	0.0	63.6	
Exiting Leg Total					0					7					0					4	11

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	1	0	0	1	4
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	5	0	0	5	8
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.250	0.000	0.625	0.000	0.000	0.625	0.500
Entering Leg	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	5	0	0	5	8
Exiting Leg					0					5					0					3	8
Total					0					7					1					8	16

PDI File #: **196895 BB**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Driveway					Mechanic Street					Johnny Appleseed Lane					Mechanic Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	2	0	0	3	5
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	1	0	0	0	1	3
Total	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	2	4	0	0	6	12
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Grand Total	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	2	5	0	0	7	14
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		28.6	71.4	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	42.9	0.0	0.0	42.9	0.0	0.0	7.1	0.0	7.1	14.3	35.7	0.0	0.0	50.0	
Exiting Leg Total					0					5					2					7	14

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Driveway					Mechanic Street					Johnny Appleseed Lane					Mechanic Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	2	0	0	3	5
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	1	0	0	0	1	3
Total Volume	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	2	4	0	0	6	12
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		33.3	66.7	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.625	0.000	0.000	0.250	0.000	0.250	0.500	0.500	0.000	0.000	0.500	0.600
Entering Leg	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	2	4	0	0	6	12
Exiting Leg					0					4					2					6	12
Total					0					9					3					12	24

PDI File #: **196895 BB**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					0					0					0					1	1

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg					0					0					0					1	1
Total					0					1					0					1	2

PDI File #: **196895 BB**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Bicycles (on Roadway and Crosswalks)

	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **196895 BB**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Leominster, MA**
Client: **TEC/ S. Gregorio**
Site Code: **T0852**
Count Date: **Thursday, April 25, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	2
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	50	50		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	50	100	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							2							0	2

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	50.0	50.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	2
Exiting Leg							0							0							2							0	2
Total							0							0							4							0	4

PDI File #: **197132 A**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	110	11	0	121	2	41	0	43	29	29	0	58	222
11:15 AM	101	18	0	119	0	56	0	56	38	27	0	65	240
11:30 AM	86	14	0	100	1	66	0	67	28	30	0	58	225
11:45 AM	115	11	0	126	1	64	0	65	37	21	0	58	249
Total	412	54	0	466	4	227	0	231	132	107	0	239	936
12:00 PM	107	19	0	126	2	46	0	48	45	38	0	83	257
12:15 PM	91	15	0	106	0	66	0	66	44	36	0	80	252
12:30 PM	90	13	0	103	2	55	0	57	41	29	0	70	230
12:45 PM	90	11	0	101	0	49	0	49	44	27	0	71	221
Total	378	58	0	436	4	216	0	220	174	130	0	304	960
Grand Total	790	112	0	902	8	443	0	451	306	237	0	543	1896
Approach %	87.6	12.4	0.0		1.8	98.2	0.0		56.4	43.6	0.0		
Total %	41.7	5.9	0.0	47.6	0.4	23.4	0.0	23.8	16.1	12.5	0.0	28.6	
Exiting Leg Total				245				418				1233	1896
Cars	782	108	0	890	8	443	0	451	305	236	0	541	1882
% Cars	99.0	96.4	0.0	98.7	100.0	100.0	0.0	100.0	99.7	99.6	0.0	99.6	99.3
Exiting Leg Total				244				413				1225	1882
Heavy Vehicles	8	4	0	12	0	0	0	0	1	1	0	2	14
% Heavy Vehicles	1.0	3.6	0.0	1.3	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.4	0.7
Exiting Leg Total				1				5				8	14

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:45 AM	115	11	0	126	1	64	0	65	37	21	0	58	249
12:00 PM	107	19	0	126	2	46	0	48	45	38	0	83	257
12:15 PM	91	15	0	106	0	66	0	66	44	36	0	80	252
12:30 PM	90	13	0	103	2	55	0	57	41	29	0	70	230
Total Volume	403	58	0	461	5	231	0	236	167	124	0	291	988
% Approach Total	87.4	12.6	0.0		2.1	97.9	0.0		57.4	42.6	0.0		
PHF	0.876	0.763	0.000	0.915	0.625	0.875	0.000	0.894	0.928	0.816	0.000	0.877	0.961
Cars	398	56	0	454	5	231	0	236	167	124	0	291	981
Cars %	98.8	96.6	0.0	98.5	100.0	100.0	0.0	100.0	100.0	100.0	0.0	100.0	99.3
Heavy Vehicles	5	2	0	7	0	0	0	0	0	0	0	0	7
Heavy Vehicles %	1.2	3.4	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Cars Enter Leg	398	56	0	454	5	231	0	236	167	124	0	291	981
Heavy Enter Leg	5	2	0	7	0	0	0	0	0	0	0	0	7
Total Entering Leg	403	58	0	461	5	231	0	236	167	124	0	291	988
Cars Exiting Leg				129				223				629	981
Heavy Exiting Leg				0				2				5	7
Total Exiting Leg				129				225				634	988

PDI File #: **197132 A**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	110	11	0	121	2	41	0	43	29	29	0	58	222
11:15 AM	99	17	0	116	0	56	0	56	37	27	0	64	236
11:30 AM	86	13	0	99	1	66	0	67	28	30	0	58	224
11:45 AM	113	11	0	124	1	64	0	65	37	21	0	58	247
Total	408	52	0	460	4	227	0	231	131	107	0	238	929
12:00 PM	106	19	0	125	2	46	0	48	45	38	0	83	256
12:15 PM	90	14	0	104	0	66	0	66	44	36	0	80	250
12:30 PM	89	12	0	101	2	55	0	57	41	29	0	70	228
12:45 PM	89	11	0	100	0	49	0	49	44	26	0	70	219
Total	374	56	0	430	4	216	0	220	174	129	0	303	953
Grand Total	782	108	0	890	8	443	0	451	305	236	0	541	1882
Approach %	87.9	12.1	0.0		1.8	98.2	0.0		56.4	43.6	0.0		
Total %	41.6	5.7	0.0	47.3	0.4	23.5	0.0	24.0	16.2	12.5	0.0	28.7	
Exiting Leg Total				244				413				1225	1882

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:45 AM	113	11	0	124	1	64	0	65	37	21	0	58	247
12:00 PM	106	19	0	125	2	46	0	48	45	38	0	83	256
12:15 PM	90	14	0	104	0	66	0	66	44	36	0	80	250
12:30 PM	89	12	0	101	2	55	0	57	41	29	0	70	228
Total Volume	398	56	0	454	5	231	0	236	167	124	0	291	981
% Approach Total	87.7	12.3	0.0		2.1	97.9	0.0		57.4	42.6	0.0		
PHF	0.881	0.737	0.000	0.908	0.625	0.875	0.000	0.894	0.928	0.816	0.000	0.877	0.958
Entering Leg	398	56	0	454	5	231	0	236	167	124	0	291	981
Exiting Leg				129				223				629	981
Total				583				459				920	1962

PDI File #: **197132 A**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	2	1	0	3	0	0	0	0	1	0	0	1	4
11:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
11:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
Total	4	2	0	6	0	0	0	0	1	0	0	1	7
12:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	1	1	0	2	0	0	0	0	0	0	0	0	2
12:30 PM	1	1	0	2	0	0	0	0	0	0	0	0	2
12:45 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
Total	4	2	0	6	0	0	0	0	0	1	0	1	7
Grand Total	8	4	0	12	0	0	0	0	1	1	0	2	14
Approach %	66.7	33.3	0.0		0.0	0.0	0.0		50.0	50.0	0.0		
Total %	57.1	28.6	0.0	85.7	0.0	0.0	0.0	0.0	7.1	7.1	0.0	14.3	
Exiting Leg Total				1				5				8	14
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total				0				0				0	0
Single-Unit Trucks	8	2	0	10	0	0	0	0	1	1	0	2	12
% Single-Unit	100.0	50.0	0.0	83.3	0.0	0.0	0.0	0.0	100.0	100.0	0.0	100.0	85.7
Exiting Leg Total				1				3				8	12
Articulated Trucks	0	2	0	2	0	0	0	0	0	0	0	0	2
% Articulated	0.0	50.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3
Exiting Leg Total				0				2				0	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:15 AM	2	1	0	3	0	0	0	0	1	0	0	1	4
11:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
11:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
12:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	5	2	0	7	0	0	0	0	1	0	0	1	8
% Approach Total	71.4	28.6	0.0		0.0	0.0	0.0		100.0	0.0	0.0		
PHF	0.625	0.500	0.000	0.583	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.500
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	5	1	0	6	0	0	0	0	1	0	0	1	7
Single-Unit %	100.0	50.0	0.0	85.7	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	87.5
Articulated Trucks	0	1	0	1	0	0	0	0	0	0	0	0	1
Articulated %	0.0	50.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	5	1	0	6	0	0	0	0	1	0	0	1	7
Articulated Trucks	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Entering Leg	5	2	0	7	0	0	0	0	1	0	0	1	8
Buses				0				0				0	0
Single-Unit Trucks				0				2				5	7
Articulated Trucks				0				1				0	1
Total Exiting Leg				0				3				5	8

PDI File #: **197132 A**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg				0				0				0	0
Total				0				0				0	0

PDI File #: **197132 A**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	2	0	0	2	0	0	0	0	1	0	0	1	3
11:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
11:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
Total	4	1	0	5	0	0	0	0	1	0	0	1	6
12:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	1	1	0	2	0	0	0	0	0	0	0	0	2
12:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
12:45 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
Total	4	1	0	5	0	0	0	0	0	1	0	1	6
Grand Total	8	2	0	10	0	0	0	0	1	1	0	2	12
Approach %	80.0	20.0	0.0		0.0	0.0	0.0		50.0	50.0	0.0		
Total %	66.7	16.7	0.0	83.3	0.0	0.0	0.0	0.0	8.3	8.3	0.0	16.7	
Exiting Leg Total				1				3				8	12

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:15 AM	2	0	0	2	0	0	0	0	1	0	0	1	3
11:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
11:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
12:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	5	1	0	6	0	0	0	0	1	0	0	1	7
% Approach Total	83.3	16.7	0.0		0.0	0.0	0.0		100.0	0.0	0.0		
PHF	0.625	0.250	0.000	0.750	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.583
Entering Leg	5	1	0	6	0	0	0	0	1	0	0	1	7
Exiting Leg				0				2				5	7
Total				6				2				6	14

PDI File #: **197132 A**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Articulated Trucks**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	2	0	2	0	0	0	0	0	0	0	0	2
Approach %	0.0	100.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				2				0	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	100.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	1	0	1	0	0	0	0	0	0	0	0	1
Exiting Leg				0				1				0	1
Total				1				1				0	2

PDI File #: **197132 A**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 A**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Pedestrians

	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Approach %	0	0	0	0	100		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						1						0						0	1

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg						1						0						0	1
Total						2						0						0	2

PDI File #: **197132 AA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	13	31	0	44	0	24	0	24	59	43	0	102	170
7:15 AM	22	18	0	40	0	28	0	28	65	29	0	94	162
7:30 AM	29	20	0	49	0	43	0	43	55	57	0	112	204
7:45 AM	48	38	0	86	0	40	0	40	60	52	0	112	238
Total	112	107	0	219	0	135	0	135	239	181	0	420	774
8:00 AM	38	26	0	64	2	29	0	31	43	45	0	88	183
8:15 AM	53	18	1	72	0	31	0	31	39	39	0	78	181
8:30 AM	51	28	0	79	0	33	0	33	42	34	0	76	188
8:45 AM	74	41	0	115	1	56	0	57	38	34	0	72	244
Total	216	113	1	330	3	149	0	152	162	152	0	314	796
Grand Total	328	220	1	549	3	284	0	287	401	333	0	734	1570
Approach %	59.7	40.1	0.2		1.0	99.0	0.0		54.6	45.4	0.0		
Total %	20.9	14.0	0.1	35.0	0.2	18.1	0.0	18.3	25.5	21.2	0.0	46.8	
Exiting Leg Total				337				621				612	1570
Cars	308	201	1	510	2	264	0	266	387	326	0	713	1489
% Cars	93.9	91.4	100.0	92.9	66.7	93.0	0.0	92.7	96.5	97.9	0.0	97.1	94.8
Exiting Leg Total				329				588				572	1489
Heavy Vehicles	20	19	0	39	1	20	0	21	14	7	0	21	81
% Heavy Vehicles	6.1	8.6	0.0	7.1	33.3	7.0	0.0	7.3	3.5	2.1	0.0	2.9	5.2
Exiting Leg Total				8				33				40	81

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:30 AM	29	20	0	49	0	43	0	43	55	57	0	112	204
7:45 AM	48	38	0	86	0	40	0	40	60	52	0	112	238
8:00 AM	38	26	0	64	2	29	0	31	43	45	0	88	183
8:15 AM	53	18	1	72	0	31	0	31	39	39	0	78	181
Total Volume	168	102	1	271	2	143	0	145	197	193	0	390	806
% Approach Total	62.0	37.6	0.4		1.4	98.6	0.0		50.5	49.5	0.0		
PHF	0.792	0.671	0.250	0.788	0.250	0.831	0.000	0.843	0.821	0.846	0.000	0.871	0.847
Cars	157	95	1	253	1	138	0	139	192	189	0	381	773
Cars %	93.5	93.1	100.0	93.4	50.0	96.5	0.0	95.9	97.5	97.9	0.0	97.7	95.9
Heavy Vehicles	11	7	0	18	1	5	0	6	5	4	0	9	33
Heavy Vehicles %	6.5	6.9	0.0	6.6	50.0	3.5	0.0	4.1	2.5	2.1	0.0	2.3	4.1
Cars Enter Leg	157	95	1	253	1	138	0	139	192	189	0	381	773
Heavy Enter Leg	11	7	0	18	1	5	0	6	5	4	0	9	33
Total Entering Leg	168	102	1	271	2	143	0	145	197	193	0	390	806
Cars Exiting Leg				191				287				295	773
Heavy Exiting Leg				5				12				16	33
Total Exiting Leg				196				299				311	806

PDI File #: **197132 AA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	13	27	0	40	0	18	0	18	54	42	0	96	154
7:15 AM	22	18	0	40	0	25	0	25	62	28	0	90	155
7:30 AM	27	18	0	45	0	42	0	42	54	57	0	111	198
7:45 AM	45	34	0	79	0	38	0	38	59	50	0	109	226
Total	107	97	0	204	0	123	0	123	229	177	0	406	733
8:00 AM	36	26	0	62	1	29	0	30	43	44	0	87	179
8:15 AM	49	17	1	67	0	29	0	29	36	38	0	74	170
8:30 AM	46	25	0	71	0	31	0	31	42	34	0	76	178
8:45 AM	70	36	0	106	1	52	0	53	37	33	0	70	229
Total	201	104	1	306	2	141	0	143	158	149	0	307	756
Grand Total	308	201	1	510	2	264	0	266	387	326	0	713	1489
Approach %	60.4	39.4	0.2		0.8	99.2	0.0		54.3	45.7	0.0		
Total %	20.7	13.5	0.1	34.3	0.1	17.7	0.0	17.9	26.0	21.9	0.0	47.9	
Exiting Leg Total				329				588				572	1489

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:30 AM	27	18	0	45	0	42	0	42	54	57	0	111	198
7:45 AM	45	34	0	79	0	38	0	38	59	50	0	109	226
8:00 AM	36	26	0	62	1	29	0	30	43	44	0	87	179
8:15 AM	49	17	1	67	0	29	0	29	36	38	0	74	170
Total Volume	157	95	1	253	1	138	0	139	192	189	0	381	773
% Approach Total	62.1	37.5	0.4		0.7	99.3	0.0		50.4	49.6	0.0		
PHF	0.801	0.699	0.250	0.801	0.250	0.821	0.000	0.827	0.814	0.829	0.000	0.858	0.855
Entering Leg	157	95	1	253	1	138	0	139	192	189	0	381	773
Exiting Leg				191				287				295	773
Total				444				426				676	1546

PDI File #: **197132 AA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	4	0	4	0	6	0	6	5	1	0	6	16
7:15 AM	0	0	0	0	0	3	0	3	3	1	0	4	7
7:30 AM	2	2	0	4	0	1	0	1	1	0	0	1	6
7:45 AM	3	4	0	7	0	2	0	2	1	2	0	3	12
Total	5	10	0	15	0	12	0	12	10	4	0	14	41
8:00 AM	2	0	0	2	1	0	0	1	0	1	0	1	4
8:15 AM	4	1	0	5	0	2	0	2	3	1	0	4	11
8:30 AM	5	3	0	8	0	2	0	2	0	0	0	0	10
8:45 AM	4	5	0	9	0	4	0	4	1	1	0	2	15
Total	15	9	0	24	1	8	0	9	4	3	0	7	40
Grand Total	20	19	0	39	1	20	0	21	14	7	0	21	81
Approach %	51.3	48.7	0.0		4.8	95.2	0.0		66.7	33.3	0.0		
Total %	24.7	23.5	0.0	48.1	1.2	24.7	0.0	25.9	17.3	8.6	0.0	25.9	
Exiting Leg Total				8				33				40	81
Buses	1	0	0	1	0	0	0	0	0	0	0	0	1
% Buses	5.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Exiting Leg Total				0				0				1	1
Single-Unit Trucks	13	10	0	23	0	14	0	14	12	5	0	17	54
% Single-Unit	65.0	52.6	0.0	59.0	0.0	70.0	0.0	66.7	85.7	71.4	0.0	81.0	66.7
Exiting Leg Total				5				22				27	54
Articulated Trucks	6	9	0	15	1	6	0	7	2	2	0	4	26
% Articulated	30.0	47.4	0.0	38.5	100.0	30.0	0.0	33.3	14.3	28.6	0.0	19.0	32.1
Exiting Leg Total				3				11				12	26

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	4	0	4	0	6	0	6	5	1	0	6	16
7:15 AM	0	0	0	0	0	3	0	3	3	1	0	4	7
7:30 AM	2	2	0	4	0	1	0	1	1	0	0	1	6
7:45 AM	3	4	0	7	0	2	0	2	1	2	0	3	12
Total Volume	5	10	0	15	0	12	0	12	10	4	0	14	41
% Approach Total	33.3	66.7	0.0		0.0	100.0	0.0		71.4	28.6	0.0		
PHF	0.417	0.625	0.000	0.536	0.000	0.500	0.000	0.500	0.500	0.500	0.000	0.583	0.641
Buses	1	0	0	1	0	0	0	0	0	0	0	0	1
Buses %	20.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4
Single-Unit Trucks	3	5	0	8	0	8	0	8	9	2	0	11	27
Single-Unit %	60.0	50.0	0.0	53.3	0.0	66.7	0.0	66.7	90.0	50.0	0.0	78.6	65.9
Articulated Trucks	1	5	0	6	0	4	0	4	1	2	0	3	13
Articulated %	20.0	50.0	0.0	40.0	0.0	33.3	0.0	33.3	10.0	50.0	0.0	21.4	31.7
Buses	1	0	0	1	0	0	0	0	0	0	0	0	1
Single-Unit Trucks	3	5	0	8	0	8	0	8	9	2	0	11	27
Articulated Trucks	1	5	0	6	0	4	0	4	1	2	0	3	13
Total Entering Leg	5	10	0	15	0	12	0	12	10	4	0	14	41
Buses				0				0				1	1
Single-Unit Trucks				2				14				11	27
Articulated Trucks				2				6				5	13
Total Exiting Leg				4				20				17	41

PDI File #: **197132 AA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	1	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	1	0	0	0	0	0	0	0	0	1
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				1	1

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	1
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	1	0	0	1	0	0	0	0	0	0	0	0	1
Exiting Leg				0				0				1	1
Total				1				0				1	2

PDI File #: **197132 AA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	2	0	2	0	4	0	4	4	0	0	4	10
7:15 AM	0	0	0	0	0	2	0	2	3	0	0	3	5
7:30 AM	1	1	0	2	0	1	0	1	1	0	0	1	4
7:45 AM	2	2	0	4	0	1	0	1	1	2	0	3	8
Total	3	5	0	8	0	8	0	8	9	2	0	11	27
8:00 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
8:15 AM	2	0	0	2	0	2	0	2	2	1	0	3	7
8:30 AM	4	2	0	6	0	2	0	2	0	0	0	0	8
8:45 AM	3	3	0	6	0	2	0	2	1	1	0	2	10
Total	10	5	0	15	0	6	0	6	3	3	0	6	27
Grand Total	13	10	0	23	0	14	0	14	12	5	0	17	54
Approach %	56.5	43.5	0.0		0.0	100.0	0.0		70.6	29.4	0.0		
Total %	24.1	18.5	0.0	42.6	0.0	25.9	0.0	25.9	22.2	9.3	0.0	31.5	
Exiting Leg Total				5				22				27	54

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	2	0	2	0	4	0	4	4	0	0	4	10
7:15 AM	0	0	0	0	0	2	0	2	3	0	0	3	5
7:30 AM	1	1	0	2	0	1	0	1	1	0	0	1	4
7:45 AM	2	2	0	4	0	1	0	1	1	2	0	3	8
Total Volume	3	5	0	8	0	8	0	8	9	2	0	11	27
% Approach Total	37.5	62.5	0.0		0.0	100.0	0.0		81.8	18.2	0.0		
PHF	0.375	0.625	0.000	0.500	0.000	0.500	0.000	0.500	0.563	0.250	0.000	0.688	0.675
Entering Leg	3	5	0	8	0	8	0	8	9	2	0	11	27
Exiting Leg				2				14				11	27
Total				10				22				22	54

PDI File #: **197132 AA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Articulated Trucks**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	2	0	2	0	2	0	2	1	1	0	2	6
7:15 AM	0	0	0	0	0	1	0	1	0	1	0	1	2
7:30 AM	1	1	0	2	0	0	0	0	0	0	0	0	2
7:45 AM	0	2	0	2	0	1	0	1	0	0	0	0	3
Total	1	5	0	6	0	4	0	4	1	2	0	3	13
8:00 AM	1	0	0	1	1	0	0	1	0	0	0	0	2
8:15 AM	2	1	0	3	0	0	0	0	1	0	0	1	4
8:30 AM	1	1	0	2	0	0	0	0	0	0	0	0	2
8:45 AM	1	2	0	3	0	2	0	2	0	0	0	0	5
Total	5	4	0	9	1	2	0	3	1	0	0	1	13
Grand Total	6	9	0	15	1	6	0	7	2	2	0	4	26
Approach %	40.0	60.0	0.0		14.3	85.7	0.0		50.0	50.0	0.0		
Total %	23.1	34.6	0.0	57.7	3.8	23.1	0.0	26.9	7.7	7.7	0.0	15.4	
Exiting Leg Total				3				11				12	26

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	2	0	2	0	2	0	2	1	1	0	2	6
7:15 AM	0	0	0	0	0	1	0	1	0	1	0	1	2
7:30 AM	1	1	0	2	0	0	0	0	0	0	0	0	2
7:45 AM	0	2	0	2	0	1	0	1	0	0	0	0	3
Total Volume	1	5	0	6	0	4	0	4	1	2	0	3	13
% Approach Total	16.7	83.3	0.0		0.0	100.0	0.0		33.3	66.7	0.0		
PHF	0.250	0.625	0.000	0.750	0.000	0.500	0.000	0.500	0.250	0.500	0.000	0.375	0.542
Entering Leg	1	5	0	6	0	4	0	4	1	2	0	3	13
Exiting Leg				2				6				5	13
Total				8				10				8	26

PDI File #: **197132 AA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 AA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Pedestrians

	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 AAA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	85	17	0	102	2	120	0	122	36	18	0	54	278
4:15 PM	89	14	0	103	0	107	0	107	44	17	0	61	271
4:30 PM	87	16	0	103	2	99	0	101	41	25	0	66	270
4:45 PM	76	13	0	89	0	116	0	116	43	20	0	63	268
Total	337	60	0	397	4	442	0	446	164	80	0	244	1087
5:00 PM	105	13	0	118	10	143	0	153	49	28	0	77	348
5:15 PM	78	20	0	98	1	117	0	118	47	30	0	77	293
5:30 PM	86	14	0	100	1	99	0	100	34	21	0	55	255
5:45 PM	64	12	0	76	2	86	0	88	38	24	0	62	226
Total	333	59	0	392	14	445	0	459	168	103	0	271	1122
Grand Total	670	119	0	789	18	887	0	905	332	183	0	515	2209
Approach %	84.9	15.1	0.0		2.0	98.0	0.0		64.5	35.5	0.0		
Total %	30.3	5.4	0.0	35.7	0.8	40.2	0.0	41.0	15.0	8.3	0.0	23.3	
Exiting Leg Total				201				451				1557	2209
Cars	656	113	0	769	17	870	0	887	327	181	0	508	2164
% Cars	97.9	95.0	0.0	97.5	94.4	98.1	0.0	98.0	98.5	98.9	0.0	98.6	98.0
Exiting Leg Total				198				440				1526	2164
Heavy Vehicles	14	6	0	20	1	17	0	18	5	2	0	7	45
% Heavy Vehicles	2.1	5.0	0.0	2.5	5.6	1.9	0.0	2.0	1.5	1.1	0.0	1.4	2.0
Exiting Leg Total				3				11				31	45

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:30 PM	87	16	0	103	2	99	0	101	41	25	0	66	270
4:45 PM	76	13	0	89	0	116	0	116	43	20	0	63	268
5:00 PM	105	13	0	118	10	143	0	153	49	28	0	77	348
5:15 PM	78	20	0	98	1	117	0	118	47	30	0	77	293
Total Volume	346	62	0	408	13	475	0	488	180	103	0	283	1179
% Approach Total	84.8	15.2	0.0		2.7	97.3	0.0		63.6	36.4	0.0		
PHF	0.824	0.775	0.000	0.864	0.325	0.830	0.000	0.797	0.918	0.858	0.000	0.919	0.847
Cars	342	60	0	402	12	468	0	480	178	101	0	279	1161
Cars %	98.8	96.8	0.0	98.5	92.3	98.5	0.0	98.4	98.9	98.1	0.0	98.6	98.5
Heavy Vehicles	4	2	0	6	1	7	0	8	2	2	0	4	18
Heavy Vehicles %	1.2	3.2	0.0	1.5	7.7	1.5	0.0	1.6	1.1	1.9	0.0	1.4	1.5
Cars Enter Leg	342	60	0	402	12	468	0	480	178	101	0	279	1161
Heavy Enter Leg	4	2	0	6	1	7	0	8	2	2	0	4	18
Total Entering Leg	346	62	0	408	13	475	0	488	180	103	0	283	1179
Cars Exiting Leg				113				238				810	1161
Heavy Exiting Leg				3				4				11	18
Total Exiting Leg				116				242				821	1179

PDI File #: **197132 AAA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	82	17	0	99	2	117	0	119	35	18	0	53	271
4:15 PM	82	13	0	95	0	102	0	102	44	17	0	61	258
4:30 PM	85	15	0	100	1	97	0	98	41	25	0	66	264
4:45 PM	76	13	0	89	0	115	0	115	43	19	0	62	266
Total	325	58	0	383	3	431	0	434	163	79	0	242	1059
5:00 PM	104	13	0	117	10	142	0	152	48	28	0	76	345
5:15 PM	77	19	0	96	1	114	0	115	46	29	0	75	286
5:30 PM	86	11	0	97	1	98	0	99	33	21	0	54	250
5:45 PM	64	12	0	76	2	85	0	87	37	24	0	61	224
Total	331	55	0	386	14	439	0	453	164	102	0	266	1105
Grand Total	656	113	0	769	17	870	0	887	327	181	0	508	2164
Approach %	85.3	14.7	0.0		1.9	98.1	0.0		64.4	35.6	0.0		
Total %	30.3	5.2	0.0	35.5	0.8	40.2	0.0	41.0	15.1	8.4	0.0	23.5	
Exiting Leg Total				198				440				1526	2164

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:30 PM	85	15	0	100	1	97	0	98	41	25	0	66	264
4:45 PM	76	13	0	89	0	115	0	115	43	19	0	62	266
5:00 PM	104	13	0	117	10	142	0	152	48	28	0	76	345
5:15 PM	77	19	0	96	1	114	0	115	46	29	0	75	286
Total Volume	342	60	0	402	12	468	0	480	178	101	0	279	1161
% Approach Total	85.1	14.9	0.0		2.5	97.5	0.0		63.8	36.2	0.0		
PHF	0.822	0.789	0.000	0.859	0.300	0.824	0.000	0.789	0.927	0.871	0.000	0.918	0.841
Entering Leg	342	60	0	402	12	468	0	480	178	101	0	279	1161
Exiting Leg				113				238				810	1161
Total				515				718				1089	2322

PDI File #: **197132 AAA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	3	0	0	3	0	3	0	3	1	0	0	1	7
4:15 PM	7	1	0	8	0	5	0	5	0	0	0	0	13
4:30 PM	2	1	0	3	1	2	0	3	0	0	0	0	6
4:45 PM	0	0	0	0	0	1	0	1	0	1	0	1	2
Total	12	2	0	14	1	11	0	12	1	1	0	2	28
5:00 PM	1	0	0	1	0	1	0	1	1	0	0	1	3
5:15 PM	1	1	0	2	0	3	0	3	1	1	0	2	7
5:30 PM	0	3	0	3	0	1	0	1	1	0	0	1	5
5:45 PM	0	0	0	0	0	1	0	1	1	0	0	1	2
Total	2	4	0	6	0	6	0	6	4	1	0	5	17
Grand Total	14	6	0	20	1	17	0	18	5	2	0	7	45
Approach %	70.0	30.0	0.0		5.6	94.4	0.0		71.4	28.6	0.0		
Total %	31.1	13.3	0.0	44.4	2.2	37.8	0.0	40.0	11.1	4.4	0.0	15.6	
Exiting Leg Total				3				11				31	45
Buses	0	1	0	1	0	2	0	2	0	0	0	0	3
% Buses	0.0	16.7	0.0	5.0	0.0	11.8	0.0	11.1	0.0	0.0	0.0	0.0	6.7
Exiting Leg Total				0				1				2	3
Single-Unit Trucks	10	3	0	13	1	11	0	12	4	2	0	6	31
% Single-Unit	71.4	50.0	0.0	65.0	100.0	64.7	0.0	66.7	80.0	100.0	0.0	85.7	68.9
Exiting Leg Total				3				7				21	31
Articulated Trucks	4	2	0	6	0	4	0	4	1	0	0	1	11
% Articulated	28.6	33.3	0.0	30.0	0.0	23.5	0.0	22.2	20.0	0.0	0.0	14.3	24.4
Exiting Leg Total				0				3				8	11

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	3	0	0	3	0	3	0	3	1	0	0	1	7
4:15 PM	7	1	0	8	0	5	0	5	0	0	0	0	13
4:30 PM	2	1	0	3	1	2	0	3	0	0	0	0	6
4:45 PM	0	0	0	0	0	1	0	1	0	1	0	1	2
Total Volume	12	2	0	14	1	11	0	12	1	1	0	2	28
% Approach Total	85.7	14.3	0.0		8.3	91.7	0.0		50.0	50.0	0.0		
PHF	0.429	0.500	0.000	0.438	0.250	0.550	0.000	0.600	0.250	0.250	0.000	0.500	0.538
Buses	0	0	0	0	0	1	0	1	0	0	0	0	1
Buses %	0.0	0.0	0.0	0.0	0.0	9.1	0.0	8.3	0.0	0.0	0.0	0.0	3.6
Single-Unit Trucks	9	2	0	11	1	8	0	9	1	1	0	2	22
Single-Unit %	75.0	100.0	0.0	78.6	100.0	72.7	0.0	75.0	100.0	100.0	0.0	100.0	78.6
Articulated Trucks	3	0	0	3	0	2	0	2	0	0	0	0	5
Articulated %	25.0	0.0	0.0	21.4	0.0	18.2	0.0	16.7	0.0	0.0	0.0	0.0	17.9
Buses	0	0	0	0	0	1	0	1	0	0	0	0	1
Single-Unit Trucks	9	2	0	11	1	8	0	9	1	1	0	2	22
Articulated Trucks	3	0	0	3	0	2	0	2	0	0	0	0	5
Total Entering Leg	12	2	0	14	1	11	0	12	1	1	0	2	28
Buses				0				0				1	1
Single-Unit Trucks				2				3				17	22
Articulated Trucks				0				0				5	5
Total Exiting Leg				2				3				23	28

PDI File #: **197132 AAA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	1	0	1	0	0	0	0	2
Grand Total	0	1	0	1	0	2	0	2	0	0	0	0	3
Approach %	0.0	100.0	0.0		0.0	100.0	0.0		0.0	0.0	0.0		
Total %	0.0	33.3	0.0	33.3	0.0	66.7	0.0	66.7	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				1				2	3

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:45 PM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	2
Total Volume	0	1	0	1	0	1	0	1	0	0	0	0	2
% Approach Total	0.0	100.0	0.0		0.0	100.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	1	0	1	0	1	0	1	0	0	0	0	2
Exiting Leg				0				1				1	2
Total				1				2				1	4

PDI File #: **197132 AAA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	3	0	0	3	0	1	0	1	1	0	0	1	5
4:15 PM	5	1	0	6	0	5	0	5	0	0	0	0	11
4:30 PM	1	1	0	2	1	1	0	2	0	0	0	0	4
4:45 PM	0	0	0	0	0	1	0	1	0	1	0	1	2
Total	9	2	0	11	1	8	0	9	1	1	0	2	22
5:00 PM	1	0	0	1	0	0	0	0	1	0	0	1	2
5:15 PM	0	0	0	0	0	2	0	2	0	1	0	1	3
5:30 PM	0	1	0	1	0	0	0	0	1	0	0	1	2
5:45 PM	0	0	0	0	0	1	0	1	1	0	0	1	2
Total	1	1	0	2	0	3	0	3	3	1	0	4	9
Grand Total	10	3	0	13	1	11	0	12	4	2	0	6	31
Approach %	76.9	23.1	0.0		8.3	91.7	0.0		66.7	33.3	0.0		
Total %	32.3	9.7	0.0	41.9	3.2	35.5	0.0	38.7	12.9	6.5	0.0	19.4	
Exiting Leg Total				3				7				21	31

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	3	0	0	3	0	1	0	1	1	0	0	1	5
4:15 PM	5	1	0	6	0	5	0	5	0	0	0	0	11
4:30 PM	1	1	0	2	1	1	0	2	0	0	0	0	4
4:45 PM	0	0	0	0	0	1	0	1	0	1	0	1	2
Total Volume	9	2	0	11	1	8	0	9	1	1	0	2	22
% Approach Total	81.8	18.2	0.0		11.1	88.9	0.0		50.0	50.0	0.0		
PHF	0.450	0.500	0.000	0.458	0.250	0.400	0.000	0.450	0.250	0.250	0.000	0.500	0.500
Entering Leg	9	2	0	11	1	8	0	9	1	1	0	2	22
Exiting Leg				2				3				17	22
Total				13				12				19	44

PDI File #: **197132 AAA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
4:15 PM	2	0	0	2	0	0	0	0	0	0	0	0	2
4:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	0	0	3	0	2	0	2	0	0	0	0	5
5:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
5:15 PM	1	1	0	2	0	1	0	1	1	0	0	1	4
5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	2	0	3	0	2	0	2	1	0	0	1	6
Grand Total	4	2	0	6	0	4	0	4	1	0	0	1	11
Approach %	66.7	33.3	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
Total %	36.4	18.2	0.0	54.5	0.0	36.4	0.0	36.4	9.1	0.0	0.0	9.1	
Exiting Leg Total				0				3				8	11

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Route 2 EB Ramps (Exit 34)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
5:15 PM	1	1	0	2	0	1	0	1	1	0	0	1	4
Total Volume	2	1	0	3	0	2	0	2	1	0	0	1	6
% Approach Total	66.7	33.3	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.500	0.250	0.000	0.375	0.000	0.500	0.000	0.500	0.250	0.000	0.000	0.250	0.375
Entering Leg	2	1	0	3	0	2	0	2	1	0	0	1	6
Exiting Leg				0				2				4	6
Total				3				4				5	12

PDI File #: **197132 AAA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
Grand Total	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	50.0	
Exiting Leg Total						0						1						1	2

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.250	0.500
Entering Leg	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
Exiting Leg						0						1						1	2
Total						0						2						2	4

PDI File #: **197132 AAA**
Location: **N: Route 2 EB Ramps (Exit 34)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Pedestrians

	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Route 2 EB Ramps (Exit 34)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 B**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	35	23	0	58	118	39	0	157	33	24	0	57	272
11:15 AM	22	35	0	57	121	30	0	151	32	30	0	62	270
11:30 AM	30	22	0	52	111	41	0	152	33	31	0	64	268
11:45 AM	32	23	0	55	131	53	0	184	39	26	0	65	304
Total	119	103	0	222	481	163	0	644	137	111	0	248	1114
12:00 PM	35	37	0	72	123	26	0	149	45	37	0	82	303
12:15 PM	26	33	0	59	116	38	0	154	41	31	0	72	285
12:30 PM	32	34	0	66	109	36	0	145	39	39	0	78	289
12:45 PM	28	39	0	67	111	31	0	142	36	36	0	72	281
Total	121	143	0	264	459	131	0	590	161	143	0	304	1158
Grand Total	240	246	0	486	940	294	0	1234	298	254	0	552	2272
Approach %	49.4	50.6	0.0		76.2	23.8	0.0		54.0	46.0	0.0		
Total %	10.6	10.8	0.0	21.4	41.4	12.9	0.0	54.3	13.1	11.2	0.0	24.3	
Exiting Leg Total				1194				544				534	2272
Cars	233	245	0	478	926	292	0	1218	296	252	0	548	2244
% Cars	97.1	99.6	0.0	98.4	98.5	99.3	0.0	98.7	99.3	99.2	0.0	99.3	98.8
Exiting Leg Total				1178				541				525	2244
Heavy Vehicles	7	1	0	8	14	2	0	16	2	2	0	4	28
% Heavy Vehicles	2.9	0.4	0.0	1.6	1.5	0.7	0.0	1.3	0.7	0.8	0.0	0.7	1.2
Exiting Leg Total				16				3				9	28

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:45 AM	32	23	0	55	131	53	0	184	39	26	0	65	304
12:00 PM	35	37	0	72	123	26	0	149	45	37	0	82	303
12:15 PM	26	33	0	59	116	38	0	154	41	31	0	72	285
12:30 PM	32	34	0	66	109	36	0	145	39	39	0	78	289
Total Volume	125	127	0	252	479	153	0	632	164	133	0	297	1181
% Approach Total	49.6	50.4	0.0		75.8	24.2	0.0		55.2	44.8	0.0		
PHF	0.893	0.858	0.000	0.875	0.914	0.722	0.000	0.859	0.911	0.853	0.000	0.905	0.971
Cars	123	127	0	250	469	153	0	622	162	132	0	294	1166
Cars %	98.4	100.0	0.0	99.2	97.9	100.0	0.0	98.4	98.8	99.2	0.0	99.0	98.7
Heavy Vehicles	2	0	0	2	10	0	0	10	2	1	0	3	15
Heavy Vehicles %	1.6	0.0	0.0	0.8	2.1	0.0	0.0	1.6	1.2	0.8	0.0	1.0	1.3
Cars Enter Leg	123	127	0	250	469	153	0	622	162	132	0	294	1166
Heavy Enter Leg	2	0	0	2	10	0	0	10	2	1	0	3	15
Total Entering Leg	125	127	0	252	479	153	0	632	164	133	0	297	1181
Cars Exiting Leg				601				289				276	1166
Heavy Exiting Leg				11				2				2	15
Total Exiting Leg				612				291				278	1181

PDI File #: **197132 B**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	33	23	0	56	117	37	0	154	33	24	0	57	267
11:15 AM	22	35	0	57	119	30	0	149	32	30	0	62	268
11:30 AM	28	22	0	50	111	41	0	152	33	30	0	63	265
11:45 AM	32	23	0	55	127	53	0	180	38	26	0	64	299
Total	115	103	0	218	474	161	0	635	136	110	0	246	1099
12:00 PM	34	37	0	71	121	26	0	147	45	36	0	81	299
12:15 PM	26	33	0	59	114	38	0	152	41	31	0	72	283
12:30 PM	31	34	0	65	107	36	0	143	38	39	0	77	285
12:45 PM	27	38	0	65	110	31	0	141	36	36	0	72	278
Total	118	142	0	260	452	131	0	583	160	142	0	302	1145
Grand Total	233	245	0	478	926	292	0	1218	296	252	0	548	2244
Approach %	48.7	51.3	0.0		76.0	24.0	0.0		54.0	46.0	0.0		
Total %	10.4	10.9	0.0	21.3	41.3	13.0	0.0	54.3	13.2	11.2	0.0	24.4	
Exiting Leg Total				1178				541				525	2244

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:45 AM	32	23	0	55	127	53	0	180	38	26	0	64	299
12:00 PM	34	37	0	71	121	26	0	147	45	36	0	81	299
12:15 PM	26	33	0	59	114	38	0	152	41	31	0	72	283
12:30 PM	31	34	0	65	107	36	0	143	38	39	0	77	285
Total Volume	123	127	0	250	469	153	0	622	162	132	0	294	1166
% Approach Total	49.2	50.8	0.0		75.4	24.6	0.0		55.1	44.9	0.0		
PHF	0.904	0.858	0.000	0.880	0.923	0.722	0.000	0.864	0.900	0.846	0.000	0.907	0.975
Entering Leg	123	127	0	250	469	153	0	622	162	132	0	294	1166
Exiting Leg				601				289				276	1166
Total				851				911				570	2332

PDI File #: **197132 B**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	2	0	0	2	1	2	0	3	0	0	0	0	5
11:15 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
11:30 AM	2	0	0	2	0	0	0	0	0	1	0	1	3
11:45 AM	0	0	0	0	4	0	0	4	1	0	0	1	5
Total	4	0	0	4	7	2	0	9	1	1	0	2	15
12:00 PM	1	0	0	1	2	0	0	2	0	1	0	1	4
12:15 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
12:30 PM	1	0	0	1	2	0	0	2	1	0	0	1	4
12:45 PM	1	1	0	2	1	0	0	1	0	0	0	0	3
Total	3	1	0	4	7	0	0	7	1	1	0	2	13
Grand Total	7	1	0	8	14	2	0	16	2	2	0	4	28
Approach %	87.5	12.5	0.0		87.5	12.5	0.0		50.0	50.0	0.0		
Total %	25.0	3.6	0.0	28.6	50.0	7.1	0.0	57.1	7.1	7.1	0.0	14.3	
Exiting Leg Total				16				3				9	28
Buses	4	0	0	4	3	0	0	3	2	0	0	2	9
% Buses	57.1	0.0	0.0	50.0	21.4	0.0	0.0	18.8	100.0	0.0	0.0	50.0	32.1
Exiting Leg Total				3				2				4	9
Single-Unit Trucks	3	1	0	4	10	1	0	11	0	1	0	1	16
% Single-Unit	42.9	100.0	0.0	50.0	71.4	50.0	0.0	68.8	0.0	50.0	0.0	25.0	57.1
Exiting Leg Total				11				1				4	16
Articulated Trucks	0	0	0	0	1	1	0	2	0	1	0	1	3
% Articulated	0.0	0.0	0.0	0.0	7.1	50.0	0.0	12.5	0.0	50.0	0.0	25.0	10.7
Exiting Leg Total				2				0				1	3

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	2	0	0	2	1	2	0	3	0	0	0	0	5
11:15 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
11:30 AM	2	0	0	2	0	0	0	0	0	1	0	1	3
11:45 AM	0	0	0	0	4	0	0	4	1	0	0	1	5
Total Volume	4	0	0	4	7	2	0	9	1	1	0	2	15
% Approach Total	100.0	0.0	0.0		77.8	22.2	0.0		50.0	50.0	0.0		
PHF	0.500	0.000	0.000	0.500	0.438	0.250	0.000	0.563	0.250	0.250	0.000	0.500	0.750
Buses	1	0	0	1	2	0	0	2	1	0	0	1	4
Buses %	25.0	0.0	0.0	25.0	28.6	0.0	0.0	22.2	100.0	0.0	0.0	50.0	26.7
Single-Unit Trucks	3	0	0	3	5	1	0	6	0	0	0	0	9
Single-Unit %	75.0	0.0	0.0	75.0	71.4	50.0	0.0	66.7	0.0	0.0	0.0	0.0	60.0
Articulated Trucks	0	0	0	0	0	1	0	1	0	1	0	1	2
Articulated %	0.0	0.0	0.0	0.0	0.0	50.0	0.0	11.1	0.0	100.0	0.0	50.0	13.3
Buses	1	0	0	1	2	0	0	2	1	0	0	1	4
Single-Unit Trucks	3	0	0	3	5	1	0	6	0	0	0	0	9
Articulated Trucks	0	0	0	0	0	1	0	1	0	1	0	1	2
Total Entering Leg	4	0	0	4	7	2	0	9	1	1	0	2	15
Buses				2				1				1	4
Single-Unit Trucks				5				0				4	9
Articulated Trucks				1				0				1	2
Total Exiting Leg				8				1				6	15

PDI File #: **197132 B**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	1	0	0	1	1	0	0	1	0	0	0	0	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	1	0	0	1	1	0	0	1	2
Total	1	0	0	1	2	0	0	2	1	0	0	1	4
12:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	1	0	0	1	1	0	0	1	1	0	0	1	3
12:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	3	0	0	3	1	0	0	1	1	0	0	1	5
Grand Total	4	0	0	4	3	0	0	3	2	0	0	2	9
Approach %	100.0	0.0	0.0		100.0	0.0	0.0		100.0	0.0	0.0		
Total %	44.4	0.0	0.0	44.4	33.3	0.0	0.0	33.3	22.2	0.0	0.0	22.2	
Exiting Leg Total				3				2				4	9

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:45 AM	0	0	0	0	1	0	0	1	1	0	0	1	2
12:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	1	0	0	1	1	0	0	1	1	0	0	1	3
Total Volume	2	0	0	2	2	0	0	2	2	0	0	2	6
% Approach Total	100.0	0.0	0.0		100.0	0.0	0.0		100.0	0.0	0.0		
PHF	0.500	0.000	0.000	0.500	0.500	0.000	0.000	0.500	0.500	0.000	0.000	0.500	0.500
Entering Leg	2	0	0	2	2	0	0	2	2	0	0	2	6
Exiting Leg				2				2				2	6
Total				4				4				4	12

PDI File #: **197132 B**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Single-Unit Trucks

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	1	0	0	1	0	1	0	1	0	0	0	0	2
11:15 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
11:30 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
11:45 AM	0	0	0	0	3	0	0	3	0	0	0	0	3
Total	3	0	0	3	5	1	0	6	0	0	0	0	9
12:00 PM	0	0	0	0	1	0	0	1	0	1	0	1	2
12:15 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
12:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
12:45 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
Total	0	1	0	1	5	0	0	5	0	1	0	1	7
Grand Total	3	1	0	4	10	1	0	11	0	1	0	1	16
Approach %	75.0	25.0	0.0		90.9	9.1	0.0		0.0	100.0	0.0		
Total %	18.8	6.3	0.0	25.0	62.5	6.3	0.0	68.8	0.0	6.3	0.0	6.3	
Exiting Leg Total				11				1				4	16

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	1	0	0	1	0	1	0	1	0	0	0	0	2
11:15 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
11:30 AM	2	0	0	2	0	0	0	0	0	0	0	0	2
11:45 AM	0	0	0	0	3	0	0	3	0	0	0	0	3
Total Volume	3	0	0	3	5	1	0	6	0	0	0	0	9
% Approach Total	100.0	0.0	0.0		83.3	16.7	0.0		0.0	0.0	0.0		
PHF	0.375	0.000	0.000	0.375	0.417	0.250	0.000	0.500	0.000	0.000	0.000	0.000	0.750
Entering Leg	3	0	0	3	5	1	0	6	0	0	0	0	9
Exiting Leg				5				0				4	9
Total				8				6				4	18

PDI File #: **197132 B**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	1	0	1	2
12:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	0	0	0	1
Grand Total	0	0	0	0	1	1	0	2	0	1	0	1	3
Approach %	0.0	0.0	0.0		50.0	50.0	0.0		0.0	100.0	0.0		
Total %	0.0	0.0	0.0	0.0	33.3	33.3	0.0	66.7	0.0	33.3	0.0	33.3	
Exiting Leg Total				2				0				1	3

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	1	0	1	2
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.250	0.500
Entering Leg	0	0	0	0	0	1	0	1	0	1	0	1	2
Exiting Leg				1				0				1	2
Total				1				1				2	4

PDI File #: **197132 B**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
Grand Total	2	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	4
Approach %	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	50.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	50.0	
Exiting Leg Total						2						0						2	4

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% Approach Total	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Exiting Leg						0						0						2	2
Total						2						0						2	4

PDI File #: **197132 B**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 BB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	12	17	0	29	18	13	0	31	85	12	0	97	157
7:15 AM	13	21	0	34	26	16	0	42	74	16	0	90	166
7:30 AM	15	33	0	48	30	34	0	64	85	22	0	107	219
7:45 AM	27	24	0	51	53	20	0	73	99	27	0	126	250
Total	67	95	0	162	127	83	0	210	343	77	0	420	792
8:00 AM	13	29	0	42	42	20	0	62	62	22	0	84	188
8:15 AM	20	27	0	47	52	24	0	76	59	23	0	82	205
8:30 AM	30	34	0	64	56	30	0	86	47	16	0	63	213
8:45 AM	21	18	0	39	76	52	0	128	55	29	0	84	251
Total	84	108	0	192	226	126	0	352	223	90	0	313	857
Grand Total	151	203	0	354	353	209	0	562	566	167	0	733	1649
Approach %	42.7	57.3	0.0		62.8	37.2	0.0		77.2	22.8	0.0		
Total %	9.2	12.3	0.0	21.5	21.4	12.7	0.0	34.1	34.3	10.1	0.0	44.5	
Exiting Leg Total				520				769				360	1649
Cars	145	199	0	344	321	201	0	522	547	163	0	710	1576
% Cars	96.0	98.0	0.0	97.2	90.9	96.2	0.0	92.9	96.6	97.6	0.0	96.9	95.6
Exiting Leg Total				484				746				346	1576
Heavy Vehicles	6	4	0	10	32	8	0	40	19	4	0	23	73
% Heavy Vehicles	4.0	2.0	0.0	2.8	9.1	3.8	0.0	7.1	3.4	2.4	0.0	3.1	4.4
Exiting Leg Total				36				23				14	73

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:30 AM	15	33	0	48	30	34	0	64	85	22	0	107	219
7:45 AM	27	24	0	51	53	20	0	73	99	27	0	126	250
8:00 AM	13	29	0	42	42	20	0	62	62	22	0	84	188
8:15 AM	20	27	0	47	52	24	0	76	59	23	0	82	205
Total Volume	75	113	0	188	177	98	0	275	305	94	0	399	862
% Approach Total	39.9	60.1	0.0		64.4	35.6	0.0		76.4	23.6	0.0		
PHF	0.694	0.856	0.000	0.922	0.835	0.721	0.000	0.905	0.770	0.870	0.000	0.792	0.862
Cars	72	111	0	183	165	96	0	261	296	92	0	388	832
Cars %	96.0	98.2	0.0	97.3	93.2	98.0	0.0	94.9	97.0	97.9	0.0	97.2	96.5
Heavy Vehicles	3	2	0	5	12	2	0	14	9	2	0	11	30
Heavy Vehicles %	4.0	1.8	0.0	2.7	6.8	2.0	0.0	5.1	3.0	2.1	0.0	2.8	3.5
Cars Enter Leg	72	111	0	183	165	96	0	261	296	92	0	388	832
Heavy Enter Leg	3	2	0	5	12	2	0	14	9	2	0	11	30
Total Entering Leg	75	113	0	188	177	98	0	275	305	94	0	399	862
Cars Exiting Leg				257				407				168	832
Heavy Exiting Leg				14				11				5	30
Total Exiting Leg				271				418				173	862

PDI File #: **197132 BB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	12	17	0	29	12	12	0	24	79	11	0	90	143
7:15 AM	12	20	0	32	24	13	0	37	71	15	0	86	155
7:30 AM	15	33	0	48	27	32	0	59	83	22	0	105	212
7:45 AM	25	24	0	49	52	20	0	72	96	27	0	123	244
Total	64	94	0	158	115	77	0	192	329	75	0	404	754
8:00 AM	12	28	0	40	40	20	0	60	62	21	0	83	183
8:15 AM	20	26	0	46	46	24	0	70	55	22	0	77	193
8:30 AM	29	34	0	63	49	29	0	78	47	16	0	63	204
8:45 AM	20	17	0	37	71	51	0	122	54	29	0	83	242
Total	81	105	0	186	206	124	0	330	218	88	0	306	822
Grand Total	145	199	0	344	321	201	0	522	547	163	0	710	1576
Approach %	42.2	57.8	0.0		61.5	38.5	0.0		77.0	23.0	0.0		
Total %	9.2	12.6	0.0	21.8	20.4	12.8	0.0	33.1	34.7	10.3	0.0	45.1	
Exiting Leg Total				484				746				346	1576

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:30 AM	15	33	0	48	27	32	0	59	83	22	0	105	212
7:45 AM	25	24	0	49	52	20	0	72	96	27	0	123	244
8:00 AM	12	28	0	40	40	20	0	60	62	21	0	83	183
8:15 AM	20	26	0	46	46	24	0	70	55	22	0	77	193
Total Volume	72	111	0	183	165	96	0	261	296	92	0	388	832
% Approach Total	39.3	60.7	0.0		63.2	36.8	0.0		76.3	23.7	0.0		
PHF	0.720	0.841	0.000	0.934	0.793	0.750	0.000	0.906	0.771	0.852	0.000	0.789	0.852
Entering Leg	72	111	0	183	165	96	0	261	296	92	0	388	832
Exiting Leg				257				407				168	832
Total				440				668				556	1664

PDI File #: **197132 BB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	6	1	0	7	6	1	0	7	14
7:15 AM	1	1	0	2	2	3	0	5	3	1	0	4	11
7:30 AM	0	0	0	0	3	2	0	5	2	0	0	2	7
7:45 AM	2	0	0	2	1	0	0	1	3	0	0	3	6
Total	3	1	0	4	12	6	0	18	14	2	0	16	38
8:00 AM	1	1	0	2	2	0	0	2	0	1	0	1	5
8:15 AM	0	1	0	1	6	0	0	6	4	1	0	5	12
8:30 AM	1	0	0	1	7	1	0	8	0	0	0	0	9
8:45 AM	1	1	0	2	5	1	0	6	1	0	0	1	9
Total	3	3	0	6	20	2	0	22	5	2	0	7	35
Grand Total	6	4	0	10	32	8	0	40	19	4	0	23	73
Approach %	60.0	40.0	0.0		80.0	20.0	0.0		82.6	17.4	0.0		
Total %	8.2	5.5	0.0	13.7	43.8	11.0	0.0	54.8	26.0	5.5	0.0	31.5	
Exiting Leg Total				36				23				14	73
Buses	2	0	0	2	1	0	0	1	2	0	0	2	5
% Buses	33.3	0.0	0.0	20.0	3.1	0.0	0.0	2.5	10.5	0.0	0.0	8.7	6.8
Exiting Leg Total				1				2				2	5
Single-Unit Trucks	4	3	0	7	21	6	0	27	14	4	0	18	52
% Single-Unit	66.7	75.0	0.0	70.0	65.6	75.0	0.0	67.5	73.7	100.0	0.0	78.3	71.2
Exiting Leg Total				25				17				10	52
Articulated Trucks	0	1	0	1	10	2	0	12	3	0	0	3	16
% Articulated	0.0	25.0	0.0	10.0	31.3	25.0	0.0	30.0	15.8	0.0	0.0	13.0	21.9
Exiting Leg Total				10				4				2	16

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	6	1	0	7	6	1	0	7	14
7:15 AM	1	1	0	2	2	3	0	5	3	1	0	4	11
7:30 AM	0	0	0	0	3	2	0	5	2	0	0	2	7
7:45 AM	2	0	0	2	1	0	0	1	3	0	0	3	6
Total Volume	3	1	0	4	12	6	0	18	14	2	0	16	38
% Approach Total	75.0	25.0	0.0		66.7	33.3	0.0		87.5	12.5	0.0		
PHF	0.375	0.250	0.000	0.500	0.500	0.500	0.000	0.643	0.583	0.500	0.000	0.571	0.679
Buses	1	0	0	1	0	0	0	0	1	0	0	1	2
Buses %	33.3	0.0	0.0	25.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	6.3	5.3
Single-Unit Trucks	2	0	0	2	10	5	0	15	10	2	0	12	29
Single-Unit %	66.7	0.0	0.0	50.0	83.3	83.3	0.0	83.3	71.4	100.0	0.0	75.0	76.3
Articulated Trucks	0	1	0	1	2	1	0	3	3	0	0	3	7
Articulated %	0.0	100.0	0.0	25.0	16.7	16.7	0.0	16.7	21.4	0.0	0.0	18.8	18.4
Buses	1	0	0	1	0	0	0	0	1	0	0	1	2
Single-Unit Trucks	2	0	0	2	10	5	0	15	10	2	0	12	29
Articulated Trucks	0	1	0	1	2	1	0	3	3	0	0	3	7
Total Entering Leg	3	1	0	4	12	6	0	18	14	2	0	16	38
Buses				0				1				1	2
Single-Unit Trucks				12				10				7	29
Articulated Trucks				2				4				1	7
Total Exiting Leg				14				15				9	38

PDI File #: **197132 BB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Buses

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	1	0	0	0	0	1	0	0	1	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	0	0	1	1	0	0	1	2
8:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	1	0	0	1	1	0	0	1	3
Grand Total	2	0	0	2	1	0	0	1	2	0	0	2	5
Approach %	100.0	0.0	0.0		100.0	0.0	0.0		100.0	0.0	0.0		
Total %	40.0	0.0	0.0	40.0	20.0	0.0	0.0	20.0	40.0	0.0	0.0	40.0	
Exiting Leg Total				1				2				2	5

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	0	0	1	1	0	0	1	2
Total Volume	1	0	0	1	1	0	0	1	2	0	0	2	4
% Approach Total	100.0	0.0	0.0		100.0	0.0	0.0		100.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.250	0.000	0.000	0.250	0.500	0.000	0.000	0.500	0.500
Entering Leg	1	0	0	1	1	0	0	1	2	0	0	2	4
Exiting Leg				1				2				1	4
Total				2				3				3	8

PDI File #: **197132 BB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	4	1	0	5	3	1	0	4	9
7:15 AM	1	0	0	1	2	3	0	5	3	1	0	4	10
7:30 AM	0	0	0	0	3	1	0	4	1	0	0	1	5
7:45 AM	1	0	0	1	1	0	0	1	3	0	0	3	5
Total	2	0	0	2	10	5	0	15	10	2	0	12	29
8:00 AM	1	1	0	2	1	0	0	1	0	1	0	1	4
8:15 AM	0	1	0	1	1	0	0	1	3	1	0	4	6
8:30 AM	0	0	0	0	6	0	0	6	0	0	0	0	6
8:45 AM	1	1	0	2	3	1	0	4	1	0	0	1	7
Total	2	3	0	5	11	1	0	12	4	2	0	6	23
Grand Total	4	3	0	7	21	6	0	27	14	4	0	18	52
Approach %	57.1	42.9	0.0		77.8	22.2	0.0		77.8	22.2	0.0		
Total %	7.7	5.8	0.0	13.5	40.4	11.5	0.0	51.9	26.9	7.7	0.0	34.6	
Exiting Leg Total				25				17				10	52

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	4	1	0	5	3	1	0	4	9
7:15 AM	1	0	0	1	2	3	0	5	3	1	0	4	10
7:30 AM	0	0	0	0	3	1	0	4	1	0	0	1	5
7:45 AM	1	0	0	1	1	0	0	1	3	0	0	3	5
Total Volume	2	0	0	2	10	5	0	15	10	2	0	12	29
% Approach Total	100.0	0.0	0.0		66.7	33.3	0.0		83.3	16.7	0.0		
PHF	0.500	0.000	0.000	0.500	0.625	0.417	0.000	0.750	0.833	0.500	0.000	0.750	0.725
Entering Leg	2	0	0	2	10	5	0	15	10	2	0	12	29
Exiting Leg				12				10				7	29
Total				14				25				19	58

PDI File #: **197132 BB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	2	0	0	2	3	0	0	3	5
7:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	2	1	0	3	3	0	0	3	7
8:00 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	4	0	0	4	0	0	0	0	4
8:30 AM	0	0	0	0	1	1	0	2	0	0	0	0	2
8:45 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
Total	0	0	0	0	8	1	0	9	0	0	0	0	9
Grand Total	0	1	0	1	10	2	0	12	3	0	0	3	16
Approach %	0.0	100.0	0.0		83.3	16.7	0.0		100.0	0.0	0.0		
Total %	0.0	6.3	0.0	6.3	62.5	12.5	0.0	75.0	18.8	0.0	0.0	18.8	
Exiting Leg Total				10				4				2	16

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	4	0	0	4	0	0	0	0	4
8:30 AM	0	0	0	0	1	1	0	2	0	0	0	0	2
8:45 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
Total Volume	0	0	0	0	8	1	0	9	0	0	0	0	9
% Approach Total	0.0	0.0	0.0		88.9	11.1	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.500	0.250	0.000	0.563	0.000	0.000	0.000	0.000	0.563
Entering Leg	0	0	0	0	8	1	0	9	0	0	0	0	9
Exiting Leg				8				0				1	9
Total				8				9				1	18

PDI File #: **197132 BB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 BB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Pedestrians

	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 BBB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	37	24	0	61	139	75	0	214	33	39	0	72	347
4:15 PM	41	25	0	66	124	75	0	199	34	38	0	72	337
4:30 PM	43	22	0	65	119	76	0	195	40	35	0	75	335
4:45 PM	52	28	0	80	131	59	0	190	34	41	0	75	345
Total	173	99	0	272	513	285	0	798	141	153	0	294	1364
5:00 PM	57	27	0	84	170	87	0	257	52	56	0	108	449
5:15 PM	54	31	0	85	130	71	0	201	45	31	0	76	362
5:30 PM	45	18	0	63	139	50	0	189	35	24	0	59	311
5:45 PM	45	30	0	75	105	45	0	150	33	30	0	63	288
Total	201	106	0	307	544	253	0	797	165	141	0	306	1410
Grand Total	374	205	0	579	1057	538	0	1595	306	294	0	600	2774
Approach %	64.6	35.4	0.0		66.3	33.7	0.0		51.0	49.0	0.0		
Total %	13.5	7.4	0.0	20.9	38.1	19.4	0.0	57.5	11.0	10.6	0.0	21.6	
Exiting Leg Total				1351				511				912	2774
Cars	368	200	0	568	1027	532	0	1559	299	290	0	589	2716
% Cars	98.4	97.6	0.0	98.1	97.2	98.9	0.0	97.7	97.7	98.6	0.0	98.2	97.9
Exiting Leg Total				1317				499				900	2716
Heavy Vehicles	6	5	0	11	30	6	0	36	7	4	0	11	58
% Heavy Vehicles	1.6	2.4	0.0	1.9	2.8	1.1	0.0	2.3	2.3	1.4	0.0	1.8	2.1
Exiting Leg Total				34				12				12	58

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:30 PM	43	22	0	65	119	76	0	195	40	35	0	75	335
4:45 PM	52	28	0	80	131	59	0	190	34	41	0	75	345
5:00 PM	57	27	0	84	170	87	0	257	52	56	0	108	449
5:15 PM	54	31	0	85	130	71	0	201	45	31	0	76	362
Total Volume	206	108	0	314	550	293	0	843	171	163	0	334	1491
% Approach Total	65.6	34.4	0.0		65.2	34.8	0.0		51.2	48.8	0.0		
PHF	0.904	0.871	0.000	0.924	0.809	0.842	0.000	0.820	0.822	0.728	0.000	0.773	0.830
Cars	204	105	0	309	538	292	0	830	167	163	0	330	1469
Cars %	99.0	97.2	0.0	98.4	97.8	99.7	0.0	98.5	97.7	100.0	0.0	98.8	98.5
Heavy Vehicles	2	3	0	5	12	1	0	13	4	0	0	4	22
Heavy Vehicles %	1.0	2.8	0.0	1.6	2.2	0.3	0.0	1.5	2.3	0.0	0.0	1.2	1.5
Cars Enter Leg	204	105	0	309	538	292	0	830	167	163	0	330	1469
Heavy Enter Leg	2	3	0	5	12	1	0	13	4	0	0	4	22
Total Entering Leg	206	108	0	314	550	293	0	843	171	163	0	334	1491
Cars Exiting Leg				701				272				496	1469
Heavy Exiting Leg				12				7				3	22
Total Exiting Leg				713				279				499	1491

PDI File #: **197132 BBB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	35	23	0	58	132	74	0	206	32	38	0	70	334
4:15 PM	41	25	0	66	117	71	0	188	34	35	0	69	323
4:30 PM	43	22	0	65	114	76	0	190	40	35	0	75	330
4:45 PM	51	27	0	78	128	59	0	187	33	41	0	74	339
Total	170	97	0	267	491	280	0	771	139	149	0	288	1326
5:00 PM	56	27	0	83	168	87	0	255	50	56	0	106	444
5:15 PM	54	29	0	83	128	70	0	198	44	31	0	75	356
5:30 PM	45	18	0	63	137	50	0	187	34	24	0	58	308
5:45 PM	43	29	0	72	103	45	0	148	32	30	0	62	282
Total	198	103	0	301	536	252	0	788	160	141	0	301	1390
Grand Total	368	200	0	568	1027	532	0	1559	299	290	0	589	2716
Approach %	64.8	35.2	0.0		65.9	34.1	0.0		50.8	49.2	0.0		
Total %	13.5	7.4	0.0	20.9	37.8	19.6	0.0	57.4	11.0	10.7	0.0	21.7	
Exiting Leg Total				1317				499				900	2716

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:30 PM	43	22	0	65	114	76	0	190	40	35	0	75	330
4:45 PM	51	27	0	78	128	59	0	187	33	41	0	74	339
5:00 PM	56	27	0	83	168	87	0	255	50	56	0	106	444
5:15 PM	54	29	0	83	128	70	0	198	44	31	0	75	356
Total Volume	204	105	0	309	538	292	0	830	167	163	0	330	1469
% Approach Total	66.0	34.0	0.0		64.8	35.2	0.0		50.6	49.4	0.0		
PHF	0.911	0.905	0.000	0.931	0.801	0.839	0.000	0.814	0.835	0.728	0.000	0.778	0.827
Entering Leg	204	105	0	309	538	292	0	830	167	163	0	330	1469
Exiting Leg				701				272				496	1469
Total				1010				1102				826	2938

PDI File #: **197132 BBB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	2	1	0	3	7	1	0	8	1	1	0	2	13
4:15 PM	0	0	0	0	7	4	0	11	0	3	0	3	14
4:30 PM	0	0	0	0	5	0	0	5	0	0	0	0	5
4:45 PM	1	1	0	2	3	0	0	3	1	0	0	1	6
Total	3	2	0	5	22	5	0	27	2	4	0	6	38
5:00 PM	1	0	0	1	2	0	0	2	2	0	0	2	5
5:15 PM	0	2	0	2	2	1	0	3	1	0	0	1	6
5:30 PM	0	0	0	0	2	0	0	2	1	0	0	1	3
5:45 PM	2	1	0	3	2	0	0	2	1	0	0	1	6
Total	3	3	0	6	8	1	0	9	5	0	0	5	20
Grand Total	6	5	0	11	30	6	0	36	7	4	0	11	58
Approach %	54.5	45.5	0.0		83.3	16.7	0.0		63.6	36.4	0.0		
Total %	10.3	8.6	0.0	19.0	51.7	10.3	0.0	62.1	12.1	6.9	0.0	19.0	
Exiting Leg Total				34				12				12	58
Buses	3	0	0	3	6	0	0	6	3	3	0	6	15
% Buses	50.0	0.0	0.0	27.3	20.0	0.0	0.0	16.7	42.9	75.0	0.0	54.5	25.9
Exiting Leg Total				9				3				3	15
Single-Unit Trucks	2	5	0	7	20	4	0	24	3	0	0	3	34
% Single-Unit	33.3	100.0	0.0	63.6	66.7	66.7	0.0	66.7	42.9	0.0	0.0	27.3	58.6
Exiting Leg Total				20				8				6	34
Articulated Trucks	1	0	0	1	4	2	0	6	1	1	0	2	9
% Articulated	16.7	0.0	0.0	9.1	13.3	33.3	0.0	16.7	14.3	25.0	0.0	18.2	15.5
Exiting Leg Total				5				1				3	9

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	2	1	0	3	7	1	0	8	1	1	0	2	13
4:15 PM	0	0	0	0	7	4	0	11	0	3	0	3	14
4:30 PM	0	0	0	0	5	0	0	5	0	0	0	0	5
4:45 PM	1	1	0	2	3	0	0	3	1	0	0	1	6
Total Volume	3	2	0	5	22	5	0	27	2	4	0	6	38
% Approach Total	60.0	40.0	0.0		81.5	18.5	0.0		33.3	66.7	0.0		
PHF	0.375	0.500	0.000	0.417	0.786	0.313	0.000	0.614	0.500	0.333	0.000	0.500	0.679
Buses	1	0	0	1	4	0	0	4	2	3	0	5	10
Buses %	33.3	0.0	0.0	20.0	18.2	0.0	0.0	14.8	100.0	75.0	0.0	83.3	26.3
Single-Unit Trucks	2	2	0	4	15	4	0	19	0	0	0	0	23
Single-Unit %	66.7	100.0	0.0	80.0	68.2	80.0	0.0	70.4	0.0	0.0	0.0	0.0	60.5
Articulated Trucks	0	0	0	0	3	1	0	4	0	1	0	1	5
Articulated %	0.0	0.0	0.0	0.0	13.6	20.0	0.0	14.8	0.0	25.0	0.0	16.7	13.2
Buses	1	0	0	1	4	0	0	4	2	3	0	5	10
Single-Unit Trucks	2	2	0	4	15	4	0	19	0	0	0	0	23
Articulated Trucks	0	0	0	0	3	1	0	4	0	1	0	1	5
Total Entering Leg	3	2	0	5	22	5	0	27	2	4	0	6	38
Buses				7				2				1	10
Single-Unit Trucks				15				2				6	23
Articulated Trucks				4				0				1	5
Total Exiting Leg				26				4				8	38

PDI File #: **197132 BBB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	1	0	0	1	1	0	0	1	1	0	0	1	3
4:15 PM	0	0	0	0	0	0	0	0	0	3	0	3	3
4:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:45 PM	0	0	0	0	2	0	0	2	1	0	0	1	3
Total	1	0	0	1	4	0	0	4	2	3	0	5	10
5:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
5:45 PM	1	0	0	1	1	0	0	1	1	0	0	1	3
Total	2	0	0	2	2	0	0	2	1	0	0	1	5
Grand Total	3	0	0	3	6	0	0	6	3	3	0	6	15
Approach %	100.0	0.0	0.0		100.0	0.0	0.0		50.0	50.0	0.0		
Total %	20.0	0.0	0.0	20.0	40.0	0.0	0.0	40.0	20.0	20.0	0.0	40.0	
Exiting Leg Total				9				3				3	15

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	1	0	0	1	1	0	0	1	1	0	0	1	3
4:15 PM	0	0	0	0	0	0	0	0	0	3	0	3	3
4:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:45 PM	0	0	0	0	2	0	0	2	1	0	0	1	3
Total Volume	1	0	0	1	4	0	0	4	2	3	0	5	10
% Approach Total	100.0	0.0	0.0		100.0	0.0	0.0		40.0	60.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.500	0.000	0.000	0.500	0.500	0.250	0.000	0.417	0.833
Entering Leg	1	0	0	1	4	0	0	4	2	3	0	5	10
Exiting Leg				7				2				1	10
Total				8				6				6	20

PDI File #: **197132 BBB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
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Class: **Single-Unit Trucks**

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	1	1	0	2	5	0	0	5	0	0	0	0	7
4:15 PM	0	0	0	0	6	4	0	10	0	0	0	0	10
4:30 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
4:45 PM	1	1	0	2	1	0	0	1	0	0	0	0	3
Total	2	2	0	4	15	4	0	19	0	0	0	0	23
5:00 PM	0	0	0	0	2	0	0	2	1	0	0	1	3
5:15 PM	0	2	0	2	1	0	0	1	1	0	0	1	4
5:30 PM	0	0	0	0	1	0	0	1	1	0	0	1	2
5:45 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
Total	0	3	0	3	5	0	0	5	3	0	0	3	11
Grand Total	2	5	0	7	20	4	0	24	3	0	0	3	34
Approach %	28.6	71.4	0.0		83.3	16.7	0.0		100.0	0.0	0.0		
Total %	5.9	14.7	0.0	20.6	58.8	11.8	0.0	70.6	8.8	0.0	0.0	8.8	
Exiting Leg Total				20				8				6	34

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	1	1	0	2	5	0	0	5	0	0	0	0	7
4:15 PM	0	0	0	0	6	4	0	10	0	0	0	0	10
4:30 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
4:45 PM	1	1	0	2	1	0	0	1	0	0	0	0	3
Total Volume	2	2	0	4	15	4	0	19	0	0	0	0	23
% Approach Total	50.0	50.0	0.0		78.9	21.1	0.0		0.0	0.0	0.0		
PHF	0.500	0.500	0.000	0.500	0.625	0.250	0.000	0.475	0.000	0.000	0.000	0.000	0.575
Entering Leg	2	2	0	4	15	4	0	19	0	0	0	0	23
Exiting Leg				15				2				6	23
Total				19				21				6	46

PDI File #: **197132 BBB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Articulated Trucks

	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	1	1	0	2	0	1	0	1	3
4:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	3	1	0	4	0	1	0	1	5
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
5:15 PM	0	0	0	0	1	1	0	2	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	1	1	1	0	2	1	0	0	1	4
Grand Total	1	0	0	1	4	2	0	6	1	1	0	2	9
Approach %	100.0	0.0	0.0		66.7	33.3	0.0		50.0	50.0	0.0		
Total %	11.1	0.0	0.0	11.1	44.4	22.2	0.0	66.7	11.1	11.1	0.0	22.2	
Exiting Leg Total				5				1				3	9

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Harvard Street				Old Union Turnpike				Mechanic Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	1	1	0	2	0	1	0	1	3
4:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	3	1	0	4	0	1	0	1	5
% Approach Total	0.0	0.0	0.0		75.0	25.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.750	0.250	0.000	0.500	0.000	0.250	0.000	0.250	0.417
Entering Leg	0	0	0	0	3	1	0	4	0	1	0	1	5
Exiting Leg				4				0				1	5
Total				4				4				2	10

PDI File #: **197132 BBB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
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Bicycles (on Roadway and Crosswalks)

	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	1	0	0	0	2	1	0	0	0	0	1	3
Grand Total	0	0	0	0	0	0	1	1	0	0	0	2	1	0	0	0	0	1	3
Approach %	0.0	0.0	0.0	0.0	0.0		50.0	50.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	33.3	33.3	0.0	0.0	0.0	66.7	33.3	0.0	0.0	0.0	0.0	33.3	
Exiting Leg Total						1						1						1	3

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	1	0	0	0	2	1	0	0	0	0	1	3
% Approach Total	0.0	0.0	0.0	0.0	0.0		50.0	50.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.250	0.375
Entering Leg	0	0	0	0	0	0	1	1	0	0	0	2	1	0	0	0	0	1	3
Exiting Leg						1						1						1	3
Total						1						3						2	6

PDI File #: **197132 BBB**
Location: **N: Harvard Street**
Location: **E: Old Union Turnpike W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Tuesday, August 20, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Pedestrians

	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Harvard Street						Old Union Turnpike						Mechanic Street						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 C**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	4	55	0	59	71	3	0	74	2	9	0	11	144
11:15 AM	4	67	0	71	94	1	0	95	3	4	0	7	173
11:30 AM	3	60	0	63	85	1	0	86	1	2	0	3	152
11:45 AM	6	101	0	107	73	2	0	75	3	6	0	9	191
Total	17	283	0	300	323	7	0	330	9	21	0	30	660
12:00 PM	8	132	0	140	71	1	0	72	2	7	0	9	221
12:15 PM	5	68	0	73	61	2	0	63	3	6	0	9	145
12:30 PM	5	59	0	64	52	1	0	53	1	4	0	5	122
12:45 PM	1	78	0	79	72	2	0	74	2	5	0	7	160
Total	19	337	0	356	256	6	0	262	8	22	0	30	648
Grand Total	36	620	0	656	579	13	0	592	17	43	0	60	1308
Approach %	5.5	94.5	0.0		97.8	2.2	0.0		28.3	71.7	0.0		
Total %	2.8	47.4	0.0	50.2	44.3	1.0	0.0	45.3	1.3	3.3	0.0	4.6	
Exiting Leg Total				622				637				49	1308
Cars	35	604	0	639	562	12	0	574	15	42	0	57	1270
% Cars	97.2	97.4	0.0	97.4	97.1	92.3	0.0	97.0	88.2	97.7	0.0	95.0	97.1
Exiting Leg Total				604				619				47	1270
Heavy Vehicles	1	16	0	17	17	1	0	18	2	1	0	3	38
% Heavy Vehicles	2.8	2.6	0.0	2.6	2.9	7.7	0.0	3.0	11.8	2.3	0.0	5.0	2.9
Exiting Leg Total				18				18				2	38

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:15 AM	4	67	0	71	94	1	0	95	3	4	0	7	173
11:30 AM	3	60	0	63	85	1	0	86	1	2	0	3	152
11:45 AM	6	101	0	107	73	2	0	75	3	6	0	9	191
12:00 PM	8	132	0	140	71	1	0	72	2	7	0	9	221
Total Volume	21	360	0	381	323	5	0	328	9	19	0	28	737
% Approach Total	5.5	94.5	0.0		98.5	1.5	0.0		32.1	67.9	0.0		
PHF	0.656	0.682	0.000	0.680	0.859	0.625	0.000	0.863	0.750	0.679	0.000	0.778	0.834
Cars	20	354	0	374	315	5	0	320	8	18	0	26	720
Cars %	95.2	98.3	0.0	98.2	97.5	100.0	0.0	97.6	88.9	94.7	0.0	92.9	97.7
Heavy Vehicles	1	6	0	7	8	0	0	8	1	1	0	2	17
Heavy Vehicles %	4.8	1.7	0.0	1.8	2.5	0.0	0.0	2.4	11.1	5.3	0.0	7.1	2.3
Cars Enter Leg	20	354	0	374	315	5	0	320	8	18	0	26	720
Heavy Enter Leg	1	6	0	7	8	0	0	8	1	1	0	2	17
Total Entering Leg	21	360	0	381	323	5	0	328	9	19	0	28	737
Cars Exiting Leg				333				362				25	720
Heavy Exiting Leg				9				7				1	17
Total Exiting Leg				342				369				26	737

PDI File #: **197132 C**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	4	51	0	55	67	2	0	69	1	9	0	10	134
11:15 AM	4	64	0	68	92	1	0	93	3	4	0	7	168
11:30 AM	2	60	0	62	82	1	0	83	1	2	0	3	148
11:45 AM	6	99	0	105	71	2	0	73	2	5	0	7	185
Total	16	274	0	290	312	6	0	318	7	20	0	27	635
12:00 PM	8	131	0	139	70	1	0	71	2	7	0	9	219
12:15 PM	5	65	0	70	59	2	0	61	3	6	0	9	140
12:30 PM	5	58	0	63	51	1	0	52	1	4	0	5	120
12:45 PM	1	76	0	77	70	2	0	72	2	5	0	7	156
Total	19	330	0	349	250	6	0	256	8	22	0	30	635
Grand Total	35	604	0	639	562	12	0	574	15	42	0	57	1270
Approach %	5.5	94.5	0.0		97.9	2.1	0.0		26.3	73.7	0.0		
Total %	2.8	47.6	0.0	50.3	44.3	0.9	0.0	45.2	1.2	3.3	0.0	4.5	
Exiting Leg Total				604				619				47	1270

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:15 AM	4	64	0	68	92	1	0	93	3	4	0	7	168
11:30 AM	2	60	0	62	82	1	0	83	1	2	0	3	148
11:45 AM	6	99	0	105	71	2	0	73	2	5	0	7	185
12:00 PM	8	131	0	139	70	1	0	71	2	7	0	9	219
Total Volume	20	354	0	374	315	5	0	320	8	18	0	26	720
% Approach Total	5.3	94.7	0.0		98.4	1.6	0.0		30.8	69.2	0.0		
PHF	0.625	0.676	0.000	0.673	0.856	0.625	0.000	0.860	0.667	0.643	0.000	0.722	0.822
Entering Leg	20	354	0	374	315	5	0	320	8	18	0	26	720
Exiting Leg				333				362				25	720
Total				707				682				51	1440

PDI File #: **197132 C**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	4	0	4	4	1	0	5	1	0	0	1	10
11:15 AM	0	3	0	3	2	0	0	2	0	0	0	0	5
11:30 AM	1	0	0	1	3	0	0	3	0	0	0	0	4
11:45 AM	0	2	0	2	2	0	0	2	1	1	0	2	6
Total	1	9	0	10	11	1	0	12	2	1	0	3	25
12:00 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
12:15 PM	0	3	0	3	2	0	0	2	0	0	0	0	5
12:30 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
12:45 PM	0	2	0	2	2	0	0	2	0	0	0	0	4
Total	0	7	0	7	6	0	0	6	0	0	0	0	13
Grand Total	1	16	0	17	17	1	0	18	2	1	0	3	38
Approach %	5.9	94.1	0.0		94.4	5.6	0.0		66.7	33.3	0.0		
Total %	2.6	42.1	0.0	44.7	44.7	2.6	0.0	47.4	5.3	2.6	0.0	7.9	
Exiting Leg Total				18				18				2	38
Buses	0	0	0	0	1	0	0	1	0	0	0	0	1
% Buses	0.0	0.0	0.0	0.0	5.9	0.0	0.0	5.6	0.0	0.0	0.0	0.0	2.6
Exiting Leg Total				1				0				0	1
Single-Unit Trucks	1	10	0	11	12	1	0	13	2	1	0	3	27
% Single-Unit	100.0	62.5	0.0	64.7	70.6	100.0	0.0	72.2	100.0	100.0	0.0	100.0	71.1
Exiting Leg Total				13				12				2	27
Articulated Trucks	0	6	0	6	4	0	0	4	0	0	0	0	10
% Articulated	0.0	37.5	0.0	35.3	23.5	0.0	0.0	22.2	0.0	0.0	0.0	0.0	26.3
Exiting Leg Total				4				6				0	10

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	4	0	4	4	1	0	5	1	0	0	1	10
11:15 AM	0	3	0	3	2	0	0	2	0	0	0	0	5
11:30 AM	1	0	0	1	3	0	0	3	0	0	0	0	4
11:45 AM	0	2	0	2	2	0	0	2	1	1	0	2	6
Total Volume	1	9	0	10	11	1	0	12	2	1	0	3	25
% Approach Total	10.0	90.0	0.0		91.7	8.3	0.0		66.7	33.3	0.0		
PHF	0.250	0.563	0.000	0.625	0.688	0.250	0.000	0.600	0.500	0.250	0.000	0.375	0.625
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	1	6	0	7	7	1	0	8	2	1	0	3	18
Single-Unit %	100.0	66.7	0.0	70.0	63.6	100.0	0.0	66.7	100.0	100.0	0.0	100.0	72.0
Articulated Trucks	0	3	0	3	4	0	0	4	0	0	0	0	7
Articulated %	0.0	33.3	0.0	30.0	36.4	0.0	0.0	33.3	0.0	0.0	0.0	0.0	28.0
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	1	6	0	7	7	1	0	8	2	1	0	3	18
Articulated Trucks	0	3	0	3	4	0	0	4	0	0	0	0	7
Total Entering Leg	1	9	0	10	11	1	0	12	2	1	0	3	25
Buses				0				0				0	0
Single-Unit Trucks				8				8				2	18
Articulated Trucks				4				3				0	7
Total Exiting Leg				12				11				2	25

PDI File #: **197132 C**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	0	0	0	1	0	0	1	0	0	0	0	1
Grand Total	0	0	0	0	1	0	0	1	0	0	0	0	1
Approach %	0.0	0.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				1				0				0	1

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:00 PM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	1
% Approach Total	0.0	0.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	1	0	0	1	0	0	0	0	1
Exiting Leg				1				0				0	1
Total				1				1				0	2

PDI File #: **197132 C**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	3	0	3	2	1	0	3	1	0	0	1	7
11:15 AM	0	3	0	3	2	0	0	2	0	0	0	0	5
11:30 AM	1	0	0	1	1	0	0	1	0	0	0	0	2
11:45 AM	0	0	0	0	2	0	0	2	1	1	0	2	4
Total	1	6	0	7	7	1	0	8	2	1	0	3	18
12:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
12:15 PM	0	2	0	2	2	0	0	2	0	0	0	0	4
12:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
12:45 PM	0	2	0	2	1	0	0	1	0	0	0	0	3
Total	0	4	0	4	5	0	0	5	0	0	0	0	9
Grand Total	1	10	0	11	12	1	0	13	2	1	0	3	27
Approach %	9.1	90.9	0.0		92.3	7.7	0.0		66.7	33.3	0.0		
Total %	3.7	37.0	0.0	40.7	44.4	3.7	0.0	48.1	7.4	3.7	0.0	11.1	
Exiting Leg Total				13				12				2	27

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	3	0	3	2	1	0	3	1	0	0	1	7
11:15 AM	0	3	0	3	2	0	0	2	0	0	0	0	5
11:30 AM	1	0	0	1	1	0	0	1	0	0	0	0	2
11:45 AM	0	0	0	0	2	0	0	2	1	1	0	2	4
Total Volume	1	6	0	7	7	1	0	8	2	1	0	3	18
% Approach Total	14.3	85.7	0.0		87.5	12.5	0.0		66.7	33.3	0.0		
PHF	0.250	0.500	0.000	0.583	0.875	0.250	0.000	0.667	0.500	0.250	0.000	0.375	0.643
Entering Leg	1	6	0	7	7	1	0	8	2	1	0	3	18
Exiting Leg				8				8				2	18
Total				15				16				5	36

PDI File #: **197132 C**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Articulated Trucks**

	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	1	0	1	2	0	0	2	0	0	0	0	3
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
11:45 AM	0	2	0	2	0	0	0	0	0	0	0	0	2
Total	0	3	0	3	4	0	0	4	0	0	0	0	7
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	3	0	0	0	0	0	0	0	0	3
Grand Total	0	6	0	6	4	0	0	4	0	0	0	0	10
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	60.0	0.0	60.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				4				6				0	10

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North				Lunenburg Road (Route 70) from South				McGovern Boulevard from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Total
11:00 AM	0	1	0	1	2	0	0	2	0	0	0	0	3
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
11:45 AM	0	2	0	2	0	0	0	0	0	0	0	0	2
Total Volume	0	3	0	3	4	0	0	4	0	0	0	0	7
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.375	0.000	0.375	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.583
Entering Leg	0	3	0	3	4	0	0	4	0	0	0	0	7
Exiting Leg				4				3				0	7
Total				7				7				0	14

PDI File #: **197132 C**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
12:30 PM	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	2	0	0	0	0	2	0	0	0	0	0	0	3
Grand Total	0	1	0	0	0	1	2	0	0	0	0	2	0	0	0	0	0	0	3
Approach %	0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	33.3	0.0	0.0	0.0	33.3	66.7	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						2						1						0	3

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
12:30 PM	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
Total Volume	0	1	0	0	0	1	2	0	0	0	0	2	0	0	0	0	0	0	3
% Approach Total	0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.000	0.250	0.500	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.375
Entering Leg	0	1	0	0	0	1	2	0	0	0	0	2	0	0	0	0	0	0	3
Exiting Leg						2						1						0	3
Total						3						3						0	6

PDI File #: **197132 C**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **W: McGovern Boulevard**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North						Lunenburg Road (Route 70) from South						McGovern Boulevard from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 D**
Location: **N: Lunenburg Road (Route 70)**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70)				Main Street (Route 70/117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	5	41	0	46	81	95	0	176	81	10	0	91	313
11:15 AM	10	57	0	67	90	103	0	193	92	17	0	109	369
11:30 AM	9	54	0	63	56	94	0	150	92	15	0	107	320
11:45 AM	6	54	0	60	71	105	0	176	95	6	0	101	337
Total	30	206	0	236	298	397	0	695	360	48	0	408	1339
12:00 PM	13	163	0	176	59	93	0	152	88	6	0	94	422
12:15 PM	8	63	0	71	63	86	0	149	78	7	0	85	305
12:30 PM	9	59	0	68	48	110	0	158	99	7	0	106	332
12:45 PM	14	55	0	69	74	99	0	173	82	5	0	87	329
Total	44	340	0	384	244	388	0	632	347	25	0	372	1388
Grand Total	74	546	0	620	542	785	0	1327	707	73	0	780	2727
Approach %	11.9	88.1	0.0		40.8	59.2	0.0		90.6	9.4	0.0		
Total %	2.7	20.0	0.0	22.7	19.9	28.8	0.0	48.7	25.9	2.7	0.0	28.6	
Exiting Leg Total				615				1253				859	2727
Cars	74	535	0	609	530	771	0	1301	696	71	0	767	2677
% Cars	100.0	98.0	0.0	98.2	97.8	98.2	0.0	98.0	98.4	97.3	0.0	98.3	98.2
Exiting Leg Total				601				1231				845	2677
Heavy Vehicles	0	11	0	11	12	14	0	26	11	2	0	13	50
% Heavy Vehicles	0.0	2.0	0.0	1.8	2.2	1.8	0.0	2.0	1.6	2.7	0.0	1.7	1.8
Exiting Leg Total				14				22				14	50

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Lunenburg Road (Route 70)				Main Street (Route 70/117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:15 AM	10	57	0	67	90	103	0	193	92	17	0	109	369
11:30 AM	9	54	0	63	56	94	0	150	92	15	0	107	320
11:45 AM	6	54	0	60	71	105	0	176	95	6	0	101	337
12:00 PM	13	163	0	176	59	93	0	152	88	6	0	94	422
Total Volume	38	328	0	366	276	395	0	671	367	44	0	411	1448
% Approach Total	10.4	89.6	0.0		41.1	58.9	0.0		89.3	10.7	0.0		
PHF	0.731	0.503	0.000	0.520	0.767	0.940	0.000	0.869	0.966	0.647	0.000	0.943	0.858
Cars	38	322	0	360	272	389	0	661	364	43	0	407	1428
Cars %	100.0	98.2	0.0	98.4	98.6	98.5	0.0	98.5	99.2	97.7	0.0	99.0	98.6
Heavy Vehicles	0	6	0	6	4	6	0	10	3	1	0	4	20
Heavy Vehicles %	0.0	1.8	0.0	1.6	1.4	1.5	0.0	1.5	0.8	2.3	0.0	1.0	1.4
Cars Enter Leg	38	322	0	360	272	389	0	661	364	43	0	407	1428
Heavy Enter Leg	0	6	0	6	4	6	0	10	3	1	0	4	20
Total Entering Leg	38	328	0	366	276	395	0	671	367	44	0	411	1448
Cars Exiting Leg				315				686				427	1428
Heavy Exiting Leg				5				9				6	20
Total Exiting Leg				320				695				433	1448

PDI File #: **197132 D**
Location: **N: Lunenburg Road (Route 70)**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Lunenburg Road (Route 70)				Main Street (Route 70/117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	5	38	0	43	77	93	0	170	78	9	0	87	300
11:15 AM	10	54	0	64	89	101	0	190	92	16	0	108	362
11:30 AM	9	53	0	62	56	92	0	148	91	15	0	106	316
11:45 AM	6	53	0	59	70	103	0	173	93	6	0	99	331
Total	30	198	0	228	292	389	0	681	354	46	0	400	1309
12:00 PM	13	162	0	175	57	93	0	150	88	6	0	94	419
12:15 PM	8	62	0	70	62	83	0	145	76	7	0	83	298
12:30 PM	9	58	0	67	48	108	0	156	97	7	0	104	327
12:45 PM	14	55	0	69	71	98	0	169	81	5	0	86	324
Total	44	337	0	381	238	382	0	620	342	25	0	367	1368
Grand Total	74	535	0	609	530	771	0	1301	696	71	0	767	2677
Approach %	12.2	87.8	0.0		40.7	59.3	0.0		90.7	9.3	0.0		
Total %	2.8	20.0	0.0	22.7	19.8	28.8	0.0	48.6	26.0	2.7	0.0	28.7	
Exiting Leg Total				601				1231				845	2677

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Lunenburg Road (Route 70)				Main Street (Route 70/117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:15 AM	10	54	0	64	89	101	0	190	92	16	0	108	362
11:30 AM	9	53	0	62	56	92	0	148	91	15	0	106	316
11:45 AM	6	53	0	59	70	103	0	173	93	6	0	99	331
12:00 PM	13	162	0	175	57	93	0	150	88	6	0	94	419
Total Volume	38	322	0	360	272	389	0	661	364	43	0	407	1428
% Approach Total	10.6	89.4	0.0		41.1	58.9	0.0		89.4	10.6	0.0		
PHF	0.731	0.497	0.000	0.514	0.764	0.944	0.000	0.870	0.978	0.672	0.000	0.942	0.852
Entering Leg	38	322	0	360	272	389	0	661	364	43	0	407	1428
Exiting Leg				315				686				427	1428
Total				675				1347				834	2856

PDI File #: **197132 D**
Location: **N: Lunenburg Road (Route 70)**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North				Main Street (Route 70/117) from East				Main Street (Route 117) from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	3	0	3	4	2	0	6	3	1	0	4	13
11:15 AM	0	3	0	3	1	2	0	3	0	1	0	1	7
11:30 AM	0	1	0	1	0	2	0	2	1	0	0	1	4
11:45 AM	0	1	0	1	1	2	0	3	2	0	0	2	6
Total	0	8	0	8	6	8	0	14	6	2	0	8	30
12:00 PM	0	1	0	1	2	0	0	2	0	0	0	0	3
12:15 PM	0	1	0	1	1	3	0	4	2	0	0	2	7
12:30 PM	0	1	0	1	0	2	0	2	2	0	0	2	5
12:45 PM	0	0	0	0	3	1	0	4	1	0	0	1	5
Total	0	3	0	3	6	6	0	12	5	0	0	5	20
Grand Total	0	11	0	11	12	14	0	26	11	2	0	13	50
Approach %	0.0	100.0	0.0		46.2	53.8	0.0		84.6	15.4	0.0		
Total %	0.0	22.0	0.0	22.0	24.0	28.0	0.0	52.0	22.0	4.0	0.0	26.0	
Exiting Leg Total				14				22				14	50
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total				0				0				0	0
Single-Unit Trucks	0	10	0	10	11	12	0	23	9	1	0	10	43
% Single-Unit	0.0	90.9	0.0	90.9	91.7	85.7	0.0	88.5	81.8	50.0	0.0	76.9	86.0
Exiting Leg Total				12				19				12	43
Articulated Trucks	0	1	0	1	1	2	0	3	2	1	0	3	7
% Articulated	0.0	9.1	0.0	9.1	8.3	14.3	0.0	11.5	18.2	50.0	0.0	23.1	14.0
Exiting Leg Total				2				3				2	7

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North				Main Street (Route 70/117) from East				Main Street (Route 117) from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	3	0	3	4	2	0	6	3	1	0	4	13
11:15 AM	0	3	0	3	1	2	0	3	0	1	0	1	7
11:30 AM	0	1	0	1	0	2	0	2	1	0	0	1	4
11:45 AM	0	1	0	1	1	2	0	3	2	0	0	2	6
Total Volume	0	8	0	8	6	8	0	14	6	2	0	8	30
% Approach Total	0.0	100.0	0.0		42.9	57.1	0.0		75.0	25.0	0.0		
PHF	0.000	0.667	0.000	0.667	0.375	1.000	0.000	0.583	0.500	0.500	0.000	0.500	0.577
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	0	8	0	8	5	7	0	12	6	1	0	7	27
Single-Unit %	0.0	100.0	0.0	100.0	83.3	87.5	0.0	85.7	100.0	50.0	0.0	87.5	90.0
Articulated Trucks	0	0	0	0	1	1	0	2	0	1	0	1	3
Articulated %	0.0	0.0	0.0	0.0	16.7	12.5	0.0	14.3	0.0	50.0	0.0	12.5	10.0
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	0	8	0	8	5	7	0	12	6	1	0	7	27
Articulated Trucks	0	0	0	0	1	1	0	2	0	1	0	1	3
Total Entering Leg	0	8	0	8	6	8	0	14	6	2	0	8	30
Buses				0				0				0	0
Single-Unit Trucks				6				14				7	27
Articulated Trucks				2				0				1	3
Total Exiting Leg				8				14				8	30

PDI File #: **197132 D**
Location: **N: Lunenburg Road (Route 70)**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Lunenburg Road (Route 70)				Main Street (Route 70/117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70)				Main Street (Route 70/117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg				0				0				0	0
Total				0				0				0	0

PDI File #: **197132 D**
Location: **N: Lunenburg Road (Route 70)**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Lunenburg Road (Route 70) from North				Main Street (Route 70/117) from East				Main Street (Route 117) from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	3	0	3	3	2	0	5	3	1	0	4	12
11:15 AM	0	3	0	3	1	1	0	2	0	0	0	0	5
11:30 AM	0	1	0	1	0	2	0	2	1	0	0	1	4
11:45 AM	0	1	0	1	1	2	0	3	2	0	0	2	6
Total	0	8	0	8	5	7	0	12	6	1	0	7	27
12:00 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
12:15 PM	0	1	0	1	1	3	0	4	1	0	0	1	6
12:30 PM	0	1	0	1	0	1	0	1	2	0	0	2	4
12:45 PM	0	0	0	0	3	1	0	4	0	0	0	0	4
Total	0	2	0	2	6	5	0	11	3	0	0	3	16
Grand Total	0	10	0	10	11	12	0	23	9	1	0	10	43
Approach %	0.0	100.0	0.0		47.8	52.2	0.0		90.0	10.0	0.0		
Total %	0.0	23.3	0.0	23.3	25.6	27.9	0.0	53.5	20.9	2.3	0.0	23.3	
Exiting Leg Total				12				19				12	43

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North				Main Street (Route 70/117) from East				Main Street (Route 117) from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	3	0	3	3	2	0	5	3	1	0	4	12
11:15 AM	0	3	0	3	1	1	0	2	0	0	0	0	5
11:30 AM	0	1	0	1	0	2	0	2	1	0	0	1	4
11:45 AM	0	1	0	1	1	2	0	3	2	0	0	2	6
Total Volume	0	8	0	8	5	7	0	12	6	1	0	7	27
% Approach Total	0.0	100.0	0.0		41.7	58.3	0.0		85.7	14.3	0.0		
PHF	0.000	0.667	0.000	0.667	0.417	0.875	0.000	0.600	0.500	0.250	0.000	0.438	0.563
Entering Leg	0	8	0	8	5	7	0	12	6	1	0	7	27
Exiting Leg				6				14				7	27
Total				14				26				14	54

PDI File #: **197132 D**
Location: **N: Lunenburg Road (Route 70)**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Lunenburg Road (Route 70)				Main Street (Route 70/117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
11:15 AM	0	0	0	0	0	1	0	1	0	1	0	1	2
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	2	0	1	0	1	3
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
12:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	1	0	1	0	1	0	1	2	0	0	2	4
Grand Total	0	1	0	1	1	2	0	3	2	1	0	3	7
Approach %	0.0	100.0	0.0		33.3	66.7	0.0		66.7	33.3	0.0		
Total %	0.0	14.3	0.0	14.3	14.3	28.6	0.0	42.9	28.6	14.3	0.0	42.9	
Exiting Leg Total				2				3				2	7

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:00 PM	Lunenburg Road (Route 70)				Main Street (Route 70/117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
12:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	1	0	1	0	1	0	1	2	0	0	2	4
% Approach Total	0.0	100.0	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.250	0.500	0.000	0.000	0.500	1.000
Entering Leg	0	1	0	1	0	1	0	1	2	0	0	2	4
Exiting Leg				0				3				1	4
Total				1				4				3	8

PDI File #: **197132 D**
Location: **N: Lunenburg Road (Route 70)**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North						Main Street (Route 70/117) from East						Main Street (Route 117) from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
Grand Total	1	1	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	3
Approach %	50.0	50.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	33.3	33.3	0.0	0.0	0.0	66.7	33.3	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						1						1						1	3

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:00 PM	Lunenburg Road (Route 70) from North						Main Street (Route 70/117) from East						Main Street (Route 117) from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
% Approach Total	0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
Exiting Leg						1						1						0	2
Total						2						2						0	4

PDI File #: **197132 D**
Location: **N: Lunenburg Road (Route 70)**
Location: **E: Main Street (Route 70/117) W: Main Street (Route 117)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North						Main Street (Route 70/117) from East						Main Street (Route 117) from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North						Main Street (Route 70/117) from East						Main Street (Route 117) from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 E**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	2	0	0	2	0	57	8	0	65	2	0	115	0	117	118	7	0	0	125	309
11:15 AM	0	1	0	0	1	1	68	2	0	71	2	1	118	1	122	150	4	0	0	154	348
11:30 AM	0	0	0	0	0	0	53	1	0	54	2	0	101	0	103	141	4	0	0	145	302
11:45 AM	0	1	0	0	1	0	65	1	0	66	11	0	112	0	123	136	8	0	0	144	334
Total	0	4	0	0	4	1	243	12	0	256	17	1	446	1	465	545	23	0	0	568	1293
12:00 PM	0	0	0	0	0	0	47	1	0	48	12	1	105	0	118	244	10	1	0	255	421
12:15 PM	0	1	0	0	1	0	16	1	0	17	2	0	135	0	137	135	4	0	0	139	294
12:30 PM	1	2	0	0	3	1	15	2	0	18	8	1	152	0	161	151	4	0	0	155	337
12:45 PM	1	0	0	0	1	0	29	2	0	31	4	4	149	0	157	130	4	0	0	134	323
Total	2	3	0	0	5	1	107	6	0	114	26	6	541	0	573	660	22	1	0	683	1375
Grand Total	2	7	0	0	9	2	350	18	0	370	43	7	987	1	1038	1205	45	1	0	1251	2668
Approach %	22.2	77.8	0.0	0.0		0.5	94.6	4.9	0.0		4.1	0.7	95.1	0.1		96.3	3.6	0.1	0.0		
Total %	0.1	0.3	0.0	0.0	0.3	0.1	13.1	0.7	0.0	13.9	1.6	0.3	37.0	0.0	38.9	45.2	1.7	0.0	0.0	46.9	
Exiting Leg Total					10					88					1231					1339	2668
Cars	2	7	0	0	9	2	348	18	0	368	41	7	964	1	1013	1182	43	1	0	1226	2616
% Cars	100.0	100.0	0.0	0.0	100.0	100.0	99.4	100.0	0.0	99.5	95.3	100.0	97.7	100.0	97.6	98.1	95.6	100.0	0.0	98.0	98.1
Exiting Leg Total					10					84					1208					1314	2616
Heavy Vehicles	0	0	0	0	0	0	2	0	0	2	2	0	23	0	25	23	2	0	0	25	52
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.5	4.7	0.0	2.3	0.0	2.4	1.9	4.4	0.0	0.0	2.0	1.9
Exiting Leg Total					0					4					23					25	52

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:15 AM	0	1	0	0	1	1	68	2	0	71	2	1	118	1	122	150	4	0	0	154	348
11:30 AM	0	0	0	0	0	0	53	1	0	54	2	0	101	0	103	141	4	0	0	145	302
11:45 AM	0	1	0	0	1	0	65	1	0	66	11	0	112	0	123	136	8	0	0	144	334
12:00 PM	0	0	0	0	0	0	47	1	0	48	12	1	105	0	118	244	10	1	0	255	421
Total Volume	0	2	0	0	2	1	233	5	0	239	27	2	436	1	466	671	26	1	0	698	1405
% Approach Total	0.0	100.0	0.0	0.0		0.4	97.5	2.1	0.0		5.8	0.4	93.6	0.2		96.1	3.7	0.1	0.0		
PHF	0.000	0.500	0.000	0.000	0.500	0.250	0.857	0.625	0.000	0.842	0.563	0.500	0.924	0.250	0.947	0.688	0.650	0.250	0.000	0.684	0.834
Cars	0	2	0	0	2	1	231	5	0	237	27	2	428	1	458	661	25	1	0	687	1384
Cars %	0.0	100.0	0.0	0.0	100.0	100.0	99.1	100.0	0.0	99.2	100.0	100.0	98.2	100.0	98.3	98.5	96.2	100.0	0.0	98.4	98.5
Heavy Vehicles	0	0	0	0	0	0	2	0	0	2	0	0	8	0	8	10	1	0	0	11	21
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.8	0.0	0.0	1.8	0.0	1.7	1.5	3.8	0.0	0.0	1.6	1.5
Cars Enter Leg	0	2	0	0	2	1	231	5	0	237	27	2	428	1	458	661	25	1	0	687	1384
Heavy Enter Leg	0	0	0	0	0	0	2	0	0	2	0	0	8	0	8	10	1	0	0	11	21
Total Entering Leg	0	2	0	0	2	1	233	5	0	239	27	2	436	1	466	671	26	1	0	698	1405
Cars Exiting Leg					4					52					669					659	1384
Heavy Exiting Leg					0					1					10					10	21
Total Exiting Leg					4					53					679					669	1405

PDI File #: **197132 E**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	2	0	0	2	0	57	8	0	65	2	0	110	0	112	112	7	0	0	119	298
11:15 AM	0	1	0	0	1	1	67	2	0	70	2	1	116	1	120	146	4	0	0	150	341
11:30 AM	0	0	0	0	0	0	53	1	0	54	2	0	99	0	101	140	3	0	0	143	298
11:45 AM	0	1	0	0	1	0	64	1	0	65	11	0	110	0	121	132	8	0	0	140	327
Total	0	4	0	0	4	1	241	12	0	254	17	1	435	1	454	530	22	0	0	552	1264
12:00 PM	0	0	0	0	0	0	47	1	0	48	12	1	103	0	116	243	10	1	0	254	418
12:15 PM	0	1	0	0	1	0	16	1	0	17	1	0	131	0	132	133	4	0	0	137	287
12:30 PM	1	2	0	0	3	1	15	2	0	18	7	1	150	0	158	148	3	0	0	151	330
12:45 PM	1	0	0	0	1	0	29	2	0	31	4	4	145	0	153	128	4	0	0	132	317
Total	2	3	0	0	5	1	107	6	0	114	24	6	529	0	559	652	21	1	0	674	1352
Grand Total	2	7	0	0	9	2	348	18	0	368	41	7	964	1	1013	1182	43	1	0	1226	2616
Approach %	22.2	77.8	0.0	0.0		0.5	94.6	4.9	0.0		4.0	0.7	95.2	0.1		96.4	3.5	0.1	0.0		
Total %	0.1	0.3	0.0	0.0	0.3	0.1	13.3	0.7	0.0	14.1	1.6	0.3	36.9	0.0	38.7	45.2	1.6	0.0	0.0	46.9	
Exiting Leg Total					10					84					1208					1314	2616

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:15 AM	0	1	0	0	1	1	67	2	0	70	2	1	116	1	120	146	4	0	0	150	341
11:30 AM	0	0	0	0	0	0	53	1	0	54	2	0	99	0	101	140	3	0	0	143	298
11:45 AM	0	1	0	0	1	0	64	1	0	65	11	0	110	0	121	132	8	0	0	140	327
12:00 PM	0	0	0	0	0	0	47	1	0	48	12	1	103	0	116	243	10	1	0	254	418
Total Volume	0	2	0	0	2	1	231	5	0	237	27	2	428	1	458	661	25	1	0	687	1384
% Approach Total	0.0	100.0	0.0	0.0		0.4	97.5	2.1	0.0		5.9	0.4	93.4	0.2		96.2	3.6	0.1	0.0		
PHF	0.000	0.500	0.000	0.000	0.500	0.250	0.862	0.625	0.000	0.846	0.563	0.500	0.922	0.250	0.946	0.680	0.625	0.250	0.000	0.676	0.828
Entering Leg	0	2	0	0	2	1	231	5	0	237	27	2	428	1	458	661	25	1	0	687	1384
Exiting Leg					4					52					669					659	1384
Total					6					289					1127					1346	2768

PDI File #: **197132 E**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	6	0	0	0	6	11
11:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	4	0	0	0	4	7
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	1	0	0	2	4
11:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	4	0	0	0	4	7
Total	0	0	0	0	0	0	2	0	0	2	0	0	11	0	11	15	1	0	0	16	29
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	3
12:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	4	0	5	2	0	0	0	2	7
12:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	2	0	3	3	1	0	0	4	7
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	6
Total	0	0	0	0	0	0	0	0	0	0	2	0	12	0	14	8	1	0	0	9	23
Grand Total	0	0	0	0	0	0	2	0	0	2	2	0	23	0	25	23	2	0	0	25	52
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		8.0	0.0	92.0	0.0		92.0	8.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	3.8	3.8	0.0	44.2	0.0	48.1	44.2	3.8	0.0	0.0	48.1	
Exiting Leg Total					0					4					23					25	52
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	4.0	1.9
Exiting Leg Total					0					0					1					0	1
Single-Unit Trucks	0	0	0	0	0	0	1	0	0	1	2	0	21	0	23	20	2	0	0	22	46
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	100.0	0.0	91.3	0.0	92.0	87.0	100.0	0.0	0.0	88.0	88.5
Exiting Leg Total					0					4					20					22	46
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	2	0	0	0	2	5
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	8.7	0.0	8.0	8.7	0.0	0.0	0.0	8.0	9.6
Exiting Leg Total					0					0					2					3	5

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	6	0	0	0	6	11
11:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	4	0	0	0	4	7
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	1	0	0	2	4
11:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	4	0	0	0	4	7
Total Volume	0	0	0	0	0	0	2	0	0	2	0	0	11	0	11	15	1	0	0	16	29
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		93.8	6.3	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.550	0.000	0.550	0.625	0.250	0.000	0.000	0.667	0.659
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	6.3	3.4
Single-Unit Trucks	0	0	0	0	0	0	1	0	0	1	0	0	10	0	10	14	1	0	0	15	26
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	90.9	0.0	90.9	93.3	100.0	0.0	0.0	93.8	89.7
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	2
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	9.1	0.0	9.1	0.0	0.0	0.0	0.0	0.0	6.9
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Single-Unit Trucks	0	0	0	0	0	0	1	0	0	1	0	0	10	0	10	14	1	0	0	15	26
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	2
Total Entering Leg	0	0	0	0	0	0	2	0	0	2	0	0	11	0	11	15	1	0	0	16	29
Buses					0					0					1					0	1
Single-Unit Trucks					0					1					14					11	26
Articulated Trucks					0					0					0					2	2
Total Exiting Leg					0					1					15					13	29

PDI File #: **197132 E**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Approach %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	
Exiting Leg Total					0					0					1					0	1

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Exiting Leg					0					0					1					0	1
Total					0					0					1					1	2

PDI File #: **197132 E**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Single-Unit Trucks

	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	6	0	0	0	6	10
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4	0	0	0	4	6
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	1	0	0	2	4
11:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	3	0	0	0	3	6
Total	0	0	0	0	0	0	1	0	0	1	0	0	10	0	10	14	1	0	0	15	26
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	3
12:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	4	0	5	1	0	0	0	1	6
12:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	3	1	0	0	4	6
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	1	0	0	0	1	5
Total	0	0	0	0	0	0	0	0	0	0	2	0	11	0	13	6	1	0	0	7	20
Grand Total	0	0	0	0	0	0	1	0	0	1	2	0	21	0	23	20	2	0	0	22	46
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		8.7	0.0	91.3	0.0		90.9	9.1	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	2.2	4.3	0.0	45.7	0.0	50.0	43.5	4.3	0.0	0.0	47.8	
Exiting Leg Total					0					4					20					22	46

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Shirley Road from North					Seven Bridge Road (Route 117) from East					Main Street (Route 70) from South					Main Street (Route 70) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	6	0	0	0	6	10
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4	0	0	0	4	6
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	1	0	0	2	4
11:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	3	0	0	0	3	6
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	10	0	10	14	1	0	0	15	26
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		93.3	6.7	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.625	0.000	0.625	0.583	0.250	0.000	0.000	0.625	0.650
Entering Leg	0	0	0	0	0	0	1	0	0	1	0	0	10	0	10	14	1	0	0	15	26
Exiting Leg					0					1					14					11	26
Total					0					2					24					26	52

PDI File #: **197132 E**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	2	3
Grand Total	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	2	0	0	0	2	5
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	0.0	0.0	40.0	0.0	40.0	40.0	0.0	0.0	0.0	40.0	
Exiting Leg Total					0					0					2					3	5

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:00 PM	Shirley Road					Seven Bridge Road (Route 117)					Main Street (Route 70)					Main Street (Route 70)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	2	3
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.500	0.000	0.000	0.000	0.500	0.750
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	2	3
Exiting Leg					0					0					2					1	3
Total					0					0					3					3	6

PDI File #: **197132 E**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	2
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	2
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	50.0	
Exiting Leg Total							0							0							1							1	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:00 PM	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	2
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	2
Exiting Leg							0							0							1							1	2
Total							0							0							2							2	4

PDI File #: **197132 E**
Location: **N: Shirley Road S: Main Street (Route 70)**
Location: **E: Seven Bridge Road (Route 117) W: Main Street (Route 70)**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	
Exiting Leg Total							0							0							0							1	1

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Shirley Road							Seven Bridge Road (Route 117)							Main Street (Route 70)							Main Street (Route 70)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Exiting Leg							0							0							0							1	1
Total							0							0							0							2	2

PDI File #: **197132 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	11	27	13	0	51	17	9	12	0	38	13	39	28	0	80	28	9	9	2	48	217
11:15 AM	12	28	12	0	52	28	8	18	0	54	30	49	29	0	108	30	9	8	2	49	263
11:30 AM	23	26	27	0	76	26	11	17	1	55	26	47	27	0	100	20	7	7	1	35	266
11:45 AM	46	26	20	1	93	28	17	133	0	178	22	43	27	0	92	27	10	4	0	41	404
Total	92	107	72	1	272	99	45	180	1	325	91	178	111	0	380	105	35	28	5	173	1150
12:00 PM	20	31	13	0	64	21	12	26	0	59	17	35	26	0	78	38	12	13	1	64	265
12:15 PM	16	33	17	0	66	29	17	20	0	66	13	40	29	0	82	40	17	10	0	67	281
12:30 PM	17	32	13	0	62	20	9	17	1	47	16	34	23	0	73	30	16	7	2	55	237
12:45 PM	16	37	19	0	72	23	11	19	0	53	23	28	25	0	76	36	7	9	0	52	253
Total	69	133	62	0	264	93	49	82	1	225	69	137	103	0	309	144	52	39	3	238	1036
Grand Total	161	240	134	1	536	192	94	262	2	550	160	315	214	0	689	249	87	67	8	411	2186
Approach %	30.0	44.8	25.0	0.2		34.9	17.1	47.6	0.4		23.2	45.7	31.1	0.0		60.6	21.2	16.3	1.9		
Total %	7.4	11.0	6.1	0.0	24.5	8.8	4.3	12.0	0.1	25.2	7.3	14.4	9.8	0.0	31.5	11.4	4.0	3.1	0.4	18.8	
Exiting Leg Total					575					383					751					477	2186
Cars	160	230	118	1	509	182	93	260	2	537	156	302	214	0	672	246	84	66	8	404	2122
% Cars	99.4	95.8	88.1	100.0	95.0	94.8	98.9	99.2	100.0	97.6	97.5	95.9	100.0	0.0	97.5	98.8	96.6	98.5	100.0	98.3	97.1
Exiting Leg Total					551					360					736					475	2122
Heavy Vehicles	1	10	16	0	27	10	1	2	0	13	4	13	0	0	17	3	3	1	0	7	64
% Heavy Vehicles	0.6	4.2	11.9	0.0	5.0	5.2	1.1	0.8	0.0	2.4	2.5	4.1	0.0	0.0	2.5	1.2	3.4	1.5	0.0	1.7	2.9
Exiting Leg Total					24					23					15					2	64

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:30 AM	23	26	27	0	76	26	11	17	1	55	26	47	27	0	100	20	7	7	1	35	266
11:45 AM	46	26	20	1	93	28	17	133	0	178	22	43	27	0	92	27	10	4	0	41	404
12:00 PM	20	31	13	0	64	21	12	26	0	59	17	35	26	0	78	38	12	13	1	64	265
12:15 PM	16	33	17	0	66	29	17	20	0	66	13	40	29	0	82	40	17	10	0	67	281
Total Volume	105	116	77	1	299	104	57	196	1	358	78	165	109	0	352	125	46	34	2	207	1216
% Approach Total	35.1	38.8	25.8	0.3		29.1	15.9	54.7	0.3		22.2	46.9	31.0	0.0		60.4	22.2	16.4	1.0		
PHF	0.571	0.879	0.713	0.250	0.804	0.897	0.838	0.368	0.250	0.503	0.750	0.878	0.940	0.000	0.880	0.781	0.676	0.654	0.500	0.772	0.752
Cars	104	112	66	1	283	98	57	194	1	350	74	159	109	0	342	123	45	34	2	204	1179
Cars %	99.0	96.6	85.7	100.0	94.6	94.2	100.0	99.0	100.0	97.8	94.9	96.4	100.0	0.0	97.2	98.4	97.8	100.0	100.0	98.6	97.0
Heavy Vehicles	1	4	11	0	16	6	0	2	0	8	4	6	0	0	10	2	1	0	0	3	37
Heavy Vehicles %	1.0	3.4	14.3	0.0	5.4	5.8	0.0	1.0	0.0	2.2	5.1	3.6	0.0	0.0	2.8	1.6	2.2	0.0	0.0	1.4	3.0
Cars Enter Leg	104	112	66	1	283	98	57	194	1	350	74	159	109	0	342	123	45	34	2	204	1179
Heavy Enter Leg	1	4	11	0	16	6	0	2	0	8	4	6	0	0	10	2	1	0	0	3	37
Total Entering Leg	105	116	77	1	299	104	57	196	1	358	78	165	109	0	352	125	46	34	2	207	1216
Cars Exiting Leg					292					186					429					272	1179
Heavy Exiting Leg					12					16					8					1	37
Total Exiting Leg					304					202					437					273	1216

PDI File #: **197132 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	11	24	12	0	47	16	8	12	0	36	13	36	28	0	77	28	8	9	2	47	207
11:15 AM	12	26	11	0	49	26	8	18	0	52	30	47	29	0	106	30	8	7	2	47	254
11:30 AM	23	25	24	0	72	24	11	17	1	53	25	44	27	0	96	19	7	7	1	34	255
11:45 AM	46	25	17	1	89	28	17	132	0	177	21	42	27	0	90	27	10	4	0	41	397
Total	92	100	64	1	257	94	44	179	1	318	89	169	111	0	369	104	33	27	5	169	1113
12:00 PM	19	30	11	0	60	19	12	25	0	56	15	35	26	0	76	38	12	13	1	64	256
12:15 PM	16	32	14	0	62	27	17	20	0	64	13	38	29	0	80	39	16	10	0	65	271
12:30 PM	17	32	12	0	61	20	9	17	1	47	16	33	23	0	72	29	16	7	2	54	234
12:45 PM	16	36	17	0	69	22	11	19	0	52	23	27	25	0	75	36	7	9	0	52	248
Total	68	130	54	0	252	88	49	81	1	219	67	133	103	0	303	142	51	39	3	235	1009
Grand Total	160	230	118	1	509	182	93	260	2	537	156	302	214	0	672	246	84	66	8	404	2122
Approach %	31.4	45.2	23.2	0.2		33.9	17.3	48.4	0.4		23.2	44.9	31.8	0.0		60.9	20.8	16.3	2.0		
Total %	7.5	10.8	5.6	0.0	24.0	8.6	4.4	12.3	0.1	25.3	7.4	14.2	10.1	0.0	31.7	11.6	4.0	3.1	0.4	19.0	
Exiting Leg Total					551					360					736					475	2122

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:30 AM	23	25	24	0	72	24	11	17	1	53	25	44	27	0	96	19	7	7	1	34	255
11:45 AM	46	25	17	1	89	28	17	132	0	177	21	42	27	0	90	27	10	4	0	41	397
12:00 PM	19	30	11	0	60	19	12	25	0	56	15	35	26	0	76	38	12	13	1	64	256
12:15 PM	16	32	14	0	62	27	17	20	0	64	13	38	29	0	80	39	16	10	0	65	271
Total Volume	104	112	66	1	283	98	57	194	1	350	74	159	109	0	342	123	45	34	2	204	1179
% Approach Total	36.7	39.6	23.3	0.4		28.0	16.3	55.4	0.3		21.6	46.5	31.9	0.0		60.3	22.1	16.7	1.0		
PHF	0.565	0.875	0.688	0.250	0.795	0.875	0.838	0.367	0.250	0.494	0.740	0.903	0.940	0.000	0.891	0.788	0.703	0.654	0.500	0.785	0.742
Entering Leg	104	112	66	1	283	98	57	194	1	350	74	159	109	0	342	123	45	34	2	204	1179
Exiting Leg					292					186					429					272	1179
Total					575					536					771					476	2358

PDI File #: **197132 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	3	1	0	4	1	1	0	0	2	0	3	0	0	3	0	1	0	0	1	10
11:15 AM	0	2	1	0	3	2	0	0	0	2	0	2	0	0	2	0	1	1	0	2	9
11:30 AM	0	1	3	0	4	2	0	0	0	2	1	3	0	0	4	1	0	0	0	1	11
11:45 AM	0	1	3	0	4	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	7
Total	0	7	8	0	15	5	1	1	0	7	2	9	0	0	11	1	2	1	0	4	37
12:00 PM	1	1	2	0	4	2	0	1	0	3	2	0	0	0	2	0	0	0	0	0	9
12:15 PM	0	1	3	0	4	2	0	0	0	2	0	2	0	0	2	1	1	0	0	2	10
12:30 PM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	3
12:45 PM	0	1	2	0	3	1	0	19	0	1	0	1	0	0	1	0	0	0	0	0	5
Total	1	3	8	0	12	5	0	1	0	6	2	4	0	0	6	2	1	0	0	3	27
Grand Total	1	10	16	0	27	10	1	2	0	13	4	13	0	0	17	3	3	1	0	7	64
Approach %	3.7	37.0	59.3	0.0		76.9	7.7	15.4	0.0		23.5	76.5	0.0	0.0		42.9	42.9	14.3	0.0		
Total %	1.6	15.6	25.0	0.0	42.2	15.6	1.6	3.1	0.0	20.3	6.3	20.3	0.0	0.0	26.6	4.7	4.7	1.6	0.0	10.9	
Exiting Leg Total					24					23					15					2	64
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total					0					0					0					0	0
Single-Unit Trucks	1	8	16	0	25	5	0	0	0	5	3	10	0	0	13	2	0	1	0	3	46
% Single-Unit	100.0	80.0	100.0	0.0	92.6	50.0	0.0	0.0	0.0	38.5	75.0	76.9	0.0	0.0	76.5	66.7	0.0	100.0	0.0	42.9	71.9
Exiting Leg Total					16					19					10					1	46
Articulated Trucks	0	2	0	0	2	5	1	2	0	8	1	3	0	0	4	1	3	0	0	4	18
% Articulated	0.0	20.0	0.0	0.0	7.4	50.0	100.0	100.0	0.0	61.5	25.0	23.1	0.0	0.0	23.5	33.3	100.0	0.0	0.0	57.1	28.1
Exiting Leg Total					8					4					5					1	18

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	3	1	0	4	1	1	0	0	2	0	3	0	0	3	0	1	0	0	1	10
11:15 AM	0	2	1	0	3	2	0	0	0	2	0	2	0	0	2	0	1	1	0	2	9
11:30 AM	0	1	3	0	4	2	0	0	0	2	1	3	0	0	4	1	0	0	0	1	11
11:45 AM	0	1	3	0	4	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	7
Total Volume	0	7	8	0	15	5	1	1	0	7	2	9	0	0	11	1	2	1	0	4	37
% Approach Total	0.0	46.7	53.3	0.0		71.4	14.3	14.3	0.0		18.2	81.8	0.0	0.0		25.0	50.0	25.0	0.0		
PHF	0.000	0.583	0.667	0.000	0.938	0.625	0.250	0.250	0.000	0.875	0.500	0.750	0.000	0.000	0.688	0.250	0.500	0.250	0.000	0.500	0.841
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	0	6	8	0	14	5	0	0	0	5	1	6	0	0	7	1	0	1	0	2	28
Single-Unit %	0.0	85.7	100.0	0.0	93.3	100.0	0.0	0.0	0.0	71.4	50.0	66.7	0.0	0.0	63.6	100.0	0.0	100.0	0.0	50.0	75.7
Articulated Trucks	0	1	0	0	1	0	1	1	0	2	1	3	0	0	4	0	2	0	0	2	9
Articulated %	0.0	14.3	0.0	0.0	6.7	0.0	100.0	100.0	0.0	28.6	50.0	33.3	0.0	0.0	36.4	0.0	100.0	0.0	0.0	50.0	24.3
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	0	6	8	0	14	5	0	0	0	5	1	6	0	0	7	1	0	1	0	2	28
Articulated Trucks	0	1	0	0	1	0	1	1	0	2	1	3	0	0	4	0	2	0	0	2	9
Total Entering Leg	0	7	8	0	15	5	1	1	0	7	2	9	0	0	11	1	2	1	0	4	37
Buses					0					0					0					0	0
Single-Unit Trucks					12					9					7					0	28
Articulated Trucks					3					3					2					1	9
Total Exiting Leg					15					12					9					1	37

PDI File #: **197132 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					0					0					0					0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg					0					0					0					0	0
Total					0					0					0					0	0

PDI File #: **197132 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Single-Unit Trucks

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	3	1	0	4	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	7
11:15 AM	0	2	1	0	3	2	0	0	0	2	0	2	0	0	2	0	0	1	0	1	8
11:30 AM	0	1	3	0	4	2	0	0	0	2	0	1	0	0	1	1	0	0	0	1	8
11:45 AM	0	0	3	0	3	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	5
Total	0	6	8	0	14	5	0	0	0	5	1	6	0	0	7	1	0	1	0	2	28
12:00 PM	1	0	2	0	3	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	5
12:15 PM	0	1	3	0	4	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	7
12:30 PM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:45 PM	0	1	2	0	3	0	0	19	0	0	0	1	0	0	1	0	0	0	0	0	4
Total	1	2	8	0	11	0	0	0	0	0	2	4	0	0	6	1	0	0	0	1	18
Grand Total	1	8	16	0	25	5	0	0	0	5	3	10	0	0	13	2	0	1	0	3	46
Approach %	4.0	32.0	64.0	0.0		100.0	0.0	0.0	0.0		23.1	76.9	0.0	0.0		66.7	0.0	33.3	0.0		
Total %	2.2	17.4	34.8	0.0	54.3	10.9	0.0	0.0	0.0	10.9	6.5	21.7	0.0	0.0	28.3	4.3	0.0	2.2	0.0	6.5	
Exiting Leg Total					16					19					10					1	46

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	3	1	0	4	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	7
11:15 AM	0	2	1	0	3	2	0	0	0	2	0	2	0	0	2	0	0	1	0	1	8
11:30 AM	0	1	3	0	4	2	0	0	0	2	0	1	0	0	1	1	0	0	0	1	8
11:45 AM	0	0	3	0	3	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	5
Total Volume	0	6	8	0	14	5	0	0	0	5	1	6	0	0	7	1	0	1	0	2	28
% Approach Total	0.0	42.9	57.1	0.0		100.0	0.0	0.0	0.0		14.3	85.7	0.0	0.0		50.0	0.0	50.0	0.0		
PHF	0.000	0.500	0.667	0.000	0.875	0.625	0.000	0.000	0.000	0.625	0.250	0.750	0.000	0.000	0.875	0.250	0.000	0.250	0.000	0.500	0.875
Entering Leg	0	6	8	0	14	5	0	0	0	5	1	6	0	0	7	1	0	1	0	2	28
Exiting Leg					12					9					7					0	28
Total					26					14					14					2	56

PDI File #: **197132 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	3
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	3
11:45 AM	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
Total	0	1	0	0	1	0	1	1	0	2	1	3	0	0	4	0	2	0	0	2	9
12:00 PM	0	1	0	0	1	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	4
12:15 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1	3
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:45 PM	0	0	0	0	0	1	0	19	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	5	0	1	0	6	0	0	0	0	0	1	1	0	0	2	9
Grand Total	0	2	0	0	2	5	1	2	0	8	1	3	0	0	4	1	3	0	0	4	18
Approach %	0.0	100.0	0.0	0.0		62.5	12.5	25.0	0.0		25.0	75.0	0.0	0.0		25.0	75.0	0.0	0.0		
Total %	0.0	11.1	0.0	0.0	11.1	27.8	5.6	11.1	0.0	44.4	5.6	16.7	0.0	0.0	22.2	5.6	16.7	0.0	0.0	22.2	
Exiting Leg Total					8					4					5					1	18

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Lunenburg Road (Route 70) from North					Old Union Turnpike from East					Lunenburg Road (Route 70) from South					Old Union Turnpike from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:30 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	3
11:45 AM	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
12:00 PM	0	1	0	0	1	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	4
12:15 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Total Volume	0	2	0	0	2	4	0	2	0	6	1	2	0	0	3	0	1	0	0	1	12
% Approach Total	0.0	100.0	0.0	0.0		66.7	0.0	33.3	0.0		33.3	66.7	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.500	0.000	0.000	0.500	0.500	0.000	0.500	0.000	0.500	0.250	0.250	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.250	0.750
Entering Leg	0	2	0	0	2	4	0	2	0	6	1	2	0	0	3	0	1	0	0	1	12
Exiting Leg					6					2					4					0	12
Total					8					8					7					1	24

PDI File #: **197132 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	3
12:45 PM	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0	0	2	0	0	0	0	0	0	0	4
Grand Total	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0	0	2	0	0	0	0	0	0	0	4
Approach %	0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0		50.0	50.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	25.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	25.0	0.0	0.0	0.0	25.0	25.0	25.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							1							1							2							0	4

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

12:00 PM	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	3
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0	0	2	0	0	0	0	0	0	0	4
% Approach Total	0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0		50.0	50.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.250	0.250	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333
Entering Leg	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0	0	2	0	0	0	0	0	0	0	4
Exiting Leg							1							1							2							0	4
Total							2							2							4							0	8

PDI File #: **197132 F**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North							Old Union Turnpike from East							Lunenburg Road (Route 70) from South							Old Union Turnpike from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **197132 G**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane SW: Driveway**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	39	6	0	45	19	0	0	10	0	29	26	32	1	0	1	60	0	0	0	0	0	0	0	1	1	0	0	2	136
11:15 AM	0	0	41	14	0	55	18	0	0	12	0	30	22	59	1	0	0	82	0	0	0	0	0	0	0	1	0	0	0	1	168
11:30 AM	0	0	52	10	0	62	13	0	0	22	0	35	24	50	0	1	0	75	0	0	0	0	0	0	0	2	0	0	0	2	174
11:45 AM	0	1	48	15	0	64	18	1	0	54	0	73	36	37	0	0	0	73	1	1	0	0	0	2	0	0	0	0	0	0	212
Total	0	1	180	45	0	226	68	1	0	98	0	167	108	178	2	1	1	290	1	1	0	0	0	2	0	4	1	0	0	5	690
12:00 PM	0	0	38	13	0	51	17	0	0	12	0	29	26	45	0	0	0	71	0	0	0	0	1	1	0	0	0	0	0	0	152
12:15 PM	0	0	49	11	0	60	24	0	0	16	0	40	25	50	1	1	0	77	0	0	0	0	0	0	0	1	0	0	0	1	178
12:30 PM	0	0	45	12	0	57	20	0	0	18	0	38	20	39	1	0	0	60	0	0	0	0	0	0	0	1	1	0	0	2	157
12:45 PM	0	0	51	8	0	59	14	0	0	19	0	33	20	39	1	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	152
Total	0	0	183	44	0	227	75	0	0	65	0	140	91	173	3	1	0	268	0	0	0	0	1	1	0	2	1	0	0	3	639
Grand Total	0	1	363	89	0	453	143	1	0	163	0	307	199	351	5	2	1	558	1	1	0	0	1	3	0	6	2	0	0	8	1329
Approach %	0.0	0.2	80.1	19.6	0.0		46.6	0.3	0.0	53.1	0.0		35.7	62.9	0.9	0.4	0.2		33.3	33.3	0.0	0.0	33.3		0.0	75.0	25.0	0.0	0.0		
Total %	0.0	0.1	27.3	6.7	0.0	34.1	10.8	0.1	0.0	12.3	0.0	23.1	15.0	26.4	0.4	0.2	0.1	42.0	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.5	0.2	0.0	0.0	0.6	
Exiting Leg Total						494						291						534						4						6	1329
Cars	0	1	341	84	0	426	132	1	0	158	0	291	194	331	5	2	1	533	1	1	0	0	1	3	0	6	2	0	0	8	1261
% Cars	0.0	100.0	93.9	94.4	0.0	94.0	92.3	100.0	0.0	96.9	0.0	94.8	97.5	94.3	100.0	100.0	100.0	95.5	100.0	100.0	0.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	0.0	100.0	94.9
Exiting Leg Total						463						281						507						4						6	1261
Heavy Vehicles	0	0	22	5	0	27	11	0	0	5	0	16	5	20	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	68
% Heavy Vehicles	0.0	0.0	6.1	5.6	0.0	6.0	7.7	0.0	0.0	3.1	0.0	5.2	2.5	5.7	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1
Exiting Leg Total						31						10						27						0						0	68

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
11:30 AM	0	0	52	10	0	62	13	0	0	22	0	35	24	50	0	1	0	75	0	0	0	0	0	0	0	2	0	0	0	2	174
11:45 AM	0	1	48	15	0	64	18	1	0	54	0	73	36	37	0	0	0	73	1	1	0	0	0	2	0	0	0	0	0	0	212
12:00 PM	0	0	38	13	0	51	17	0	0	12	0	29	26	45	0	0	0	71	0	0	0	0	1	1	0	0	0	0	0	0	152
12:15 PM	0	0	49	11	0	60	24	0	0	16	0	40	25	50	1	1	0	77	0	0	0	0	0	0	0	1	0	0	0	1	178
Total Volume	0	1	187	49	0	237	72	1	0	104	0	177	111	182	1	2	0	296	1	1	0	0	1	3	0	3	0	0	0	3	716
% Approach Total	0.0	0.4	78.9	20.7	0.0		40.7	0.6	0.0	58.8	0.0		37.5	61.5	0.3	0.7	0.0		33.3	33.3	0.0	0.0	33.3		0.0	100.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.899	0.817	0.000	0.926	0.750	0.250	0.000	0.481	0.000	0.606	0.771	0.910	0.250	0.500	0.000	0.961	0.250	0.250	0.000	0.000	0.250	0.375	0.000	0.375	0.000	0.000	0.000	0.375	0.844
Cars	0	1	175	45	0	221	66	1	0	100	0	167	108	173	1	2	0	284	1	1	0	0	1	3	0	3	0	0	0	3	678
Cars %	0.0	100.0	93.6	91.8	0.0	93.2	91.7	100.0	0.0	96.2	0.0	94.4	97.3	95.1	100.0	100.0	0.0	95.9	100.0	100.0	0.0	0.0	100.0	100.0	0.0	100.0	0.0	0.0	0.0	100.0	94.7
Heavy Vehicles	0	0	12	4	0	16	6	0	0	4	0	10	3	9	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	38
Heavy Vehicles %	0.0	0.0	6.4	8.2	0.0	6.8	8.3	0.0	0.0	3.8	0.0	5.6	2.7	4.9	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
Cars Enter Leg	0	1	175	45	0	221	66	1	0	100	0	167	108	173	1	2	0	284	1	1	0	0	1	3	0	3	0	0	0	3	678
Heavy Enter Leg	0	0	12	4	0	16	6	0	0	4	0	10	3	9	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	38
Total Entering Leg	0	1	187	49	0	237	72	1	0	104	0	177	111	182	1	2	0	296	1	1	0	0	1	3	0	3	0	0	0	3	716
Cars Exiting Leg						239						154						279						4						2	678
Heavy Exiting Leg						15						7						16						0						0	38
Total Exiting Leg						254						161						295						4						2	716

PDI File #: **197132 G**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane SW: Driveway**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Right	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	35	6	0	41	18	0	0	10	0	28	24	29	1	0	1	55	0	0	0	0	0	0	0	1	1	0	0	2	126
11:15 AM	0	0	38	13	0	51	14	0	0	12	0	26	22	54	1	0	0	77	0	0	0	0	0	0	0	1	0	0	0	1	155
11:30 AM	0	0	49	10	0	59	11	0	0	21	0	32	23	46	0	1	0	70	0	0	0	0	0	0	0	2	0	0	0	2	163
11:45 AM	0	1	45	13	0	59	16	1	0	52	0	69	35	37	0	0	0	72	1	1	0	0	0	2	0	0	0	0	0	0	202
Total	0	1	167	42	0	210	59	1	0	95	0	155	104	166	2	1	1	274	1	1	0	0	0	2	0	4	1	0	0	5	646
12:00 PM	0	0	36	12	0	48	16	0	0	11	0	27	26	43	0	0	0	69	0	0	0	0	1	1	0	0	0	0	0	0	145
12:15 PM	0	0	45	10	0	55	23	0	0	16	0	39	24	47	1	1	0	73	0	0	0	0	0	0	0	1	0	0	0	1	168
12:30 PM	0	0	44	12	0	56	20	0	0	18	0	38	20	38	1	0	0	59	0	0	0	0	0	0	0	1	1	0	0	2	155
12:45 PM	0	0	49	8	0	57	14	0	0	18	0	32	20	37	1	0	0	58	0	0	0	0	0	0	0	0	0	0	0	0	147
Total	0	0	174	42	0	216	73	0	0	63	0	136	90	165	3	1	0	259	0	0	0	0	1	1	0	2	1	0	0	3	615
Grand Total	0	1	341	84	0	426	132	1	0	158	0	291	194	331	5	2	1	533	1	1	0	0	1	3	0	6	2	0	0	8	1261
Approach %	0.0	0.2	80.0	19.7	0.0		45.4	0.3	0.0	54.3	0.0		36.4	62.1	0.9	0.4	0.2		33.3	33.3	0.0	0.0	33.3		0.0	75.0	25.0	0.0	0.0		
Total %	0.0	0.1	27.0	6.7	0.0	33.8	10.5	0.1	0.0	12.5	0.0	23.1	15.4	26.2	0.4	0.2	0.1	42.3	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.5	0.2	0.0	0.0	0.6	
Exiting Leg Total						463						281						507						4						6	1261

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Right	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Total
11:30 AM	0	0	49	10	0	59	11	0	0	21	0	32	23	46	0	1	0	70	0	0	0	0	0	0	0	2	0	0	0	2	163
11:45 AM	0	1	45	13	0	59	16	1	0	52	0	69	35	37	0	0	0	72	1	1	0	0	0	2	0	0	0	0	0	0	202
12:00 PM	0	0	36	12	0	48	16	0	0	11	0	27	26	43	0	0	0	69	0	0	0	0	1	1	0	0	0	0	0	0	145
12:15 PM	0	0	45	10	0	55	23	0	0	16	0	39	24	47	1	1	0	73	0	0	0	0	0	0	0	1	0	0	0	1	168
Total Volume	0	1	175	45	0	221	66	1	0	100	0	167	108	173	1	2	0	284	1	1	0	0	1	3	0	3	0	0	0	3	678
% Approach Total	0.0	0.5	79.2	20.4	0.0		39.5	0.6	0.0	59.9	0.0		38.0	60.9	0.4	0.7	0.0		33.3	33.3	0.0	0.0	33.3		0.0	100.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.893	0.865	0.000	0.936	0.717	0.250	0.000	0.481	0.000	0.605	0.771	0.920	0.250	0.500	0.000	0.973	0.250	0.250	0.000	0.000	0.250	0.375	0.000	0.375	0.000	0.000	0.000	0.375	0.839
Entering Leg	0	1	175	45	0	221	66	1	0	100	0	167	108	173	1	2	0	284	1	1	0	0	1	3	0	3	0	0	0	3	678
Exiting Leg						239						154						279						4						2	678
Total						460						321						563						7						5	1356

PDI File #: **197132 G**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane SW: Driveway**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	4	0	0	4	1	0	0	0	0	1	2	3	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	10
11:15 AM	0	0	3	1	0	4	4	0	0	0	0	4	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	13
11:30 AM	0	0	3	0	0	3	2	0	0	1	0	3	1	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	11
11:45 AM	0	0	3	2	0	5	2	0	0	2	0	4	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	10
Total	0	0	13	3	0	16	9	0	0	3	0	12	4	12	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	44
12:00 PM	0	0	2	1	0	3	1	0	0	1	0	2	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	7
12:15 PM	0	0	4	1	0	5	1	0	0	0	0	1	1	3	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	10
12:30 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
12:45 PM	0	0	2	0	0	2	0	0	0	1	0	1	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	0	9	2	0	11	2	0	0	2	0	4	1	8	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	24
Grand Total	0	0	22	5	0	27	11	0	0	5	0	16	5	20	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	68
Approach %	0.0	0.0	81.5	18.5	0.0		68.8	0.0	0.0	31.3	0.0		20.0	80.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	32.4	7.4	0.0	39.7	16.2	0.0	0.0	7.4	0.0	23.5	7.4	29.4	0.0	0.0	0.0	36.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						31						10						27						0						0	68
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total						0						0						0						0						0	0
Single-Unit Trucks	0	0	22	3	0	25	11	0	0	2	0	13	2	19	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	59
% Single-Unit	0.0	0.0	100.0	60.0	0.0	92.6	100.0	0.0	0.0	40.0	0.0	81.3	40.0	95.0	0.0	0.0	0.0	84.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.8
Exiting Leg Total						30						5						24						0						0	59
Articulated Trucks	0	0	0	2	0	2	0	0	0	3	0	3	3	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	9
% Articulated	0.0	0.0	0.0	40.0	0.0	7.4	0.0	0.0	0.0	60.0	0.0	18.8	60.0	5.0	0.0	0.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2
Exiting Leg Total						1						5						3						0						0	9

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	4	0	0	4	1	0	0	0	0	1	2	3	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	10
11:15 AM	0	0	3	1	0	4	4	0	0	0	0	4	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	13
11:30 AM	0	0	3	0	0	3	2	0	0	1	0	3	1	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	11
11:45 AM	0	0	3	2	0	5	2	0	0	2	0	4	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	10
Total Volume	0	0	13	3	0	16	9	0	0	3	0	12	4	12	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	44
% Approach Total	0.0	0.0	81.3	18.8	0.0		75.0	0.0	0.0	25.0	0.0		25.0	75.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.813	0.375	0.000	0.800	0.563	0.000	0.000	0.375	0.000	0.750	0.500	0.600	0.000	0.000	0.000	0.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.846
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	0	0	13	2	0	15	9	0	0	1	0	10	2	11	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	38
Single-Unit %	0.0	0.0	100.0	66.7	0.0	93.8	100.0	0.0	0.0	33.3	0.0	83.3	50.0	91.7	0.0	0.0	0.0	81.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.4
Articulated Trucks	0	0	0	1	0	1	0	0	0	2	0	2	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6
Articulated %	0.0	0.0	0.0	33.3	0.0	6.3	0.0	0.0	0.0	66.7	0.0	16.7	50.0	8.3	0.0	0.0	0.0	18.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	0	0	13	2	0	15	9	0	0	1	0	10	2	11	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	38
Articulated Trucks	0	0	0	1	0	1	0	0	0	2	0	2	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6

PDI File #: **197132 G**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane SW: Driveway**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
Total Entering Leg	0	0	13	3	0	16	9	0	0	3	0	12	4	12	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	44
Buses						0						0						0						0						0	0
Single-Unit Trucks						20						4						14						0						0	38
Articulated Trucks						1						3						2						0						0	6
Total Exiting Leg						21						7						16						0						0	44

PDI File #: **197132 G**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane SW: Driveway**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0						0						0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0						0						0	0
Total						0						0						0						0						0	0

PDI File #: **197132 G**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane SW: Driveway**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
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Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Single-Unit Trucks

	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	4	0	0	4	1	0	0	0	0	1	1	3	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	9
11:15 AM	0	0	3	1	0	4	4	0	0	0	0	4	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	13
11:30 AM	0	0	3	0	0	3	2	0	0	1	0	3	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	9
11:45 AM	0	0	3	1	0	4	2	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	7
Total	0	0	13	2	0	15	9	0	0	1	0	10	2	11	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	38
12:00 PM	0	0	2	1	0	3	1	0	0	0	0	1	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	6
12:15 PM	0	0	4	0	0	4	1	0	0	0	0	1	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	8
12:30 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
12:45 PM	0	0	2	0	0	2	0	0	0	1	0	1	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	0	9	1	0	10	2	0	0	1	0	3	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	21
Grand Total	0	0	22	3	0	25	11	0	0	2	0	13	2	19	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	59
Approach %	0.0	0.0	88.0	12.0	0.0		84.6	0.0	0.0	15.4	0.0		9.5	90.5	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	37.3	5.1	0.0	42.4	18.6	0.0	0.0	3.4	0.0	22.0	3.4	32.2	0.0	0.0	0.0	35.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						30						5						24						0						0	59

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Righ	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Righ	Bear Left	Hard Left	U-Turn	Total	Hard Righ	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	4	0	0	4	1	0	0	0	0	1	1	3	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	9
11:15 AM	0	0	3	1	0	4	4	0	0	0	0	4	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	13
11:30 AM	0	0	3	0	0	3	2	0	0	1	0	3	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	9
11:45 AM	0	0	3	1	0	4	2	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	7
Total Volume	0	0	13	2	0	15	9	0	0	1	0	10	2	11	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	38
% Approach Total	0.0	0.0	86.7	13.3	0.0		90.0	0.0	0.0	10.0	0.0		15.4	84.6	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.813	0.500	0.000	0.938	0.563	0.000	0.000	0.250	0.000	0.625	0.500	0.550	0.000	0.000	0.000	0.650	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.731
Entering Leg	0	0	13	2	0	15	9	0	0	1	0	10	2	11	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	38
Exiting Leg						20						4						14						0						0	38
Total						35						14						27						0						0	76

PDI File #: **197132 G**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane SW: Driveway**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Right	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
11:45 AM	0	0	0	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	1	0	1	0	0	0	2	0	2	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6
12:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
Grand Total	0	0	0	2	0	2	0	0	0	3	0	3	3	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	9
Approach %	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	100.0	0.0		75.0	25.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	22.2	0.0	22.2	0.0	0.0	0.0	33.3	0.0	33.3	33.3	11.1	0.0	0.0	0.0	44.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						1						5						3						0						0	9

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Lunenburg Road (Route 70) from North						Fort Pond Road from East						Lunenburg Road (Route 70) from South						Driveway from Southwest						Woods Lane from West						
	Right	Bear Right	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Total
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
11:45 AM	0	0	0	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
12:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	2	0	2	0	0	0	3	0	3	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	8
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	100.0	0.0		66.7	33.3	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.375	0.000	0.375	0.500	0.250	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.667
Entering Leg	0	0	0	2	0	2	0	0	0	3	0	3	2	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	8
Exiting Leg						1						4						3						0						0	8
Total						3						7						6						0						0	16

PDI File #: **197132 G**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane SW: Driveway**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Lunenburg Road (Route 70) from North								Fort Pond Road from East								Lunenburg Road (Route 70) from South								Driveway from Southwest								Woods Lane from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Approach %	0.0	0.0	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	50.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total								1								1								0								0								0	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North								Fort Pond Road from East								Lunenburg Road (Route 70) from South								Driveway from Southwest								Woods Lane from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg								0								1								0								0								0	1
Total								1								1								0								0								0	2

PDI File #: **197132 G**
Location: **N: Lunenburg Road (Route 70) S: Lunenburg Road (Route 70)**
Location: **E: Fort Pond Road W: Woods Lane SW: Driveway**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Lunenburg Road (Route 70) from North								Fort Pond Road from East								Lunenburg Road (Route 70) from South								Driveway from Southwest								Woods Lane from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total								0								0								0								0								0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Lunenburg Road (Route 70) from North								Fort Pond Road from East								Lunenburg Road (Route 70) from South								Driveway from Southwest								Woods Lane from West								
	Right	Bear Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	Hard Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-NWB	CW-SEB	Total	Hard Right	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg								0								0								0								0								0	0
Total								0								0								0								0								0	0

197132 H

Location: **N: Route 2 EB Ramps (Exit 35)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	28	2	0	30	0	12	0	12	10	27	0	37	79
11:15 AM	39	3	0	42	0	13	0	13	15	37	0	52	107
11:30 AM	38	2	0	40	2	17	0	19	17	44	0	61	120
11:45 AM	49	6	0	55	0	127	0	127	22	31	0	53	235
Total	154	13	0	167	2	169	0	171	64	139	0	203	541
12:00 PM	36	5	0	41	1	21	0	22	17	26	0	43	106
12:15 PM	43	5	0	48	0	20	0	20	19	27	0	46	114
12:30 PM	33	4	0	37	0	13	0	13	18	30	0	48	98
12:45 PM	40	4	0	44	0	15	0	15	12	36	0	48	107
Total	152	18	0	170	1	69	0	70	66	119	0	185	425
Grand Total	306	31	0	337	3	238	0	241	130	258	0	388	966
Approach %	90.8	9.2	0.0		1.2	98.8	0.0		33.5	66.5	0.0		
Total %	31.7	3.2	0.0	34.9	0.3	24.6	0.0	24.9	13.5	26.7	0.0	40.2	
Exiting Leg Total				261				161				544	966
Cars	293	31	0	324	3	238	0	241	129	235	0	364	929
% Cars	95.8	100.0	0.0	96.1	100.0	100.0	0.0	100.0	99.2	91.1	0.0	93.8	96.2
Exiting Leg Total				238				160				531	929
Heavy Vehicles	13	0	0	13	0	0	0	0	1	23	0	24	37
% Heavy Vehicles	4.2	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.8	8.9	0.0	6.2	3.8
Exiting Leg Total				23				1				13	37

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:30 AM	38	2	0	40	2	17	0	19	17	44	0	61	120
11:45 AM	49	6	0	55	0	127	0	127	22	31	0	53	235
12:00 PM	36	5	0	41	1	21	0	22	17	26	0	43	106
12:15 PM	43	5	0	48	0	20	0	20	19	27	0	46	114
Total Volume	166	18	0	184	3	185	0	188	75	128	0	203	575
% Approach Total	90.2	9.8	0.0		1.6	98.4	0.0		36.9	63.1	0.0		
PHF	0.847	0.750	0.000	0.836	0.375	0.364	0.000	0.370	0.852	0.727	0.000	0.832	0.612
Cars	158	18	0	176	3	185	0	188	74	111	0	185	549
Cars %	95.2	100.0	0.0	95.7	100.0	100.0	0.0	100.0	98.7	86.7	0.0	91.1	95.5
Heavy Vehicles	8	0	0	8	0	0	0	0	1	17	0	18	26
Heavy Vehicles %	4.8	0.0	0.0	4.3	0.0	0.0	0.0	0.0	1.3	13.3	0.0	8.9	4.5
Cars Enter Leg	158	18	0	176	3	185	0	188	74	111	0	185	549
Heavy Enter Leg	8	0	0	8	0	0	0	0	1	17	0	18	26
Total Entering Leg	166	18	0	184	3	185	0	188	75	128	0	203	575
Cars Exiting Leg				114				92				343	549
Heavy Exiting Leg				17				1				8	26
Total Exiting Leg				131				93				351	575

PDI File #: **197132 H**
Location: **N: Route 2 EB Ramps (Exit 35)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	26	2	0	28	0	12	0	12	10	25	0	35	75
11:15 AM	37	3	0	40	0	13	0	13	15	36	0	51	104
11:30 AM	36	2	0	38	2	17	0	19	17	39	0	56	113
11:45 AM	48	6	0	54	0	127	0	127	21	28	0	49	230
Total	147	13	0	160	2	169	0	171	63	128	0	191	522
12:00 PM	33	5	0	38	1	21	0	22	17	21	0	38	98
12:15 PM	41	5	0	46	0	20	0	20	19	23	0	42	108
12:30 PM	33	4	0	37	0	13	0	13	18	29	0	47	97
12:45 PM	39	4	0	43	0	15	0	15	12	34	0	46	104
Total	146	18	0	164	1	69	0	70	66	107	0	173	407
Grand Total	293	31	0	324	3	238	0	241	129	235	0	364	929
Approach %	90.4	9.6	0.0		1.2	98.8	0.0		35.4	64.6	0.0		
Total %	31.5	3.3	0.0	34.9	0.3	25.6	0.0	25.9	13.9	25.3	0.0	39.2	
Exiting Leg Total				238				160				531	929

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:30 AM	36	2	0	38	2	17	0	19	17	39	0	56	113
11:45 AM	48	6	0	54	0	127	0	127	21	28	0	49	230
12:00 PM	33	5	0	38	1	21	0	22	17	21	0	38	98
12:15 PM	41	5	0	46	0	20	0	20	19	23	0	42	108
Total Volume	158	18	0	176	3	185	0	188	74	111	0	185	549
% Approach Total	89.8	10.2	0.0		1.6	98.4	0.0		40.0	60.0	0.0		
PHF	0.823	0.750	0.000	0.815	0.375	0.364	0.000	0.370	0.881	0.712	0.000	0.826	0.597
Entering Leg	158	18	0	176	3	185	0	188	74	111	0	185	549
Exiting Leg				114				92				343	549
Total				290				280				528	1098

PDI File #: **197132 H**
Location: **N: Route 2 EB Ramps (Exit 35)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	2	0	0	2	0	0	0	0	0	2	0	2	4
11:15 AM	2	0	0	2	0	0	0	0	0	1	0	1	3
11:30 AM	2	0	0	2	0	0	0	0	0	5	0	5	7
11:45 AM	1	0	0	1	0	0	0	0	1	3	0	4	5
Total	7	0	0	7	0	0	0	0	1	11	0	12	19
12:00 PM	3	0	0	3	0	0	0	0	0	5	0	5	8
12:15 PM	2	0	0	2	0	0	0	0	0	4	0	4	6
12:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
12:45 PM	1	0	0	1	0	0	0	0	0	2	0	2	3
Total	6	0	0	6	0	0	0	0	0	12	0	12	18
Grand Total	13	0	0	13	0	0	0	0	1	23	0	24	37
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		4.2	95.8	0.0		
Total %	35.1	0.0	0.0	35.1	0.0	0.0	0.0	0.0	2.7	62.2	0.0	64.9	
Exiting Leg Total				23				1				13	37
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total				0				0				0	0
Single-Unit Trucks	9	0	0	9	0	0	0	0	1	19	0	20	29
% Single-Unit	69.2	0.0	0.0	69.2	0.0	0.0	0.0	0.0	100.0	82.6	0.0	83.3	78.4
Exiting Leg Total				19				1				9	29
Articulated Trucks	4	0	0	4	0	0	0	0	0	4	0	4	8
% Articulated	30.8	0.0	0.0	30.8	0.0	0.0	0.0	0.0	0.0	17.4	0.0	16.7	21.6
Exiting Leg Total				4				0				4	8

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:30 AM	2	0	0	2	0	0	0	0	0	5	0	5	7
11:45 AM	1	0	0	1	0	0	0	0	1	3	0	4	5
12:00 PM	3	0	0	3	0	0	0	0	0	5	0	5	8
12:15 PM	2	0	0	2	0	0	0	0	0	4	0	4	6
Total Volume	8	0	0	8	0	0	0	0	1	17	0	18	26
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		5.6	94.4	0.0		
PHF	0.667	0.000	0.000	0.667	0.000	0.000	0.000	0.000	0.250	0.850	0.000	0.900	0.813
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	5	0	0	5	0	0	0	0	1	14	0	15	20
Single-Unit %	62.5	0.0	0.0	62.5	0.0	0.0	0.0	0.0	100.0	82.4	0.0	83.3	76.9
Articulated Trucks	3	0	0	3	0	0	0	0	0	3	0	3	6
Articulated %	37.5	0.0	0.0	37.5	0.0	0.0	0.0	0.0	0.0	17.6	0.0	16.7	23.1
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	5	0	0	5	0	0	0	0	1	14	0	15	20
Articulated Trucks	3	0	0	3	0	0	0	0	0	3	0	3	6
Total Entering Leg	8	0	0	8	0	0	0	0	1	17	0	18	26
Buses				0				0				0	0
Single-Unit Trucks				14				1				5	20
Articulated Trucks				3				0				3	6
Total Exiting Leg				17				1				8	26

PDI File #: **197132 H**
Location: **N: Route 2 EB Ramps (Exit 35)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				0				0				0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg				0				0				0	0
Total				0				0				0	0

PDI File #: **197132 H**
Location: **N: Route 2 EB Ramps (Exit 35)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
11:15 AM	2	0	0	2	0	0	0	0	0	1	0	1	3
11:30 AM	2	0	0	2	0	0	0	0	0	3	0	3	5
11:45 AM	0	0	0	0	0	0	0	0	1	3	0	4	4
Total	5	0	0	5	0	0	0	0	1	8	0	9	14
12:00 PM	2	0	0	2	0	0	0	0	0	5	0	5	7
12:15 PM	1	0	0	1	0	0	0	0	0	3	0	3	4
12:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
12:45 PM	1	0	0	1	0	0	0	0	0	2	0	2	3
Total	4	0	0	4	0	0	0	0	0	11	0	11	15
Grand Total	9	0	0	9	0	0	0	0	1	19	0	20	29
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		5.0	95.0	0.0		
Total %	31.0	0.0	0.0	31.0	0.0	0.0	0.0	0.0	3.4	65.5	0.0	69.0	
Exiting Leg Total				19				1				9	29

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:30 AM	2	0	0	2	0	0	0	0	0	3	0	3	5
11:45 AM	0	0	0	0	0	0	0	0	1	3	0	4	4
12:00 PM	2	0	0	2	0	0	0	0	0	5	0	5	7
12:15 PM	1	0	0	1	0	0	0	0	0	3	0	3	4
Total Volume	5	0	0	5	0	0	0	0	1	14	0	15	20
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		6.7	93.3	0.0		
PHF	0.625	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.250	0.700	0.000	0.750	0.714
Entering Leg	5	0	0	5	0	0	0	0	1	14	0	15	20
Exiting Leg				14				1				5	20
Total				19				1				20	40

PDI File #: **197132 H**
Location: **N: Route 2 EB Ramps (Exit 35)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:00 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	2
11:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	2	0	0	2	0	0	0	0	0	3	0	3	5
12:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	2	0	0	0	0	0	1	0	1	3
Grand Total	4	0	0	4	0	0	0	0	0	4	0	4	8
Approach %	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	
Exiting Leg Total				4				0				4	8

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:30 AM	Route 2 EB Ramps (Exit 35)				Old Union Turnpike				Old Union Turnpike				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
11:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	2
11:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
12:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
Total Volume	3	0	0	3	0	0	0	0	0	3	0	3	6
% Approach Total	100.0	0.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.750	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.375	0.750
Entering Leg	3	0	0	3	0	0	0	0	0	3	0	3	6
Exiting Leg				3				0				3	6
Total				6				0				6	12

PDI File #: **197132 H**
Location: **N: Route 2 EB Ramps (Exit 35)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Route 2 EB Ramps (Exit 35)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
12:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
Grand Total	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	50.0	
Exiting Leg Total						0						1						1	2

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Route 2 EB Ramps (Exit 35)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
12:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.250	0.500
Entering Leg	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
Exiting Leg						0						1						1	2
Total						0						2						2	4

PDI File #: **197132 H**
Location: **N: Route 2 EB Ramps (Exit 35)**
Location: **E: Old Union Turnpike W: Old Union Turnpike**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Route 2 EB Ramps (Exit 35)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Route 2 EB Ramps (Exit 35)						Old Union Turnpike						Old Union Turnpike						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **197132 I**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	2	58	6	1	67	6	0	2	0	8	6	51	0	0	57	132
11:15 AM	1	0	1	0	2	0	66	1	0	67	0	0	6	0	6	4	57	0	0	61	136
11:30 AM	0	0	0	0	0	0	70	1	0	71	1	0	4	0	5	3	57	0	0	60	136
11:45 AM	0	0	0	0	0	0	66	5	0	71	0	0	3	0	3	3	63	0	0	66	140
Total	1	0	1	0	2	2	260	13	1	276	7	0	15	0	22	16	228	0	0	244	544
12:00 PM	0	0	0	0	0	0	67	2	0	69	2	0	3	0	5	6	71	0	0	77	151
12:15 PM	0	0	0	0	0	0	61	2	0	63	3	0	2	0	5	5	69	0	0	74	142
12:30 PM	1	0	0	0	1	0	57	5	0	62	4	0	6	0	10	1	71	1	0	73	146
12:45 PM	1	0	0	0	1	0	56	0	0	56	1	1	3	0	5	4	66	0	0	70	132
Total	2	0	0	0	2	0	241	9	0	250	10	1	14	0	25	16	277	1	0	294	571
Grand Total	3	0	1	0	4	2	501	22	1	526	17	1	29	0	47	32	505	1	0	538	1115
Approach %	75.0	0.0	25.0	0.0		0.4	95.2	4.2	0.2		36.2	2.1	61.7	0.0		5.9	93.9	0.2	0.0		
Total %	0.3	0.0	0.1	0.0	0.4	0.2	44.9	2.0	0.1	47.2	1.5	0.1	2.6	0.0	4.2	2.9	45.3	0.1	0.0	48.3	
Exiting Leg Total					4					524					54					533	1115
Cars	3	0	1	0	4	2	495	22	1	520	17	1	29	0	47	32	499	1	0	532	1103
% Cars	100.0	0.0	100.0	0.0	100.0	100.0	98.8	100.0	100.0	98.9	100.0	100.0	100.0	0.0	100.0	100.0	98.8	100.0	0.0	98.9	98.9
Exiting Leg Total					4					518					54					527	1103
Heavy Vehicles	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	6	0	0	6	12
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.1	1.1
Exiting Leg Total					0					6					0					6	12

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:45 AM	0	0	0	0	0	0	66	5	0	71	0	0	3	0	3	3	63	0	0	66	140
12:00 PM	0	0	0	0	0	0	67	2	0	69	2	0	3	0	5	6	71	0	0	77	151
12:15 PM	0	0	0	0	0	0	61	2	0	63	3	0	2	0	5	5	69	0	0	74	142
12:30 PM	1	0	0	0	1	0	57	5	0	62	4	0	6	0	10	1	71	1	0	73	146
Total Volume	1	0	0	0	1	0	251	14	0	265	9	0	14	0	23	15	274	1	0	290	579
% Approach Total	100.0	0.0	0.0	0.0		0.0	94.7	5.3	0.0		39.1	0.0	60.9	0.0		5.2	94.5	0.3	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.937	0.700	0.000	0.933	0.563	0.000	0.583	0.000	0.575	0.625	0.965	0.250	0.000	0.942	0.959
Cars	1	0	0	0	1	0	249	14	0	263	9	0	14	0	23	15	270	1	0	286	573
Cars %	100.0	0.0	0.0	0.0	100.0	0.0	99.2	100.0	0.0	99.2	100.0	0.0	100.0	0.0	100.0	100.0	98.5	100.0	0.0	98.6	99.0
Heavy Vehicles	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	1.4	1.0
Cars Enter Leg	1	0	0	0	1	0	249	14	0	263	9	0	14	0	23	15	270	1	0	286	573
Heavy Enter Leg	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
Total Entering Leg	1	0	0	0	1	0	251	14	0	265	9	0	14	0	23	15	274	1	0	290	579
Cars Exiting Leg					1					279					29					264	573
Heavy Exiting Leg					0					4					0					2	6
Total Exiting Leg					1					283					29					266	579

PDI File #: **197132 I**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	2	57	6	1	66	6	0	2	0	8	6	51	0	0	57	131
11:15 AM	1	0	1	0	2	0	66	1	0	67	0	0	6	0	6	4	56	0	0	60	135
11:30 AM	0	0	0	0	0	0	68	1	0	69	1	0	4	0	5	3	56	0	0	59	133
11:45 AM	0	0	0	0	0	0	66	5	0	71	0	0	3	0	3	3	61	0	0	64	138
Total	1	0	1	0	2	2	257	13	1	273	7	0	15	0	22	16	224	0	0	240	537
12:00 PM	0	0	0	0	0	0	66	2	0	68	2	0	3	0	5	6	70	0	0	76	149
12:15 PM	0	0	0	0	0	0	61	2	0	63	3	0	2	0	5	5	69	0	0	74	142
12:30 PM	1	0	0	0	1	0	56	5	0	61	4	0	6	0	10	1	70	1	0	72	144
12:45 PM	1	0	0	0	1	0	55	0	0	55	1	1	3	0	5	4	66	0	0	70	131
Total	2	0	0	0	2	0	238	9	0	247	10	1	14	0	25	16	275	1	0	292	566
Grand Total	3	0	1	0	4	2	495	22	1	520	17	1	29	0	47	32	499	1	0	532	1103
Approach %	75.0	0.0	25.0	0.0		0.4	95.2	4.2	0.2		36.2	2.1	61.7	0.0		6.0	93.8	0.2	0.0		
Total %	0.3	0.0	0.1	0.0	0.4	0.2	44.9	2.0	0.1	47.1	1.5	0.1	2.6	0.0	4.3	2.9	45.2	0.1	0.0	48.2	
Exiting Leg Total					4					518					54					527	1103

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:45 AM	0	0	0	0	0	0	66	5	0	71	0	0	3	0	3	3	61	0	0	64	138
12:00 PM	0	0	0	0	0	0	66	2	0	68	2	0	3	0	5	6	70	0	0	76	149
12:15 PM	0	0	0	0	0	0	61	2	0	63	3	0	2	0	5	5	69	0	0	74	142
12:30 PM	1	0	0	0	1	0	56	5	0	61	4	0	6	0	10	1	70	1	0	72	144
Total Volume	1	0	0	0	1	0	249	14	0	263	9	0	14	0	23	15	270	1	0	286	573
% Approach Total	100.0	0.0	0.0	0.0		0.0	94.7	5.3	0.0		39.1	0.0	60.9	0.0		5.2	94.4	0.3	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.943	0.700	0.000	0.926	0.563	0.000	0.583	0.000	0.575	0.625	0.964	0.250	0.000	0.941	0.961
Entering Leg	1	0	0	0	1	0	249	14	0	263	9	0	14	0	23	15	270	1	0	286	573
Exiting Leg					1					279					29					264	573
Total					2					542					52					550	1146

PDI File #: **197132 I**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
12:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
12:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
Grand Total	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	6	0	0	6	12
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	
Exiting Leg Total					0					6					0					6	12
Buses	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	33.3	41.7
Exiting Leg Total					0					2					0					3	5
Single-Unit Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	66.7	58.3
Exiting Leg Total					0					4					0					3	7
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exiting Leg Total					0					0					0					0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
12:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total Volume	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	8
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.625	0.667
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	20.0	25.0
Single-Unit Trucks	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	80.0	0.0	0.0	80.0	75.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Single-Unit Trucks	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Entering Leg	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	8
Buses					0					1					0					1	2
Single-Unit Trucks					0					4					0					2	6
Articulated Trucks					0					0					0					0	0
Total Exiting Leg					0					5					0					3	8

PDI File #: **197132 I**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
12:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Grand Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	40.0	
Exiting Leg Total					0					2					0					3	5

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.750
Entering Leg	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Exiting Leg					0					2					0					1	3
Total					0					3					0					3	6

PDI File #: **197132 I**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Grand Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	42.9	0.0	0.0	42.9	0.0	0.0	0.0	0.0	0.0	0.0	57.1	0.0	0.0	57.1	
Exiting Leg Total					0					4					0					3	7

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:15 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000	0.500
Entering Leg	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
Exiting Leg					0					4					0					2	6
Total					0					6					0					6	12

PDI File #: **197132 I**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					0					0					0					0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Driveway from North					Mechanic Street from East					Johnny Appleseed Lane from South					Mechanic Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg					0					0					0					0	0
Total					0					0					0					0	0

PDI File #: **197132 I**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
Grand Total	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	2	3
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	66.7	
Exiting Leg Total							0							2							0							1	3

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:45 AM	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.500	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
Exiting Leg							0							2							0							0	2
Total							0							2							0							2	4

PDI File #: **197132 I**
Location: **N: Driveway S: Johnny Appleseed Lane**
Location: **E: Mechanic Street W: Mechanic Street**
City, State: **Lancaster, MA**
Client: **TEC/L. Oltman**
Site Code: **T0852.02**
Count Date: **Saturday, August 17, 2019**
Start Time: **11:00 AM**
End Time: **1:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 11:00 AM to 01:00 PM begins at:

11:00 AM	Driveway from North							Mechanic Street from East							Johnny Appleseed Lane from South							Mechanic Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

Appendix F.2

Automatic Traffic Recorder (ATR) Counts

Lunenburg Road (Route 70)
north Kimball Farms
City, State: Lancaster, MA
Client: TEC / E. Oltman

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

186634 A Volume
Site Code: T0852

Start	12/18/18		12/19/18		12/20/18		12/21/18		12/22/18		12/23/18		12/24/18		Week Average	
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 AM	22	16	17	22	*	*	*	*	*	*	*	*	*	*	20	19
01:00	14	6	9	12	*	*	*	*	*	*	*	*	*	*	12	9
02:00	23	12	17	8	*	*	*	*	*	*	*	*	*	*	20	10
03:00	24	17	27	15	*	*	*	*	*	*	*	*	*	*	26	16
04:00	84	31	76	35	*	*	*	*	*	*	*	*	*	*	80	33
05:00	235	81	241	78	*	*	*	*	*	*	*	*	*	*	238	80
06:00	**352**	180	**362**	177	*	*	*	*	*	*	*	*	*	*	**357**	178
07:00	346	**343**	350	**328**	*	*	*	*	*	*	*	*	*	*	348	**336**
08:00	335	336	332	319	*	*	*	*	*	*	*	*	*	*	334	328
09:00	295	275	315	285	*	*	*	*	*	*	*	*	*	*	305	280
10:00	281	264	310	271	*	*	*	*	*	*	*	*	*	*	296	268
11:00	307	235	337	282	*	*	*	*	*	*	*	*	*	*	322	258
12:00 PM	273	250	304	302	*	*	*	*	*	*	*	*	*	*	288	276
01:00	318	277	371	308	*	*	*	*	*	*	*	*	*	*	**344**	292
02:00	314	358	363	382	*	*	*	*	*	*	*	*	*	*	338	370
03:00	**343**	504	331	478	*	*	*	*	*	*	*	*	*	*	337	491
04:00	287	**528**	**381**	**641**	*	*	*	*	*	*	*	*	*	*	334	**584**
05:00	261	527	360	555	*	*	*	*	*	*	*	*	*	*	310	541
06:00	226	346	253	418	*	*	*	*	*	*	*	*	*	*	240	382
07:00	168	196	245	246	*	*	*	*	*	*	*	*	*	*	206	221
08:00	130	175	149	154	*	*	*	*	*	*	*	*	*	*	140	164
09:00	84	121	110	171	*	*	*	*	*	*	*	*	*	*	97	146
10:00	56	58	68	79	*	*	*	*	*	*	*	*	*	*	62	68
11:00	30	45	34	49	*	*	*	*	*	*	*	*	*	*	32	47
Total	4808	5181	5362	5615	0	0	0	0	0	0	0	0	0	0	5086	5397
Day	9989		10977		0		0		0		0		0		10483	
AM Peak	06:00	07:00	06:00	07:00	-	-	-	-	-	-	-	-	-	-	06:00	07:00
Vol.	352	343	362	328	-	-	-	-	-	-	-	-	-	-	357	336
PM Peak	15:00	16:00	16:00	16:00	-	-	-	-	-	-	-	-	-	-	13:00	16:00
Vol.	343	528	381	641	-	-	-	-	-	-	-	-	-	-	344	584

Lunenburg Road (Route 70)
north Kimball Farms
City, State: Lancaster, MA
Client: TEC / E. Oltman

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

186634 A Volume
Site Code: T0852

Start	SB				NB				Combined				12/18/18
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	7		67		7		55		14		122		
12:15	6		63		3		69		9		132		
12:30	3		71		1		53		4		124		
12:45	6	22	72	273	5	16	73	250	11	38	145	523	
01:00	6		76		3		53		9		129		
01:15	3		82		1		83		4		165		
01:30	2		78		0		69		2		147		
01:45	3	14	82	318	2	6	72	277	5	20	154	595	
02:00	4		76		5		68		9		144		
02:15	7		76		4		83		11		159		
02:30	5		77		1		96		6		173		
02:45	7	23	85	314	2	12	111	358	9	35	196	672	
03:00	5		73		2		128		7		201		
03:15	4		95		8		135		12		230		
03:30	7		94		2		113		9		207		
03:45	8	24	81	343	5	17	128	504	13	41	209	847	
04:00	10		67		4		137		14		204		
04:15	16		73		6		142		22		215		
04:30	26		74		12		124		38		198		
04:45	32	84	73	287	9	31	125	528	41	115	198	815	
05:00	34		66		14		135		48		201		
05:15	43		67		21		114		64		181		
05:30	69		75		22		139		91		214		
05:45	89	235	53	261	24	81	139	527	113	316	192	788	
06:00	101		60		28		96		129		156		
06:15	89		66		36		104		125		170		
06:30	81		51		62		86		143		137		
06:45	81	352	49	226	54	180	60	346	135	532	109	572	
07:00	86		48		67		55		153		103		
07:15	89		44		77		56		166		100		
07:30	79		39		105		47		184		86		
07:45	92	346	37	168	94	343	38	196	186	689	75	364	
08:00	107		34		81		47		188		81		
08:15	67		36		76		35		143		71		
08:30	77		33		89		53		166		86		
08:45	84	335	27	130	90	336	40	175	174	671	67	305	
09:00	90		18		64		35		154		53		
09:15	64		17		71		38		135		55		
09:30	77		21		68		26		145		47		
09:45	64	295	28	84	72	275	22	121	136	570	50	205	
10:00	72		26		64		17		136		43		
10:15	85		14		76		21		161		35		
10:30	51		9		66		11		117		20		
10:45	73	281	7	56	58	264	9	58	131	545	16	114	
11:00	68		7		57		8		125		15		
11:15	67		13		50		13		117		26		
11:30	83		6		65		14		148		20		
11:45	89	307	4	30	63	235	10	45	152	542	14	75	
Total	2318		2490		1796		3385		4114		5875		
Percent	56.3%		42.4%		43.7%		57.6%						
Day Total		4808				5181				9989			
Peak	07:15	-	02:45	-	07:15	-	03:45	-	07:15	-	03:15	-	- -
Vol.	367	-	347	-	357	-	531	-	724	-	850	-	- -
P.H.F.	0.857		0.913		0.850		0.935		0.963		0.924		

Lunenburg Road (Route 70)
north Kimball Farms
City, State: Lancaster, MA
Client: TEC / E. Oltman

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

186634 A Volume
Site Code: T0852

Start	SB				NB				Combined				12/19/18
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	5		92		8		66		13		158		
12:15	4		82		6		88		10		170		
12:30	1		66		6		66		7		132		
12:45	7	17	64	304	2	22	82	302	9	39	146	606	
01:00	3		109		3		76		6		185		
01:15	4		86		3		74		7		160		
01:30	2		87		4		80		6		167		
01:45	0	9	89	371	2	12	78	308	2	21	167	679	
02:00	1		92		3		94		4		186		
02:15	5		92		1		88		6		180		
02:30	6		76		3		93		9		169		
02:45	5	17	103	363	1	8	107	382	6	25	210	745	
03:00	2		87		3		95		5		182		
03:15	7		79		3		131		10		210		
03:30	12		94		4		124		16		218		
03:45	6	27	71	331	5	15	128	478	11	42	199	809	
04:00	10		112		4		131		14		243		
04:15	10		101		10		155		20		256		
04:30	20		87		8		178		28		265		
04:45	36	76	81	381	13	35	177	641	49	111	258	1022	
05:00	38		95		15		139		53		234		
05:15	52		86		19		152		71		238		
05:30	62		91		16		133		78		224		
05:45	89	241	88	360	28	78	131	555	117	319	219	915	
06:00	80		70		25		154		105		224		
06:15	88		57		37		101		125		158		
06:30	94		62		47		86		141		148		
06:45	100	362	64	253	68	177	77	418	168	539	141	671	
07:00	93		73		61		49		154		122		
07:15	90		86		83		65		173		151		
07:30	80		39		98		87		178		126		
07:45	87	350	47	245	86	328	45	246	173	678	92	491	
08:00	108		44		80		39		188		83		
08:15	68		34		78		45		146		79		
08:30	74		34		94		41		168		75		
08:45	82	332	37	149	67	319	29	154	149	651	66	303	
09:00	78		39		90		47		168		86		
09:15	84		25		65		54		149		79		
09:30	72		20		69		35		141		55		
09:45	81	315	26	110	61	285	35	171	142	600	61	281	
10:00	64		25		62		22		126		47		
10:15	86		19		75		18		161		37		
10:30	71		16		60		24		131		40		
10:45	89	310	8	68	74	271	15	79	163	581	23	147	
11:00	79		17		70		9		149		26		
11:15	81		6		57		18		138		24		
11:30	92		7		77		14		169		21		
11:45	85	337	4	34	78	282	8	49	163	619	12	83	
Total	2393		2969		1832		3783		4225		6752		
Percent	56.6%		44.0%		43.4%		56.0%						
Day Total		5362				5615				10977			
Peak	06:30	-	04:00	-	07:15	-	04:15	-	07:15	-	04:00	-	-	-
Vol.	377	-	381	-	347	-	649	-	712	-	1022	-	-	-
P.H.F.	0.943		0.850		0.885		0.912		0.947		0.964			

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Lunenburg Road (Route 70)
north Kimball Farms
City, State: Lancaster, MA
Client: TEC / E. Oltman

186634 A Class
Site Code: T0852

SB

Start Time	Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
12/18/1														
8	1	16	3	0	0	1	0	1	0	0	0	0	0	22
01:00	0	6	3	1	4	0	0	0	0	0	0	0	0	14
02:00	1	9	3	2	3	5	0	0	0	0	0	0	0	23
03:00	0	16	6	0	2	0	0	0	0	0	0	0	0	24
04:00	0	61	16	0	6	1	0	0	0	0	0	0	0	84
05:00	1	154	59	1	14	1	1	1	2	1	0	0	0	235
06:00	1	225	85	1	28	5	0	2	4	1	0	0	0	352
07:00	1	261	65	2	11	3	0	2	1	0	0	0	0	346
08:00	2	240	61	5	13	3	3	4	4	0	0	0	0	335
09:00	0	211	60	2	14	3	1	0	4	0	0	0	0	295
10:00	1	201	51	3	12	7	3	0	3	0	0	0	0	281
11:00	0	207	63	1	17	7	2	4	6	0	0	0	0	307
12 PM	0	179	51	5	22	7	5	1	2	1	0	0	0	273
13:00	4	206	66	4	12	15	3	5	3	0	0	0	0	318
14:00	0	213	66	5	17	6	1	1	5	0	0	0	0	314
15:00	1	253	53	4	17	9	1	5	0	0	0	0	0	343
16:00	0	207	49	3	16	6	0	1	5	0	0	0	0	287
17:00	3	197	42	2	10	4	0	0	3	0	0	0	0	261
18:00	0	175	45	0	4	1	0	0	1	0	0	0	0	226
19:00	2	130	32	0	4	0	0	0	0	0	0	0	0	168
20:00	0	106	21	0	2	1	0	0	0	0	0	0	0	130
21:00	0	67	13	0	3	1	0	0	0	0	0	0	0	84
22:00	0	47	8	0	1	0	0	0	0	0	0	0	0	56
23:00	0	20	7	0	2	0	0	0	1	0	0	0	0	30
Total	18	3407	928	41	234	86	20	27	44	3	0	0	0	4808
Percent	0.4%	70.9%	19.3%	0.9%	4.9%	1.8%	0.4%	0.6%	0.9%	0.1%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	06:00	08:00	06:00	10:00	08:00	08:00	11:00	05:00				06:00
Vol.	2	261	85	5	28	7	3	4	6	1				352
PM Peak	13:00	15:00	13:00	12:00	12:00	13:00	12:00	13:00	14:00	12:00				15:00
Vol.	4	253	66	5	22	15	5	5	5	1				343

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north Kimball Farms
City, State: Lancaster, MA
Client: TEC / E. Oltman

186634 A Class
Site Code: T0852

SB

Start Time	Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
12/19/1														
8	0	13	3	0	0	1	0	0	0	0	0	0	0	17
01:00	0	4	1	0	3	1	0	0	0	0	0	0	0	9
02:00	0	10	3	2	1	1	0	0	0	0	0	0	0	17
03:00	0	17	5	0	1	3	0	0	1	0	0	0	0	27
04:00	0	53	17	0	5	0	0	1	0	0	0	0	0	76
05:00	1	154	58	0	19	2	1	2	4	0	0	0	0	241
06:00	0	234	85	3	27	3	0	5	5	0	0	0	0	362
07:00	0	269	61	3	8	3	0	1	4	1	0	0	0	350
08:00	1	248	49	6	18	4	3	1	2	0	0	0	0	332
09:00	0	225	55	1	20	6	1	1	6	0	0	0	0	315
10:00	0	218	57	2	17	2	3	2	9	0	0	0	0	310
11:00	1	236	63	0	20	3	2	2	10	0	0	0	0	337
12 PM	2	220	55	3	9	5	3	1	5	1	0	0	0	304
13:00	3	250	66	7	20	9	4	7	4	1	0	0	0	371
14:00	6	234	72	5	18	15	4	1	8	0	0	0	0	363
15:00	2	237	52	6	18	10	1	3	2	0	0	0	0	331
16:00	1	283	62	0	20	13	1	1	0	0	0	0	0	381
17:00	1	266	76	0	8	6	0	0	3	0	0	0	0	360
18:00	2	192	49	0	7	2	0	0	1	0	0	0	0	253
19:00	0	201	38	0	3	0	0	1	2	0	0	0	0	245
20:00	0	121	25	1	0	1	0	0	1	0	0	0	0	149
21:00	0	95	14	0	1	0	0	0	0	0	0	0	0	110
22:00	0	55	10	0	2	1	0	0	0	0	0	0	0	68
23:00	0	24	5	0	4	0	0	0	1	0	0	0	0	34
Total	20	3859	981	39	249	91	23	29	68	3	0	0	0	5362
Percent	0.4%	72.0%	18.3%	0.7%	4.6%	1.7%	0.4%	0.5%	1.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	05:00	07:00	06:00	08:00	06:00	09:00	08:00	06:00	11:00	07:00				06:00
Vol.	1	269	85	6	27	6	3	5	10	1				362
PM Peak	14:00	16:00	17:00	13:00	13:00	14:00	13:00	13:00	14:00	12:00				16:00
Vol.	6	283	76	7	20	15	4	7	8	1				381

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Lunenburg Road (Route 70)
north Kimball Farms
City, State: Lancaster, MA
Client: TEC / E. Oltman

186634 A Class
Site Code: T0852

NB

Start Time	Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
12/18/1														
8	0	10	4	1	0	0	0	0	1	0	0	0	0	16
01:00	0	5	0	0	1	0	0	0	0	0	0	0	0	6
02:00	0	8	3	0	0	0	0	0	1	0	0	0	0	12
03:00	0	8	5	0	0	4	0	0	0	0	0	0	0	17
04:00	0	18	7	0	1	5	0	0	0	0	0	0	0	31
05:00	0	50	20	1	4	5	0	1	0	0	0	0	0	81
06:00	0	104	35	4	19	13	0	3	0	1	0	0	1	180
07:00	2	248	61	3	5	17	1	1	4	1	0	0	0	343
08:00	2	264	57	0	10	3	0	0	0	0	0	0	0	336
09:00	1	188	58	3	13	5	0	2	4	1	0	0	0	275
10:00	0	188	47	1	13	6	0	3	5	1	0	0	0	264
11:00	1	170	33	2	15	7	0	4	3	0	0	0	0	235
12 PM	1	178	39	6	11	8	0	2	5	0	0	0	0	250
13:00	2	194	46	2	15	9	1	3	4	1	0	0	0	277
14:00	1	265	61	4	17	6	0	2	2	0	0	0	0	358
15:00	1	378	98	3	16	5	2	1	0	0	0	0	0	504
16:00	3	392	109	1	15	0	0	6	2	0	0	0	0	528
17:00	1	440	68	2	13	2	0	1	0	0	0	0	0	527
18:00	0	301	35	1	9	0	0	0	0	0	0	0	0	346
19:00	0	165	26	0	3	1	0	1	0	0	0	0	0	196
20:00	0	148	21	1	5	0	0	0	0	0	0	0	0	175
21:00	0	108	11	0	2	0	0	0	0	0	0	0	0	121
22:00	0	50	6	0	1	1	0	0	0	0	0	0	0	58
23:00	0	39	6	0	0	0	0	0	0	0	0	0	0	45
Total	15	3919	856	35	188	97	4	30	31	5	0	0	1	5181
Percent	0.3%	75.6%	16.5%	0.7%	3.6%	1.9%	0.1%	0.6%	0.6%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	07:00	06:00	06:00	07:00	07:00	11:00	10:00	06:00			06:00	07:00
Vol.	2	264	61	4	19	17	1	4	5	1			1	343
PM Peak	16:00	17:00	16:00	12:00	14:00	13:00	15:00	16:00	12:00	13:00				16:00
Vol.	3	440	109	6	17	9	2	6	5	1				528

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Lunenburg Road (Route 70)
north Kimball Farms
City, State: Lancaster, MA
Client: TEC / E. Oltman

186634 A Class
Site Code: T0852

NB

Start Time	Cycles	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
12/19/1														
8	0	18	3	1	0	0	0	0	0	0	0	0	0	22
01:00	0	8	2	0	1	0	0	0	1	0	0	0	0	12
02:00	0	6	1	0	0	0	0	0	1	0	0	0	0	8
03:00	0	8	3	0	0	4	0	0	0	0	0	0	0	15
04:00	1	18	7	1	2	6	0	0	0	0	0	0	0	35
05:00	0	49	13	0	7	5	0	2	2	0	0	0	0	78
06:00	2	109	32	2	16	11	0	3	2	0	0	0	0	177
07:00	0	236	60	2	9	13	2	2	3	1	0	0	0	328
08:00	2	237	56	3	9	7	0	1	4	0	0	0	0	319
09:00	2	212	41	0	11	8	2	3	5	1	0	0	0	285
10:00	0	192	49	2	17	1	0	4	6	0	0	0	0	271
11:00	2	183	53	4	18	11	0	5	5	1	0	0	0	282
12 PM	1	219	42	2	20	7	0	3	8	0	0	0	0	302
13:00	1	246	37	3	13	5	0	0	3	0	0	0	0	308
14:00	1	283	59	5	17	11	0	2	4	0	0	0	0	382
15:00	0	359	97	3	12	5	0	0	2	0	0	0	0	478
16:00	1	508	105	0	23	2	0	1	1	0	0	0	0	641
17:00	1	462	78	0	11	1	0	2	0	0	0	0	0	555
18:00	2	350	58	0	7	0	0	0	1	0	0	0	0	418
19:00	1	210	32	0	2	0	0	1	0	0	0	0	0	246
20:00	0	134	19	1	0	0	0	0	0	0	0	0	0	154
21:00	0	145	22	0	4	0	0	0	0	0	0	0	0	171
22:00	0	67	10	0	2	0	0	0	0	0	0	0	0	79
23:00	0	40	8	0	0	0	0	0	1	0	0	0	0	49
Total	17	4299	887	29	201	97	4	29	49	3	0	0	0	5615
Percent	0.3%	76.6%	15.8%	0.5%	3.6%	1.7%	0.1%	0.5%	0.9%	0.1%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	07:00	11:00	11:00	07:00	07:00	11:00	10:00	07:00				07:00
Vol.	2	237	60	4	18	13	2	5	6	1				328
PM Peak	18:00	16:00	16:00	14:00	16:00	14:00		12:00	12:00					16:00
Vol.	2	508	105	5	23	11		3	8					641

PRECISION
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Lunenburg Road (Route 70)
north Kimball Farms
City, State: Lancaster, MA
Client: TEC / E. Oltman

186634 A Speed
Site Code: T0852

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
12/18/ 18	0	0	0	0	0	3	0	7	5	4	3	0	0	22	58	51
01:00	0	0	0	0	0	0	3	1	4	3	3	0	0	14	60	53
02:00	0	0	0	0	0	3	1	6	8	4	1	0	0	23	55	50
03:00	0	0	0	0	0	1	1	3	13	5	0	1	0	24	56	52
04:00	0	0	0	0	1	0	2	14	35	21	9	**2**	0	84	58	53
05:00	**1**	0	0	0	0	0	13	49	103	51	16	2	0	235	57	52
06:00	1	0	0	0	0	3	19	80	146	**85**	**17**	1	0	**352**	56	52
07:00	1	0	0	1	0	3	12	92	**164**	61	11	0	**1**	346	55	51
08:00	0	**1**	0	0	0	2	**42**	104	125	53	8	0	0	335	55	50
09:00	0	0	0	0	0	6	42	**114**	106	21	5	1	0	295	53	49
10:00	0	0	**2**	0	1	**14**	30	99	89	35	10	0	1	281	54	49
11:00	0	0	0	**2**	**3**	2	24	103	118	50	3	2	0	307	54	50
12 PM	0	0	0	1	1	6	20	77	110	45	12	1	0	273	55	51
13:00	0	**1**	0	**2**	**4**	**19**	23	88	120	50	10	1	0	318	55	50
14:00	0	0	0	0	2	7	25	101	102	**60**	**15**	**2**	0	314	56	51
15:00	0	0	**2**	0	3	6	38	116	**126**	40	11	1	0	**343**	54	50
16:00	0	0	0	0	0	3	19	**118**	99	40	6	2	0	287	54	50
17:00	**1**	0	0	0	0	6	**39**	102	89	23	1	0	0	261	53	49
18:00	0	0	0	0	0	2	33	89	79	21	1	1	0	226	53	49
19:00	0	0	0	0	0	2	13	57	62	27	7	0	0	168	55	51
20:00	0	0	0	0	0	0	19	37	45	24	4	1	0	130	55	50
21:00	0	0	0	0	0	1	6	25	36	9	5	1	**1**	84	55	51
22:00	0	0	0	0	0	0	3	13	27	7	5	0	1	56	56	52
23:00	0	0	0	0	0	0	0	6	13	8	3	0	0	30	58	53
Total	4	2	4	6	15	89	427	1501	1824	747	166	19	4	4808		
%	0.1%	0.0%	0.1%	0.1%	0.3%	1.9%	8.9%	31.2%	37.9%	15.5%	3.5%	0.4%	0.1%			
AM Peak	05:00	08:00	10:00	11:00	11:00	10:00	08:00	09:00	07:00	06:00	06:00	04:00	07:00	06:00		
Vol.	1	1	2	2	3	14	42	114	164	85	17	2	1	352		
PM Peak	17:00	13:00	15:00	13:00	13:00	13:00	17:00	16:00	15:00	14:00	14:00	14:00	21:00	15:00		
Vol.	1	1	2	2	4	19	39	118	126	60	15	2	1	343		

Stats

15th Percentile :	44 MPH
50th Percentile :	49 MPH
85th Percentile :	55 MPH
95th Percentile :	58 MPH
Mean Speed(Average) :	50 MPH
10 MPH Pace Speed :	45-54 MPH
Number in Pace :	3325
Percent in Pace :	69.2%
Number of Vehicles > 50 MPH :	2395
Percent of Vehicles > 50 MPH :	49.8%

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
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Lunenburg Road (Route 70)
north Kimball Farms
City, State: Lancaster, MA
Client: TEC / E. Oltman

186634 A Speed
Site Code: T0852

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
12/19/ 18	0	0	0	0	0	0	1	4	6	5	1	0	0	17	57	52
01:00	0	0	0	0	0	1	0	4	2	2	0	0	0	9	55	49
02:00	0	0	0	0	0	0	3	3	8	2	1	0	0	17	55	51
03:00	0	0	0	0	0	0	3	5	14	4	1	0	0	27	55	51
04:00	0	0	0	0	1	0	3	13	37	13	6	3	0	76	58	53
05:00	0	0	0	0	0	0	11	56	97	64	7	**6**	0	241	57	52
06:00	0	0	0	0	0	3	36	99	**140**	**71**	11	2	0	**362**	56	51
07:00	0	0	0	**4**	1	3	31	98	131	63	**14**	4	**1**	350	56	51
08:00	0	0	0	0	2	2	37	**112**	118	48	13	0	0	332	55	50
09:00	0	0	0	2	0	7	24	109	123	45	4	1	0	315	54	50
10:00	0	0	**1**	0	**5**	12	21	101	117	46	6	1	0	310	54	50
11:00	**2**	0	0	1	2	**13**	**38**	102	126	43	10	0	0	337	54	49
12 PM	1	0	0	**2**	3	4	28	96	121	40	6	**3**	0	304	54	50
13:00	1	0	0	2	1	5	33	131	121	**62**	**14**	1	0	371	55	50
14:00	**2**	**2**	**1**	1	**4**	**12**	61	136	108	30	4	2	0	363	53	48
15:00	1	1	0	1	2	0	41	115	**124**	40	5	0	**1**	331	53	49
16:00	0	0	0	0	2	3	52	149	117	50	8	0	0	**381**	54	49
17:00	0	0	0	0	1	9	**75**	**159**	92	20	3	1	0	360	52	48
18:00	0	0	0	0	0	10	50	85	83	23	1	1	0	253	53	48
19:00	0	0	0	0	0	1	36	95	81	24	5	3	0	245	53	49
20:00	0	0	0	0	0	0	25	58	50	14	2	0	0	149	53	49
21:00	0	0	0	0	0	1	17	44	31	11	6	0	0	110	54	49
22:00	0	0	0	0	0	1	4	18	25	10	8	2	0	68	58	52
23:00	0	0	0	0	0	0	5	7	10	9	3	0	0	34	57	52
Total	7	3	2	13	24	87	635	1799	1882	739	139	30	2	5362		
%	0.1%	0.1%	0.0%	0.2%	0.4%	1.6%	11.8%	33.6%	35.1%	13.8%	2.6%	0.6%	0.0%			
AM Peak	11:00		10:00	07:00	10:00	11:00	11:00	08:00	06:00	06:00	07:00	05:00	07:00	06:00		
Vol.	2		1	4	5	13	38	112	140	71	14	6	1	362		
PM Peak	14:00	14:00	14:00	12:00	14:00	14:00	17:00	17:00	15:00	13:00	13:00	12:00	15:00	16:00		
Vol.	2	2	1	2	4	12	75	159	124	62	14	3	1	381		

Stats

15th Percentile :	44 MPH
50th Percentile :	49 MPH
85th Percentile :	54 MPH
95th Percentile :	58 MPH
Mean Speed(Average) :	50 MPH
10 MPH Pace Speed :	45-54 MPH
Number in Pace :	3681
Percent in Pace :	68.6%
Number of Vehicles > 50 MPH :	2416
Percent of Vehicles > 50 MPH :	45.1%

PRECISION
D A T A
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Lunenburg Road (Route 70)
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186634 A Speed
Site Code: T0852

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
12/18/ 18	0	0	0	0	0	0	2	7	5	2	0	0	0	16	53	49
01:00	0	0	0	0	0	1	2	2	1	0	0	0	0	6	49	45
02:00	0	0	0	0	0	0	0	7	4	0	0	**1**	0	12	52	50
03:00	0	0	0	**2**	1	1	6	3	4	0	0	0	0	17	50	43
04:00	0	0	0	0	1	1	5	14	8	2	0	0	0	31	52	47
05:00	0	0	0	0	0	3	13	32	24	8	1	0	0	81	53	48
06:00	0	0	0	0	**3**	15	34	66	59	3	0	0	0	180	51	47
07:00	0	0	0	0	2	**17**	**62**	**140**	106	14	2	0	0	**343**	52	48
08:00	0	0	**1**	0	0	5	50	139	**118**	**22**	1	0	0	336	52	48
09:00	0	0	0	1	1	12	45	137	71	7	1	0	0	275	51	47
10:00	0	0	1	0	3	11	33	108	90	16	2	0	0	264	52	48
11:00	0	0	1	0	2	10	24	86	90	19	**3**	0	0	235	53	49
12 PM	0	0	**2**	**1**	2	13	48	77	90	14	3	0	0	250	52	48
13:00	0	**1**	1	0	**4**	4	33	101	111	20	2	0	0	277	53	49
14:00	0	0	0	1	4	11	49	133	**139**	17	**4**	0	0	358	52	48
15:00	0	0	1	0	0	9	70	**261**	138	**22**	2	**1**	0	504	52	48
16:00	0	0	0	0	0	24	140	235	117	11	1	0	0	**528**	51	47
17:00	0	0	0	0	2	**47**	**170**	243	58	5	2	0	0	527	48	45
18:00	0	0	0	0	0	8	113	162	57	4	2	0	0	346	49	46
19:00	0	0	0	0	0	7	31	95	51	10	2	0	0	196	52	48
20:00	0	0	0	0	1	5	29	79	52	7	2	0	0	175	52	48
21:00	0	0	0	0	0	6	22	50	36	6	1	0	0	121	52	48
22:00	0	0	0	0	0	0	6	24	22	5	1	0	0	58	53	50
23:00	0	0	0	0	0	3	8	17	10	7	0	0	0	45	54	48
Total	0	1	7	5	26	213	995	2218	1461	221	32	2	0	5181		
%	0.0%	0.0%	0.1%	0.1%	0.5%	4.1%	19.2%	42.8%	28.2%	4.3%	0.6%	0.0%	0.0%			
AM Peak			08:00	03:00	06:00	07:00	07:00	07:00	08:00	08:00	11:00	02:00		07:00		
Vol.			1	2	3	17	62	140	118	22	3	1		343		
PM Peak		13:00	12:00	12:00	13:00	17:00	17:00	15:00	14:00	15:00	14:00	15:00		16:00		
Vol.		1	2	1	4	47	170	261	139	22	4	1		528		

Stats

15th Percentile :	41 MPH
50th Percentile :	47 MPH
85th Percentile :	52 MPH
95th Percentile :	53 MPH
Mean Speed(Average) :	47 MPH
10 MPH Pace Speed :	45-54 MPH
Number in Pace :	3679
Percent in Pace :	71.0%
Number of Vehicles > 50 MPH :	1424
Percent of Vehicles > 50 MPH :	27.5%

PRECISION
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186634 A Speed
Site Code: T0852

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
12/19/ 18	0	0	0	0	0	0	0	9	8	3	1	1	0	22	56	52
01:00	0	0	0	0	0	2	2	6	1	1	0	0	0	12	49	46
02:00	0	0	0	0	0	1	0	3	3	1	0	0	0	8	53	49
03:00	0	0	0	0	1	0	3	6	4	1	0	0	0	15	52	47
04:00	0	0	0	0	0	5	2	10	16	2	0	0	0	35	52	48
05:00	0	0	0	0	1	3	10	32	26	5	1	0	0	78	52	48
06:00	0	0	0	1	0	9	42	68	48	7	0	**2**	0	177	52	47
07:00	0	0	**3**	**3**	3	15	**75**	121	99	9	0	0	0	**328**	51	47
08:00	0	0	0	1	1	8	44	**148**	96	16	**5**	0	0	319	52	48
09:00	0	0	0	1	3	7	43	124	87	16	3	1	0	285	52	48
10:00	0	0	0	1	**6**	2	33	99	**113**	13	2	2	0	271	52	49
11:00	0	**1**	0	0	3	**19**	38	115	85	**20**	1	0	0	282	52	48
12 PM	0	0	0	0	**8**	8	35	119	103	**25**	**4**	0	0	302	53	48
13:00	**1**	0	0	1	6	13	36	131	102	15	2	0	**1**	308	52	48
14:00	0	0	**1**	2	1	10	64	172	110	20	2	0	0	382	52	48
15:00	0	0	1	**4**	5	15	68	212	**152**	21	0	0	0	478	52	48
16:00	0	0	0	0	0	20	**202**	**301**	101	15	2	0	0	**641**	50	46
17:00	0	0	0	3	2	**45**	156	261	77	10	1	0	0	555	49	46
18:00	0	0	0	0	1	21	130	188	67	10	1	0	0	418	50	46
19:00	0	0	0	0	1	5	67	115	51	6	1	0	0	246	51	47
20:00	0	0	0	0	0	11	25	67	36	10	2	**2**	1	154	52	48
21:00	0	0	0	0	0	7	48	80	32	2	2	0	0	171	50	46
22:00	0	0	0	0	0	0	6	24	34	13	2	0	0	79	55	51
23:00	0	0	0	0	0	0	5	18	17	8	1	0	0	49	55	50
Total	1	1	5	17	42	226	1134	2429	1468	249	33	8	2	5615		
%	0.0%	0.0%	0.1%	0.3%	0.7%	4.0%	20.2%	43.3%	26.1%	4.4%	0.6%	0.1%	0.0%			
AM Peak		11:00	07:00	07:00	10:00	11:00	07:00	08:00	10:00	11:00	08:00	06:00		07:00		
Vol.		1	3	3	6	19	75	148	113	20	5	2		328		
PM Peak	13:00		14:00	15:00	12:00	17:00	16:00	16:00	15:00	12:00	12:00	20:00	13:00	16:00		
Vol.	1		1	4	8	45	202	301	152	25	4	2	1	641		

Stats

15th Percentile :	41 MPH
50th Percentile :	46 MPH
85th Percentile :	52 MPH
95th Percentile :	54 MPH
Mean Speed(Average) :	47 MPH
10 MPH Pace Speed :	45-54 MPH
Number in Pace :	3897
Percent in Pace :	69.4%
Number of Vehicles > 50 MPH :	1466
Percent of Vehicles > 50 MPH :	26.1%

Appendix F.3

Seasonal Adjustment Data

Seasonal Adjustment

Project: T0852 - Capital Commerce Center - Lancaster, Massachusetts
Date: September 4, 2019
Analyst: TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source: MassDOT Permanent Count Station #34

	STATION 34 - LANCASTER - RTE.2 - WEST OF RTE.70													April Seasonal Adjustment	August Seasonal Adjustment	December Seasonal Adjustment
YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR			
16	48,359	54,181	55,218	56,581	58,854	60,613	58,377	60,920	57,668	58,375	57,216	53,307	56,639	0.1%	-7.6%	5.9%
17	51,048	50,853	53,637	54,355	56,934	59,006	56,546	59,116	57,559	58,141	55,096	52,436	55,394	1.9%	-6.7%	5.3%
												Seasonal Average =		1.0%	-7.1%	5.6%

Appendix F.4

Road Safety Audit

ROAD SAFETY AUDIT

Main Street (Route 70 / Route 117) @
Lunenburg Road (Route 70)

Town of Lancaster

May 27, 2017

Prepared For:
Massachusetts Department of Transportation (MassDOT)
Highway Division – District 3

Town of Lancaster, Massachusetts

Prepared By:
TEC, Inc.
65 Glenn Street
Lawrence, MA 01843

Table of Contents

Contents

Background **1**

Project Data **1**

Project Location and Description **3**

Audit Observations and Potential Safety Enhancements **7**

Summary of Road Safety Audit **18**

List of Appendices

Appendix A. RSA Meeting Agenda
Appendix B. RSA Audit Team Contact List
Appendix C. Detailed Crash Data
Appendix D. Additional Information
Appendix E. Road Safety Audit References

List of Figures

Figure 1: Locus Map 4

List of Tables

Table 1: Participating Audit Team Members 2
Table 2: Existing Traffic Volume Summary 5
Table 3: Crash Rates by Intersection 6
Table 4: Estimated Time Frame and Costs Breakdown 19
Table 5: Potential Safety Enhancement Summary 20

Background

The Town of Lancaster, Massachusetts is currently planning improvements along the Main Street corridor, specifically at the intersections with Lunenburg Road and Seven Bridge Road, to address existing operational and safety concerns. TEC, Inc. (TEC) has been retained by the Town of Lancaster to specifically evaluate the existing traffic safety characteristics at the intersection of Main Street (Route 70 / Route 117) / Lunenburg Road (Route 70), an intersection designated as a high crash location for the region.

Road Safety Audit Justification

In conjunction with the preliminary design (pre-25% Design) stage and Functional Design Report (FDR) for these improvements, TEC is submitting this Road Safety Audit (RSA) report for the intersection of Main Street / Lunenburg Road (Route 70) in Lancaster, Massachusetts. An RSA, as defined by the Federal Highway Administration (FHWA), is the *formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team.* The purpose of the RSA is to observe, identify, and report all safety issues and identify future opportunities for safety enhancement improvements for all roadway users. This includes identifying short-term, mid-term, and long-term safety improvements that can be implemented through general maintenance, immediate installation / removal, or could be potentially incorporated into future improvement projects.

The U.S. Congress enacted the "Safe, Accountable, Flexible, Efficient, Transportation Act - A Legacy for Users" (SAFETEA-LU) in August 2005. This act provides guidance and funding for the implementation of a State Highway Safety Improvement Program (HSIP). As part of this Program, all states are required to develop a Strategic Highway Safety Plan (SHSP). The Massachusetts Department of Transportation (MassDOT) guidelines require an RSA be conducted where HSIP-eligible crash clusters are present within the study area of a transportation improvement project prior to commencing or finalizing a 25% Design. An intersection is defined as HSIP-eligible if the intersection is within the top five (5) percent of clusters in its respective Regional Planning Commission (RPC) boundaries based on Equivalent Property Damage Only (EPDO). EPDO rates crashes based on the crash severity.

Based on the published MassDOT database, the intersection of Main Street / Lunenburg Road is designated as a 2012-2014 HSIP Crash Cluster.

Project Data

TEC of Lawrence, Massachusetts is the primary traffic safety investigation consultant in this RSA for the intersection of Main Street / Lunenburg Road in Lancaster, Massachusetts. The RSA meeting was conducted on Thursday, May 4, 2017 at 9:00 AM, with the pre- and post-audit meetings held in the auditorium at the Lancaster Town Hall, located at 695 Main Street in Lancaster, Massachusetts. A copy of the RSA agenda can be found in Appendix A. TEC also conducted various field visits to the audit location as part of its scoping and planning during the preliminary design stage.

As presented below in Table 1, the audit team consisted of a cross-section of state, regional, and local engineering, enforcement, maintenance, and emergency response professionals and was assembled in

conjunction with input from MassDOT's Traffic Safety Management Unit. Contact information for all participating audit team members is provided in Appendix B.

Table 1: Participating Audit Team Members

Audit Team Member	Agency/Affiliation
Noreen Piazza	Lancaster Town Planner
Everett Moody	Lancaster Police Department
Courtney Manning	Lancaster Fire Department
Kevin Bartlett	Lancaster Department of Public Works
Sheri Bean	Montachusett Regional Planning Commission
George Snow	Montachusett Regional Planning Commission
Elsa Chan	MassDOT Traffic Safety
Christopher Falcos	MassDOT Traffic Safety
Connor Keating	MassDOT Traffic Safety
Lori Shattuck	MassDOT District 3
Lola Campbell	MassDOT District 3
Samuel Gregorio	TEC, Inc.
Douglas Halpert	TEC, Inc.

Audit participants were provided with materials to review prior to the audit meeting. The materials included a summary of crash data, collision diagrams (See Appendix), a summary of the type and severity of crashes, and traffic volume data. Participants were encouraged to visit the site prior to the audit and were urged to consider elements on MassDOT's Safety Review Prompt List.

On the day of the audit, a pre-audit meeting was held to discuss the project's background, the audit process, review the distributed materials, and discuss some of the issues that Team members had observed individually. The audit site walk consisted of field observations at the audit intersection. Handwritten notes and photographs documented the observations made by audit team members during the site walk. Following the audit site walk, a post-audit meeting was held where the Team confirmed the observations made in the field and offered solutions to enhance the safety of areas noted in the site walk and pre-audit meeting.

Project Location and Description

The RSA was conducted at the intersection of Main Street / Lunenburg Road in Lancaster, Massachusetts. A study area location map is provided in Figure 1. A detailed description of the study area roadways and intersections is provided below:

Existing Geometry and Infrastructure Summary

Main Street (Route 70 / Route 117)

Main Street, signed as MA State Route 117 west of the audit intersection and both MA State Route 70 and MA State Route 117 east of the audit intersection, is a two-lane, northwest-southeast urban principal arterial roadway under jurisdiction and maintained by the Town of Lancaster. The roadway is also designated as a National Highway System (NHS) roadway. Main Street provides connection between the City of Leominster to the west and the Town of Clinton to the south. In the vicinity of the audit area, Main Street is approximately 30 to 35 feet wide. Directional flow along Main Street is separated by a marked centerline. A posted speed limit of 30 miles per hour (mph) is present on the corridor; however MassDOT speed regulations indicate that Main Street is regulated at 40 mph in the vicinity of the intersection. A 20 mph speed for the school zone when signage is flashing is present is present to the east of the audit area. Land uses along Main Street generally include residential uses. A sidewalk is present along the southerly side of Main Street. There are no bicycle accommodations provided along Main Street.

Lunenburg Road (Route 70)

Lunenburg Road, signed as MA State Route 70, is a two-lane, north-south urban minor arterial roadway under jurisdiction and maintained by the Town of Lancaster. The roadway provides local connection between the Town of Lunenburg to the north and Main Street to the south. In the vicinity of the audit area, Lunenburg Road is approximately 40 feet wide. Directional flow along Lunenburg Road is separated by a marked centerline. A posted/regulated speed limit of 25 miles per hour (mph) is present along Lunenburg Road southbound approaching the intersection. Generally, the posted/regulated speed along the corridor is 45 mph to the north of the audit intersection. Land uses along Lunenburg Road generally include residential use. There are no sidewalks or bicycle accommodations provided along Lunenburg Road.

Intersection: Main Street (Route 70 / Route 117) / Lunenburg Road (Route 70)

Lunenburg Road intersects Main Street to form a three-legged, unsignalized intersection. The Lunenburg Road southbound approach operates under STOP-control and consists of an exclusive left-turn lane and an exclusive right-turn lane with separation of directional flow separated by a marked double-yellow centerline and an approximately seven foot long raised median island at the intersection. The Main Street eastbound and westbound approaches operate under free-flow conditions and with each approach consisting of a single general-purpose lane. Directional flow along the roadway is separated by a marked centerline. Sidewalks are provided along the southerly side of Main Street. There are no crosswalks or bicycle accommodations provided at the intersection.

1" = 20'

Lunenburg Road (Route 70) at Main Street (Route 117) - Lancaster, Massachusetts

Road Safety Audit

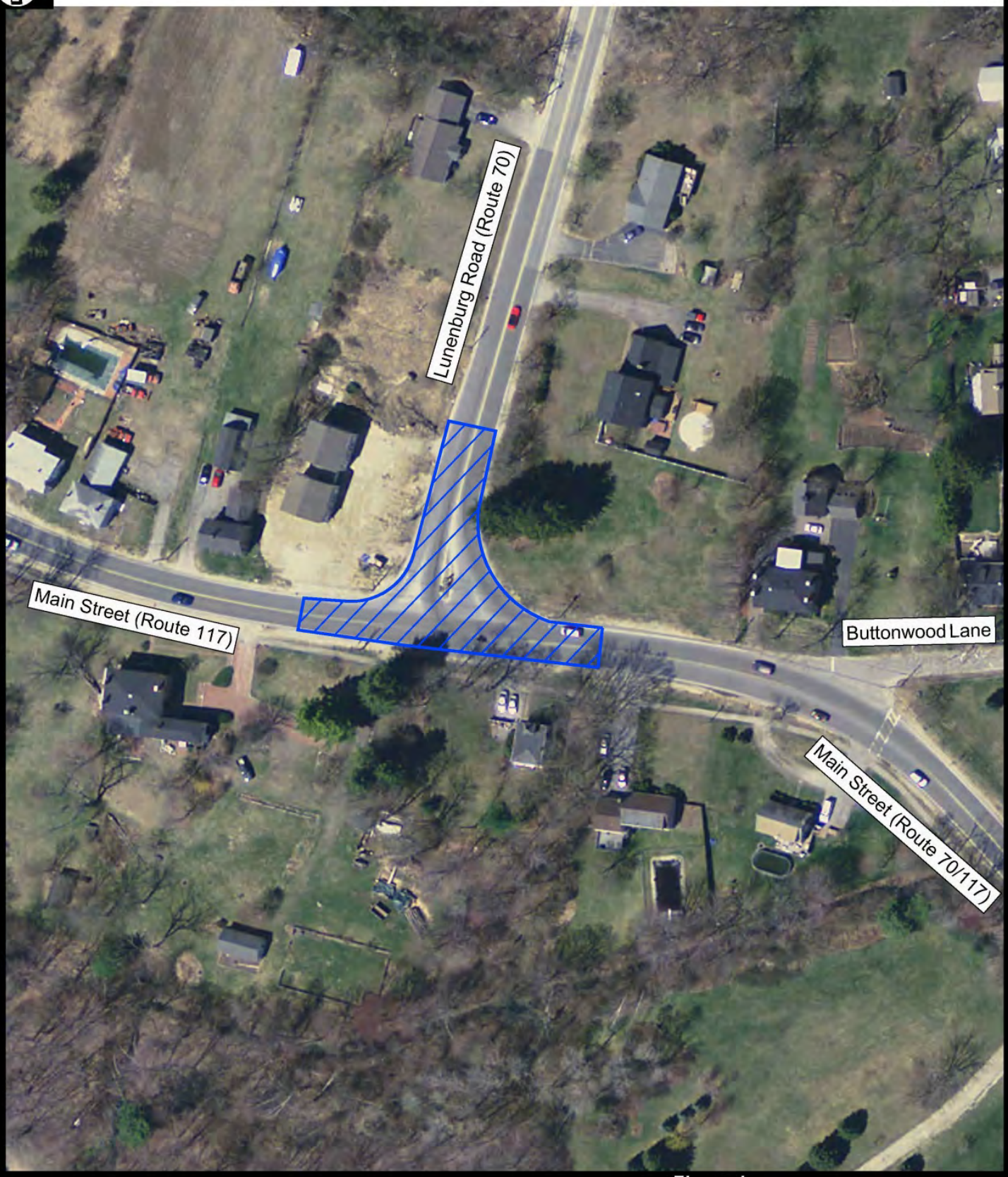


Figure 1

Project Location Map & Study Area Intersections

TEC

T:\T0698\CAD\Highway\Graphics\T0698_RSA__Locus Map.dwg 5/1/2017 4:34:54 PM

Automatic Traffic Recorder Count Data

Automatic Traffic Recorder (ATR) counts were conducted by MassDOT on behalf of the Montachusett Regional Planning Commission (MRPC) on Main Street between Shirley Road and Lunenburg Road and on Lunenburg Road north of Main Street from Tuesday, December 1, 2015 to Wednesday, December 2, 2015 to record traffic volumes during a continuous 48-hour period. The counts were used to collect volume, speed, and vehicle classification information. A summary of the weekday ATR traffic data is presented in Table 2.

Table 2: Existing Traffic Volume Summary

Location	Weekday Traffic Volume[a]	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Traffic Volume[b]	K Factor[c]	Directional Distribution[d]	Traffic Volume	K Factor	Directional Distribution
Route 117 (between Shirley Road and Lunenburg Road)	19,550	1,486	7.6%	65.3% EB	1,667	8.5%	66.0% WB
Route 70 (North of Route 117)	8,150	518	6.4%	66.6% SB	713	8.8%	60.6% NB

Main Street carries approximately 19,550 vehicles-per-day (vpd) on an average weekday between Shirley Road and Lunenburg Road. The majority of vehicles along Main Street are travelling eastbound in the weekday morning peak period and westbound during the weekday evening peak period. The directional distribution is almost split in reciprocal favor during the weekday morning and weekday evening peak hours, confirming heavy commuters travel to / from Interstate 495.

Lunenburg Road carries approximately 8,150 vehicles-per-day (vpd) on an average weekday. The majority of vehicles along Lunenburg Road are travelling southbound in the weekday morning peak period and northbound during the weekday evening peak period. Similar to Main Street, the directional distribution is almost split in reciprocal favor during the weekday morning and weekday evening peak hours, confirming heavy commuters travel to / from Interstate 495.

Speed Data

The ATR counts that were conducted from Tuesday, December 1, 2015 to Wednesday, December 2, 2015 included an evaluation of travel speeds for all vehicles during the course of the 48-hour period. This speed data indicated an 85th percentile speed along Main Street of 39 mph and 38 mph in the eastbound and westbound directions, respectively. The 85th percentile speeds along Main Street increase to 40 mph and 41 mph west of Lunenburg Road in the eastbound and westbound directions, respectively. This speed data also indicated an 85th percentile speed along Lunenburg Road is approximately 45 mph and 43 mph in the northbound and southbound directions, respectively. The data along Lunenburg Road was provided from a location further upstream along the roadway.

General Crash History

Crash data for the Main Street / Lunenburg Road intersection was compiled and analyzed for the most-recent consecutive five-year period (2012-2016) on file with the Town of Lancaster Police Department

and MassDOT. The motor vehicle crash data was reviewed to determine if any crash trends exist within the study area.

In addition to examining the number of crashes at the study area intersection, a crash rate was calculated to compare the occurrence of crashes to the volume of traffic passing through the intersection. The crash rate per million entering vehicles (MEV) was calculated using the evening peak-hour volumes from the TMCs, and the K-factor of 0.085 was obtained from ATR counts conducted along Main Street between Shirley Road and Lunenburg Road. The crash rates at the study area intersections were compared to the statewide and district-wide averages published by MassDOT in February 2016 to determine the significance of the crash occurrence. The statewide average for unsignalized intersections is 0.58 crashes per MEV and the District 3 average for unsignalized intersections is 0.65 crashes per MEV.

The crash rates per MEV for the Main Street / Lunenburg Road intersection is provided in Table 3.

Table 3: Crash Rates by Intersection

Intersection	Total Crashes	Crash Rate
Main Street / Lunenburg Road	39	0.94

The Main Street / Lunenburg Road intersection experienced an average of approximately eight (7.8) crashes per year over the five-year (2012-2016) study period, yielding a crash rate of 0.94 crashes per MEV, significantly above the statewide and District 3 averages for unsignalized intersections. Approximately 30 percent (12 of 39) of the crashes were rear-end crashes, 40 percent (15 of 39) were angled crashes, 25 percent (10 of 39) of the crashes were single vehicle crashes, and the remaining 5 percent (2 of 39) of the crashes were equally distributed amongst head-on and other/not reported crashes.

The reported ages of the drivers were polarized, with 66 percent under 21, between the ages of 21 and 30 and between 51 and 60, comprising over half of the motorists involved in the crashes. Of the reported crashes, 44 percent (17 of 39) were attributed to “inattention/distracted”, 21 percent (8 of 39) were “failure to yield right-of-way” or “other /not reported”.

There were nine (9) crashes reported to have occurred during wet and an additional 4 crashes in snow or ice covered roadway conditions. The pavement along the Lunenburg Road southbound approach is in poor condition with rutting and settling from heavy vehicles decelerating and coming to a stop just north of Main Street. During peak hours, vehicle queues along the southbound approach have been observed by audit participants to exceed 30 vehicles. It is likely that vehicle fluids are discharged over time while waiting in the queue. Combined with the lack of a crowned roadway to lead water efficiently to the catch basins, water likely mixes with vehicle oils and creates a slippery driving surface. Other key crash characteristics are highlighted in the following observations section.

Audit Observations and Potential Safety Enhancements

Pre- and post-RSA site walk meetings were held in the auditorium at the Town Hall, located at 695 Main Street in Lancaster, Massachusetts. The pre-audit meeting included brief introductions, an overview of the future design project and RSA process, and an overview of the safety characteristics of the Main Street / Lunenburg Road intersection. Each participant was asked to provide his or her concerns and comments related to the safety issues at the study area intersection. At the end of discussion about the intersection's deficiencies, the group participated in a site walk to observe. After the group's site walk concluded, the meeting was reconvened to discuss potential countermeasures for concerns raised during the morning session and site walk.

The RSA Team's field observations and discussions show that the Team has several general concerns about existing conditions at the study intersections which may negatively impact safety. Several of these concerns require further evaluation and design work to develop appropriate safety enhancements. More specific safety challenges located at the audit area intersections are also included.

Summary of Safety Concerns

The RSA Team identified the following safety issues at the Main Street / Lunenburg Road intersection prior to, during, and after the field visit:

- Driver frustration and bypassing behavior due to intersection queues;
- Deteriorated or sub-standard multi-modal accommodations;
- Deteriorated or sub-standard pavement markings;
- Deteriorated, blocked, or damaged corridor signage;
- Deteriorated or sub-standard drainage;
- Cell phone usage and distracted driving;
- Visibility;
- Lane departures; and
- Vehicle speeds.

The following section provides a detailed summary of the identified safety concerns and potential safety enhancements at the study intersections.

Safety Issue #1: Driver Frustration & Bypassing Behavior Due to Intersection Queues

Specific Observations:

The Main Street / Lunenburg Road intersection operates as an unsignalized intersection, inadequately accommodating the vehicle queues on the Lunenburg Road southbound approach which operates under STOP-control. Audit participants noted that Lunenburg Road is a major cut-through route, especially for

heavy vehicle trips which seek to by-pass US Route 2 for access to Interstate 495 to the east. Main Street was also noted as a major cut-through route for heavy vehicle trips which seek access between Interstate 190 to the west and Interstate 495 to the east. In addition to regional cut-through vehicles, audit participants noted that there are a number of local heavy construction companies which utilize the study area intersection for access to principal arterial roadways. As a result, there are a high percentage of heavy vehicles which, by nature, decelerate and accelerate at slower rates than passenger vehicles which may contribute to increased delays at the intersection which have been noted to reach approximately 30 vehicles or more during the peak hours.

Lunenburg Road Southbound – The extended queue during commute hours leads to driver frustration and may be contributing factors for the ten (10) rear-end crashes and sixteen (16) angle crashes involving a southbound vehicle. The queue results from drivers attempting to judge gaps in traffic that is usually insufficient to make turns out from the approach. Audit participants noted that additional crashes may go unrecorded as minor fender-benders may not result in more than $1,000 worth of damage. Audit participants also noted that the long queue of vehicles attempting to make a left-turn onto Main Street results in vehicles making a right-turn instead and then making an illegal U-turn in a private driveway in order to head back in the eastbound direction. The Department has unsuccessfully sought grants for commercial vehicle enforcement which could reduce the number of heavy vehicles attempting to cut-through Lancaster. Traffic during peak hours is one of the few things helping to reduce the travel speeds along the approaches.



Image 1: Within the queue along Lunenburg Road southbound approach.

Main Street Eastbound – Audit participants noted that a roadway extension was constructed to allow Main Street eastbound vehicles to by-pass left-turning vehicles onto Lunenburg Road northbound. While the lanes are greater than 13 feet wide for the eastbound approach to the intersection, the extension of road is only passable if the first vehicle is encroaching into the oncoming lane. Some vehicles still do not utilize the bypass area resulting in queuing along the approach.

Potential Safety Enhancements:

1. Evaluate the installation of a fully actuated traffic signal to mitigate queuing and accommodate the roadway ADT. Evaluation should be checked against MUTCD signal warrants for traffic volume and safety.
2. Evaluate the installation of a roundabout to mitigate queuing.
3. Evaluate signal phasing opportunities (pending installation of a traffic signal) to include a Main Street eastbound protected left-turn phase.
4. Evaluate traffic calming measures, such as the narrowing of travel lanes, to reduce travel speed and increase gaps in Main Street traffic flow.
5. Evaluate turning lane warrants for dedicated left-turn lane for Main Street eastbound approach and improved storage length for Lunenburg Road southbound approach.

6. Evaluate extending the right-turn lane along the Lunenburg Road southbound approach to vehicles attempting to turn right are less likely to wait in a longer queue for left-turning vehicles.
7. Consider targeted enforcement by Lancaster Police for vehicles attempting to make a right-turn along Lunenburg Road southbound and then making an illegal U-turn in a private driveway in order to head back in the eastbound direction.
8. Consider further commercial vehicle enforcement for Lancaster Police to help reduce the number of heavy vehicles cutting through Lancaster.

Safety Issue #2: Sub-Standard Multi-Modal Accommodations

Specific Observations:

Pedestrian Accommodations – The sidewalk is provided along the southerly side of Main Street in poor to fair condition. The sidewalk is separate from the roadway by an approximately 3-foot grass buffer. The buffer does not provide any vertical separation as there is no curbing on either side of the roadway for any approach. A crossing guard is present at the nearby school crossing during the weekday morning peak period. There is a potential for increased pedestrian usage along Main Street to access the Rowlandson Elementary School, located south of the intersection, should enhancements for pedestrian accommodations be made. The reported crash data does not indicate any recent pedestrian related crashes.



Image 2: Variable width grass buffer with lack of vertical separation for sidewalk along southerly side of Main Street

Non-crosswalk Crossing – Audit participants noted that there are no crosswalks provided at the Main Street / Lunenburg Road intersection. Pedestrians are observed crossing Main Street south of the Lunenburg Road / Main Street intersection at the Buttonwood Lane / Main Street intersection at an existing crosswalk in order to access the sidewalks along the southwesterly side of Main Street. The existing crosswalk is located on a horizontal curve and lacks the appropriate advanced warning signage to alert approaching vehicles of a potential pedestrian in the crosswalk. There is also a lack of ADA/AAB compliant access ramps on either side of the crosswalk.

Bicycle Accommodations – Formalized bicycle accommodations are not provided along Main Street or Lunenburg Road. Audit participants noted that cyclists utilize Main Street for recreation and advanced cyclist events where they utilize the roadway over sidewalk. Some cyclists have been observed to ride side-by-side instead of single file which has historically resulted in vehicle delays. Lancaster Police are currently seeking a grant for targeted enforcement for cyclists. The reported crash data does not indicate any recent bicycle related crashes. Proposed multi-modal countermeasures should be considered for future improvements along the Main Street corridor.



Image 3: Lack of bicycle accommodations and sidewalk along northerly side of Main Street

Potential Safety Enhancements:

1. Conduct educational events or distribute pamphlets at the surrounding schools or notable pedestrian-heavy destinations to help promote walking safety. Use these events and pamphlets to discuss safe walking habits associated with both existing and any new pedestrian infrastructure along the corridor.
2. Consider constructing sidewalk along the northerly side of Main Street and along Lunenburg Road to improve connectivity for residents. This enhancement should be considered as part of a larger corridor improvement.
3. Construct Americans with Disabilities Act (ADA) / Architectural Access Board (AAB) compliant accessible curb ramps on the corners of the Main Street / Lunenburg Road intersection with a corresponding crosswalk between each ramp pair upon enhancements to sidewalk facilities. Providing defined crossing opportunities is anticipated to assist in relocating pedestrian crossing maneuvers to a more safe and defined location.
4. Consider adding shared-use lane markings (also referred to as "sharrow" bicycle markings) with associated signage along the Main Street and Lunenburg Road corridors to increase driver awareness of the shared-use nature of the roadways. This improvement should be considered as part of a larger corridor-wide improvement to provide connectivity for multi-modal usage.
5. Evaluate the potential to construct dedicated bicycle lanes along Main Street and Lunenburg Road corridors. Note that the construction of bicycle lanes may require the removal or relocation of grass buffer for sidewalk and require potential private property easements. This improvement should be considered as part of a larger corridor-wide improvement to provide connectivity for multi-modal usage.
6. Should a traffic signal or roundabout be considered, provide specific pedestrian crossing enhancements, such as pedestrian traffic signal phasing, countdown signals housings, MUTCD-compliant signage, ADA-compliant accessible pedestrian signals (APS), and push buttons.

7. Consider installation of crosswalks across Main Street, at the intersection with Lunenburg Road, pending the installation of sidewalk connectivity through the intersection.

Safety Issue #3: Deteriorated or Sub-Standard Pavement Markings

Specific Observations:

Lack of Lane Delineation – At present, lane delineation for turning lanes on the Lunenburg Road southbound approach is in poor condition. The exclusive right-turn lane was observed as having two edge lines which is confusing for drivers as to where the lane splits off from the exclusive left-turn lane. In addition, no lane delineation pavement markings, such as arrows, are provided along the Lunenburg Road southbound approach.

Stop Bar Location – The STOP bar located at the terminus of the Lunenburg Road southbound approach is highly faded. Audit participants noted that due to the high number of heavy vehicles, drivers will pull farther out into the intersection in an attempt to maintain their sight lines. The lack of sight lines may be the contributing factors for many rear-end crashes along the approach where vehicles following have assumed a vehicle is moving, but only "inching" forward to reset sight line visibility.

Faded Pavement Markings – Audit participants noted that many of the existing pavement markings along all approaches to the intersection are faded and difficult to see, particularly at night and during periods of solar glare. Poor pavement markings give the appearance of wide travel lanes which frequently leads to high travel speeds.

Potential Safety Enhancements:

1. Eliminate second edge line pavement markings along the Lunenburg Road Southbound approach corridor to eliminate lane confusion.
2. Apply arrow pavement markings to the Lunenburg Road southbound approach to delineate the turning movements in each striped lane. This countermeasure is currently being pursued by the Town DPW.
3. Consider relocating or staggering of STOP-bar for the left-turn and right-turn lanes along the Lunenburg Road southbound approach to improve sight lines. This countermeasure is currently being pursued by the Town DPW.
4. Reapply all existing pavement markings; including STOP bars, and centerlines; to improve motorist and pedestrian safety. This countermeasure is currently being pursued by the Town DPW.
5. Consider replacement of existing pavement markings with thermoplastic markings which will last longer against snow plow damage and improve visibility during inclement weather.

Safety Issue #4: Deteriorated, Blocked, or Damaged Corridor Signage

Specific Observations:

Faded, Damaged, and Non-compliant Signage – Audit participants noted that some of the existing signs along Main Street are faded, damaged, or not MUTCD-compliant which is detracting from their effectiveness.

Signage Height Placement – Audit participants noted damage to guide signage placed in the median island of the Lunenburg Road southbound approach. It was also noted that the signs had been hit before and then re-installed where the sign height was adjusted to avoid conflict with heavy vehicles.



Image 4: Guide signage heights below 7-foot minimum set by MUTCD standards

Object Marker Signage – A red object marker (OM4-1) sign was installed opposite the Lunenburg Road (Route 70) southbound approach in an effort to catch the headlights of oncoming vehicles. However, the sign height is less than the minimum required by the MUTCD and is located out of the general cone of vision for vehicles along the approach. This is similar to other signage in the vicinity of the intersection. The sign is to the extreme east of the opposing approach and does not convey the roadway terminus effectively. The property resident noted that it is not uncommon for vehicles to end up on his property as they were unaware of the terminus of the roadway. The crash data noted eight (8) single vehicle crashes where vehicles struck an object across Main Street opposite Lunenburg Road, which may be the result of no warning signage and an open opposing grass area were drivers may consider opportunities for a non-existing through movement. In addition, 6 of 8 single vehicle crashes in which objects opposite Lunenburg Road were struck occurred at night where the improper placement did not convey the geometry of the T-intersection.

Lack of Advanced Warning Signage – The posted speed limit along Lunenburg Road southbound drops from 45 mph to 25 mph approximately 450 feet north of the intersection. However, there are no advanced warning signs for the reduction in posted speed or other advance warning signage, such as an intersection ahead warning signage, along the southbound approach. Although not directly noted, some of the crashes involving a southbound vehicle may be a direct result on the lack of clarity in speed reduction and the lack of advance intersection warning.

Potential Safety Enhancements:

1. Complete a full sign inventory along all three approaches to the Main Street / Lunenburg Road intersections to determine accurate placement, condition, and possible replacement of existing signs.
2. Replace all existing signs along Lunenburg Road and Main Street that are currently faded, damaged, or non-compliant with new MUTCD-compliant signs to provide clear and concise regulatory and warning messages. Provide retro-reflective signs where necessary.

3. Evaluate the relocation of guide and regulatory signage from the median island of the Lunenburg Road southbound approach.
4. Adjust heights of existing signage to meet current MUTCD minimum height standard of 7-feet in urbanized areas.
5. Evaluate the relocation of existing signage which is not currently within the cone of vision for the intended drivers, utility poles, and other roadside structures that do not comply with current lateral offset standards.
6. Consider replacement on the red object marker (OM4-1) with a W1-7 dual arrow sign for improved visibility. Relocate position of sign to be directly opposing Lunenburg Road and positioned to impede the through path of travel. This countermeasure is currently being pursued by the Town DPW.
7. Consider installation of an advance intersection sign (W2-4) along Lunenburg Road southbound approach along with reduced speed warning signage (W3-5). This countermeasure is currently being pursued by the Town DPW.
8. Consider installation of dynamic speed signs or an advance speed reduction sign (W3-5) along Lunenburg Road southbound approach along with reduced speed warning signage.

Safety Issue #5: Deteriorated or Sub-Standard Drainage

Specific Observations:

Audit participants noted that due to the high percentage of heavy vehicles through this intersection, there are sections of pavement heaving where vehicles begin to decelerate by downshifting or compression release braking. The resulted heaving of the pavement creates difficulties with snow removal and drainage. Audit participants noted that while vehicles are in the long queue on Lunenburg Road southbound, there are likely leaking oils and other vehicle fluids escaping as the vehicles advance towards the intersection. This could contribute to the 33 percent of crashes which occurred under wet or snow/ice covered roadways, or even in crashes where deceleration may not have been noted.

Audit participants noted that there is no curbing provided along either side of all approaches to the intersection. The edge of roadway was noted to be predominately a sandy soil that requires street sweeping. There are two catch basins located along the southerly side of Main Street. However, they are not the lowest points of the roadway compared to resident gravel driveways. On the day of the audit, the catch basins were predominately full. Audit participants noted that catch basins throughout the town are cleared annually. It was also noted that the roadway was last repaved approximately 6-7 years ago.



Image 5: Sand buildup around existing catch basin along the southerly side of Main Street

Potential Safety Enhancements:

1. Consider installing vertical granite curbing along both sides of all approaches to define edge of roadway, reduce roadway erosion, and improve drainage. This would have an added benefit as a traffic calming measure.
2. Consider resurfacing all intersection approaches to achieve a 2% cross-slope for improved drainage of roadway runoff out of the travel lane.
3. Consider regrading of driveway aprons and center of intersection towards exiting catch basins. This countermeasure is currently being pursued by the Town DPW.

Safety Issue #6: Cell Phone Usage and Distracted Driving

Specific Observations:

Audit participants indicated that distracted driving due to cell phone usage is a serious problem in the vicinity of the audit area. Of the reported crashes within the audit area, 17 listed "inattention / distracted" as the main contributing factor. Although no specific crash report noted cell phone usage, audit participants noted that during general field observations and enforcement activities, it is not uncommon for a large number of drivers at the intersection to be using a cell phone while operating the vehicle. Current enforcement exists at the study area intersection during multiple hour blocks throughout the day.

Potential Safety Enhancements:

1. Increase police enforcement of cell phone usage and other distracted driving occurrences in the vicinity of the audit area.
2. Conduct educational events or distribute pamphlets at the surrounding schools and residents to help promote driving safety. Use these events and pamphlets to discuss the dangers of distracted driving, including texting while behind the wheel of a motor vehicle.

Safety Issue #7: Visibility

Specific Observations:

Truck and Passenger Vehicle Sight Lines – Audit participants noted that due to the high volume of heavy vehicles through the study area intersection, personal vehicles attempting to turn onto Main Street encroach into the intersection in an attempt to regain site lines past the blocking heavy vehicle. It was also noted that solar glare during the weekday morning peak period impedes drivers' visibility for Main Street eastbound traffic during certain times of the year. Guide and regulatory signage located in the raised median on the Lunenburg Road southbound approach limits sight distance of personal vehicles due to bottom sign's low mounting height. A percentage of the angled crashes at this intersection may be the result of temporarily impaired sight lines.

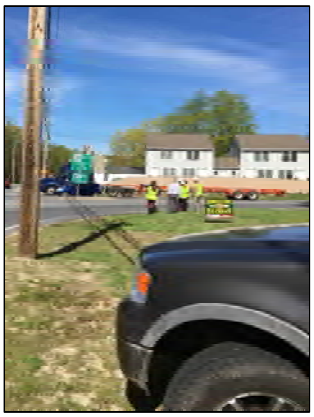


Image 6: Heavy vehicle attempting to exit Lunenburg Road approach

Roadway Lighting – The Town of Lancaster replaced all street luminaries within the last year; however there is only one present at the northeast corner of the intersection. While additional lighting could be beneficial for reducing nighttime crashes, there is awareness against light pollution for nearby residents. There were 26 crashes which occurred at dawn, dusk, or night hours for 2012-2016.

Potential Safety Enhancements:

1. Evaluate the installation of a fully actuated traffic signal to eliminate the need to encroach into the intersection to improve sight lines.
2. Should a traffic signal be considered, provide signal head backplates for solar glare with retro-reflective tape for nighttime visibility and louvers to limit the signal head visibility to within 20 degrees of the cone of visibility to reduce light pollution of surrounding residents.
3. Evaluate the installation of a roundabout to eliminate the need to encroach into the intersection to improve sight lines.
4. Consider installing new retro-reflective signage for improved visibility for existing signage which is faded or no longer compliant with current MUTCD standards.
5. Consider relocating or staggering of STOP-bar along the Lunenburg Road southbound approach to improve sight lines. This countermeasure is currently being pursued by the Town DPW.
6. Consider the installation of additional overhead lighting luminaries to increase the nighttime visibility at the intersection and its approaches.

Safety Issue #8: Lane Departure

Specific Observations:

Truck Lane Departures – Tire tracks through the soil are present on the northeast corner of the intersection where no curbing is present. Field observations showed heavy vehicles attempting wide turns from Main Street westbound to Lunenburg Road and from Lunenburg Road southbound to Main Street eastbound. The lane departures wheel path did not specifically result in any past crash history; however, the potential introduction of enhanced pedestrian and bicycle accommodations may be effected by the current wheel path of heavy vehicles.

Opposing Driveway Apron – Audit participants noted that the residential driveway apron present along the southerly side of Main Street opposing the Lunenburg Road southbound approach is a concern. As previously noted, no object marker sign or associated warning sign is placed immediately opposite Lunenburg Road. The property resident noted that it is not uncommon for vehicles to end up on his property as they were unaware of the terminus of the roadway. Current fixed object placement has been recorded as struck by vehicles multiple times from 2012-2016.

Objects off the Road – Eight (8) crashes during the study period at the intersection resulted in a vehicle striking a fixed object off the roadway including a combination of sign posts, utility poles, and fire hydrants.

Roadway Edge Drop-off – There is a culvert located under the driveway accessing #1357 Main Street housing units which has a drop-off swale parallel to Lunenburg Road approximately 2-foot deep. The swale presents a safety hazard because it is not protected by a guardrail and exceeds the MassDOT standard for the minimally accepted 1:4 foreslope grade. The crash reports did not indicate any particular crash occurrence where a lane departure vehicle entered the drainage swale.

Potential Safety Enhancements:

1. Redefine the intersection's northeast corner with granite curbing to separate the travel way from the adjacent property. Consider the installation of a raised truck apron to allow for wider truck turns but providing a traditional turning radius for passenger vehicles to lower speeds. This countermeasure is currently being pursued by the Town DPW.
2. Evaluate gates with reflective tape for secondary driveways and differentiated pavement materials to separate the intersection roadway and delineate where the Lunenburg Road southbound approach terminates.
3. Evaluate the relocation of existing object marker (OM4-1) signage which is not currently within the cone of vision for the intended drivers.
4. Consider replacement on the red object marker (OM4-1) with a W1-7 dual arrow sign for improved visibility. Relocate position of sign to be directly opposing Lunenburg Road and positioned to impede the through path of travel.
5. Consider applying reflector plaques on roadside utility poles and sign posts for improved visibility.

6. Install guardrail and/or vertical curbing along the west side of Lunenburg Road approaching the intersection to provide separation of vehicle traffic from the drainage swale on the edge of pavement without adversely affecting stormwater runoff.

7. Consider reconstruction of existing drainage swale with erosion resistant materials to prevent future roadway and drainage issues and conform to MassDOT roadside design guide standards.

Safety Issue #9: Vehicle Speeds

Specific Observations:

Audit participants expressed concerns over vehicle speeds within the audit area. The Police Department indicated that target speed enforcement has been conducted in the past due to resident complaints; however, the Police Department noted that the heavy vehicle congestion along Main Street helps in reducing vehicle speeds. Speed data obtained from ATR counts in the audit area indicate an 85th percentile speed at or above 40 mph, is in excess of the posted speed regulations. It was also noted that the Lunenburg Road southbound approach is graded down towards the intersection which attributes to higher speeds. Lancaster Police noted that tickets are being issued approximately three (3) per hour in a four-hour window throughout the day to discourage speeding and distracted driving with additional grants being sought. However, little improvement in driver behavior has been recognized.



Image 7: Wide turn radii for heavy vehicles leads to high turning speeds for personal vehicles

Audit participants noted that there was a lack of traffic calming along the Lunenburg Road southbound approach which could change the nature of the roadway and indicate to motorists that they are entering a reduced speed zone in addition to regulatory signage. Audit participants also noted that there was a lack of reduce speed warning signage, as previously noted, to highlight the reduction of speed limit from 45 mph to 25 mph along the Lunenburg Road southbound approach to the intersection. The intersection's wide geometry is required in order to facilitate heavy vehicles which require more room when executing turns. As a result, smaller vehicles are able to travel at higher rates of speed through turns. Despite the existing warning signage, enforcement, and traffic calming measures in place along the Main Street corridor, audit participants noted that excessive speed still occurs through the study area intersection.

Excessive speed was only noted as the contributing factor in one (1) crash within the study period; however, twelve (12) crashes within the audit area occurred during the nighttime hours when speeds are typically at their peak along the corridor.

The Town installed chevron signage, within the last year, along Main Street east of the study area intersection at Buttonwood Lane / Main Street and warning signage for a 30 mph speed limit around the roadway curve. This bend in the roadway had a fatal crash which occurred years prior to signage.

Potential Safety Enhancements:

1. Consider increased enforcement of speeding within the audit area outside of peak commuter congestion periods.
2. Consider strategic placement of dynamic message speed signs consistent with those already installed in the Town and advanced warning signage.
3. Consider narrowing travel lanes along Main Street and Lunenburg Road comply with the minimum for NHS and arterial roadways respectively to help reduce vehicle travel speeds down towards their regulated and posted limits.
4. Consider installation of vertical granite curbing and sidewalks along both sides of all approaches to provide vertical separation from the roadway and change the characteristic of a high speed location.
5. Redefine the intersection's northeast corner with granite curbing to separate the travel way from the adjacent property. Consider the installation of a raised truck apron to allow for wider truck turns but providing a traditional turning radius for passenger vehicles to lower speeds.
6. Consider installation of reduce speed flashers along Lunenburg Road southbound approach along with advanced warning signage in a location where light pollution will not adversely affect residents.

Summary of Road Safety Audit

Each improvement considered has been categorized as short-term, mid-term, or long-term. Additionally, a cost category has been assigned to each improvement based on the definitions shown in Table 4. Table 5 includes a summary of the potential safety enhancements. Safety benefit estimates are subjective, based on engineering experience and the relative percentage of crashes that may be reduced by the enhancement based on known and documented crash reduction factors (such as FHWA documented crash reduction factors).

Note that some costs are noted with two cost thresholds. This is included as some enhancements may require additional measures to ensure regulatory compliance. For instance, the targeted enforcement by Lancaster police for vehicles attempting to make an illegal U-turn may require short-term or mid-term sources depending on the timeline of planning through construction. In addition, some enhancements are defined to mitigate multiple safety issues. For those enhancements identified for multiple issues, such as the consideration of relocating or staggering of stop bar along the Lunenburg Road southbound approach to improve sight lines, the enhancement has only been listed once in Table 5.

Table 4: Estimated Time Frame and Costs Breakdown

Time Frame		Costs	
Short-Term	<1 Year	Low	<$10,000
Mid-Term	1-3 Years	Medium	$10,001-$50,000
Long-Term	>3 Years	High	>$50,000

Table 5: Potential Safety Enhancement Summary

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Party
Driver Frustration and Bypassing Behavior due to Intersection Queues	Evaluate the installation of a fully actuated traffic signal. Evaluation should be checked against MUTCD signal warrants for traffic volume and safety. [Also applies to Visibility Safety Issue].	High	Long-Term	High	Town
	Evaluate the installation of a roundabout. [Also applies to Visibility Safety Issue].	High	Long-Term	High	Town
	Evaluate signal phasing opportunities (pending installation of a traffic signal) to include a Main street eastbound protected left-turn phase.	Medium	Long-Term	Low	Town
	Evaluate turning lane warrants for dedicated left-turn lane for Main Street eastbound approach and improved storage length for Lunenburg Road southbound approach.	Medium	Long-Term	Medium	Town
	Evaluate extending the right-turn lane along the Lunenburg Road southbound approach	Low	Mid-Term	Low to Medium	Town
	Consider targeted enforcement by Lancaster Police for vehicles attempting to make a right-turn along Lunenburg Road southbound and then making an illegal U-turn in a private driveway.	Medium	Short-Term	Low to Medium	Town Police
	Consider further commercial vehicle enforcement for Lancaster Police.	Medium	Mid-Term	Low to Medium	Town Police
Sub-Standard Multi-Modal Accommodations	Conduct educational events or distribute pamphlets at the surrounding schools or notable pedestrian-heavy destinations. [Also applies to Cell Phone Usage and Distracted Driving Safety Issue].	Medium	Short-Term	Low	Town
	Consider constructing sidewalk along the northerly side of Main Street and along Lunenburg Road.	High	Long-Term	High	Town
	Construct ADA / AAB compliant accessible curb ramps on the corners of the intersection with a corresponding crosswalk between each ramp pair upon enhancements to sidewalk facilities.	Medium	Long-Term	Medium	Town
	Consider adding shared-use lane markings with associated signage along the Main Street and Lunenburg Road corridors.	Low	Short-Term	Low	Town
	Evaluate the potential to construct dedicated bicycle lanes along Main Street and Lunenburg Road corridors.	High	Long-Term	High	Town

Table 5 Continued: Potential Safety Enhancement Summary

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Deteriorated or Sub-Standard Multi-Modal Accommodations	Should a traffic signal be considered, provide pedestrian traffic signal operations including phasing and infrastructure, such as countdown signals with MUTCD compliant signage, ADA compliant APS, and push buttons.	High	Long-Term	Medium	Town
	Consider installation of crosswalks across Main Street, at the intersection with Lunenburg Road, pending the installation of sidewalk connectivity through the intersection.	High	Long-Term	Medium	Town
Deteriorated or Sub-Standard Pavement Markings	Eliminate second edge line pavement markings along the Lunenburg Road Southbound approach corridor.	Low	Short-Term	Low	Town
	Apply arrow pavement markings to the Lunenburg Road southbound approach. This countermeasure is currently being pursued by the Town DPW.	Low	Short-Term	Low	Town
	Consider relocating or staggering of STOP-bar for left-turn and right-turn lanes along the Lunenburg Road southbound approach. [Also applies to Visibility Safety Issue].	Medium	Short-Term	Low	Town
	Reapply all existing pavement markings; including STOP bars, and centerlines.	Medium	Short-Term	Low	Town
	Consider replacement of existing pavement markings with thermoplastic markings which will last longer against snow plow damage and improve visibility during inclement weather.	Medium	Mid-Term	High	Town
Deteriorated, Blocked, or Damaged Corridor Signage	Complete a full sign inventory along all three approaches to the Main Street / Lunenburg Road intersections.	Medium	Short-Term	Low	Town
	Replace all existing signs along Lunenburg Road and Main Street that are currently faded, damaged, or non-compliant with new MUTCD-compliant signs.	Medium	Short-Term	Medium	Town
	Evaluate the relocation of guide and regulatory signage from the median island of the Lunenburg Road southbound approach. [Also applies to Visibility and Lane Departure Safety Issue].	Low	Short-Term	Low	Town
	Adjust heights of existing signage to meet current MUTCD minimum height standard of 7-feet. [Also applies to Visibility Safety Issue].	Medium	Short-Term	Low	Town

Table 5 Continued: Potential Safety Enhancement Summary

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Deteriorated, Blocked, or Damaged Corridor Signage	Evaluate the relocation of existing signage which is not currently within the cone of vision for the intended drivers, utility poles, and other roadside structures that do not comply with current lateral offset standards. [Also applies to Visibility Safety Issue].	High	Short-Term	Low	Town
	Consider replacement on the red object marker (OM4-1) with a W1-7 dual arrow sign and relocate position. [Also applies to Visibility and Lane Departure Safety Issue].	Medium	Short-Term	Low	Town
Deteriorated, Blocked, or Damaged Corridor Signage	Consider installation of an advance intersection sign (W2-4) along Lunenburg Road southbound approach along with reduced speed warning signage (W3-5).	Medium	Short-Term	Low	Town
	Consider installation of dynamic speed signs consistent with those already installed in the Town or an advanced speed reduction sign (W3-5) along Lunenburg Road southbound approach along with reduced speed warning signage. [Also applies to Vehicle Speeds Safety Issue].	Medium	Short-Term	Medium	Town
Deteriorated or Sub-Standard Drainage	Consider installing vertical granite curbing along both sides of all approaches. [Also applies to Vehicle Speeds Safety Issue].	Medium	Long-Term	High	Town
	Consider resurfacing all intersection approaches to achieve a 2% cross-slope for improved drainage of roadway runoff out of the travel lane.	High	Mid-Term	High	Town
	Consider regrading of driveway aprons and center of intersection towards exiting catch basins.	Low	Mid-Term	Medium	Town
Cell Phone Usage and Distracted Driving	Increase police enforcement of cell phone usage while driving in the vicinity of the audit area.	Medium	Short-Term	Low	Town Police
	Conduct educational events or distribute pamphlets at the surrounding schools and residents to help promote driving safety regarding distracted driving.	Medium	Short-Term	Low	Town
Visibility	Evaluate the installation of a fully actuated traffic signal to eliminate the need to encroach into the intersection.	High	Long-Term	High	Town
	Should a traffic signal be considered, provide signal head backplates for solar glare with retro-reflective tape for improved visibility and louvers to limit the signal head visibility to within 20 degrees of the cone of visibility to reduce light pollution of surrounding residents.	Medium	Mid-Term	Low	Town

Table 5 Continued: Potential Safety Enhancement Summary

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Visibility	Consider installing new retro-reflective signage.	Medium	Short-Term	Medium	Town
	Consider the installation of additional overhead lighting luminaries at the intersection.	Medium	Short-Term	Medium	Town
Lane Departure	Redefine the intersection's northeast corner with granite curbing. Consider the installation of a raised truck apron for wider truck turns but providing a traditional turning radius for passenger vehicles.	Medium	Long-Term	Medium	Town
	Evaluate gates with reflective tape for secondary driveways and differentiated pavement materials.	Low	Short-Term	Low	Town
	Evaluate the relocation of existing object marker signage (OM4-1) signage which is not currently within the cone of vision for the intended drivers	High	Short-Term	Low	Town
	Consider applying reflector plaques on roadside utility poles and sign posts for improved visibility.	Low	Short-Term	Low	Town
	Install guardrail and/or curbing along the west side of Lunenburg Road approaching the intersection adjacent to drainage swale.	Medium	Mid-Term	Medium	Town
	Consider reconstruction of existing drainage swale with erosion resistant materials.	Low	Mid-Term	Low	Town
Vehicle Speeds	Consider increased enforcement of speeding within the audit area outside of peak commuter congestion periods.	Medium	On-Going	High	Town Police
	Consider narrowing travel lanes along Main Street and Lunenburg Road comply with the minimum for NHS and arterial roadways respectively. [Also applies to Driver Frustration and Bypassing Behavior due to Intersection Queues Safety Issue].	Medium	Mid-Term	Medium	Town
	Redefine the intersection's northeast corner with granite curbing to separate the travel way from the adjacent property. Consider the installation of a raised truck apron to allow for wider truck turns but providing a traditional turning radius for passenger vehicles.	High	Long-Term	High	Town
	Consider installation of reduce speed flashers along Lunenburg Road southbound approach along with advanced warning signage in a location where light pollution will not adversely affect residents	Medium	Short-Term	Medium	Town

Appendix A. RSA Meeting Agenda

Agenda

Road Safety Audit

LOCATION

Meeting Location:

Lancaster Town Hall
Auditorium
695 Main Street
Lancaster, Massachusetts
Thursday May 4, 2017
9:00 AM – 12:00 PM

Type of meeting:	**High Crash Locations – Road Safety Audit**
Attendees:	**Invited Participants to Comprise a Multidisciplinary Team**
Please bring:	**Thoughts and Enthusiasm!**

9:00 AM	**Welcome and Introductions** • Introductions
9:15 AM	**Review of Site Specific Material** • Crash Summaries – provided in advance • Lunenburg Road (Route 70) @ Main Street (Route 117) • Existing Geometries, Volumes, Speed, and Conditions
10:00 AM	**Visit the Site** • Conduct Field Visit • As a group, identify areas for improvement
11:00 AM	**Post Visit Discussion / Completion of RSA** • Discuss observations and finalize findings • Discuss potential improvements and finalize recommendations
12:00 PM	**Adjourn for the Day – but the RSA has not ended**

Instructions for Participants:

- **Before attending the RSA on May 4, participants are encouraged to drive through the intersection and complete / consider elements on the RSA Prompt List, with a focus on safety.**
- **All participants will be actively involved throughout the RSA process. Participants are encouraged to come with thoughts and ideas; however, remember that the synergy that develops and respect for others' opinions are key elements to the success of the overall RSA process.**
- **After the RSA meeting, participants will be asked to comment and respond to the document materials to assure it is reflective of the RSA completed by the multidisciplinary team.**

Appendix B. RSA Audit Team Contact List

Participating Audit Team Members

Date: May 4, 2017 Location: Lancaster, Massachusetts

Audit Team Members	Agency/Affiliation	Email Address
Noreen Piazza	Lancaster Town Planner	npiazza@lancasterma.net
Everett Moody	Lancaster Police Department	elmoody@lancasterma.net
Courtney Manning	Lancaster Fire Department	cmanning@lancasterfd.net
Kevin Bartlett	Lancaster Department of Public Works	kbartlett@lancasterma.net
Sheri Bean	Montachusett Regional Planning Commission	sbean@mrpc.com
George Snow	Montachusett Regional Planning Commission	gnow@mprc.com
Elsa Chan	MassDOT Traffic Safety	elsa.chan@state.ma.us
Christopher Falcos	MassDOT Traffic Safety	christopher.falcos@dot.state.ma.us
Connor Keating	MassDOT Traffic Safety	connor.keating@state.ma.us
Lori Shattuck	MassDOT District 3	lori.shattuck@dot.state.ma.us
Lola Campbell	MassDOT District 3	alolade.campbell@state.ma.us
Samuel Gregorio	TEC, Inc.	sgregorio@theengineeringcorp.com
Douglas Halpert	TEC, Inc.	dhalpert@theengineeringcorp.com

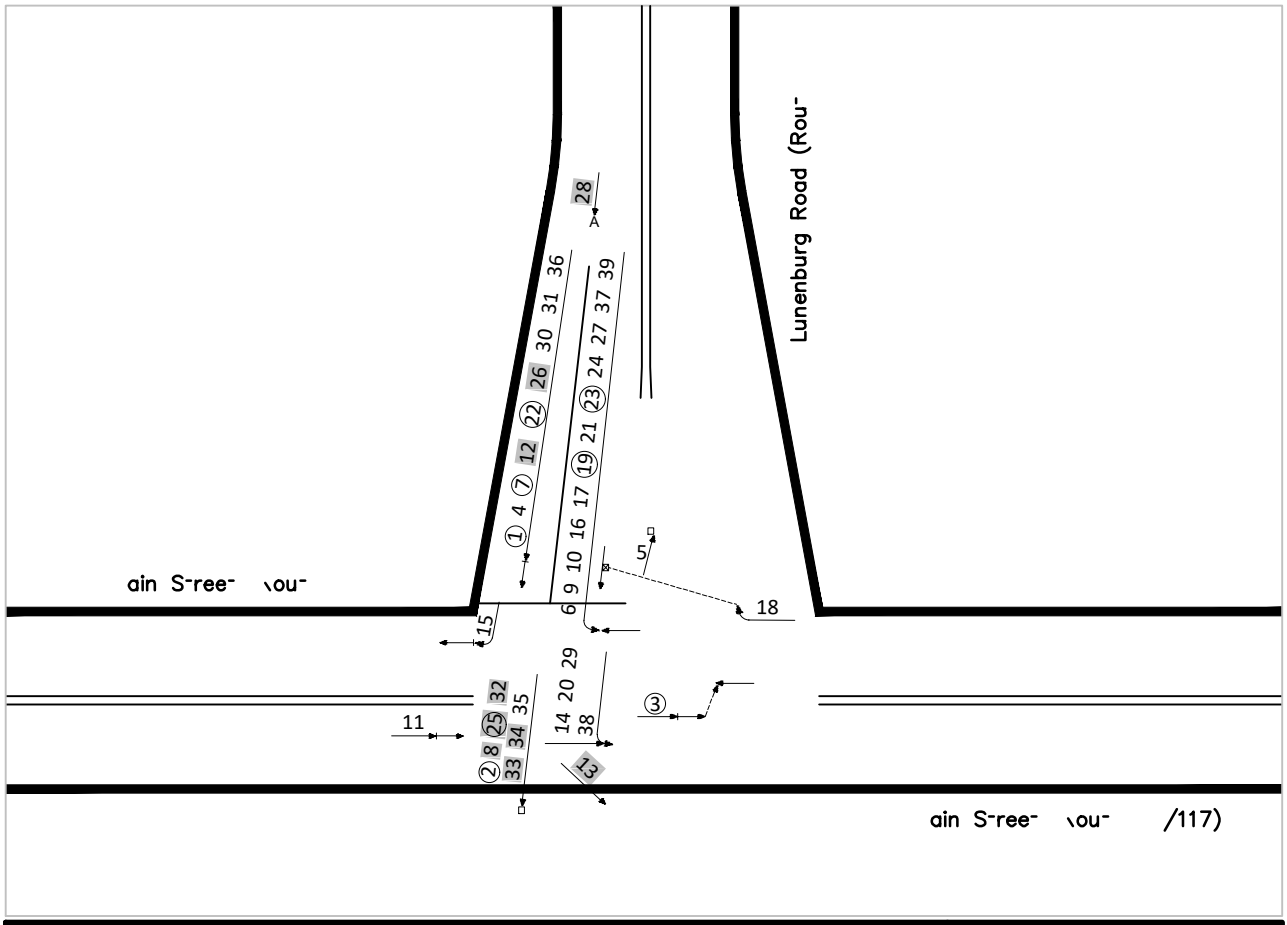
Appendix C. Detailed Crash Data

Not to Scale

Route 117 from Lunenburg Road (Route 70) to Main Street (Route 70) - Lancaster, MA

Road Safety Audit

LOCATION: Main Street (Route 117) @ Lunenburg Road (Route 70)
CITY/STATE: Lancaster, Massachusetts
TIME PERIOD: 2012- 2016
PREPARED BY: TEC, Inc. / Eindra (Elena) Aung, E.I.T.
SOURCE: MassDOT / Town of Lancaster Police Department



LEGEND			SHOW FOR COLLISION
VEHICLE PATH	HEAD-ON COLLISION	FIXED OBJECT	1. Approximate location of collision,
BACKING VEHICLE	ANGLED COLLISION	MOVEABLE OBJECT	2. Direction of collision,
SIDESWIPE COLLISION	FIXED OBJECT COLLISION	PARKED VEHICLE	3. Type of collision and vehicles involved,
P PEDESTRIAN COLLISION	OVERTURNED VEHICLE	PERSONAL INJURY	4. Time, Day, Date
C CYCLIST COLLISION	OUT-OF-CONTROL VEHICLE	FATALITY	5. Any other pertinent factors mentioned on the report.
REAR-END COLLISION		A ANIMAL	NOTE: Shaded number indicates crash occurred under "nighttime" conditions.

SUMMARY OF CRASHES ON DIAGRAM [*no fatal collisions*]

	REAR-END	SIDESWIPE	HEAD-ON	ANGLED	SINGLE VEH	PED/BIKE	OTHER / UNK	TOTAL
PROPERTY DAMAGE ONLY	9	0	0	15	9	0	1	34
NON-FATAL INJURY	3	0	1	0	1	0	0	5
UNKNOWN / NOT REPORTED	0	0	0	0	0	0	0	0
TOTAL	12	0	1	15	10	0	1	39

Figure RSA-1

Collision Diagram
2012-2016 Collision Data

TEC, Inc.
65 Glenn Street | 169 Ocean Blvd, Unit 101
Lawrence, MA 01843 | Hampton, NH 03842
(978) 794.1792 | (603) 601.8154
www.TheEngineeringCorp.com

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Crash Data Summary Tables

Main Street (Route 117) @ Lunenburg Road (Route 70) - Lancaster, Massachusetts

01/01/2012 - 12/31/2016

Collision Diagram	Crash Date	Crash Time	Day of Week	Ambient Light	Weather Condition	Road Surface	Operator's Age				Crash Severity	Manner of Collision	Driver Contributing Codes	Detailed Narrative (from Crash Report)
							V1	V2	V3	V4				
1	4/1/2012	3:14 PM	Sunday	Daylight	Cloudy	Dry	26	17			Non-fatal Injury	Rear-end	Inattention / Distracted	MV1 and MV2: travelling SB on Lunenburg Rd. MV1 was stopped in traffic. MV2 did not stop on time and rear-ended MV1.
2	8/21/2012	12:41 PM	Tuesday	Daylight	Clear	Dry	27				Non-fatal Injury	Single Vehicle	Erratic / Aggressive / Reckless Driving	MV1: travelling SB on Lunenburg Rd. Due to its high speed, MV1 failed to stop at the stop sign and collide into the utility pole.
3	10/23/2012	4:20 PM	Tuesday	Daylight	Clear	Dry	25	64	58		Non-fatal Injury	Rear-end	Inattention / Distracted	MV1 and MV2: travelling EB on Main St; MV3: travelling WB on Main St. MV1 rear-ended MV2 when MV2 stopped to turn left onto Lunenburg Rd. The collision cause MV2 to move forward across the road and stuck MV3.
4	10/30/2012	10:18 AM	Tuesday	Daylight	Cloudy	Wet	42	27			Property Damage Only	Rear-end	Inattention / Distracted	MV1 and MV2: travelling SB on Lunenburg Rd. MV1 was stopped in traffic. MV2 did not stop on time and rear-ended MV1.
5	2/23/2013	6:05 AM	Saturday	Dawn	Clear	Dry	23				Property Damage Only	Single Vehicle	Other	MV1: travelling EB on Main St. MV1 drifted across the WB lane and drove onto the traffic island separating the lanes of Lunenburg Rd. MV1 hit the street sign on the island and continued across Lunenburg Rd. The vehicle came to a stop after colliding the samll trees and shrubs. The operator of MV1 was fatigued.
6	4/4/2013	4:20 PM	Thursday	Daylight	Clear	Dry	57	25			Property Damage Only	Angled	Inattention / Distracted	MV1: travelling SB on Lunenburg Rd; MV2: travelling WB on Main St. MV2 collided with MV1 when MV1 attempted to take a left-turn onto Main St.
7	4/7/2013	1:07 PM	Sunday	Daylight	Clear	Dry	52	43			Non-fatal Injury	Rear-end	Inattention / Distracted	MV1 and MV2: travelling SB on Lunenburg Rd. MV1 was stopped in traffic at the STOP-sign. MV2 did not stop on time and rear-ended MV1.
8	7/7/2013	10:07 PM	Sunday	Dark - Not Lighted	Clear	Dry	33				Property Damage Only	Single Vehicle	Other	MV1: travelling SB on Lunenburg Rd. MV1 failed to come to a stop, and continued through the intersection striking a sign and bushes.
9	10/29/2013	7:22 AM	Tuesday	Daylight	Clear	Dry	19	16			Property Damage Only	Angled	Failure to Yield Right-of-Way	MV1: travelling WB on Main St; MV2: travelling SB on Lunenburg Rd. MV1 struck MV2 when MV2 attempted to turn left onto Main St.
10	10/30/2014	3:57 PM	Thursday	Daylight	Clear	Dry	51	25			Property Damage Only	Angled	Inattention / Distracted	MV1: travelling WB on Main St; MV2: travelling SB on Lunenburg Rd. MV1 struck MV2 when MV2 attempted to turn left onto Main St.
11	1/16/2015	4:38 PM	Friday	Dusk	Clear	Dry	57	84			Property Damage Only	Rear-end	Disregarded Traffic Controls	MV1 and MV2: travelling EB on Main St. MV1 was stopped in traffic at the Lunenburg Rd intersection. MV2 attempted to pass MV1 on the left and struck the rear of MV1.
12	1/12/2016	6:52 PM	Tuesday	Dark - Lighted	Snow	Snow	63	20			Property Damage Only	Rear-end	Followed Too Closely	MV1 and MV2: travelling SB on Lunenburg Rd. Due to the snow on the road, MV2 slid and rear-ended MV1 when MV1 was slowing to stop at the STOP-sign.
13	2/7/2016	2:18 AM	Sunday	Dark - Lighted	Clear	Dry	22				Property Damage Only	Single Vehicle	Other	MV1: travelling EB on Main St. MV1 travelled off the road to the right, hit the guard posts and a tree at the Lunenburg Rd intersection. The vehicle rotated left and landed on the WB lane of Main St.
14	2/9/2016	11:44 AM	Tuesday	Daylight	Clear	Wet	58	44			Property Damage Only	Angled	Inattention / Distracted	MV1: travelling SB on Lunenburg Rd; MV2: travelling EB on Main St. MV2 collided with MV1 when MV1 attempted to take a left-turn onto Main St.
15	4/4/2016	7:20 AM	Monday	Daylight	Snow	Snow	57	62			Property Damage Only	Rear-end	Not Reported	MV1: travelling WB on Main St; MV2: travelling SB on Lunenburg Rd. MV1 was making a left-turn just west of the intersection. MV2 rear-ended MV1 when MV2 turned right onto Main St.
16	10/6/2016	11:42 AM	Thursday	Daylight	Clear	Dry	29	58			Property Damage Only	Angled	Failure to Yield Right-of-Way	MV1: travelling WB on Main St; MV2: travelling SB on Lunenburg Rd. MV2 struck MV1 when MV2 pulled out from Lunenburg Rd thinking that MV1 was making a right-turn.
17	10/20/2016	5:08 PM	Thursday	Daylight	Cloudy	Dry	37	56			Property Damage Only	Angled	Failure to Yield Right-of-Way	MV1: travelling WB on Main St; MV2: travelling SB on Lunenburg Rd. MV1 struck MV2 when MV2 pulled out from Lunenburg Rd and entered the travel lane of MV1.

Crash Data Summary Tables
Main Street (Route 117) @ Lunenburg Road (Route 70) - Lancaster, Massachusetts
01/01/2012 - 12/31/2016

Collision Diagram	Crash Date	Crash Time	Day of Week	Ambient Light	Weather Condition	Road Surface	Operator's Age				Crash Severity	Manner of Collision	Driver Contributing Codes	Detailed Narrative (from Crash Report)
							V1	V2	V3	V4				
18	11/3/2016	3:50 PM	Thursday	Daylight	Rain	Wet	34	61			Property Damage Only	Other	Other	MV1: stopped at the STOP-sign on Lunenburg Rd; MV2: turning right from Main St WB lane onto Lunenburg Rd NB lane. The folding tables that MV2 was carrying falls out and hit MV1 while MV2 was making the turn.
19	12/7/2016	1:06 PM	Wednesday	Daylight	Cloudy	Wet	59	44			Non-fatal Injury	Head-on	Failure to Yield Right-of-Way	MV1: travelling SB on Lunenburg Rd; MV2: travelling WB on Main St. MV2 collided with MV1 when MV1 attempted to take a left-turn onto Main St.
20	12/10/2016	11:54 AM	Saturday	Daylight	Clear	Dry	25	71			Property Damage Only	Angled	Not Reported	MV1: turning left from Main St EB lane onto Lunenburg Rd NB lane; MV2: attempting to turn left onto Main St EB lane from Lunenburg Rd SB lane. MV2 stuck MV1 while maing the turn.
21	1/19/2012	3:34 PM	Thursday	Daylight	Cloudy	Wet	47	20			Property Damage Only	Angled	Failure to Yield Right-of-Way	MV1: travelling WB on Main St; MV2: travelling SB on Lunenburg Rd. MV1 and MV2 collided with each other when MV2 attempted to make a left-turn without yielding for MV1.
22	4/27/2013	1:07 PM	Saturday	Daylight	Clear	Dry	52	43			Non-fatal Injury	Rear-end	Inattention / Distracted	MV1 and MV2: travelling SB on Lunenburg Rd. M1 was stopped at the STOP-sign and got rear-ended by MV2.
23	9/30/2013	8:35 AM	Monday	Daylight	Clear	Dry	57	47			Non-fatal Injury	Angled	Failure to Yield Right-of-Way	MV1: travelling SB on Lunenburg Rd; MV2: travelling WB on Main St. MV2 collided with MV1 when MV1 attempted to take a left-turn onto Main St.
24	11/4/2013	3:34 PM	Monday	Daylight	Clear	Dry	29	31			Property Damage Only	Angled	Inattention / Distracted	MV1: travelling WB on Main St; MV2: travelling SB on Lunenburg Rd. MV1 had its right turn blinker on and turned it off before it approaches the Lunenburg Rd intersection. MV2 struck MV1 when MV2 did not see the blinker turned off and made a left-turn.
25	12/14/2013	7:27 PM	Saturday	Dark - Lighted	Snow	Snow	57				Non-fatal Injury	Single Vehicle	Erratic / Aggressive / Reckless Driving	MV1: travelling SB on Lunenburg Rd. MV1 lost control of the vehicle on the snowy roads and went off roadway and struck the utility pole across the intersection.
26	12/19/2013	6:22 PM	Thursday	Dark - Lighted	Clear	Dry	46	20			Property Damage Only	Rear-end	Inattention / Distracted	MV1 and MV2: travelling SB on Lunenburg Rd. MV2 rear-ended MV1 when MV1 stopped at the STOP-sign.
27	8/11/2014	10:29 AM	Monday	Daylight	Clear	Dry	20	15			Property Damage Only	Angled	Failure to Yield Right-of-Way	MV1: travelling WB on Main St; MV2: travelling SB on Lunenburg Rd. MV1 struck MV2 when MV2 made a left-turn without yielding for MV1.
28	10/26/2013	1:39 AM	Saturday	Dark - Not Lighted	Clear	Dry	18				Property Damage Only	Single Vehicle	No Improper Driving	MV1: travelling SB on Lunenburg Rd. A deer ran out in front of the vehicle and MV1 collided with it.
29	1/22/2015	8:43 AM	Thursday	Daylight	Clear	Dry	48	63			Property Damage Only	Angled	Inattention / Distracted	MV1: travelling EB on Main St; MV2: travelling SB on Lunenburg Rd. MV2 collided with MV1 when MV2 entered Main St.
30	2/3/2015	1:06 PM	Tuesday	Daylight	Clear	Snow	53	54			Property Damage Only	Rear-end	Inattention / Distracted	MV1 and MV2: travelling SB on Lunenburg Rd. MV2 slid on ice and rear-ended MV1 when MV1 slowed down to stop at the STOP-sign.
31	2/4/2015	11:26 AM	Wednesday	Daylight	Clear	Wet	45	17			Property Damage Only	Rear-end	Inattention / Distracted	MV1 and MV2: travelling SB on Lunenburg Rd. MV2 rear-ended MV1 when MV1 had to stop for traffic.
32	6/10/2015	11:30 PM	Wednesday	Dark - Lighted	Clear	Dry	29				Property Damage Only	Single Vehicle	Inattention / Distracted	MV1: travelling SB on Lunenburg Rd. MV1 went through the STOP-sign without stopping and struck a tree across Main St.
33	7/21/2015	2:31 AM	Tuesday	Dark - Lighted	Clear	Dry	23				Property Damage Only	Single Vehicle	Other	MV1: travelling SB on Lunenburg Rd. Operator of MV1 fell asleep and entered the intersection, crossing Main St without stopping at the STOP-sign and crashed into the wooded area.
34	9/10/2015	12:04 AM	Thursday	Dark - Lighted	Rain	Wet	32				Property Damage Only	Single Vehicle	Other	MV1: travelling SB on Lunenburg Rd. MV1 did not stop at the STOP-sign and collided with a fire hydrant at the intersection.
35	12/11/2015	4:12 AM	Friday	Dark - Lighted	Other	Wet	20				Property Damage Only	Single Vehicle	Inattention / Distracted	MV1: travelling SB on Lunenburg Rd. MV1 crossed both travel lanes of Main St and struck with the bushes and stone wall.
36	6/29/2016	11:07 AM	Wednesday	Daylight	Cloudy	Dry	53	42			Property Damage Only	Rear-end	Inattention / Distracted	MV1 and MV2: travelling SB on Lunenburg Rd. MV2 rear-ended MV1 when MV1 stopped at the STOP-sign.
37	7/23/2016	11:51 AM	Saturday	Daylight	Clear	Dry	57	42			Property Damage Only	Angled	Inattention / Distracted	MV1: travelling WB on Main St; MV2: travelling SB on Lunenburg Rd. MV2 struck MV1 when MV2 attempted to make a left-turn.

Crash Data Summary Tables

Main Street (Route 117) @ Lunenburg Road (Route 70) - Lancaster, Massachusetts

01/01/2012 - 12/31/2016

Collision Diagram	Crash Date	Crash Time	Day of Week	Ambient Light	Weather Condition	Road Surface	Operator's Age				Crash Severity	Manner of Collision	Driver Contributing Codes	Detailed Narrative (from Crash Report)
							V1	V2	V3	V4				
38	8/2/2016	7:30 AM	Tuesday	Daylight	Cloudy	Wet	55	53			Property Damage Only	Angled	Failure to Yield Right-of-Way	MV1: travelling EB on Main St; MV2: travelling SB on Lunenburg Rd. MV2 collided with MV1 when MV2 made a left-turn.
39	9/25/2016	5:29 PM	Sunday	Daylight	Clear	Dry	25	76			Property Damage Only	Angled	Over-Steering / Over-Correcting	MV1: travelling SB on Lunenburg Rd; MV2: travelling WB on Main St. MV2 collided with MV1 when MV1 made a left-turn onto Main St.

Crash Data Summary Tables

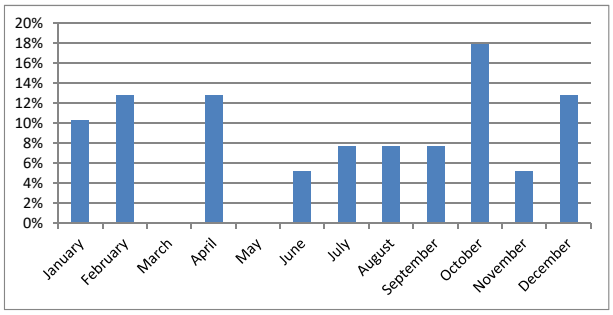
Main Street (Route 117) @ Lunenburg Road (Route 70) - Lancaster, Massachusetts

01/01/2012 - 12/31/2016

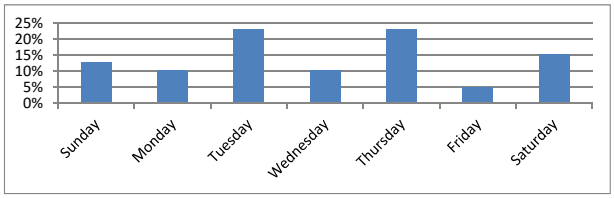
Main Street @ Lunenburg Road

39

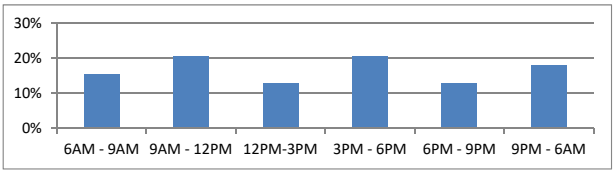
Month	#	%
January	4	10%
February	5	13%
March	0	0%
April	5	13%
May	0	0%
June	2	5%
July	3	8%
August	3	8%
September	3	8%
October	7	18%
November	2	5%
December	5	13%



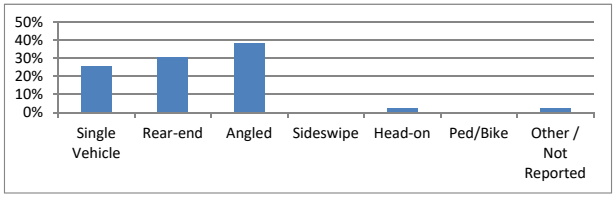
Day of Week	#	%
Sunday	5	13%
Monday	4	10%
Tuesday	9	23%
Wednesday	4	10%
Thursday	9	23%
Friday	2	5%
Saturday	6	15%



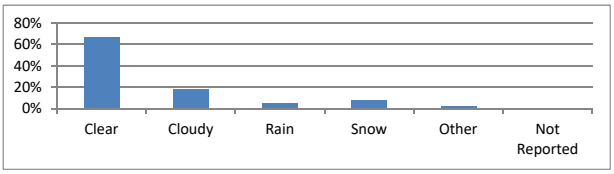
Time of Day	#	%
6AM - 9AM	6	15%
9AM - 12PM	8	21%
12PM-3PM	5	13%
3PM - 6PM	8	21%
6PM - 9PM	5	13%
9PM - 6AM	7	18%



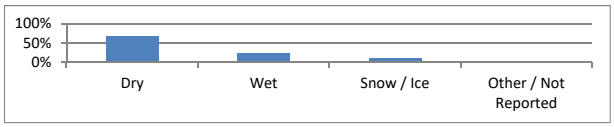
Manner of Collision	#	%
Single Vehicle	10	26%
Rear-end	12	31%
Angled	15	38%
Sideswipe	0	0%
Head-on	1	3%
Ped/Bike	0	0%
Other / Not Reported	1	3%



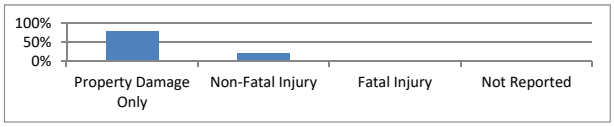
Weather Conditions	#	%
Clear	26	67%
Cloudy	7	18%
Rain	2	5%
Snow	3	8%
Other	1	3%
Not Reported	0	0%



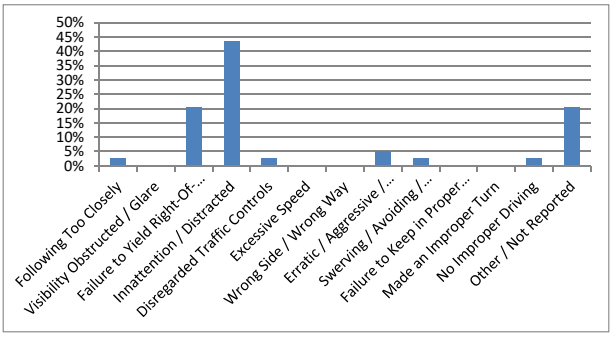
Road Surface	#	%
Dry	26	67%
Wet	9	23%
Snow / Ice	4	10%
Other / Not Reported	0	0%



Crash Severity	#	%
Property Damage Only	31	79%
Non-Fatal Injury	8	21%
Fatal Injury	0	0%
Not Reported	0	0%



Main Contributing Factor from Narrative	#	%
Following Too Closely	1	3%
Visibility Obstructed / Glare	0	0%
Failure to Yield Right-Of-Way	8	21%
Innattention / Distracted	17	44%
Disregarded Traffic Controls	1	3%
Excessive Speed	0	0%
Wrong Side / Wrong Way	0	0%
Erratic / Aggressive / Reckless Driving	2	5%
Swerving / Avoiding / Over-Steering / Over-Correcting	1	3%
Failure to Keep in Proper Lane	0	0%
Made an Improper Turn	0	0%
No Improper Driving	1	3%
Other / Not Reported	8	21%



Appendix D. Additional Information

Study Name	Lancaster - Route 117 at Route 70 and Shirley Road TM1 TMC
Start Date	Wednesday, December 02, 2015 7:00 AM
End Date	Wednesday, December 02, 2015 7:00 PM
Site Code	

Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk	
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Pedestrians	Total
Peak 1	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
7:00 AM - 12:00 PM	Cars	0	1	0	0	1	1	0	315	13	0	328	575	4	0	97	1	102	359	344	571	1	0	916	412	1347	E	0	0
One Hour Peak	%	0%	100%	0%	0%	100%	50%	0%	76%	100%	0%	77%	86%	80%	0%	82%	100%	82%	90%	90%	86%	50%	0%	88%	77%	84%		0%	
7:00 AM - 8:00 AM	Light Goods Vehicles	0	0	0	0	0	1	0	75	0	0	75	68	0	0	15	0	15	22	22	68	1	0	91	90	181	S	0	0
	%	0%	0%	0%	0%	0%	50%	0%	18%	0%	0%	18%	10%	0%	0%	13%	0%	12%	6%	6%	10%	50%	0%	9%	17%	11%		0%	
	Buses	0	0	0	0	0	0	0	2	0	0	2	5	0	0	2	0	2	8	8	5	0	0	13	4	17	W	2	2
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	0%	2%	2%	2%	1%	0%	0%	1%	1%	1%		100%	
	Single-Unit Trucks	0	0	0	0	0	0	0	17	0	0	17	14	1	0	4	0	5	7	7	13	0	0	20	21	42		2	2
	%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	4%	2%	20%	0%	3%	0%	4%	2%	2%	2%	0%	0%	2%	4%	3%			
	Articulated Trucks	0	0	0	0	0	0	0	6	0	0	6	5	0	0	0	0	0	1	1	5	0	0	6	6	12			
	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	1%			
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	**0**	**1**	**0**	**0**	**1**	**2**	**0**	**415**	**13**	**0**	**428**	**667**	**5**	**0**	**118**	**1**	**124**	**397**	**382**	**662**	**2**	**0**	**1046**	**533**	**1599**			
	PHF	0	0.25	0	0	0.25	0.25	0	0.88	0.65	0	0.87	0.76	0.62	0	0.76	0.25	0.76	0.83	0.84	0.76	0.25	0	0.9	0.87	0.93			
	Approach %					0%	0%					27%	42%					8%	25%					65%	33%				
Peak 2	Motorcycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
12:00 PM - 7:00 PM	Cars	1	1	0	0	2	5	2	815	4	0	821	307	7	2	150	1	160	213	207	300	1	0	508	966	1491	E	0	0
One Hour Peak	%	100%	100%	0%	0%	100%	100%	100%	83%	57%	0%	83%	81%	100%	100%	91%	100%	92%	88%	89%	81%	100%	0%	84%	84%	84%		0%	
3:45 PM - 4:45 PM	Light Goods Vehicles	0	0	0	0	0	0	0	129	0	0	129	54	0	0	7	0	7	17	17	54	0	0	71	136	207	S	0	0
	%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	13%	14%	0%	0%	4%	0%	4%	7%	7%	15%	0%	0%	12%	12%	12%		0%	
	Buses	0	0	0	0	0	0	0	7	0	0	7	1	0	0	4	0	4	5	5	1	0	0	6	11	17	W	0	0
	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	2%	0%	2%	2%	2%	0%	0%	0%	1%	1%	1%		0%	
	Single-Unit Trucks	0	0	0	0	0	0	0	22	3	0	25	11	0	0	1	0	1	5	2	11	0	0	13	23	39		0	0
	%	0%	0%	0%	0%	0%	0%	0%	2%	43%	0%	3%	3%	0%	0%	1%	0%	1%	2%	1%	3%	0%	0%	2%	2%	2%			
	Articulated Trucks	0	0	0	0	0	0	0	10	0	0	10	5	0	0	2	0	2	1	1	5	0	0	6	12	18			
	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	1%	0%	1%	0%	0%	1%	0%	0%	1%	1%	1%			
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	**1**	**1**	**0**	**0**	**2**	**5**	**2**	**983**	**7**	**0**	**992**	**378**	**7**	**2**	**164**	**1**	**174**	**241**	**232**	**371**	**1**	**0**	**604**	**1148**	**1772**			
	PHF	0.25	0.25	0	0	0.5	0.42	0.25	0.95	0.44	0	0.96	0.95	0.58	0.25	0.87	0.25	0.85	0.89	0.89	0.95	0.25	0	0.94	0.94	0.98			
	Approach %					0%	0%					56%	21%					10%	14%					34%	65%				

Study Name	Lancaster - Routes 117/70 (Main Street) at Route 70 (Lunenberg Road) TM2 TMC
Start Date	Wednesday, December 02, 2015 7:00 AM
End Date	Wednesday, December 02, 2015 7:00 PM
Site Code	

Report Summary

		Southbound					Westbound					Eastbound							Crosswalk	
Time Period	**Class.**	**R**	**L**	**U**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**Total**		**Pedestrians**	**Total**
Peak 1	**Motorcycles**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
7:00 AM - 12:00 PM	**Cars**	25	190	1	216	219	179	261	0	440	879	689	39	0	728	286	1384	E	0	0
One Hour Peak	%	93%	82%	100%	83%	87%	88%	79%	0%	83%	85%	86%	83%	0%	86%	80%	84%		0%	
7:00 AM - 8:00 AM	**Light Goods Vehicles**	2	30	0	32	23	17	49	0	66	114	84	6	0	90	51	188	W	0	0
	%	7%	13%	0%	12%	9%	8%	15%	0%	12%	11%	10%	13%	0%	11%	14%	11%		0%	
	Buses	0	1	0	1	1	1	3	0	4	11	10	0	0	10	3	15		0	0
	%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%	0%	0%	1%	1%	1%			
	Single-Unit Trucks	0	6	0	6	8	6	10	0	16	21	15	2	0	17	10	39			
	%	0%	3%	0%	2%	3%	3%	3%	0%	3%	2%	2%	4%	0%	2%	3%	2%			
	Articulated Trucks	0	5	0	5	1	1	6	0	7	9	4	0	0	4	6	16			
	%	0%	2%	0%	2%	0%	0%	2%	0%	1%	1%	0%	0%	0%	0%	2%	1%			
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	27	232	1	260	252	204	329	0	533	1034	802	47	0	849	356	1642			
	PHF	0.61	0.89	0.25	0.87	0.86	0.82	0.78	0	0.83	0.91	0.92	0.84	0	0.92	0.83	0.97			
	Approach %				16%	15%				32%	63%				52%	22%				
Peak 2	**Motorcycles**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
Specified Period	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
12:00 PM - 7:00 PM	**Cars**	46	167	0	213	387	350	597	0	947	472	305	37	0	342	643	1502	E	0	0
One Hour Peak	%	79%	80%	0%	79%	87%	87%	81%	0%	83%	78%	77%	90%	0%	79%	81%	81%		0%	
3:45 PM - 4:45 PM	**Light Goods Vehicles**	12	37	0	49	43	40	112	0	152	103	66	3	0	69	124	270	W	0	0
	%	21%	18%	0%	18%	10%	10%	15%	0%	13%	17%	17%	7%	0%	16%	16%	15%		0%	
	Buses	0	1	0	1	2	2	10	0	12	5	4	0	0	4	10	17		0	0
	%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%	0%	0%	1%	1%	1%			
	Single-Unit Trucks	0	3	0	3	8	7	11	0	18	18	15	1	0	16	11	37			
	%	0%	1%	0%	1%	2%	2%	1%	0%	2%	3%	4%	2%	0%	4%	1%	2%			
	Articulated Trucks	0	2	0	2	4	4	10	0	14	6	4	0	0	4	10	20			
	%	0%	1%	0%	1%	1%	1%	1%	0%	1%	1%	1%	0%	0%	1%	1%	1%			
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	58	210	0	268	444	403	740	0	1143	604	394	41	0	435	798	1846			
	PHF	0.76	0.86	0	0.88	0.9	0.95	0.91	0	0.95	0.96	0.94	0.6	0	0.95	0.92	0.99			
	Approach %				15%	24%				62%	33%				24%	43%				

MassDOT Highway Division
SPEED SUMMARY
Mon 11/30/2015

STA. 2 EB

Site Reference: 150580000513
Site ID: 000000000203
Location: RTE. 117, BTWN SHIRLEY RD &LUNENBURG RD
Direction: EAST
Lane: 1

File: SPD2-03.prn
City: LANCASTER
County: SPEED EB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
12:00	0	1	0	10	39	190	188	53	2	0	0	0	0	0	483
13:00	0	1	2	6	79	194	166	37	2	0	0	0	0	0	487
14:00	0	0	1	5	75	268	146	22	3	0	0	0	0	0	520
15:00	0	0	2	33	127	249	123	22	2	0	0	0	0	0	558
16:00	1	2	11	75	114	235	139	24	3	1	0	0	0	0	605
17:00	0	0	1	10	84	244	194	38	1	1	0	0	0	0	573
18:00	0	0	0	12	86	310	146	23	3	0	0	0	0	0	580
19:00	0	0	0	1	16	160	158	23	3	0	0	0	0	0	361
20:00	0	0	0	2	18	132	134	27	2	0	0	0	0	0	315
21:00	0	0	0	0	20	110	95	22	0	0	0	0	0	0	247
22:00	0	0	0	0	11	56	73	20	4	0	0	0	0	0	164
23:00	0	0	0	0	5	31	39	19	1	0	0	0	0	0	95
24:00	0	0	0	0	4	15	23	9	3	1	0	0	0	0	55
DAY TOTAL	1	4	17	154	678	2194	1624	339	29	3	0	0	0	0	5043
PERCENTS	0.1%	0.1%	0.4%	3.1%	13.4%	43.5%	32.2%	6.7%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
29.3 mph

85th Percentile Speed
38.8 mph

Median Speed
33.8 mph

Average Speed
33.8 mph

10 MPH Pace Speed
30 mph to 40 mph
3818 vehicles in pace
Representing 75.7% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Tue 12/1/2015

Site Reference: 150580000513
Site ID: 000000000203
Location: RTE. 117, BTWN SHIRLEY RD &LUNENBURG RD
Direction: EAST
Lane: 1

File: SPD2-03.prn
City: LANCASTER
County: SPEED EB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	2	12	8	4	0	0	0	0	0	0	26
02:00	0	0	0	0	1	3	6	2	0	0	0	0	0	0	12
03:00	0	0	0	0	0	4	3	3	2	0	0	1	0	0	13
04:00	0	0	0	0	1	9	13	4	5	0	0	0	0	0	32
05:00	0	0	0	1	2	15	44	29	7	0	0	0	0	0	98
06:00	0	0	0	0	13	140	270	61	2	1	0	0	0	0	487
07:00	22	5	5	9	95	468	279	32	3	0	0	0	0	0	918
08:00	17	25	50	169	315	330	107	8	0	0	0	0	0	0	1021
09:00	0	0	6	39	140	349	229	30	0	0	0	0	0	0	793
10:00	0	0	0	10	34	262	195	45	5	0	0	0	0	0	551
11:00	0	0	0	3	46	217	157	35	0	0	0	0	0	0	458
12:00	0	0	0	2	62	196	169	23	5	0	0	0	0	0	457
13:00	0	0	0	1	63	195	175	29	2	0	0	0	0	0	465
14:00	0	0	0	7	53	224	165	28	0	0	0	0	0	0	477
15:00	1	3	17	53	145	201	101	14	1	0	0	0	0	0	536
16:00	0	0	3	35	140	245	145	34	2	0	0	0	0	0	604
17:00	0	0	0	4	96	294	167	17	0	0	0	0	0	0	578
18:00	0	0	0	11	84	284	136	18	3	0	0	0	0	0	536
19:00	0	0	0	7	46	194	137	23	1	0	0	0	0	0	408
20:00	0	0	0	0	20	156	120	21	0	0	0	0	0	0	317
21:00	0	0	0	0	7	95	91	24	1	0	0	0	0	0	218
22:00	0	0	0	0	9	76	94	20	1	0	0	0	0	0	200
23:00	0	0	0	0	7	42	41	16	3	0	0	0	0	0	109
24:00	0	0	0	0	2	20	19	8	3	0	0	0	0	0	52
DAY TOTAL	40	33	81	351	1383	4031	2871	528	46	1	0	1	0	0	9366
PERCENTS	0.5%	0.4%	0.9%	3.8%	14.8%	43.0%	30.6%	5.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
28.3 mph

85th Percentile Speed
38.6 mph

Median Speed
33.5 mph

Average Speed
33.3 mph

10 MPH Pace Speed
30 mph to 40 mph
6902 vehicles in pace
Representing 73.6% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Wed 12/2/2015

Site Reference: 150580000513
Site ID: 000000000203
Location: RTE. 117, BTWN SHIRLEY RD &LUNENBURG RD
Direction: EAST
Lane: 1

File: SPD2-03.prn
City: LANCASTER
County: SPEED EB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	3	5	6	5	0	0	0	0	0	0	19
02:00	0	0	0	0	1	8	6	3	0	0	0	0	0	0	18
03:00	0	0	0	0	1	4	6	3	1	0	0	0	0	0	15
04:00	0	0	0	0	3	6	9	4	0	0	0	0	0	0	22
05:00	0	0	1	0	3	39	57	11	4	1	1	0	0	0	117
06:00	0	0	0	0	35	206	193	40	1	0	0	0	0	0	475
07:00	2	0	4	28	216	551	205	17	0	0	0	0	0	0	1023
08:00	1	10	21	103	255	418	152	11	0	0	0	0	0	0	971
09:00	0	0	5	61	164	333	165	17	0	0	0	0	0	0	745
10:00	0	0	1	4	78	292	184	34	2	0	0	0	0	0	595
11:00	0	0	0	4	82	223	167	21	1	0	0	0	0	0	498
12:00	0	0	0	2	41	231	194	29	1	0	0	0	0	0	498
13:00	2	0	0	1	44	205	175	45	3	0	0	0	0	0	475
14:00	0	0	0	7	32	236	188	42	1	0	0	0	0	0	506
15:00	0	0	7	61	136	228	139	21	2	0	0	0	0	0	594
16:00	0	0	9	46	117	232	131	17	5	0	0	0	0	0	557
17:00	1	5	2	5	96	291	143	23	1	0	0	0	0	0	567
18:00	0	0	1	7	78	253	166	23	1	0	0	0	0	0	529
19:00	0	0	1	0	45	220	98	14	0	0	0	0	0	0	378
20:00	0	0	0	3	34	139	113	9	3	0	0	0	0	0	301
21:00	0	0	0	0	17	111	83	20	5	1	0	0	0	0	237
22:00	0	0	0	1	13	67	79	12	3	1	0	0	0	0	176
23:00	0	0	0	2	13	42	58	21	3	0	0	0	0	0	139
24:00	0	0	0	0	3	22	17	8	2	0	0	0	0	0	52
DAY TOTAL	6	15	52	335	1510	4362	2734	450	39	3	1	0	0	0	9507
PERCENTS	0.1%	0.2%	0.6%	3.6%	15.9%	45.8%	28.7%	4.7%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
28.4 mph

85th Percentile Speed
38.3 mph

Median Speed
33.3 mph

Average Speed
33.2 mph

10 MPH Pace Speed
30 mph to 40 mph
7096 vehicles in pace
Representing 74.6% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Thu 12/3/2015

Site Reference: 150580000513
Site ID: 000000000203
Location: RTE. 117, BTWN SHIRLEY RD &LUNENBURG RD
Direction: EAST
Lane: 1

File: SPD2-03.prn
City: LANCASTER
County: SPEED EB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	1	4	7	4	0	0	0	0	0	0	16
02:00	0	0	1	0	1	6	2	6	0	0	0	0	0	0	16
03:00	0	0	0	0	2	11	10	2	1	0	0	0	0	0	26
04:00	0	0	0	1	0	6	12	4	1	1	0	0	0	0	25
05:00	0	0	0	0	4	30	48	20	5	0	0	0	0	0	107
06:00	0	0	0	0	17	165	252	62	9	0	0	0	0	0	505
07:00	0	1	0	21	141	460	330	25	1	0	0	0	0	0	979
08:00	3	7	29	101	251	378	160	30	0	0	0	0	0	0	959
09:00	0	0	13	72	150	261	213	49	2	0	0	0	0	0	760
DAY TOTAL	3	8	43	195	567	1321	1034	202	19	1	0	0	0	0	3393
PERCENTS	0.1%	0.3%	1.3%	5.8%	16.8%	38.9%	30.4%	5.9%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
27.3 mph

85th Percentile Speed
38.6 mph

Median Speed
33.3 mph

Average Speed
33.0 mph

10 MPH Pace Speed
30 mph to 40 mph
2355 vehicles in pace
Representing 69.4% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Mon 11/30/2015

STA 2 WB

Site Reference: 150580000732
Site ID: 000000000204
Location: RTE. 117, BTWN SHIRLEY RD &LUNENBURG RD
Direction: WEST
Lane: 1

File: SPD2-04.prn
City: LANCASTER
County: SPEED WB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
12:00	0	0	1	7	55	209	175	23	2	0	0	0	0	0	472
13:00	0	1	1	7	39	255	173	18	2	0	0	0	0	0	496
14:00	0	0	2	7	93	253	117	7	1	0	0	0	0	0	480
15:00	0	0	1	6	60	412	189	14	1	0	0	0	0	0	683
16:00	10	7	15	44	164	495	199	23	1	0	0	0	0	0	958
17:00	0	0	1	11	196	617	222	11	1	0	0	0	0	0	1059
18:00	0	0	1	19	145	606	257	9	0	0	0	0	0	0	1037
19:00	0	0	0	9	91	442	238	21	1	0	0	0	0	0	802
20:00	0	0	0	2	24	224	150	19	1	0	0	0	0	0	420
21:00	0	0	0	0	14	112	124	18	0	0	0	0	0	0	268
22:00	0	0	0	0	20	69	101	17	0	0	0	0	0	0	207
23:00	0	0	0	6	3	50	68	18	1	0	0	0	0	0	146
24:00	0	0	0	0	3	34	42	14	4	0	0	0	0	0	97
DAY TOTAL	10	8	22	118	907	3778	2055	212	15	0	0	0	0	0	7125
PERCENTS	0.2%	0.2%	0.4%	1.6%	12.7%	53.0%	28.8%	2.9%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
30.0 mph

85th Percentile Speed
38.0 mph

Median Speed
33.3 mph

Average Speed
33.4 mph

10 MPH Pace Speed
30 mph to 40 mph
5833 vehicles in pace
Representing 81.8% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Tue 12/1/2015

Site Reference: 150580000732
Site ID: 000000000204
Location: RTE. 117, BTWN SHIRLEY RD &LUNENBURG RD
Direction: WEST
Lane: 1

File: SPD2-04.prn
City: LANCASTER
County: SPEED WB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	1	5	28	21	3	0	0	0	0	0	0	58
02:00	0	0	0	0	3	9	7	4	0	0	0	0	0	0	23
03:00	0	0	0	0	4	2	1	2	1	0	0	0	0	0	10
04:00	0	0	0	0	0	5	8	4	1	0	0	0	0	0	18
05:00	0	0	0	1	2	18	28	3	0	0	0	0	0	0	52
06:00	0	0	0	0	10	47	40	16	1	0	0	0	0	0	114
07:00	0	1	0	2	22	112	111	21	1	0	0	0	0	0	270
08:00	1	0	0	23	133	282	139	17	1	0	0	0	0	0	596
09:00	0	0	0	2	67	292	194	17	0	0	0	0	0	0	572
10:00	0	0	1	19	45	226	164	14	0	0	0	0	0	0	469
11:00	0	0	1	7	59	204	140	15	1	0	0	0	0	0	427
12:00	0	0	0	6	65	196	115	19	0	0	0	0	0	0	401
13:00	0	0	0	2	59	268	144	18	1	0	0	0	0	0	492
14:00	1	0	0	12	88	213	130	14	0	0	0	0	0	0	458
15:00	0	0	1	15	147	368	98	11	0	0	0	0	0	0	640
16:00	1	0	1	11	186	509	211	18	0	0	0	0	0	0	937
17:00	0	0	0	39	301	571	151	7	1	0	0	0	0	0	1070
18:00	0	0	0	13	179	619	260	8	0	0	0	0	0	0	1079
19:00	0	0	0	4	90	499	224	23	1	0	0	0	0	0	841
20:00	0	0	0	0	36	256	161	13	0	0	0	0	0	0	466
21:00	0	0	0	1	19	153	107	11	0	0	0	0	0	0	291
22:00	0	0	2	1	19	109	75	10	0	0	0	0	0	0	216
23:00	0	0	0	0	17	76	68	7	0	0	0	0	0	0	168
24:00	0	0	0	1	6	62	47	11	2	0	0	0	0	0	129
DAY TOTAL	3	1	6	160	1562	5124	2644	286	11	0	0	0	0	0	9797
PERCENTS	0.1%	0.1%	0.1%	1.6%	15.9%	52.3%	26.9%	2.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
29.2 mph

85th Percentile Speed
37.8 mph

Median Speed
33.1 mph

Average Speed
33.2 mph

10 MPH Pace Speed
30 mph to 40 mph
7768 vehicles in pace
Representing 79.2% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Wed 12/2/2015

Site Reference: 150580000732
Site ID: 000000000204
Location: RTE. 117, BTWN SHIRLEY RD &LUNENBURG RD
Direction: WEST
Lane: 1

File: SPD2-04.prn
City: LANCASTER
County: SPEED WB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	5	26	13	5	0	0	0	0	0	0	49
02:00	0	0	0	0	3	4	8	2	0	0	0	0	0	0	17
03:00	0	0	0	0	1	1	6	2	1	0	0	0	0	0	11
04:00	0	0	0	0	0	4	6	0	1	0	0	0	0	0	11
05:00	0	0	0	0	7	15	12	5	1	0	0	0	0	0	40
06:00	0	0	0	1	10	50	47	8	2	0	0	0	0	0	118
07:00	0	0	1	6	37	125	108	21	1	0	0	0	0	0	299
08:00	0	0	1	7	87	219	170	29	2	0	0	0	0	0	515
09:00	0	0	0	2	71	317	174	23	0	0	0	0	0	0	587
10:00	0	0	1	7	66	268	134	20	1	0	0	0	0	0	497
11:00	0	1	0	6	51	229	159	17	2	0	0	0	0	0	465
12:00	1	1	1	14	82	215	121	11	0	0	0	0	0	0	446
13:00	0	0	1	6	52	253	168	12	3	0	0	0	0	0	495
14:00	0	1	0	1	67	229	169	15	2	0	0	0	0	0	484
15:00	0	0	0	14	155	352	147	6	1	0	0	0	0	0	675
16:00	5	15	38	41	181	490	176	14	0	1	0	0	0	0	961
17:00	0	0	0	52	372	571	103	2	0	0	0	0	0	0	1100
18:00	0	0	3	24	276	655	112	6	0	0	0	0	0	0	1076
19:00	0	0	2	7	116	474	222	17	0	0	0	0	0	0	838
20:00	0	0	0	6	46	311	142	10	0	0	0	0	0	0	515
21:00	0	0	1	5	20	180	116	16	0	0	0	0	0	0	338
22:00	0	0	0	3	11	102	73	14	0	0	0	0	0	0	203
23:00	0	0	0	0	12	65	74	11	1	0	0	0	0	0	163
24:00	0	0	0	0	7	40	55	22	0	0	0	0	0	0	124
DAY TOTAL	6	18	49	202	1735	5195	2515	288	18	1	0	0	0	0	10027
PERCENTS	0.1%	0.2%	0.5%	2.1%	17.4%	51.8%	25.0%	2.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
28.6 mph

85th Percentile Speed
37.6 mph

Median Speed
32.9 mph

Average Speed
32.9 mph

10 MPH Pace Speed
30 mph to 40 mph
7710 vehicles in pace
Representing 76.8% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Thu 12/3/2015

Site Reference: 150580000732
Site ID: 000000000204
Location: RTE. 117, BTWN SHIRLEY RD &LUNENBURG RD
Direction: WEST
Lane: 1

File: SPD2-04.prn
City: LANCASTER
County: SPEED WB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	2	32	17	3	2	0	0	0	0	0	56
02:00	0	0	0	1	1	7	6	1	2	1	0	0	0	0	19
03:00	0	0	0	0	2	5	8	2	0	0	0	0	0	0	17
04:00	0	0	0	0	0	8	4	3	0	0	0	0	0	0	15
05:00	0	0	0	1	4	16	16	4	1	0	0	0	0	0	42
06:00	0	0	0	0	13	49	50	10	0	0	0	0	0	0	122
07:00	0	0	0	3	42	144	114	8	0	0	0	0	0	0	311
08:00	0	0	1	44	111	265	134	13	0	0	0	0	0	0	568
09:00	0	0	1	13	71	291	196	16	2	0	0	0	0	0	590
DAY TOTAL	0	0	2	62	246	817	545	60	7	1	0	0	0	0	1740
PERCENTS	0.0%	0.0%	0.2%	3.6%	14.2%	46.9%	31.3%	3.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
29.0 mph

85th Percentile Speed
38.2 mph

Median Speed
33.4 mph

Average Speed
33.4 mph

10 MPH Pace Speed
30 mph to 40 mph
1362 vehicles in pace
Representing 78.2% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Mon 11/30/2015

STA. 3 EB

Site Reference: 150580000423
Site ID: 000000000303
Location: RTE. 117, W. OF RTE. 70 (LUNENBURG RD.)
Direction: EAST
Lane: 1

File: SPD3-03.prn
City: LANCASTER
County: SPEED EB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
11:00	0	0	1	0	21	94	132	69	2	0	0	0	0	0	319
12:00	1	0	0	6	15	83	135	67	6	0	0	0	0	0	313
13:00	1	2	0	6	23	83	122	58	3	0	0	0	0	0	298
14:00	0	0	1	0	25	114	159	44	3	1	0	0	0	0	347
15:00	0	0	0	0	17	118	162	60	4	0	0	0	0	0	361
16:00	1	0	0	4	17	144	187	62	6	1	0	0	0	0	422
17:00	0	1	1	7	28	130	202	49	4	1	0	0	0	0	423
18:00	0	2	0	1	19	132	217	50	2	0	0	0	0	0	423
19:00	0	0	0	0	5	60	127	51	5	0	0	0	0	0	248
20:00	0	0	0	0	4	31	73	45	7	0	1	0	0	0	161
21:00	0	0	0	0	3	35	52	37	7	1	0	0	0	0	135
22:00	0	0	0	0	0	15	42	16	7	0	1	0	0	0	81
23:00	0	0	0	0	1	11	20	24	5	0	0	0	0	0	61
24:00	0	0	0	0	1	3	10	6	5	1	1	0	0	0	27
DAY TOTAL	3	5	3	24	179	1053	1640	638	66	5	3	0	0	0	3619
PERCENTS	0.1%	0.2%	0.1%	0.7%	5.0%	29.1%	45.3%	17.6%	1.8%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
31.6 mph

85th Percentile Speed
41.3 mph

Median Speed
36.7 mph

Average Speed
36.5 mph

10 MPH Pace Speed
30 mph to 40 mph
2693 vehicles in pace
Representing 74.4% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Tue 12/1/2015

Site Reference: 150580000423
Site ID: 000000000303
Location: RTE. 117, W. OF RTE. 70 (LUNENBURG RD.)
Direction: EAST
Lane: 1

File: SPD3-03.prn
City: LANCASTER
County: SPEED EB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	1	3	6	4	1	0	0	0	0	0	15
02:00	0	0	0	0	0	2	2	1	0	0	0	0	0	0	5
03:00	0	0	0	0	0	2	1	5	0	1	0	1	0	0	10
04:00	0	0	0	0	1	1	9	6	4	1	0	0	0	0	22
05:00	0	0	2	0	3	10	20	20	10	1	2	0	0	0	68
06:00	0	0	0	0	5	57	162	92	7	2	1	0	0	0	326
07:00	4	4	1	9	47	221	327	81	5	0	0	0	0	0	699
08:00	51	61	51	105	67	153	264	62	8	1	0	0	0	0	823
09:00	0	0	2	14	47	147	296	66	4	0	0	0	0	0	576
10:00	1	5	1	2	28	125	137	57	5	0	0	0	0	0	361
11:00	1	1	0	5	22	107	122	35	4	0	0	0	0	0	297
12:00	1	1	0	9	37	94	109	30	1	0	0	0	0	0	282
13:00	0	0	1	3	23	95	121	35	3	0	0	0	0	0	281
14:00	1	0	0	0	21	114	132	26	5	0	0	0	0	0	299
15:00	0	0	0	2	49	133	139	34	4	1	0	0	0	0	362
16:00	2	1	5	0	40	141	175	41	5	0	0	0	0	0	410
17:00	0	1	10	3	28	158	190	31	0	0	0	0	0	0	421
18:00	1	0	0	1	31	158	150	40	0	0	0	0	0	0	381
19:00	2	1	0	2	9	95	117	39	2	0	0	0	0	0	267
20:00	0	1	0	0	8	64	67	19	3	0	0	0	0	0	162
21:00	0	0	0	0	8	42	57	17	1	0	0	0	0	0	125
22:00	0	0	0	0	7	40	55	11	0	0	0	0	0	0	113
23:00	0	0	0	2	3	22	26	17	3	2	0	0	0	0	75
24:00	0	0	0	1	1	15	7	4	1	0	0	0	0	0	29
DAY TOTAL	64	76	73	158	486	1999	2691	773	76	9	3	1	0	0	6409
PERCENTS	1.0%	1.2%	1.2%	2.5%	7.6%	31.2%	42.0%	12.1%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
30.3 mph

85th Percentile Speed
39.8 mph

Median Speed
35.7 mph

Average Speed
34.7 mph

10 MPH Pace Speed
30 mph to 40 mph
4690 vehicles in pace
Representing 73.1% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Wed 12/2/2015

Site Reference: 150580000423
Site ID: 000000000303
Location: RTE. 117, W. OF RTE. 70 (LUNENBURG RD.)
Direction: EAST
Lane: 1

File: SPD3-03.prn
City: LANCASTER
County: SPEED EB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	0	4	4	4	0	0	0	0	0	0	12
02:00	0	1	0	0	0	1	6	1	0	0	0	0	0	0	9
03:00	0	0	0	0	1	3	1	3	1	0	0	0	0	0	9
04:00	0	0	0	0	0	2	4	5	0	0	0	0	0	0	11
05:00	0	2	0	0	2	15	40	14	4	0	0	1	0	0	78
06:00	0	0	0	0	10	71	163	54	10	0	0	0	0	0	308
07:00	0	1	0	6	59	246	381	64	5	0	0	0	0	0	762
08:00	3	2	7	4	32	286	409	86	6	1	0	0	0	0	836
09:00	2	0	1	12	55	188	218	65	4	0	0	0	0	0	545
10:00	1	0	0	5	27	175	157	39	4	0	0	0	0	0	408
11:00	2	0	0	0	30	100	142	48	2	0	0	0	0	0	324
12:00	0	0	0	4	19	113	142	40	2	0	0	0	0	0	320
13:00	0	0	0	0	9	95	128	45	5	0	0	0	0	0	282
14:00	0	1	0	1	6	114	145	46	2	0	0	0	0	0	315
15:00	1	0	0	6	21	110	187	61	8	0	0	0	0	0	394
16:00	0	0	1	11	60	150	137	30	3	0	0	0	0	0	392
17:00	1	0	1	2	25	143	189	45	1	0	0	0	0	0	407
18:00	0	0	0	1	35	146	149	29	2	0	0	0	0	0	362
19:00	2	0	1	6	19	93	104	20	1	0	0	0	0	0	246
20:00	0	0	0	0	6	68	83	28	6	0	0	0	0	0	191
21:00	0	0	0	2	8	43	68	26	3	0	0	0	0	0	150
22:00	0	0	0	0	2	16	42	15	9	1	0	0	0	0	85
23:00	0	0	0	0	1	19	42	14	4	0	0	0	0	0	80
24:00	0	0	0	0	0	7	14	4	2	0	0	0	0	0	27
DAY TOTAL	12	7	11	60	427	2208	2955	786	84	2	0	1	0	0	6553
PERCENTS	0.2%	0.2%	0.2%	1.0%	6.6%	33.7%	45.0%	11.9%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
31.1 mph

85th Percentile Speed
39.8 mph

Median Speed
35.9 mph

Average Speed
35.7 mph

10 MPH Pace Speed
30 mph to 40 mph
5163 vehicles in pace
Representing 78.7% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Thu 12/3/2015

Site Reference: 150580000423
Site ID: 000000000303
Location: RTE. 117, W. OF RTE. 70 (LUNENBURG RD.)
Direction: EAST
Lane: 1

File: SPD3-03.prn
City: LANCASTER
County: SPEED EB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	0	3	1	2	1	0	0	0	0	0	7
02:00	0	0	0	0	0	3	5	3	0	0	0	0	0	0	11
03:00	0	0	0	0	0	4	6	6	0	1	0	0	0	0	17
04:00	0	0	0	0	0	3	6	2	1	0	0	0	0	0	12
05:00	0	0	0	0	0	18	30	16	5	0	0	0	0	0	69
06:00	0	0	0	1	14	78	163	70	7	1	0	0	0	0	334
07:00	1	0	4	11	99	267	289	68	4	0	0	0	0	0	743
08:00	5	3	3	16	56	293	337	75	4	0	0	0	0	0	792
09:00	2	10	19	45	33	94	203	137	17	1	0	0	0	0	561
DAY TOTAL	8	13	26	73	202	763	1040	379	39	3	0	0	0	0	2546
PERCENTS	0.4%	0.6%	1.1%	2.9%	7.9%	29.9%	40.8%	14.8%	1.5%	0.1%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
30.4 mph

85th Percentile Speed
40.5 mph

Median Speed
35.9 mph

Average Speed
35.3 mph

10 MPH Pace Speed
30 mph to 40 mph
1803 vehicles in pace
Representing 70.8% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Mon 11/30/2015

STA 3 WB

Site Reference: 150580000429
Site ID: 000000000304
Location: RTE. 117, W. OF RTE. 70 (LUNENBURG RD.)
Direction: WEST
Lane: 1

File: SPD3-04.prn
City: LANCASTER
County: SPEED WB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
11:00	0	0	0	2	9	91	154	67	5	1	0	0	0	0	329
12:00	1	2	1	6	7	84	137	67	6	0	0	0	0	0	311
13:00	0	0	2	2	19	110	159	57	5	0	0	0	0	0	354
14:00	4	0	2	1	16	79	178	53	5	0	0	0	0	0	338
15:00	3	1	4	1	7	109	246	94	7	0	0	0	0	0	472
16:00	0	1	4	0	23	185	372	131	7	0	0	0	0	0	723
17:00	0	1	0	0	9	180	413	127	14	0	0	0	0	0	744
18:00	0	0	0	4	17	133	414	134	15	0	0	0	0	0	717
19:00	0	0	0	1	8	91	316	110	10	0	0	0	0	0	536
20:00	0	1	1	0	0	47	157	88	6	2	0	0	0	0	302
21:00	0	0	0	0	5	34	114	47	2	0	0	0	0	0	202
22:00	0	0	0	0	0	14	73	43	6	0	0	0	0	0	136
23:00	0	0	0	0	3	25	30	29	6	0	0	0	0	0	93
24:00	0	0	0	0	2	10	32	17	7	2	1	0	0	0	71
DAY TOTAL	8	6	14	17	125	1192	2795	1064	101	5	1	0	0	0	5328
PERCENTS	0.2%	0.2%	0.3%	0.4%	2.4%	22.4%	52.4%	19.9%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
32.6 mph

85th Percentile Speed
41.8 mph

Median Speed
37.3 mph

Average Speed
37.2 mph

10 MPH Pace Speed
30 mph to 40 mph
3987 vehicles in pace
Representing 74.8% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Tue 12/1/2015

Site Reference: 150580000429
Site ID: 000000000304
Location: RTE. 117, W. OF RTE. 70 (LUNENBURG RD.)
Direction: WEST
Lane: 1

File: SPD3-04.prn
City: LANCASTER
County: SPEED WB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	2	10	13	6	3	1	0	0	0	0	35
02:00	0	0	0	0	0	3	9	4	3	0	1	0	0	0	20
03:00	0	0	0	0	0	3	3	2	2	0	0	0	0	0	10
04:00	0	0	0	0	0	0	6	3	0	0	0	0	0	0	9
05:00	0	0	0	0	0	4	18	11	1	0	0	0	0	0	34
06:00	0	0	0	0	2	11	34	19	3	0	0	0	0	0	69
07:00	1	0	0	0	1	42	86	42	6	0	0	0	0	0	178
08:00	0	1	0	5	52	166	183	55	7	0	0	0	0	0	469
09:00	3	0	0	1	18	118	196	48	3	0	0	0	0	0	387
10:00	0	1	0	0	7	106	171	35	3	1	0	0	0	0	324
11:00	0	0	1	1	36	116	132	26	1	0	0	0	0	0	313
12:00	0	0	0	1	11	103	118	35	0	0	0	0	0	0	268
13:00	0	0	1	0	27	101	161	46	2	1	0	0	0	0	339
14:00	0	0	0	1	22	121	125	45	5	1	0	0	0	0	320
15:00	0	0	0	2	23	161	223	55	3	0	0	0	0	0	467
16:00	3	1	3	4	14	180	343	114	9	0	0	0	0	0	671
17:00	0	0	2	2	25	283	359	81	5	1	0	0	0	0	758
18:00	0	0	0	2	29	238	398	95	5	0	0	0	0	0	767
19:00	0	0	2	0	2	111	364	105	6	0	0	0	0	0	590
20:00	0	1	2	1	5	81	149	73	4	0	0	0	0	0	316
21:00	0	0	0	0	0	58	99	45	2	0	0	0	0	0	204
22:00	0	0	0	0	3	48	74	21	5	0	0	0	0	0	151
23:00	0	0	0	0	5	33	53	28	2	0	0	0	0	0	121
24:00	0	0	0	0	1	18	47	25	4	0	0	0	0	0	95
DAY TOTAL	7	4	11	20	285	2115	3364	1019	84	5	1	0	0	0	6915
PERCENTS	0.2%	0.1%	0.2%	0.3%	4.2%	30.5%	48.6%	14.7%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
31.7 mph

85th Percentile Speed
40.4 mph

Median Speed
36.5 mph

Average Speed
36.3 mph

10 MPH Pace Speed
30 mph to 40 mph
5479 vehicles in pace
Representing 79.2% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Wed 12/2/2015

Site Reference: 150580000429
Site ID: 000000000304
Location: RTE. 117, W. OF RTE. 70 (LUNENBURG RD.)
Direction: WEST
Lane: 1

File: SPD3-04.prn
City: LANCASTER
County: SPEED WB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	4	13	10	9	0	0	0	0	0	0	36
02:00	0	0	0	0	0	3	3	4	0	0	0	0	0	0	10
03:00	0	0	0	0	1	0	3	4	3	0	0	0	0	0	11
04:00	0	0	0	0	0	0	4	2	0	0	0	0	0	0	6
05:00	0	0	0	0	2	5	15	8	2	0	0	0	0	0	32
06:00	0	0	0	0	2	17	30	12	3	0	0	0	0	0	64
07:00	0	0	0	1	5	70	91	23	3	0	0	0	0	0	193
08:00	0	0	0	2	13	106	164	65	5	0	0	0	0	0	355
09:00	2	2	1	1	11	118	201	61	4	0	1	0	0	0	402
10:00	0	0	0	0	17	103	169	42	6	0	0	0	0	0	337
11:00	0	1	0	0	7	99	158	49	4	2	0	0	0	0	320
12:00	0	0	2	2	15	100	150	51	4	0	0	0	0	0	324
13:00	0	0	0	0	19	88	163	61	4	0	0	0	0	0	335
14:00	0	1	0	1	17	115	140	56	4	0	0	0	0	0	334
15:00	0	0	0	1	10	119	276	67	5	0	0	0	0	0	478
16:00	4	1	4	22	93	305	211	50	5	1	0	0	0	0	696
17:00	0	2	1	5	39	286	351	88	7	0	0	0	0	0	779
18:00	0	0	2	7	20	242	366	88	5	2	0	0	0	0	732
19:00	0	0	0	2	20	146	316	93	4	0	0	0	0	0	581
20:00	0	0	0	0	9	89	218	62	4	0	0	0	0	0	382
21:00	0	0	0	0	3	43	143	47	4	0	0	0	0	0	240
22:00	0	0	0	0	3	33	64	34	4	0	0	0	0	0	138
23:00	0	0	0	0	1	20	69	27	7	0	0	0	0	0	124
24:00	0	0	0	0	5	23	36	21	8	0	0	0	0	0	93
DAY TOTAL	6	7	10	44	316	2143	3351	1024	95	5	1	0	0	0	7002
PERCENTS	0.1%	0.1%	0.2%	0.7%	4.6%	30.6%	47.8%	14.6%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
31.6 mph

85th Percentile Speed
40.4 mph

Median Speed
36.5 mph

Average Speed
36.2 mph

10 MPH Pace Speed
30 mph to 40 mph
5494 vehicles in pace
Representing 78.4% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Thu 12/3/2015

Site Reference: 150580000429
Site ID: 000000000304
Location: RTE. 117, W. OF RTE. 70 (LUNENBURG RD.)
Direction: WEST
Lane: 1

File: SPD3-04.prn
City: LANCASTER
County: SPEED WB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	0	10	18	5	2	0	0	0	0	0	35
02:00	0	0	0	0	0	0	2	4	0	2	0	0	0	0	8
03:00	0	0	0	0	1	6	3	1	2	0	0	0	0	0	13
04:00	0	0	0	0	0	3	6	3	1	0	0	0	0	0	13
05:00	0	0	0	0	3	4	15	5	7	0	1	0	0	0	35
06:00	0	0	0	0	0	9	39	12	3	0	0	0	0	0	63
07:00	0	1	1	0	12	57	99	30	4	1	0	0	0	0	205
08:00	1	0	1	6	25	134	180	58	9	0	0	0	0	0	414
09:00	1	0	0	1	16	135	209	58	3	0	0	0	0	0	423
DAY TOTAL	2	1	2	7	57	358	571	176	31	3	1	0	0	0	1209
PERCENTS	0.2%	0.1%	0.2%	0.6%	4.8%	29.7%	47.2%	14.5%	2.5%	0.2%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
31.6 mph

85th Percentile Speed
40.9 mph

Median Speed
36.6 mph

Average Speed
36.4 mph

10 MPH Pace Speed
30 mph to 40 mph
929 vehicles in pace
Representing 76.8% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Mon 11/30/2015

STA 5 NB

Site Reference: 150580000497
Site ID: 000000000501
Location: RTE. 70 (LUNENBURG RD.) N. OF RTE. 117
Direction: NORTH
Lane: 1

File: SPD5-01.prn
City: LANCASTER
County: SPEED NB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
12:00	0	0	0	0	11	23	80	67	16	1	0	0	0	0	198
13:00	0	0	0	0	1	10	89	68	21	2	1	0	0	0	192
14:00	0	0	0	0	4	19	81	69	22	2	0	0	0	0	197
15:00	0	0	0	0	7	28	108	87	35	9	0	0	0	0	274
16:00	0	0	0	1	6	24	133	171	56	6	1	0	0	0	398
17:00	0	0	0	2	11	33	149	173	56	7	0	2	0	0	433
18:00	0	0	0	0	1	21	175	176	39	7	1	0	0	0	420
19:00	0	0	0	0	0	31	108	120	31	3	1	0	0	0	294
20:00	0	0	0	0	0	16	52	55	14	4	1	0	0	0	142
21:00	0	0	0	0	1	10	50	21	13	1	0	0	0	0	96
22:00	0	0	0	0	6	7	33	26	12	1	0	0	0	0	85
23:00	0	0	0	0	2	4	21	20	10	0	0	1	0	0	58
24:00	0	0	0	0	0	2	11	10	4	2	0	0	0	0	29
DAY TOTAL	0	0	0	3	50	228	1090	1063	329	45	5	3	0	0	2816
PERCENTS	0.0%	0.0%	0.0%	0.2%	1.8%	8.1%	38.8%	37.8%	11.6%	1.5%	0.1%	0.1%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
35.7 mph

85th Percentile Speed
44.8 mph

Median Speed
40.2 mph

Average Speed
40.3 mph

10 MPH Pace Speed
35 mph to 45 mph
2153 vehicles in pace
Representing 76.4% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Tue 12/1/2015

Site Reference: 150580000497
Site ID: 000000000501
Location: RTE. 70 (LUNENBURG RD.) N. OF RTE. 117
Direction: NORTH
Lane: 1

File: SPD5-01.prn
City: LANCASTER
County: SPEED NB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	0	2	8	9	2	0	0	0	0	0	21
02:00	0	0	0	0	0	3	4	0	1	0	0	0	0	0	8
03:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
04:00	0	0	0	0	1	0	3	1	0	2	0	1	0	0	8
05:00	0	0	0	0	1	5	10	6	0	0	0	0	0	0	22
06:00	0	0	0	0	0	6	30	22	12	1	0	0	0	0	71
07:00	0	0	0	0	0	22	35	59	22	6	1	0	0	0	145
08:00	0	0	0	0	2	19	92	109	37	1	1	0	0	0	261
09:00	0	0	0	0	2	16	80	103	41	2	0	1	0	0	245
10:00	0	0	0	0	4	22	89	66	19	2	0	0	0	0	202
11:00	0	0	0	0	3	21	61	56	19	2	0	0	0	0	162
12:00	0	0	0	0	7	25	65	70	11	3	0	0	0	0	181
13:00	0	0	0	1	4	25	82	69	22	3	0	0	0	0	206
14:00	0	0	0	0	3	25	86	68	17	3	0	0	0	0	202
15:00	0	0	0	1	11	20	100	99	22	4	1	0	0	0	258
16:00	0	0	0	0	1	36	137	153	51	5	1	0	0	0	384
17:00	0	0	2	4	4	42	182	152	33	2	1	0	0	0	422
18:00	0	0	0	0	3	42	173	172	39	8	0	0	0	0	437
19:00	0	0	0	0	1	27	119	97	41	1	0	0	0	0	286
20:00	0	0	0	0	5	26	82	54	15	3	1	0	0	0	186
21:00	0	0	0	0	1	20	45	36	14	2	0	0	0	0	118
22:00	0	0	0	0	2	12	41	24	4	1	0	0	0	0	84
23:00	0	0	0	0	2	6	22	27	10	1	1	0	0	0	69
24:00	0	0	0	0	0	3	7	19	6	1	0	0	0	0	36
DAY TOTAL	0	0	2	6	57	426	1554	1471	438	53	7	2	0	0	4016
PERCENTS	0.0%	0.0%	0.1%	0.2%	1.5%	10.7%	38.6%	36.6%	10.9%	1.3%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
35.4 mph

85th Percentile Speed
44.7 mph

Median Speed
39.9 mph

Average Speed
40.0 mph

10 MPH Pace Speed
35 mph to 45 mph
3025 vehicles in pace
Representing 75.3% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Wed 12/2/2015

Site Reference: 150580000497
Site ID: 000000000501
Location: RTE. 70 (LUNENBURG RD.) N. OF RTE. 117
Direction: NORTH
Lane: 1

File: SPD5-01.prn
City: LANCASTER
County: SPEED NB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	3	0	6	9	1	0	0	0	0	0	19
02:00	0	0	0	0	0	0	3	3	1	0	0	0	0	0	7
03:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
04:00	0	0	0	0	0	1	2	2	0	0	0	1	0	0	6
05:00	0	0	0	0	0	5	6	4	0	0	0	0	0	0	15
06:00	0	0	0	0	1	7	31	21	5	1	0	0	0	0	66
07:00	0	0	0	0	3	24	73	60	11	2	0	0	0	0	173
08:00	0	0	0	0	1	21	71	109	37	5	1	0	0	0	245
09:00	3	0	3	5	28	74	82	39	4	1	0	0	0	0	239
10:00	0	0	1	2	23	59	87	27	11	1	0	0	0	0	211
11:00	0	0	0	3	4	19	79	59	13	1	1	0	0	0	179
12:00	0	0	0	0	6	23	75	58	18	2	0	0	0	0	182
13:00	0	0	0	2	7	29	78	60	15	3	0	0	0	0	194
14:00	0	0	0	0	7	28	74	69	17	0	0	0	0	0	195
15:00	0	0	0	0	2	27	113	97	32	3	0	0	0	0	274
16:00	0	0	0	0	6	23	147	156	51	3	1	0	0	0	387
17:00	0	0	0	0	1	27	192	172	38	2	0	0	0	0	432
18:00	0	0	0	0	2	45	205	155	29	8	1	0	0	0	445
19:00	0	0	0	0	1	16	125	118	36	3	1	0	0	0	300
20:00	0	0	0	0	2	4	80	64	22	2	0	0	0	0	174
21:00	0	0	0	0	3	12	51	36	12	0	0	0	0	0	114
22:00	0	0	0	0	0	5	28	33	8	0	1	0	0	0	75
23:00	0	0	0	0	0	6	15	17	12	0	0	0	0	0	50
24:00	0	0	0	0	0	3	6	15	4	0	0	0	0	0	28
DAY TOTAL	3	0	4	12	101	459	1629	1383	377	37	6	1	0	0	4012
PERCENTS	0.1%	0.0%	0.1%	0.3%	2.6%	11.5%	40.7%	34.4%	9.3%	0.9%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
35.1 mph

85th Percentile Speed
44.4 mph

Median Speed
39.4 mph

Average Speed
39.4 mph

10 MPH Pace Speed
35 mph to 45 mph
3012 vehicles in pace
Representing 75.0% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Thu 12/3/2015

Site Reference: 150580000497
Site ID: 000000000501
Location: RTE. 70 (LUNENBURG RD.) N. OF RTE. 117
Direction: NORTH
Lane: 1

File: SPD5-01.prn
City: LANCASTER
County: SPEED NB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	1	0	0	1	2	14	5	1	0	0	0	0	0	24
02:00	0	0	0	0	0	1	6	4	1	0	0	0	0	0	12
03:00	0	0	0	0	0	1	4	1	0	1	0	0	0	0	7
04:00	0	0	0	0	0	0	0	2	0	0	1	0	0	0	3
05:00	0	0	0	0	0	5	10	1	0	0	0	0	0	0	16
06:00	0	0	0	0	1	12	33	21	6	0	0	0	0	0	73
07:00	0	0	0	0	0	16	61	67	14	2	0	0	0	0	160
08:00	0	0	0	0	3	11	94	96	39	3	0	0	0	0	246
09:00	0	0	1	0	3	21	80	104	33	3	0	0	0	0	245
DAY TOTAL	0	1	1	0	8	69	302	301	94	9	1	0	0	0	786
PERCENTS	0.0%	0.2%	0.2%	0.0%	1.1%	8.8%	38.4%	38.2%	11.9%	1.1%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
35.7 mph

85th Percentile Speed
44.8 mph

Median Speed
40.2 mph

Average Speed
40.2 mph

10 MPH Pace Speed
35 mph to 45 mph
603 vehicles in pace
Representing 76.7% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Mon 11/30/2015

STA. 5 SB

Site Reference: 150580000832
Site ID: 000000000502
Location: RTE. 70 (LUNENBURG RD.) N. OF RTE. 117
Direction: SOUTH
Lane: 1

File: SPD5-02.prn
City: LANCASTER
County: SPEED SB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
12:00	0	0	0	0	3	19	61	89	44	9	0	0	0	0	225
13:00	0	0	0	1	6	44	89	64	19	4	0	0	0	0	227
14:00	0	0	0	0	13	29	79	91	13	0	0	0	0	0	225
15:00	0	0	6	6	15	55	86	67	17	1	0	0	0	0	253
16:00	2	6	10	9	37	81	78	49	10	0	1	0	0	0	283
17:00	0	0	1	4	25	64	98	49	10	2	0	0	0	0	253
18:00	0	0	0	4	14	81	84	45	9	0	0	0	0	0	237
19:00	0	0	1	2	3	26	52	52	18	1	0	0	0	0	155
20:00	0	0	0	1	9	34	58	59	16	3	0	0	0	0	180
21:00	0	0	2	2	4	12	45	49	15	2	0	0	0	0	131
22:00	0	0	0	0	1	4	19	45	21	3	0	0	0	0	93
23:00	0	0	0	1	3	1	14	12	10	2	1	0	0	0	44
24:00	0	0	0	0	0	1	10	10	6	1	1	0	0	0	29
DAY TOTAL	2	6	20	30	133	451	773	681	208	28	3	0	0	0	2335
PERCENTS	0.1%	0.3%	0.9%	1.3%	5.7%	19.4%	33.1%	29.1%	8.9%	1.1%	0.1%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
31.8 mph

85th Percentile Speed
44.2 mph

Median Speed
38.4 mph

Average Speed
38.1 mph

10 MPH Pace Speed
35 mph to 45 mph
1454 vehicles in pace
Representing 62.2% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Tue 12/1/2015

Site Reference: 150580000832
Site ID: 000000000502
Location: RTE. 70 (LUNENBURG RD.) N. OF RTE. 117
Direction: SOUTH
Lane: 1

File: SPD5-02.prn
City: LANCASTER
County: SPEED SB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	0	1	4	2	3	0	0	0	0	0	10
02:00	0	0	0	0	1	3	2	4	2	0	0	0	0	0	12
03:00	0	0	0	0	0	1	2	2	0	0	0	0	0	0	5
04:00	0	0	0	0	0	0	5	3	2	1	0	0	0	0	11
05:00	0	0	0	0	0	1	6	15	10	4	0	0	0	0	36
06:00	0	0	0	0	0	15	81	65	22	5	0	0	0	0	188
07:00	10	2	6	7	46	99	108	41	8	0	0	0	0	0	327
08:00	166	1	6	8	15	38	31	24	2	1	0	0	0	0	292
09:00	8	2	7	18	34	53	63	51	11	0	0	0	0	0	247
10:00	1	0	0	0	2	39	74	75	25	3	0	0	0	0	219
11:00	0	0	0	4	15	45	59	61	22	2	0	0	0	0	208
12:00	2	0	0	3	16	32	72	71	23	2	0	0	0	0	221
13:00	0	0	2	6	15	41	72	77	11	1	1	0	0	0	226
14:00	0	0	0	1	11	64	98	29	21	0	0	0	0	0	224
15:00	0	0	1	7	23	73	105	53	6	0	0	0	0	0	268
16:00	25	5	2	10	22	49	103	72	14	0	0	0	0	0	302
17:00	45	20	9	15	37	63	58	21	3	0	0	0	0	0	271
18:00	23	5	24	23	31	58	61	25	5	3	1	0	0	0	259
19:00	0	0	0	4	8	43	66	58	11	0	0	0	0	0	190
20:00	0	0	0	1	15	50	79	32	11	2	0	0	0	0	190
21:00	0	0	0	0	7	33	40	27	7	2	0	0	0	1	117
22:00	0	0	0	0	0	13	48	30	11	1	0	0	0	0	103
23:00	0	0	0	0	0	5	17	12	10	0	0	0	0	0	44
24:00	0	0	0	0	2	5	6	7	10	2	0	0	0	0	32
DAY TOTAL	280	35	57	107	300	824	1260	857	250	29	2	0	0	1	4002
PERCENTS	7.0%	0.9%	1.5%	2.7%	7.5%	20.6%	31.5%	21.4%	6.2%	0.7%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
27.0 mph

85th Percentile Speed
43.2 mph

Median Speed
36.6 mph

Average Speed
34.4 mph

10 MPH Pace Speed
35 mph to 45 mph
2117 vehicles in pace
Representing 52.8% of the total vehicles

Vehicles > 65 MPH
1
0.0%

MassDOT Highway Division
SPEED SUMMARY
Wed 12/2/2015

Site Reference: 150580000832
Site ID: 000000000502
Location: RTE. 70 (LUNENBURG RD.) N. OF RTE. 117
Direction: SOUTH
Lane: 1

File: SPD5-02.prn
City: LANCASTER
County: SPEED SB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	0	2	2	5	3	0	0	0	0	0	12
02:00	0	0	0	0	0	4	3	4	1	0	0	0	0	0	12
03:00	0	0	0	0	0	2	1	2	0	0	0	0	0	0	5
04:00	0	0	0	0	0	3	6	3	0	0	0	0	0	0	12
05:00	0	0	0	0	2	2	13	16	6	3	0	0	0	0	42
06:00	0	0	0	1	19	33	70	43	10	5	0	0	0	0	181
07:00	161	14	10	20	24	38	42	33	3	0	0	0	0	0	345
08:00	5	0	1	7	25	65	85	54	9	0	0	0	0	0	251
09:00	3	0	8	25	91	133	104	40	6	0	0	0	0	0	410
10:00	3	3	0	10	40	104	110	35	3	0	0	0	0	0	308
11:00	0	0	0	3	22	48	48	52	21	4	0	0	0	0	198
12:00	0	0	0	0	15	49	86	58	16	1	1	0	0	0	226
13:00	0	0	0	3	5	34	93	75	17	3	0	0	0	0	230
14:00	0	0	2	3	8	29	99	67	18	3	0	0	0	0	229
15:00	0	0	0	7	14	49	124	67	14	0	1	0	0	0	276
16:00	0	0	3	14	22	85	86	60	5	0	0	0	0	0	275
17:00	0	0	1	13	55	71	66	37	3	0	0	0	0	0	246
18:00	0	0	0	7	40	57	76	49	8	1	0	0	0	0	238
19:00	0	0	0	3	7	54	73	42	6	2	1	0	0	0	188
20:00	0	0	0	1	8	26	58	39	13	2	0	0	0	0	147
21:00	0	0	0	0	4	19	38	32	10	2	0	0	0	0	105
22:00	0	0	0	1	1	7	36	41	13	2	0	1	0	0	102
23:00	0	0	0	5	4	4	23	16	8	1	0	0	0	0	61
24:00	0	0	0	0	0	2	7	11	9	0	0	0	0	0	29
DAY TOTAL	172	17	25	123	406	920	1349	881	202	29	3	1	0	0	4128
PERCENTS	4.2%	0.5%	0.7%	3.0%	9.9%	22.3%	32.6%	21.3%	4.8%	0.7%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
28.5 mph

85th Percentile Speed
42.8 mph

Median Speed
36.5 mph

Average Speed
35.1 mph

10 MPH Pace Speed
30 mph to 40 mph
2269 vehicles in pace
Representing 54.9% of the total vehicles

Vehicles > 65 MPH
0
0.0%

MassDOT Highway Division
SPEED SUMMARY
Thu 12/3/2015

Site Reference: 150580000832
Site ID: 000000000502
Location: RTE. 70 (LUNENBURG RD.) N. OF RTE. 117
Direction: SOUTH
Lane: 1

File: SPD5-02.prn
City: LANCASTER
County: SPEED SB

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	0	1	2	2	4	1	0	0	0	0	10
02:00	0	0	0	0	0	1	0	3	0	0	0	0	0	0	4
03:00	0	0	0	0	0	3	3	5	1	0	0	0	0	0	12
04:00	0	0	0	0	0	1	5	3	4	1	0	0	0	0	14
05:00	0	0	0	0	0	0	10	15	12	3	0	0	0	0	40
06:00	0	0	0	0	6	31	66	63	18	4	0	0	0	0	188
07:00	31	3	18	19	23	58	86	40	9	2	0	0	0	0	289
08:00	0	0	0	9	41	52	87	84	13	1	0	0	0	0	287
09:00	0	0	0	6	34	64	78	58	24	6	0	0	0	0	270
DAY TOTAL	31	3	18	34	104	211	337	273	85	18	0	0	0	0	1114
PERCENTS	2.8%	0.3%	1.7%	3.1%	9.3%	18.9%	30.2%	24.5%	7.6%	1.6%	0.0%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
28.9 mph

85th Percentile Speed
43.8 mph

Median Speed
37.3 mph

Average Speed
36.1 mph

10 MPH Pace Speed
35 mph to 45 mph
610 vehicles in pace
Representing 54.7% of the total vehicles

Vehicles > 65 MPH
0
0.0%

Sullivan

MAR 2 1977

TOWN OF LANCASTER
SPECIAL SPEED REGULATION NO. 619-A

Highway Location: LANCASTER

Authority In Control: TOWN OF LANCASTER

Name of Highway: LUNENBURG ROAD

In accordance with the provisions of Chapter 90, Section 18, of the General Laws (Ter. Ed.) as amended, the following Special Speed Regulation is

hereby Adopted

by the Board of Selectmen

of the Town of Lancaster

Special Speed Regulation Number 619 dated April 13, 1971 is hereby amended by striking out the regulation in its entirety and inserting in place thereof the following revisions and addenda.

That the following speed limits are established at which motor vehicles may be operated in the areas described:

LUNENBURG ROAD-NORTHBOUND

Beginning at a point 400 feet north of Main Street (Route 117)
Thence northerly on Lunenburg Road.

1.05 miles at 45 miles per hour
2.23 " " 50 " " "
0.23 " " 30 " " "
0.82 " " 40 " " " ending at the

Lunenburg Town Line; the total distance being 4.33 miles.

LUNENBURG ROAD-SOUTHBOUND

Beginning at the Lunenburg Town Line
Thence southerly on Lunenburg Road

0.82 miles at 40 miles per hour
0.23 " " 30 " " "
2.23 " " 50 " " "
1.05 " " 45 " " "
0.08 " " 25 " " " ending at Main Street

(Route 117); the total distance being 4.41 miles.

Operation of a motor vehicle at a rate of speed in excess of these limits shall be prima facie evidence that such speed is greater than is reasonable and proper.

The provisions of this regulation shall not, however, abrogate in any sense Chapter 90, Section 14, of the General Laws (Ter. Ed).

Date of Passage January 27, 1977

Russell P. Bartlett

Harold G. Sanders

Board of Selectmen

Attest Raymond C. Harris
Town Clerk

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

SPECIAL SPEED REGULATION NO. 619-A

The Department of Public Works and the Registrar of Motor Vehicles, acting jointly, do hereby certify that this regulation is consistent with the public interests.

Standard signs must be erected at the beginning of each zone.

DATE: MAR 2 1977

FOR THE DEPARTMENT OF PUBLIC WORKS

BY: J. J. Collins
Traffic Engineer

E. Theodore Semanas
~~REGISTRAR OF MOTOR VEHICLES~~
Chief Deputy Registrar

TOWN OF LANCASTER
SPECIAL SPEED REGULATION
NO. 6034-A

Highway Location: TOWN OF LANCASTER

Authority In Control: TOWN OF LANCASTER

Name of Highway(s) ROUTE 117

In accordance with the provisions of Chapter 90, Section 18, of the General Laws (Ter.Ed) as amended, the following Special Speed Regulation is hereby adopted by the Board of Selectmen of the Town of Lancaster

Special Speed Regulation number 6034, dated April 15, 1980, is hereby amended by striking out the regulation in its entirety and inserting in place thereof the following revision.

That the following speed limits are established at which motor vehicles may be operated in the areas described:

ROUTE 117--EASTBOUND

Beginning at the end of State Highway
thence easterly on Route 117
0.90 miles at 40 miles per hour
0.34 miles at 35 miles per hour
1.17 miles at 40 miles per hour
0.65 miles at 30 miles per hour
0.31 miles at 35 miles per hour
0.92 miles at 45 miles per hour ending at the Bolton Town Line; the total distance being 4.29 miles.

ROUTE 117--WESTBOUND

Beginning at the Bolton Town Line
thence westerly on Route 117
0.92 miles at 45 miles per hour
0.31 miles at 35 miles per hour
0.65 miles at 30 miles per hour
1.17 miles at 40 miles per hour
0.34 miles at 35 miles per hour
0.90 miles at 40 miles per hour ending at the beginning of State Highway; the total distance being 4.29 miles.

NO. 6034-A

Operation of a motor vehicle at a rate of speed in excess of these limits shall be prima facie evidence that such speed is greater than is reasonable and proper.

The provisions of this regulation shall not, however, abrogate in any sense Chapter 90, Section 14, of the General Laws (Ter. Ed).

Date of passage January 13, 1982

Edward J. Kelly

Anthony R. Pino

Paul F. Lantastro

Board of Selectmen

Attest Eunice F. Landas

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

SPECIAL SPEED REGULATION NO. 6034-A

The Department of Public Works and the Registrar of Motor Vehicles, acting jointly, do hereby certify that this regulation is consistent with the public interests.

Standard signs must be erected at the beginning of each zone.

DATE: 3/4/82

FOR THE DEPARTMENT OF PUBLIC WORKS

BY: [signature]
Traffic Engineer

Robert A. Parsons
Chief Deputy Registrar

Appendix E. Road Safety Audit References

Road Safety Audit References

Massachusetts Traffic Safety Toolbox, Massachusetts Highway Department, www.mhd.state.ma.us/safetytoolbox.

Road Safety Audits, A Synthesis of Highway Practice. NCHRP Synthesis 336. Transportation Research Board, National Cooperative Highway Research Program, 2004.

Road Safety Audits. Institute of Transportation Engineers and U.S. Department of Transportation, Federal Highway Administration, www.roadwaysafetyaudits.org.

FHWA Road Safety Audit Guidelines. U.S. Department of Transportation, Federal Highway Administration, 2006.

Road Safety Audit, 2nd edition. Austroads, 2000.

Road Safety Audits. ITE Technical Council Committee 4S-7. Institute of Transportation Engineers, February 1995.

Appendix F.5

Crash History Data

146 Dascomb Road
Andover, MA 01810
978.794.1792
TheEngineeringCorp.com
Create | Design | Innovate

Ms. Ana Fill, PE
Highway Safety Engineer
MassDOT – Highway Division
10 Park Plaza, Suite 7210
Boston, Massachusetts 02116

September 13, 2019

Ref. T0852.03

Re: Capital Commerce Center (EEA #16043) – Lancaster, Massachusetts
Supplemental Crash Data Summary – Route 2 Interchange 35 Ramps

Dear Ms. Fill:

On behalf of the Applicant, Capital Group Properties (the "Proponent"), TEC, Inc. (TEC) submitted a Traffic Impact, Access, and Parking Study (TIAPS) to the Massachusetts Environmental Policy Act (MEPA) office in conjunction with the Environmental Notification Form (ENF) for the proposed Capital Commerce Center (EEA #16043) in Lancaster, Massachusetts. Availability of the ENF for public review was published in *The Environmental Monitor* on June 10, 2019. The Secretary of the Executive Office of Energy and Environmental Affairs (EEA) issued a Certificate on the ENF on July 11, 2019 which included specific comments from the Massachusetts Department of Transportation (MassDOT).

The TIAPS included a traffic study area that included the surface intersection of the Route 2 Interchange 35 with Fort Pond Road and Old Union Turnpike. Based on the MassDOT online crash cluster database, the Route 2 Interchange 35 was considered 2015 Highway Safety Improvement Plan (HSIP) eligible (current crash years of HSIP-eligibility at time of analysis). Subsequent of the analyses provided as part of the TIAPS, MassDOT had issued an updated 2016 HSIP crash cluster listing which removes the Route 2 Interchange 35 as a designated high crash location. Upon discussions with MassDOT on September 5, 2019, TEC was directed to provide documentation that the surface intersection of the Route 2 Interchange 35 with Fort Pond Road and Old Union Turnpike were in fact not HSIP-eligible.

Many freeway interchanges across the Commonwealth are noted as HSIP-eligible locations; however, this is generally the result of crashes being geocoded on the center of the nearest or corresponding interchange, as opposed to the specific crash location along a freeway segment, along the ramps, or other location along or in the vicinity of the interchange. Although the vicinity of the interchange does experience a large number of crashes, the MassDOT Crash Portal does not denote a high crash total at the surface intersection of Fort Pond Road and Old Union Turnpike with the Route 2 ramps.

The TIAPS identified that TEC was currently in the process obtaining individual crash reports from the MassDOT Traffic and Safety Engineering Section for 2014 through 2018 in order to determine the crash history of the two surface intersections as part of the study area. TEC obtained electronic versions of all crash reports from the MassDOT Traffic and Safety Engineering Section on April 25, 2019. TEC has since reviewed each crash report documented by MassDOT. The following is a summary of TEC's findings.

Crash Data Review

The objective of obtaining all crash reports for the Route 2 Interchange 35 was to determine if the surface intersection of Route 2 EB Ramps / Old Union Turnpike and Route 2 WB Ramps / Fort Pond Road were themselves HSIP-eligible, external of the entire interchange. Therefore, all crashes that in the vicinity of Interchange 35 were examined to determine which crashes occurred along the Interchange 35 Off-Ramps; and more specifically, which crashes occurred at the study area surface intersection.

Route 2 EB Ramps / Old Union Turnpike

The crash reports indicate that only five (5) reported crashes occurred along the Route 2 EB Interchange 35 Ramps / Old Turnpike Road intersection during the five-year study period (1.0 crashes per year on average). This also included any crash that was more than half-way along the ramp or any crash that was deemed as intersection related, such as rear-ending a queued vehicle due to congestion from the stop-sign at Old Union Turnpike. It does not include vehicles in crashes related to the freeway merge or diverge. Table 1 provides a summary of the crashes that occurred along the surface intersection of the Route 2 Interchange 35 / Old Union Turnpike during the five-year study period.

Table 1 – Summary of Route 2 EB Interchange 35 Crashes – Surface Intersection Only

Year	Crash #	Date	EPDO	Location
2015	PW201530300915	10-17-2015	21	Route 2 EB Ramp at Old Union Turnpike
2017	PW201723302813	07-09-2017	21	Route 2 EB Ramp at Old Union Turnpike
2018	PW201807201109	03-09-2018	21	Route 2 EB Ramp at Old Union Turnpike
2018	PW201811300765	04-13-2018	1	Route 2 EB Ramp at Old Union Turnpike
2018	PW201819101786	06-27-2018	1	Route 2 EB Ramp at Old Union Turnpike
				2014-2016 3-YR EPDO Total = 21
				2015-2017 3-YR EPDO Total = 42
				2017-2018 3-YR EPDO Total = 44

Based upon the crash report data, the intersection does not meet the threshold for 2016 HSIP eligibility (EPDO $\geq$ 92) for the Montachusett Regional Planning Commission. Therefore, a Road Safety Audit (RSA) is not required for this ramp intersection location.

Route 2 WB Ramps / Fort Pond Road

The crash reports indicate that only one (1) reported crashes occurred along the Route 2 WB Interchange 35 Ramps / Fort Pond Road intersection during the five-year study period (0.2 crashes per year on average). This also included any crash that was more than half-way along the ramp or any crash that was deemed as intersection related, such as rear-ending a queued vehicle due to congestion from the stop-sign at Fort Pond Road. It does not include vehicles in crashes related to the freeway merge or diverge. Table 2 provides a summary of the crashes that occurred along the surface intersection of the Route 2 Interchange 35 / Fort Pond Road during the five-year study period.

Table 2 – Summary of Route 2 WB Interchange 35 Crashes – Surface Intersection Only

Year	Crash #	Date	EPDO	Location
2018	PS201821900291	07-23-2018	21	Route 2 WB Ramp at Fort Pond Road
				2014-2016 3-YR EPDO Total = 0
				2015-2017 3-YR EPDO Total = 0
				2017-2018 3-YR EPDO Total = 21

Based upon the crash report data, the intersection does not meet the threshold for 2016 HSIP eligibility (EPDO $\geq$ 92) for the Montachusett Regional Planning Commission. Therefore, an RSA is not required for this ramp intersection location.

TEC respectfully requests that MassDOT Traffic and Safety Engineering commence with its review of the DEIR with no requirement of a Road Safety Audit at the interchange location. Please do not hesitate to contact me directly if you have any questions concerning our summary at 978-794-1792.Thank you for your consideration.

Sincerely,
TEC, Inc.
*"**T**he **E**ngineering **C**orporation"*

Samuel W. Gregorio, PE, PTOE, RSP_1
Senior Design Engineer – Transportation Planning & ITS

Attachments
A –Crash Data and Reports

Crash Data Summary Tables
Rotue 2 Interchange 35 Surface Intersections
1/1/2014-12/31/2018

Crash Number	Crash Date	Crash Time	Ambient Light	Weather Condition	Road Surface	Number of Vehicles	Vehicle Travel Directions				Crash Severity	Number of NonFatal Injuries	Manner of Collision	Driver Contributing Codes	Detailed Narrative (from Crash Report)
4102112	10/17/2015	3:26 PM	Daylight	Clear	Dry	2	W	E			Non-fatal Injury	1	Angled	No Improper Driving	MV1 exited RT2 turning left onto Old Union TPKE. MV2 was traveling WB on Old Union TPKE when MV1 pulled out in front of MV2. MV2 struck the left side of MV1.
4410451	7/9/2017	6:50 AM	Daylight	Clear	Dry	1	N				Non-fatal Injury	1	Cyclist	Glare	MV1 was traveling E on Old Union TPKE and attempted to turn left on to the RT2 on ramp when MV1 collided with a cyclist that was traveling W on Old Union TPKE.
4513080	3/9/2018	12:15 PM	Daylight	Clear	Dry	2	E	E			Non-fatal Injury	1	Rear-end	No Improper Driving	MV1 and MV2 exiting RT2 EB onto exit ramp. MV1 stopped then started then quickly stopped and MV2 rear ended MV1.
4528921	4/13/2018	8:31 AM	Daylight	Clear	Dry	2	E	S			Property Damage Only	0	Angled	No Improper Driving	MV1 took a left turn out from the exit of RT2 East but failed to notice MV2 traveling East on Old Union TPKE. MV1 struck the left side of MV2.
4562509	6/27/2018	10:44 PM	Dark - Lighted	Clear	Dry	1	W				Property Damage Only	0	Single Vehicle	Inattention / Distracted	MV1 exited RT2 E off ramp onto Old Union TPKE. MV1 struck curb and roadway sign.
4577264	7/23/2018	1:00 PM	Daylight	Clear	Dry	2	N	S			Non-fatal Injury	1	Angled	Excessive Speed	MV1 was exiting Exit 35 from RT2 WB when it rolled over into the on ramp. MV2 was traveling on the on ramp to merge onto RT2 WB when MV1's load spilled over hitting MV2.

Lunenburg Road @ Old Union Turnpike
Crash History 2013-2015

Crash Number	Crash Date	Crash Time	Crash Severity	Manner of Collision	Vehicle Travel Directions	Road Surface	Ambient Light	Weather Condition	Number of NonFatal Injuries	Number of Vehicles
3392970	3/10/2013	4:38 PM	Property damage only (none injured)	Angle	V1:S / V2:E	Dry	Daylight	Clear	0	2
3393110	1/21/2013	12:14 PM	Property damage only (none injured)	Angle	V1:N / V2:E	Dry	Daylight	Cloudy	0	2
3753007	3/24/2013	8:06 AM	Property damage only (none injured)	Angle	V1:S / V2:E	Dry	Daylight	Clear	0	2
3753562	3/17/2013	9:38 AM	Property damage only (none injured)	Angle	V1:S / V2:E	Dry	Daylight	Clear	0	2
3753581	1/30/2014	4:06 PM	Property damage only (none injured)	Angle	V1:E / V2:S	Dry	Daylight	Clear	0	2
4121405	10/22/2015	2:09 AM	Property damage only (none injured)	Single vehicle crash	V1:N	Dry	Dark - lighted roadway	Clear	0	1
4144203	12/24/2014	6:37 PM	Property damage only (none injured)	Single vehicle crash	V1:E	Wet	Dark - lighted roadway	Cloudy/Rain	0	1
4244498	6/24/2015	6:14 PM	Property damage only (none injured)	Rear-end	V1:S / V2:S	Dry	Daylight	Clear	0	2
4244504	5/18/2015	5:47 PM	Property damage only (none injured)	Unknown	V1:W / V2:W	Dry	Daylight	Clear/Other	0	2

Lunenburg Road @ Fort Pond Road / Woods Lane
Crash History 2013-2016

Crash Number	Crash Date	Crash Time	Crash Severity	Manner of Collision	Vehicle Travel Directions	Road Surface	Ambient Light	Weather Condition	Number of NonFatal Injuries	Number of Vehicles
3753011	4/7/2013	3:36 PM	Property damage only (none injured)	Rear-end	V1:W / V2:W	Dry	Daylight	Clear/Unknown	0	2
3893588	12/21/2013	1:39 PM	Property damage only (none injured)	Angle	V1:S / V2:W	Dry	Daylight	Clear	0	2
3954486	8/12/2014	8:47 AM	Property damage only (none injured)	Rear-end	V1:S / V2:S	Dry	Daylight	Clear/Unknown	0	2
4244505	5/23/2015	10:19 AM	Property damage only (none injured)	Angle	V1:W / V2:S	Dry	Daylight	Clear	0	2
4246376	7/17/2015	5:49 PM	Property damage only (none injured)	Rear-end	V1:W / V2:W	Dry	Daylight	Cloudy	0	2
4277345	10/24/2016	6:26 PM	Non-fatal injury	Angle	V1:W / V2:N	Dry	Dark - lighted roadway	Clear	4	2
4266938	9/24/2016	1:50 PM	Non-fatal injury	Head-on	V1:S / V2:N	Dry	Daylight	Clear/Other	1	2

Route 2 EB Interchange 35
Crash History 2013-2016

Crash Number	Crash Date	Crash Time	Crash Severity	Number of NonFatal Injuries	Number of Vehicles	Manner of Collision	Vehicle Travel Directions	Road Surface	Ambient Light	Weather Condition
4144631	1/18/2016	8:40 PM	Non-fatal injury	1	1	Single vehicle crash	V1:S	Dry	Dark - roadway not lighted	Clear
4315685	11/30/2016	8:10 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Clear
4312114	12/17/2016	3:14 PM	Property damage only (none injured)	0	1	Single vehicle crash	V1:W	Wet	Daylight	Clear
4270556	10/19/2016	6:01 AM	Property damage only (none injured)	0	3	Rear-end	V1:E / V2:E / V3:E	Dry	Dark - roadway not lighted	Clear
4227784	7/26/2016	7:05 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Clear
4202386	6/5/2016	1:00 PM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Not Reported
4202315	5/17/2016	7:15 AM	Property damage only (none injured)	0	1	Single vehicle crash	V1:E	Dry	Daylight	Clear
4189258	5/8/2016	2:16 PM	Property damage only (none injured)	0	1	Single vehicle crash	V1:E	Dry	Daylight	Cloudy
4156508	2/21/2016	6:40 PM	Property damage only (none injured)	0	2	Sideswipe, same direction	V1:E / V2:E	Dry	Dark - roadway not lighted	Clear
4134193	1/8/2016	7:13 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Clear
4108565	11/2/2015	6:25 AM	Property damage only (none injured)	0	3	Rear-end	V1:E / V2:E / V3:E	Dry	Daylight	Clear
4102112	10/17/2015	3:26 PM	Non-fatal injury	1	2	Angle	V1:S / V2:W	Dry	Daylight	Clear
4100945	10/20/2015	6:40 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Dawn	Not Reported
4067174	7/20/2015	6:58 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Clear
4024137	3/3/2015	8:15 AM	Non-fatal injury	3	2	Rear-end	V1:E / V2:E	Dry	Daylight	Clear
4017927	3/3/2015	8:10 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Sand, mud, dirt, oil, gravel	Daylight	Clear
3950088	9/18/2014	6:45 AM	Property damage only (none injured)	0	3	Rear-end	V1:E / V2:E / V3:E	Dry	Daylight	Clear/Other
3950087	9/18/2014	6:40 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Clear
3949346	9/4/2014	7:20 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Clear/Other
3898351	7/31/2014	10:12 AM	Non-fatal injury	2	2	Rear-end	V1:E / V2:E	Dry	Daylight	Not Reported
3753010	4/4/2013	2:19 PM	Non-fatal injury	1	2	Rear-end	V1:E / V2:E	Dry	Daylight	Cloudy/Unknown
3753008	3/27/2013	2:27 PM	Property damage only (none injured)	0	2	Angle	V1:W / V2:S	Dry	Daylight	Clear/Unknown
3718391	12/7/2013	6:30 AM	Property damage only (none injured)	0	1	Single vehicle crash	V1:E	Dry	Dark - roadway not lighted	Clear
3660135	11/7/2013	9:15 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Not Reported
3641404	9/20/2013	4:45 PM	Property damage only (none injured)	0	2	Angle	V1:W / V2:S	Dry	Daylight	Clear
3641127	10/28/2013	7:55 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Clear/Other
3588445	9/9/2013	8:05 AM	Non-fatal injury	1	5	Rear-end	V1:E / V2:E / V3:E / V4:E / V5:E	Dry	Daylight	Not Reported
3576739	8/25/2013	9:00 PM	Property damage only (none injured)	0	1	Single vehicle crash	V1:E	Dry	Dark - roadway not lighted	Clear
3557038	8/7/2013	7:59 AM	Property damage only (none injured)	0	1	Single vehicle crash	V1:E	Dry	Daylight	Clear
3498390	7/2/2013	8:30 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Daylight	Cloudy
3414296	4/24/2013	8:14 PM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:E	Dry	Dark - roadway not lighted	Clear
3396250	4/12/2013	3:10 PM	Property damage only (none injured)	0	2	Angle	V1:E / V2:E	Dry	Daylight	Clear
3388257	3/27/2013	5:53 PM	Non-fatal injury	1	1	Single vehicle crash	V1:E	Dry	Daylight	Clear
3363232	2/20/2013	6:10 PM	Property damage only (none injured)	0	1	Single vehicle crash	V1:E	Dry	Dark - roadway not lighted	Clear

Route 2 WB Interchange 35
Crash History 2013-2016

Crash Number	Crash Date	Crash Time	Crash Severity	Number of NonFatal Injuries	Number of Vehicles	Manner of Collision	Vehicle Travel Directions	Road Surface	Ambient Light	Weather Condition
4144199	3/20/2014	8:10 AM	Non-fatal injury	1	1	Single vehicle crash	V1:E	Ice	Dawn	Cloudy/Rain
4133859	1/6/2016	5:45 PM	Property damage only (none injured)	0	2	Sideswipe, same direction	V1:W / V2:W	Dry	Dark - roadway not lighted	Clear
4432272	11/4/2016	4:40 PM	Property damage only (none injured)	0	2	Rear-end	V1:S / V2:S	Dry	Daylight	Cloudy
4267660	10/17/2016	7:30 AM	Property damage only (none injured)	0	3	Sideswipe, same direction	V1:W / V2:W / V3:W	Dry	Daylight	Clear
4014423	2/8/2015	9:27 AM	Property damage only (none injured)	0	2	Angle	V1:W / V2:W	Snow	Daylight	Cloudy/Snow
3975795	11/13/2014	11:07 AM	Property damage only (none injured)	0	3	Rear-end	V1:W / V2:W / V3:W	Dry	Daylight	Clear
3949347	9/11/2014	2:45 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Clear
3868090	6/14/2014	2:30 AM	Property damage only (none injured)	0	1	Single vehicle crash	V1:W	Dry	Dark - lighted roadway	Clear
3834444	5/28/2014	3:21 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Not Reported
3699067	12/11/2013	2:20 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:E	Dry	Daylight	Not Reported
3694817	12/8/2013	1:40 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Not Reported
3600116	9/17/2013	12:45 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Not Reported
3491254	6/10/2013	9:25 AM	Property damage only (none injured)	0	1	Single vehicle crash	V1:W	Dry	Daylight	Cloudy
3455652	5/26/2013	3:37 PM	Property damage only (none injured)	0	1	Single vehicle crash	V1:N	Dry	Daylight	Clear
3389777	4/6/2013	12:20 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Not Reported
4044519	5/18/2015	9:10 AM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Clear
4008624	2/8/2015	7:40 AM	Property damage only (none injured)	0	1	Single vehicle crash	V1:W	Snow	Daylight	Snow
4293238	11/26/2016	8:04 AM	Non-fatal injury	1	1	Single vehicle crash	V1:W	Dry	Daylight	Cloudy
4289178	11/17/2016	11:00 PM	Property damage only (none injured)	0	2	Sideswipe, same direction	V1:W / V2:W	Dry	Dark - roadway not lighted	Clear
4239086	8/9/2016	2:15 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Clear
4222078	6/24/2016	1:10 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Clear
4196504	5/25/2016	9:15 AM	Property damage only (none injured)	0	1	Single vehicle crash	V1:W	Dry	Daylight	Clear
4059540	6/22/2015	3:30 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Clear
4044512	5/8/2015	2:55 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Clear
3997833	1/12/2015	3:57 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Clear
3629136	9/30/2013	1:40 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Not Reported
4204009	5/30/2016	9:30 PM	Non-fatal injury	1	3	Single vehicle crash	V1:W / V2:W / V3:W	Dry	Dark - roadway not lighted	Clear

Mechanic Street @ White Pond Road
Crash History 2013-2015

Crash Number	Crash Date	Crash Time	Crash Severity	Manner of Collision	Vehicle Travel Directions	Road Surface	Ambient Light	Weather Condition	Number of NonFatal Injuries	Number of Vehicles
3919349	8/13/2014	6:41 PM	Property damage only (none injured)	Rear-end	V1:W / V2:W	Wet	Daylight	Rain/Cloudy	0	2
3991212	1/5/2015	2:18 PM	Non-fatal injury	Angle	V1:E / V2:N	Dry	Daylight	Clear/Cloudy	1	2

Mechanic Street @ Johnny Appleseed Lane
Crash History 2013-2016

Crash Number	Crash Date	Crash Time	Crash Severity	Number of NonFatal Injuries	Number of Vehicles	Manner of Collision	Vehicle Travel Directions	Road Surface	Ambient Light	Weather Condition
4135386	1/12/2016	7:15 PM	Non-fatal injury	2	2	Rear-end	V1:E / V2:E	Snow	Dark - lighted roadway	Snow/Rain
4089524	9/28/2015	3:54 AM	Property damage only (none injured)	0	2	Rear-end	V1:E / V2:W	Dry	Dark - lighted roadway	Clear
4046114	5/27/2015	4:21 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Daylight	Clear
4021163	3/13/2015	11:23 PM	Property damage only (none injured)	0	2	Rear-end	V1:W / V2:W	Dry	Dark - lighted roadway	Clear
3989157	12/12/2014	6:39 PM	Property damage only (none injured)	0	2	Sideswipe, same direction	V1:W / V2:W	Dry	Dark - lighted roadway	Cloudy

Crash Data Summary Tables

Old Union Turnpike @ Exit 34 Eastbound Ramps- Lancaster, Massachusetts

1/1/2013- 12/31/2016

Collision Diagram	Crash Number	Crash Date	Crash Time	Ambient Light	Weather Condition	Road Surface	Number of Vehicles	Vehicle Travel Directions				Crash Severity	Number of NonFatal Injuries	Manner of Collision
								V1	V2	V3	V4			
1	3953844	07/25/2014	1:51 AM	Daylight	Clear	Dry	1	E				Non-fatal Injury	1	Single Vehicle
2	3954485	08/06/2014	12:26 PM	Daylight	Clear	Dry	2	W	W			Property Damage Only	0	Rear-end
3	3987809	10/03/2014	1:15 PM	Daylight	Clear	Dry	2	S	W			Property Damage Only	0	Angled
4	4121467	10/14/2015	5:44 PM	Daylight	Clear	Dry	2	S	W			Non-fatal Injury	1	Angled
5	4144179	12/22/2014	3:27 PM	Daylight	Clear	Dry	2	W	W			Property Damage Only	0	Rear-end
6	4144207	11/08/2014	4:37 PM	Dusk	Clear	Dry	2	N	S			Property Damage Only	2	Angled
7	4144277	11/13/2014	1:31 PM	Daylight	Clear	Dry	2	W	S			Non-fatal Injury	1	Angled
8	4201941	01/02/2016	3:54 PM	Daylight	Clear	Dry	2	W	E			Property Damage Only	0	Sideswipe
9	4237560	08/18/2016	5:15 PM	Daylight	Clear	Dry	2	E	E			Property Damage Only	0	Rear-end
10	4241097	12/12/2015	11:37 AM	Daylight	Clear	Dry	2	W	W			Property Damage Only	0	Rear-end
11	4245418	07/24/2015	7:43 PM	Daylight	Rain	Wet	1	N				Property Damage Only	0	Rear-end
12	4251991	03/13/2016	10:00 AM	Daylight	Clear	Dry	2	E	S			Property Damage Only	0	Angled
13	4259113	09/27/2016	7:55 AM	Daylight	Clear	Dry	2	E	E			Non-fatal Injury	1	Rear-end
14	4278274	10/04/2016	5:05 PM	Daylight	Clear	Dry	2	S	W			Property Damage Only	0	Rear-end
15	4314050	12/06/2016	10:51 AM	Daylight	Cloudy	Dry	2	W	W			Property Damage Only	0	Rear-end
16	4427802	05/08/2016	12:22 PM	Daylight	Cloudy	Wet	2	W	W			Property Damage Only	0	Rear-end
17	4444627	01/23/2016	8:30 AM	Daylight	Cloudy	Dry	2	E	S			Property Damage Only	1	Angled
18	4444629	02/01/2016	2:41 PM	Daylight	Clear	Dry	2	W	W			Property Damage Only	2	Rear-end
19	3893667	10/23/2013	11:25 AM	Daylight	Clear	Dry	2	W	W			Property Damage Only	0	Rear-end
20	3893669	10/25/2013	3:59 PM	Daylight	Clear	Dry	2	W	E			Property Damage Only	0	Angled
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Crash Data Summary Tables

Old Union Turnpike @ Harvard Street - Lancaster, Massachusetts

1/1/2013- 12/31/2016

Collision Diagram	Crash Number	Crash Date	Crash Time	Ambient Light	Weather Condition	Road Surface	Number of Vehicles	Vehicle Travel Directions				Crash Severity	Manner of Collision
								V1	V2	V3	V4		
1	3753018	12/01/2014	5:51 PM	Dark - Lighted	Cloudy	Dry	2	S	S			Property Damage Only	Rear-end
2	4144173	03/28/2014	5:28 PM	Daylight	Rain	Wet	2	W	S			Non-fatal Injury	Angled
3	4144200	11/06/2014	4:54 PM	Dusk	Rain	Wet	2	S	E			Property Damage Only	Angled
4	4144206	06/02/2016	11:39 AM	Daylight	Cloudy	Dry	2	E	S			Property Damage Only	Sideswipe
5	4253705	10/27/2016	5:05 PM	Daylight	Rain	Wet	2	S	E			Property Damage Only	Not Reported
6	4277349	10/25/2016	11:33 AM	Daylight	Clear	Dry	2	S	E			Property Damage Only	Angled
7	3893571	11/29/2013	3:42 PM	Daylight	Clear	Dry	2	W	S			Property Damage Only	Angled
8													
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INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Lancaster | COUNT DATE : Dec-18

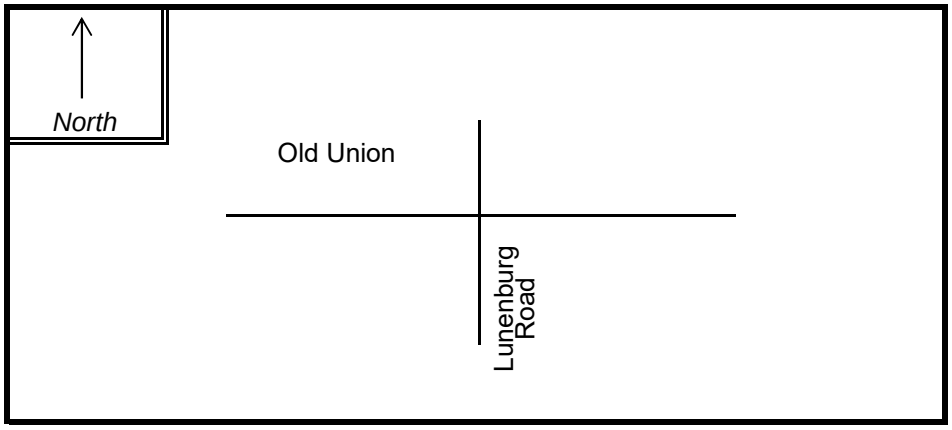
DISTRICT : 3 | UNSIGNALIZED : **YES** | SIGNALIZED : NO

~ INTERSECTION DATA ~

MAJOR STREET : Lunenburg Road (Route 70)

MINOR STREET(S) : Old Union Turnpike

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	264	310	591	465		**1,630**

" K " FACTOR : **0.093** | INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **17,527**

TOTAL # OF CRASHES : 9 | # OF YEARS : 4 | AVERAGE # OF CRASHES PER YEAR (**A**) : **2.25**

CRASH RATE CALCULATION : **0.35**

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

Comments : K Factor based on ATR counts along Lunenburg Road

Project Title & Date: Capital Commerce Center - Lancaster, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Lancaster | COUNT DATE : Dec-18

DISTRICT : 3 | UNSIGNALIZED : **YES** | SIGNALIZED : NO

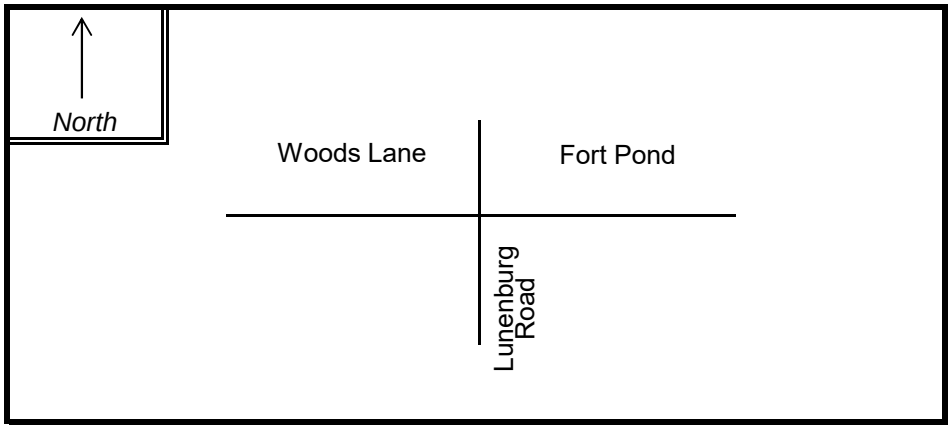
~ INTERSECTION DATA ~

MAJOR STREET : Lunenburg Road (Route 70)

MINOR STREET(S) : Fort Pond Road

Woods Lane

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	4	606	541	200		**1,351**

" K " FACTOR : **0.093** | INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **14,527**

TOTAL # OF CRASHES : 7 | # OF YEARS : 4 | AVERAGE # OF CRASHES PER YEAR (**A**) : **1.75**

CRASH RATE CALCULATION : **0.33**

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

Comments : K Factor based on ATR counts along Lunenburg Road

Project Title & Date: Capital Commerce Center - Lancaster, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Leominster | COUNT DATE : Dec-18

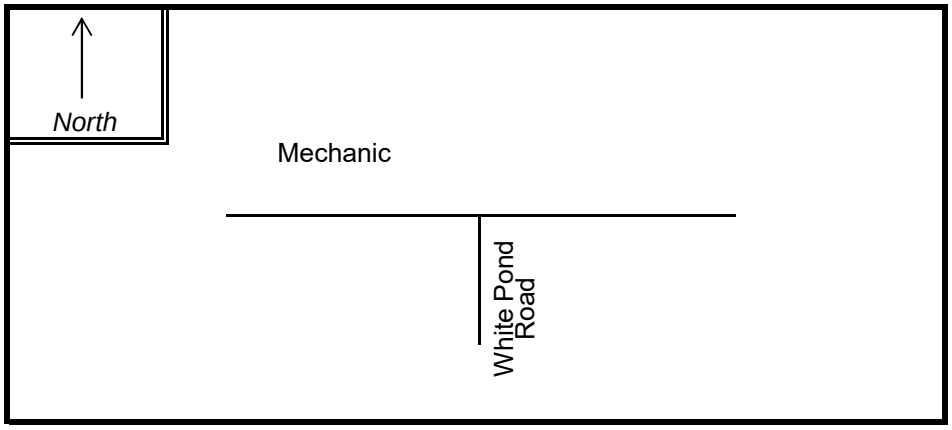
DISTRICT : 3 | UNSIGNALIZED : **YES** | SIGNALIZED : NO

~ INTERSECTION DATA ~

MAJOR STREET : Mechanic Street

MINOR STREET(S) : White Pond Road

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	297	492	17			**806**

" K " FACTOR : **0.093**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **8,667**

TOTAL # OF CRASHES : 2

OF YEARS : 4

AVERAGE # OF CRASHES PER YEAR (**A**) : **0.50**

CRASH RATE CALCULATION : **0.16**

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : K Factor based on ATR counts along Lunenburg Road

Project Title & Date: Capital Commerce Center - Lancaster, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Leominster | COUNT DATE : Dec-18

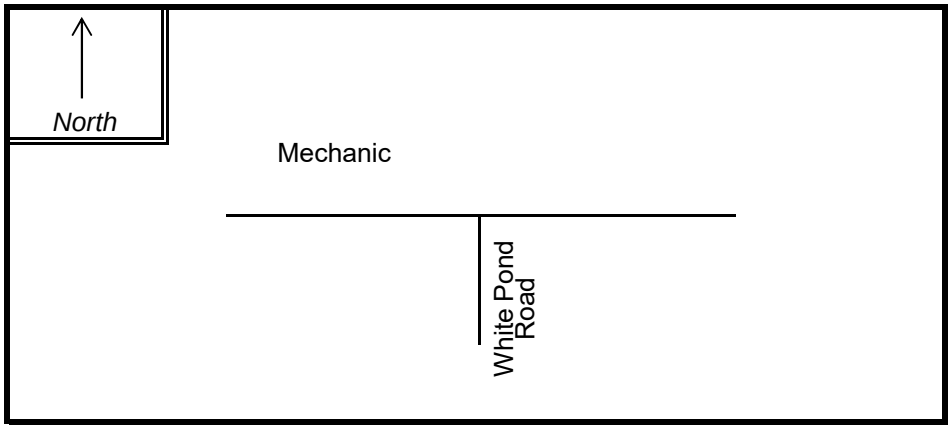
DISTRICT : 3 | UNSIGNALIZED : **YES** | SIGNALIZED : NO

~ INTERSECTION DATA ~

MAJOR STREET : Mechanic Street

MINOR STREET(S) : Johnny Appleseed Lane

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	**1**	**2**	**3**	**4**	**5**	**Total Peak Hourly Approach Volume**
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	307	492	33	1		**833**

" K " FACTOR : **0.093**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **8,957**

TOTAL # OF CRASHES : 5

OF YEARS : 4

AVERAGE # OF CRASHES PER YEAR (**A**) : **1.25**

CRASH RATE CALCULATION : **0.38**

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

Comments : K Factor based on ATR counts along Lunenburg Road

Project Title & Date: Capital Commerce Center - Lancaster, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Lancaster COUNT DA 12/1/2018

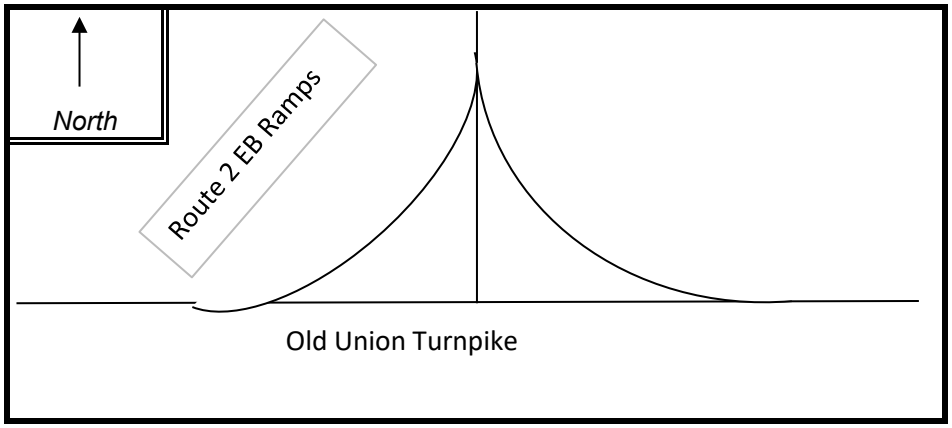
DISTRICT : 3 UNSIGNALIZED : Y SIGNALIZED : N

~ INTERSECTION DATA ~

MAJOR STREET : Old Union Turnpike

MINOR STREET(S) : Route 2 EB Ramps

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	EB SB			
PEAK HOURLY VOLUMES (AM/PM) :	283	488	408			**1,179**

" K " FACTOR : **0.093** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **12,677**

TOTAL # OF CRASHES : 20 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **4.00**

CRASH RATE CALCULATION : **0.86** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : K factor based on ATR counts along Lunenburg

Project Title & Date: Capital Commerce Center - Lancaster, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Lancaster COUNT DA 12/1/2018

DISTRICT : 3 UNSIGNALIZED : Y SIGNALIZED : N

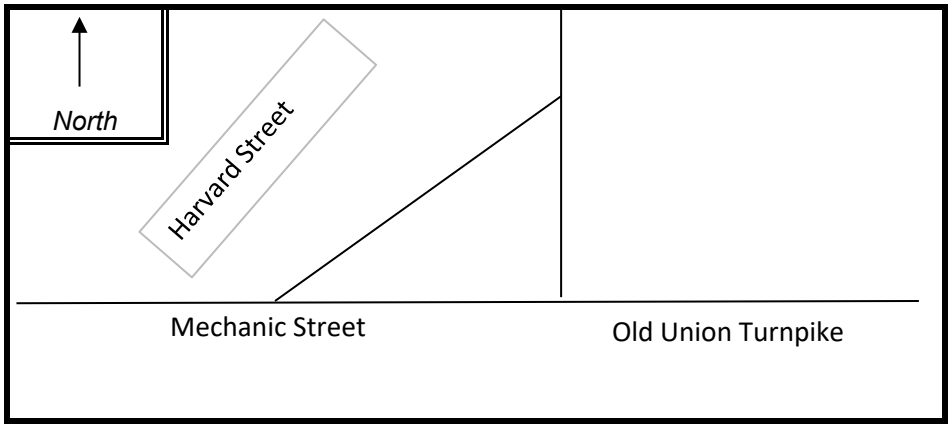
~ INTERSECTION DATA ~

MAJOR STREET : Old Union Turnpike

MINOR STREET(S) : Havard Street

Mechanic Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	EB SB			
PEAK HOURLY VOLUMES (AM/PM) :	334	843	314			1,491

" K " FACTOR : **0.093** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **16,032**

TOTAL # OF CRASHES : 7 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.40**

CRASH RATE CALCULATION : **0.24** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : K factor based on ATR counts along Lunenburg

Project Title & Date: Capital Commerce Center - Lancaster, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Lancaster COUNT DA Dec-18

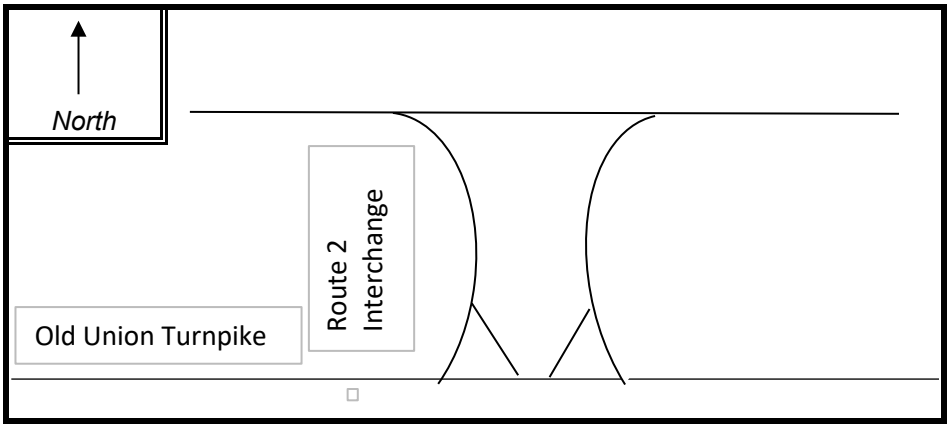
DISTRICT : 3 UNSIGNALIZED : Y SIGNALIZED : N

~ INTERSECTION DATA ~

MAJOR STREET : Old Union Turnpike

MINOR STREET(S) : Route 2 Interchange 35

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB	NB		
PEAK HOURLY VOLUMES (AM/PM) :	136	91	209			**436**

" K " FACTOR :	**0.093**	INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME :			**4,688**
TOTAL # OF CRASHES :	5	# OF YEARS :	5	AVERAGE # OF CRASHES PER YEAR (**A**) :	**1.00**

CRASH RATE CALCULATION : **0.58** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : K factor based on ATR counts along Lunenburg

Project Title & Date: Capital Commerce Center - Lancaster, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Lancaster COUNT DA Dec-18

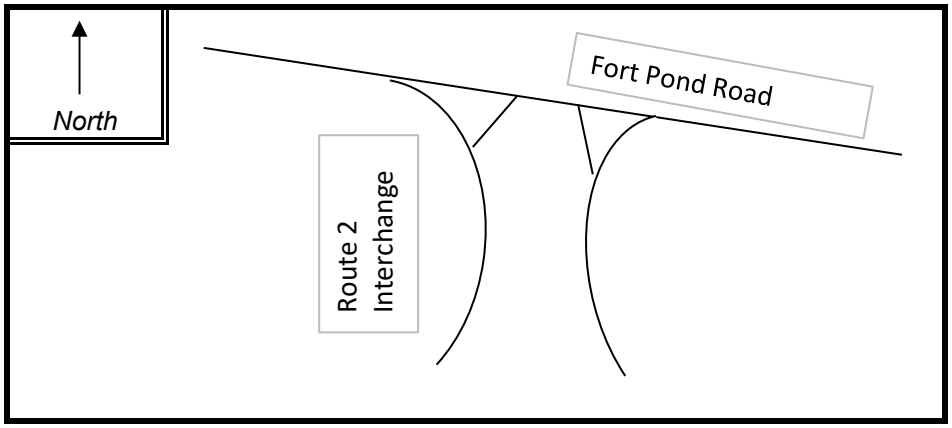
DISTRICT : 3 UNSIGNALIZED : Y SIGNALIZED : N

~ INTERSECTION DATA ~

MAJOR STREET : Fort Pond Road

MINOR STREET(S) : Route 2 Interchange 35

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	126	243	351			**720**

" K " FACTOR : **0.093** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **7,742**

TOTAL # OF CRASHES : 1 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.20**

CRASH RATE CALCULATION : **0.07** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : K factor based on ATR counts along Lunenburg

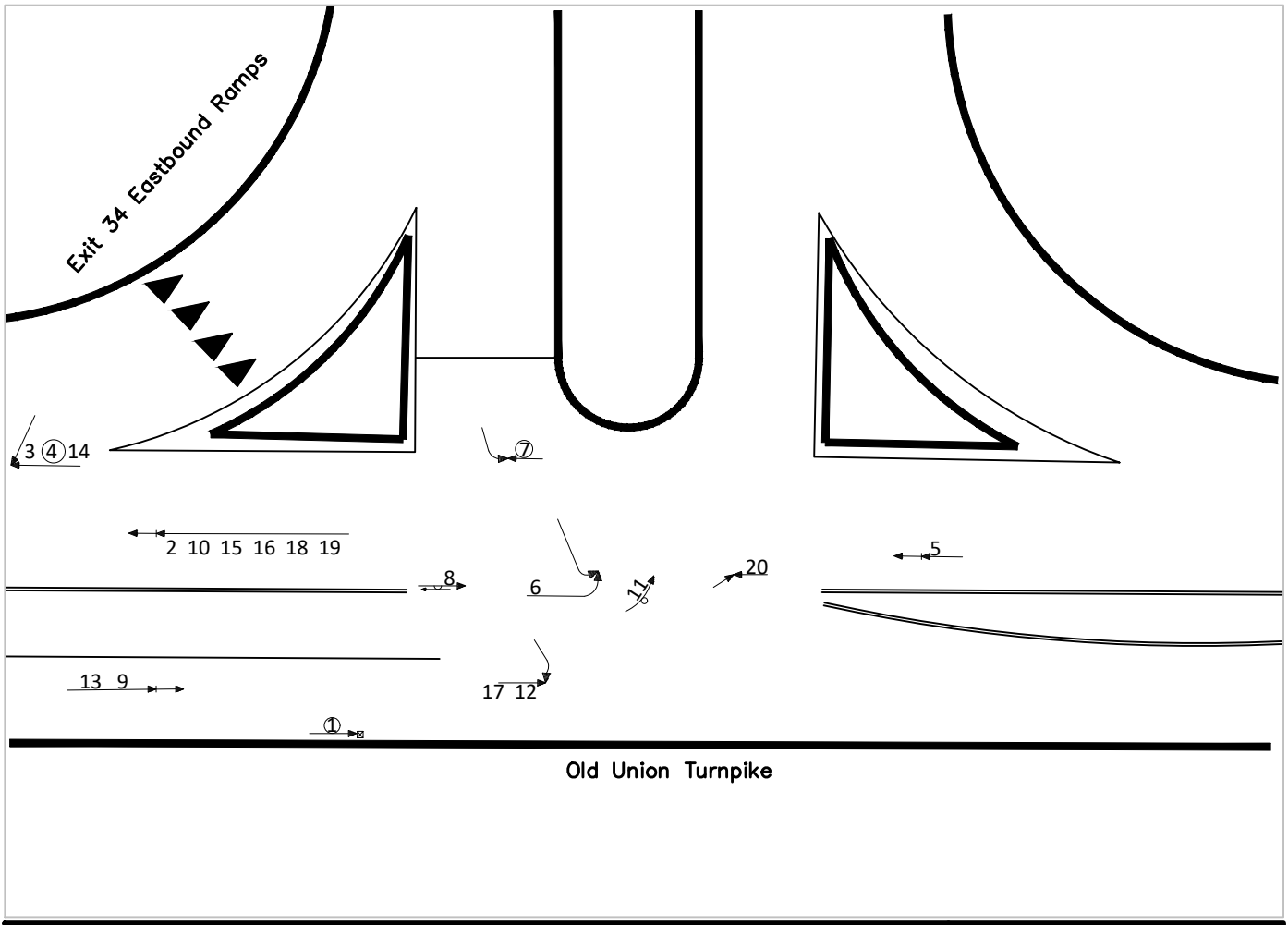
Project Title & Date: Capital Commerce Center - Lancaster, MA

Not to Scale

Capital Commerce Center - McGovern Boulevard - Lancaster, Massachusetts

Draft Environmental Impact Report

LOCATION: Old Union Turnpike @ Exit 34 Eastbound Ramps
CITY/STATE: Lancaster, Massachusetts
TIME PERIOD: October 2013 - December 2016
PREPARED BY: TEC, Inc. / Danah Hamzeh
SOURCE: MassDOT



LEGEND				SHOW FOR COLLISION
VEHICLE PATH	HEAD-ON COLLISION	FIXED OBJECT		1. Approximate location of collision,
BACKING VEHICLE	ANGLED COLLISION	MOVEABLE OBJECT		2. Direction of collision,
SIDESWIPE COLLISION	FIXED OBJECT COLLISION	PARKED VEHICLE		3. Type of collision and vehicles involved,
PEDESTRIAN COLLISION	OVERTURNED VEHICLE	PERSONAL INJURY		4. Time, Day, Date
CYCLIST COLLISION	OUT-OF-CONTROL VEHICLE	FATALITY		5. Any other pertinent factors mentioned on the report.
REAR-END COLLISION		ANIMAL		NOTE: Shaded number indicates crash occurred under "nighttime" conditions.

SUMMARY OF CRASHES ON DIAGRAM [*no fatal collisions*]

	REAR-END	SIDESWIPE	HEAD-ON	ANGLED	SINGLE VEH	PED/BIKE	OTHER / UNK	TOTAL
PROPERTY DAMAGE ONLY	10	1	0	5	0	0	0	16
NON-FATAL INJURY	1	0	0	2	1	0	0	4
UNKNOWN / NOT REPORTED	0	0	0	0	0	0	0	0
TOTAL	11	1	0	7	1	0	0	20

Figure

Collision Diagram
October 2013 - December 2016
Collision Data

TEC, Inc.
146 Dascomb Road | 169 Ocean Blvd
Andover, MA 01810 | Hampton, NH 03842

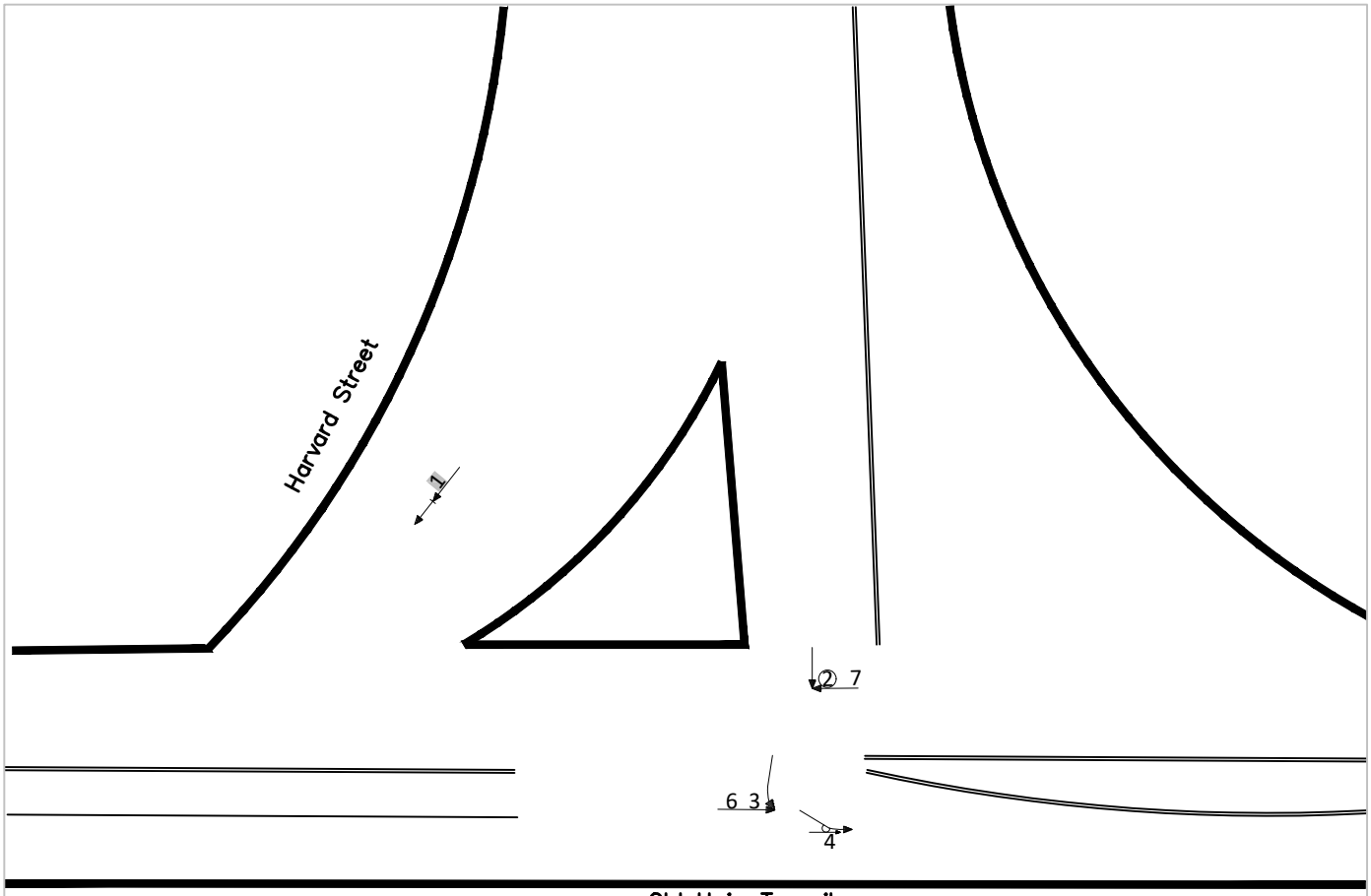
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Not to Scale

Capital Commerce Center - McGovern Boulevard - Lancaster, Massachusetts

Draft Environmental Impact Report

LOCATION: Old Union Turnpike @ Harvard Street
CITY/STATE: Lancaster, Massachusetts
TIME PERIOD: November 2013 - October 2016
PREPARED BY: TEC, Inc. / Danah Hamzeh
SOURCE: MassDOT



#5 is not locatable.

LEGEND

- VEHICLE PATH
- BACKING VEHICLE
- SIDESWIPE COLLISION
- P PEDESTRIAN COLLISION
- C CYCLIST COLLISION
- REAR-END COLLISION
- HEAD-ON COLLISION
- ANGLED COLLISION
- FIXED OBJECT COLLISION
- OVERTURNED VEHICLE
- OUT-OF-CONTROL VEHICLE
- FIXED OBJECT
- MOVEABLE OBJECT
- PARKED VEHICLE
- PERSONAL INJURY
- FATALITY
- A ANIMAL

SHOW FOR COLLISION

1. Approximate location of collision,
2. Direction of collision,
3. Type of collision and vehicles involved,
4. Time, Day, Date
5. Any other pertinent factors mentioned on the report.

NOTE: Shaded number indicates crash occurred under "nighttime" conditions.

SUMMARY OF CRASHES ON DIAGRAM [*no fatal collisions*]

	REAR-END	SIDESWIPE	HEAD-ON	ANGLED	SINGLE VEH	PED/BIKE	OTHER / UNK	TOTAL
PROPERTY DAMAGE ONLY	1	1	0	3	0	0	1	6
NON-FATAL INJURY	0	0	0	1	0	0	0	1
UNKNOWN / NOT REPORTED	0	0	0	0	0	0	0	0
TOTAL	1	1	0	4	0	0	1	7

Figure

Collision Diagram
November 2013 - October 2016
Collision Data

TEC, Inc.
146 Dascomb Road | Andover, MA 01810
169 Ocean Blvd | Hampton, NH 03842

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Appendix F.6

MassDOT Ambient Growth Data

Average Daily Traffic Summary Table

Project: T0852- Capital Commerce Center - Lunenburg Road
Date: Janurary 7,2019
Analyst: TEC, Inc. / Danah Hamzeh
Source: MassDOT Permanent & Temporary Count Stations

STA.	TOWN	ROUTE/STREET	LOCATION	2015	2016	2017	Amb. Growth
3081	LANCASTER	MAIN STREET (ROUTE 117 & 70)	EAST OF OTIS ST.	19,025	19,272	20,631	4.17%
253426	LANCASTER	MAIN STREET (ROUTE 117 & 70)	SOUTH OF ROUTE 117	6744	6832	6907	1.20%
253425	LANCASTER	LUNENBURG ROAD	NORTH OF ROUTE 117	8227	8737	7571	-3.57%
							0.6%

Appendix F.7

Site Trip Generation

Existing Land Uses

Trip Generation Estimate - Existing

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 488 Soccer Complex

Average Vehicle Trips Ends vs:	Fields
Independent Variable (X):	3
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 71.33 * (X)
T = 71.33 * 3.00
T = **214** vehicle trips
with 50% entering (107 vpd) and with 50% exiting (107 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.99 * (X)
T = 0.99 * 3.00
T = **2** vehicle trips
with 61% entering (1 vpd) and with 39% exiting (1 vpd)

WEEKDAY EVENING PEAK HOUR

T = 16.43 * (X)
T = 16.43 * 3.00
T = **50** vehicle trips
with 66% entering (33 vpd) and with 34% exiting (17 vpd)

AVERAGE SATURDAY DAILY

T = 404.88 * (X)
T = 404.88 * 3.00
T = **1,214** vehicle trips
with 50% entering (607 vpd) and with 50% exiting (607 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 30.34 * (X)
T = 30.34 * 3.00
T = **92** vehicle trips
with 48% entering (44 vpd) and with 52% exiting (48 vpd)

Trip Generation Estimate - Existing

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 488 Soccer Complex

Average Vehicle Trips Ends vs:	Fields
Independent Variable (X):	3
Curve Method:	Fitted

WEEKDAY EVENING PEAK HOUR

T = 13.92 * (X) + 35.13
T = 13.92 * 3.00 + 35.13
T = **76** vehicle trips
with 66% entering (50 vpd) and with 34% exiting (26 vpd)

SATURDAY MIDDAY PEAK HOUR

Ln T = 0.96 * Ln(X) + 3.72
Ln T = 0.96 * 1.10 + 3.72
T = **118** vehicle trips
with 48% entering (57 vpd) and with 52% exiting (61 vpd)

Trip Generation Estimate - Existing Use

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 110 General Light Industrial

Average Vehicle Trips Ends vs: 1000 SF Gross Floor Area
Independent Variable (X): 11.8
Curve Method: Average

AVERAGE WEEKDAY DAILY

T = 4.96 * (X)
T = 4.96 * 11.80
T = **58** vehicle trips
with 50% entering (29 vpd) and with 50% exiting (29 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.70 * (X)
T = 0.70 * 11.80
T = **8** vehicle trips
with 88% entering (7 vpd) and with 12% exiting (1 vpd)

WEEKDAY EVENING PEAK HOUR

T = 0.63 * (X)
T = 0.63 * 11.80
T = **8** vehicle trips
with 13% entering (1 vpd) and with 87% exiting (7 vpd)

AVERAGE SATURDAY DAILY

T = 1.99 * (X)
T = 1.99 * 11.80
T = **24** vehicle trips
with 50% entering (12 vpd) and with 50% exiting (12 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 0.41 * (X)
T = 0.41 * 11.80
T = **4** vehicle trips
with 47% entering (2 vpd) and with 53% exiting (2 vpd)

Trip Generation Estimate - Existing Use

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 937 Coffee/Donut Shop with Drive-Through Window

Average Vehicle Trips Ends vs:	1000 SF Gross Floor Area
Independent Variable (X):	2.3
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 820.38 * (X)
T = 820.38 * 2.30
T = **1,886** vehicle trips
with 50% entering (943 vpd) and with 50% exiting (943 vpd)

WEEKDAY MORNING PEAK HOUR

T = 88.99 * (X)
T = 88.99 * 2.30
T = **204** vehicle trips
with 51% entering (104 vpd) and with 49% exiting (100 vpd)

WEEKDAY EVENING PEAK HOUR

T = 43.38 * (X)
T = 43.38 * 2.30
T = **100** vehicle trips
with 50% entering (50 vpd) and with 50% exiting (50 vpd)

AVERAGE SATURDAY DAILY (Interpolated from LUC 936)

T = 1001.16 * (X)
T = 1001.16 * 2.30
T = **2,302** vehicle trips
with 50% entering (1,151 vpd) and with 50% exiting (1,151 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 87.70 * (X)
T = 87.70 * 2.30
T = **202** vehicle trips
with 50% entering (101 vpd) and with 50% exiting (101 vpd)

Trip Generation Estimate - Existing Use

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 960 Super Convenience Market / Gas Stati

Average Vehicle Trips Ends vs:	1000 SF Gross Floor Area
Independent Variable (X):	5
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 837.58 * (X)
T = 837.58 * 5.00
T = **4,188** vehicle trips
with 50% entering (2,094 vpd) and with 50% exiting (2,094 vpd)

WEEKDAY MORNING PEAK HOUR

T = 83.14 * (X)
T = 83.14 * 5.00
T = **416** vehicle trips
with 50% entering (208 vpd) and with 50% exiting (208 vpd)

WEEKDAY EVENING PEAK HOUR

T = 69.28 * (X)
T = 69.28 * 5.00
T = **346** vehicle trips
with 50% entering (173 vpd) and with 50% exiting (173 vpd)

AVERAGE SATURDAY DAILY

T = 700.00 * (X)
T = 700.00 * 5.00
T = **3,500** vehicle trips
with 50% entering (1,750 vpd) and with 50% exiting (1,750 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 63.80 * (X)
T = 63.80 * 5.00
T = **320** vehicle trips
with 50% entering (160 vpd) and with 50% exiting (160 vpd)

Trip Generation Estimate - Existing Use

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 960 Super Convenience Market / Gas Stati

Average Vehicle Trips Ends vs:	1000 SF Gross Floor Area
Independent Variable (X):	5
Curve Method:	Fitted

WEEKDAY MORNING PEAK HOUR

T = 137.38 * (X) + -264.53
T = 137.38 * 5.00 + -264.53
T = **422** vehicle trips
with 50% entering (211 vpd) and with 50% exiting (211 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 104.71 * (X) + -204.23
T = 104.71 * 5.00 + -204.23
T = **320** vehicle trips
with 50% entering (160 vpd) and with 50% exiting (160 vpd)

Proposed Land Uses

Trip Generation Assessment - Build Condition

Project: Capital Commerce Center - Lancaster, MA
Date: May 10, 2019
Analyst: TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source: Institute of Transportation Engineers - *Trip Generation - 10th Ed.*

Proposed Development "East"

Single Family Housing (ITE LUC 210)
Units: 117 Units

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	1104	1202	**1202**	50%	50%	601	601	0	0	0	**1202**	0	0	601	601
Weekday AM PH	86	88	**88**	25%	75%	22	66	0	0	0	**88**	0	0	22	66
Weekday PM PH	116	118	**118**	63%	37%	74	44	0	0	0	**118**	0	0	74	44
Saturday Daily	1116	1138	**1138**	50%	50%	569	569	0	0	0	**1138**	0	0	569	569
Sat Midday PH	108	116	**116**	54%	46%	63	53	0	0	0	**116**	0	0	63	53

Proposed Development "West"

Industrial Park (ITE LUC 130)
Units: 1567 kSF

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	5280	3926	**3926**	50%	50%	1963	1963	84	89	0	**3753**	0	0	1879	1874
Weekday AM PH	470	N/A	**470**	79%	21%	371	99	20	13	0	**437**	0	0	351	86
Weekday PM PH	408	N/A	**408**	22%	78%	90	318	6	15	0	**387**	0	0	84	303
Saturday Daily	3980	N/A	**3980**	50%	50%	1990	1990	84	90	0	**3806**	0	0	1906	1900
Sat Midday PH	690	N/A	**690**	32%	68%	221	469	8	6	0	**676**	0	0	213	463

Multifamily Housing (ITE LUC 221)
Units: 500 Units

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	2720	2723	**2724**	50%	50%	1362	1362	175	139	0	**2410**	0	0	1187	1223
Weekday AM PH	166	166	**166**	26%	74%	43	123	1	3	0	**162**	0	0	42	120
Weekday PM PH	220	208	**208**	61%	39%	127	81	39	17	0	**152**	0	0	88	64
Saturday Daily	2456	1937	**1938**	50%	50%	969	969	196	155	0	**1587**	0	0	773	814
Sat Midday PH	220	217	**217**	49%	51%	106	111	10	10	0	**197**	0	0	96	101

Hotel (ITE LUC 310)
Units: 120 Rooms

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	1004	928	**928**	50%	50%	464	464	23	45	0	**860**	0	0	441	419
Weekday AM PH	56	54	**54**	59%	41%	32	22	0	13	0	**41**	0	0	32	9
Weekday PM PH	72	64	**64**	51%	49%	33	31	8	2	0	**54**	0	0	25	29
Saturday Daily	982	860	**860**	50%	50%	430	430	22	50	0	**788**	0	0	408	380
Sat Midday PH	86	88	**88**	56%	44%	49	39	2	5	0	**81**	0	0	47	34

Soccer Complex (ITE LUC 488)
Units: 1 Field

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	72	N/A	**72**	50%	50%	36	36	0	0	0	**72**	0	0	36	36
Weekday AM PH	2	N/A	**2**	61%	39%	1	1	0	0	0	**2**	0	0	1	1
Weekday PM PH	16	14	**14**	66%	34%	9	5	0	0	0	**14**	0	0	9	5
Saturday Daily	406	N/A	**406**	50%	50%	203	203	0	0	0	**406**	0	0	203	203
Sat Midday PH	30	38	**38**	48%	52%	18	20	0	0	0	**38**	0	0	18	20

Shopping Center (ITE LUC 820)
Units: 65.7 KSF

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	2480	N/A	**2480**	50%	50%	1240	1240	187	196	**546**	**1551**	273	273	780	771
Weekday AM PH	64	N/A	**64**	62%	38%	40	24	16	8	**10**	**30**	5	5	19	11
Weekday PM PH	250	N/A	**250**	48%	52%	120	130	24	43	**62**	**121**	31	31	65	56
Saturday Daily	3030	N/A	**3030**	50%	50%	1515	1515	227	234	**668**	**1901**	334	334	954	947
Sat Midday PH	296	N/A	**296**	52%	48%	154	142	17	16	**68**	**195**	34	34	103	92

Assumed 34% pass-by rate for weekday PM and 26% pass-by rate for all others (Trip Generation Handbook, 3rd Edition).

TOTAL NEW DEVELOPMENT	***Total Trips***			***Total New Trips***		***Total Multi-Use Trips***		***Total New***	***Total New***	***Total Pass-by Trips***		***Total Primary Trips***	
				In	***Out***	***In***	***Out***	***Pass-by Trips***	***Primary Trips***	***In***	***Out***	***In***	***Out***
Weekday Daily	**11332**			**5666**	**5666**	**469**	**469**	**546**	**9848**	**273**	**273**	**4924**	**4924**
Weekday AM Peak Hour	**844**			**509**	**335**	**37**	**37**	**10**	**760**	**5**	**5**	**467**	**293**
Weekday PM Peak Hour	**1062**			**453**	**609**	**77**	**77**	**62**	**846**	**31**	**31**	**345**	**501**
Saturday Daily	**11352**			**5676**	**5676**	**529**	**529**	**668**	**9626**	**334**	**334**	**4813**	**4813**
Sat Midday Peak Hour	**1445**			**611**	**834**	**37**	**37**	**68**	**1303**	**34**	**34**	**540**	**763**

Existing Development

Light Industrial (ITE LUC 110)
Units: 11.8 kSF

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	58	N/A	**58**	50%	50%	29	29	0	0	0	**58**	0	0	29	29
Weekday AM PH	8	N/A	**8**	88%	12%	7	1	0	0	0	**8**	0	0	7	1
Weekday PM PH	8	N/A	**8**	13%	87%	1	7	0	0	0	**8**	0	0	1	7
Saturday Daily	24	N/A	**24**	50%	50%	12	12	0	0	0	**24**	0	0	12	12
Sat Midday PH	4	N/A	**4**	47%	53%	2	2	0	0	0	**4**	0	0	2	2

Soccer Complex (ITE LUC 488)
Units: 3 Fields

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	214	N/A	**214**	50%	50%	107	107	0	0	0	**214**	0	0	107	107
Weekday AM PH	2	N/A	**2**	61%	39%	1	1	0	0	0	**2**	0	0	1	1
Weekday PM PH	50	76	**76**	66%	34%	50	26	0	0	0	**76**	0	0	50	26
Saturday Daily	1214	N/A	**1214**	50%	50%	607	607	0	0	0	**1214**	0	0	607	607
Sat Midday PH	92	118	**118**	48%	52%	57	61	0	0	0	**118**	0	0	57	61

Coffee/Donut Shop with DT (ITE LUC 937)
Units: 2.3 KSF

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	1886	N/A	**1886**	50%	50%	943	943	244	174	734	**734**	367	367	332	402
Weekday AM PH	204	N/A	**204**	51%	49%	104	100	13	8	90	**93**	45	45	46	47
Weekday PM PH	100	N/A	**100**	50%	50%	50	50	13	19	34	**34**	17	17	20	14
Saturday Daily	2302	N/A	**2302**	50%	50%	1151	1151	250	213	920	**919**	460	460	441	478
Sat Midday PH	202	N/A	**202**	50%	50%	101	101	16	19	84	**83**	42	42	43	40

Assumed 49% pass-by rate for weekday AM and 50% pass-by rate for all others (Trip Generation Handbook, 3rd Edition - LUC 934).

Convenience Market & Gas Station (ITE LUC 960)
Units: 5 KSF

	Total Trips		Total	% Distribution		# New Trips		Multi-Use Trips		Total New	Total New	# Passby Trips		# Primary Trips	
	Avg. Rates	Fitted Curve	New Trips	IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	4188	N/A	**4188**	50%	50%	2094	2094	174	244	2112	**1658**	1056	1056	864	794
Weekday AM PH	416	422	**422**	50%	50%	211	211	8	13	248	**153**	124	124	79	74
Weekday PM PH	346	N/A	**346**	50%	50%	173	173	19	13	176	**138**	88	88	66	72
Saturday Daily	3500	N/A	**3500**	50%	50%	1750	1750	213	250	1700	**1337**	850	850	687	650
Sat Midday PH	320	320	**320**	50%	50%	160	160	19	16	160	**125**	80	80	61	64

Assumed 62% pass-by rate for weekday AM, 56% pass-by rate for all others (Trip Generation Handbook, 3rd Edition).

EXISTING DEVELOPMENT	***Total Trips***			***Total New Trips***		***Total Multi-Use Trips***		***Total New***	***Total New***	***Total Pass-by Trips***		***Total Primary Trips***	
				In	***Out***	***In***	***Out***	***Pass-by Trips***	***Primary Trips***	***In***	***Out***	***In***	***Out***
Weekday Daily	**6346**			**3173**	**3173**	**418**	**418**	**2846**	**2664**	**1423**	**1423**	**1332**	**1332**
Weekday AM Peak Hour	**636**			**323**	**313**	**21**	**21**	**338**	**256**	**169**	**169**	**133**	**123**
Weekday PM Peak Hour	**530**			**274**	**256**	**32**	**32**	**210**	**256**	**105**	**105**	**137**	**119**
Saturday Daily	**7040**			**3520**	**3520**	**463**	**463**	**2620**	**3494**	**1310**	**1310**	**1747**	**1747**
Sat Midday Peak Hour	**644**			**320**	**324**	**35**	**35**	**244**	**330**	**122**	**122**	**163**	**167**

POST SITE TRIPS	***Total Trips***			***Total New Trips***		***Total Multi-Use Trips***		***Total New***	***Total New***	***Total Pass-by Trips***		***Total Primary Trips***	
				In	***Out***	***In***	***Out***	***Pass-by Trips***	***Primary Trips***	***In***	***Out***	***In***	***Out***
Weekday Daily	**17620**			**8810**	**8810**	**887**	**887**	**3392**	**12454**	**1696**	**1696**	**6227**	**6227**
Weekday AM Peak Hour	**1472**			**825**	**647**	**58**	**58**	**348**	**1008**	**174**	**174**	**593**	**415**
Weekday PM Peak Hour	**1584**			**726**	**858**	**109**	**109**	**272**	**1094**	**136**	**136**	**481**	**613**
Saturday Daily	**18368**			**9184**	**9184**	**992**	**992**	**3288**	**13096**	**1644**	**1644**	**6548**	**6548**
Sat Midday Peak Hour	**2085**			**929**	**1156**	**72**	**72**	**312**	**1629**	**156**	**156**	**701**	**928**

NET TRIP ASSESSMENT	***Total Trips***			***Total New Trips***		***Total Multi-Use Trips***		***Total New***	***Total New***	***Total Pass-by Trips***		***Total Primary Trips***	
				In	***Out***	***In***	***Out***	***Pass-by Trips***	***Primary Trips***	***In***	***Out***	***In***	***Out***
Weekday Daily	**11274**			**5637**	**5637**	**469**	**469**	**546**	**9790**	**273**	**273**	**4895**	**4895**
Weekday AM Peak Hour	**836**			**502**	**334**	**37**	**37**	**10**	**752**	**5**	**5**	**460**	**292**
Weekday PM Peak Hour	**1054**			**452**	**602**	**77**	**77**	**62**	**838**	**31**	**31**	**344**	**494**
Saturday Daily	**11328**			**5664**	**5664**	**529**	**529**	**668**	**9802**	**334**	**334**	**4801**	**4801**
Sat Midday Peak Hour	**1441**			**609**	**832**	**37**	**37**	**68**	**1299**	**34**	**34**	**538**	**761**

Trip Generation Estimate

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 130 Industrial Park

Average Vehicle Trips Ends vs:	1000 SF Gross Floor Area
Independent Variable (X):	1567
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 3.37 * (X)
T = 3.37 * 1567.00
T = **5,280** vehicle trips
with 50% entering (2,640 vpd) and with 50% exiting (2,640 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.30 * (X)
T = 0.30 * 1567.00
T = **470** vehicle trips
with 79% entering (371 vpd) and with 21% exiting (99 vpd)

WEEKDAY EVENING PEAK HOUR

T = 0.26 * (X)
T = 0.26 * 1567.00
T = **408** vehicle trips
with 22% entering (90 vpd) and with 78% exiting (318 vpd)

AVERAGE SATURDAY DAILY

T = 2.54 * (X)
T = 2.54 * 1567.00
T = **3,980** vehicle trips
with 50% entering (1,990 vpd) and with 50% exiting (1,990 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 0.44 * (X)
T = 0.44 * 1567.00
T = **690** vehicle trips
with 32% entering (221 vpd) and with 68% exiting (469 vpd)

Trip Generation Estimate

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 130 Industrial Park

Average Vehicle Trips Ends vs:	1000 SF Gross Floor Area
Independent Variable (X):	1567
Curve Method:	Fitted

AVERAGE WEEKDAY DAILY

Ln(T) = 0.52 * Ln(X) + 4.45

Ln(T) = 0.52 * 7.36 + 4.45

T = **3,926** vehicle trips

with 50% entering (1,963 vpd) and with 50% exiting (1,963 vpd)

Trip Generation Estimate

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 210 Single-Family Detached Housing

Average Vehicle Trips Ends vs:	Dwelling Units
Independent Variable (X):	117
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 9.44 * (X)
T = 9.44 * 117.00
T = **1,104** vehicle trips
with 50% entering (552 vpd) and with 50% exiting (552 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.74 * (X)
T = 0.74 * 117.00
T = **86** vehicle trips
with 25% entering (22 vpd) and with 75% exiting (64 vpd)

WEEKDAY EVENING PEAK HOUR

T = 0.99 * (X)
T = 0.99 * 117.00
T = **116** vehicle trips
with 63% entering (73 vpd) and with 37% exiting (43 vpd)

AVERAGE SATURDAY DAILY

T = 9.54 * (X)
T = 9.54 * 117.00
T = **1,116** vehicle trips
with 50% entering (558 vpd) and with 50% exiting (558 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 0.93 * (X)
T = 0.93 * 117.00
T = **108** vehicle trips
with 54% entering (58 vpd) and with 46% exiting (50 vpd)

Trip Generation Estimate

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 210 Single-Family Detached Housing

Average Vehicle Trips Ends vs:	Dwelling Units
Independent Variable (X):	117
Curve Method:	Fitted

AVERAGE WEEKDAY DAILY

Ln(T) = 0.92 * Ln(X) + 2.71
Ln(T) = 0.92 * 4.76 + 2.71
T = **1,202** vehicle trips
with 50% entering (601 vpd) and with 50% exiting (601 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.71 * (X) + 4.8
T = 0.71 * 117.00 + 4.8
T = **88** vehicle trips
with 25% entering (22 vpd) and with 75% exiting (66 vpd)

WEEKDAY EVENING PEAK HOUR

Ln(T) = 0.96 * Ln(X) + 0.2
Ln(T) = 0.96 * 4.76 + 0.2
T = **118** vehicle trips
with 63% entering (74 vpd) and with 37% exiting (44 vpd)

AVERAGE SATURDAY DAILY

Ln(T) = 0.94 * Ln(X) + 2.56
Ln(T) = 0.94 * 4.76 + 2.56
T = **1,138** vehicle trips
with 50% entering (569 vpd) and with 50% exiting (569 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 0.84 * (X) + 17.99
T = 0.84 * 117.00 + 17.99
T = **116** vehicle trips
with 54% entering (63 vpd) and with 46% exiting (53 vpd)

Trip Generation Estimate

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 221 Multifamily Housing (Mid-Rise)

Average Vehicle Trips Ends vs:	Dwelling Units
Independent Variable (X):	500
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 5.44 * (X)
T = 5.44 * 500
T = **2,720** vehicle trips
with 50% entering (1,360 vpd) and with 50% exiting (1,360 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.36 * (X)
T = 0.36 * 500
T = **180** vehicle trips
with 26% entering (47 vpd) and with 74% exiting (133 vpd)

WEEKDAY EVENING PEAK HOUR

T = 0.44 * (X)
T = 0.44 * 500
T = **220** vehicle trips
with 61% entering (134 vpd) and with 39% exiting (86 vpd)

AVERAGE SATURDAY DAILY

T = 4.91 * (X)
T = 4.91 * 500
T = **2,456** vehicle trips
with 50% entering (1,228 vpd) and with 50% exiting (1,228 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 0.44 * (X)
T = 0.44 * 500
T = **220** vehicle trips
with 49% entering (108 vpd) and with 51% exiting (112 vpd)

TEC The Engineering Corp

Trip Generation Estimate

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 221 Multifamily Housing (Mid-Rise)

Average Vehicle Trips Ends vs:	Dwelling Units
Independent Variable (X):	500
Curve Method:	Fitted

Average Weekday Daily

T = 5.45 * (X) + -1.75
T = 5.45 * 500 + -1.75
T = **2,723** vehicle trips
with 50% entering (1,362 vpd) and with 50% exiting (1,361 vpd)

Weekday Morning Peak Hour

Ln(T) = 0.98 * Ln(X) + -0.98
Ln(T) = 0.98 * 6.21 + -0.98
T = **166** vehicle trips
with 26% entering (43 vpd) and with 74% exiting (123 vpd)

Weekday Evening Peak Hour

Ln(T) = 0.96 * Ln(X) + -0.63
Ln(T) = 0.96 * 6.21 + -0.63
T = **208** vehicle trips
with 61% entering (127 vpd) and with 39% exiting (81 vpd)

Average Saturday Daily

T = 3.04 * (X) + 417.11
T = 3.04 * 500 + 417.11
T = **1,937** vehicle trips
with 50% entering (969 vpd) and with 50% exiting (968 vpd)

Saturday Midday Peak Hour

T = 0.42 * (X) + 6.73
T = 0.42 * 500 + 6.73
T = **217** vehicle trips
with 49% entering (106 vpd) and with 51% exiting (111 vpd)

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ITE Land Use Code (LUC): 310 Hotel

Average Vehicle Trips Ends vs:	Rooms
Independent Variable (X):	120
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 8.36 * (X)
T = 8.36 * 120.00
T = **1,004** vehicle trips
with 50% entering (502 vpd) and with 50% exiting (502 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.47 * (X)
T = 0.47 * 120.00
T = **56** vehicle trips
with 59% entering (33 vpd) and with 41% exiting (23 vpd)

WEEKDAY EVENING PEAK HOUR

T = 0.60 * (X)
T = 0.60 * 120.00
T = **72** vehicle trips
with 51% entering (37 vpd) and with 49% exiting (35 vpd)

AVERAGE SATURDAY DAILY

T = 8.19 * (X)
T = 8.19 * 120.00
T = **982** vehicle trips
with 50% entering (491 vpd) and with 50% exiting (491 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 0.72 * (X)
T = 0.72 * 120.00
T = **86** vehicle trips
with 56% entering (48 vpd) and with 44% exiting (38 vpd)

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ITE Land Use Code (LUC): 310 Hotel

Average Vehicle Trips Ends vs:	Rooms
Independent Variable (X):	120
Curve Method:	Fitted

Average Weekday Daily

T = 11.29 * (X) + -426.97
T = 11.29 * 120.00 + -426.97
T = **928** vehicle trips
with 50% entering (464 vpd) and with 50% exiting (464 vpd)

Weekday Morning Peak Hour

T = 0.50 * (X) + -5.34
T = 0.50 * 120.00 + -5.34
T = **54** vehicle trips
with 59% entering (32 vpd) and with 41% exiting (22 vpd)

Weekday Evening Peak Hour

T = 0.75 * (X) + -26.02
T = 0.75 * 120.00 + -26.02
T = **64** vehicle trips
with 51% entering (33 vpd) and with 49% exiting (31 vpd)

Average Saturday Daily

T = 9.62 * (X) + -294.56
T = 9.62 * 120.00 + -294.56
T = **860** vehicle trips
with 50% entering (430 vpd) and with 50% exiting (430 vpd)

Saturday Midday Peak Hour

T = 0.69 * (X) + 4.32
T = 0.69 * 120.00 + 4.32
T = **88** vehicle trips
with 56% entering (49 vpd) and with 44% exiting (39 vpd)

Trip Generation Estimate

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 488 Soccer Complex

Average Vehicle Trips Ends vs:	Fields
Independent Variable (X):	4
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 71.33 * (X)
T = 71.33 * 4.00
T = **286** vehicle trips
with 50% entering (143 vpd) and with 50% exiting (143 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.99 * (X)
T = 0.99 * 4.00
T = **4** vehicle trips
with 61% entering (2 vpd) and with 39% exiting (2 vpd)

WEEKDAY EVENING PEAK HOUR

T = 16.43 * (X)
T = 16.43 * 4.00
T = **66** vehicle trips
with 66% entering (44 vpd) and with 34% exiting (22 vpd)

AVERAGE SATURDAY DAILY

T = 404.88 * (X)
T = 404.88 * 4.00
T = **1,620** vehicle trips
with 50% entering (810 vpd) and with 50% exiting (810 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 30.34 * (X)
T = 30.34 * 4.00
T = **122** vehicle trips
with 48% entering (59 vpd) and with 52% exiting (63 vpd)

Trip Generation Estimate

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 488 Soccer Complex

Average Vehicle Trips Ends vs:	Fields
Independent Variable (X):	4
Curve Method:	Fitted

WEEKDAY EVENING PEAK HOUR

T = 13.92 * (X) + 35.13
T = 13.92 * 4.00 + 35.13
T = **90** vehicle trips
with 66% entering (59 vpd) and with 34% exiting (31 vpd)

SATURDAY MIDDAY PEAK HOUR

Ln T = 0.96 * Ln(X) + 3.72
Ln T = 0.96 * 1.39 + 3.72
T = **156** vehicle trips
with 48% entering (75 vpd) and with 52% exiting (81 vpd)

Trip Generation Estimate

Project:	T0852 - Capital Commerce Center - Lancaster, MA
Date:	April 5, 2019
Analyst:	TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 820 Shopping Center

Average Vehicle Trips Ends vs:	1000 SF Gross Leasable Area
Independent Variable (X):	65.7
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 37.75 * (X)
T = 37.75 * 65.70
T = **2,480** vehicle trips
with 50% entering (1,240 vpd) and with 50% exiting (1,240 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.96 * (X)
T = 0.96 * 65.70
T = **64** vehicle trips
with 62% entering (40 vpd) and with 38% exiting (24 vpd)

WEEKDAY EVENING PEAK HOUR

T = 3.81 * (X)
T = 3.81 * 65.70
T = **250** vehicle trips
with 48% entering (120 vpd) and with 52% exiting (130 vpd)

AVERAGE SATURDAY DAILY

T = 46.12 * (X)
T = 46.12 * 65.70
T = **3,030** vehicle trips
with 50% entering (1,515 vpd) and with 50% exiting (1,515 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 4.50 * (X)
T = 4.50 * 65.70
T = **296** vehicle trips
with 52% entering (154 vpd) and with 48% exiting (142 vpd)

Industrial Park – ITE Adjustment Data

Industrial Park
(130)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 9 out of 31
Avg. 1000 Sq. Ft. GFA: 1665
Directional Distribution: 79% entering , 21% exiting

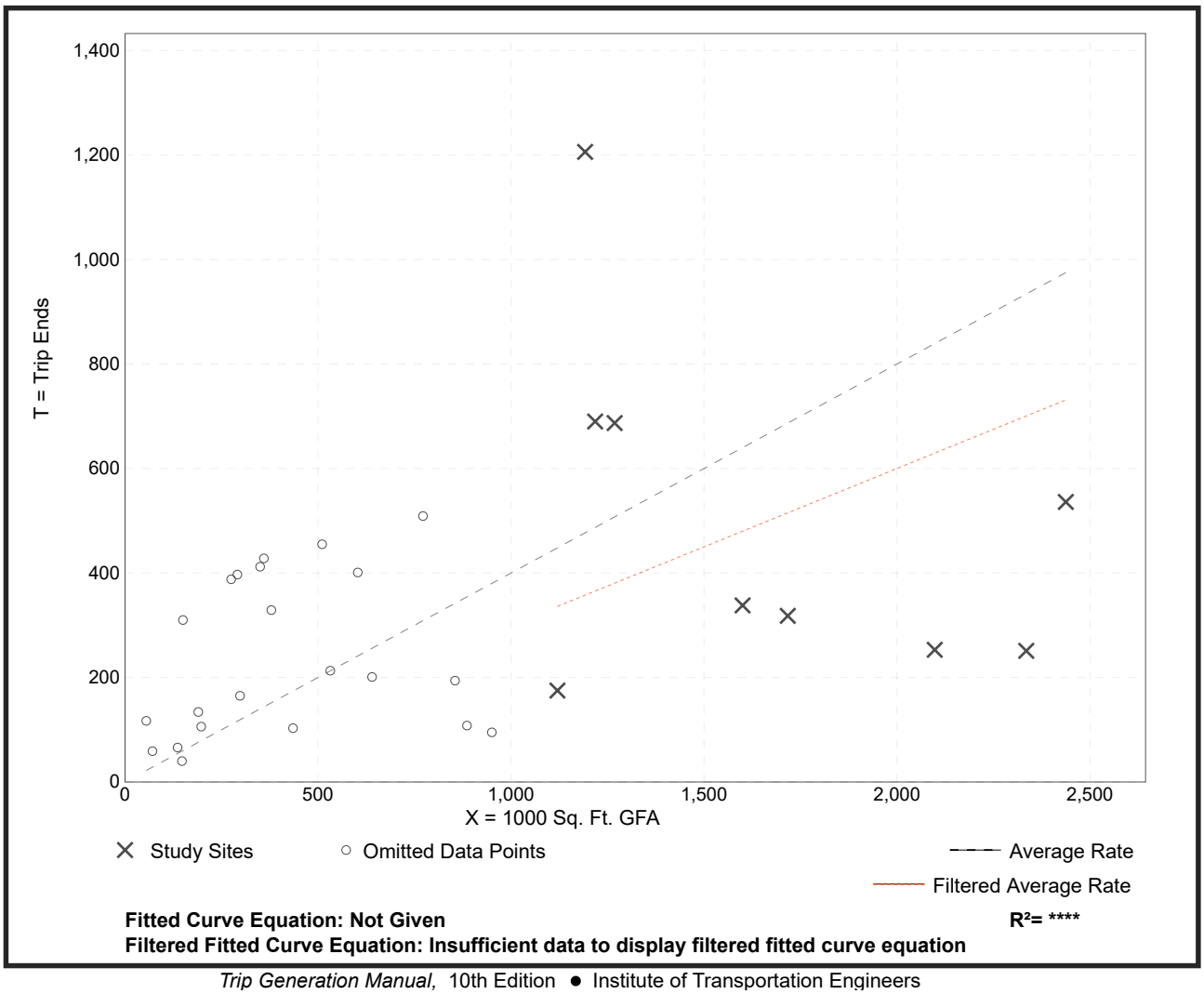
Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.30	0.11 - 1.01	0.27

Data Filtered By: [IV Value: 1000-2437.44]

Data Plot and Equation

Caution – Filtered Data Set



Fitted Curve Equation: Not Given
R^2= **
Filtered Fitted Curve Equation: Insufficient data to display filtered fitted curve equation

Trip Generation Manual, 10th Edition ● Institute of Transportation Engineers

Industrial Park
(130)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 8 out of 32
Avg. 1000 Sq. Ft. GFA: 1721
Directional Distribution: 22% entering , 78% exiting

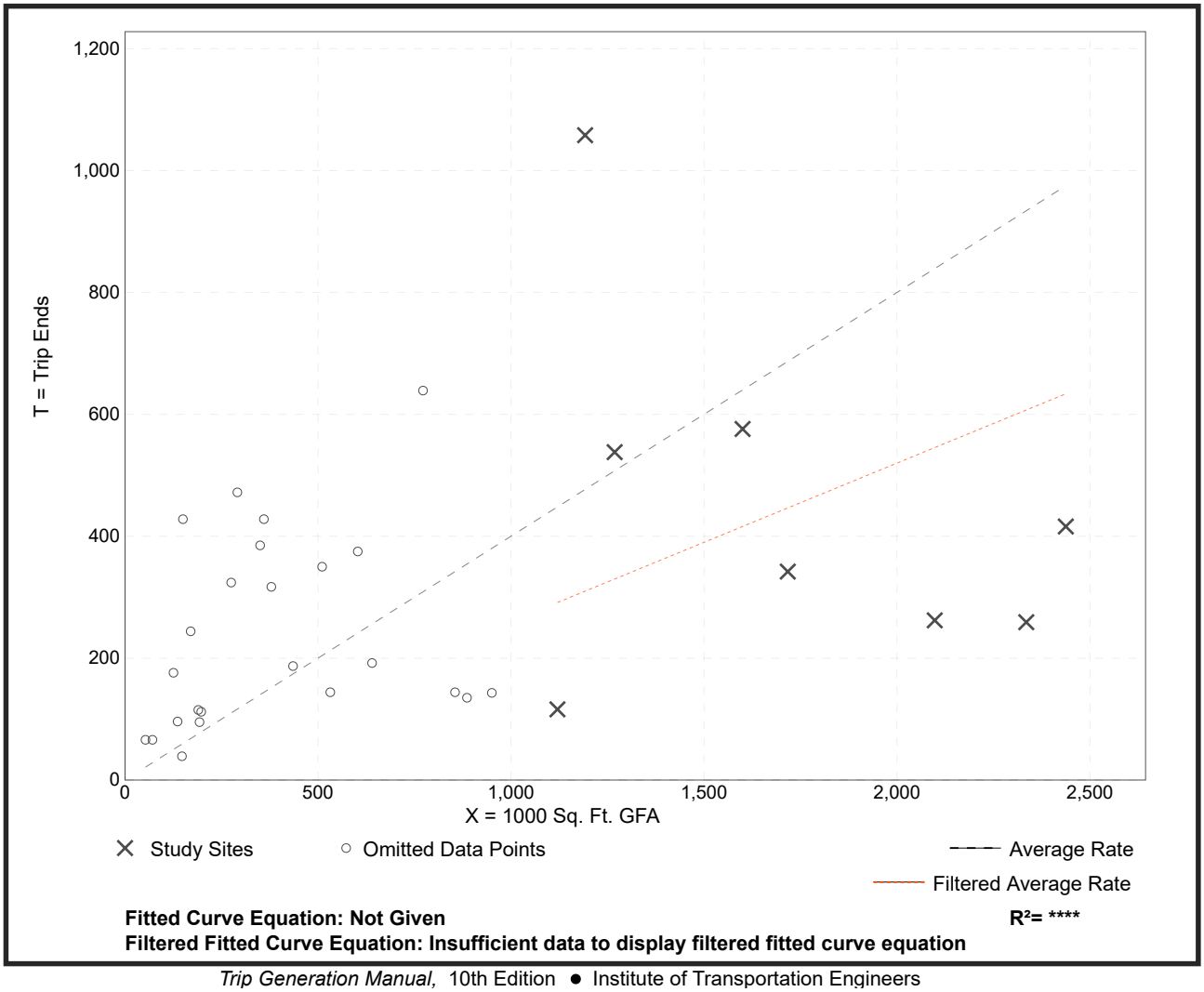
Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.26	0.10 - 0.89	0.23

Data Filtered By: [IV Value: 1000-2437.44]

Data Plot and Equation

Caution – Filtered Data Set



Fitted Curve Equation: Not Given
R^2= **
Filtered Fitted Curve Equation: Insufficient data to display filtered fitted curve equation

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Shared Trip Calculations

Land Use Description	Land Use	A	B	C	D
	Land Use Name	Indust	Hotel	Multifamily	Retail
	Land Use Type	Office	Hotel	Residential	Retail
	ITE LUC	130	310	221	820
	Size	1,567.5 kSF	120 rooms	500 units	54.7 kSF
New Trips	*Weekday Daily*				
	Enter	1963	464	1362	1240
	Exit	1963	464	1362	1240
	Weekday AM				
	Enter	371	32	43	40
	Exit	99	22	123	24
	Weekday PM				
	Enter	90	33	127	120
	Exit	318	31	81	130
	Saturday Daily				
	Enter	1990	430	969	1515
	Exit	1990	430	969	1515
	Saturday Midday				
	Enter	221	49	106	154
	Exit	469	39	111	142

Project Name: Capital Commerce Center - BUILD
Analyst: TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Date: 4/5/2019

KEY: Entry Cells

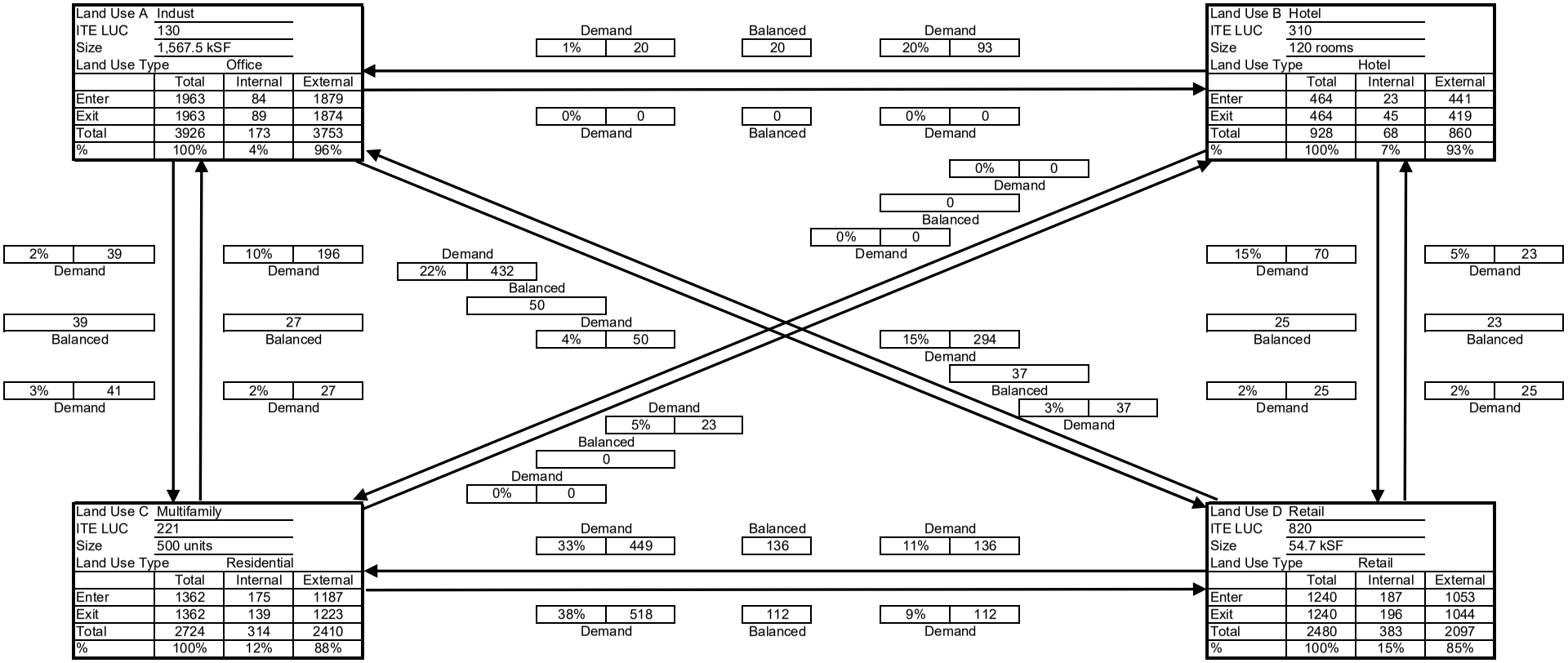
INSTRUCTIONS:

1.) Enter the Land Use Name for each land use in table above.
2.) Select from the drop down menu in the table above which Land Use Type to use.
3.) Enter the ITE LUC for each land use in the table above.
4.) Enter the Size of each land use in the table above.
5.) Fill in the NEW TRIPS for each land use in the table above (Note: This is the total of primary and pass-by trips).
6.) Enter the Project Name above.
7.) Enter you initials for the Analyst above.
8.) Enter the Date above.
9.) Print the Multi-Use Trip Generation Calculation Sheet for each time period.

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Samuel W. G
Date: 4/5/2019

Project Name: Capital Commerce Center - BUILD
Time Period: Weekday Daily

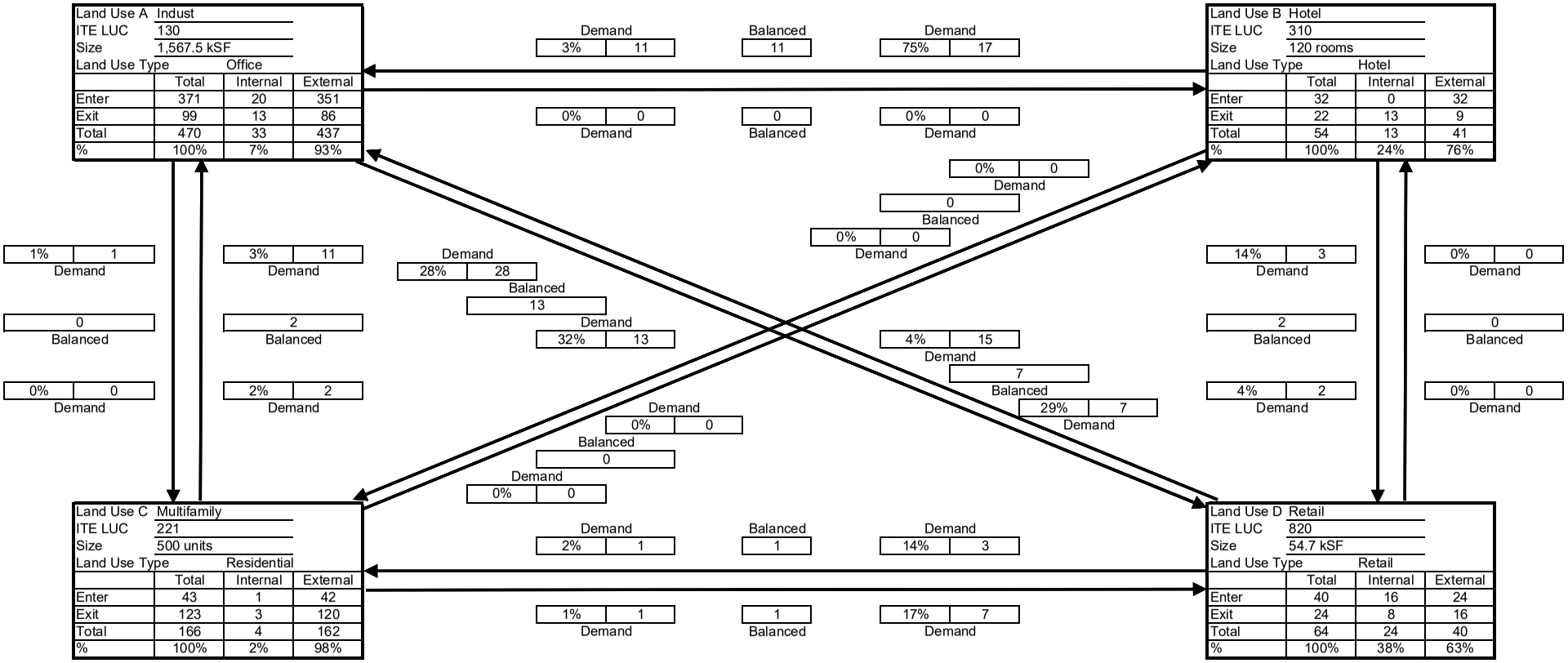


Net External Trips for Multi-Use Development						
Land Use	A	B	C	D	Total	
Enter	1879	441	1187	1053	4560	
Exit	1874	419	1223	1044	4560	
Total External Trips	**3753**	**860**	**2410**	**2097**	**9120**	***Internal Capture***
Single-Use Trip Gen. Est.	3926	928	2724	2480	10058	**9%**
Net Internal Trips	**173**	**68**	**314**	**383**	**938**	

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Samuel W. G
Date: 4/5/2019

Project Name: Capital Commerce Center - BUILD
Time Period: Weekday AM Peak Hour

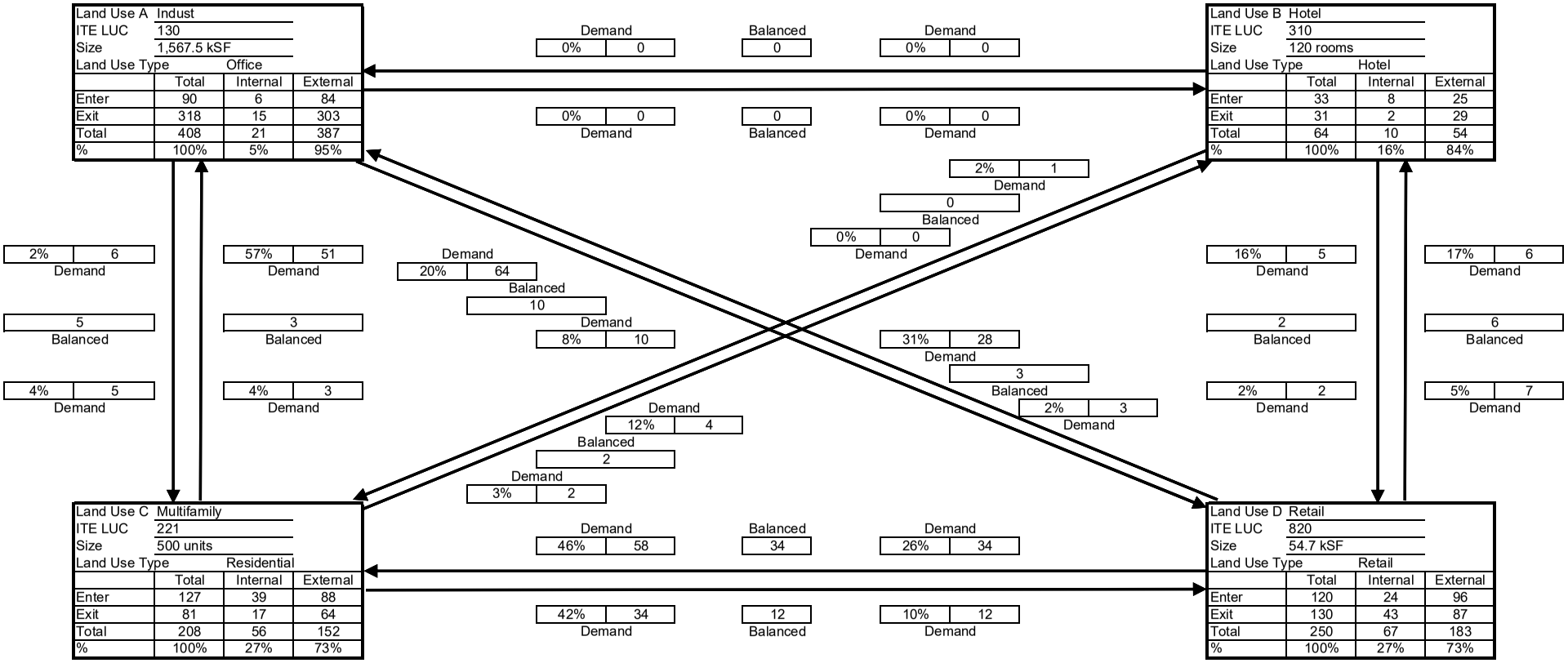


Net External Trips for Multi-Use Development						
Land Use	A	B	C	D	Total	
Enter	351	32	42	24	449	
Exit	86	9	120	16	231	
Total External Trips	**437**	**41**	**162**	**40**	**680**	***Internal Capture***
Single-Use Trip Gen. Est.	470	54	166	64	754	**10%**
Net Internal Trips	**33**	**13**	**4**	**24**	**74**	

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Samuel W. G
Date: 4/5/2019

Project Name: Capital Commerce Center - BUILD
Time Period: Weekday PM Peak Hour

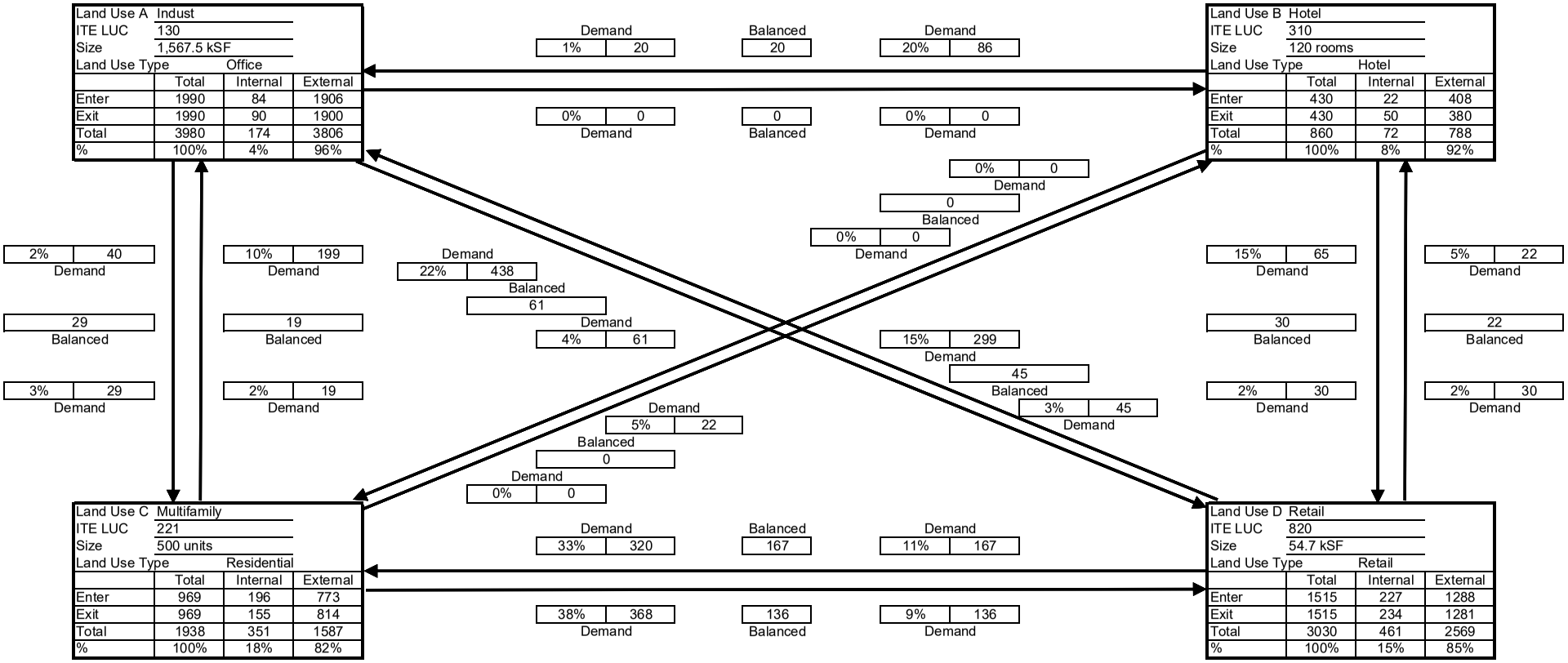


Net External Trips for Multi-Use Development						
Land Use	A	B	C	D	Total	
Enter	84	25	88	96	293	
Exit	303	29	64	87	483	
Total External Trips	**387**	**54**	**152**	**183**	**776**	***Internal Capture***
Single-Use Trip Gen. Est.	408	64	208	250	930	**17%**
Net Internal Trips	**21**	**10**	**56**	**67**	**154**	

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Samuel W. G
Date: 4/5/2019

Project Name: Capital Commerce Center - BUILD
Time Period: Saturday Daily

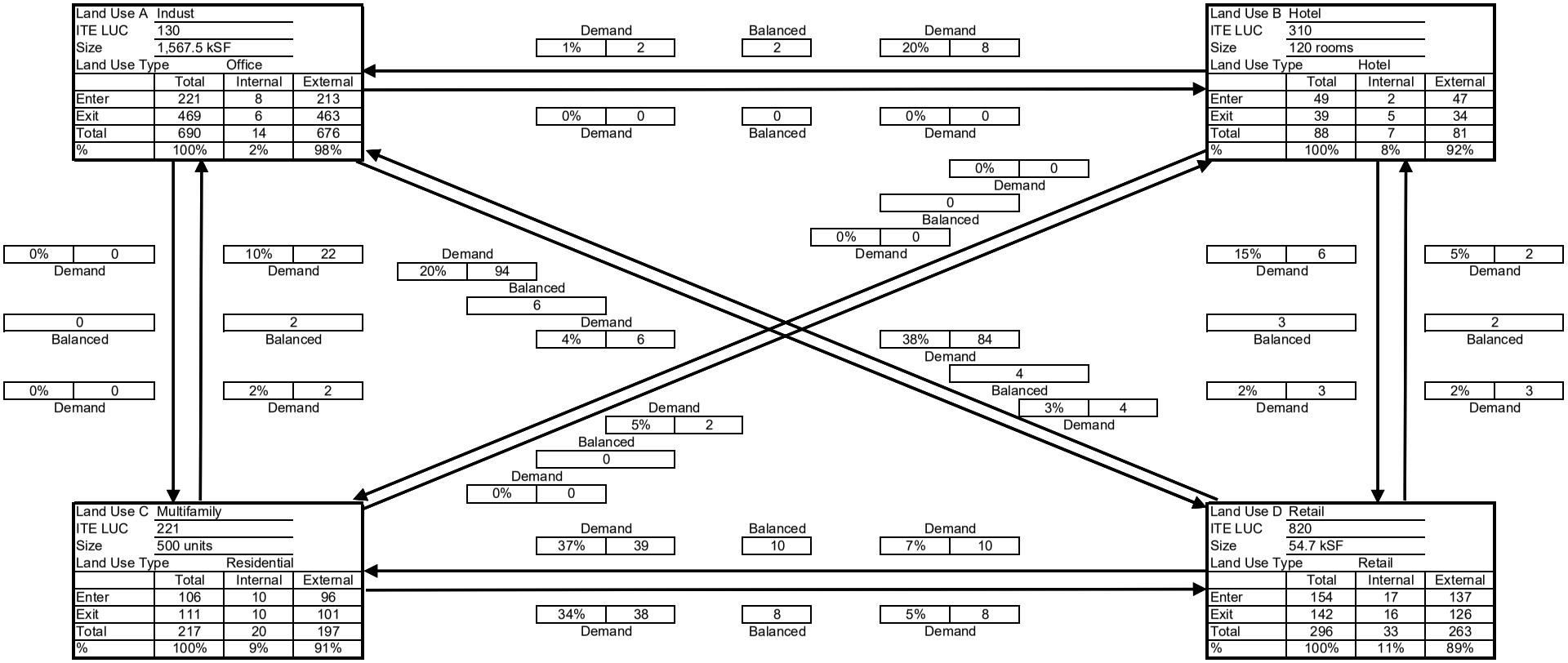


Net External Trips for Multi-Use Development						
Land Use	A	B	C	D	Total	
Enter	1906	408	773	1288	4375	
Exit	1900	380	814	1281	4375	
Total External Trips	**3806**	**788**	**1587**	**2569**	**8750**	***Internal Capture***
Single-Use Trip Gen. Est.	3980	860	1938	3030	9808	**11%**
Net Internal Trips	**174**	**72**	**351**	**461**	**1058**	

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Samuel W. G
Date: 4/5/2019

Project Name: Capital Commerce Center - BUILD
Time Period: Saturday Midday



Net External Trips for Multi-Use Development						
Land Use	A	B	C	D	Total	
Enter	213	47	96	137	493	
Exit	463	34	101	126	724	
Total External Trips	**676**	**81**	**197**	**263**	**1217**	***Internal Capture***
Single-Use Trip Gen. Est.	690	88	217	296	1291	**6%**
Net Internal Trips	**14**	**7**	**20**	**33**	**74**	

Appendix F.8

Site Trip Distribution

Trip Distribution Gravity Model - Soccer Complex

Project: T0852 - Capital Commerce Center - Lancaster, MA
Date: April 8, 2019
Analyst: TEC, Inc / Danah Hamzeh
Source: U.S. Census Data - 2017, Estimated Population by Residence State-County

Surrounding Community State-County-MCD Name	Population	MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA-70 from south	TOTAL
Lancaster town Middlesex Co. MA	8,055				5%	5%	10%	20%	10%	50%	100%
Lunenburg town Worcester Co. MA	11,312								100%		100%
Shirley town Middlesex Co. MA	7,672								100%		100%
Leominster town Worcester Co. MA	41,615		67%	33%							100%
Harvard town Worcester Co. MA	22,947	50%					50%				100%
Bolton town Worcester Co. MA	5,283						100%				100%
Berlin town Hartford Co. CT	2,866						50%			50%	100%
Boylston town Worcester Co. MA	4,634									100%	100%
Sterling town Worcester Co. MA	7,808		80%					10%		10%	100%
Clinton town Worcester Co. MA	13,435									100%	100%
Boxborough town Middlesex Co. MA	6,401	50%					50%				100%
Use											

Surrounding Community State-County-MCD Name	MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA-70 from south	Total
Lancaster town Middlesex Co. MA	0	0	0	403	403	806	1611	806	4028	8055
Lunenburg town Worcester Co. MA	0	0	0	0	0	0	0	11312	0	11312
Shirley town Middlesex Co. MA	0	0	0	0	0	0	0	7672	0	7672
Leominster town Worcester Co. MA	0	27882	13733	0	0	0	0	0	0	41615
Harvard town Worcester Co. MA	11474	0	0	0	0	11474	0	0	0	22947
Bolton town Worcester Co. MA	0	0	0	0	0	5283	0	0	0	5283
Berlin town Hartford Co. CT	0	0	0	0	0	1433	0	0	1433	2866
Boylston town Worcester Co. MA	0	0	0	0	0	0	0	0	4634	4634
Sterling town Worcester Co. MA	0	6246	0	0	0	0	781	0	781	7808
Clinton town Worcester Co. MA	0	0	0	0	0	0	0	0	13435	13435
Boxborough town Middlesex Co. MA	3201	0	0	0	0	3201	0	0	0	6401
Total	**14674**	**34128**	**13733**	**403**	**403**	**22196**	**2392**	**19790**	**24310**	**132028**
Percentage	**11.1%**	**25.8%**	**10.4%**	**0.3%**	**0.3%**	**16.8%**	**1.8%**	**15.0%**	**18.4%**	**100%**
Use	**11%**	**25%**	**10%**	**1%**	**1%**	**17%**	**2%**	**15%**	**18%**	**100%**

Trip Distribution Gravity Model - Retail/Restaurant

Project: T0852 - Capital Commerce Center - Lancaster, MA
Date: April 8, 2019
Analyst: TEC, Inc / Danah Hamzeh
Source: U.S. Census Data - 2017, Estimated Population by Residence State-County

Surrounding Community State-County-MCD Name	Population	Distance (Travel Time)	Competing Opportunity	Adjusted Population	MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA- 70 from south	TOTAL
Lancaster town Middlesex Co. MA	8,055	1	1	8,055				5%	5%	10%	20%	10%	50%	100%
Lunenburg town Worcester Co. MA	11,312	0.5	0.5	2,828								100%		100%
Shirley town Middlesex Co. MA	7,672	1	1	7,672								100%		100%
Leominster town Worcester Co. MA	41,615	0.5	0.1	2,081		67%	33%							100%
Harvard town Worcester Co. MA	22,947	0.5	1	11,474	50%					50%				100%
Bolton town Worcester Co. MA	5,283	0.5	0.5	1,321						100%				100%
Berlin town Hartford Co. CT	2,866	0.5	0.1	143						50%			50%	100%
Boylston town Worcester Co. MA	4,634	0.5	0.1	232									100%	100%
Sterling town Worcester Co. MA	7,808	0.5	0.5	1,952		80%					10%		10%	100%
Clinton town Worcester Co. MA	13,435	1	0.1	1,344									100%	100%
Boxborough town Middlesex Co. MA	6,401	0.5	1	3,201	50%					50%				100%
Use														

Notes:
1.) 7.5-mile gravity model
2.) Distance Factors: 0-15 min. = 1.0; 15-30 min = 0.5; +30min = 0.25
3.) Competing Opportunities Factors: Little-No Competition = 1.0; Same distance to competition = 0.5; Closer to competion = 0.1

Surrounding Community State-County-MCD Name		MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA- 70 from south	Total
Lancaster town Middlesex Co. MA		0	0	0	403	403	806	1611	806	4028	8055
Lunenburg town Worcester Co. MA		0	0	0	0	0	0	0	2828	0	2828
Shirley town Middlesex Co. MA		0	0	0	0	0	0	0	7672	0	7672
Leominster town Worcester Co. MA		0	1394	687	0	0	0	0	0	0	2081
Harvard town Worcester Co. MA		5737	0	0	0	0	5737	0	0	0	11474
Bolton town Worcester Co. MA		0	0	0	0	0	1321	0	0	0	1321
Berlin town Hartford Co. CT		0	0	0	0	0	72	0	0	72	143
Boylston town Worcester Co. MA		0	0	0	0	0	0	0	0	232	232
Sterling town Worcester Co. MA		0	1562	0	0	0	0	195	0	195	1952
Clinton town Worcester Co. MA		0	0	0	0	0	0	0	0	1344	1344
Boxborough town Middlesex Co. MA		1600	0	0	0	0	1600	0	0	0	3201
Total		**7337**	**2956**	**687**	**403**	**403**	**9535**	**1806**	**11306**	**5870**	**40301**
Percentage		**18.2%**	**7.3%**	**1.7%**	**1.0%**	**1.0%**	**23.7%**	**4.5%**	**28.1%**	**14.6%**	**100%**
Use		**18%**	**7%**	**2%**	**1%**	**1%**	**23%**	**5%**	**28%**	**15%**	**100%**

Trip Distribution Gravity Model

Project: T0852 - Capital Commerce Center - lancaster, MA
Date: April 12, 2019
Analyst: TEC, Inc. / Danah Hamzeh
Source: United States Census Bureau, 5-Year ACS, 2009-2013

Residence State -County-MCD Name	Workplace State -County-MCD Name	Count	% of Total Lancaster Workers	% of Distributed Workforce	Major Route Entering / Exiting: MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA- 70 from south	Check	Major Route Entering / Exiting: MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA- 70 from south	Check
Lancaster Town Worcester Co. MA	Pittsfield City Berkshire Co. MA	27	0.75%	0.83%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Andover Town Essex Co. MA	31	0.86%	0.95%	75%					25%				100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Danvers Town Essex Co. MA	29	0.80%	0.89%	100%									100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Holyoke City Hampden Co. MA	48	1.33%	1.47%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Acton Town Middlesex Co. MA	72	2.00%	2.21%	50%					50%				100%	1%	0%	0%	0%	0%	1%	0%	0%	0%	2%
Lancaster Town Worcester Co. MA	Ayer Town Middlesex Co. MA	29	0.80%	0.89%								100%		100%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%
Lancaster Town Worcester Co. MA	Concord Town Middlesex Co. MA	42	1.16%	1.29%	100%									100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Framingham Town Middlesex Co. MA	56	1.55%	1.72%						100%				100%	0%	0%	0%	0%	0%	2%	0%	0%	0%	2%
Lancaster Town Worcester Co. MA	Hudson Town Middlesex Co. MA	39	1.08%	1.20%						100%				100%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Marlborough City Middlesex Co. MA	202	5.60%	6.20%						67%			33%	100%	0%	0%	0%	0%	0%	4%	0%	0%	2%	6%
Lancaster Town Worcester Co. MA	Shirley Town Middlesex Co. MA	30	0.83%	0.92%								100%		100%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%
Lancaster Town Worcester Co. MA	Stow Town Middlsex Co. MA	57	1.58%	1.75%	50%					50%				100%	1%	0%	0%	0%	0%	1%	0%	0%	0%	2%
Lancaster Town Worcester Co. MA	Waltham City Middlsex Co. MA	37	1.03%	1.14%	50%					50%				100%	1%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Westford Town Middlesex Co. MA	32	0.89%	0.98%	75%					25%				100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Bellingham Town Norfolk Co. MA	38	1.05%	1.17%						100%				100%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Franklin Town City Norfolk Co. MA	29	0.80%	0.89%						100%				100%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Wellsely Town Norfolk Co. MA	41	1.14%	1.26%	50%					50%				100%	1%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Boston City Suffolk Co. MA	113	3.13%	3.47%	100%									100%	3%	0%	0%	0%	0%	0%	0%	0%	0%	3%
Lancaster Town Worcester Co. MA	Auburn Town Worcester Co. MA	62	1.72%	1.90%		100%								100%	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%
Lancaster Town Worcester Co. MA	Bolton Town Worcester Co. MA	264	7.32%	8.11%						100%				100%	0%	0%	0%	0%	0%	8%	0%	0%	0%	8%
Lancaster Town Worcester Co. MA	Boylston Town Worcester Co. MA	44	1.22%	1.35%									100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
Lancaster Town Worcester Co. MA	Clinton Town Worcester Co. MA	530	14.69%	16.27%									100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	16%	16%
Lancaster Town Worcester Co. MA	Fitchburg City Worcester Co. MA	85	2.36%	2.61%		100%								100%	0%	3%	0%	0%	0%	0%	0%	0%	0%	3%
Lancaster Town Worcester Co. MA	Harvard Town Worcester Co. MA	117	3.24%	3.59%	50%					50%				100%	2%	0%	0%	0%	0%	2%	0%	0%	0%	4%
Lancaster Town Worcester Co. MA	Lancaster Town Woecester Co. MA	351	9.73%	10.78%				5%	5%	10%	20%	10%	50%	100%	0%	0%	0%	1%	1%	1%	2%	1%	5%	11%
Lancaster Town Worcester Co. MA	Leominster City Worcester Co. MA	217	6.01%	6.66%		67%	33%							100%	0%	4%	2%	0%	0%	0%	0%	0%	0%	7%
Lancaster Town Worcester Co. MA	Northborough Town Worcester Co. MA	46	1.27%	1.41%						50%			50%	100%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Lancaster Town Worcester Co. MA	Oxford Town Worcester Co. MA	29	0.80%	0.89%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Shrewsbury Town Worcester Co. MA	44	1.22%	1.35%		33%				34%			33%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Sterling Town Worcester Co. MA	34	0.94%	1.04%		80%					10%		10%	100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Westborough Town Worcester Co. MA	131	3.63%	4.02%						75%			25%	100%	0%	0%	0%	0%	0%	3%	0%	0%	1%	4%
Lancaster Town Worcester Co. MA	West Boylston Town Worcester Co. MA	32	0.89%	0.98%		50%					50%			100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Worcester City Worcester Co. MA	319	8.84%	9.79%		100%								100%	0%	10%	0%	0%	0%	0%	0%	0%	0%	10%
TOTAL		**3609**	**90.25%**	**100.00%**											**12.1%**	**23.7%**	**2.2%**	**0.5%**	**0.5%**	**28.0%**	**2.8%**	**2.9%**	**27.3%**	**100.0%**
														Say	**12%**	**23%**	**2%**	**1%**	**1%**	**28%**	**3%**	**3%**	**27%**	**100%**

Trip Distribution Gravity Model

Project: T0852 - Capital Commerce Center - lancaster, MA
Date: April 12, 2019
Analyst: TEC, Inc. / Danah Hamzeh
Source: United States Census Bureau, 5-Year ACS, 2009-2013

					Major Route Entering / Exiting										Major Route Entering / Exiting									
Workplace State -County-MCD Name	**Residence State -County-MCD Name**	**Count**	**% of Total Lancaster Workers**	**% of Distributed Workforce**	MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA- 70 from south	Check	MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA-70 from south	Check
Lancaster Town Worcester Co. I	Andover Town Essex Co. MA	17	0.71%	0.82%	75%					25%				100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Ware Town Hampsire Co. MA	23	0.96%	1.11%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Acton Middlesex Co. MA	42	1.76%	2.02%	75%					25%				100%	2%	0%	0%	0%	0%	1%	0%	0%	0%	2%
Lancaster Town Worcester Co. I	Ashby Town Middlsex Co. MA	21	0.88%	1.01%		67%						33%		100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Billerica Town Middlesex Co. MA	17	0.71%	0.82%	75%					25%				100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Groton Town Middlesex Co. MA	21	0.88%	1.01%	100%									100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Hudson Town Middlesex Co. MA	36	1.51%	1.73%	25%					75%				100%	0%	0%	0%	0%	0%	1%	0%	0%	0%	2%
Lancaster Town Worcester Co. I	Lowell City Middlsex Co. MA	28	1.17%	1.35%	75%					25%				100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Stow Town Middlsex Co. MA	18	0.75%	0.87%	50%					50%				100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Westford Town Middlesex Co. MA	22	0.92%	1.06%	75%					25%				100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Ashburnham Town Worcester Co. MA	20	0.84%	0.96%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Barre Town Worcester Co. MA	40	1.67%	1.92%		100%								100%	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%
Lancaster Town Worcester Co. I	Boylston Town Worcester Co. MA	27	1.13%	1.30%									100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
Lancaster Town Worcester Co. I	Clinton Town Worcester Co. MA	293	12.26%	14.10%									100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	14%	14%
Lancaster Town Worcester Co. I	Fitchburg City Worcester Co. MA	289	12.10%	13.91%		100%								100%	0%	14%	0%	0%	0%	0%	0%	0%	0%	14%
Lancaster Town Worcester Co. I	Gardner City Worcester Co. MA	40	1.67%	1.92%		100%								100%	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%
Lancaster Town Worcester Co. I	Holden Town Worcester Co. MA	43	1.80%	2.07%		75%							25%	100%	0%	2%	0%	0%	0%	0%	0%	0%	1%	2%
Lancaster Town Worcester Co. I	Lancaster Town Worcester Co. MA	351	14.69%	16.89%				5%	5%	10%	20%	10%	50%	100%	0%	0%	0%	1%	1%	2%	3%	2%	8%	17%
Lancaster Town Worcester Co. I	Leicester Town Worcester Co. MA	26	1.09%	1.25%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Leominster City Worcester Co. MA	472	19.76%	22.71%		67%	33%							100%	0%	15%	7%	0%	0%	0%	0%	0%	0%	23%
Lancaster Town Worcester Co. I	Lunenburg Town Worcester Co. MA	87	3.64%	4.19%								100%		100%	0%	0%	0%	0%	0%	0%	0%	4%	0%	4%
Lancaster Town Worcester Co. I	Shrewbury Town Worcester Co. MA	24	1.00%	1.15%		33%				34%			33%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. I	Sterling Town Worcester Co. MA	66	2.76%	3.18%		80%					10%		10%	100%	0%	3%	0%	0%	0%	0%	0%	0%	0%	3%
Lancaster Town Worcester Co. I	Westborough Town Worcester Co. MA	38	1.59%	1.83%						75%			25%	100%	0%	0%	0%	0%	0%	1%	0%	0%	0%	2%
Lancaster Town Worcester Co. I	Winchendon Town Worcester Co. MA	17	0.71%	0.82%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
TOTAL		**2389**	**86.98%**	**100.00%**											**6.4%**	**42.3%**	**7.5%**	**0.8%**	**0.8%**	**6.7%**	**3.7%**	**6.2%**	**25.5%**	**100.0%**
														SAY	**6%**	**42%**	**8%**	**1%**	**1%**	**7%**	**4%**	**6%**	**25%**	**100%**

Trip Distribution Gravity Model

Project: T0852
Date: November 30, 2018
Analyst: TEC, Inc. /Danah Hamzeh
Source: United States Census Bureau, 5-Year ACS, 2009-2013

					Major Route Entering / Exiting										Major Route Entering / Exiting									
Residence State -County-MCD Name	**Workplace State -County-MCD Name**	**Count**	**% of Total Lancaster Workers**	**% of Distributed Workforce**	MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA- 70 from south	Check	MA-2 from east	MA-2 from west	Mechanic Street from West	Fort Pond Road from East	Old Union Trpk from East	MA-117 from east	MA-117 from west	MA-70 from north	MA- 70 from south	Check
Lancaster Town Worcester Co. MA	Pittsfield City Berkshire Co. MA	27	0.75%	0.83%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Andover Town Essex Co. MA	31	0.86%	0.95%	100%									100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Danvers Town Essex Co. MA	29	0.80%	0.89%	100%									100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Holyoke City Hampden Co. MA	48	1.33%	1.47%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Acton Town Middlesex Co. MA	72	2.00%	2.21%	100%									100%	2%	0%	0%	0%	0%	0%	0%	0%	0%	2%
Lancaster Town Worcester Co. MA	Ayer Town Middlesex Co. MA	29	0.80%	0.89%	50%							50%		100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Concord Town Middlesex Co. MA	42	1.16%	1.29%	100%									100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Framingham Town Middlesex Co. MA	56	1.55%	1.72%						100%				100%	0%	0%	0%	0%	0%	2%	0%	0%	0%	2%
Lancaster Town Worcester Co. MA	Hudson Town Middlesex Co. MA	39	1.08%	1.20%						100%				100%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Marlborough City Middlesex Co. MA	202	5.60%	6.20%	50%					50%				100%	3%	0%	0%	0%	0%	3%	0%	0%	0%	6%
Lancaster Town Worcester Co. MA	Shirley Town Middlesex Co. MA	30	0.83%	0.92%	50%							50%		100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Stow Town Middlsex Co. MA	57	1.58%	1.75%	50%					50%				100%	1%	0%	0%	0%	0%	1%	0%	0%	0%	2%
Lancaster Town Worcester Co. MA	Waltham City Middlsex Co. MA	37	1.03%	1.14%	100%									100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Westford Town Middlesex Co. MA	32	0.89%	0.98%	100%									100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Bellingham Town Norfolk Co. MA	38	1.05%	1.17%						100%				100%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Franklin Town City Norfolk Co. MA	29	0.80%	0.89%						100%				100%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Wellsely Town Norfolk Co. MA	41	1.14%	1.26%	100%									100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Boston City Suffolk Co. MA	113	3.13%	3.47%	100%									100%	3%	0%	0%	0%	0%	0%	0%	0%	0%	3%
Lancaster Town Worcester Co. MA	Auburn Town Worcester Co. MA	62	1.72%	1.90%		100%								100%	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%
Lancaster Town Worcester Co. MA	Bolton Town Worcester Co. MA	264	7.32%	8.11%						100%				100%	0%	0%	0%	0%	0%	8%	0%	0%	0%	8%
Lancaster Town Worcester Co. MA	Boylston Town Worcester Co. MA	44	1.22%	1.35%		50%				50%				100%	0%	1%	0%	0%	0%	1%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Clinton Town Worcester Co. MA	530	14.69%	16.27%		50%							50%	100%	0%	8%	0%	0%	0%	0%	0%	0%	8%	16%
Lancaster Town Worcester Co. MA	Fitchburg City Worcester Co. MA	85	2.36%	2.61%		50%	50%							100%	0%	1%	1%	0%	0%	0%	0%	0%	0%	3%
Lancaster Town Worcester Co. MA	Harvard Town Worcester Co. MA	117	3.24%	3.59%	100%									100%	4%	0%	0%	0%	0%	0%	0%	0%	0%	4%
Lancaster Town Worcester Co. MA	Lancaster Town Woecester Co. MA	351	9.73%	10.78%		20%		5%	5%	10%		10%	50%	100%	0%	2%	0%	1%	1%	1%	0%	1%	5%	11%
Lancaster Town Worcester Co. MA	Leominster City Worcester Co. MA	217	6.01%	6.66%			100%							100%	0%	0%	7%	0%	0%	0%	0%	0%	0%	7%
Lancaster Town Worcester Co. MA	Northborough Town Worcester Co. MA	46	1.27%	1.41%	33%	33%				34%				100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Oxford Town Worcester Co. MA	29	0.80%	0.89%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Shrewsbury Town Worcester Co. MA	44	1.22%	1.35%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Sterling Town Worcester Co. MA	34	0.94%	1.04%		50%	50%							100%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Westborough Town Worcester Co. MA	131	3.63%	4.02%	50%					50%				100%	2%	0%	0%	0%	0%	2%	0%	0%	0%	4%
Lancaster Town Worcester Co. MA	West Boylston Town Worcester Co. MA	32	0.89%	0.98%		100%								100%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%
Lancaster Town Worcester Co. MA	Worcester City Worcester Co. MA	319	8.84%	9.79%		100%								100%	0%	10%	0%	0%	0%	0%	0%	0%	0%	10%
TOTAL		**3609**	**90.25%**	**100.00%**											**23.1%**	**30.5%**	**8.5%**	**0.5%**	**0.5%**	**21.3%**	**0.0%**	**2.0%**	**13.5%**	**100.0%**
														Say	**23%**	**30%**	**9%**	**1%**	**1%**	**21%**	**0%**	**2%**	**13%**	**100%**

Appendix F.9

Left-turn Lane Warrants

Left-Turn Lane Volume Warrants

Project: T0852 - Capital Commerce Center - Lancaster, Massachsuetts
Date: April 25, 2019
Analyst: TEC Inc. / Samuel W. Gregorio, PE, PTOE

Roadway Speed = 50

Operating Speed	Opposing Volume	Advancing Motor Vehicle Volumes (veh/hr)			
		5% LT	10% LT	20% LT	30% LT
30 mph or less	800	370	265	195	185
	600	460	345	250	225
	400	570	430	305	275
	200	720	530	390	335
40 mph	800	330	240	180	160
	600	410	305	225	200
	400	510	380	275	245
	200	640	470	350	305
	100	720	515	390	340
50 mph	800	280	210	165	135
	600	350	260	195	170
	400	430	320	240	210
	200	550	400	300	270
	100	615	445	335	295
60 mph	800	230	170	125	115
	600	290	210	160	140
	400	365	270	200	175
	200	450	330	250	215
	100	505	370	275	240

Signalized Intersections:

Left-Turn Lane Configuration	Minimum Turn Volume
Single exclusive left-turn lane	100 veh/hr
Dual exclusive left-turn lane	300 veh/hr

Source: Massachusetts Highway Department Design Manual, 2006 Edition, Exhibit 6-23
Source: AASHTO A Policy on Geometric Design of Highways and Streets, 2011 6th Edition, Table 9-23

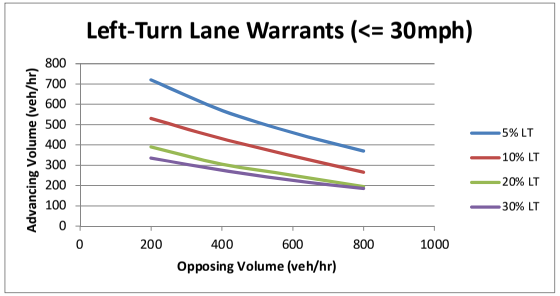
Lunenburg Road at McGovern Boulevard

Left-Turn Lane Warranted?

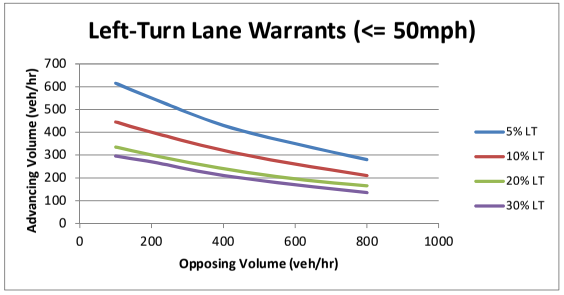
Signalized	YES
Unsignalized	YES

Lunenburg Road at McGovern Boulevard
2026 FUTURE YEAR w/ TRIP GEN DATA INPUT

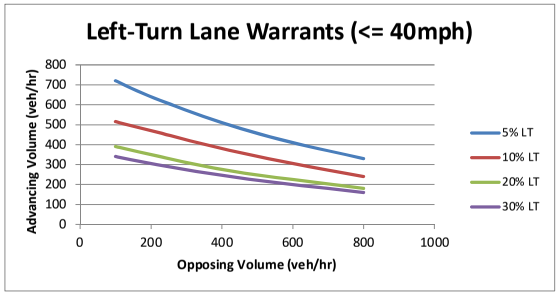
Time	Advancing Route 70 NBL	Advancing Route 70 NB	% Left Turns	Opposing Route 70 SB	Warranted
6-7 AM			#DIV/0!		#DIV/0!
7-8 AM			#DIV/0!		#DIV/0!
8-9 AM	189	522	36.2%	682	YES
9-10 AM			#DIV/0!		#DIV/0!
10-11 AM			#DIV/0!		#DIV/0!
11-12 PM			#DIV/0!		#DIV/0!
12-1 PM			#DIV/0!		#DIV/0!
1-2 PM			#DIV/0!		#DIV/0!
2-3 PM			#DIV/0!		#DIV/0!
3-4 PM			#DIV/0!		#DIV/0!
4-5 PM	167	863	19.4%	590	YES
5-6 PM			#DIV/0!		#DIV/0!



5% LT y = 0.0004x^2 - 0.955x + 895
10% LT y = 0.0001x^2 - 0.565x + 637.5
20% LT y = 0.0002x^2 - 0.5075x + 482.5
30% LT y = 0.0001x^2 - 0.375x + 405



5% LT y = 0.0003x^2 - 0.7581x + 687.65
10% LT y = 0.0002x^2 - 0.5068x + 493.54
20% LT y = 0.0002x^2 - 0.4095x + 374.26
30% LT y = 0.0001x^2 - 0.3425x + 329.9



5% LT y = 0.0003x^2 - 0.8622x + 800.98
10% LT y = 0.0001x^2 - 0.5196x +566.57
20% LT y = 0.0002x^2 - 0.4669x + 434.85
30% LT y = 0.0001x^2 - 0.3784x + 375.77

Appendix F.10

Traffic Signal Warrants

Project: Capital Commerce Center
Town: Lancaster, MA
TEC # T0852
Analyst: TEC / Samuel W. Gregorio, PE, PTOE

RAW DATA INPUT

	VOLUMES			
	Minor	Minor	Major	Major
Time	EBL	WB	NB	SB
6-7 AM			180	352
7-8 AM	16		343	346
8-9 AM	20		336	335
9-10 AM			275	295
10-11 AM			264	281
11-12 PM			235	307
12-1 PM			250	273
1-2 PM			277	318
2-3 PM			358	314
3-4 PM			504	343
4-5 PM	43		528	287
5-6 PM	24		527	261
6-7 PM			346	226

SEASONALLY ADJUSTED DATA

	VOLUMES			
	Minor	Minor	Major	Major
Time	EBL	WB	NB	SB
6-7 AM	0	0	190	372
7-8 AM	17	0	362	365
8-9 AM	21	0	355	354
9-10 AM	0	0	290	312
10-11 AM	0	0	279	297
11-12 PM	0	0	248	324
12-1 PM	0	0	264	288
1-2 PM	0	0	293	336
2-3 PM	0	0	378	332
3-4 PM	0	0	532	362
4-5 PM	45	0	558	303
5-6 PM	25	0	557	276
6-7 PM	0	0	365	239

Seasonal Adjustment: 5.6%

SITE-GENERATED DATA

	VOLUMES			
	Minor	Minor	Major	Major
Time	EBL	WB	NB	SB
6-7 AM	61		83	138
7-8 AM	116		160	281
8-9 AM	117		163	286
9-10 AM	76		57	90
10-11 AM	84		62	97
11-12 PM	91		67	103
12-1 PM	91		76	112
1-2 PM	108		114	168
2-3 PM	163		69	99
3-4 PM	163		69	99
4-5 PM	279		111	149
5-6 PM	280		112	151
6-7 PM	102		65	76

Assumptions:

EXISTING YEAR BUILD DATA

	VOLUMES			
	Minor	Minor	Major	Major
Time	EBL	WB	NB	SB
6-7 AM	61	0	273	510
7-8 AM	133	0	522	646
8-9 AM	138	0	518	640
9-10 AM	76	0	347	402
10-11 AM	84	0	341	394
11-12 PM	91	0	315	427
12-1 PM	91	0	340	400
1-2 PM	108	0	407	504
2-3 PM	163	0	447	431
3-4 PM	163	0	601	461
4-5 PM	324	0	669	452
5-6 PM	305	0	669	427
6-7 PM	102	0	430	315

PERCENTAGE OF PEAK HOUR FOR SITE TRIPS (LUC 221)

			EBL	NB	SB
	Entering	Exiting	Minor	Major	Major
Time	Traffic	Traffic	Exiting	Entering	Entering
6-7 AM	50.0%	50.0%	21.0%	29.0%	21.0%
7-8 AM	100.0%	100.0%	42.0%	58.0%	42.0%
8-9 AM	100.0%	100.0%	42.0%	58.0%	42.0%
9-10 AM	25.0%	25.0%	10.5%	14.5%	10.5%
10-11 AM	25.0%	25.0%	10.5%	14.5%	10.5%
11-12 PM	25.0%	25.0%	10.5%	14.5%	10.5%
12-1 PM	50.0%	50.0%	21.0%	29.0%	21.0%
1-2 PM	50.0%	50.0%	21.0%	29.0%	21.0%
2-3 PM	25.0%	25.0%	10.5%	14.5%	10.5%
3-4 PM	25.0%	25.0%	10.5%	14.5%	10.5%
4-5 PM	100.0%	100.0%	42.0%	58.0%	42.0%
5-6 PM	100.0%	100.0%	42.0%	58.0%	42.0%
6-7 PM	50.0%	50.0%	21.0%	29.0%	21.0%

AM Trip Generation Housing
Total Trips (in) = 42
Total Trips (out) = 120
162

PM Trip Generation Housing
Total Trips (in) = 88
Total Trips (out) = 64
152

Lunenburg Road @ McGovern Blvd
42% Exiting Eastbound Left
58% Entering Northbound Left
42% Exiting Southbound Right

HOUSING TRIPS

	VOLUMES			
	Minor	Minor	Major	Major
Time	EBL	WB	NB	SB
6-7 AM	25		12	9
7-8 AM	50		24	18
8-9 AM	50		24	18
9-10 AM	13		6	4
10-11 AM	13		6	4
11-12 PM	13		6	4
12-1 PM	25		12	9
1-2 PM	13		26	18
2-3 PM	7		13	9
3-4 PM	7		13	9
4-5 PM	27		51	37
5-6 PM	27		51	37
6-7 PM	13		26	18

PERCENTAGE OF PEAK HOUR FOR SITE TRIPS (LUC 310)

			EBL	NB	SB
	Entering	Exiting	Minor	Major	Major
Time	Traffic	Traffic	Exiting	Entering	Entering
6-7 AM	25.0%	25.0%	22.5%	2.5%	22.5%
7-8 AM	100.0%	100.0%	90.0%	10.0%	90.0%
8-9 AM	100.0%	100.0%	90.0%	10.0%	90.0%
9-10 AM	10.0%	10.0%	9.0%	1.0%	9.0%
10-11 AM	10.0%	10.0%	9.0%	1.0%	9.0%
11-12 PM	10.0%	10.0%	9.0%	1.0%	9.0%
12-1 PM	10.0%	25.0%	22.5%	1.0%	9.0%
1-2 PM	25.0%	10.0%	9.0%	2.5%	22.5%
2-3 PM	10.0%	10.0%	9.0%	1.0%	9.0%
3-4 PM	10.0%	10.0%	9.0%	1.0%	9.0%
4-5 PM	100.0%	100.0%	90.0%	10.0%	90.0%
5-6 PM	100.0%	100.0%	90.0%	10.0%	90.0%
6-7 PM	5.0%	5.0%	4.5%	0.5%	4.5%

AM Trip Generation Hotel
Total Trips (in) = 32
Total Trips (out) = 9
41

PM Trip Generation Hotel
Total Trips (in) = 25
Total Trips (out) = 29
54

Lunenburg Road @ McGovern Blvd
90% Exiting Eastbound Left
10% Entering Northbound Left
90% Exiting Southbound Right

HOTEL TRIPS

	VOLUMES			
	Minor	Minor	Major	Major
Time	EBL	WB	NB	SB
6-7 AM	2		1	7
7-8 AM	8		3	29
8-9 AM	8		3	29
9-10 AM	1		0	3
10-11 AM	1		0	3
11-12 PM	1		0	3
12-1 PM	2		0	3
1-2 PM	3		1	6
2-3 PM	3		0	2
3-4 PM	3		0	2
4-5 PM	26		3	23
5-6 PM	26		3	23
6-7 PM	1		0	1

PERCENTAGE OF PEAK HOUR FOR SITE TRIPS (LUC 130)

			EBL	NB	SB
	Entering	Exiting	Minor	Major	Major
Time	Traffic	Traffic	Exiting	Entering	Entering
6-7 AM	10.0%	3.0%	38.4%	18.9%	33.7%
7-8 AM	19.0%	5.0%	64.0%	36.0%	64.0%
8-9 AM	19.0%	5.0%	64.0%	36.0%	64.0%
9-10 AM	5.0%	5.0%	64.0%	9.5%	16.8%
10-11 AM	5.0%	5.0%	64.0%	9.5%	16.8%
11-12 PM	5.0%	5.0%	64.0%	9.5%	16.8%
12-1 PM	5.0%	10.0%	40.0%	9.5%	16.8%
1-2 PM	10.0%	5.0%	20.0%	72.0%	128.0%
2-3 PM	5.0%	10.0%	40.0%	36.0%	64.0%
3-4 PM	5.0%	10.0%	40.0%	36.0%	64.0%
4-5 PM	5.0%	16.0%	64.0%	36.0%	64.0%
5-6 PM	5.0%	16.0%	64.0%	36.0%	64.0%
6-7 PM	2.0%	5.0%	20.0%	14.4%	25.6%

AM Trip Generation Industrial
Total Trips (in) = 351
Total Trips (out) = 86
437

PM Trip Generation Industrial
Total Trips (in) = 84
Total Trips (out) = 303
387

Lunenburg Road @ McGovern Blvd
64% Exiting Eastbound Left
36% Entering Northbound Left
64% Exiting Southbound Right

INDUSTRIAL PARK TRIPS

	VOLUMES			
	Minor	Minor	Major	Major
Time	EBL	WB	NB	SB
6-7 AM	33		67	118
7-8 AM	55		126	225
8-9 AM	55		126	225
9-10 AM	55		33	59
10-11 AM	55		33	59
11-12 PM	55		33	59
12-1 PM	34		33	59
1-2 PM	61		60	108
2-3 PM	121		30	54
3-4 PM	121		30	54
4-5 PM	194		30	54
5-6 PM	194		30	54
6-7 PM	61		12	22

PERCENTAGE OF PEAK HOUR FOR SITE TRIPS (LUC 820)

			EBL	NB	SB
	Entering	Exiting	Minor	Major	Major
Time	Traffic	Traffic	Exiting	Entering	Entering
6-7 AM	0.8%	0.3%	1.9%	4.1%	5.4%
7-8 AM	2.0%	0.9%	5.8%	10.2%	13.6%
8-9 AM	3.1%	1.2%	7.7%	15.9%	21.0%
9-10 AM	5.5%	2.0%	12.8%	28.2%	37.3%
10-11 AM	7.0%	4.3%	27.5%	35.8%	47.5%
11-12 PM	8.4%	6.2%	39.7%	43.0%	57.0%
12-1 PM	9.4%	8.3%	53.2%	48.1%	63.8%
1-2 PM	8.2%	8.6%	55.1%	42.0%	55.6%
2-3 PM	7.7%	8.9%	57.0%	39.4%	52.3%
3-4 PM	7.8%	8.8%	56.4%	39.9%	52.9%
4-5 PM	8.0%	8.9%	57.0%	41.0%	54.3%
5-6 PM	8.4%	9.2%	58.9%	43.0%	57.0%
6-7 PM	8.0%	7.5%	48.0%	41.0%	54.3%

Source: *ITE Trip Generation, 9th Edition* , LUC 820: Shopping Center [Table 1]

AM Trip Generation Industrial
Total Trips (in) = 19
Total Trips (out) = 11
30

PM Trip Generation Industrial
Total Trips (in) = 65
Total Trips (out) = 56
121

Lunenburg Road @ McGovern Blvd
57% Exiting Eastbound Left
43% Entering Northbound Left
57% Exiting Southbound Right

INDUSTRIAL PARK TRIPS

	VOLUMES			
	Minor	Minor	Major	Major
Time	EBL	WB	NB	SB
6-7 AM	1		3	4
7-8 AM	3		7	9
8-9 AM	4		10	14
9-10 AM	7		18	24
10-11 AM	15		23	31
11-12 PM	22		28	37
12-1 PM	30		31	41
1-2 PM	31		27	36
2-3 PM	32		26	34
3-4 PM	32		26	34
4-5 PM	32		27	35
5-6 PM	33		28	37
6-7 PM	27		27	35

Project: Capital Commerce Center
Town: Lancaster, MA
TEC # T0852
Analyst: TEC / Samuel W. Gregorio, PE, PTOE

85th Percentile > 40 mph? **OR** Population <10,000 people? Y

Warrant 1 - One of the Following Conditions Must Be Met for any 8 hours of an average day (Table 4C-1)

Individual Option:

Condition A: Minimum Vehicular Volume

70%

Street	Lanes	Minimum Volume	ATR Data												
			6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11-12 PM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Major	1	350	783	1168	1158	749	735	742	740	911	878	1062	1121	1096	745
Minor	1	105	61	133	138	76	84	91	91	108	163	163	324	305	102
		Met?	NO	YES	YES	NO	NO	NO	NO	YES	YES	YES	YES	YES	NO

OR

Condition B: Interruption of Continuous Traffic

70%

Street	Lanes	Minimum Volume	ATR Data												
			6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11-12 PM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Major	1	525	783	1168	1158	749	735	742	740	911	878	1062	1121	1096	745
Minor	1	53	61	133	138	76	84	91	91	108	163	163	324	305	102
		Met?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Result:	YES

Combination Option:

Condition A: Minimum Vehicular Volume

56%

Street	Lanes	Minimum Volume	ATR Data												
			6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11-12 PM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Major	1	280	783	1168	1158	749	735	742	740	911	878	1062	1121	1096	745
Minor	1	84	61	133	138	76	84	91	91	108	163	163	324	305	102
		Met?	NO	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES

AND

Condition B: Interruption of Continuous Traffic

56%

Street	Lanes	Minimum Volume	ATR Data												
			6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11-12 PM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Major	1	420	783	1168	1158	749	735	742	740	911	878	1062	1121	1096	745
Minor	1	42	61	133	138	76	84	91	91	108	163	163	324	305	102
		Met?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Result:	YES

Project: Capital Commerce Center
Town: Lancaster, MA
TEC # T0852
Analyst: TEC / Samuel W. Gregorio, PE, PTOE

Warrant 2 - Four-Hour Vehicular Volume (must be met for any 4 hours of an average day)

Street	Lanes	Minimum Volume	ATR Data												
			6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11-12 PM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Major	1	Figure 4C-2	783	1168	1158	749	735	742	740	911	878	1062	1121	1096	745
Minor	1	Figure 4C-2	61	133	138	76	84	91	91	108	163	163	324	305	102
		Met?	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Result:	YES

Warrant 3 - Peak Hour Volume (must be met for 1 hour of an average day)

Street	Lanes	Minimum Volume	ATR Data												
			6-7 AM	7-8 AM	8-9 AM	9-10 AM	10-11 AM	11-12 PM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM
Major	1	Figure 4C-4	783	1168	1158	749	735	742	740	911	878	1062	1121	1096	745
Minor	2	Figure 4C-4	61	133	138	76	84	91	91	108	163	163	324	305	102
		Met?	NO	YES	YES	NO	NO	NO	NO	YES	YES	YES	YES	YES	NO

Result:	YES

Warrants 4 to 8: Not Evaluated

Appendix F.11

Intersection Capacity and Queue Analysis

2019 Base Year

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	730	338	15	455	0	184	0	7	0	0	0
Future Volume (vph)	0	730	338	15	455	0	184	0	7	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	14	14	14	12	13	12	13	12	12	12
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	3%	0%	6%	0%	7%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	62.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	730	338	15	455	0	184	0	7	0	0	0
Future Vol, veh/h	0	730	338	15	455	0	184	0	7	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	6	3	0	6	0	7	0	0	0	0	0
Mvmt Flow	0	785	363	16	489	0	198	0	8	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	489	0	0	785	0	0	1488	1488	967	1310	1306	489
Stage 1	-	-	-	-	-	-	967	967	-	521	521	-
Stage 2	-	-	-	-	-	-	521	521	-	789	785	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.17	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.563	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1085	-	-	843	-	-	~ 100	125	311	137	161	583
Stage 1	-	-	-	-	-	-	299	335	-	542	535	-
Stage 2	-	-	-	-	-	-	529	535	-	387	407	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1085	-	-	843	-	-	~ 98	122	311	131	157	583
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 98	122	-	131	157	-
Stage 1	-	-	-	-	-	-	299	335	-	542	521	-
Stage 2	-	-	-	-	-	-	515	521	-	378	407	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	$ 567.6	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	101	1085	-	-	843	-	-	-
HCM Lane V/C Ratio	2.033	-	-	-	0.019	-	-	-
HCM Control Delay (s)	$ 567.6	0	-	-	9.4	0	-	0
HCM Lane LOS	F	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	17.5	0	-	-	0.1	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	49	751	369	277	312	38
Future Volume (vph)	49	751	369	277	312	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	15	15	15	15
Storage Length (ft)	0			0	0	80
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	6%	6%	8%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	149.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	49	751	369	277	312	38
Future Vol, veh/h	49	751	369	277	312	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	4	6	6	8	3
Mvmt Flow	53	808	397	298	335	41

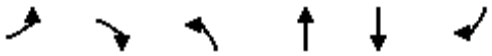
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	695	0	-	0	1460	546
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	914	-
Critical Hdwy	4.12	-	-	-	6.48	6.23
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	2.218	-	-	-	3.572	3.327
Pot Cap-1 Maneuver	901	-	-	-	~ 138	536
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	381	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	901	-	-	-	~ 123	536
Mov Cap-2 Maneuver	-	-	-	-	~ 123	-
Stage 1	-	-	-	-	508	-
Stage 2	-	-	-	-	381	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	$ 763.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	901	-	-	-	123	536
HCM Lane V/C Ratio	0.058	-	-	-	2.728	0.076
HCM Control Delay (s)	9.2	0	-	-	$ 855.4	12.3
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.2	-	-	-	30.7	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	18	28	27	304	339	18
Future Volume (vph)	18	28	27	304	339	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	33%	18%	7%	10%	6%	17%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection						
Int Delay, s/veh	1.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	28	27	304	339	18
Future Vol, veh/h	18	28	27	304	339	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	33	18	7	10	6	17
Mvmt Flow	19	30	29	327	365	19

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	760	375	384	0	-	0
Stage 1	375	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Critical Hdwy	6.73	6.38	4.17	-	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.462	2.263	-	-	-
Pot Cap-1 Maneuver	333	637	1148	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	323	637	1148	-	-	-
Mov Cap-2 Maneuver	323	-	-	-	-	-
Stage 1	612	-	-	-	-	-
Stage 2	625	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1148	-	461	-	-
HCM Lane V/C Ratio	0.025	-	0.107	-	-
HCM Control Delay (s)	8.2	0	13.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	137	93	72	26	61	73	170	104	270	216	42
Future Volume (vph)	34	137	93	72	26	61	73	170	104	270	216	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	16	16	16	14	14	14	15	15	15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		999			500			4300			875	
Travel Time (s)		22.7			11.4			97.7			19.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	6%	2%	3%	9%	0%	16%	6%	7%	21%	4%	4%	10%
Shared Lane Traffic (%)												
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout

ROUNDABOUT ANALYSIS

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	Appr Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	Lunenburg Road	70.00*	17.50*	105.0*	65.0*	30.0*	1	1	13.50*	1500.0	NA[5]	0.0[1]
East	Old Union Turnpike	70.00*	17.50*	105.0*	100.0*	30.0*	1	1	17.00*	1500.0	NA[5]	0.0[1]
North	Lunenburg Road	70.00*	17.50*	105.0*	50.0*	30.0*	1	1	13.00*	1500.0	NA[5]	0.0[1]
West	Old Union Turnpike	70.00*	17.50*	105.0*	75.0*	30.0*	1	1	14.00*	1500.0	NA[5]	0.0[1]

Roundabout Capacity Model: US HCM 6

* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
1 Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).
5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	OD Mov	Lane No	Lane Type	Opng Flow pcu/h	In-Bunch Headway sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	HVE for Entry	Critical Gap sec	Follow-up Headway sec
South: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
West	L2	1	Dominant	471	0.00	0.000	No	No	–	1.06	4.98	2.61
North	T1	1	Dominant	471	0.00	0.000	No	No	–	1.07	4.98	2.61
East	R2	1	Dominant	471	0.00	0.000	No	No	–	1.21	4.98	2.61
East: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
South	L2	1	Dominant	304	0.00	0.000	No	No	–	1.09	4.98	2.61
West	T1	1	Dominant	304	0.00	0.000	No	No	–	1.00	4.98	2.61
North	R2	1	Dominant	304	0.00	0.000	No	No	–	1.16	4.98	2.61
North: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
East	L2	1	Dominant	187	0.00	0.000	No	No	–	1.04	4.98	2.61
South	T1	1	Dominant	187	0.00	0.000	No	No	–	1.04	4.98	2.61
West	R2	1	Dominant	187	0.00	0.000	No	No	–	1.10	4.98	2.61
West: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
North	L2	1	Dominant	602	0.00	0.000	No	No	–	1.06	4.98	2.61
East	T1	1	Dominant	602	0.00	0.000	No	No	–	1.02	4.98	2.61
South	R2	1	Dominant	602	0.00	0.000	No	No	–	1.03	4.98	2.61

Roundabout Capacity Model: US HCM 6

Circulating Lane Flow Rates

Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: Lunenburg Road			
Lane 1	455	471	100.0
Approach	455	471	
East: Old Union Turnpike			
Lane 1	286	304	100.0
Approach	286	304	
North: Lunenburg Road			
Lane 1	176	187	100.0
Approach	176	187	
West: Old Union Turnpike			
Lane 1	575	602	100.0
Approach	575	602	

Roundabout Capacity Model: The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes.
To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

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MOVEMENT SUMMARY

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lunenburg Road											
3	L2	75	6.0	0.465	10.8	LOS B	2.7	74.5	0.66	0.72	28.2
8	T1	175	7.0	0.465	10.8	LOS B	2.7	74.5	0.66	0.72	28.2
18	R2	107	21.0	0.465	11.4	LOS B	2.7	74.5	0.66	0.72	27.4
Approach		358	11.0	0.465	11.0	LOS B	2.7	74.5	0.66	0.72	27.9
East: Old Union Turnpike											
1	L2	74	9.0	0.179	5.6	LOS A	0.7	19.9	0.45	0.34	29.9
6	T1	27	0.0	0.179	5.3	LOS A	0.7	19.9	0.45	0.34	29.9
16	R2	63	16.0	0.179	5.9	LOS A	0.7	19.9	0.45	0.34	29.0
Approach		164	10.2	0.179	5.7	LOS A	0.7	19.9	0.45	0.34	29.6
North: Lunenburg Road											
7	L2	278	4.0	0.499	9.0	LOS A	3.2	83.3	0.51	0.36	28.5
4	T1	223	4.0	0.499	9.0	LOS A	3.2	83.3	0.51	0.36	28.5
14	R2	43	10.0	0.499	9.2	LOS A	3.2	83.3	0.51	0.36	27.8
Approach		544	4.5	0.499	9.0	LOS A	3.2	83.3	0.51	0.36	28.4
West: Old Union Turnpike											
5	L2	35	6.0	0.375	9.9	LOS A	1.9	48.1	0.67	0.71	28.8
2	T1	141	2.0	0.375	9.7	LOS A	1.9	48.1	0.67	0.71	28.9
12	R2	96	3.0	0.375	9.8	LOS A	1.9	48.1	0.67	0.71	28.2
Approach		272	2.9	0.375	9.8	LOS A	1.9	48.1	0.67	0.71	28.6
All Vehicles		1338	6.6	0.499	9.3	LOS A	3.2	83.3	0.58	0.52	28.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	5	3	42	0	41	0	144	121	68	483	0
Future Volume (vph)	0	5	3	42	0	41	0	144	121	68	483	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	11	11	11
Storage Length (ft)	0		0	65		0	0		55	0		0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		500			420			875			1000	
Travel Time (s)		11.4			8.2			17.0			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	10%	0%	11%	0%	10%	8%	2%	4%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	3	42	0	41	0	144	121	68	483	0
Future Vol, veh/h	0	5	3	42	0	41	0	144	121	68	483	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	65	-	-	-	-	55	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	10	0	11	0	10	8	2	4	0
Mvmt Flow	0	5	3	44	0	43	0	150	126	71	503	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	817	795	503	799	795	150	503	0	0	150	0	0
Stage 1	645	645	-	150	150	-	-	-	-	-	-	-
Stage 2	172	150	-	649	645	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.2	6.5	6.31	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.2	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.2	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.59	4	3.399	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	298	323	573	294	323	873	1072	-	-	1431	-	-
Stage 1	464	471	-	834	777	-	-	-	-	-	-	-
Stage 2	835	777	-	445	471	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	268	301	573	273	301	873	1072	-	-	1431	-	-
Mov Cap-2 Maneuver	268	301	-	273	301	-	-	-	-	-	-	-
Stage 1	464	439	-	834	777	-	-	-	-	-	-	-
Stage 2	794	777	-	407	439	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.1	15.1	0	0.9
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1072	-	-	366	273	873	1431	-	-
HCM Lane V/C Ratio	-	-	-	0.023	0.16	0.049	0.049	-	-
HCM Control Delay (s)	0	-	-	15.1	20.7	9.3	7.6	0	-
HCM Lane LOS	A	-	-	C	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.2	0.2	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	384	127	65	0	12	94
Future Volume (vph)	384	127	65	0	12	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	16	16	16
Storage Length (ft)	0			60	0	75
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		30	
Link Distance (ft)		500	500		300	
Travel Time (s)		8.5	8.5		6.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	4%	2%	0%	0%	17%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	384	127	65	0	12	94
Future Vol, veh/h	384	127	65	0	12	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	-	-	-	60	0	75
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	4	2	0	0	17
Mvmt Flow	409	135	69	0	13	100

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	69	0	-	0	1022	69
Stage 1	-	-	-	-	69	-
Stage 2	-	-	-	-	953	-
Critical Hdwy	4.18	-	-	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.272	-	-	-	3.5	3.453
Pot Cap-1 Maneuver	1495	-	-	-	264	954
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	378	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1495	-	-	-	186	954
Mov Cap-2 Maneuver	-	-	-	-	186	-
Stage 1	-	-	-	-	675	-
Stage 2	-	-	-	-	378	-

Approach	EB	WB	SB
HCM Control Delay, s	6.2	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1495	-	-	-	186	954
HCM Lane V/C Ratio	0.273	-	-	-	0.069	0.105
HCM Control Delay (s)	8.3	0	-	-	25.8	9.2
HCM Lane LOS	A	A	-	-	D	A
HCM 95th %tile Q(veh)	1.1	-	-	-	0.2	0.4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	60	134	14	26	57	0
Future Volume (vph)	60	134	14	26	57	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	13	13	16	16
Storage Length (ft)		75	0		0	60
Storage Lanes		1	0		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	30	
Link Distance (ft)	420			500	300	
Travel Time (s)	8.2			9.7	6.8	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	13%	2%	0%	12%	8%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	60	134	14	26	57	0
Future Vol, veh/h	60	134	14	26	57	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Stop
Storage Length	-	75	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	13	2	0	12	8	0
Mvmt Flow	67	151	16	29	64	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	67	0	128	67
Stage 1	-	-	-	-	67	-
Stage 2	-	-	-	-	61	-
Critical Hdwy	-	-	4.1	-	6.48	6.2
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	2.2	-	3.572	3.3
Pot Cap-1 Maneuver	-	-	1547	-	852	1002
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	947	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1547	-	843	1002
Mov Cap-2 Maneuver	-	-	-	-	843	-
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	937	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	843	-	-	-	1547	-
HCM Lane V/C Ratio	0.076	-	-	-	0.01	-
HCM Control Delay (s)	9.6	0	-	-	7.4	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	1	474	8	2	150	0	24	0	16	0	0	1
Future Volume (vph)	1	474	8	2	150	0	24	0	16	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		500			2950			500			200	
Travel Time (s)		9.7			57.5			11.4			4.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	2%	13%	50%	6%	0%	4%	0%	6%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	474	8	2	150	0	24	0	16	0	0	1
Future Vol, veh/h	1	474	8	2	150	0	24	0	16	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	2	13	50	6	0	4	0	6	0	0	0
Mvmt Flow	1	510	9	2	161	0	26	0	17	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	161	0	0	519	0	0	683	682	515	690	686	161
Stage 1	-	-	-	-	-	-	517	517	-	165	165	-
Stage 2	-	-	-	-	-	-	166	165	-	525	521	-
Critical Hdwy	4.1	-	-	4.6	-	-	7.14	6.5	6.26	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.65	-	-	3.536	4	3.354	3.5	4	3.3
Pot Cap-1 Maneuver	1430	-	-	842	-	-	361	375	552	362	373	889
Stage 1	-	-	-	-	-	-	538	537	-	842	766	-
Stage 2	-	-	-	-	-	-	831	766	-	540	535	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1430	-	-	842	-	-	360	374	552	350	372	889
Mov Cap-2 Maneuver	-	-	-	-	-	-	360	374	-	350	372	-
Stage 1	-	-	-	-	-	-	537	536	-	841	764	-
Stage 2	-	-	-	-	-	-	828	764	-	523	534	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	14.6	9.1
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	418	1430	-	-	842	-	-	889
HCM Lane V/C Ratio	0.103	0.001	-	-	0.003	-	-	0.001
HCM Control Delay (s)	14.6	7.5	0	-	9.3	0	-	9.1
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	94	305	98	177	113	75
Future Volume (vph)	94	305	98	177	113	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	265			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		2950	300		300	
Travel Time (s)		67.0	5.8		6.8	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	2%	3%	2%	7%	2%	4%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection						
Int Delay, s/veh	4.8					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	94	305	98	177	113	75
Future Vol, veh/h	94	305	98	177	113	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	265	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	3	2	7	2	4
Mvmt Flow	109	355	114	206	131	87

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	320	0	-	0	790	217
Stage 1	-	-	-	-	217	-
Stage 2	-	-	-	-	573	-
Critical Hdwy	4.12	-	-	-	6.42	6.24
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.336
Pot Cap-1 Maneuver	1240	-	-	-	359	818
Stage 1	-	-	-	-	819	-
Stage 2	-	-	-	-	564	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1240	-	-	-	327	818
Mov Cap-2 Maneuver	-	-	-	-	327	-
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	564	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	17.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1240	-	-	-	327	818
HCM Lane V/C Ratio	0.088	-	-	-	0.402	0.107
HCM Control Delay (s)	8.2	-	-	-	23.2	9.9
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.3	-	-	-	1.9	0.4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	193	197	143	2	102	168
Future Volume (vph)	193	197	143	2	102	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	16
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		300	400		300	
Travel Time (s)		6.8	7.8		6.8	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	2%	3%	4%	50%	7%	7%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	193	197	143	2	102	168
Future Vol, veh/h	193	197	143	2	102	168
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	140	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	3	4	50	7	7
Mvmt Flow	227	232	168	2	120	198

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	168	0	-	0	855	169
Stage 1	-	-	-	-	169	-
Stage 2	-	-	-	-	686	-
Critical Hdwy	4.12	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	1410	-	-	-	322	862
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	491	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1410	-	-	-	270	862
Mov Cap-2 Maneuver	-	-	-	-	270	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	491	-

Approach	EB	WB	SB
HCM Control Delay, s	4	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1410	-	-	-	270	862
HCM Lane V/C Ratio	0.161	-	-	-	0.444	0.229
HCM Control Delay (s)	8	-	-	-	28.6	10.4
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.6	-	-	-	2.2	0.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	477	223	4	1146	0	196	0	3	0	0	0
Future Volume (vph)	0	477	223	4	1146	0	196	0	3	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	14	14	14	12	13	12	13	12	12	12
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	2%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	122.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	477	223	4	1146	0	196	0	3	0	0	0
Future Vol, veh/h	0	477	223	4	1146	0	196	0	3	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	3	2	0	2	0	2	0	0	0	0	0
Mvmt Flow	0	502	235	4	1206	0	206	0	3	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1206	0	0	502	0	0	1834	1834	620	1718	1716	1206
Stage 1	-	-	-	-	-	-	620	620	-	1214	1214	-
Stage 2	-	-	-	-	-	-	1214	1214	-	504	502	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.12	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.518	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	586	-	-	1073	-	-	~ 59	77	492	71	91	226
Stage 1	-	-	-	-	-	-	476	483	-	224	257	-
Stage 2	-	-	-	-	-	-	222	257	-	554	545	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	586	-	-	1073	-	-	~ 59	76	492	70	90	226
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 59	76	-	70	90	-
Stage 1	-	-	-	-	-	-	476	483	-	224	254	-
Stage 2	-	-	-	-	-	-	220	254	-	550	545	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	$ 1264.6	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	60	586	-	-	1073	-	-	-
HCM Lane V/C Ratio	3.491	-	-	-	0.004	-	-	-
HCM Control Delay (s)	$ 1264.6	0	-	-	8.4	0	-	0
HCM Lane LOS	F	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	22.2	0	-	-	0	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	48	465	762	573	233	65
Future Volume (vph)	48	465	762	573	233	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	15	15	15	15
Storage Length (ft)	0			0	0	80
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	3%	1%	2%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection						
Int Delay, s/veh	99.8					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	465	762	573	233	65
Future Vol, veh/h	48	465	762	573	233	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	3	3	1	2	0
Mvmt Flow	51	489	802	603	245	68

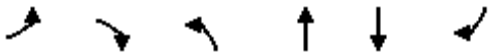
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1405	0	-	0	1695	1104
Stage 1	-	-	-	-	1104	-
Stage 2	-	-	-	-	591	-
Critical Hdwy	4.1	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	492	-	-	-	~ 102	259
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	553	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	492	-	-	-	~ 88	259
Mov Cap-2 Maneuver	-	-	-	-	~ 88	-
Stage 1	-	-	-	-	272	-
Stage 2	-	-	-	-	553	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	$ 716.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	492	-	-	-	88	259
HCM Lane V/C Ratio	0.103	-	-	-	2.787	0.264
HCM Control Delay (s)	13.2	0	-	-	$ 909.5	23.8
HCM Lane LOS	B	A	-	-	F	C
HCM 95th %tile Q(veh)	0.3	-	-	-	23.6	1

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	40	13	24	630	298	58
Future Volume (vph)	40	13	24	630	298	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	2%	6%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	13	24	630	298	58
Future Vol, veh/h	40	13	24	630	298	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	2	6	0
Mvmt Flow	42	14	25	656	310	60

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1046	340	370	0	-	0
Stage 1	340	-	-	-	-	-
Stage 2	706	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	255	707	1200	-	-	-
Stage 1	725	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	247	707	1200	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.1	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1200	-	294	-	-
HCM Lane V/C Ratio	0.021	-	0.188	-	-
HCM Control Delay (s)	8.1	0	20.1	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	43	146	95	78	137	211	329	51	54	163	248
Future Volume (vph)	75	43	146	95	78	137	211	329	51	54	163	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	16	16	16	14	14	14	15	15	15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		999			500			4300			875	
Travel Time (s)		22.7			11.4			97.7			19.9	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	0%	0%	1%	1%	7%	1%	1%	4%	2%	9%	1%
Shared Lane Traffic (%)												
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout

ROUNDABOUT ANALYSIS

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	Appr Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	Lunenburg Road	70.00*	17.50*	105.0*	65.0*	30.0*	1	1	13.50*	1500.0	NA[5]	0.0[1]
East	Old Union Turnpike	70.00*	17.50*	105.0*	100.0*	30.0*	1	1	17.00*	1500.0	NA[5]	0.0[1]
North	Lunenburg Road	70.00*	17.50*	105.0*	50.0*	30.0*	1	1	13.00*	1500.0	NA[5]	0.0[1]
West	Old Union Turnpike	70.00*	17.50*	105.0*	75.0*	30.0*	1	1	14.00*	1500.0	NA[5]	0.0[1]

Roundabout Capacity Model: US HCM 6

* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
1 Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).
5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	OD Mov	Lane No	Lane Type	Opng Flow pcu/h	In-Bunch Headway sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	HVE for Entry	Critical Gap sec	Follow-up Headway sec
South: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
West	L2	1	Dominant	175	0.00	0.000	No	No	–	1.01	4.98	2.61
North	T1	1	Dominant	175	0.00	0.000	No	No	–	1.01	4.98	2.61
East	R2	1	Dominant	175	0.00	0.000	No	No	–	1.04	4.98	2.61
East: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
South	L2	1	Dominant	627	0.00	0.000	No	No	–	1.01	4.98	2.61
West	T1	1	Dominant	627	0.00	0.000	No	No	–	1.01	4.98	2.61
North	R2	1	Dominant	627	0.00	0.000	No	No	–	1.07	4.98	2.61
North: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
East	L2	1	Dominant	392	0.00	0.000	No	No	–	1.02	4.98	2.61
South	T1	1	Dominant	392	0.00	0.000	No	No	–	1.09	4.98	2.61
West	R2	1	Dominant	392	0.00	0.000	No	No	–	1.01	4.98	2.61
West: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
North	L2	1	Dominant	332	0.00	0.000	No	No	–	1.00	4.98	2.61
East	T1	1	Dominant	332	0.00	0.000	No	No	–	1.00	4.98	2.61
South	R2	1	Dominant	332	0.00	0.000	No	No	–	1.00	4.98	2.61

Roundabout Capacity Model: US HCM 6

Circulating Lane Flow Rates

Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: Lunenburg Road			
Lane 1	174	175	100.0
Approach	174	175	
East: Old Union Turnpike			
Lane 1	621	627	100.0
Approach	621	627	
North: Lunenburg Road			
Lane 1	388	392	100.0
Approach	388	392	
West: Old Union Turnpike			
Lane 1	315	332	100.0
Approach	315	332	

Roundabout Capacity Model: The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes.
To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

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MOVEMENT SUMMARY

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lunenburg Road											
3	L2	213	1.0	0.524	9.2	LOS A	3.7	94.1	0.53	0.36	28.7
8	T1	332	1.0	0.524	9.2	LOS A	3.7	94.1	0.53	0.36	28.7
18	R2	52	4.0	0.524	9.3	LOS A	3.7	94.1	0.53	0.36	28.0
Approach		597	1.3	0.524	9.2	LOS A	3.7	94.1	0.53	0.36	28.7
East: Old Union Turnpike											
1	L2	96	1.0	0.446	11.3	LOS B	2.6	66.6	0.71	0.80	27.9
6	T1	79	1.0	0.446	11.3	LOS B	2.6	66.6	0.71	0.80	27.9
16	R2	138	7.0	0.446	11.6	LOS B	2.6	66.6	0.71	0.80	27.2
Approach		313	3.7	0.446	11.4	LOS B	2.6	66.6	0.71	0.80	27.6
North: Lunenburg Road											
7	L2	55	2.0	0.527	11.0	LOS B	4.1	106.0	0.68	0.73	28.3
4	T1	165	9.0	0.527	11.3	LOS B	4.1	106.0	0.68	0.73	28.3
14	R2	251	1.0	0.527	11.0	LOS B	4.1	106.0	0.68	0.73	27.7
Approach		470	3.9	0.527	11.1	LOS B	4.1	106.0	0.68	0.73	28.0
West: Old Union Turnpike											
5	L2	76	0.0	0.271	6.4	LOS A	1.3	33.5	0.51	0.42	30.0
2	T1	43	0.0	0.271	6.4	LOS A	1.3	33.5	0.51	0.42	29.9
12	R2	147	0.0	0.271	6.4	LOS A	1.3	33.5	0.51	0.42	29.3
Approach		267	0.0	0.271	6.4	LOS A	1.3	33.5	0.51	0.42	29.6
All Vehicles		1646	2.3	0.527	9.7	LOS A	4.1	106.0	0.60	0.56	28.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	4	292	0	314	2	435	104	30	169	1
Future Volume (vph)	0	0	4	292	0	314	2	435	104	30	169	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	11	11	11
Storage Length (ft)	0		0	65		0	0		55	0		0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		500			420			875			1000	
Travel Time (s)		11.4			8.2			17.0			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	5%	0%	1%	0%	1%	2%	14%	1%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	29.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	4	292	0	314	2	435	104	30	169	1
Future Vol, veh/h	0	0	4	292	0	314	2	435	104	30	169	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	65	-	-	-	-	55	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	5	0	1	0	1	2	14	1	0
Mvmt Flow	0	0	5	332	0	357	2	494	118	34	192	1

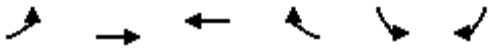
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	938	759	193	761	759	494	193	0	0	494	0	0
Stage 1	261	261	-	498	498	-	-	-	-	-	-	-
Stage 2	677	498	-	263	261	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.15	6.5	6.21	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.545	4	3.309	2.2	-	-	2.326	-	-
Pot Cap-1 Maneuver	247	338	854	~ 318	338	577	1392	-	-	1010	-	-
Stage 1	748	696	-	549	548	-	-	-	-	-	-	-
Stage 2	446	548	-	736	696	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	91	324	854	~ 307	324	577	1392	-	-	1010	-	-
Mov Cap-2 Maneuver	91	324	-	~ 307	324	-	-	-	-	-	-	-
Stage 1	747	670	-	548	547	-	-	-	-	-	-	-
Stage 2	170	547	-	704	670	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	65	0	1.3
HCM LOS	A	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1392	-	-	854	307	577	1010	-	-
HCM Lane V/C Ratio	0.002	-	-	0.005	1.081	0.618	0.034	-	-
HCM Control Delay (s)	7.6	0	-	9.2	112.6	20.8	8.7	0	-
HCM Lane LOS	A	A	-	A	F	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	12.8	4.2	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	76	72	97	1	12	213
Future Volume (vph)	76	72	97	1	12	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	16	16	16
Storage Length (ft)	0			60	0	75
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		30	
Link Distance (ft)		500	500		300	
Travel Time (s)		8.5	8.5		6.8	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	5%	1%	0%	0%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	76	72	97	1	12	213
Future Vol, veh/h	76	72	97	1	12	213
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	-	-	-	60	0	75
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	3	5	1	0	0	3
Mvmt Flow	90	86	115	1	14	254

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	115	0	-	0	381	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	4.13	-	-	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.327
Pot Cap-1 Maneuver	1468	-	-	-	625	935
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1468	-	-	-	585	935
Mov Cap-2 Maneuver	-	-	-	-	585	-
Stage 1	-	-	-	-	856	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	SB
HCM Control Delay, s	3.9	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1468	-	-	-	585	935
HCM Lane V/C Ratio	0.062	-	-	-	0.024	0.271
HCM Control Delay (s)	7.6	0	-	-	11.3	10.3
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	1.1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	14	120	27	231	375	0
Future Volume (vph)	14	120	27	231	375	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	13	13	16	16
Storage Length (ft)		75	0		0	60
Storage Lanes		1	0		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	30	
Link Distance (ft)	420			500	300	
Travel Time (s)	8.2			9.7	6.8	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles (%)	8%	4%	8%	2%	3%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	20.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	14	120	27	231	375	0
Future Vol, veh/h	14	120	27	231	375	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Stop
Storage Length	-	75	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	8	4	8	2	3	0
Mvmt Flow	19	164	37	316	514	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	19	0	409	19
Stage 1	-	-	-	-	19	-
Stage 2	-	-	-	-	390	-
Critical Hdwy	-	-	4.18	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.272	-	3.527	3.3
Pot Cap-1 Maneuver	-	-	1559	-	597	1065
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	682	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1559	-	580	1065
Mov Cap-2 Maneuver	-	-	-	-	580	-
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	41.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	580	-	-	-	1559	-
HCM Lane V/C Ratio	0.886	-	-	-	0.024	-
HCM Control Delay (s)	41.5	0	-	-	7.4	0
HCM Lane LOS	E	A	-	-	A	A
HCM 95th %tile Q(veh)	10.3	-	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	286	20	20	470	2	23	0	10	0	0	1
Future Volume (vph)	1	286	20	20	470	2	23	0	10	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		500			2950			500			200	
Travel Time (s)		9.7			57.5			11.4			4.5	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	2%	5%	0%	1%	0%	4%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

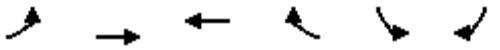
Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	286	20	20	470	2	23	0	10	0	0	1
Future Vol, veh/h	1	286	20	20	470	2	23	0	10	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	2	5	0	1	0	4	0	0	0	0	0
Mvmt Flow	1	349	24	24	573	2	28	0	12	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	575	0	0	373	0	0	986	986	361	991	997	574
Stage 1	-	-	-	-	-	-	363	363	-	622	622	-
Stage 2	-	-	-	-	-	-	623	623	-	369	375	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.14	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.536	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1008	-	-	1197	-	-	225	250	688	227	246	522
Stage 1	-	-	-	-	-	-	652	628	-	478	482	-
Stage 2	-	-	-	-	-	-	470	481	-	655	621	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1008	-	-	1197	-	-	219	243	688	218	239	522
Mov Cap-2 Maneuver	-	-	-	-	-	-	219	243	-	218	239	-
Stage 1	-	-	-	-	-	-	651	627	-	478	468	-
Stage 2	-	-	-	-	-	-	455	467	-	643	620	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	20.3	11.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	276	1008	-	-	1197	-	-	522
HCM Lane V/C Ratio	0.146	0.001	-	-	0.02	-	-	0.002
HCM Control Delay (s)	20.3	8.6	0	-	8.1	0	-	11.9
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	163	171	293	550	108	206
Future Volume (vph)	163	171	293	550	108	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	265			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		2950	300		300	
Travel Time (s)		67.0	5.8		6.8	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	2%	0%	2%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection						
Int Delay, s/veh	14.9					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	163	171	293	550	108	206
Future Vol, veh/h	163	171	293	550	108	206
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	265	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	2	0	2	3	1
Mvmt Flow	196	206	353	663	130	248

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1016	0	-	0	1283	685
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	598	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	691	-	-	-	181	450
Stage 1	-	-	-	-	499	-
Stage 2	-	-	-	-	547	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	691	-	-	-	~ 130	450
Mov Cap-2 Maneuver	-	-	-	-	~ 130	-
Stage 1	-	-	-	-	357	-
Stage 2	-	-	-	-	547	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	64.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	691	-	-	-	130	450
HCM Lane V/C Ratio	0.284	-	-	-	1.001	0.552
HCM Control Delay (s)	12.3	-	-	-	144.6	22.4
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	1.2	-	-	-	7	3.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	103	180	475	13	62	346
Future Volume (vph)	103	180	475	13	62	346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	16
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		300	600		300	
Travel Time (s)		6.8	11.7		6.8	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	2%	1%	2%	8%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

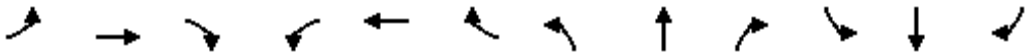
Intersection						
Int Delay, s/veh	11.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	103	180	475	13	62	346
Future Vol, veh/h	103	180	475	13	62	346
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	140	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	1	2	8	3	1
Mvmt Flow	121	212	559	15	73	407

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	559	0	-	0	1021	567
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	454	-
Critical Hdwy	4.12	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1012	-	-	-	261	525
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	638	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1012	-	-	-	230	525
Mov Cap-2 Maneuver	-	-	-	-	230	-
Stage 1	-	-	-	-	498	-
Stage 2	-	-	-	-	638	-

Approach	EB	WB	SB
HCM Control Delay, s	3.3	0	31
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1012	-	-	-	230	525
HCM Lane V/C Ratio	0.12	-	-	-	0.317	0.775
HCM Control Delay (s)	9	-	-	-	27.8	31.6
HCM Lane LOS	A	-	-	-	D	D
HCM 95th %tile Q(veh)	0.4	-	-	-	1.3	7



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	26	671	5	233	1	436	2	27	0	2	0
Future Volume (vph)	1	26	671	5	233	1	436	2	27	0	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	14	14	14	12	13	12	13	12	12	12
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	4%	2%	0%	1%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	107.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	26	671	5	233	1	436	2	27	0	2	0
Future Vol, veh/h	1	26	671	5	233	1	436	2	27	0	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	4	2	0	1	0	2	0	0	0	0	0
Mvmt Flow	1	31	808	6	281	1	525	2	33	0	2	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	282	0	0	31	0	0	732	731	435	345	327	282
Stage 1	-	-	-	-	-	-	437	437	-	294	294	-
Stage 2	-	-	-	-	-	-	295	294	-	51	33	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.12	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.518	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1292	-	-	1595	-	-	~ 337	351	625	613	595	762
Stage 1	-	-	-	-	-	-	598	583	-	719	673	-
Stage 2	-	-	-	-	-	-	713	673	-	967	872	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1292	-	-	1595	-	-	~ 334	349	625	576	591	762
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 334	349	-	576	591	-
Stage 1	-	-	-	-	-	-	597	582	-	718	670	-
Stage 2	-	-	-	-	-	-	708	670	-	911	870	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	$ 325.4	11.1
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	343	1292	-	-	1595	-	-	591
HCM Lane V/C Ratio	1.633	0.001	-	-	0.004	-	-	0.004
HCM Control Delay (s)	$ 325.4	7.8	0	-	7.3	0	-	11.1
HCM Lane LOS	F	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	33.4	0	-	-	0	-	-	0

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	44	367	395	276	328	38
Future Volume (vph)	44	367	395	276	328	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	15	15	15	15
Storage Length (ft)	0			0	0	80
Storage Lanes	0			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	2%	1%	2%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	60.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	44	367	395	276	328	38
Future Vol, veh/h	44	367	395	276	328	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	1	2	1	2	0
Mvmt Flow	46	386	416	291	345	40

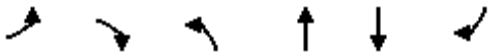
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	707	0	-	0	1040	562
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	478	-
Critical Hdwy	4.12	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	891	-	-	-	~ 255	530
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	891	-	-	-	~ 238	530
Mov Cap-2 Maneuver	-	-	-	-	~ 238	-
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	624	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	237.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	891	-	-	-	238	530
HCM Lane V/C Ratio	0.052	-	-	-	1.451	0.075
HCM Control Delay (s)	9.3	0	-	-	263.5	12.3
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.2	-	-	-	19.9	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	19	9	5	323	360	21
Future Volume (vph)	19	9	5	323	360	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	5%	11%	0%	3%	2%	5%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	9	5	323	360	21
Future Vol, veh/h	19	9	5	323	360	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	5	11	0	3	2	5
Mvmt Flow	20	9	5	336	375	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	732	386	397	0	-	0
Stage 1	386	-	-	-	-	-
Stage 2	346	-	-	-	-	-
Critical Hdwy	6.45	6.31	4.1	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.399	2.2	-	-	-
Pot Cap-1 Maneuver	384	642	1173	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	710	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	382	642	1173	-	-	-
Mov Cap-2 Maneuver	382	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	710	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1173	-	439	-	-
HCM Lane V/C Ratio	0.004	-	0.066	-	-
HCM Control Delay (s)	8.1	0	13.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	46	125	196	57	104	109	165	79	78	116	105
Future Volume (vph)	34	46	125	196	57	104	109	165	79	78	116	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	16	16	16	14	14	14	15	15	15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		999			500			4300			875	
Travel Time (s)		22.7			11.4			97.7			19.9	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles (%)	0%	2%	2%	1%	0%	6%	0%	4%	5%	14%	3%	1%
Shared Lane Traffic (%)												
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout

ROUNDABOUT ANALYSIS

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	Appr Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	Lunenburg Road	70.00*	17.50*	105.0*	65.0*	30.0*	1	1	13.50*	1500.0	NA[5]	0.0[1]
East	Old Union Turnpike	70.00*	17.50*	105.0*	100.0*	30.0*	1	1	17.00*	1500.0	NA[5]	0.0[1]
North	Lunenburg Road	70.00*	17.50*	105.0*	50.0*	30.0*	1	1	13.00*	1500.0	NA[5]	0.0[1]
West	Old Union Turnpike	70.00*	17.50*	105.0*	75.0*	30.0*	1	1	14.00*	1500.0	NA[5]	0.0[1]

Roundabout Capacity Model: US HCM 6

* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
1 Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).
5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	OD Mov	Lane No	Lane Type	Opng Flow pcu/h	In-Bunch Headway sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	HVE for Entry	Critical Gap sec	Follow-up Headway sec
South: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
West	L2	1	Dominant	169	0.00	0.000	No	No	–	1.06	4.98	2.61
North	T1	1	Dominant	169	0.00	0.000	No	No	–	1.07	4.98	2.61
East	R2	1	Dominant	169	0.00	0.000	No	No	–	1.21	4.98	2.61
East: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
South	L2	1	Dominant	338	0.00	0.000	No	No	–	1.09	4.98	2.61
West	T1	1	Dominant	338	0.00	0.000	No	No	–	1.00	4.98	2.61
North	R2	1	Dominant	338	0.00	0.000	No	No	–	1.16	4.98	2.61
North: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
East	L2	1	Dominant	398	0.00	0.000	No	No	–	1.04	4.98	2.61
South	T1	1	Dominant	398	0.00	0.000	No	No	–	1.04	4.98	2.61
West	R2	1	Dominant	398	0.00	0.000	No	No	–	1.10	4.98	2.61
West: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
North	L2	1	Dominant	428	0.00	0.000	No	No	–	1.06	4.98	2.61
East	T1	1	Dominant	428	0.00	0.000	No	No	–	1.02	4.98	2.61
South	R2	1	Dominant	428	0.00	0.000	No	No	–	1.03	4.98	2.61

Roundabout Capacity Model: US HCM 6

Circulating Lane Flow Rates

Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: Lunenburg Road			
Lane 1	163	169	100.0
Approach	163	169	
East: Old Union Turnpike			
Lane 1	318	338	100.0
Approach	318	338	
North: Lunenburg Road			
Lane 1	373	398	100.0
Approach	373	398	
West: Old Union Turnpike			
Lane 1	402	428	100.0
Approach	402	428	

Roundabout Capacity Model: The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes.
To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

MOVEMENT SUMMARY

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lunenburg Road											
3	L2	112	6.0	0.344	6.8	LOS A	1.7	47.0	0.40	0.26	29.6
8	T1	170	7.0	0.344	6.8	LOS A	1.7	47.0	0.40	0.26	29.6
18	R2	81	21.0	0.344	7.2	LOS A	1.7	47.0	0.40	0.26	28.8
Approach		364	9.8	0.344	6.9	LOS A	1.7	47.0	0.40	0.26	29.4
East: Old Union Turnpike											
1	L2	202	9.0	0.413	8.9	LOS A	2.0	55.1	0.57	0.49	28.4
6	T1	59	0.0	0.413	8.6	LOS A	2.0	55.1	0.57	0.49	28.5
16	R2	107	16.0	0.413	9.1	LOS A	2.0	55.1	0.57	0.49	27.7
Approach		368	9.6	0.413	8.9	LOS A	2.0	55.1	0.57	0.49	28.2
North: Lunenburg Road											
7	L2	80	4.0	0.356	8.1	LOS A	1.7	44.7	0.58	0.52	29.2
4	T1	120	4.0	0.356	8.1	LOS A	1.7	44.7	0.58	0.52	29.2
14	R2	108	10.0	0.356	8.4	LOS A	1.7	44.7	0.58	0.52	28.5
Approach		308	6.1	0.356	8.2	LOS A	1.7	44.7	0.58	0.52	29.0
West: Old Union Turnpike											
5	L2	35	6.0	0.245	6.9	LOS A	1.1	28.2	0.55	0.49	30.0
2	T1	47	2.0	0.245	6.7	LOS A	1.1	28.2	0.55	0.49	30.0
12	R2	129	3.0	0.245	6.7	LOS A	1.1	28.2	0.55	0.49	29.3
Approach		211	3.3	0.245	6.7	LOS A	1.1	28.2	0.55	0.49	29.6
All Vehicles		1252	7.7	0.413	7.8	LOS A	2.0	55.1	0.52	0.43	29.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	3	106	1	72	1	188	114	49	190	0
Future Volume (vph)	0	0	3	106	1	72	1	188	114	49	190	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	11	11	11
Storage Length (ft)	0		0	65		0	0		55	0		0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		500			500			875			1000	
Travel Time (s)		11.4			9.7			17.0			19.5	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	4%	0%	8%	0%	5%	3%	8%	6%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

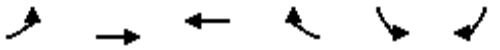
Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	106	1	72	1	188	114	49	190	0
Future Vol, veh/h	0	0	3	106	1	72	1	188	114	49	190	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	65	-	-	-	-	55	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	4	0	8	0	5	3	8	6	0
Mvmt Flow	0	0	4	126	1	86	1	224	136	58	226	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	612	568	226	570	568	224	226	0	0	224	0	0
Stage 1	342	342	-	226	226	-	-	-	-	-	-	-
Stage 2	270	226	-	344	342	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.14	6.5	6.28	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.536	4	3.372	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	408	435	818	429	435	801	1354	-	-	1310	-	-
Stage 1	677	642	-	772	721	-	-	-	-	-	-	-
Stage 2	740	721	-	667	642	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	349	412	818	410	412	801	1354	-	-	1310	-	-
Mov Cap-2 Maneuver	349	412	-	410	412	-	-	-	-	-	-	-
Stage 1	676	609	-	771	720	-	-	-	-	-	-	-
Stage 2	659	720	-	630	609	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	14.5	0	1.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1354	-	-	818	410	791	1310	-	-
HCM Lane V/C Ratio	0.001	-	-	0.004	0.308	0.11	0.045	-	-
HCM Control Delay (s)	7.7	0	-	9.4	17.6	10.1	7.9	0	-
HCM Lane LOS	A	A	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	1.3	0.4	0.1	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	128	75	188	3	18	169
Future Volume (vph)	128	75	188	3	18	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	16	16	16
Storage Length (ft)	0			60	0	75
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		30	
Link Distance (ft)		500	500		300	
Travel Time (s)		8.5	8.5		6.8	
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61
Heavy Vehicles (%)	13%	1%	0%	0%	0%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	128	75	188	3	18	169
Future Vol, veh/h	128	75	188	3	18	169
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	-	-	-	60	0	75
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	61	61	61	61	61	61
Heavy Vehicles, %	13	1	0	0	0	5
Mvmt Flow	210	123	308	5	30	277

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	308	0	-	0	851	308
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	543	-
Critical Hdwy	4.23	-	-	-	6.4	6.25
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.317	-	-	-	3.5	3.345
Pot Cap-1 Maneuver	1193	-	-	-	333	725
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	586	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1193	-	-	-	270	725
Mov Cap-2 Maneuver	-	-	-	-	270	-
Stage 1	-	-	-	-	608	-
Stage 2	-	-	-	-	586	-

Approach	EB	WB	SB
HCM Control Delay, s	5.5	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1193	-	-	-	270	725
HCM Lane V/C Ratio	0.176	-	-	-	0.109	0.382
HCM Control Delay (s)	8.7	0	-	-	20	13
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.6	-	-	-	0.4	1.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	274	15	14	251	0	14	0	9	0	0	1
Future Volume (vph)	1	274	15	14	251	0	14	0	9	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		500			2950			500			200	
Travel Time (s)		9.7			57.5			11.4			4.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

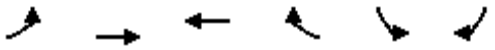
Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	274	15	14	251	0	14	0	9	0	0	1
Future Vol, veh/h	1	274	15	14	251	0	14	0	9	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	285	16	15	261	0	15	0	9	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	261	0	0	301	0	0	587	586	293	591	594	261
Stage 1	-	-	-	-	-	-	295	295	-	291	291	-
Stage 2	-	-	-	-	-	-	292	291	-	300	303	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1315	-	-	1272	-	-	424	425	751	422	421	783
Stage 1	-	-	-	-	-	-	718	673	-	721	675	-
Stage 2	-	-	-	-	-	-	720	675	-	713	667	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1315	-	-	1272	-	-	418	419	751	412	415	783
Mov Cap-2 Maneuver	-	-	-	-	-	-	418	419	-	412	415	-
Stage 1	-	-	-	-	-	-	717	672	-	720	666	-
Stage 2	-	-	-	-	-	-	709	666	-	703	666	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	12.5	9.6
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	506	1315	-	-	1272	-	-	783
HCM Lane V/C Ratio	0.047	0.001	-	-	0.011	-	-	0.001
HCM Control Delay (s)	12.5	7.7	0	-	7.9	0	-	9.6
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	133	164	153	479	127	125
Future Volume (vph)	133	164	153	479	127	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	265			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		2950	300		300	
Travel Time (s)		67.0	5.8		6.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	2%	0%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

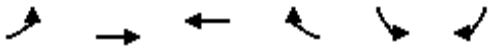
Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	133	164	153	479	127	125
Future Vol, veh/h	133	164	153	479	127	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	265	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	0	2	0	2
Mvmt Flow	137	169	158	494	131	129

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	652	0	-	0	848	405
Stage 1	-	-	-	-	405	-
Stage 2	-	-	-	-	443	-
Critical Hdwy	4.11	-	-	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.318
Pot Cap-1 Maneuver	939	-	-	-	334	646
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	651	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	939	-	-	-	285	646
Mov Cap-2 Maneuver	-	-	-	-	285	-
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	651	-

Approach	EB	WB	SB
HCM Control Delay, s	4.2	0	20
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	939	-	-	-	285	646
HCM Lane V/C Ratio	0.146	-	-	-	0.459	0.199
HCM Control Delay (s)	9.5	-	-	-	27.9	12
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.5	-	-	-	2.3	0.7



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	124	167	231	5	58	403
Future Volume (vph)	124	167	231	5	58	403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	16
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		300	400		300	
Travel Time (s)		6.8	7.8		6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	124	167	231	5	58	403
Future Vol, veh/h	124	167	231	5	58	403
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	140	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	3	1
Mvmt Flow	129	174	241	5	60	420

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	241	0	-	0	676	244
Stage 1	-	-	-	-	244	-
Stage 2	-	-	-	-	432	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1337	-	-	-	417	797
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	652	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1337	-	-	-	377	797
Mov Cap-2 Maneuver	-	-	-	-	377	-
Stage 1	-	-	-	-	718	-
Stage 2	-	-	-	-	652	-

Approach	EB	WB	SB
HCM Control Delay, s	3.4	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1337	-	-	-	377	797
HCM Lane V/C Ratio	0.097	-	-	-	0.16	0.527
HCM Control Delay (s)	8	-	-	-	16.4	14.4
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6	3.1

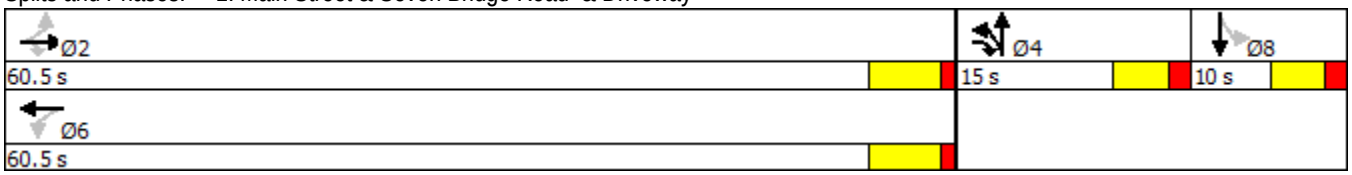
2026 No-Build Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	783	363	16	488	0	198	0	8	0	0	0
Future Volume (vph)	0	783	363	16	488	0	198	0	8	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	13	13	13	12	12	12
Storage Length (ft)	0		115	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	3%	0%	6%	0%	7%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type		NA	pm+ov	Perm	NA		Split	NA				
Protected Phases		2	4		6		4	4			8	
Permitted Phases	2		2	6						8		
Detector Phase	2	2	4	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		5.0	5.0	
Minimum Split (s)	15.5	15.5	15.0	15.5	15.5		15.0	15.0		10.0	10.0	
Total Split (s)	60.5	60.5	15.0	60.5	60.5		15.0	15.0		10.0	10.0	
Total Split (%)	70.8%	70.8%	17.5%	70.8%	70.8%		17.5%	17.5%		11.7%	11.7%	
Maximum Green (s)	55.0	55.0	10.0	55.0	55.0		10.0	10.0		5.0	5.0	
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.5	5.0	5.5	5.5			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	2.0	3.0	3.0		2.0	2.0		0.2	0.2	
Recall Mode	Min	Min	None	Min	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 85.5
Actuated Cycle Length: 51.9
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Main Street & Seven Bridge Road & Driveway



Lane Group	EBT	EBR	WBL	WBT	NBT
Lane Group Flow (vph)	842	390	17	525	222
v/c Ratio	0.82	0.26	0.08	0.51	0.52
Control Delay	15.6	0.4	4.6	7.6	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	0.4	4.6	7.6	19.2
Queue Length 50th (ft)	165	0	2	76	33
Queue Length 95th (ft)	282	0	7	124	#133
Internal Link Dist (ft)	1370			920	920
Turn Bay Length (ft)		115	50		
Base Capacity (vph)	1657	1516	344	1657	425
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.26	0.05	0.32	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	783	363	16	488	0	198	0	8	0	0	0
Future Volume (veh/h)	0	783	363	16	488	0	198	0	8	0	0	0
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1792	1845	1900	1792	1900	1976	1852	1976	1900	1900	1900
Adj Flow Rate, veh/h	0	842	390	17	525	0	213	0	9	0	0	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	3	0	6	6	0	0	0	0	0	0
Cap, veh/h	0	1152	1277	277	1152	0	289	0	12	0	3	0
Arrive On Green	0.00	0.64	0.64	0.64	0.64	0.00	0.17	0.00	0.17	0.00	0.00	0.00
Sat Flow, veh/h	0	1792	1568	459	1792	0	1684	0	71	0	1900	0
Grp Volume(v), veh/h	0	842	390	17	525	0	222	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1792	1568	459	1792	0	1755	0	0	0	1900	0
Q Serve(g_s), s	0.0	17.9	3.5	1.5	8.4	0.0	6.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	17.9	3.5	19.4	8.4	0.0	6.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00	0.96		0.04	0.00		0.00
Lane Grp Cap(c), veh/h	0	1152	1277	277	1152	0	301	0	0	0	3	0
V/C Ratio(X)	0.00	0.73	0.31	0.06	0.46	0.00	0.74	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1744	1794	429	1744	0	310	0	0	0	168	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	6.8	1.3	13.3	5.1	0.0	22.2	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.1	0.1	0.3	0.0	7.5	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.9	2.9	0.2	4.2	0.0	3.9	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	7.7	1.4	13.4	5.4	0.0	29.7	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		A	A	B	A		C					
Approach Vol, veh/h		1232			542			222			0	
Approach Delay, s/veh		5.7			5.6			29.7			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		41.8		14.7		41.8		0.0
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0
Max Green Setting (Gmax), s		55.0		10.0		55.0		5.0
Max Q Clear Time (g_c+I1), s		19.9		8.8		21.4		0.0
Green Ext Time (p_c), s		15.2		0.1		15.0		0.0

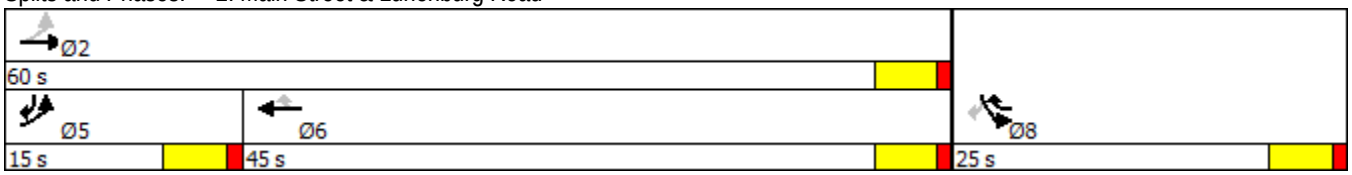
Intersection Summary	
HCM 2010 Ctrl Delay	8.4
HCM 2010 LOS	A

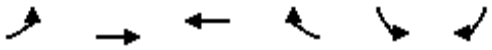
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	53	805	396	298	336	41
Future Volume (vph)	53	805	396	298	336	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	100			160	0	240
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	6%	6%	8%	3%
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	8	8	5
Permitted Phases	2			6		8
Detector Phase	5	2	6	8	8	5
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	11.0	15.0	15.0	15.0	15.0	11.0
Total Split (s)	15.0	60.0	45.0	25.0	25.0	15.0
Total Split (%)	17.6%	70.6%	52.9%	29.4%	29.4%	17.6%
Maximum Green (s)	10.0	55.0	40.0	20.0	20.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	3.0	3.0	2.0	2.0	2.0
Recall Mode	None	Min	Min	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 68.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Main Street & Lunenburg Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	57	866	426	320	361	44
v/c Ratio	0.13	0.86	0.55	0.25	0.80	0.06
Control Delay	6.7	22.5	17.8	0.7	41.4	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	22.5	17.8	0.7	41.4	15.0
Queue Length 50th (ft)	10	284	137	0	141	10
Queue Length 95th (ft)	22	446	217	12	#358	37
Internal Link Dist (ft)		920	1370		920	
Turn Bay Length (ft)	100			160		240
Base Capacity (vph)	513	1422	1064	1268	489	770
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.61	0.40	0.25	0.74	0.06

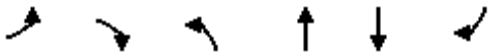
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	53	805	396	298	336	41
Future Volume (veh/h)	53	805	396	298	336	41
Number	5	2	6	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1827	1792	1792	1759	1845
Adj Flow Rate, veh/h	57	866	426	320	361	44
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	4	6	6	8	3
Cap, veh/h	426	1091	821	1069	409	477
Arrive On Green	0.06	0.60	0.46	0.46	0.24	0.24
Sat Flow, veh/h	1774	1827	1792	1524	1675	1568
Grp Volume(v), veh/h	57	866	426	320	361	44
Grp Sat Flow(s),veh/h/ln	1774	1827	1792	1524	1675	1568
Q Serve(g_s), s	0.9	22.9	10.7	5.0	13.1	1.3
Cycle Q Clear(g_c), s	0.9	22.9	10.7	5.0	13.1	1.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	426	1091	821	1069	409	477
V/C Ratio(X)	0.13	0.79	0.52	0.30	0.88	0.09
Avail Cap(c_a), veh/h	601	1594	1138	1339	532	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.0	9.7	12.2	3.5	22.9	15.7
Incr Delay (d2), s/veh	0.1	1.8	0.5	0.2	11.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	11.8	5.3	3.9	7.3	0.6
LnGrp Delay(d),s/veh	8.0	11.5	12.7	3.7	34.1	15.7
LnGrp LOS	A	B	B	A	C	B
Approach Vol, veh/h		923	746		405	
Approach Delay, s/veh		11.3	8.8		32.1	
Approach LOS		B	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		42.6			8.8	33.9		20.4
Change Period (Y+Rc), s		5.0			5.0	5.0		5.0
Max Green Setting (Gmax), s		55.0			10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s		24.9			2.9	12.7		15.1
Green Ext Time (p_c), s		12.8			0.0	12.2		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	18	29	28	326	363	18
Future Volume (vph)	18	29	28	326	363	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	33%	18%	7%	10%	6%	17%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	29	28	326	363	18
Future Vol, veh/h	18	29	28	326	363	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	33	18	7	10	6	17
Mvmt Flow	19	31	30	351	390	19

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	811	400	409	0	-	0
Stage 1	400	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Critical Hdwy	6.73	6.38	4.17	-	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.462	2.263	-	-	-
Pot Cap-1 Maneuver	310	617	1123	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	607	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	300	617	1123	-	-	-
Mov Cap-2 Maneuver	300	-	-	-	-	-
Stage 1	595	-	-	-	-	-
Stage 2	607	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1123	-	439	-	-
HCM Lane V/C Ratio	0.027	-	0.115	-	-
HCM Control Delay (s)	8.3	0	14.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	147	100	77	28	66	78	182	112	289	232	45
Future Volume (vph)	36	147	100	77	28	66	78	182	112	289	232	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	16	16	16	14	14	14	15	15	15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		999			500			4300			875	
Travel Time (s)		22.7			11.4			97.7			19.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	6%	2%	3%	9%	0%	16%	6%	7%	21%	4%	4%	10%
Shared Lane Traffic (%)												
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout

ROUNDABOUT ANALYSIS

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	Appr Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	Lunenburg Road	70.00*	17.50*	105.0*	65.0*	30.0*	1	1	13.50*	1500.0	NA[5]	0.0[1]
East	Old Union Turnpike	70.00*	17.50*	105.0*	100.0*	30.0*	1	1	17.00*	1500.0	NA[5]	0.0[1]
North	Lunenburg Road	70.00*	17.50*	105.0*	50.0*	30.0*	1	1	13.00*	1500.0	NA[5]	0.0[1]
West	Old Union Turnpike	70.00*	17.50*	105.0*	75.0*	30.0*	1	1	14.00*	1500.0	NA[5]	0.0[1]

Roundabout Capacity Model: US HCM 6

* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
1 Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).
5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	OD Mov	Lane No	Lane Type	Opng Flow pcu/h	In-Bunch Headway sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	HVE for Entry	Critical Gap sec	Follow-up Headway sec
South: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
West	L2	1	Dominant	504	0.00	0.000	No	No	–	1.06	4.98	2.61
North	T1	1	Dominant	504	0.00	0.000	No	No	–	1.07	4.98	2.61
East	R2	1	Dominant	504	0.00	0.000	No	No	–	1.21	4.98	2.61
East: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
South	L2	1	Dominant	325	0.00	0.000	No	No	–	1.09	4.98	2.61
West	T1	1	Dominant	325	0.00	0.000	No	No	–	1.00	4.98	2.61
North	R2	1	Dominant	325	0.00	0.000	No	No	–	1.16	4.98	2.61
North: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
East	L2	1	Dominant	201	0.00	0.000	No	No	–	1.04	4.98	2.61
South	T1	1	Dominant	201	0.00	0.000	No	No	–	1.04	4.98	2.61
West	R2	1	Dominant	201	0.00	0.000	No	No	–	1.10	4.98	2.61
West: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
North	L2	1	Dominant	645	0.00	0.000	No	No	–	1.06	4.98	2.61
East	T1	1	Dominant	645	0.00	0.000	No	No	–	1.02	4.98	2.61
South	R2	1	Dominant	645	0.00	0.000	No	No	–	1.03	4.98	2.61

Roundabout Capacity Model: US HCM 6

Circulating Lane Flow Rates

Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: Lunenburg Road			
Lane 1	487	504	100.0
Approach	487	504	
East: Old Union Turnpike			
Lane 1	305	325	100.0
Approach	305	325	
North: Lunenburg Road			
Lane 1	189	201	100.0
Approach	189	201	
West: Old Union Turnpike			
Lane 1	616	645	100.0
Approach	616	645	

Roundabout Capacity Model: The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes.
To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

MOVEMENT SUMMARY

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lunenburg Road											
3	L2	80	6.0	0.516	12.2	LOS B	3.5	94.0	0.69	0.83	27.6
8	T1	188	7.0	0.516	12.3	LOS B	3.5	94.0	0.69	0.83	27.6
18	R2	115	21.0	0.516	12.9	LOS B	3.5	94.0	0.69	0.83	26.9
Approach		384	11.0	0.516	12.5	LOS B	3.5	94.0	0.69	0.83	27.4
East: Old Union Turnpike											
1	L2	79	9.0	0.196	5.9	LOS A	0.8	22.0	0.47	0.37	29.8
6	T1	29	0.0	0.196	5.6	LOS A	0.8	22.0	0.47	0.37	29.8
16	R2	68	16.0	0.196	6.2	LOS A	0.8	22.0	0.47	0.37	28.9
Approach		176	10.2	0.196	6.0	LOS A	0.8	22.0	0.47	0.37	29.4
North: Lunenburg Road											
7	L2	298	4.0	0.542	9.9	LOS A	3.7	94.8	0.56	0.40	28.1
4	T1	239	4.0	0.542	9.9	LOS A	3.7	94.8	0.56	0.40	28.2
14	R2	46	10.0	0.542	10.1	LOS B	3.7	94.8	0.56	0.40	27.5
Approach		584	4.5	0.542	9.9	LOS A	3.7	94.8	0.56	0.40	28.1
West: Old Union Turnpike											
5	L2	37	6.0	0.420	11.1	LOS B	2.3	59.2	0.70	0.78	28.3
2	T1	152	2.0	0.420	10.9	LOS B	2.3	59.2	0.70	0.78	28.4
12	R2	103	3.0	0.420	11.0	LOS B	2.3	59.2	0.70	0.78	27.8
Approach		292	2.9	0.420	11.0	LOS B	2.3	59.2	0.70	0.78	28.2
All Vehicles		1435	6.6	0.542	10.3	LOS B	3.7	94.8	0.61	0.59	28.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	5	3	45	0	44	0	154	130	73	518	0
Future Volume (vph)	0	5	3	45	0	44	0	154	130	73	518	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	11	11	11
Storage Length (ft)	0		0	65		0	0		55	0		0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		500			420			875			1000	
Travel Time (s)		11.4			8.2			17.0			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	10%	0%	11%	0%	10%	8%	2%	4%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	3	45	0	44	0	154	130	73	518	0
Future Vol, veh/h	0	5	3	45	0	44	0	154	130	73	518	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	65	-	-	-	-	55	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	10	0	11	0	10	8	2	4	0
Mvmt Flow	0	5	3	47	0	46	0	160	135	76	540	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	875	852	540	856	852	160	540	0	0	160	0	0
Stage 1	692	692	-	160	160	-	-	-	-	-	-	-
Stage 2	183	160	-	696	692	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.2	6.5	6.31	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.2	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.2	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.59	4	3.399	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	272	299	546	269	299	862	1039	-	-	1419	-	-
Stage 1	437	448	-	824	769	-	-	-	-	-	-	-
Stage 2	823	769	-	419	448	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	243	276	546	248	276	862	1039	-	-	1419	-	-
Mov Cap-2 Maneuver	243	276	-	248	276	-	-	-	-	-	-	-
Stage 1	437	414	-	824	769	-	-	-	-	-	-	-
Stage 2	779	769	-	380	414	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.9	16.2	0	0.9
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1039	-	-	339	248	862	1419	-	-
HCM Lane V/C Ratio	-	-	-	0.025	0.189	0.053	0.054	-	-
HCM Control Delay (s)	0	-	-	15.9	22.9	9.4	7.7	0	-
HCM Lane LOS	A	-	-	C	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.7	0.2	0.2	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	412	136	70	0	13	101
Future Volume (vph)	412	136	70	0	13	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	16	16	16
Storage Length (ft)	0			60	0	75
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		30	
Link Distance (ft)		500	500		300	
Travel Time (s)		8.5	8.5		6.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	4%	2%	0%	0%	17%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	412	136	70	0	13	101
Future Vol, veh/h	412	136	70	0	13	101
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	-	-	-	60	0	75
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	4	2	0	0	17
Mvmt Flow	438	145	74	0	14	107

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	74	0	-	0	1095	74
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	1021	-
Critical Hdwy	4.18	-	-	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.272	-	-	-	3.5	3.453
Pot Cap-1 Maneuver	1488	-	-	-	239	947
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	351	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1488	-	-	-	163	947
Mov Cap-2 Maneuver	-	-	-	-	163	-
Stage 1	-	-	-	-	649	-
Stage 2	-	-	-	-	351	-

Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1488	-	-	-	163	947
HCM Lane V/C Ratio	0.295	-	-	-	0.085	0.113
HCM Control Delay (s)	8.4	0	-	-	29.1	9.3
HCM Lane LOS	A	A	-	-	D	A
HCM 95th %tile Q(veh)	1.2	-	-	-	0.3	0.4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	64	144	15	28	61	0
Future Volume (vph)	64	144	15	28	61	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	13	13	16	16
Storage Length (ft)		75	0		0	60
Storage Lanes		1	0		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	30	
Link Distance (ft)	420			500	300	
Travel Time (s)	8.2			9.7	6.8	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	13%	2%	0%	12%	8%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	64	144	15	28	61	0
Future Vol, veh/h	64	144	15	28	61	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Stop
Storage Length	-	75	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	13	2	0	12	8	0
Mvmt Flow	72	162	17	31	69	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	72	0	137	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	65	-
Critical Hdwy	-	-	4.1	-	6.48	6.2
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	2.2	-	3.572	3.3
Pot Cap-1 Maneuver	-	-	1541	-	842	996
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	943	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1541	-	833	996
Mov Cap-2 Maneuver	-	-	-	-	833	-
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	933	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	833	-	-	-	1541	-
HCM Lane V/C Ratio	0.082	-	-	-	0.011	-
HCM Control Delay (s)	9.7	0	-	-	7.4	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	508	8	2	161	0	24	0	16	0	0	1
Future Volume (vph)	1	508	8	2	161	0	24	0	16	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		500			2950			500			200	
Travel Time (s)		9.7			57.5			11.4			4.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	2%	13%	50%	6%	0%	4%	0%	6%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	508	8	2	161	0	24	0	16	0	0	1
Future Vol, veh/h	1	508	8	2	161	0	24	0	16	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	2	13	50	6	0	4	0	6	0	0	0
Mvmt Flow	1	546	9	2	173	0	26	0	17	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	555	0	0	731	730	551	738	734	173
Stage 1	-	-	-	-	-	-	553	553	-	177	177	-
Stage 2	-	-	-	-	-	-	178	177	-	561	557	-
Critical Hdwy	4.1	-	-	4.6	-	-	7.14	6.5	6.26	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.65	-	-	3.536	4	3.354	3.5	4	3.3
Pot Cap-1 Maneuver	1416	-	-	814	-	-	335	352	526	336	350	876
Stage 1	-	-	-	-	-	-	514	518	-	829	756	-
Stage 2	-	-	-	-	-	-	819	756	-	516	515	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1416	-	-	814	-	-	334	351	526	324	349	876
Mov Cap-2 Maneuver	-	-	-	-	-	-	334	351	-	324	349	-
Stage 1	-	-	-	-	-	-	513	517	-	828	754	-
Stage 2	-	-	-	-	-	-	816	754	-	499	514	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	15.3	9.1
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	391	1416	-	-	814	-	-	876
HCM Lane V/C Ratio	0.11	0.001	-	-	0.003	-	-	0.001
HCM Control Delay (s)	15.3	7.5	0	-	9.4	0	-	9.1
HCM Lane LOS	C	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	327	105	190	121	80
Future Volume (vph)	101	327	105	190	121	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	265			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		2950	300		300	
Travel Time (s)		67.0	5.8		6.8	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	2%	3%	2%	7%	2%	4%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	101	327	105	190	121	80
Future Vol, veh/h	101	327	105	190	121	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	265	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	3	2	7	2	4
Mvmt Flow	117	380	122	221	141	93

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	343	0	-	0	847	233
Stage 1	-	-	-	-	233	-
Stage 2	-	-	-	-	614	-
Critical Hdwy	4.12	-	-	-	6.42	6.24
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.336
Pot Cap-1 Maneuver	1216	-	-	-	332	801
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	540	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1216	-	-	-	300	801
Mov Cap-2 Maneuver	-	-	-	-	300	-
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	540	-

Approach	EB	WB	SB
HCM Control Delay, s	2	0	20.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1216	-	-	-	300	801
HCM Lane V/C Ratio	0.097	-	-	-	0.469	0.116
HCM Control Delay (s)	8.3	-	-	-	27.2	10.1
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.3	-	-	-	2.4	0.4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	207	211	153	2	109	180
Future Volume (vph)	207	211	153	2	109	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	16
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		300	520		300	
Travel Time (s)		6.8	10.1		6.8	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	2%	3%	4%	50%	7%	7%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	207	211	153	2	109	180
Future Vol, veh/h	207	211	153	2	109	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	140	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	3	4	50	7	7
Mvmt Flow	244	248	180	2	128	212

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	180	0	-	0	917	181
Stage 1	-	-	-	-	181	-
Stage 2	-	-	-	-	736	-
Critical Hdwy	4.12	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	1396	-	-	-	296	849
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	465	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1396	-	-	-	244	849
Mov Cap-2 Maneuver	-	-	-	-	244	-
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	465	-

Approach	EB	WB	SB
HCM Control Delay, s	4	0	19.8
HCM LOS			C

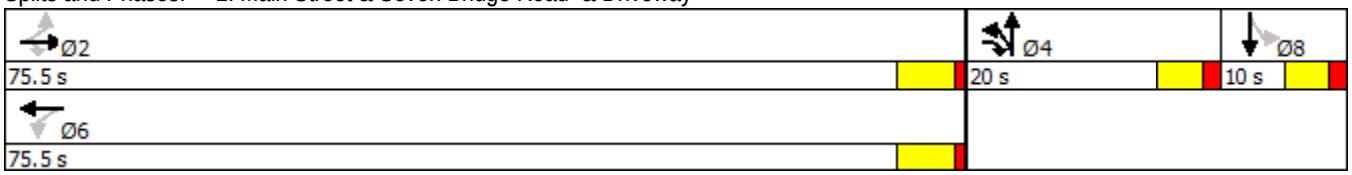
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1396	-	-	-	244	849
HCM Lane V/C Ratio	0.174	-	-	-	0.526	0.249
HCM Control Delay (s)	8.1	-	-	-	35	10.6
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0.6	-	-	-	2.8	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	515	244	4	1237	0	219	0	3	0	0	0
Future Volume (vph)	0	515	244	4	1237	0	219	0	3	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	15	15	15	12	12	12
Storage Length (ft)	0		115	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	2%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type		NA	pm+ov	Perm	NA		Split	NA				
Protected Phases		2	4		6		4	4			8	
Permitted Phases	2		2	6						8		
Detector Phase	2	2	4	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		5.0	5.0	
Minimum Split (s)	15.5	15.5	15.0	15.5	15.5		15.0	15.0		10.0	10.0	
Total Split (s)	75.5	75.5	20.0	75.5	75.5		20.0	20.0		10.0	10.0	
Total Split (%)	71.6%	71.6%	19.0%	71.6%	71.6%		19.0%	19.0%		9.5%	9.5%	
Maximum Green (s)	70.0	70.0	15.0	70.0	70.0		15.0	15.0		5.0	5.0	
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.5	5.0	5.5	5.5			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	2.0	3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min	None	Min	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105.5
Actuated Cycle Length: 92.8
Natural Cycle: 110
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Main Street & Seven Bridge Road & Driveway



Lane Group	EBT	EBR	WBL	WBT	NBT
Lane Group Flow (vph)	542	257	4	1302	234
v/c Ratio	0.40	0.17	0.01	0.96	0.72
Control Delay	5.3	0.2	3.5	28.8	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	0.2	3.5	28.8	38.6
Queue Length 50th (ft)	90	0	0	544	88
Queue Length 95th (ft)	156	0	3	#1067	167
Internal Link Dist (ft)	1370			920	920
Turn Bay Length (ft)		115	50		
Base Capacity (vph)	1345	1513	579	1358	380
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.17	0.01	0.96	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	515	244	4	1237	0	219	0	3	0	0	0
Future Volume (veh/h)	0	515	244	4	1237	0	219	0	3	0	0	0
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1863	1900	1863	1900	1976	1938	1976	1900	1900	1900
Adj Flow Rate, veh/h	0	542	257	4	1302	0	231	0	3	0	0	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	2	0	2	2	0	0	0	0	0	0
Cap, veh/h	0	1363	1403	514	1377	0	267	0	3	0	2	0
Arrive On Green	0.00	0.74	0.74	0.74	0.74	0.00	0.15	0.00	0.15	0.00	0.00	0.00
Sat Flow, veh/h	0	1845	1583	691	1863	0	1819	0	24	0	1900	0
Grp Volume(v), veh/h	0	542	257	4	1302	0	234	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1845	1583	691	1863	0	1843	0	0	0	1900	0
Q Serve(g_s), s	0.0	10.0	2.0	0.2	55.8	0.0	11.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.0	2.0	10.2	55.8	0.0	11.4	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00	0.99		0.01	0.00		0.00
Lane Grp Cap(c), veh/h	0	1363	1403	514	1377	0	271	0	0	0	2	0
V/C Ratio(X)	0.00	0.40	0.18	0.01	0.95	0.00	0.86	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1402	1436	528	1415	0	300	0	0	0	103	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	4.4	0.7	6.3	10.4	0.0	38.4	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.1	0.0	13.0	0.0	19.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.0	2.0	0.0	32.8	0.0	7.2	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	4.6	0.8	6.3	23.4	0.0	57.6	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		A	A	A	C		E					
Approach Vol, veh/h		799			1306			234			0	
Approach Delay, s/veh		3.4			23.3			57.6			0.0	
Approach LOS		A			C			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		73.6		18.5		73.6		0.0
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0
Max Green Setting (Gmax), s		70.0		15.0		70.0		5.0
Max Q Clear Time (g_c+I1), s		12.0		13.4		57.8		0.0
Green Ext Time (p_c), s		32.7		0.1		10.3		0.0

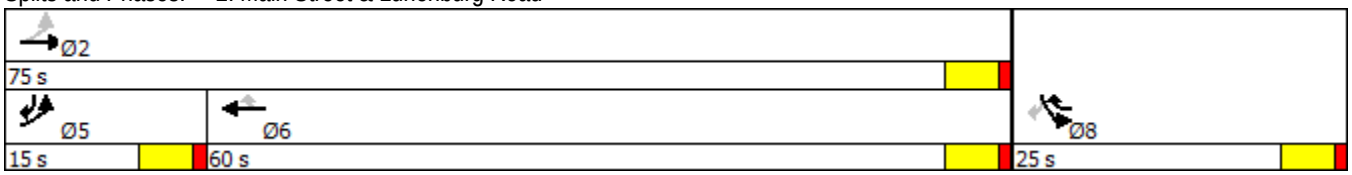
Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	B

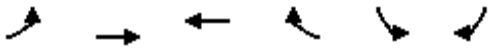
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	52	499	817	631	259	71
Future Volume (vph)	52	499	817	631	259	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	100			160	0	240
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	3%	1%	2%	0%
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	8	8	5
Permitted Phases	2			6		8
Detector Phase	5	2	6	8	8	5
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	11.0	15.0	15.0	15.0	15.0	11.0
Total Split (s)	15.0	75.0	60.0	25.0	25.0	15.0
Total Split (%)	15.0%	75.0%	60.0%	25.0%	25.0%	15.0%
Maximum Green (s)	10.0	70.0	55.0	20.0	20.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	3.0	3.0	2.0	2.0	2.0
Recall Mode	None	Min	Min	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 82.3
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Main Street & Lunenburg Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	55	525	860	664	273	75
v/c Ratio	0.20	0.45	0.88	0.47	0.76	0.13
Control Delay	6.5	7.9	30.0	1.3	49.5	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	7.9	30.0	1.3	49.5	22.6
Queue Length 50th (ft)	10	124	415	0	153	31
Queue Length 95th (ft)	21	182	#715	17	#291	66
Internal Link Dist (ft)		920	1370		920	
Turn Bay Length (ft)	100			160		240
Base Capacity (vph)	336	1450	1215	1421	459	643
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.36	0.71	0.47	0.59	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	52	499	817	631	259	71
Future Volume (veh/h)	52	499	817	631	259	71
Number	5	2	6	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1881	1863	1900
Adj Flow Rate, veh/h	55	525	860	664	273	75
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	3	3	1	2	0
Cap, veh/h	260	1280	1063	1207	317	375
Arrive On Green	0.05	0.69	0.58	0.58	0.18	0.18
Sat Flow, veh/h	1810	1845	1845	1599	1774	1615
Grp Volume(v), veh/h	55	525	860	664	273	75
Grp Sat Flow(s),veh/h/ln	1810	1845	1845	1599	1774	1615
Q Serve(g_s), s	0.8	9.5	29.0	13.6	11.7	2.9
Cycle Q Clear(g_c), s	0.8	9.5	29.0	13.6	11.7	2.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	260	1280	1063	1207	317	375
V/C Ratio(X)	0.21	0.41	0.81	0.55	0.86	0.20
Avail Cap(c_a), veh/h	395	1648	1295	1408	453	498
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.1	5.1	13.2	4.0	31.2	24.2
Incr Delay (d2), s/veh	0.1	0.2	3.3	0.4	8.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.9	15.5	10.5	6.4	1.3
LnGrp Delay(d),s/veh	12.2	5.3	16.4	4.4	39.6	24.3
LnGrp LOS	B	A	B	A	D	C
Approach Vol, veh/h		580	1524		348	
Approach Delay, s/veh		6.0	11.2		36.3	
Approach LOS		A	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		59.4			9.2	50.2		19.0
Change Period (Y+Rc), s		5.0			5.0	5.0		5.0
Max Green Setting (Gmax), s		70.0			10.0	55.0		20.0
Max Q Clear Time (g_c+I1), s		11.5			2.8	31.0		13.7
Green Ext Time (p_c), s		21.1			0.0	14.2		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	56	23	42	675	319	90
Future Volume (vph)	56	23	42	675	319	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	2%	6%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	56	23	42	675	319	90
Future Vol, veh/h	56	23	42	675	319	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	2	6	0
Mvmt Flow	58	24	44	703	332	94

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1170	379	426	0	-	0
Stage 1	379	-	-	-	-	-
Stage 2	791	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	215	672	1144	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	201	672	1144	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	450	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.9	0.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1144	-	253	-	-
HCM Lane V/C Ratio	0.038	-	0.325	-	-
HCM Control Delay (s)	8.3	0	25.9	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	45	161	115	84	147	228	364	58	58	189	265
Future Volume (vph)	80	45	161	115	84	147	228	364	58	58	189	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	16	16	16	14	14	14	15	15	15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		999			500			4300			875	
Travel Time (s)		22.7			11.4			97.7			19.9	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	0%	0%	1%	1%	7%	1%	1%	4%	2%	9%	1%
Shared Lane Traffic (%)												
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout

ROUNDABOUT ANALYSIS

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	Appr Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	Lunenburg Road	70.00*	17.50*	105.0*	65.0*	30.0*	1	1	13.50*	1500.0	NA[5]	0.0[1]
East	Old Union Turnpike	70.00*	17.50*	105.0*	100.0*	30.0*	1	1	17.00*	1500.0	NA[5]	0.0[1]
North	Lunenburg Road	70.00*	17.50*	105.0*	50.0*	30.0*	1	1	13.00*	14.5	NA[5]	0.0[1]
West	Old Union Turnpike	70.00*	17.50*	105.0*	75.0*	30.0*	1	1	14.00*	1500.0	NA[5]	0.0[1]

Roundabout Capacity Model: US HCM 6

* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
1 Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).
5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	OD Mov	Lane No	Lane Type	Opng Flow pcu/h	In-Bunch Headway sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	HVE for Entry	Critical Gap sec	Follow-up Headway sec
South: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
West	L2	1	Dominant	186	0.00	0.000	No	No	–	1.01	4.98	2.61
North	T1	1	Dominant	186	0.00	0.000	No	No	–	1.01	4.98	2.61
East	R2	1	Dominant	186	0.00	0.000	No	No	–	1.04	4.98	2.61
East: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
South	L2	1	Dominant	583	0.00	0.000	No	No	–	1.01	4.98	2.61
West	T1	1	Dominant	583	0.00	0.000	No	No	–	1.01	4.98	2.61
North	R2	1	Dominant	583	0.00	0.000	No	No	–	1.07	4.98	2.61
North: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
East	L2	1	Dominant	436	0.00	0.000	No	No	–	1.02	4.98	2.61
South	T1	1	Dominant	436	0.00	0.000	No	No	–	1.09	4.98	2.61
West	R2	1	Dominant	436	0.00	0.000	No	No	–	1.01	4.98	2.61
West: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
North	L2	1	Dominant	385	0.00	0.000	No	No	–	1.00	4.98	2.61
East	T1	1	Dominant	385	0.00	0.000	No	No	–	1.00	4.98	2.61
South	R2	1	Dominant	385	0.00	0.000	No	No	–	1.00	4.98	2.61

Roundabout Capacity Model: US HCM 6

Circulating Lane Flow Rates

Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: Lunenburg Road			
Lane 1	185	186	100.0
Approach	185	186	
East: Old Union Turnpike			
Lane 1	578	583	100.0
Approach	578	583	
North: Lunenburg Road			
Lane 1	431	436	100.0
Approach	431	436	
West: Old Union Turnpike			
Lane 1	366	385	100.0
Approach	366	385	

Roundabout Capacity Model: The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes.
To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

MOVEMENT SUMMARY

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lunenburg Road											
3	L2	230	1.0	0.493	8.7	LOS A	3.3	84.0	0.52	0.36	28.8
8	T1	267	1.0	0.493	8.7	LOS A	3.3	84.0	0.52	0.36	18.1
18	R2	59	4.0	0.493	8.8	LOS A	3.3	84.0	0.52	0.36	28.1
Approach		556	1.3	0.493	8.7	LOS A	3.3	84.0	0.52	0.36	24.1
East: Old Union Turnpike											
1	L2	116	1.0	0.475	11.5	LOS B	3.0	77.2	0.71	0.82	27.8
6	T1	85	1.0	0.475	11.5	LOS B	3.0	77.2	0.71	0.82	27.8
16	R2	148	7.0	0.475	11.8	LOS B	3.0	77.2	0.71	0.82	16.8
Approach		349	3.5	0.475	11.6	LOS B	3.0	77.2	0.71	0.82	23.5
North: Lunenburg Road											
7	L2	59	2.0	0.608	13.5	LOS B	5.9	152.3	0.75	0.93	24.0
4	T1	191	9.0	0.608	13.8	LOS B	5.9	152.3	0.75	0.93	24.0
14	R2	268	1.0	0.608	13.5	LOS B	5.9	152.3	0.75	0.93	23.2
Approach		517	4.1	0.608	13.6	LOS B	5.9	152.3	0.75	0.93	23.6
West: Old Union Turnpike											
5	L2	81	0.0	0.310	7.1	LOS A	1.6	38.8	0.56	0.49	16.3
2	T1	45	0.0	0.310	7.1	LOS A	1.6	38.8	0.56	0.49	29.6
12	R2	163	0.0	0.310	7.1	LOS A	1.6	38.8	0.56	0.49	28.9
Approach		289	0.0	0.310	7.1	LOS A	1.6	38.8	0.56	0.49	25.7
All Vehicles		1711	2.4	0.608	10.5	LOS B	5.9	152.3	0.64	0.65	24.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	4	319	0	337	2	470	119	32	189	1
Future Volume (vph)	0	0	4	319	0	337	2	470	119	32	189	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	11	11	11
Storage Length (ft)	0		0	65		0	0		55	0		0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		500			420			875			1000	
Travel Time (s)		11.4			8.2			17.0			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	5%	0%	1%	0%	1%	2%	14%	1%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	49.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	4	319	0	337	2	470	119	32	189	1
Future Vol, veh/h	0	0	4	319	0	337	2	470	119	32	189	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	65	-	-	-	-	55	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	5	0	1	0	1	2	14	1	0
Mvmt Flow	0	0	5	363	0	383	2	534	135	36	215	1

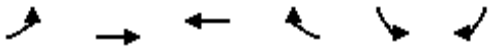
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1018	826	216	828	826	534	216	0	0	534	0	0
Stage 1	288	288	-	538	538	-	-	-	-	-	-	-
Stage 2	730	538	-	290	288	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.15	6.5	6.21	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.545	4	3.309	2.2	-	-	2.326	-	-
Pot Cap-1 Maneuver	218	310	829	~ 287	310	548	1366	-	-	976	-	-
Stage 1	724	677	-	522	526	-	-	-	-	-	-	-
Stage 2	417	526	-	711	677	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	63	296	829	~ 276	296	548	1366	-	-	976	-	-
Mov Cap-2 Maneuver	63	296	-	~ 276	296	-	-	-	-	-	-	-
Stage 1	723	649	-	521	525	-	-	-	-	-	-	-
Stage 2	125	525	-	677	649	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	110.9	0	1.3
HCM LOS	A	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1366	-	-	829	276	548	976	-	-
HCM Lane V/C Ratio	0.002	-	-	0.005	1.313	0.699	0.037	-	-
HCM Control Delay (s)	7.6	0	-	9.4	201.2	25.4	8.8	0	-
HCM Lane LOS	A	A	-	A	F	D	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	18.3	5.5	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	84	77	105	1	13	241
Future Volume (vph)	84	77	105	1	13	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	16	16	16
Storage Length (ft)	0			60	0	75
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		30	
Link Distance (ft)		500	500		300	
Travel Time (s)		8.5	8.5		6.8	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	5%	1%	0%	0%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	84	77	105	1	13	241
Future Vol, veh/h	84	77	105	1	13	241
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	-	-	-	60	0	75
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	3	5	1	0	0	3
Mvmt Flow	100	92	125	1	15	287

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	125	0	-	0	417	125
Stage 1	-	-	-	-	125	-
Stage 2	-	-	-	-	292	-
Critical Hdwy	4.13	-	-	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.327
Pot Cap-1 Maneuver	1455	-	-	-	596	923
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1455	-	-	-	553	923
Mov Cap-2 Maneuver	-	-	-	-	553	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	762	-

Approach	EB	WB	SB
HCM Control Delay, s	4	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1455	-	-	-	553	923
HCM Lane V/C Ratio	0.069	-	-	-	0.028	0.311
HCM Control Delay (s)	7.7	0	-	-	11.7	10.7
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	1.3

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	15	136	29	249	407	0
Future Volume (vph)	15	136	29	249	407	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	13	13	16	16
Storage Length (ft)		75	0		0	60
Storage Lanes		1	0		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	30	
Link Distance (ft)	420			500	300	
Travel Time (s)	8.2			9.7	6.8	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	8%	4%	8%	2%	3%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	14.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	15	136	29	249	407	0
Future Vol, veh/h	15	136	29	249	407	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Stop
Storage Length	-	75	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	8	4	8	2	3	0
Mvmt Flow	18	160	34	293	479	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	18	0	379	18
Stage 1	-	-	-	-	18	-
Stage 2	-	-	-	-	361	-
Critical Hdwy	-	-	4.18	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.272	-	3.527	3.3
Pot Cap-1 Maneuver	-	-	1561	-	621	1066
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	703	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1561	-	605	1066
Mov Cap-2 Maneuver	-	-	-	-	605	-
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	685	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	29.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	605	-	-	-	1561	-
HCM Lane V/C Ratio	0.791	-	-	-	0.022	-
HCM Control Delay (s)	29.8	0	-	-	7.4	0
HCM Lane LOS	D	A	-	-	A	A
HCM 95th %tile Q(veh)	7.7	-	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	311	20	20	506	2	23	0	10	0	0	1
Future Volume (vph)	1	311	20	20	506	2	23	0	10	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		500			2850			500			200	
Travel Time (s)		9.7			55.5			11.4			4.5	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	2%	5%	0%	1%	0%	4%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	311	20	20	506	2	23	0	10	0	0	1
Future Vol, veh/h	1	311	20	20	506	2	23	0	10	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	2	5	0	1	0	4	0	0	0	0	0
Mvmt Flow	1	384	25	25	625	2	28	0	12	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	627	0	0	409	0	0	1076	1076	397	1081	1087	626
Stage 1	-	-	-	-	-	-	399	399	-	676	676	-
Stage 2	-	-	-	-	-	-	677	677	-	405	411	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.14	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.536	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	965	-	-	1161	-	-	195	221	657	197	218	488
Stage 1	-	-	-	-	-	-	623	606	-	446	456	-
Stage 2	-	-	-	-	-	-	439	455	-	626	598	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	965	-	-	1161	-	-	190	213	657	188	211	488
Mov Cap-2 Maneuver	-	-	-	-	-	-	190	213	-	188	211	-
Stage 1	-	-	-	-	-	-	622	605	-	446	441	-
Stage 2	-	-	-	-	-	-	423	440	-	614	597	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	22.9	12.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	242	965	-	-	1161	-	-	488
HCM Lane V/C Ratio	0.168	0.001	-	-	0.021	-	-	0.003
HCM Control Delay (s)	22.9	8.7	0	-	8.2	0	-	12.4
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	0



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	175	187	316	590	116	221
Future Volume (vph)	175	187	316	590	116	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	265			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		2850	400		399	
Travel Time (s)		64.8	7.8		9.1	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	0%	2%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	20.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	175	187	316	590	116	221
Future Vol, veh/h	175	187	316	590	116	221
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	265	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	2	0	2	3	1
Mvmt Flow	206	220	372	694	136	260

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1066	0	-	0	1351	719
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	632	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	661	-	-	-	165	430
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	528	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	661	-	-	-	~ 114	430
Mov Cap-2 Maneuver	-	-	-	-	~ 114	-
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	528	-

Approach	EB	WB	SB
HCM Control Delay, s	6.2	0	91.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	661	-	-	-	114	430
HCM Lane V/C Ratio	0.311	-	-	-	1.197	0.605
HCM Control Delay (s)	12.9	-	-	-	218.7	25.4
HCM Lane LOS	B	-	-	-	F	D
HCM 95th %tile Q(veh)	1.3	-	-	-	8.7	3.9

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	110	197	511	14	66	371
Future Volume (vph)	110	197	511	14	66	371
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		400	400		412	
Travel Time (s)		9.1	7.8		9.4	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	2%	1%	2%	8%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	15.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	110	197	511	14	66	371
Future Vol, veh/h	110	197	511	14	66	371
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	140	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	1	2	8	3	1
Mvmt Flow	129	232	601	16	78	436

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	601	0	-	0	1099	609
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	490	-
Critical Hdwy	4.12	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	976	-	-	-	234	497
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	614	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	976	-	-	-	203	497
Mov Cap-2 Maneuver	-	-	-	-	203	-
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	614	-

Approach	EB	WB	SB
HCM Control Delay, s	3.3	0	43.2
HCM LOS			E

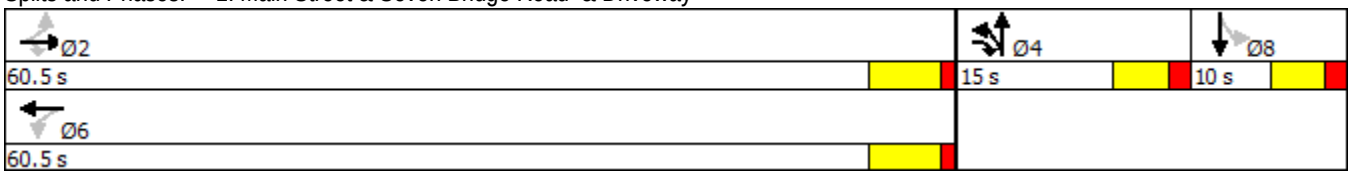
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	976	-	-	-	203	497
HCM Lane V/C Ratio	0.133	-	-	-	0.382	0.878
HCM Control Delay (s)	9.3	-	-	-	33.3	45
HCM Lane LOS	A	-	-	-	D	E
HCM 95th %tile Q(veh)	0.5	-	-	-	1.7	9.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	38	730	5	259	1	477	2	29	0	2	0
Future Volume (vph)	1	38	730	5	259	1	477	2	29	0	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	13	13	13	12	12	12
Storage Length (ft)	0		115	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	4%	2%	0%	1%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	pm+ov	Perm	NA		Split	NA			NA	
Protected Phases		2	4		6		4	4			8	
Permitted Phases	2		2	6						8		
Detector Phase	2	2	4	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		5.0	5.0	
Minimum Split (s)	15.5	15.5	15.0	15.5	15.5		15.0	15.0		10.0	10.0	
Total Split (s)	60.5	60.5	15.0	60.5	60.5		15.0	15.0		10.0	10.0	
Total Split (%)	70.8%	70.8%	17.5%	70.8%	70.8%		17.5%	17.5%		11.7%	11.7%	
Maximum Green (s)	55.0	55.0	10.0	55.0	55.0		10.0	10.0		5.0	5.0	
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.5	5.0	5.5	5.5			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	2.0	3.0	3.0		2.0	2.0		0.2	0.2	
Recall Mode	Min	Min	None	Min	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 85.5
Actuated Cycle Length: 34.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Main Street & Seven Bridge Road & Driveway



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	47	880	6	313	612	2
v/c Ratio	0.08	0.59	0.01	0.51	1.11	0.01
Control Delay	8.9	2.1	8.8	12.9	91.6	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	2.1	8.8	12.9	91.6	16.0
Queue Length 50th (ft)	5	0	1	38	~99	0
Queue Length 95th (ft)	22	15	6	108	#375	5
Internal Link Dist (ft)	1370			920	920	120
Turn Bay Length (ft)		115	50			
Base Capacity (vph)	1750	1489	1287	1819	552	286
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.59	0.00	0.17	1.11	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	38	730	5	259	1	477	2	29	0	2	0
Future Volume (veh/h)	1	38	730	5	259	1	477	2	29	0	2	0
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1828	1863	1900	1881	1900	1976	1940	1976	1900	1900	1900
Adj Flow Rate, veh/h	1	46	880	6	312	1	575	2	35	0	2	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	4	4	2	0	1	1	0	0	0	0	0	0
Cap, veh/h	71	961	1128	449	991	3	317	1	19	0	5	0
Arrive On Green	0.53	0.53	0.53	0.53	0.53	0.53	0.18	0.18	0.18	0.00	0.00	0.00
Sat Flow, veh/h	6	1818	1583	614	1874	6	1724	6	105	0	1900	0
Grp Volume(v), veh/h	47	0	880	6	0	313	612	0	0	0	2	0
Grp Sat Flow(s),veh/h/ln	1824	0	1583	614	0	1880	1835	0	0	0	1900	0
Q Serve(g_s), s	0.0	0.0	19.6	0.3	0.0	5.1	10.0	0.0	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.7	0.0	19.6	0.9	0.0	5.1	10.0	0.0	0.0	0.0	0.1	0.0
Prop In Lane	0.02		1.00	1.00		0.00	0.94		0.06	0.00		0.00
Lane Grp Cap(c), veh/h	1032	0	1128	449	0	994	337	0	0	0	5	0
V/C Ratio(X)	0.05	0.00	0.78	0.01	0.00	0.31	1.81	0.00	0.00	0.00	0.38	0.00
Avail Cap(c_a), veh/h	1899	0	1891	745	0	1900	337	0	0	0	175	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	6.2	0.0	5.1	6.4	0.0	7.3	22.2	0.0	0.0	0.0	27.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.2	0.0	0.0	0.2	378.2	0.0	0.0	0.0	16.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	13.3	0.0	0.0	2.7	40.4	0.0	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	6.2	0.0	6.3	6.4	0.0	7.4	400.5	0.0	0.0	0.0	43.4	0.0
LnGrp LOS	A		A	A		A	F				D	
Approach Vol, veh/h		927			319			612			2	
Approach Delay, s/veh		6.3			7.4			400.5			43.4	
Approach LOS		A			A			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		34.3		15.0		34.3		5.1
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0
Max Green Setting (Gmax), s		55.0		10.0		55.0		5.0
Max Q Clear Time (g_c+I1), s		21.6		12.0		7.1		2.1
Green Ext Time (p_c), s		7.2		0.0		7.5		0.0

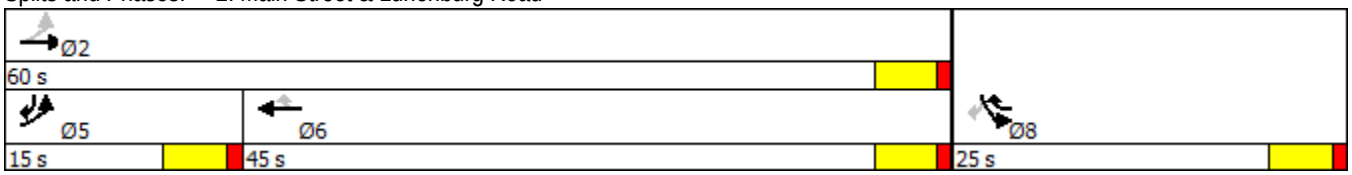
Intersection Summary		
HCM 2010 Ctrl Delay		136.2
HCM 2010 LOS		F

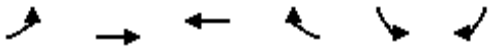
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	48	393	423	315	373	42
Future Volume (vph)	48	393	423	315	373	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	100			160	0	240
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	2%	1%	2%	0%
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	8	8	5
Permitted Phases	2			6		8
Detector Phase	5	2	6	8	8	5
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	11.0	15.0	15.0	15.0	15.0	11.0
Total Split (s)	15.0	60.0	45.0	25.0	25.0	15.0
Total Split (%)	17.6%	70.6%	52.9%	29.4%	29.4%	17.6%
Maximum Green (s)	10.0	55.0	40.0	20.0	20.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	3.0	3.0	2.0	2.0	2.0
Recall Mode	None	Min	Min	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 58.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Main Street & Lunenburg Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	51	414	445	332	393	44
v/c Ratio	0.14	0.47	0.73	0.26	0.68	0.05
Control Delay	7.9	11.3	25.7	0.8	28.2	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	11.3	25.7	0.8	28.2	9.8
Queue Length 50th (ft)	9	89	144	0	123	7
Queue Length 95th (ft)	22	144	243	15	#310	27
Internal Link Dist (ft)		920	1370		920	
Turn Bay Length (ft)	100			160		240
Base Capacity (vph)	439	1618	1264	1287	614	946
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.26	0.35	0.26	0.64	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	48	393	423	315	373	42
Future Volume (veh/h)	48	393	423	315	373	42
Number	5	2	6	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1863	1881	1863	1900
Adj Flow Rate, veh/h	51	414	445	332	393	44
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	2	1	2	0
Cap, veh/h	380	1018	708	1022	459	517
Arrive On Green	0.06	0.54	0.38	0.38	0.26	0.26
Sat Flow, veh/h	1774	1881	1863	1599	1774	1615
Grp Volume(v), veh/h	51	414	445	332	393	44
Grp Sat Flow(s),veh/h/ln	1774	1881	1863	1599	1774	1615
Q Serve(g_s), s	0.8	6.5	9.7	4.7	10.5	1.0
Cycle Q Clear(g_c), s	0.8	6.5	9.7	4.7	10.5	1.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	380	1018	708	1022	459	517
V/C Ratio(X)	0.13	0.41	0.63	0.32	0.86	0.09
Avail Cap(c_a), veh/h	627	2068	1490	1693	709	744
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.4	6.8	12.6	4.1	17.6	11.9
Incr Delay (d2), s/veh	0.1	0.3	0.9	0.2	3.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.4	5.1	3.6	5.6	0.4
LnGrp Delay(d),s/veh	8.5	7.0	13.5	4.3	21.6	11.9
LnGrp LOS	A	A	B	A	C	B
Approach Vol, veh/h		465	777		437	
Approach Delay, s/veh		7.2	9.6		20.6	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		32.1			8.0	24.0		18.0
Change Period (Y+Rc), s		5.0			5.0	5.0		5.0
Max Green Setting (Gmax), s		55.0			10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s		8.5			2.8	11.7		12.5
Green Ext Time (p_c), s		7.9			0.0	7.3		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	59	32	25	346	386	60
Future Volume (vph)	59	32	25	346	386	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	5%	11%	0%	3%	2%	5%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	59	32	25	346	386	60
Future Vol, veh/h	59	32	25	346	386	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	5	11	0	3	2	5
Mvmt Flow	61	33	26	360	402	63

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	846	434	465	0	-	0
Stage 1	434	-	-	-	-	-
Stage 2	412	-	-	-	-	-
Critical Hdwy	6.45	6.31	4.1	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.399	2.2	-	-	-
Pot Cap-1 Maneuver	329	603	1107	-	-	-
Stage 1	647	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	319	603	1107	-	-	-
Mov Cap-2 Maneuver	319	-	-	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	662	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.5	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1107	-	382	-	-
HCM Lane V/C Ratio	0.024	-	0.248	-	-
HCM Control Delay (s)	8.3	0	17.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	49	141	225	61	112	123	202	93	84	139	113
Future Volume (vph)	36	49	141	225	61	112	123	202	93	84	139	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	16	16	16	14	14	14	15	15	15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		999			500			4300			875	
Travel Time (s)		22.7			11.4			97.7			19.9	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	2%	1%	0%	6%	0%	4%	5%	14%	3%	1%
Shared Lane Traffic (%)												
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout

ROUNDABOUT ANALYSIS

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	Appr Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	Lunenburg Road	70.00*	17.50*	105.0*	65.0*	30.0*	1	1	13.50*	1500.0	NA[5]	0.0[1]
East	Old Union Turnpike	70.00*	17.50*	105.0*	100.0*	30.0*	1	1	17.00*	1500.0	NA[5]	0.0[1]
North	Lunenburg Road	70.00*	17.50*	105.0*	50.0*	30.0*	1	1	13.00*	1500.0	NA[5]	0.0[1]
West	Old Union Turnpike	70.00*	17.50*	105.0*	75.0*	30.0*	1	1	14.00*	1500.0	NA[5]	0.0[1]

Roundabout Capacity Model: US HCM 6

* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
1 Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).
5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	OD Mov	Lane No	Lane Type	Opng Flow pcu/h	In-Bunch Headway sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	HVE for Entry	Critical Gap sec	Follow-up Headway sec
South: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
West	L2	1	Dominant	181	0.00	0.000	No	No	–	1.06	4.98	2.61
North	T1	1	Dominant	181	0.00	0.000	No	No	–	1.07	4.98	2.61
East	R2	1	Dominant	181	0.00	0.000	No	No	–	1.21	4.98	2.61
East: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
South	L2	1	Dominant	397	0.00	0.000	No	No	–	1.09	4.98	2.61
West	T1	1	Dominant	397	0.00	0.000	No	No	–	1.00	4.98	2.61
North	R2	1	Dominant	397	0.00	0.000	No	No	–	1.16	4.98	2.61
North: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
East	L2	1	Dominant	450	0.00	0.000	No	No	–	1.04	4.98	2.61
South	T1	1	Dominant	450	0.00	0.000	No	No	–	1.04	4.98	2.61
West	R2	1	Dominant	450	0.00	0.000	No	No	–	1.10	4.98	2.61
West: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
North	L2	1	Dominant	492	0.00	0.000	No	No	–	1.06	4.98	2.61
East	T1	1	Dominant	492	0.00	0.000	No	No	–	1.02	4.98	2.61
South	R2	1	Dominant	492	0.00	0.000	No	No	–	1.03	4.98	2.61

Roundabout Capacity Model: US HCM 6

Circulating Lane Flow Rates

Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: Lunenburg Road			
Lane 1	174	181	100.0
Approach	174	181	
East: Old Union Turnpike			
Lane 1	372	397	100.0
Approach	372	397	
North: Lunenburg Road			
Lane 1	422	450	100.0
Approach	422	450	
West: Old Union Turnpike			
Lane 1	462	492	100.0
Approach	462	492	

Roundabout Capacity Model: The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes.
To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

MOVEMENT SUMMARY

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lunenburg Road											
3	L2	127	6.0	0.412	7.8	LOS A	2.2	60.1	0.44	0.30	29.2
8	T1	208	7.0	0.412	7.8	LOS A	2.2	60.1	0.44	0.30	29.3
18	R2	96	21.0	0.412	8.3	LOS A	2.2	60.1	0.44	0.30	28.4
Approach		431	9.8	0.412	7.9	LOS A	2.2	60.1	0.44	0.30	29.1
East: Old Union Turnpike											
1	L2	232	9.0	0.488	10.7	LOS B	3.1	84.2	0.64	0.67	27.7
6	T1	63	0.0	0.488	10.4	LOS B	3.1	84.2	0.64	0.67	27.7
16	R2	115	16.0	0.488	11.0	LOS B	3.1	84.2	0.64	0.67	27.0
Approach		410	9.6	0.488	10.7	LOS B	3.1	84.2	0.64	0.67	27.5
North: Lunenburg Road											
7	L2	87	4.0	0.421	9.5	LOS A	2.3	59.8	0.64	0.64	28.7
4	T1	143	4.0	0.421	9.5	LOS A	2.3	59.8	0.64	0.64	28.7
14	R2	116	10.0	0.421	9.8	LOS A	2.3	59.8	0.64	0.64	28.0
Approach		346	6.0	0.421	9.6	LOS A	2.3	59.8	0.64	0.64	28.4
West: Old Union Turnpike											
5	L2	37	6.0	0.288	7.8	LOS A	1.3	33.5	0.60	0.56	29.6
2	T1	51	2.0	0.288	7.6	LOS A	1.3	33.5	0.60	0.56	29.6
12	R2	145	3.0	0.288	7.7	LOS A	1.3	33.5	0.60	0.56	28.9
Approach		233	3.3	0.288	7.7	LOS A	1.3	33.5	0.60	0.56	29.2
All Vehicles		1421	7.8	0.488	9.1	LOS A	3.1	84.2	0.57	0.53	28.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	3	120	1	77	1	211	138	53	213	0
Future Volume (vph)	0	0	3	120	1	77	1	211	138	53	213	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	11	11	11
Storage Length (ft)	0		0	65		0	0		55	0		0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		500			500			875			1000	
Travel Time (s)		11.4			9.7			17.0			19.5	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	4%	0%	8%	0%	5%	3%	8%	6%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection

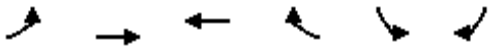
Int Delay, s/veh 4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	120	1	77	1	211	138	53	213	0
Future Vol, veh/h	0	0	3	120	1	77	1	211	138	53	213	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	65	-	-	-	-	55	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	4	0	8	0	5	3	8	6	0
Mvmt Flow	0	0	4	143	1	92	1	251	164	63	254	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	680	633	254	635	633	251	254	0	0	251	0	0
Stage 1	380	380	-	253	253	-	-	-	-	-	-	-
Stage 2	300	253	-	382	380	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.14	6.5	6.28	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.536	4	3.372	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	368	400	790	388	400	773	1323	-	-	1280	-	-
Stage 1	646	617	-	747	701	-	-	-	-	-	-	-
Stage 2	713	701	-	636	617	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	309	377	790	369	377	773	1323	-	-	1280	-	-
Mov Cap-2 Maneuver	309	377	-	369	377	-	-	-	-	-	-	-
Stage 1	645	582	-	746	700	-	-	-	-	-	-	-
Stage 2	627	700	-	597	582	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	16.7	0	1.6
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1323	-	-	790	369	763	1280	-	-
HCM Lane V/C Ratio	0.001	-	-	0.005	0.387	0.122	0.049	-	-
HCM Control Delay (s)	7.7	0	-	9.6	20.8	10.4	8	0	-
HCM Lane LOS	A	A	-	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	1.8	0.4	0.2	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	144	81	203	3	19	195
Future Volume (vph)	144	81	203	3	19	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	16	16	16
Storage Length (ft)	0			60	0	75
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		30	
Link Distance (ft)		500	500		300	
Travel Time (s)		8.5	8.5		6.8	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	13%	1%	0%	0%	0%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	144	81	203	3	19	195
Future Vol, veh/h	144	81	203	3	19	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	-	-	-	60	0	75
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	13	1	0	0	0	5
Mvmt Flow	169	95	239	4	22	229

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	239	0	-	0	672	239
Stage 1	-	-	-	-	239	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	4.23	-	-	-	6.4	6.25
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.317	-	-	-	3.5	3.345
Pot Cap-1 Maneuver	1266	-	-	-	424	793
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	658	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1266	-	-	-	364	793
Mov Cap-2 Maneuver	-	-	-	-	364	-
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	658	-

Approach	EB	WB	SB
HCM Control Delay, s	5.3	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1266	-	-	-	364	793
HCM Lane V/C Ratio	0.134	-	-	-	0.061	0.289
HCM Control Delay (s)	8.3	0	-	-	15.5	11.4
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.2	1.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	301	16	15	275	0	15	0	10	0	0	1
Future Volume (vph)	1	301	16	15	275	0	15	0	10	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		500			2950			500			200	
Travel Time (s)		9.7			57.5			11.4			4.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	301	16	15	275	0	15	0	10	0	0	1
Future Vol, veh/h	1	301	16	15	275	0	15	0	10	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	314	17	16	286	0	16	0	10	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	286	0	0	331	0	0	644	643	323	648	651	286
Stage 1	-	-	-	-	-	-	325	325	-	318	318	-
Stage 2	-	-	-	-	-	-	319	318	-	330	333	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1288	-	-	1240	-	-	389	394	723	386	390	758
Stage 1	-	-	-	-	-	-	692	653	-	698	657	-
Stage 2	-	-	-	-	-	-	697	657	-	687	647	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1288	-	-	1240	-	-	384	388	723	376	384	758
Mov Cap-2 Maneuver	-	-	-	-	-	-	384	388	-	376	384	-
Stage 1	-	-	-	-	-	-	691	652	-	697	647	-
Stage 2	-	-	-	-	-	-	686	647	-	676	646	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	13.1	9.8
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	473	1288	-	-	1240	-	-	758
HCM Lane V/C Ratio	0.055	0.001	-	-	0.013	-	-	0.001
HCM Control Delay (s)	13.1	7.8	0	-	7.9	0	-	9.8
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	143	176	164	514	136	134
Future Volume (vph)	143	176	164	514	136	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	265			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		2950	300		300	
Travel Time (s)		67.0	5.8		6.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	2%	0%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

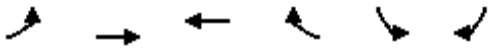
Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	143	176	164	514	136	134
Future Vol, veh/h	143	176	164	514	136	134
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	265	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	0	2	0	2
Mvmt Flow	147	181	169	530	140	138

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	699	0	-	0	909	434
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	475	-
Critical Hdwy	4.11	-	-	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.318
Pot Cap-1 Maneuver	902	-	-	-	308	622
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	630	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	902	-	-	-	258	622
Mov Cap-2 Maneuver	-	-	-	-	258	-
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	630	-

Approach	EB	WB	SB
HCM Control Delay, s	4.4	0	23.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	902	-	-	-	258	622
HCM Lane V/C Ratio	0.163	-	-	-	0.543	0.222
HCM Control Delay (s)	9.8	-	-	-	34.4	12.4
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.6	-	-	-	3	0.8



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	133	179	248	5	62	432
Future Volume (vph)	133	179	248	5	62	432
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	16
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		300	450		300	
Travel Time (s)		6.8	8.8		6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	133	179	248	5	62	432
Future Vol, veh/h	133	179	248	5	62	432
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	140	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	3	1
Mvmt Flow	139	186	258	5	65	450

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	258	0	-	0	725	261
Stage 1	-	-	-	-	261	-
Stage 2	-	-	-	-	464	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1318	-	-	-	391	780
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1318	-	-	-	350	780
Mov Cap-2 Maneuver	-	-	-	-	350	-
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	SB
HCM Control Delay, s	3.4	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1318	-	-	-	350	780
HCM Lane V/C Ratio	0.105	-	-	-	0.185	0.577
HCM Control Delay (s)	8.1	-	-	-	17.6	15.7
HCM Lane LOS	A	-	-	-	C	C
HCM 95th %tile Q(veh)	0.4	-	-	-	0.7	3.8

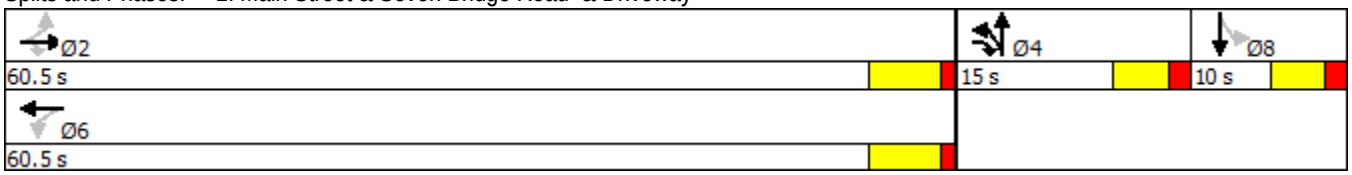
2026 Build Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	840	427	16	535	0	303	0	8	0	0	0
Future Volume (vph)	0	840	427	16	535	0	303	0	8	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	15	15	15	12	12	12
Storage Length (ft)	0		115	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	3%	0%	6%	0%	7%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type		NA	pm+ov	Perm	NA		Split	NA				
Protected Phases		2	4		6		4	4			8	
Permitted Phases	2		2	6						8		
Detector Phase	2	2	4	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		5.0	5.0	
Minimum Split (s)	15.5	15.5	15.0	15.5	15.5		15.0	15.0		10.0	10.0	
Total Split (s)	60.5	60.5	15.0	60.5	60.5		15.0	15.0		10.0	10.0	
Total Split (%)	70.8%	70.8%	17.5%	70.8%	70.8%		17.5%	17.5%		11.7%	11.7%	
Maximum Green (s)	55.0	55.0	10.0	55.0	55.0		10.0	10.0		5.0	5.0	
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.5	5.0	5.5	5.5			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	2.0	3.0	3.0		2.0	2.0		0.2	0.2	
Recall Mode	Min	Min	None	Min	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 85.5
Actuated Cycle Length: 56.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Main Street & Seven Bridge Road & Driveway



Lane Group	EBT	EBR	WBL	WBT	NBT
Lane Group Flow (vph)	903	459	17	575	335
v/c Ratio	0.84	0.30	0.08	0.53	0.80
Control Delay	15.8	0.5	4.4	7.4	36.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	0.5	4.4	7.4	36.4
Queue Length 50th (ft)	190	0	2	87	74
Queue Length 95th (ft)	320	0	7	137	#283
Internal Link Dist (ft)	1370			920	920
Turn Bay Length (ft)		115	50		
Base Capacity (vph)	1596	1516	302	1596	420
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.57	0.30	0.06	0.36	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	840	427	16	535	0	303	0	8	0	0	0
Future Volume (veh/h)	0	840	427	16	535	0	303	0	8	0	0	0
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1792	1845	1900	1792	1900	1976	1850	1976	1900	1900	1900
Adj Flow Rate, veh/h	0	903	459	17	575	0	326	0	9	0	0	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	3	0	6	6	0	0	0	0	0	0
Cap, veh/h	0	1195	1300	250	1195	0	278	0	8	0	3	0
Arrive On Green	0.00	0.67	0.67	0.67	0.67	0.00	0.16	0.00	0.16	0.00	0.00	0.00
Sat Flow, veh/h	0	1792	1568	406	1792	0	1709	0	47	0	1900	0
Grp Volume(v), veh/h	0	903	459	17	575	0	335	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1792	1568	406	1792	0	1756	0	0	0	1900	0
Q Serve(g_s), s	0.0	20.8	4.3	1.8	9.7	0.0	10.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	20.8	4.3	22.6	9.7	0.0	10.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00	0.97		0.03	0.00		0.00
Lane Grp Cap(c), veh/h	0	1195	1300	250	1195	0	286	0	0	0	3	0
V/C Ratio(X)	0.00	0.76	0.35	0.07	0.48	0.00	1.17	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1604	1658	343	1604	0	286	0	0	0	155	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	6.9	1.3	14.5	5.0	0.0	25.7	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.4	0.2	0.1	0.3	0.0	108.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.5	3.6	0.2	4.7	0.0	13.4	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	8.3	1.4	14.6	5.3	0.0	134.0	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		A	A	B	A		F					
Approach Vol, veh/h		1362			592			335			0	
Approach Delay, s/veh		6.0			5.6			134.0			0.0	
Approach LOS		A			A			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		46.5		15.0		46.5		0.0
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0
Max Green Setting (Gmax), s		55.0		10.0		55.0		5.0
Max Q Clear Time (g_c+I1), s		22.8		12.0		24.6		0.0
Green Ext Time (p_c), s		16.8		0.0		16.3		0.0

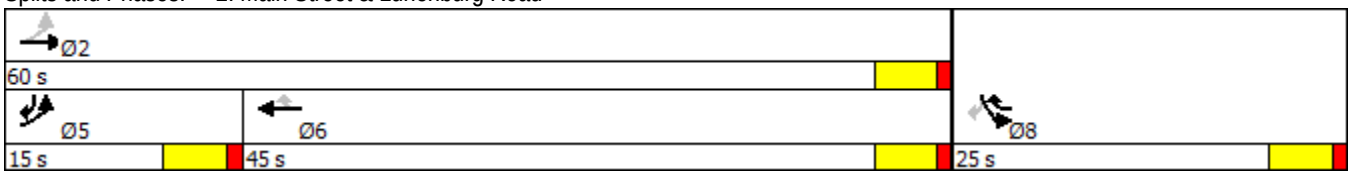
Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

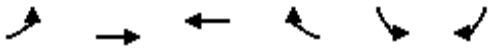
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	69	805	396	450	457	49
Future Volume (vph)	69	805	396	450	457	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	100			160	0	240
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	6%	6%	8%	3%
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	8	8	5
Permitted Phases	2			6		8
Detector Phase	5	2	6	8	8	5
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	11.0	15.0	15.0	15.0	15.0	11.0
Total Split (s)	15.0	60.0	45.0	25.0	25.0	15.0
Total Split (%)	17.6%	70.6%	52.9%	29.4%	29.4%	17.6%
Maximum Green (s)	10.0	55.0	40.0	20.0	20.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	3.0	3.0	2.0	2.0	2.0
Recall Mode	None	Min	Min	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 69.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Main Street & Lunenburg Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	74	866	426	484	491	53
v/c Ratio	0.17	0.88	0.57	0.37	1.03	0.08
Control Delay	7.1	24.0	18.4	1.1	80.8	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	24.0	18.4	1.1	80.8	14.9
Queue Length 50th (ft)	13	284	137	0	~237	13
Queue Length 95th (ft)	27	446	221	14	#523	42
Internal Link Dist (ft)		920	1370		920	
Turn Bay Length (ft)	100			160		240
Base Capacity (vph)	497	1422	1030	1295	475	780
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.61	0.41	0.37	1.03	0.07

Intersection Summary

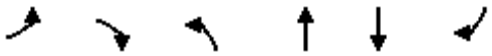
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	69	805	396	450	457	49
Future Volume (veh/h)	69	805	396	450	457	49
Number	5	2	6	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1827	1792	1792	1759	1845
Adj Flow Rate, veh/h	74	866	426	484	491	53
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	4	6	6	8	3
Cap, veh/h	384	1065	805	1108	466	537
Arrive On Green	0.06	0.58	0.45	0.45	0.28	0.28
Sat Flow, veh/h	1774	1827	1792	1524	1675	1568
Grp Volume(v), veh/h	74	866	426	484	491	53
Grp Sat Flow(s),veh/h/ln	1774	1827	1792	1524	1675	1568
Q Serve(g_s), s	1.4	27.0	12.4	9.1	20.0	1.7
Cycle Q Clear(g_c), s	1.4	27.0	12.4	9.1	20.0	1.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	384	1065	805	1108	466	537
V/C Ratio(X)	0.19	0.81	0.53	0.44	1.05	0.10
Avail Cap(c_a), veh/h	516	1397	997	1271	466	537
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.5	11.9	14.3	3.9	26.0	16.1
Incr Delay (d2), s/veh	0.1	2.9	0.5	0.3	56.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	14.3	6.2	7.7	16.5	0.7
LnGrp Delay(d),s/veh	9.6	14.8	14.9	4.2	82.7	16.1
LnGrp LOS	A	B	B	A	F	B
Approach Vol, veh/h		940	910		544	
Approach Delay, s/veh		14.4	9.2		76.2	
Approach LOS		B	A		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		46.9			9.6	37.3		25.0
Change Period (Y+Rc), s		5.0			5.0	5.0		5.0
Max Green Setting (Gmax), s		55.0			10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s		29.0			3.4	14.4		22.0
Green Ext Time (p_c), s		12.9			0.0	12.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	26.4
HCM 2010 LOS	C



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	139	136	189	333	385	297
Future Volume (vph)	139	136	189	333	385	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	33%	18%	7%	10%	6%	17%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	78

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	139	136	189	333	385	297
Future Vol, veh/h	139	136	189	333	385	297
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	33	18	7	10	6	17
Mvmt Flow	149	146	203	358	414	319

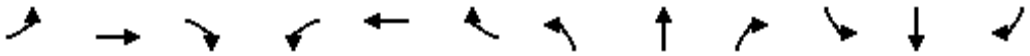
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1338	574	733	0	-	0
Stage 1	574	-	-	-	-	-
Stage 2	764	-	-	-	-	-
Critical Hdwy	6.73	6.38	4.17	-	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.462	2.263	-	-	-
Pot Cap-1 Maneuver	~ 145	489	849	-	-	-
Stage 1	507	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 102	489	849	-	-	-
Mov Cap-2 Maneuver	~ 102	-	-	-	-	-
Stage 1	356	-	-	-	-	-
Stage 2	409	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 412.4	3.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	849	-	168	-	-
HCM Lane V/C Ratio	0.239	-	1.76	-	-
HCM Control Delay (s)	10.6	0	$ 412.4	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.9	-	21.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	148	157	247	28	66	98	263	139	289	306	45
Future Volume (vph)	38	148	157	247	28	66	98	263	139	289	306	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	16	16	16	14	14	14	15	15	15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		999			500			4300			875	
Travel Time (s)		22.7			11.4			97.7			19.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	6%	2%	3%	9%	0%	16%	6%	7%	21%	4%	4%	10%
Shared Lane Traffic (%)												
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout

ROUNDABOUT ANALYSIS

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	Appr Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	Lunenburg Road	70.00*	17.50*	105.0*	65.0*	30.0*	1	1	13.50*	1500.0	NA[5]	0.0[1]
East	Old Union Turnpike	70.00*	17.50*	105.0*	100.0*	30.0*	1	1	17.00*	1500.0	NA[5]	0.0[1]
North	Lunenburg Road	70.00*	17.50*	105.0*	50.0*	30.0*	1	1	13.00*	1500.0	NA[5]	0.0[1]
West	Old Union Turnpike	70.00*	17.50*	105.0*	75.0*	30.0*	1	1	14.00*	1500.0	NA[5]	0.0[1]

Roundabout Capacity Model: US HCM 6

* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
1 Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).
5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	OD Mov	Lane No	Lane Type	Opng Flow pcu/h	In-Bunch Headway sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	HVE for Entry	Critical Gap sec	Follow-up Headway sec
South: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
West	L2	1	Dominant	507	0.00	0.000	No	No	–	1.06	4.98	2.61
North	T1	1	Dominant	507	0.00	0.000	No	No	–	1.07	4.98	2.61
East	R2	1	Dominant	507	0.00	0.000	No	No	–	1.21	4.98	2.61
East: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
South	L2	1	Dominant	439	0.00	0.000	No	No	–	1.09	4.98	2.61
West	T1	1	Dominant	439	0.00	0.000	No	No	–	1.00	4.98	2.61
North	R2	1	Dominant	439	0.00	0.000	No	No	–	1.16	4.98	2.61
North: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
East	L2	1	Dominant	414	0.00	0.000	No	No	–	1.04	4.98	2.61
South	T1	1	Dominant	414	0.00	0.000	No	No	–	1.04	4.98	2.61
West	R2	1	Dominant	414	0.00	0.000	No	No	–	1.10	4.98	2.61
West: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
North	L2	1	Dominant	915	0.00	0.000	No	No	–	1.06	4.98	2.61
East	T1	1	Dominant	915	0.00	0.000	No	No	–	1.02	4.98	2.61
South	R2	1	Dominant	915	0.00	0.000	No	No	–	1.03	4.98	2.61

Roundabout Capacity Model: US HCM 6

Circulating Lane Flow Rates

Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: Lunenburg Road			
Lane 1	490	507	100.0
Approach	490	507	
East: Old Union Turnpike			
Lane 1	411	439	100.0
Approach	411	439	
North: Lunenburg Road			
Lane 1	385	414	100.0
Approach	385	414	
West: Old Union Turnpike			
Lane 1	868	915	100.0
Approach	868	915	

Roundabout Capacity Model: The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes.
To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

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MOVEMENT SUMMARY

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lunenburg Road											
3	L2	101	6.0	0.694	18.3	LOS C	7.4	201.4	0.80	1.13	25.6
8	T1	271	7.0	0.694	18.4	LOS C	7.4	201.4	0.80	1.13	25.6
18	R2	143	21.0	0.694	19.0	LOS C	7.4	201.4	0.80	1.13	25.0
Approach		515	10.7	0.694	18.5	LOS C	7.4	201.4	0.80	1.13	25.5
East: Old Union Turnpike											
1	L2	255	9.0	0.437	10.1	LOS B	2.4	64.1	0.63	0.64	27.7
6	T1	29	0.0	0.437	9.7	LOS A	2.4	64.1	0.63	0.64	27.7
16	R2	68	16.0	0.437	10.3	LOS B	2.4	64.1	0.63	0.64	27.0
Approach		352	9.6	0.437	10.1	LOS B	2.4	64.1	0.63	0.64	27.6
North: Lunenburg Road											
7	L2	298	4.0	0.761	19.9	LOS C	12.1	313.4	0.88	1.27	25.0
4	T1	315	4.0	0.761	19.9	LOS C	12.1	313.4	0.88	1.27	25.0
14	R2	46	10.0	0.761	20.1	LOS C	12.1	313.4	0.88	1.27	24.4
Approach		660	4.4	0.761	19.9	LOS C	12.1	313.4	0.88	1.27	24.9
West: Old Union Turnpike											
5	L2	39	6.0	0.671	23.2	LOS C	5.0	127.2	0.84	1.11	24.4
2	T1	153	2.0	0.671	22.9	LOS C	5.0	127.2	0.84	1.11	24.4
12	R2	162	3.0	0.671	23.0	LOS C	5.0	127.2	0.84	1.11	24.0
Approach		354	2.9	0.671	23.0	LOS C	5.0	127.2	0.84	1.11	24.2
All Vehicles		1880	6.8	0.761	18.3	LOS C	12.1	313.4	0.81	1.09	25.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	5	3	90	0	44	0	166	201	73	547	0
Future Volume (vph)	0	5	3	90	0	44	0	166	201	73	547	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	11	11	11
Storage Length (ft)	0		0	65		0	0		55	0		0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		500			420			875			1000	
Travel Time (s)		11.4			8.2			17.0			19.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	10%	0%	11%	0%	10%	8%	2%	4%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

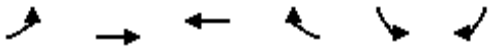
Intersection												
Int Delay, s/veh	3.4											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	3	90	0	44	0	166	201	73	547	0
Future Vol, veh/h	0	5	3	90	0	44	0	166	201	73	547	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	65	-	-	-	-	55	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	10	0	11	0	10	8	2	4	0
Mvmt Flow	0	5	3	94	0	46	0	173	209	76	570	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	918	895	570	899	895	173	570	0	0	173	0	0
Stage 1	722	722	-	173	173	-	-	-	-	-	-	-
Stage 2	196	173	-	726	722	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.2	6.5	6.31	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.2	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.2	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.59	4	3.399	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	254	282	525	252	282	848	1013	-	-	1404	-	-
Stage 1	421	434	-	810	760	-	-	-	-	-	-	-
Stage 2	810	760	-	404	434	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	226	260	525	232	260	848	1013	-	-	1404	-	-
Mov Cap-2 Maneuver	226	260	-	232	260	-	-	-	-	-	-	-
Stage 1	421	400	-	810	760	-	-	-	-	-	-	-
Stage 2	766	760	-	365	400	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.5	23.7	0	0.9
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1013	-	-	321	232	848	1404	-	-
HCM Lane V/C Ratio	-	-	-	0.026	0.404	0.054	0.054	-	-
HCM Control Delay (s)	0	-	-	16.5	30.7	9.5	7.7	0	-
HCM Lane LOS	A	-	-	C	D	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.8	0.2	0.2	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	437	139	73	0	13	268
Future Volume (vph)	437	139	73	0	13	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	16	16	16
Storage Length (ft)	0			60	0	75
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		30	
Link Distance (ft)		500	500		300	
Travel Time (s)		8.5	8.5		6.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	8%	4%	2%	0%	0%	17%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	437	139	73	0	13	268
Future Vol, veh/h	437	139	73	0	13	268
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	-	-	-	60	0	75
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	8	4	2	0	0	17
Mvmt Flow	465	148	78	0	14	285

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	78	0	-	0	1156	78
Stage 1	-	-	-	-	78	-
Stage 2	-	-	-	-	1078	-
Critical Hdwy	4.18	-	-	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.272	-	-	-	3.5	3.453
Pot Cap-1 Maneuver	1483	-	-	-	219	943
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	330	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1483	-	-	-	144	943
Mov Cap-2 Maneuver	-	-	-	-	144	-
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	330	-

Approach	EB	WB	SB
HCM Control Delay, s	6.5	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1483	-	-	-	144	943
HCM Lane V/C Ratio	0.313	-	-	-	0.096	0.302
HCM Control Delay (s)	8.5	0	-	-	32.6	10.5
HCM Lane LOS	A	A	-	-	D	B
HCM 95th %tile Q(veh)	1.4	-	-	-	0.3	1.3

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	67	212	15	31	103	0
Future Volume (vph)	67	212	15	31	103	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	13	13	16	16
Storage Length (ft)		75	0		0	60
Storage Lanes		1	0		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	30	
Link Distance (ft)	420			500	300	
Travel Time (s)	8.2			9.7	6.8	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	13%	2%	0%	12%	8%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	67	212	15	31	103	0
Future Vol, veh/h	67	212	15	31	103	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Stop
Storage Length	-	75	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	13	2	0	12	8	0
Mvmt Flow	75	238	17	35	116	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	75	0	144	75
Stage 1	-	-	-	-	75	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	-	-	4.1	-	6.48	6.2
Critical Hdwy Stg 1	-	-	-	-	5.48	-
Critical Hdwy Stg 2	-	-	-	-	5.48	-
Follow-up Hdwy	-	-	2.2	-	3.572	3.3
Pot Cap-1 Maneuver	-	-	1537	-	835	992
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	939	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1537	-	826	992
Mov Cap-2 Maneuver	-	-	-	-	826	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	929	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	826	-	-	-	1537	-
HCM Lane V/C Ratio	0.14	-	-	-	0.011	-
HCM Control Delay (s)	10.1	0	-	-	7.4	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	542	10	4	173	0	30	0	76	0	0	1
Future Volume (vph)	1	542	10	4	173	0	30	0	76	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		500			2950			500			200	
Travel Time (s)		9.7			57.5			11.4			4.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	2%	13%	50%	6%	0%	4%	0%	6%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	542	10	4	173	0	30	0	76	0	0	1
Future Vol, veh/h	1	542	10	4	173	0	30	0	76	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	2	13	50	6	0	4	0	6	0	0	0
Mvmt Flow	1	583	11	4	186	0	32	0	82	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	186	0	0	594	0	0	786	785	589	826	790	186
Stage 1	-	-	-	-	-	-	591	591	-	194	194	-
Stage 2	-	-	-	-	-	-	195	194	-	632	596	-
Critical Hdwy	4.1	-	-	4.6	-	-	7.14	6.5	6.26	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.65	-	-	3.536	4	3.354	3.5	4	3.3
Pot Cap-1 Maneuver	1401	-	-	785	-	-	307	327	501	293	325	861
Stage 1	-	-	-	-	-	-	490	498	-	812	744	-
Stage 2	-	-	-	-	-	-	802	744	-	472	495	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1401	-	-	785	-	-	305	325	501	244	323	861
Mov Cap-2 Maneuver	-	-	-	-	-	-	305	325	-	244	323	-
Stage 1	-	-	-	-	-	-	490	498	-	811	740	-
Stage 2	-	-	-	-	-	-	796	740	-	395	495	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	16.6	9.2
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	424	1401	-	-	785	-	-	861
HCM Lane V/C Ratio	0.269	0.001	-	-	0.005	-	-	0.001
HCM Control Delay (s)	16.6	7.6	0	-	9.6	0	-	9.2
HCM Lane LOS	C	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	120	402	132	190	121	85
Future Volume (vph)	120	402	132	190	121	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	265			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		2950	300		300	
Travel Time (s)		67.0	5.8		6.8	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	2%	3%	2%	7%	2%	4%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	402	132	190	121	85
Future Vol, veh/h	120	402	132	190	121	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	265	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	3	2	7	2	4
Mvmt Flow	140	467	153	221	141	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	374	0	-	0	1011	264
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	747	-
Critical Hdwy	4.12	-	-	-	6.42	6.24
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.336
Pot Cap-1 Maneuver	1184	-	-	-	265	770
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	468	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1184	-	-	-	234	770
Mov Cap-2 Maneuver	-	-	-	-	234	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	468	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	28.5
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1184	-	-	-	234	770
HCM Lane V/C Ratio	0.118	-	-	-	0.601	0.128
HCM Control Delay (s)	8.4	-	-	-	41.2	10.4
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0.4	-	-	-	3.5	0.4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	222	271	173	2	109	187
Future Volume (vph)	222	271	173	2	109	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	16
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		300	600		300	
Travel Time (s)		6.8	11.7		6.8	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	2%	3%	4%	50%	7%	7%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	9.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	222	271	173	2	109	187
Future Vol, veh/h	222	271	173	2	109	187
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	140	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	3	4	50	7	7
Mvmt Flow	261	319	204	2	128	220

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	204	0	-	0	1046	205
Stage 1	-	-	-	-	205	-
Stage 2	-	-	-	-	841	-
Critical Hdwy	4.12	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	1368	-	-	-	248	823
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	415	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1368	-	-	-	201	823
Mov Cap-2 Maneuver	-	-	-	-	201	-
Stage 1	-	-	-	-	662	-
Stage 2	-	-	-	-	415	-

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	25.4
HCM LOS			D

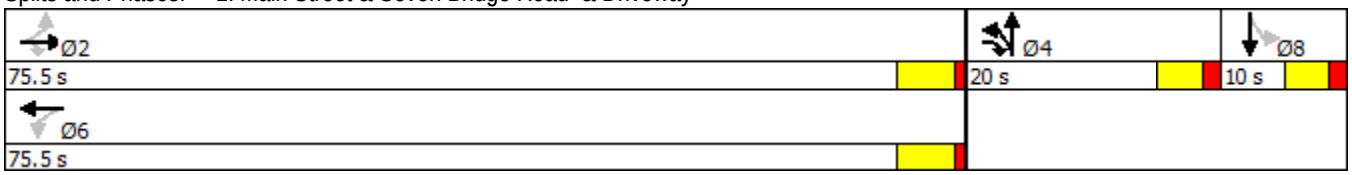
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1368	-	-	-	201	823
HCM Lane V/C Ratio	0.191	-	-	-	0.638	0.267
HCM Control Delay (s)	8.3	-	-	-	50	11
HCM Lane LOS	A	-	-	-	F	B
HCM 95th %tile Q(veh)	0.7	-	-	-	3.7	1.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	577	353	4	1301	0	286	0	3	0	0	0
Future Volume (vph)	0	577	353	4	1301	0	286	0	3	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	15	15	15	12	12	12
Storage Length (ft)	0		115	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	2%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type		NA	pm+ov	Perm	NA		Split	NA				
Protected Phases		2	4		6		4	4			8	
Permitted Phases	2		2	6						8		
Detector Phase	2	2	4	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		5.0	5.0	
Minimum Split (s)	15.5	15.5	15.0	15.5	15.5		15.0	15.0		10.0	10.0	
Total Split (s)	75.5	75.5	20.0	75.5	75.5		20.0	20.0		10.0	10.0	
Total Split (%)	71.6%	71.6%	19.0%	71.6%	71.6%		19.0%	19.0%		9.5%	9.5%	
Maximum Green (s)	70.0	70.0	15.0	70.0	70.0		15.0	15.0		5.0	5.0	
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.5	5.0	5.5	5.5			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	2.0	3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min	None	Min	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 105.5
Actuated Cycle Length: 94.7
Natural Cycle: 140
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Main Street & Seven Bridge Road & Driveway



Lane Group	EBT	EBR	WBL	WBT	NBT
Lane Group Flow (vph)	607	372	4	1369	304
v/c Ratio	0.46	0.24	0.01	1.03	0.85
Control Delay	6.4	0.4	3.5	46.9	51.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	0.4	3.5	46.9	51.5
Queue Length 50th (ft)	125	0	1	~901	135
Queue Length 95th (ft)	184	0	3	#1156	#271
Internal Link Dist (ft)	1370			920	920
Turn Bay Length (ft)		115	50		
Base Capacity (vph)	1318	1529	512	1332	375
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.46	0.24	0.01	1.03	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	577	353	4	1301	0	286	0	3	0	0	0
Future Volume (veh/h)	0	577	353	4	1301	0	286	0	3	0	0	0
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1863	1900	1863	1900	1976	1938	1976	1900	1900	1900
Adj Flow Rate, veh/h	0	607	372	4	1369	0	301	0	3	0	0	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	2	0	2	2	0	0	0	0	0	0
Cap, veh/h	0	1352	1409	427	1365	0	287	0	3	0	2	0
Arrive On Green	0.00	0.73	0.73	0.73	0.73	0.00	0.16	0.00	0.16	0.00	0.00	0.00
Sat Flow, veh/h	0	1845	1583	584	1863	0	1825	0	18	0	1900	0
Grp Volume(v), veh/h	0	607	372	4	1369	0	304	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1845	1583	584	1863	0	1843	0	0	0	1900	0
Q Serve(g_s), s	0.0	12.5	3.2	0.3	70.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	12.5	3.2	12.8	70.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00	0.99		0.01	0.00		0.00
Lane Grp Cap(c), veh/h	0	1352	1409	427	1365	0	290	0	0	0	2	0
V/C Ratio(X)	0.00	0.45	0.26	0.01	1.00	0.00	1.05	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1352	1409	427	1365	0	290	0	0	0	99	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	5.1	0.8	7.6	12.8	0.0	40.3	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.1	0.0	25.0	0.0	66.6	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.3	3.4	0.0	44.4	0.0	12.9	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	5.3	0.9	7.6	37.7	0.0	106.9	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		A	A	A	F		F					
Approach Vol, veh/h		979			1373			304			0	
Approach Delay, s/veh		3.6			37.7			106.9			0.0	
Approach LOS		A			D			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		75.5		20.0		75.5		0.0
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0
Max Green Setting (Gmax), s		70.0		15.0		70.0		5.0
Max Q Clear Time (g_c+I1), s		14.5		17.0		72.0		0.0
Green Ext Time (p_c), s		37.3		0.0		0.0		0.0

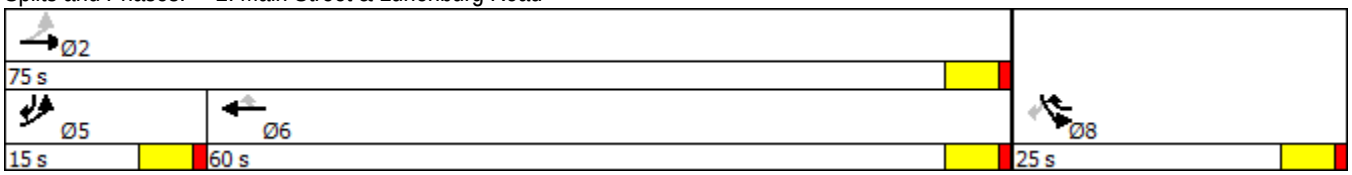
Intersection Summary	
HCM 2010 Ctrl Delay	33.0
HCM 2010 LOS	C

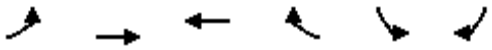
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	61	499	817	762	430	87
Future Volume (vph)	61	499	817	762	430	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	100			160	0	240
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	3%	1%	2%	0%
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	8	8	5
Permitted Phases	2			6		8
Detector Phase	5	2	6	8	8	5
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	11.0	15.0	15.0	15.0	15.0	11.0
Total Split (s)	15.0	75.0	60.0	25.0	25.0	15.0
Total Split (%)	15.0%	75.0%	60.0%	25.0%	25.0%	15.0%
Maximum Green (s)	10.0	70.0	55.0	20.0	20.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	3.0	3.0	2.0	2.0	2.0
Recall Mode	None	Min	Min	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 86.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Main Street & Lunenburg Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	64	525	860	802	453	92
v/c Ratio	0.27	0.46	0.91	0.57	1.10	0.15
Control Delay	7.6	8.7	34.4	2.3	110.2	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	8.7	34.4	2.3	110.2	22.8
Queue Length 50th (ft)	11	124	420	14	~340	38
Queue Length 95th (ft)	23	182	#724	41	#567	77
Internal Link Dist (ft)		920	1370		920	
Turn Bay Length (ft)	100			160		240
Base Capacity (vph)	292	1422	1183	1408	412	659
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.37	0.73	0.57	1.10	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	499	817	762	430	87
Future Volume (veh/h)	61	499	817	762	430	87
Number	5	2	6	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1881	1863	1900
Adj Flow Rate, veh/h	64	525	860	802	453	92
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	3	3	1	2	0
Cap, veh/h	227	1223	1021	1244	399	449
Arrive On Green	0.05	0.66	0.55	0.55	0.22	0.22
Sat Flow, veh/h	1810	1845	1845	1599	1774	1615
Grp Volume(v), veh/h	64	525	860	802	453	92
Grp Sat Flow(s),veh/h/ln	1810	1845	1845	1599	1774	1615
Q Serve(g_s), s	1.2	11.9	34.7	19.9	20.0	3.9
Cycle Q Clear(g_c), s	1.2	11.9	34.7	19.9	20.0	3.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	227	1223	1021	1244	399	449
V/C Ratio(X)	0.28	0.43	0.84	0.64	1.14	0.20
Avail Cap(c_a), veh/h	334	1451	1140	1347	399	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	7.1	16.6	4.4	34.5	24.6
Incr Delay (d2), s/veh	0.2	0.2	5.4	1.0	87.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	6.1	19.0	17.7	19.5	1.7
LnGrp Delay(d),s/veh	16.2	7.3	22.0	5.4	122.2	24.7
LnGrp LOS	B	A	C	A	F	C
Approach Vol, veh/h		589	1662		545	
Approach Delay, s/veh		8.3	14.0		105.8	
Approach LOS		A	B		F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		64.0			9.8	54.2		25.0
Change Period (Y+Rc), s		5.0			5.0	5.0		5.0
Max Green Setting (Gmax), s		70.0			10.0	55.0		20.0
Max Q Clear Time (g_c+I1), s		13.9			3.2	36.7		22.0
Green Ext Time (p_c), s		23.0			0.0	12.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.7
HCM 2010 LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	364	198	161	696	331	251
Future Volume (vph)	364	198	161	696	331	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	2%	6%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection						
Int Delay, s/veh	458					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	364	198	161	696	331	251
Future Vol, veh/h	364	198	161	696	331	251
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	2	6	0
Mvmt Flow	379	206	168	725	345	261

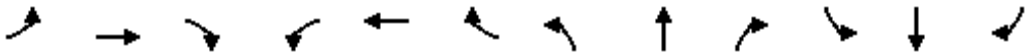
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1537	476	606	0	-	0
Stage 1	476	-	-	-	-	-
Stage 2	1061	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	~ 129	593	982	-	-	-
Stage 1	629	-	-	-	-	-
Stage 2	~ 336	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 92	593	982	-	-	-
Mov Cap-2 Maneuver	~ 92	-	-	-	-	-
Stage 1	449	-	-	-	-	-
Stage 2	~ 336	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 1628.1	1.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	982	-	131	-	-
HCM Lane V/C Ratio	0.171	-	4.469	-	-
HCM Control Delay (s)	9.4	$	1628.1	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.6	-	60.4	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	45	189	190	85	147	283	566	112	58	259	267
Future Volume (vph)	81	45	189	190	85	147	283	566	112	58	259	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	16	16	16	14	14	14	15	15	15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		999			500			4300			875	
Travel Time (s)		22.7			11.4			97.7			19.9	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	0%	0%	0%	1%	1%	7%	1%	1%	4%	2%	9%	1%
Shared Lane Traffic (%)												
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout

ROUNDABOUT ANALYSIS

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	Appr Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	Lunenburg Road	70.00*	17.50*	105.0*	65.0*	30.0*	1	1	13.50*	1500.0	NA[5]	0.0[1]
East	Old Union Turnpike	70.00*	17.50*	105.0*	100.0*	30.0*	1	1	17.00*	1500.0	NA[5]	0.0[1]
North	Lunenburg Road	70.00*	17.50*	105.0*	50.0*	30.0*	1	1	13.00*	14.5	NA[5]	0.0[1]
West	Old Union Turnpike	70.00*	17.50*	105.0*	75.0*	30.0*	1	1	14.00*	1500.0	NA[5]	0.0[1]

Roundabout Capacity Model: US HCM 6

* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
1 Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).
5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	OD Mov	Lane No	Lane Type	Opng Flow pcu/h	In-Bunch Headway sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	HVE for Entry	Critical Gap sec	Follow-up Headway sec
South: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
West	L2	1	Dominant	187	0.00	0.000	No	No	–	1.01	4.98	2.61
North	T1	1	Dominant	187	0.00	0.000	No	No	–	1.01	4.98	2.61
East	R2	1	Dominant	187	0.00	0.000	No	No	–	1.04	4.98	2.61
East: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
South	L2	1	Dominant	960	0.00	0.000	No	No	–	1.01	4.98	2.61
West	T1	1	Dominant	960	0.00	0.000	No	No	–	1.01	4.98	2.61
North	R2	1	Dominant	960	0.00	0.000	No	No	–	1.07	4.98	2.61
North: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
East	L2	1	Dominant	571	0.00	0.000	No	No	–	1.02	4.98	2.61
South	T1	1	Dominant	571	0.00	0.000	No	No	–	1.09	4.98	2.61
West	R2	1	Dominant	571	0.00	0.000	No	No	–	1.01	4.98	2.61
West: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
North	L2	1	Dominant	546	0.00	0.000	No	No	–	1.00	4.98	2.61
East	T1	1	Dominant	546	0.00	0.000	No	No	–	1.00	4.98	2.61
South	R2	1	Dominant	546	0.00	0.000	No	No	–	1.00	4.98	2.61

Roundabout Capacity Model: US HCM 6

Circulating Lane Flow Rates

Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: Lunenburg Road			
Lane 1	186	187	100.0
Approach	186	187	
East: Old Union Turnpike			
Lane 1	952	960	100.0
Approach	952	960	
North: Lunenburg Road			
Lane 1	566	571	100.0
Approach	566	571	
West: Old Union Turnpike			
Lane 1	519	546	100.0
Approach	519	546	

Roundabout Capacity Model: The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes.
To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

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MOVEMENT SUMMARY

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lunenburg Road											
3	L2	287	1.0	0.879	25.2	LOS D	34.4	870.6	1.00	1.32	23.7
8	T1	583	1.0	0.879	25.2	LOS D	34.4	870.6	1.00	1.32	14.4
18	R2	119	4.0	0.879	25.3	LOS D	34.4	870.6	1.00	1.32	23.2
Approach		989	1.4	0.879	25.2	LOS D	34.4	870.6	1.00	1.32	18.5
East: Old Union Turnpike											
1	L2	193	1.0	0.850	39.8	LOS E	9.3	238.9	0.92	1.46	20.2
6	T1	86	1.0	0.850	39.8	LOS E	9.3	238.9	0.92	1.46	20.2
16	R2	148	7.0	0.850	40.2	LOS E	9.3	238.9	0.92	1.46	11.7
Approach		427	3.1	0.850	39.9	LOS E	9.3	238.9	0.92	1.46	17.4
North: Lunenburg Road											
7	L2	59	2.0	0.810	26.1	LOS D	12.0	310.9	0.93	1.44	18.8
4	T1	268	9.0	0.810	26.5	LOS D	12.0	310.9	0.93	1.44	18.8
14	R2	270	1.0	0.810	26.1	LOS D	12.0	310.9	0.93	1.44	18.3
Approach		596	4.7	0.810	26.3	LOS D	12.0	310.9	0.93	1.44	18.5
West: Old Union Turnpike											
5	L2	82	0.0	0.404	9.6	LOS A	2.3	56.5	0.68	0.72	15.7
2	T1	45	0.0	0.404	9.6	LOS A	2.3	56.5	0.68	0.72	28.7
12	R2	192	0.0	0.404	9.6	LOS A	2.3	56.5	0.68	0.72	28.0
Approach		319	0.0	0.404	9.6	LOS A	2.3	56.5	0.68	0.72	25.1
All Vehicles		2331	2.3	0.879	26.0	LOS D	34.4	870.6	0.92	1.30	19.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	4	362	0	337	2	509	283	32	218	1
Future Volume (vph)	0	0	4	362	0	337	2	509	283	32	218	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	11	11	11
Storage Length (ft)	0		0	65		0	0		55	0		0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		500			420			875			1000	
Travel Time (s)		11.4			8.2			17.0			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	5%	0%	1%	0%	1%	2%	14%	1%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	80.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	4	362	0	337	2	509	283	32	218	1
Future Vol, veh/h	0	0	4	362	0	337	2	509	283	32	218	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	65	-	-	-	-	55	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	5	0	1	0	1	2	14	1	0
Mvmt Flow	0	0	5	411	0	383	2	578	322	36	248	1

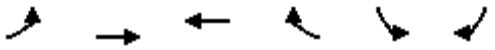
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1095	903	249	905	903	578	249	0	0	578	0	0
Stage 1	321	321	-	582	582	-	-	-	-	-	-	-
Stage 2	774	582	-	323	321	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.15	6.5	6.21	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.545	4	3.309	2.2	-	-	2.326	-	-
Pot Cap-1 Maneuver	193	279	795	~ 254	279	517	1328	-	-	939	-	-
Stage 1	695	655	-	494	502	-	-	-	-	-	-	-
Stage 2	394	502	-	683	655	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	48	266	795	~ 244	266	517	1328	-	-	939	-	-
Mov Cap-2 Maneuver	48	266	-	~ 244	266	-	-	-	-	-	-	-
Stage 1	693	626	-	493	500	-	-	-	-	-	-	-
Stage 2	102	500	-	649	626	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	201.2	0	1.1
HCM LOS	A	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1328	-	-	795	244	517	939	-	-
HCM Lane V/C Ratio	0.002	-	-	0.006	1.686	0.741	0.039	-	-
HCM Control Delay (s)	7.7	0	-	9.6	$ 361.2	29.3	9	0	-
HCM Lane LOS	A	A	-	A	F	D	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	26.7	6.2	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	133	82	109	1	13	313
Future Volume (vph)	133	82	109	1	13	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	16	16	16
Storage Length (ft)	0			60	0	75
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		30	
Link Distance (ft)		500	500		300	
Travel Time (s)		8.5	8.5		6.8	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	5%	1%	0%	0%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	133	82	109	1	13	313
Future Vol, veh/h	133	82	109	1	13	313
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	-	-	-	60	0	75
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	3	5	1	0	0	3
Mvmt Flow	158	98	130	1	15	373

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	130	0	-	0	544	130
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	414	-
Critical Hdwy	4.13	-	-	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.327
Pot Cap-1 Maneuver	1449	-	-	-	504	917
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	671	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1449	-	-	-	446	917
Mov Cap-2 Maneuver	-	-	-	-	446	-
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	671	-

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1449	-	-	-	446	917
HCM Lane V/C Ratio	0.109	-	-	-	0.035	0.406
HCM Control Delay (s)	7.8	0	-	-	13.4	11.6
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0.4	-	-	-	0.1	2

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	20	295	29	253	446	0
Future Volume (vph)	20	295	29	253	446	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	13	13	16	16
Storage Length (ft)		75	0		0	60
Storage Lanes		1	0		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	30	
Link Distance (ft)	420			500	300	
Travel Time (s)	8.2			9.7	6.8	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	8%	4%	8%	2%	3%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	17.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	20	295	29	253	446	0
Future Vol, veh/h	20	295	29	253	446	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	None	-	Stop
Storage Length	-	75	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	8	4	8	2	3	0
Mvmt Flow	24	347	34	298	525	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	24	0	390	24
Stage 1	-	-	-	-	24	-
Stage 2	-	-	-	-	366	-
Critical Hdwy	-	-	4.18	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.272	-	3.527	3.3
Pot Cap-1 Maneuver	-	-	1553	-	612	1058
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1553	-	596	1058
Mov Cap-2 Maneuver	-	-	-	-	596	-
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	681	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	40
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	596	-	-	-	1553	-
HCM Lane V/C Ratio	0.88	-	-	-	0.022	-
HCM Control Delay (s)	40	0	-	-	7.4	0
HCM Lane LOS	E	A	-	-	A	A
HCM 95th %tile Q(veh)	10.3	-	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	324	27	87	535	2	27	0	50	0	0	1
Future Volume (vph)	1	324	27	87	535	2	27	0	50	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		500			2950			500			200	
Travel Time (s)		9.7			57.5			11.4			4.5	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	2%	5%	0%	1%	0%	4%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	324	27	87	535	2	27	0	50	0	0	1
Future Vol, veh/h	1	324	27	87	535	2	27	0	50	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	2	5	0	1	0	4	0	0	0	0	0
Mvmt Flow	1	400	33	107	660	2	33	0	62	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	662	0	0	433	0	0	1295	1295	417	1325	1310	661
Stage 1	-	-	-	-	-	-	419	419	-	875	875	-
Stage 2	-	-	-	-	-	-	876	876	-	450	435	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.14	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.536	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	936	-	-	1137	-	-	138	164	640	134	160	466
Stage 1	-	-	-	-	-	-	608	593	-	347	370	-
Stage 2	-	-	-	-	-	-	341	369	-	592	584	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	936	-	-	1137	-	-	122	139	640	107	136	466
Mov Cap-2 Maneuver	-	-	-	-	-	-	122	139	-	107	136	-
Stage 1	-	-	-	-	-	-	607	592	-	347	315	-
Stage 2	-	-	-	-	-	-	289	314	-	534	583	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.2	27	12.7
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	257	936	-	-	1137	-	-	466
HCM Lane V/C Ratio	0.37	0.001	-	-	0.094	-	-	0.003
HCM Control Delay (s)	27	8.9	0	-	8.5	0	-	12.7
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.6	0	-	-	0.3	-	-	0



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	189	226	396	590	116	237
Future Volume (vph)	189	226	396	590	116	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	265			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		2950	300		300	
Travel Time (s)		67.0	5.8		6.8	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	2%	0%	2%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	41.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	189	226	396	590	116	237
Future Vol, veh/h	189	226	396	590	116	237
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	265	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	2	0	2	3	1
Mvmt Flow	228	272	477	711	140	286

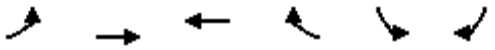
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1188	0	-	0	1561	833
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	728	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	595	-	-	-	~ 123	370
Stage 1	-	-	-	-	425	-
Stage 2	-	-	-	-	476	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	595	-	-	-	~ 76	370
Mov Cap-2 Maneuver	-	-	-	-	~ 76	-
Stage 1	-	-	-	-	262	-
Stage 2	-	-	-	-	476	-

Approach	EB	WB	SB
HCM Control Delay, s	6.7	0	196.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	595	-	-	-	76	370
HCM Lane V/C Ratio	0.383	-	-	-	1.839	0.772
HCM Control Delay (s)	14.8	-	-	-	$ 514.7	40.9
HCM Lane LOS	B	-	-	-	F	E
HCM 95th %tile Q(veh)	1.8	-	-	-	12.2	6.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	120	226	569	14	66	393
Future Volume (vph)	120	226	569	14	66	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	16
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		300	400		300	
Travel Time (s)		6.8	7.8		6.8	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	2%	1%	2%	8%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	24.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	226	569	14	66	393
Future Vol, veh/h	120	226	569	14	66	393
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	140	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	1	2	8	3	1
Mvmt Flow	141	266	669	16	78	462

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	669	0	-	0	1225	677
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	548	-
Critical Hdwy	4.12	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	921	-	-	-	197	~ 455
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	921	-	-	-	167	~ 455
Mov Cap-2 Maneuver	-	-	-	-	167	-
Stage 1	-	-	-	-	426	-
Stage 2	-	-	-	-	577	-

Approach	EB	WB	SB
HCM Control Delay, s	3.3	0	72.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	921	-	-	-	167	455
HCM Lane V/C Ratio	0.153	-	-	-	0.465	1.016
HCM Control Delay (s)	9.6	-	-	-	44	76.8
HCM Lane LOS	A	-	-	-	E	F
HCM 95th %tile Q(veh)	0.5	-	-	-	2.2	13.6

Notes

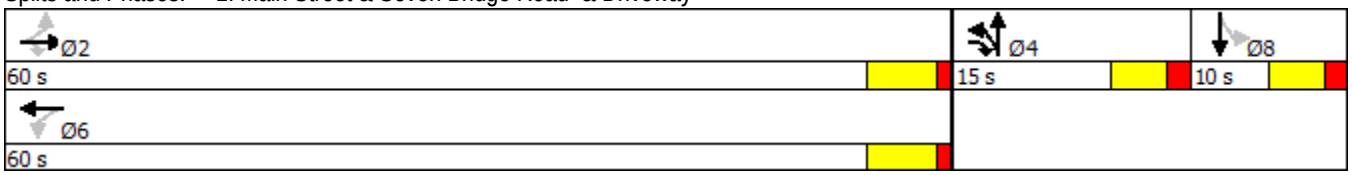
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	108	845	5	332	1	549	2	29	0	2	0
Future Volume (vph)	1	108	845	5	332	1	549	2	29	0	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	15	15	15	12	12	12
Storage Length (ft)	0		115	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	4%	2%	0%	1%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	pm+ov	Perm	NA		Split	NA			NA	
Protected Phases		2	4		6		4	4			8	
Permitted Phases	2		2	6						8		
Detector Phase	2	2	4	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		5.0	5.0	
Minimum Split (s)	15.5	15.5	15.0	15.5	15.5		15.0	15.0		10.0	10.0	
Total Split (s)	60.0	60.0	15.0	60.0	60.0		15.0	15.0		10.0	10.0	
Total Split (%)	70.6%	70.6%	17.6%	70.6%	70.6%		17.6%	17.6%		11.8%	11.8%	
Maximum Green (s)	54.5	54.5	10.0	54.5	54.5		10.0	10.0		5.0	5.0	
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.5	5.0	5.5	5.5			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	2.0	3.0	3.0		2.0	2.0		0.2	0.2	
Recall Mode	Min	Min	None	Min	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 36
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Main Street & Seven Bridge Road & Driveway



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	131	1018	6	401	698	2
v/c Ratio	0.20	0.68	0.01	0.60	1.24	0.01
Control Delay	9.0	2.9	8.0	13.8	142.4	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	2.9	8.0	13.8	142.4	18.0
Queue Length 50th (ft)	14	0	1	52	~160	0
Queue Length 95th (ft)	47	14	6	138	#473	5
Internal Link Dist (ft)	1370			920	920	120
Turn Bay Length (ft)		115	50			
Base Capacity (vph)	1759	1501	1193	1819	564	274
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.68	0.01	0.22	1.24	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	108	845	5	332	1	549	2	29	0	2	0
Future Volume (veh/h)	1	108	845	5	332	1	549	2	29	0	2	0
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1863	1900	1881	1900	1976	1939	1976	1900	1900	1900
Adj Flow Rate, veh/h	1	130	1018	6	400	1	661	2	35	0	2	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	4	4	2	0	1	1	0	0	0	0	0	0
Cap, veh/h	56	1107	1203	397	1138	3	266	1	14	0	5	0
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.15	0.15	0.15	0.00	0.00	0.00
Sat Flow, veh/h	1	1825	1583	498	1876	5	1739	5	92	0	1900	0
Grp Volume(v), veh/h	131	0	1018	6	0	401	698	0	0	0	2	0
Grp Sat Flow(s),veh/h/ln	1826	0	1583	498	0	1880	1836	0	0	0	1900	0
Q Serve(g_s), s	0.0	0.0	28.2	0.3	0.0	7.0	10.0	0.0	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	2.0	0.0	28.2	2.3	0.0	7.0	10.0	0.0	0.0	0.0	0.1	0.0
Prop In Lane	0.01		1.00	1.00		0.00	0.95		0.05	0.00		0.00
Lane Grp Cap(c), veh/h	1164	0	1203	397	0	1141	281	0	0	0	5	0
V/C Ratio(X)	0.11	0.00	0.85	0.02	0.00	0.35	2.48	0.00	0.00	0.00	0.39	0.00
Avail Cap(c_a), veh/h	1577	0	1564	510	0	1570	281	0	0	0	146	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	5.4	0.0	5.3	5.9	0.0	6.4	27.6	0.0	0.0	0.0	32.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	3.5	0.0	0.0	0.2	677.5	0.0	0.0	0.0	16.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	19.3	0.0	0.0	3.6	57.9	0.0	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	5.5	0.0	8.8	5.9	0.0	6.6	705.1	0.0	0.0	0.0	49.0	0.0
LnGrp LOS	A		A	A		A	F				D	
Approach Vol, veh/h		1149			407			698			2	
Approach Delay, s/veh		8.4			6.6			705.1			49.0	
Approach LOS		A			A			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.1		15.0		45.1		5.2
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0
Max Green Setting (Gmax), s		54.5		10.0		54.5		5.0
Max Q Clear Time (g_c+I1), s		30.2		12.0		9.0		2.1
Green Ext Time (p_c), s		9.4		0.0		11.1		0.0

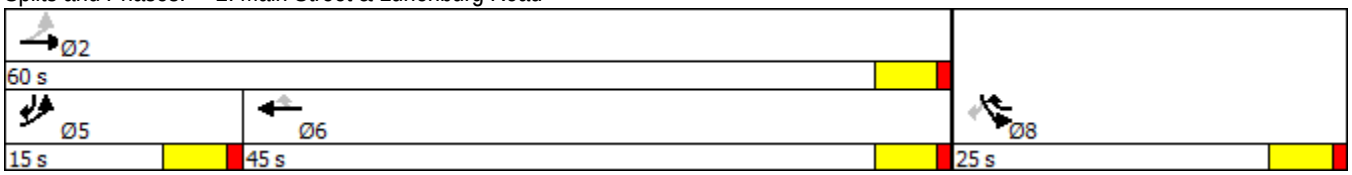
Intersection Summary	
HCM 2010 Ctrl Delay	223.7
HCM 2010 LOS	F

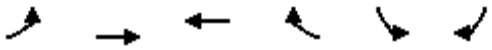
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	59	393	423	460	558	60
Future Volume (vph)	59	393	423	460	558	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	100			160	0	240
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	2%	1%	2%	0%
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	8	8	5
Permitted Phases	2			6		8
Detector Phase	5	2	6	8	8	5
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	11.0	15.0	15.0	15.0	15.0	11.0
Total Split (s)	15.0	60.0	45.0	25.0	25.0	15.0
Total Split (%)	17.6%	70.6%	52.9%	29.4%	29.4%	17.6%
Maximum Green (s)	10.0	55.0	40.0	20.0	20.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	3.0	3.0	2.0	2.0	2.0
Recall Mode	None	Min	Min	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 59.9
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Main Street & Lunenburg Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	62	414	445	484	587	63
v/c Ratio	0.18	0.47	0.75	0.37	0.99	0.07
Control Delay	8.2	11.4	26.8	1.1	61.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	11.4	26.8	1.1	61.8	9.9
Queue Length 50th (ft)	11	89	145	0	~242	11
Queue Length 95th (ft)	25	143	247	18	#527	36
Internal Link Dist (ft)		920	1370		920	
Turn Bay Length (ft)	100			160		240
Base Capacity (vph)	424	1612	1249	1321	593	947
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.26	0.36	0.37	0.99	0.07

Intersection Summary

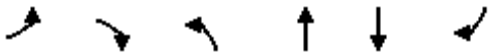
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	393	423	460	558	60
Future Volume (veh/h)	59	393	423	460	558	60
Number	5	2	6	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1863	1881	1863	1900
Adj Flow Rate, veh/h	62	414	445	484	587	63
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	2	1	2	0
Cap, veh/h	329	957	676	1104	581	632
Arrive On Green	0.06	0.51	0.36	0.36	0.33	0.33
Sat Flow, veh/h	1774	1881	1863	1599	1774	1615
Grp Volume(v), veh/h	62	414	445	484	587	63
Grp Sat Flow(s),veh/h/ln	1774	1881	1863	1599	1774	1615
Q Serve(g_s), s	1.2	8.5	12.2	8.2	20.0	1.5
Cycle Q Clear(g_c), s	1.2	8.5	12.2	8.2	20.0	1.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	329	957	676	1104	581	632
V/C Ratio(X)	0.19	0.43	0.66	0.44	1.01	0.10
Avail Cap(c_a), veh/h	506	1694	1220	1571	581	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	9.4	16.3	4.2	20.5	11.8
Incr Delay (d2), s/veh	0.1	0.3	1.1	0.3	40.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.5	6.4	7.5	16.1	0.7
LnGrp Delay(d),s/veh	11.2	9.8	17.4	4.5	60.5	11.8
LnGrp LOS	B	A	B	A	F	B
Approach Vol, veh/h		476	929		650	
Approach Delay, s/veh		9.9	10.7		55.8	
Approach LOS		A	B		E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		36.1			8.9	27.2		25.0
Change Period (Y+Rc), s		5.0			5.0	5.0		5.0
Max Green Setting (Gmax), s		55.0			10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s		10.5			3.2	14.2		22.0
Green Ext Time (p_c), s		8.9			0.0	8.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	24.8
HCM 2010 LOS	C



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	369	223	160	367	398	242
Future Volume (vph)	369	223	160	367	398	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	3%	2%	5%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection						
Int Delay, s/veh	408.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	369	223	160	367	398	242
Future Vol, veh/h	369	223	160	367	398	242
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	3	2	5
Mvmt Flow	401	242	174	399	433	263

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1312	565	696	0	-	0
Stage 1	565	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	~ 172	519	886	-	-	-
Stage 1	563	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 129	519	886	-	-	-
Mov Cap-2 Maneuver	~ 129	-	-	-	-	-
Stage 1	421	-	-	-	-	-
Stage 2	463	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 1210.8	3.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	886	-	180	-	-
HCM Lane V/C Ratio	0.196	-	3.575	-	-
HCM Control Delay (s)	10.1	$	1210.8	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.7	-	61.8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	49	170	302	62	112	179	416	154	84	227	115
Future Volume (vph)	37	49	170	302	62	112	179	416	154	84	227	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	16	16	16	14	14	14	15	15	15
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		999			500			4300			875	
Travel Time (s)		22.7			11.4			97.7			19.9	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	2%	2%	1%	0%	6%	0%	4%	5%	14%	3%	1%
Shared Lane Traffic (%)												
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout

ROUNDABOUT ANALYSIS

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	Appr Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	Lunenburg Road	70.00*	17.50*	105.0*	65.0*	30.0*	1	1	13.50*	1500.0	NA[5]	0.0[1]
East	Old Union Turnpike	70.00*	17.50*	105.0*	100.0*	30.0*	1	1	17.00*	1500.0	NA[5]	0.0[1]
North	Lunenburg Road	70.00*	17.50*	105.0*	50.0*	30.0*	1	1	13.00*	1500.0	NA[5]	0.0[1]
West	Old Union Turnpike	70.00*	17.50*	105.0*	75.0*	30.0*	1	1	14.00*	1500.0	NA[5]	0.0[1]

Roundabout Capacity Model: US HCM 6

* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
1 Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).
5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	OD Mov	Lane No	Lane Type	Opng Flow pcu/h	In-Bunch Headway sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	HVE for Entry	Critical Gap sec	Follow-up Headway sec
South: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
West	L2	1	Dominant	182	0.00	0.000	No	No	–	1.06	4.98	2.61
North	T1	1	Dominant	182	0.00	0.000	No	No	–	1.07	4.98	2.61
East	R2	1	Dominant	182	0.00	0.000	No	No	–	1.21	4.98	2.61
East: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
South	L2	1	Dominant	695	0.00	0.000	No	No	–	1.09	4.98	2.61
West	T1	1	Dominant	695	0.00	0.000	No	No	–	1.00	4.98	2.61
North	R2	1	Dominant	695	0.00	0.000	No	No	–	1.16	4.98	2.61
North: Lunenburg Road Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
East	L2	1	Dominant	698	0.00	0.000	No	No	–	1.04	4.98	2.61
South	T1	1	Dominant	698	0.00	0.000	No	No	–	1.04	4.98	2.61
West	R2	1	Dominant	698	0.00	0.000	No	No	–	1.10	4.98	2.61
West: Old Union Turnpike Model Calibration Factor (HCM 6): 1.00 Entry/Circ Flow Adj (HCM 6): None												
North	L2	1	Dominant	524	0.00	0.000	No	No	–	1.06	4.98	2.61
East	T1	1	Dominant	524	0.00	0.000	No	No	–	1.02	4.98	2.61
South	R2	1	Dominant	524	0.00	0.000	No	No	–	1.03	4.98	2.61

Roundabout Capacity Model: US HCM 6

Circulating Lane Flow Rates

Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: Lunenburg Road			
Lane 1	175	182	100.0
Approach	175	182	
East: Old Union Turnpike			
Lane 1	652	695	100.0
Approach	652	695	
North: Lunenburg Road			
Lane 1	671	698	100.0
Approach	671	698	
West: Old Union Turnpike			
Lane 1	496	524	100.0
Approach	496	524	

Roundabout Capacity Model: The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes.
To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

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MOVEMENT SUMMARY

Site: 4 [Lunenburg Road at Old Union Turnpike]

Lunenburg Road at Old Union Turnpike
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Lunenburg Road											
3	L2	185	6.0	0.739	16.1	LOS C	11.9	321.4	0.69	0.69	26.3
8	T1	429	7.0	0.739	16.1	LOS C	11.9	321.4	0.69	0.69	26.3
18	R2	159	21.0	0.739	16.5	LOS C	11.9	321.4	0.69	0.69	25.7
Approach		772	9.6	0.739	16.2	LOS C	11.9	321.4	0.69	0.69	26.2
East: Old Union Turnpike											
1	L2	175	9.0	0.849	33.2	LOS D	12.2	316.0	0.95	1.55	21.8
6	T1	311	0.0	0.849	32.8	LOS D	12.2	316.0	0.95	1.55	21.8
16	R2	64	16.0	0.849	33.6	LOS D	12.2	316.0	0.95	1.55	21.3
Approach		551	4.7	0.849	33.0	LOS D	12.2	316.0	0.95	1.55	21.7
North: Lunenburg Road											
7	L2	87	4.0	0.685	20.3	LOS C	6.1	160.4	0.84	1.14	25.1
4	T1	234	4.0	0.685	20.3	LOS C	6.1	160.4	0.84	1.14	25.1
14	R2	119	10.0	0.685	20.6	LOS C	6.1	160.4	0.84	1.14	24.6
Approach		439	5.6	0.685	20.3	LOS C	6.1	160.4	0.84	1.14	25.0
West: Old Union Turnpike											
5	L2	38	6.0	0.337	8.7	LOS A	1.6	40.1	0.63	0.62	29.2
2	T1	51	2.0	0.337	8.5	LOS A	1.6	40.1	0.63	0.62	29.3
12	R2	175	3.0	0.337	8.6	LOS A	1.6	40.1	0.63	0.62	28.6
Approach		264	3.2	0.337	8.6	LOS A	1.6	40.1	0.63	0.62	28.8
All Vehicles		2026	6.6	0.849	20.7	LOS C	12.2	321.4	0.79	1.01	24.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	3	170	1	77	1	260	304	53	253	0
Future Volume (vph)	0	0	3	170	1	77	1	260	304	53	253	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	11	11	11	11	11	11
Storage Length (ft)	0		0	65		0	0		55	0		0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		500			500			875			1000	
Travel Time (s)		11.4			9.7			17.0			19.5	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	4%	0%	8%	0%	5%	3%	8%	6%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

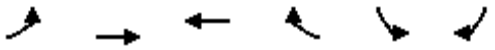
Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	170	1	77	1	260	304	53	253	0
Future Vol, veh/h	0	0	3	170	1	77	1	260	304	53	253	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	65	-	-	-	-	55	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	4	0	8	0	5	3	8	6	0
Mvmt Flow	0	0	4	200	1	91	1	306	358	62	298	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	776	730	298	732	730	306	298	0	0	306	0	0
Stage 1	422	422	-	308	308	-	-	-	-	-	-	-
Stage 2	354	308	-	424	422	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.14	6.5	6.28	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.536	4	3.372	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	317	352	746	334	352	720	1275	-	-	1221	-	-
Stage 1	613	592	-	698	664	-	-	-	-	-	-	-
Stage 2	667	664	-	604	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	263	330	746	317	330	720	1275	-	-	1221	-	-
Mov Cap-2 Maneuver	263	330	-	317	330	-	-	-	-	-	-	-
Stage 1	612	556	-	697	663	-	-	-	-	-	-	-
Stage 2	581	663	-	564	556	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	26.6	0	1.4
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1275	-	-	746	317	709	1221	-	-
HCM Lane V/C Ratio	0.001	-	-	0.005	0.631	0.129	0.051	-	-
HCM Control Delay (s)	7.8	0	-	9.8	33.9	10.8	8.1	0	-
HCM Lane LOS	A	A	-	A	D	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	4	0.4	0.2	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	200	86	207	3	19	269
Future Volume (vph)	200	86	207	3	19	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	16	16	16
Storage Length (ft)	0			60	0	75
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		30	
Link Distance (ft)		500	500		300	
Travel Time (s)		8.5	8.5		6.8	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	13%	1%	0%	0%	0%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	200	86	207	3	19	269
Future Vol, veh/h	200	86	207	3	19	269
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	-	-	-	60	0	75
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	13	1	0	0	0	5
Mvmt Flow	235	101	244	4	22	316

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	244	0	-	0	815	244
Stage 1	-	-	-	-	244	-
Stage 2	-	-	-	-	571	-
Critical Hdwy	4.23	-	-	-	6.4	6.25
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.317	-	-	-	3.5	3.345
Pot Cap-1 Maneuver	1260	-	-	-	350	787
Stage 1	-	-	-	-	801	-
Stage 2	-	-	-	-	569	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1260	-	-	-	281	787
Mov Cap-2 Maneuver	-	-	-	-	281	-
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	569	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1260	-	-	-	281	787
HCM Lane V/C Ratio	0.187	-	-	-	0.08	0.402
HCM Control Delay (s)	8.5	0	-	-	18.9	12.6
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.7	-	-	-	0.3	2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	315	23	82	305	0	19	0	50	0	0	1
Future Volume (vph)	1	315	23	82	305	0	19	0	50	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		500			2950			500			200	
Travel Time (s)		9.7			57.5			11.4			4.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

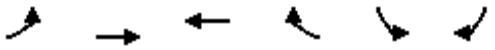
Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	315	23	82	305	0	19	0	50	0	0	1
Future Vol, veh/h	1	315	23	82	305	0	19	0	50	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	328	24	85	318	0	20	0	52	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	318	0	0	352	0	0	831	830	340	856	842	318
Stage 1	-	-	-	-	-	-	342	342	-	488	488	-
Stage 2	-	-	-	-	-	-	489	488	-	368	354	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1253	-	-	1218	-	-	291	308	707	280	303	727
Stage 1	-	-	-	-	-	-	677	642	-	565	553	-
Stage 2	-	-	-	-	-	-	564	553	-	656	634	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1253	-	-	1218	-	-	272	282	707	242	277	727
Mov Cap-2 Maneuver	-	-	-	-	-	-	272	282	-	242	277	-
Stage 1	-	-	-	-	-	-	676	641	-	564	506	-
Stage 2	-	-	-	-	-	-	515	506	-	607	633	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.7	13.6	10
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	491	1253	-	-	1218	-	-	727
HCM Lane V/C Ratio	0.146	0.001	-	-	0.07	-	-	0.001
HCM Control Delay (s)	13.6	7.9	0	-	8.2	0	-	10
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	157	216	245	514	136	150
Future Volume (vph)	157	216	245	514	136	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	265			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		2950	300		300	
Travel Time (s)		67.0	5.8		6.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	0%	2%	0%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	157	216	245	514	136	150
Future Vol, veh/h	157	216	245	514	136	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	265	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	0	2	0	2
Mvmt Flow	162	223	253	530	140	155

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	783	0	-	0	1065	518
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	547	-
Critical Hdwy	4.11	-	-	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.318
Pot Cap-1 Maneuver	840	-	-	-	249	558
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	584	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	840	-	-	-	201	558
Mov Cap-2 Maneuver	-	-	-	-	201	-
Stage 1	-	-	-	-	486	-
Stage 2	-	-	-	-	584	-

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	34
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	840	-	-	-	201	558
HCM Lane V/C Ratio	0.193	-	-	-	0.698	0.277
HCM Control Delay (s)	10.3	-	-	-	56.1	13.9
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	0.7	-	-	-	4.4	1.1



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	143	209	307	5	62	454
Future Volume (vph)	143	209	307	5	62	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Link Speed (mph)		30	35		30	
Link Distance (ft)		300	400		300	
Travel Time (s)		6.8	7.8		6.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	9.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	143	209	307	5	62	454
Future Vol, veh/h	143	209	307	5	62	454
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	140	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	3	1
Mvmt Flow	149	218	320	5	65	473

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	320	0	-	0	839	323
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	516	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1251	-	-	-	335	720
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	597	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1251	-	-	-	295	720
Mov Cap-2 Maneuver	-	-	-	-	295	-
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	597	-

Approach	EB	WB	SB
HCM Control Delay, s	3.4	0	19.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1251	-	-	-	295	720
HCM Lane V/C Ratio	0.119	-	-	-	0.219	0.657
HCM Control Delay (s)	8.3	-	-	-	20.6	19
HCM Lane LOS	A	-	-	-	C	C
HCM 95th %tile Q(veh)	0.4	-	-	-	0.8	4.9

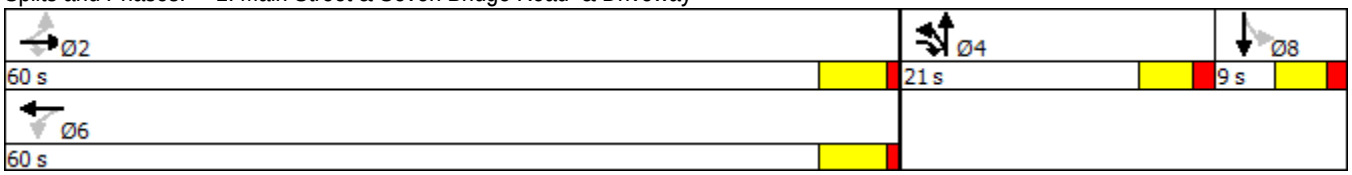
2026 Build with Mitigation Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	840	427	16	535	0	303	0	8	0	0	0
Future Volume (vph)	0	840	427	16	535	0	303	0	8	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	15	15	15	12	12	12
Storage Length (ft)	0		115	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	6%	3%	0%	6%	0%	7%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type		NA	pm+ov	Perm	NA		Split	NA				
Protected Phases		2	4		6		4	4			8	
Permitted Phases	2		2	6						8		
Detector Phase	2	2	4	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		4.0	4.0	
Minimum Split (s)	15.5	15.5	15.0	15.5	15.5		15.0	15.0		9.0	9.0	
Total Split (s)	60.0	60.0	21.0	60.0	60.0		21.0	21.0		9.0	9.0	
Total Split (%)	66.7%	66.7%	23.3%	66.7%	66.7%		23.3%	23.3%		10.0%	10.0%	
Maximum Green (s)	54.5	54.5	16.0	54.5	54.5		16.0	16.0		4.0	4.0	
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.5	5.0	5.5	5.5			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	2.0	3.0	3.0		2.0	2.0		0.2	0.2	
Recall Mode	Min	Min	None	Min	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 66.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Main Street & Seven Bridge Road & Driveway



Lane Group	EBT	EBR	WBL	WBT	NBT
Lane Group Flow (vph)	903	459	17	575	335
v/c Ratio	0.85	0.30	0.09	0.54	0.70
Control Delay	18.9	0.5	6.1	9.2	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	0.5	6.1	9.2	29.1
Queue Length 50th (ft)	269	0	3	123	93
Queue Length 95th (ft)	441	0	10	190	#240
Internal Link Dist (ft)	1370			920	920
Turn Bay Length (ft)		115	50		
Base Capacity (vph)	1417	1508	247	1417	542
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.30	0.07	0.41	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	840	427	16	535	0	303	0	8	0	0	0
Future Volume (veh/h)	0	840	427	16	535	0	303	0	8	0	0	0
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1792	1845	1900	1792	1900	1976	1850	1976	1900	1900	1900
Adj Flow Rate, veh/h	0	903	459	17	575	0	326	0	9	0	0	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	3	0	6	6	0	0	0	0	0	0
Cap, veh/h	0	1139	1334	210	1139	0	368	0	10	0	3	0
Arrive On Green	0.00	0.64	0.64	0.64	0.64	0.00	0.22	0.00	0.22	0.00	0.00	0.00
Sat Flow, veh/h	0	1792	1568	406	1792	0	1709	0	47	0	1900	0
Grp Volume(v), veh/h	0	903	459	17	575	0	335	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1792	1568	406	1792	0	1756	0	0	0	1900	0
Q Serve(g_s), s	0.0	26.0	4.3	2.3	12.1	0.0	13.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	26.0	4.3	28.3	12.1	0.0	13.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00	0.97		0.03	0.00		0.00
Lane Grp Cap(c), veh/h	0	1139	1334	210	1139	0	378	0	0	0	3	0
V/C Ratio(X)	0.00	0.79	0.34	0.08	0.50	0.00	0.89	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1391	1554	267	1391	0	400	0	0	0	108	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.4	1.1	19.8	6.9	0.0	26.7	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.6	0.2	0.2	0.3	0.0	19.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.4	4.5	0.3	6.0	0.0	8.2	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	12.1	1.3	20.0	7.2	0.0	45.7	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		B	A	B	A		D					
Approach Vol, veh/h		1362			592			335			0	
Approach Delay, s/veh		8.4			7.6			45.7			0.0	
Approach LOS		A			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.1		20.1		50.1		0.0
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0
Max Green Setting (Gmax), s		54.5		16.0		54.5		4.0
Max Q Clear Time (g_c+I1), s		28.0		15.0		30.3		0.0
Green Ext Time (p_c), s		15.1		0.1		14.4		0.0

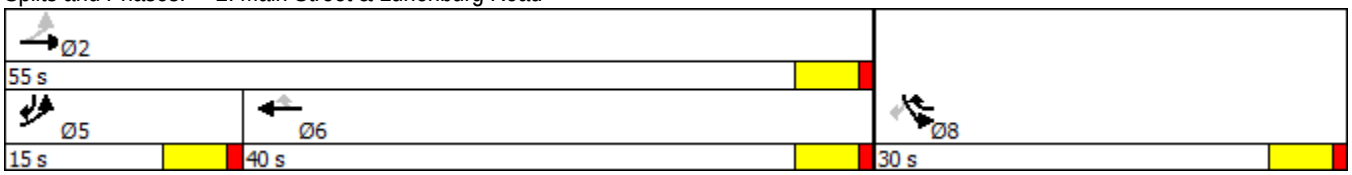
Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

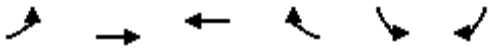
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	69	805	396	450	457	49
Future Volume (vph)	69	805	396	450	457	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	100			160	0	240
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	4%	6%	6%	8%	3%
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	8	8	5
Permitted Phases	2			6		8
Detector Phase	5	2	6	8	8	5
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	11.0	15.0	15.0	15.0	15.0	11.0
Total Split (s)	15.0	55.0	40.0	30.0	30.0	15.0
Total Split (%)	17.6%	64.7%	47.1%	35.3%	35.3%	17.6%
Maximum Green (s)	10.0	50.0	35.0	25.0	25.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	3.0	3.0	2.0	2.0	2.0
Recall Mode	None	Min	Min	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 77.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Main Street & Lunenburg Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	74	866	426	484	491	53
v/c Ratio	0.18	0.91	0.58	0.37	0.93	0.07
Control Delay	8.8	30.1	21.1	1.0	54.9	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	30.1	21.1	1.0	54.9	13.8
Queue Length 50th (ft)	16	343	157	0	246	15
Queue Length 95th (ft)	33	#571	254	15	#470	37
Internal Link Dist (ft)		920	1370		920	
Turn Bay Length (ft)	100			160		240
Base Capacity (vph)	464	1155	817	1310	528	793
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.75	0.52	0.37	0.93	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	69	805	396	450	457	49
Future Volume (veh/h)	69	805	396	450	457	49
Number	5	2	6	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1827	1792	1792	1759	1845
Adj Flow Rate, veh/h	74	866	426	484	491	53
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	4	6	6	8	3
Cap, veh/h	358	1018	772	1132	524	587
Arrive On Green	0.06	0.56	0.43	0.43	0.31	0.31
Sat Flow, veh/h	1774	1827	1792	1524	1675	1568
Grp Volume(v), veh/h	74	866	426	484	491	53
Grp Sat Flow(s),veh/h/ln	1774	1827	1792	1524	1675	1568
Q Serve(g_s), s	1.6	30.7	13.7	9.2	21.9	1.7
Cycle Q Clear(g_c), s	1.6	30.7	13.7	9.2	21.9	1.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	358	1018	772	1132	524	587
V/C Ratio(X)	0.21	0.85	0.55	0.43	0.94	0.09
Avail Cap(c_a), veh/h	478	1187	815	1169	544	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	14.3	16.4	3.7	25.7	15.6
Incr Delay (d2), s/veh	0.1	5.4	0.7	0.3	23.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	16.7	6.9	8.6	13.5	0.7
LnGrp Delay(d),s/veh	11.2	19.7	17.1	4.0	48.8	15.6
LnGrp LOS	B	B	B	A	D	B
Approach Vol, veh/h		940	910		544	
Approach Delay, s/veh		19.0	10.1		45.6	
Approach LOS		B	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		47.9			9.8	38.1		29.1
Change Period (Y+Rc), s		5.0			5.0	5.0		5.0
Max Green Setting (Gmax), s		50.0			10.0	35.0		25.0
Max Q Clear Time (g_c+I1), s		32.7			3.6	15.7		23.9
Green Ext Time (p_c), s		10.2			0.0	10.9		0.1

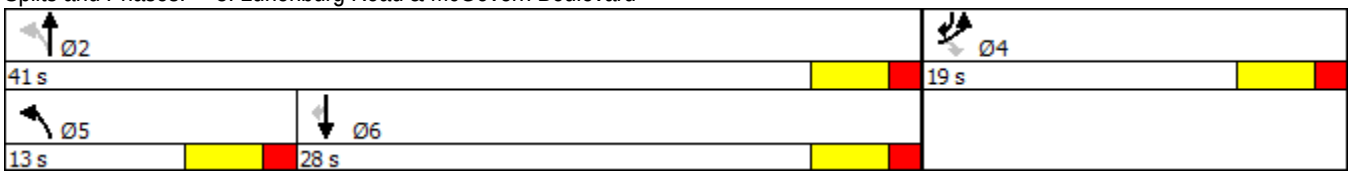
Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

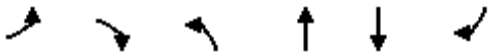
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	139	136	189	333	385	297
Future Volume (vph)	139	136	189	333	385	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	150	0	100			200
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	33%	18%	7%	10%	6%	17%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	4
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	11.0	11.0	11.0	15.0	15.0	11.0
Total Split (s)	19.0	19.0	13.0	41.0	28.0	19.0
Total Split (%)	31.7%	31.7%	21.7%	68.3%	46.7%	31.7%
Maximum Green (s)	14.0	14.0	8.0	36.0	23.0	14.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	2.0
Recall Mode	None	None	None	Min	Min	None

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 47.3
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Lunenburg Road & McGovern Boulevard





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	149	146	203	358	414	319
v/c Ratio	0.53	0.37	0.43	0.39	0.67	0.30
Control Delay	27.1	7.3	8.1	7.1	20.6	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	7.3	8.1	7.1	20.6	1.3
Queue Length 50th (ft)	39	0	23	44	102	0
Queue Length 95th (ft)	97	38	55	100	201	17
Internal Link Dist (ft)	920			920	4220	
Turn Bay Length (ft)	150		100			200
Base Capacity (vph)	425	527	492	1262	922	1102
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.28	0.41	0.28	0.45	0.29

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	139	136	189	333	385	297
Future Volume (veh/h)	139	136	189	333	385	297
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1429	1610	1776	1727	1792	1624
Adj Flow Rate, veh/h	149	146	203	358	414	319
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	33	18	7	10	6	17
Cap, veh/h	211	212	503	1042	629	698
Arrive On Green	0.15	0.15	0.13	0.60	0.35	0.35
Sat Flow, veh/h	1361	1369	1691	1727	1792	1380
Grp Volume(v), veh/h	149	146	203	358	414	319
Grp Sat Flow(s),veh/h/ln	1361	1369	1691	1727	1792	1380
Q Serve(g_s), s	4.3	4.2	2.6	4.3	8.1	6.1
Cycle Q Clear(g_c), s	4.3	4.2	2.6	4.3	8.1	6.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	211	212	503	1042	629	698
V/C Ratio(X)	0.71	0.69	0.40	0.34	0.66	0.46
Avail Cap(c_a), veh/h	461	464	609	1505	998	982
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	16.5	6.9	4.1	11.3	6.6
Incr Delay (d2), s/veh	1.6	1.5	0.2	0.2	1.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.2	1.2	2.0	4.1	3.1
LnGrp Delay(d),s/veh	18.2	18.0	7.1	4.3	12.5	7.0
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	295			561	733	
Approach Delay, s/veh	18.1			5.3	10.1	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		29.9		11.4	10.4	19.5		
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0		
Max Green Setting (Gmax), s		36.0		14.0	8.0	23.0		
Max Q Clear Time (g_c+I1), s		6.3		6.3	4.6	10.1		
Green Ext Time (p_c), s		5.8		0.3	0.1	4.5		

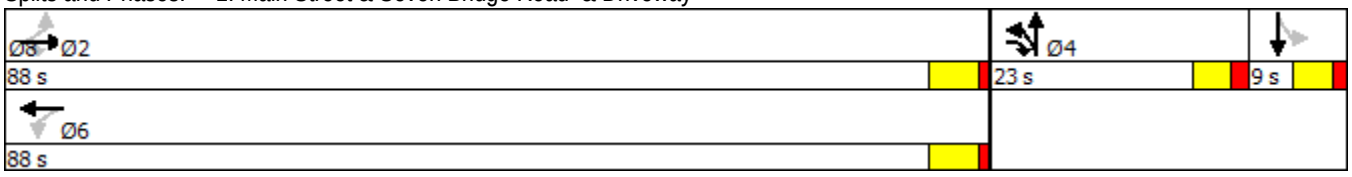
Intersection Summary	
HCM 2010 Ctrl Delay	9.9
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	585	359	4	1304	0	288	0	3	0	0	0
Future Volume (vph)	0	585	359	4	1304	0	288	0	3	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	15	15	15	12	12	12
Storage Length (ft)	0		115	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	2%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type		NA	pm+ov	Perm	NA		Split	NA				
Protected Phases		2	4		6		4	4			8	
Permitted Phases	2		2	6						8		
Detector Phase	2	2	4	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		4.0	4.0	
Minimum Split (s)	15.5	15.5	15.0	15.5	15.5		15.0	15.0		9.0	9.0	
Total Split (s)	88.0	88.0	23.0	88.0	88.0		23.0	23.0		9.0	9.0	
Total Split (%)	73.3%	73.3%	19.2%	73.3%	73.3%		19.2%	19.2%		7.5%	7.5%	
Maximum Green (s)	82.5	82.5	18.0	82.5	82.5		18.0	18.0		4.0	4.0	
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.5	5.0	5.5	5.5			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	2.0	3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min	None	Min	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 109.7
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Main Street & Seven Bridge Road & Driveway



Lane Group	EBT	EBR	WBL	WBT	NBT
Lane Group Flow (vph)	616	378	4	1373	306
v/c Ratio	0.46	0.25	0.01	1.01	0.86
Control Delay	6.6	0.4	3.8	43.5	59.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	0.4	3.8	43.5	59.1
Queue Length 50th (ft)	147	0	1	~1046	167
Queue Length 95th (ft)	209	0	3	#1306	#309
Internal Link Dist (ft)	1370			920	920
Turn Bay Length (ft)		115	50		
Base Capacity (vph)	1341	1523	515	1354	377
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.46	0.25	0.01	1.01	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	585	359	4	1304	0	288	0	3	0	0	0
Future Volume (veh/h)	0	585	359	4	1304	0	288	0	3	0	0	0
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1863	1900	1863	1900	1976	1938	1976	1900	1900	1900
Adj Flow Rate, veh/h	0	616	378	4	1373	0	303	0	3	0	0	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	2	0	2	2	0	0	0	0	0	0
Cap, veh/h	0	1371	1434	418	1384	0	296	0	3	0	2	0
Arrive On Green	0.00	0.74	0.74	0.74	0.74	0.00	0.16	0.00	0.16	0.00	0.00	0.00
Sat Flow, veh/h	0	1845	1583	576	1863	0	1825	0	18	0	1900	0
Grp Volume(v), veh/h	0	616	378	4	1373	0	306	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1845	1583	576	1863	0	1843	0	0	0	1900	0
Q Serve(g_s), s	0.0	14.3	3.3	0.3	79.9	0.0	18.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	14.3	3.3	14.6	79.9	0.0	18.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00	0.99		0.01	0.00		0.00
Lane Grp Cap(c), veh/h	0	1371	1434	418	1384	0	299	0	0	0	2	0
V/C Ratio(X)	0.00	0.45	0.26	0.01	0.99	0.00	1.02	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1371	1434	419	1385	0	299	0	0	0	68	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	5.5	0.7	8.3	13.9	0.0	46.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.1	0.0	22.1	0.0	58.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	3.9	0.0	48.6	0.0	14.0	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	5.7	0.7	8.3	36.1	0.0	104.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS		A	A	A	D		F					
Approach Vol, veh/h		994			1377			306			0	
Approach Delay, s/veh		3.8			36.0			104.8			0.0	
Approach LOS		A			D			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		88.0		23.0		88.0		0.0
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0
Max Green Setting (Gmax), s		82.5		18.0		82.5		4.0
Max Q Clear Time (g_c+I1), s		16.3		20.0		81.9		0.0
Green Ext Time (p_c), s		42.2		0.0		0.6		0.0

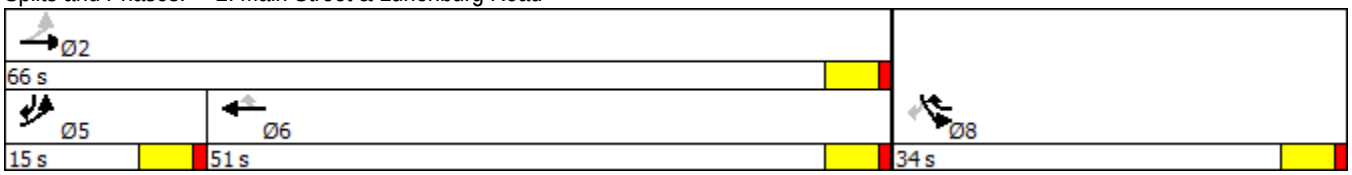
Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C

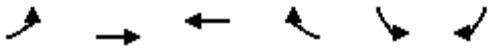
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	62	499	817	767	444	89
Future Volume (vph)	62	499	817	767	444	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	100			160	0	240
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	3%	1%	2%	0%
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	8	8	5
Permitted Phases	2			6		8
Detector Phase	5	2	6	8	8	5
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	11.0	15.0	15.0	15.0	15.0	11.0
Total Split (s)	15.0	66.0	51.0	34.0	34.0	15.0
Total Split (%)	15.0%	66.0%	51.0%	34.0%	34.0%	15.0%
Maximum Green (s)	10.0	61.0	46.0	29.0	29.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	3.0	3.0	2.0	2.0	2.0
Recall Mode	None	Min	Min	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 93.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Main Street & Lunenburg Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	65	525	860	807	467	94
v/c Ratio	0.31	0.49	0.98	0.57	0.93	0.14
Control Delay	11.9	12.8	51.6	2.4	60.1	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	12.8	51.6	2.4	60.1	17.7
Queue Length 50th (ft)	16	170	~541	18	277	35
Queue Length 95th (ft)	32	250	#825	46	#482	67
Internal Link Dist (ft)		920	1370		920	
Turn Bay Length (ft)	100			160		240
Base Capacity (vph)	257	1168	881	1409	533	710
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.45	0.98	0.57	0.88	0.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	499	817	767	444	89
Future Volume (veh/h)	62	499	817	767	444	89
Number	5	2	6	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1881	1863	1900
Adj Flow Rate, veh/h	65	525	860	807	467	94
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	3	3	1	2	0
Cap, veh/h	194	1120	921	1250	502	542
Arrive On Green	0.05	0.61	0.50	0.50	0.28	0.28
Sat Flow, veh/h	1810	1845	1845	1599	1774	1615
Grp Volume(v), veh/h	65	525	860	807	467	94
Grp Sat Flow(s),veh/h/ln	1810	1845	1845	1599	1774	1615
Q Serve(g_s), s	1.4	14.2	39.8	20.2	23.3	3.7
Cycle Q Clear(g_c), s	1.4	14.2	39.8	20.2	23.3	3.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	194	1120	921	1250	502	542
V/C Ratio(X)	0.33	0.47	0.93	0.65	0.93	0.17
Avail Cap(c_a), veh/h	297	1237	933	1261	566	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.1	9.8	21.4	4.4	31.8	21.3
Incr Delay (d2), s/veh	0.4	0.3	15.8	1.1	20.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	7.2	24.1	20.6	14.2	1.7
LnGrp Delay(d),s/veh	20.5	10.1	37.2	5.5	51.8	21.4
LnGrp LOS	C	B	D	A	D	C
Approach Vol, veh/h		590	1667		561	
Approach Delay, s/veh		11.2	21.9		46.7	
Approach LOS		B	C		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		60.2			9.8	50.4		30.7
Change Period (Y+Rc), s		5.0			5.0	5.0		5.0
Max Green Setting (Gmax), s		61.0			10.0	46.0		29.0
Max Q Clear Time (g_c+I1), s		16.2			3.4	41.8		25.3
Green Ext Time (p_c), s		21.2			0.0	3.6		0.4

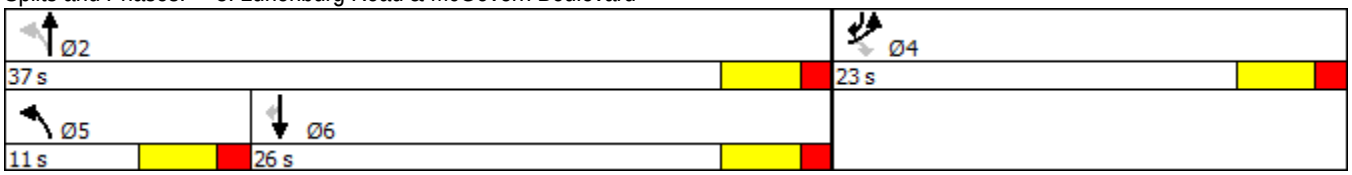
Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

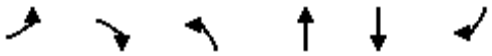
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	364	214	167	696	331	259
Future Volume (vph)	364	214	167	696	331	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	150	0	100			200
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	2%	6%	0%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	4
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	11.0	11.0	11.0	15.0	15.0	11.0
Total Split (s)	23.0	23.0	11.0	37.0	26.0	23.0
Total Split (%)	38.3%	38.3%	18.3%	61.7%	43.3%	38.3%
Maximum Green (s)	18.0	18.0	6.0	32.0	21.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	2.0
Recall Mode	None	None	None	Min	Min	None

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 50.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Lunenburg Road & McGovern Boulevard





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	379	223	174	725	345	270
v/c Ratio	0.76	0.37	0.38	0.80	0.59	0.22
Control Delay	29.1	4.9	9.6	19.0	20.2	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	4.9	9.6	19.0	20.2	0.8
Queue Length 50th (ft)	104	0	27	169	93	0
Queue Length 95th (ft)	#235	41	57	#316	172	13
Internal Link Dist (ft)	920			920	4220	
Turn Bay Length (ft)	150		100			200
Base Capacity (vph)	661	730	462	1212	766	1295
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.31	0.38	0.60	0.45	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	364	214	167	696	331	259
Future Volume (veh/h)	364	214	167	696	331	259
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1792	1900
Adj Flow Rate, veh/h	379	223	174	725	345	270
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	2	6	0
Cap, veh/h	459	410	484	1000	571	924
Arrive On Green	0.25	0.25	0.11	0.54	0.32	0.32
Sat Flow, veh/h	1810	1615	1810	1863	1792	1615
Grp Volume(v), veh/h	379	223	174	725	345	270
Grp Sat Flow(s),veh/h/ln	1810	1615	1810	1863	1792	1615
Q Serve(g_s), s	9.4	5.7	2.7	14.1	7.7	4.1
Cycle Q Clear(g_c), s	9.4	5.7	2.7	14.1	7.7	4.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	459	410	484	1000	571	924
V/C Ratio(X)	0.83	0.54	0.36	0.73	0.60	0.29
Avail Cap(c_a), veh/h	683	609	507	1250	789	1121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	15.4	8.6	8.4	13.7	5.2
Incr Delay (d2), s/veh	3.2	0.4	0.2	1.6	1.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	5.2	1.3	7.5	4.0	2.9
LnGrp Delay(d),s/veh	20.0	15.8	8.7	10.0	14.7	5.4
LnGrp LOS	C	B	A	A	B	A
Approach Vol, veh/h	602			899	615	
Approach Delay, s/veh	18.5			9.7	10.6	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		30.6		17.1	10.4	20.2		
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0		
Max Green Setting (Gmax), s		32.0		18.0	6.0	21.0		
Max Q Clear Time (g_c+I1), s		16.1		11.4	4.7	9.7		
Green Ext Time (p_c), s		6.6		0.7	0.0	5.5		

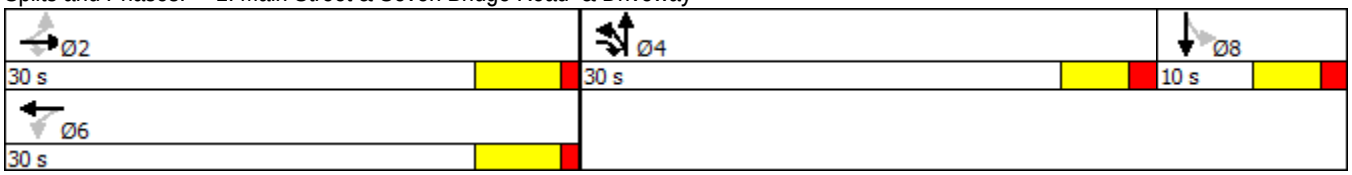
Intersection Summary	
HCM 2010 Ctrl Delay	12.5
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	108	845	5	332	1	549	2	29	0	2	0
Future Volume (vph)	1	108	845	5	332	1	549	2	29	0	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	15	15	15	12	12	12
Storage Length (ft)	0		115	50		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1450			1000			1000			200	
Travel Time (s)		28.2			19.5			19.5			4.5	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	4%	2%	0%	1%	0%	2%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	pm+ov	Perm	NA		Split	NA			NA	
Protected Phases		2	4		6		4	4			8	
Permitted Phases	2		2	6						8		
Detector Phase	2	2	4	6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		5.0	5.0	
Minimum Split (s)	15.5	15.5	15.0	15.5	15.5		15.0	15.0		10.0	10.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0		30.0	30.0		10.0	10.0	
Total Split (%)	42.9%	42.9%	42.9%	42.9%	42.9%		42.9%	42.9%		14.3%	14.3%	
Maximum Green (s)	24.5	24.5	25.0	24.5	24.5		25.0	25.0		5.0	5.0	
Yellow Time (s)	4.5	4.5	3.5	4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.5	1.0	1.0		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.5	5.0	5.5	5.5			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	2.0	3.0	3.0		2.0	2.0		0.2	0.2	
Recall Mode	Min	Min	None	Min	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 54.3
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Main Street & Seven Bridge Road & Driveway



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	131	1018	6	401	698	2
v/c Ratio	0.25	0.67	0.02	0.73	0.76	0.01
Control Delay	15.7	2.7	13.8	25.5	22.2	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	2.7	13.8	25.5	22.2	27.0
Queue Length 50th (ft)	29	0	1	105	156	1
Queue Length 95th (ft)	69	10	8	205	#452	7
Internal Link Dist (ft)	1370			920	920	120
Turn Bay Length (ft)		115	50			
Base Capacity (vph)	811	1509	549	838	916	178
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.67	0.01	0.48	0.76	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	108	845	5	332	1	549	2	29	0	2	0
Future Volume (veh/h)	1	108	845	5	332	1	549	2	29	0	2	0
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1863	1900	1881	1900	1976	1939	1976	1900	1900	1900
Adj Flow Rate, veh/h	1	130	1018	6	400	1	661	2	35	0	2	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	4	4	2	0	1	1	0	0	0	0	0	0
Cap, veh/h	56	686	1202	274	705	2	667	2	35	0	5	0
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.00	0.00	0.00
Sat Flow, veh/h	2	1824	1583	498	1876	5	1739	5	92	0	1900	0
Grp Volume(v), veh/h	131	0	1018	6	0	401	698	0	0	0	2	0
Grp Sat Flow(s),veh/h/ln	1826	0	1583	498	0	1880	1836	0	0	0	1900	0
Q Serve(g_s), s	0.0	0.0	24.5	0.5	0.0	11.0	24.6	0.0	0.0	0.0	0.1	0.0
Cycle Q Clear(g_c), s	3.1	0.0	24.5	3.7	0.0	11.0	24.6	0.0	0.0	0.0	0.1	0.0
Prop In Lane	0.01		1.00	1.00		0.00	0.95		0.05	0.00		0.00
Lane Grp Cap(c), veh/h	742	0	1202	274	0	707	704	0	0	0	5	0
V/C Ratio(X)	0.18	0.00	0.85	0.02	0.00	0.57	0.99	0.00	0.00	0.00	0.39	0.00
Avail Cap(c_a), veh/h	742	0	1202	274	0	707	704	0	0	0	146	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	13.7	0.0	4.8	14.9	0.0	16.1	20.0	0.0	0.0	0.0	32.4	0.0
Incr Delay (d2), s/veh	0.1	0.0	5.8	0.0	0.0	1.1	31.5	0.0	0.0	0.0	16.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	20.0	0.1	0.0	5.9	18.6	0.0	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	13.8	0.0	10.6	14.9	0.0	17.2	51.5	0.0	0.0	0.0	48.9	0.0
LnGrp LOS	B		B	B		B	D				D	
Approach Vol, veh/h		1149			407			698			2	
Approach Delay, s/veh		11.0			17.2			51.5			48.9	
Approach LOS		B			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		30.0		30.0		30.0		5.2
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0
Max Green Setting (Gmax), s		24.5		25.0		24.5		5.0
Max Q Clear Time (g_c+I1), s		26.5		26.6		13.0		2.1
Green Ext Time (p_c), s		0.0		0.0		6.3		0.0

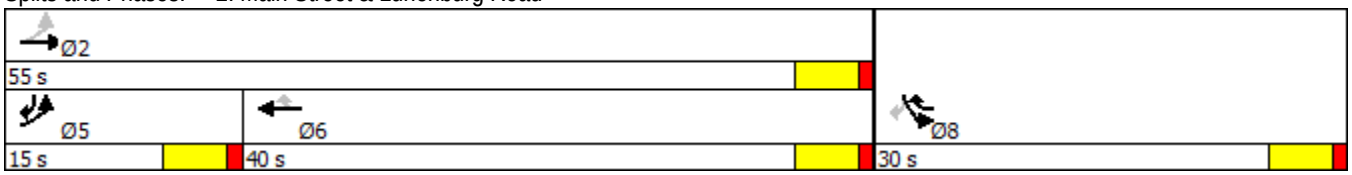
Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

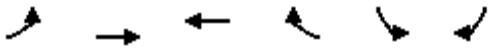
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	59	393	423	460	558	60
Future Volume (vph)	59	393	423	460	558	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	100			160	0	240
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		No
Link Speed (mph)		35	35		45	
Link Distance (ft)		1000	1450		1000	
Travel Time (s)		19.5	28.2		15.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	2%	1%	2%	0%
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	8	8	5
Permitted Phases	2			6		8
Detector Phase	5	2	6	8	8	5
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	11.0	15.0	15.0	15.0	15.0	11.0
Total Split (s)	15.0	55.0	40.0	30.0	30.0	15.0
Total Split (%)	17.6%	64.7%	47.1%	35.3%	35.3%	17.6%
Maximum Green (s)	10.0	50.0	35.0	25.0	25.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	3.0	3.0	2.0	2.0	2.0
Recall Mode	None	Min	Min	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 66.9
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Main Street & Lunenburg Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	62	414	445	484	587	63
v/c Ratio	0.20	0.50	0.77	0.36	0.89	0.07
Control Delay	10.1	13.8	30.4	1.0	41.7	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	13.8	30.4	1.0	41.7	10.0
Queue Length 50th (ft)	13	108	166	0	228	12
Queue Length 95th (ft)	29	168	275	17	#546	38
Internal Link Dist (ft)		920	1370		920	
Turn Bay Length (ft)	100			160		240
Base Capacity (vph)	382	1384	976	1341	662	967
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.30	0.46	0.36	0.89	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	393	423	460	558	60
Future Volume (veh/h)	59	393	423	460	558	60
Number	5	2	6	16	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1863	1881	1863	1900
Adj Flow Rate, veh/h	62	414	445	484	587	63
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	2	1	2	0
Cap, veh/h	309	920	649	1126	631	675
Arrive On Green	0.06	0.49	0.35	0.35	0.36	0.36
Sat Flow, veh/h	1774	1881	1863	1599	1774	1615
Grp Volume(v), veh/h	62	414	445	484	587	63
Grp Sat Flow(s),veh/h/ln	1774	1881	1863	1599	1774	1615
Q Serve(g_s), s	1.3	9.3	13.1	8.3	20.5	1.5
Cycle Q Clear(g_c), s	1.3	9.3	13.1	8.3	20.5	1.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	309	920	649	1126	631	675
V/C Ratio(X)	0.20	0.45	0.69	0.43	0.93	0.09
Avail Cap(c_a), veh/h	474	1464	1015	1439	690	729
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.4	10.8	17.9	4.0	19.9	11.3
Incr Delay (d2), s/veh	0.1	0.3	1.3	0.3	17.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.8	6.9	8.0	13.0	0.7
LnGrp Delay(d),s/veh	12.5	11.1	19.2	4.3	37.6	11.3
LnGrp LOS	B	B	B	A	D	B
Approach Vol, veh/h		476	929		650	
Approach Delay, s/veh		11.3	11.4		35.1	
Approach LOS		B	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		36.4			9.0	27.4		27.8
Change Period (Y+Rc), s		5.0			5.0	5.0		5.0
Max Green Setting (Gmax), s		50.0			10.0	35.0		25.0
Max Q Clear Time (g_c+I1), s		11.3			3.3	15.1		22.5
Green Ext Time (p_c), s		8.7			0.0	7.3		0.4

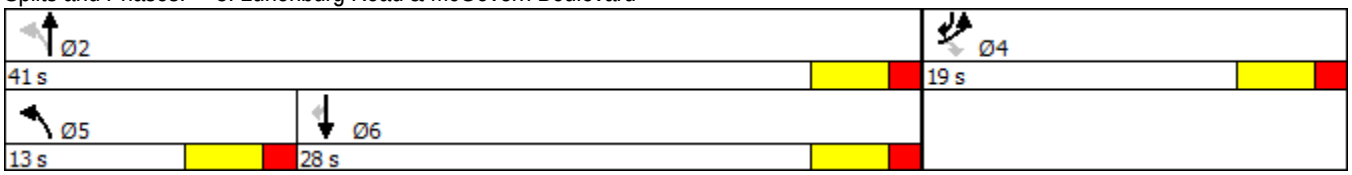
Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

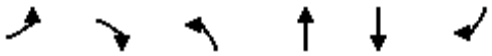
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	369	223	160	367	398	242
Future Volume (vph)	369	223	160	367	398	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Storage Length (ft)	150	0	100			200
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			50	50	
Link Distance (ft)	1000			1000	4300	
Travel Time (s)	22.7			13.6	58.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	3%	2%	5%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	4
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	10.0	10.0	6.0
Minimum Split (s)	11.0	11.0	11.0	15.0	15.0	11.0
Total Split (s)	19.0	19.0	13.0	41.0	28.0	19.0
Total Split (%)	31.7%	31.7%	21.7%	68.3%	46.7%	31.7%
Maximum Green (s)	14.0	14.0	8.0	36.0	23.0	14.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	2.0
Recall Mode	None	None	None	Min	Min	None

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 51.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Lunenburg Road & McGovern Boulevard





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	401	242	174	399	433	263
v/c Ratio	0.85	0.41	0.43	0.44	0.73	0.22
Control Delay	43.1	5.7	9.1	8.6	23.8	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	5.7	9.1	8.6	23.8	1.0
Queue Length 50th (ft)	127	0	24	64	123	0
Queue Length 95th (ft)	#308	48	47	110	208	15
Internal Link Dist (ft)	920			920	4220	
Turn Bay Length (ft)	150		100			200
Base Capacity (vph)	470	594	424	1276	837	1173
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.41	0.41	0.31	0.52	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	369	223	160	367	398	242
Future Volume (veh/h)	369	223	160	367	398	242
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1810	1810	1845	1863	1810
Adj Flow Rate, veh/h	401	242	174	399	433	263
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	3	2	5
Cap, veh/h	458	409	420	987	607	910
Arrive On Green	0.27	0.27	0.11	0.53	0.33	0.33
Sat Flow, veh/h	1723	1538	1723	1845	1863	1538
Grp Volume(v), veh/h	401	242	174	399	433	263
Grp Sat Flow(s),veh/h/ln	1723	1538	1723	1845	1863	1538
Q Serve(g_s), s	11.2	6.9	3.0	6.4	10.2	4.2
Cycle Q Clear(g_c), s	11.2	6.9	3.0	6.4	10.2	4.2
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	458	409	420	987	607	910
V/C Ratio(X)	0.88	0.59	0.41	0.40	0.71	0.29
Avail Cap(c_a), veh/h	481	430	507	1325	855	1114
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	16.0	9.6	6.9	14.8	5.0
Incr Delay (d2), s/veh	15.1	1.3	0.2	0.3	1.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	6.0	1.4	3.3	5.4	3.0
LnGrp Delay(d),s/veh	32.8	17.3	9.9	7.2	16.5	5.2
LnGrp LOS	C	B	A	A	B	A
Approach Vol, veh/h	643			573	696	
Approach Delay, s/veh	26.9			8.0	12.2	
Approach LOS	C			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		31.8		18.3	10.5	21.3		
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0		
Max Green Setting (Gmax), s		36.0		14.0	8.0	23.0		
Max Q Clear Time (g_c+I1), s		8.4		13.2	5.0	12.2		
Green Ext Time (p_c), s		5.9		0.2	0.1	4.1		

Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Appendix F.12

Parking Demand Calculations

Parking Demand Assessment

Project: Capital Commerce Center
Date: April 10, 2019
Analyst: TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source: Institute of Transportation Engineers - *Parking Generation - 5th Ed.*

Land Use: Industrial Park
LUC: 130
Size 1,567,000 SF

Average Percentile Peak Period Parking Demand:

Weekday:	1.20	vehicles per kSF	x	1567	kSF =	**1880**	**vehicles**
Saturday*:	0.80	vehicles per kSF	x	1567	kSF =	**1260**	**vehicles**

Parking Demand - Time of Day Distribution

	Weekday		Saturday	
Time	Percent of Peak	Demand	Percent of Peak	Demand
12:00-4:00 AM	30%	564	30%	378
5:00 AM	30%	564	30%	378
6:00 AM	30%	564	30%	378
7:00 AM	59%	1109	59%	743
8:00 AM	89%	1673	89%	1121
9:00 AM	99%	1861	99%	1247
10:00 AM	99%	1861	99%	1247
11:00 AM	99%	1861	99%	1247
12:00 PM	95%	1786	95%	1197
1:00 PM	98%	1842	98%	1235
2:00 PM	100%	1880	100%	1260
3:00 PM	94%	1767	94%	1184
4:00 PM	66%	1241	66%	832
5:00 PM	47%	884	47%	592
6:00 PM	30%	564	30%	378
7:00 PM	30%	564	30%	378
8:00 PM	30%	564	30%	378
9:00 PM	30%	564	30%	378
10:00 PM	30%	564	30%	378
11:00 PM	30%	564	30%	378

Parking Demand Assessment

Project: Capital Commerce Center
Date: April 10, 2019
Analyst: TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source: Institute of Transportation Engineers - *Parking Generation - 5th Ed.*

Land Use: Multifamily Housing (Mid-Rise)
LUC: 221
Size 500 Dwelling Units

GENERAL URBAN / SUBURBAN

Avg Percentile Peak Period Parking Demand:

Weekday:	1.21	vehicles per units	x	500	units =	**605**	**vehicles**
Saturday*:	1.31	vehicles per units	x	500	units =	**655**	**vehicles**

Parking Demand - Time of Day Distribution

	Weekday		Saturday	
Time	Percent of Peak	Demand	Percent of Peak	Demand
12:00-4:00 AM	100%	605	100%	655
5:00 AM	94%	569	99%	648
6:00 AM	83%	502	97%	635
7:00 AM	71%	430	95%	622
8:00 AM	61%	369	88%	576
9:00 AM	55%	333	83%	544
10:00 AM	54%	327	75%	491
11:00 AM	53%	321	71%	465
12:00 PM	50%	303	68%	445
1:00 PM	49%	296	66%	432
2:00 PM	49%	296	70%	459
3:00 PM	50%	303	69%	452
4:00 PM	58%	351	72%	472
5:00 PM	64%	387	74%	485
6:00 PM	67%	405	74%	485
7:00 PM	70%	424	73%	478
8:00 PM	76%	460	75%	491
9:00 PM	83%	502	78%	511
10:00 PM	90%	545	82%	537
11:00 PM	93%	563	88%	576

TEC The Engineering Corp

Parking Demand Assessment

Project: Capital Commerce Center
Date: April 10, 2019
Analyst: TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source: Institute of Transportation Engineers - *Parking Generation - 5th Ed.*

Land Use: Hotel
LUC: 310
Size 120 rooms

GENERAL URBAN / SUBURBAN

Avg Percentile Peak Period Parking Demand:

Weekday:	0.74	vehicles per room	x	120	rooms =	**89**	**vehicles**
Saturday*:	1.15	vehicles per room	x	120	rooms =	**138**	**vehicles**

Parking Demand - Time of Day Distribution

Time	Weekday		Saturday	
	Percent of Peak	Demand	Percent of Peak	Demand
12:00-4:00 AM	96%	85	93%	128
5:00 AM	96%	85	93%	128
6:00 AM	91%	81	97%	134
7:00 AM	89%	79	100%	138
8:00 AM	90%	80	93%	128
9:00 AM	100%	89	72%	99
10:00 AM	98%	87	69%	95
11:00 AM	89%	79	65%	90
12:00 PM	85%	76	78%	108
1:00 PM	75%	67	78%	108
2:00 PM	81%	72	63%	87
3:00 PM	70%	62	59%	81
4:00 PM	74%	66	58%	80
5:00 PM	65%	58	52%	72
6:00 PM	73%	65	63%	87
7:00 PM	78%	69	74%	102
8:00 PM	93%	83	78%	108
9:00 PM	96%	85	72%	99
10:00 PM	95%	85	84%	116
11:00 PM	95%	85	92%	127

Assumed based on 12:00 AM & 4:00 AM percentages

TEC The Engineering Corp

Parking Demand Assessment

Project: Capital Commerce Center
Date: April 10, 2019
Analyst: TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source: Institute of Transportation Engineers - *Parking Generation - 5th Ed.*

Land Use: Soccer Complex
LUC: 488
Size 4 Fields

GENERAL URBAN / SUBURBAN

Avg Percentile Peak Period Parking Demand:

Friday:	59.63	vehicles per Field	X	4	Field =	**239**	**vehicles**
Saturday*:	62.12	vehicles per Field	X	4	Field =	**248**	**vehicles**

Parking Demand - Time of Day Distribution

Time	Weekday		Saturday	
	Percent of Peak	Demand	Percent of Peak	Demand
12:00-4:00 AM	5%	12	5%	12
5:00 AM	5%	12	5%	12
6:00 AM	5%	12	5%	12
7:00 AM	5%	12	50%	124
8:00 AM	5%	12	75%	186
9:00 AM	5%	12	75%	186
10:00 AM	5%	12	75%	186
11:00 AM	5%	12	75%	186
12:00 PM	10%	24	100%	248
1:00 PM	10%	24	100%	248
2:00 PM	10%	24	100%	248
3:00 PM	50%	120	75%	186
4:00 PM	100%	239	50%	124
5:00 PM	100%	239	50%	124
6:00 PM	100%	239	50%	124
7:00 PM	100%	239	50%	124
8:00 PM	50%	120	5%	12
9:00 PM	5%	12	5%	12
10:00 PM	5%	12	5%	12
11:00 PM	5%	12	5%	12
Assumed based on limited data provided				

TEC The Engineering Corp

Parking Demand Assessment

Project: Capital Commerce Center
Date: April 10, 2019
Analyst: TEC, Inc. / Samuel W. Gregorio, PE, PTOE
Source: Institute of Transportation Engineers - *Parking Generation - 5th Ed.*

Land Use: Shopping Center
LUC: 820
Size 65,700 SF

GENERAL URBAN / SUBURBAN

Avg Percentile Peak Period Parking Demand:

Weekday:	3.68	vehicles per kSF	X	65,700	SF =	**242** **vehicles**
Saturday:	3.74	vehicles per kSF	X	65,700	SF =	**246** **vehicles**

Parking Demand - Time of Day Distribution

Time	Weekday		Saturday	
	Percent of Peak	Demand	Percent of Peak	Demand
12:00-4:00 AM	1%	2	1%	2
5:00 AM	1%	2	1%	2
6:00 AM	1%	2	1%	2
7:00 AM	5%	12	5%	12
8:00 AM	15%	36	27%	66
9:00 AM	32%	77	46%	113
10:00 AM	54%	131	67%	165
11:00 AM	71%	172	85%	209
12:00 PM	99%	240	95%	234
1:00 PM	100%	242	100%	246
2:00 PM	90%	218	98%	241
3:00 PM	83%	201	92%	226
4:00 PM	81%	196	86%	212
5:00 PM	84%	203	79%	194
6:00 PM	86%	208	71%	175
7:00 PM	80%	194	69%	170
8:00 PM	63%	152	60%	148
9:00 PM	42%	102	51%	125
10:00 PM	15%	36	38%	93
11:00 PM	1%	2	1%	2
Assumed based on minor staff committments overnight				

TEC The Engineering Corp

APPENDIX G: GREENHOUSE GAS AND MESOSCALE ANLYSIS

- Greenhouse Gas and Mesoscale Analysis for Capital Commerce Center (Prepared by Tech Environmental, dated September 2019)

GREENHOUSE GAS AND MESOSCALE ANALYSIS FOR CAPITAL COMMERCE CENTER

LANCASTER, MASSACHUSETTS

September 2019

tech environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

GREENHOUSE GAS ANALYSIS
FOR CAPITAL COMMERCE CENTER

LANCASTER, MASSACHUSETTS

Prepared for:

Capital Group Properties
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September 24, 2019

TABLE OF CONTENTS

Section	Contents	Page
1.0	INTRODUCTION AND SUMMARY	1
	1.1 Mesoscale Air Quality Analysis	1
	1.2 Greenhouse Gas Analysis	1
	1.3 Summary of Results	3
	1.4 Section 61 Findings	4
2.0	PROJECT MESOSCALE AIR QUALITY ANALYSIS	5
	2.1 Mesoscale Study Area	6
	2.2 Mesoscale Analysis Procedure	6
	2.3 Predicted Project Impacts	7
	2.4 Measures to Mitigate Air Quality Impacts	8
3.0	TRANSPORTATION GHG EMISSIONS	11
4.0	GREENHOUSE GAS (GHG) MITIGATION ANALYSIS	13
	4.1 Methodology and Results	13
	4.2 Site Design Mitigation Measures	27
	4.3 Building Design and Operation Mitigation Measures	27
	4.4 Infeasible Efficiency Measures	30
	4.5 Additional Energy Mitigation Measures	43
	4.6 Draft Outline for Tenant Manual	46
	4.7 Transportation Mitigation Measures	47
5.0	LOSS OF CARBON SEQUESTRATION	48

APPENDIX A - EQUEST MODEL OUTPUT

APPENDIX B - WORKSHEETs FOR VMT AND CO_2 EMISSIONS

APPENDIX C – PV COST CALCULATION SPEADSHEET

APPENDIX D – CARBON SEQUESTRATION SPREADSHEET

LIST OF TABLES

Table	Description	Page
1	Mesoscale VOC Emissions Summary	10
2	Mesoscale NO_x Emissions Summary	10
3	Motor Vehicle CO_2 Emissions Summary	12
4	Energy and CO_2 Modeling	16 to 25
5	Greenhouse Gas Emissions Summary	26
6	Energy Modeling Assumptions	35 to 40
7	Summary of Activity Areas	41
8	Comparison of Base Case EUI to PNNL Building Data	42

1.0 INTRODUCTION AND SUMMARY

1.1 Mesoscale Air Quality Analysis

A mesoscale air quality analysis was performed for Capital Commerce Center (the "Project"), an approximately 2.6 million square foot (sf) mixed-use development on McGovern Boulevard in Lancaster. Mesoscale emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x) were calculated for four scenarios: 2019 Existing, 2026 No-Build, 2026 Full Build and 2026 Full Build with Mitigation. This analysis used the US Environmental Protection Agency (EPA) MOVES2014 Mobile Source Emission Factor Model, and followed the Massachusetts Department of Environmental Protection (DEP) guideline for mesoscale analyses[1].

The mesoscale analysis predicts that the emissions of VOC and NO_x in the project study area for the 2026 Full Build cases will be larger than the emissions for the 2026 No-Build case. Details are provided in Section 2.3. The Project will mitigate potential air quality impacts by committing to a number of transportation demand management (TDM) measures, discussed in Section 2.4. The TDM measures will improve traffic operations, reduce project generated vehicle trips, and reduce project-related motor vehicle air pollutant emissions. These mitigation measures will result in small reductions in VOC and NO_x emissions compared to the 2026 Full Build case. The proposed TDM measures constitute all reasonable and feasible traffic mitigation measures for the Project.

1.2 Greenhouse Gas Analysis

A greenhouse gas (GHG) emissions analysis was performed for Capital Commerce Center (the "Project"), consistent with the EOEEA "Greenhouse Gas Emissions Policy and Protocol" (May 5, 2010). The Project is a mixed-use commercial and residential development of approximately 2.3 million square feet (sf).

Project components include: nine one-story industrial buildings (Buildings A through H, K), an auto storage facility office (Building J), 117 units of single-family/duplex/triplex housing (Buildings I), 500 apartments in a series of multi-family four-story buildings (Buildings L, M and N), a four-story hotel (Building O), an indoor soccer facility (Building Q), and retail (Building R). Three of the

industrial buildings have more than 100,000 sf of interior space (Buildings A, B and D), and Building A with 1,020,000 sf of space is clearly planned for warehouse use. The other industrial buildings lend themselves to either manufacturing or warehousing, and these were conservatively modeled as light manufacturing space. The site was previously developed as a sand and gravel pit, and currently houses multiple industrial uses.

Commercial Development (Buildings A-H, J, K and O-R)

As discussed in Section 4.0, GHG emissions are reduced by the following building design and operational energy efficiency measures (EEMs). Reference below is to the baseline code IECC 2015 with Section C406.1 code-options 1 and 2 (the "Code"):

- Using higher efficiency than Code building envelope (roof and wall insulation);
- Installing cool roofs with a light-colored material;
- Using higher efficiency than Code heating and cooling systems;
- Using higher efficiency than Code domestic hot water systems;
- Interior and exterior lighting systems with a lower light power density than Code;
- Sealing, insulating, and testing HVAC supply ducts;
- Energy management systems;
- Using Energy STAR electric appliances, where possible;
- Providing solar-ready roof space on the building roofs for possible third-party PV systems.

The GHG Policy requires a project to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize or mitigate such emissions, quantifying the effect of proposed mitigation in terms of energy savings and emissions reduction. CO_2 emissions were quantified for: (1) the Base Case corresponding to the 9th Edition of the Massachusetts Building Code that includes the 2015 IECC and ASHRAE 90.1-2013, with Section C406.1 code-options 1 and 2, and (2) the Mitigation Alternative, which includes all energy saving measures, detailed in Section 4.3.

Lancaster has adopted the Stretch Code. Since three industrial buildings (Buildings A, B and D) are over 100k sf in size, this report includes a demonstration that the Mitigation Alternative complies with the Stretch Code (780 CMR Appendix AA, Section AA103.2), requiring building energy use to be at least 10% below ASHRAE 90.1-2013 Appendix G. All other commercial structures are less than 100k sf in size, and for them the prescriptive Stretch Code is to follow the Massachusetts

[1] MassDEP, Guidelines for Performing Mesoscale Analysis of Indirect Sources, May 1991.

Building and Energy Code (780 CMR 13), which is the 2015 IECC with Section C406.1 code options 1 and 2. The Proponent will construct core and shell space in which the tenant will fit-out mechanical systems and lighting. A draft outline for the Tenant Manual is provided in Section 4.6.

Residential Development (Buildings I, L, M and N)

All residential structures are four stories or less in height. Both the Base Case and the Mitigation Alternative will comply with the Stretch Code as it applies to residential structures (780 CMR 51.00, Section N1106), and this analysis assumes the Energy STAR Homes path for compliance. As discussed in Section 4.0, GHG emissions for the Project are reduced by the following building design and operational energy efficiency measures (EEMs). Reference below is to the baseline IECC 2015 plus the requirements of Energy STAR Certified Homes (version 3.1) (the "Code"):

- Using higher efficiency than Code building envelope (roof and wall insulation);
- Using higher efficiency than Code heating and cooling systems;
- Using higher efficiency than Code domestic hot water systems;
- Interior and exterior lighting systems with a lower light power density than Code;
- Sealing, insulating, and testing HVAC supply ducts;
- Energy management systems;
- Using Energy STAR electric appliances;
- Providing solar-ready roof space on all building roofs for possible third-party PV systems.

1.3 Summary of Results

The Proponent commits to the CO_2 reduction presented below, but retains the flexibility to achieve this goal using energy efficiency measures that may be refined at the stage of detailed design for the Project. Table 5A reveals that the Mitigation Alternative will reduce CO_2 emissions (for stationary sources) by 14.2% compared to the Base Case. As discussed in Section 4.7, Transportation Demand Management (TDM) measures for this project will reduce Project-related motor vehicle CO_2 emissions by 2%. The net reduction of the Project's total CO_2 emissions (stationary sources plus transportation) is 11.0% compared to the Base Case. Table 8 confirms the three commercial buildings over 100k sf in size comply with the Stretch Code requirement for an energy use reduction of at least 10% relative to the ASHRAE 90.1-2013 Appendix G baseline.

1.4 Section 61 Findings

At the completion of construction, the Proponent will provide a certification to the MEPA Office, signed by an appropriate professional. The certification will identify either of the following: 1) all of the energy efficiency mitigation measures adopted by the Project as part of the Mitigation Alternative have been implemented; or 2) an equivalent set of energy efficiency mitigation measures, which together are designed to achieve the same percentage reduction in CO_2 emissions as the Mitigation Alternative, when compared to the Base Case, based on the same modeling assumptions in this report, have been adopted.

2.0 PROJECT MESOSCALE AIR QUALITY ANALYSIS

The mesoscale air quality analysis was performed to calculate the potential regional air quality effects of the proposed project, using as a measure, the total daily emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x) in the study area following the latest DEP guidance[2]. Specifically, calculations were performed to compare area-wide VOC and NO_x emissions after the Full Build of the project is built with existing and future no-build emissions.

The purpose of controlling VOC and NO_x emissions is to reduce the concentration of ground-level ozone. VOC react with NO_x in the presence of sunlight to create ground-level photochemical oxidants (ozone). Motor vehicles are the predominant source of VOC and NO_x in Massachusetts.

The entire Commonwealth of Massachusetts was classified by the US EPA as a "serious" ozone non-attainment area with regard to the old one-hour ozone standard. Massachusetts was required by the 1990 Clean Air Act Amendments to reduce VOC emissions until attainment of the one-hour Massachusetts and National Ambient Air Quality Standard (NAAQS) for ozone is reached. The Commonwealth developed a State Implementation Plan (SIP) for ozone that showed how these reductions would be achieved. Air monitoring showed that compliance with the one-hour ozone standard has been achieved in most of Massachusetts.

In 1997, the U.S. EPA established a new eight-hour NAAQS for ozone. In April of 2004, the U.S. EPA designated eastern Massachusetts as a moderate nonattainment area with respect to the new eight-hour ozone NAAQS. The U.S. EPA revoked the one-hour ozone standard nationwide in 2005, as part of the implementation of the eight-hour ozone NAAQS. The Commonwealth submitted the required final ozone SIP to the U.S. EPA on January 31, 2008, demonstrating compliance with the 8-hour ozone NAAQS. On March 12, 2008, the U.S. EPA revised the 8-hour ozone standard by reducing it from 0.08 parts of ozone per million parts of air (ppm) to 0.075 ppm. The U.S. EPA issued final attainment status designations regarding the new standard on June 28, 2012. On October

[2]Massachusetts DEP, Guidelines for Performing Mesoscale Analysis of Indirect Sources, Division of Air Quality Control, May 1991.

26, 2015, U.S. EPA lowered the standard to 0.070 ppm. The final rule became effective on December 28, 2015.

Ozone concentrations in the study area are made up of three parts: 1) natural ozone; 2) locally generated ozone; and 3) ozone transported from upwind urban areas. Emissions of VOC and NO_x in the study area have almost no effect on the local ozone levels due to their relatively small size and the fact that photochemical reaction times are not rapid enough to form ozone until a parcel of air has been transported a long distance downwind. VOC and NO_x emissions from the urban areas south and west of Massachusetts are the primary determinants of ozone levels in the study area. The VOC and NO_x emissions from the study area are insignificant when compared to emissions from the entire region and urban areas upwind (such as Springfield, Hartford, and New York City). Effective ozone control measures are national programs such as those setting motor vehicle emission standards and controls on large fuel-burning sources (electric utility plants and industrial boilers).

2.1 Mesoscale Study Area

The mesoscale study area includes the following nine roadway segments:

- Main Street between Shirley Road and Lunenberg Road
- Lunenberg Road between Main Street and McGovern Boulevard
- McGovern Boulevard
- Lunenberg Road between McGovern Blvd. and Old Union Turnpike
- Old Union Turnpike between Lunenberg Road and Route 2 East Ramps
- Old Union Turnpike between Route 2 East Ramps and Harvard Road
- Mechanic Street between Harvard Road and White Pond Road
- Mechanic Street between White Pond Road and Johnny Appleseed Lane
- Johnny Appleseed Lane

2.2 Mesoscale Analysis Procedure

The mesoscale analysis calculated emissions of VOC and NO_x over the study area for four scenarios:

- 2019 Existing
- 2026 No-Build
- 2026 Build
- 2026 Build with Mitigation.

The VOC and NO_x emissions for each roadway segment were calculated by multiplying the VMT (miles per day) by the EPA MOVES2014 model predicted VOC and NO_x emission factors in grams per mile. The MOVES model was run using input files provided by the DEP for 2019 and 2026. These emission factors were calculated for the warm summertime temperatures, which correspond with the peak ozone season. The vehicle miles traveled (VMT) for each roadway segment was calculated by multiplying the length of each road segment by the average daily traffic volume on the segment. Average daily (24-hour average) traffic volumes (ADTs) were calculated based on traffic data provided by Bohler Engineering; the calculations are shown in Appendix B.

2.3 Predicted Project Impacts

A summary of the results of the mesoscale analysis is presented in Tables 1 and 2. In Table 1, the 2019 Existing VOC mesoscale emissions over the study area are 10.829 kg/day. The mesoscale emissions of VOC for the 2026 No-Build case are predicted to be 9.040 kg/day. This is a 16% decrease from the existing mesoscale VOC emissions. The mesoscale emissions of VOC for the 2026 Build case are predicted to be 12.167 kg/day. This is a 12% increase from the existing mesoscale VOC emissions. Table 2 shows that the 2019 Existing NO_x mesoscale emissions over the study area are 16.420 kg/day. The mesoscale emissions of NO_x for the 2026 No-Build case are predicted to be 9.727 kg/day. This is a 40% decrease from the existing mesoscale NO_x emissions. The mesoscale emissions of NOx for the 2026 Build case are predicted to be 12.795 kg/day. This is a 22% decrease from the existing mesoscale NO_x emissions.

The US EPA has established stricter emission standards for new motor vehicles than older vehicles. The MOVES model predicts motor vehicle VOC and NO_x emissions to decrease between 2019 and 2026, as new, lower polluting vehicles replace older vehicles on the roadways. The MOVES model predicts further declines in VOC and NO_x motor vehicle emission rates after 2026. These national control programs are the most effective mitigation measures for ozone, a regional air pollutant. While each individual project needs to pursue all reasonable mitigation measures for motor vehicle emissions, the net effect of a single project is very small at the margins.

2.4 Measures to Mitigate Air Quality Impacts

The mesoscale analysis results show that the VOC emissions for the 2026 Build are predicted to be 3.127 kg/day higher than those for the 2026 No-Build case. Compared to countywide VOC emissions of approximately 98,182 kg/summer day, this represents an insignificant area-wide increase of approximately 0.003%. NO_x emissions for the 2026 Build case are predicted to be 3.068 kg/day higher than those for the 2026 No-Build case. Compared to countywide NO_x emissions of approximately 70,435 kg/summer day, this represents an insignificant area-wide increase of approximately 0.004%.

The Project will implement reasonable and feasible mitigation measures to reduce traffic-related air quality impacts, discussed below. These mitigation measures are also used to calculate emissions reductions for the transportation portion of the greenhouse gas emissions mitigation analysis.

Transportation Demand Management

There is no regularly scheduled public transportation to the Project site. The nearest public bus stop is the Montachusett Regional Transit Authority (MRTA) Route 8 bus stop at D'Ambrosio Eye Care, 479 Old Union Turnpike, a two mile walk from the Project. We expect the following TDM measures to decrease trips to the site, and which in aggregate it is estimated will reduce CO_2 transportation emissions by 2%.[3]

- ***Preferential Parking –*** The Proponent will provide preferential parking for rideshare, carpool and hybrid vehicles at locations throughout the site.
- ***Electric Vehicle Charging Stations –*** The Proponent will provide electric vehicle charging stations at locations throughout the site.
- ***Sidewalk Connectivity –*** The Proponent will provide connectivity of sidewalk infrastructure along McGovern Boulevard to land uses within the site and Lunenberg Road.

[3] Ewing, R. "TDM , Growth Management, and the Other Four Out of Five Trips," Transportation Quarterly, Vol. 47, No. 3, 1993, pp. 343-366.

- ***Provide Bicycle Storage*** – The Proponent will provide secure, weather-protected bicycle parking for employees at designated locations within the site. The Proponent will coordinate with tenants to provide showers for employees who commute by bicycle.

- ***Nearby Food and Fuel Service*** – There are three restaurants and food marts within walking distance of the Project buildings. A Mobil gas station is located at the head of McGovern Boulevard.

- ***On-Site Employee Transportation Coordinator (ETC)*** – An ETC will be provided onsite to oversee, implement, monitor and evaluate TDM measures, employed or funded by the Proponent. The ETC will actively registered employees with NuRide, as requested, to encourage ride-sharing. The Proponent, and the ETC, will encourage vanpool and carpooling participation through marketing, events and vanpool formation meetings. The ETC will be responsible for providing all employees who carpool, bicycle or walk to work with an emergency ride home.

Benefits of Mitigation

The implementation of the TDM measures will decrease the 2026 Build mesoscale VOC and NO_x emissions by 0.063 kg/day and 0.062 kg/day, respectively. All reasonable and feasible traffic demand reduction measures have been considered by the Project Proponent to reduce motor vehicle traffic and air pollutant emissions generated by the Project. The Commonwealth's SIP for achieving compliance with the eight-hour ozone standard includes allowances for increases in VOC and NO_x emissions due to general background growth and the Project's VOC and NO_x emissions are part of the Commonwealth's background growth. The mesoscale air quality analysis demonstrates that the Project will not have an adverse impact on regional air quality and is compatible with the Commonwealth's SIP to achieve the eight-hour NAAQS for ozone.

TABLE 1

MESOSCALE VOC EMISSIONS SUMMARY

Total Predicted VOC Emissions Burden			
2019 Existing	2026 No-Build	2026 Build	2026 Build with Mitigation
10.829 kg/day	9.040 kg/day	12.167 kg/day	12.104 kg/day

TABLE 2

MESOSCALE NO_x EMISSIONS SUMMARY

Total Predicted NO_x Emissions Burden			
2019 Existing	2026 No-Build	2026 Build	2026 Build with Mitigation
16.420 kg/day	9.727 kg/day	12.795 kg/day	12.733 kg/day

3.0 TRANSPORTATION GHG EMISSIONS

The transportation portion of the GHG analysis calculated emissions of CO_2 for the traffic study area for three traffic analysis scenarios:

- 2026 No-Build
- 2026 Build without TDMs
- 2026 Build with TDMs

The vehicle miles traveled (VMT) for the major roadway segments in the traffic study area was calculated by multiplying the length of each road segment by the average daily traffic (ADT) volume on the segment. The CO_2 emissions for each roadway segment were calculated with the EPA MOVES model. Average daily traffic volumes were provided by Bohler Engineering. Appendix B presents the VMT and emission calculations.

Transportation CO_2 emissions are summarized in Table 3. The emissions listed for the No-Build and Build cases include both existing volumes on the roadway network and new project-generated trips. The Build case does not include the benefit of TDMs. The project's transportation emissions are calculated by subtracting the No-Build values from those for the Build case. The reduction in project daily traffic is assumed to be 2%.

TABLE 3

MOTOR VEHICLE CO_2 EMISSIONS SUMMARY

Total Predicted CO_2 Emissions Burden

2026 No-Build	**2026 Build without TDMs**	**2026 Build with TDMs**
18,791.39 kg/day	24,772.81 kg/day Project: 5,981.43 kg/day	24,653.18 kg/day Project: 5,861.80 kg/day
7,553.8 tons/yr	9,958.2 tons/year Project: 2,404.4 tons/year	9,910.1 tons/year Project: 2,356.3 tons/year

4.0 GREENHOUSE GAS (GHG) MITIGATION ANALYSIS

The GHG Policy requires that the Proponent to identify measures to avoid, minimize, or mitigate GHG emissions. Section 4.1 presents the methodology and summary of results. Sections 4.2 through 4.7 discuss the Project's site, building design, infeasible efficiency measures, draft tenant manual, and transportation mitigation measures.

4.1 Methodology and Results

A greenhouse gas (GHG) emissions analysis was performed for Capital Commerce Center (the "Project"), consistent with the EOEEA "Greenhouse Gas Emissions Policy and Protocol" (May 5, 2010). The Project is a mixed-use commercial and residential development of approximately 2.3 million square feet (sf). Project components include: nine one-story industrial buildings (Buildings A through H, K), an auto storage facility office (Building J), 117 units of single-family/duplex/triplex housing (Buildings I), 500 apartments in a series of multi-family four-story buildings (Buildings L, M and N), a four-story hotel (Building O), an indoor soccer facility (Building Q), and a retail (Building R). Three of the industrial buildings have more than 100,000 sf of interior space (Buildings A, B and D), and Building A with 1,020,000 sf of space is clearly planned for warehouse use. The other industrial buildings lend themselves to either manufacturing or warehousing, and these were conservatively modeled as light manufacturing space. The site was previously developed as a sand and gravel pit, and currently houses multiple industrial uses.

The GHG Policy requires a project to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize or mitigate such emissions, quantifying the effect of proposed mitigation in terms of energy savings and emissions reduction. The GHG Policy requires quantification of GHG emissions from three sources: direct emissions from on-site stationary sources, indirect emissions from energy generated off-site (electricity), and traffic generated by the Project. The Project's GHG emissions will include: 1) direct emissions of CO_2 from natural gas combustion for space heating and hot water; 2) indirect emissions of CO_2 from electricity generated off-site and used on-site for lighting, building cooling and ventilation, and the operation of other equipment; and 3) transportation emissions of CO_2 from Project traffic.

For the commercial development, CO_2 emissions were quantified for: (1) the Base Case corresponding to the 9th Edition of the Massachusetts Building Code that includes the 2015 IECC and ASHRAE 90.1-2013, with Section C406.1 code-options 1 and 2, and (2) the Mitigation Alternative, which includes all energy saving measures, detailed in Section 4.3.

Lancaster has adopted the Stretch Code. Since three industrial buildings (Buildings A, B and D) are over 100k sf in size, this report includes a demonstration that the Mitigation Alternative complies with the Stretch Code (780 CMR Appendix AA, Section AA103.2), requiring building energy use to be at least 10% below ASHRAE 90.1-2013 Appendix G. All other commercial structures are less than 100k sf in size, and for them the prescriptive Stretch Code is to follow the Massachusetts Building and Energy Code (780 CMR 13), which is the 2015 IECC with Section C406.1 code options 1 and 2. This analysis used the eQUEST energy design software (version 3.65), which incorporates the U.S. Department of Energy's DOE-2 building energy use model, and CO_2 emission rates of 117.1 lb/MMBtu cubic feet of natural gas[4] and 682 lb/MWhr.[5]

For the residential development, all residential structures are four stories or less in height. The IECC 2015 with Massachusetts Amendments applies. For Stretch Code compliance, the analysis assumes the requirements of Energy STAR Certified Homes v3.1. CO_2 emissions were quantified for: (1) the Base Case corresponding to the 9th Edition of the Massachusetts Building Code that includes the 2015 IECC plus the requirements of Energy STAR Certified Homes v3.1: and (2) the Mitigation Alternative, which includes all energy saving measures, detailed in Section 4.3. Both the Base Case and the Mitigation Alternative include the Stretch Code as it applies to residential structures (780 CMR 51.00, Section N1106), following the Energy STAR Homes3.1 Path for Stretch Code compliance.

The eQUEST model inputs are summarized in Tables 7 and 8. Energy use and CO_2 emissions are detailed in Tables 4A through 4U in Section 4.3, and the eQUEST model output is provided in Appendix A.

[4] U.S. Department of Energy, Energy Information Administration.
[5] ISO New England Inc., 2017 New England Electric Generator Air Emissions Report, Annual Average Emission Rate, April 2019.

CO_2 emissions produced by project motor vehicle trips were calculated using the EPA MOVES model. Appendix B contains the transportation-related CO_2 emission calculations. Table 5A summarizes total CO_2 emissions for the Project, for the Base Case, and the Mitigation Alternative (includes all energy saving measures). The eQUEST model input files have been provided to the Massachusetts Department of Energy Resources (DOER). The Proponent will construct core and shell space in which the tenant will fit-out mechanical systems and lighting. A draft outline for the Tenant Manual is provided in Section 4.6.

The Proponent commits to the CO_2 reduction presented below, but retains the flexibility to achieve this goal using energy efficiency measures that may be refined at the stage of detailed design. Table 4U reveals that the Mitigation Alternative will reduce CO_2 emissions (for stationary sources) by 14.2% compared to the Base Case. As discussed in Section 4.7, Transportation Demand Management (TDM) measures for this project will reduce Project-related motor vehicle CO_2 emissions by 2%. The net reduction of the Project's total CO_2 emissions (stationary sources plus transportation) is 11.0% compared to the Base Case. Table 8 confirms the three commercial buildings over 100k sf in size comply with the Stretch Code requirement for an energy use reduction of at least 10% relative to the ASHRAE 90.1-2013 Appendix G baseline.

TABLE 4A

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING A - WAREHOUSE

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	1,020,000	422.7		13,020.0		762.3	144.2	906.5	
Increased Roof Insulation		418.7	-1.0%	12,070.0	-7.3%	706.7	142.8	849.5	-6.3%
Increased Wall Insulation		421.7	-0.2%	12,780.0	-1.8%	748.3	143.8	892.1	-1.6%
Increased Heating Efficiency		422.7	0.0%	11,490.0	-11.8%	672.7	144.2	816.9	-9.9%
Higher Efficiency Hot Water Heaters		422.7	0.0%	12,920.0	-0.8%	756.5	144.1	900.6	-0.6%
Mitigation Alternative - All Measures Listed Above		417.6	-1.2%	10,350.0	-20.5%	606.0	142.4	748.4	-17.4%

Note: DOER requested this building be modeled without the benefit of the reduction in LPD even though the Project is committed to that mitigation. Actual emissions reduction will be greater.

Note: Building A Warehouse is heated, but not cooled.

TABLE 4B

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING B - LIGHT MANUFACTURING

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	150,000	334.7		2,359.4		138.1	114.1	252.3	
Increased Roof Insulation		335.5	0.2%	2,220.6	-5.9%	130.0	114.4	244.4	-3.1%
Increased Wall Insulation		334.9	0.0%	2,288.8	-3.0%	134.0	114.2	248.2	-1.6%
Increased Heating Efficiency		334.7	0.0%	2,274.9	-3.6%	133.2	114.1	247.3	-2.0%
Increased Cooling Efficiency		332.0	-0.8%	2,359.4	0.0%	138.1	113.2	251.4	-0.4%
Higher Efficiency Hot Water Heaters		334.7	0.0%	2,279.4	-3.4%	133.5	114.1	247.6	-1.9%
Mitigation Alternative - All Measures Listed Above		332.9	-0.6%	1,994.9	password	116.8	113.5	230.3	-8.7%

Note: DOER requested this building be modeled without the benefit of the reduction in LPD even though the Project is committed to that mitigation. Actual emissions reduction will be greater.

TABLE 4C

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING C - LIGHT MANUFACTURING

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	42,000	254.3		280.7		16.4	86.7	103.2	
Increased Roof Insulation		254.4	0.0%	247.7	-11.8%	14.5	86.8	101.3	-1.8%
Increased Wall Insulation		254.4	0.0%	256.8	-8.5%	15.0	86.8	101.8	-1.3%
Increased Heating Efficiency		254.3	0.0%	270.5	-3.7%	15.8	86.7	102.6	-0.6%
Increased Cooling Efficiency		253.1	-0.5%	280.7	0.0%	16.4	86.3	102.7	-0.4%
Higher Efficiency Hot Water Heaters		254.3	0.0%	277.4	-1.2%	16.2	86.7	103.0	-0.2%
Energy STAR Electric Appliances		248.0	-2.5%	292.1	4.0%	17.1	84.6	101.7	-1.4%
Lower Light Power Density		225.5	-11.3%	333.7	18.9%	19.5	76.9	96.4	-6.5%
Mitigation Alternative - All Measures Listed Above		218.2	-14.2%	270.9	-3.5%	15.9	74.4	90.3	-12.5%

TABLE 4D

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING D - LIGHT MANUFACTURING

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	145,000	324.6		2,084.9		122.1	110.7	232.8	
Increased Roof Insulation		325.3	0.2%	1,950.3	-6.5%	114.2	110.9	225.1	-3.3%
Increased Wall Insulation		324.8	0.1%	2,012.9	-3.5%	117.9	110.8	228.6	-1.8%
Increased Heating Efficiency		324.6	0.0%	2,011.5	-3.5%	117.8	110.7	228.5	-1.8%
Increased Cooling Efficiency		321.9	-0.8%	2,084.9	0.0%	122.1	109.8	231.8	-0.4%
Higher Efficiency Hot Water Heaters		324.6	0.0%	2,004.9	-3.8%	117.4	110.7	228.1	-2.0%
Mitigation Alternative - All Measures Listed Above		322.8	-0.6%	1,732.6	-16.9%	101.4	110.1	211.5	-9.1%

Note: DOER requested this building be modeled without the benefit of the reduction in LPD even though the Project is committed to that mitigation. Actual emissions reduction will be greater.

TABLE 4E

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING E - LIGHT MANUFACTURING

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)[1]	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	100,000	606.5		523.3		30.6	206.8	237.4	
Increased Roof Insulation		606.7	0.0%	445.4	-14.9%	26.1	206.9	232.9	-1.9%
Increased Wall Insulation		606.1	-0.1%	490.0	-6.4%	28.7	206.7	235.4	-0.9%
Increased Heating Efficiency		606.5	0.0%	504.7	-3.6%	29.6	206.8	236.4	-0.5%
Increased Cooling Efficiency		603.5	-0.5%	523.3	0.0%	30.6	205.8	236.4	-0.4%
Higher Efficiency Hot Water Heaters		606.5	0.0%	516.4	-1.3%	30.2	206.8	237.0	-0.2%
Energy STAR Electric Appliances		591.3	-2.5%	548.3	4.8%	32.1	201.6	233.8	-1.6%
Lower Light Power Density		537.5	-11.4%	640.5	22.4%	37.5	183.3	220.8	-7.0%
Mitigation Alternative - All Measures Listed Above		519.4	-14.4%	521.5	-0.4%	30.5	177.1	207.6	-12.5%

TABLE 4F

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING F - LIGHT MANUFACTURING

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	70,800	431.3		472.4		27.7	147.1	174.7	
Increased Roof Insulation		431.4	0.0%	416.2	-11.9%	24.4	147.1	171.5	-1.8%
Increased Wall Insulation		431.4	0.0%	442.2	-6.4%	25.9	147.1	173.0	-1.0%
Increased Heating Efficiency		431.3	0.0%	455.1	-3.7%	26.6	147.1	173.7	-0.6%
Increased Cooling Efficiency		429.1	-0.5%	472.4	0.0%	27.7	146.3	174.0	-0.4%
Higher Efficiency Hot Water Heaters		431.3	0.0%	467.2	-1.1%	27.4	147.1	174.4	-0.2%
Energy STAR Electric Appliances		420.6	-2.5%	491.7	4.1%	28.8	143.4	172.2	-1.4%
Lower Light Power Density		382.5	-11.3%	561.2	18.8%	32.9	130.4	163.3	-6.5%
Mitigation Alternative - All Measures Listed Above		370.0	-14.2%	465.7	-1.4%	27.3	126.2	153.4	-12.2%

TABLE 4G

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING G - LIGHT MANUFACTURING

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	37,500	226.8		282.9		16.6	77.3	93.9	
Increased Roof Insulation		226.9	0.0%	252.7	-10.7%	14.8	77.4	92.2	-1.9%
Increased Wall Insulation		226.9	0.0%	264.4	-6.5%	15.5	77.4	92.8	-1.1%
Increased Heating Efficiency		226.8	0.0%	272.4	-3.7%	16.0	77.3	93.3	-0.7%
Increased Cooling Efficiency		225.7	-0.5%	282.9	0.0%	16.6	77.0	93.5	-0.4%
Higher Efficiency Hot Water Heaters		226.8	0.0%	279.8	-1.1%	16.4	77.3	93.7	-0.2%
Energy STAR Electric Appliances		221.2	-2.5%	293.5	3.7%	17.2	75.4	92.6	-1.4%
Lower Light Power Density		201.1	-11.4%	331.3	17.1%	19.4	68.6	88.0	-6.3%
Mitigation Alternative - All Measures Listed Above		194.6	-14.2%	277.3	-2.0%	16.2	66.3	82.6	-12.1%

TABLE 4H

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING H - LIGHT MANUFACTURING

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	37,500	226.8		282.9		16.6	77.3	93.9	
Increased Roof Insulation		226.9	0.0%	252.7	-10.7%	14.8	77.4	92.2	-1.9%
Increased Wall Insulation		226.9	0.0%	264.4	-6.5%	15.5	77.4	92.8	-1.1%
Increased Heating Efficiency		226.8	0.0%	272.4	-3.7%	16.0	77.3	93.3	-0.7%
Increased Cooling Efficiency		225.7	-0.5%	282.9	0.0%	16.6	77.0	93.5	-0.4%
Higher Efficiency Hot Water Heaters		226.8	0.0%	279.8	-1.1%	16.4	77.3	93.7	-0.2%
Energy STAR Electric Appliances		221.2	-2.5%	293.5	3.7%	17.2	75.4	92.6	-1.4%
Lower Light Power Density		201.1	-11.4%	331.3	17.1%	19.4	68.6	88.0	-6.3%
Mitigation Alternative - All Measures Listed Above		194.6	-14.2%	277.3	-2.0%	16.2	66.3	82.6	-12.1%

TABLE 4I

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING K - LIGHT MANUFACTURING

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	30,.000	181.4		226.3		13.3	61.9	75.1	
Increased Roof Insulation		181.5	0.0%	202.1	-10.7%	11.8	61.9	73.7	-1.9%
Increased Wall Insulation		181.5	0.0%	211.5	-6.5%	12.4	61.9	74.3	-1.1%
Increased Heating Efficiency		181.4	0.0%	218.0	-3.7%	12.8	61.9	74.6	-0.7%
Increased Cooling Efficiency		180.6	-0.5%	226.3	0.0%	13.3	61.6	74.8	-0.4%
Higher Efficiency Hot Water Heaters		181.4	0.0%	223.9	-1.1%	13.1	61.9	75.0	-0.2%
Energy STAR Electric Appliances		176.9	-2.5%	234.8	3.7%	13.7	60.3	74.1	-1.4%
Lower Light Power Density		160.8	-11.4%	265.0	17.1%	15.5	54.8	70.4	-6.3%
Mitigation Alternative - All Measures Listed Above		155.6	-14.2%	221.8	-2.0%	13.0	53.1	66.1	-12.1%

TABLE 4J

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING J - AUTO STORAGE FACILITY OFFICE

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	14,000	90.5		98.3		5.8	30.9	36.6	
Increased Roof Insulation		90.6	0.0%	88.7	-9.8%	5.2	30.9	36.1	-1.5%
Increased Wall Insulation		90.6	0.1%	89.2	-9.3%	5.2	30.9	36.1	-1.4%
Increased Heating Efficiency		90.5	0.0%	94.7	-3.7%	5.5	30.9	36.4	-0.6%
Increased Cooling Efficiency		90.1	-0.5%	98.3	0.0%	5.8	30.7	36.5	-0.4%
Higher Efficiency Hot Water Heaters		90.5	0.0%	96.7	-1.7%	5.7	30.9	36.5	-0.3%
Energy STAR Electric Appliances		88.6	-2.2%	101.3	3.1%	5.9	30.2	36.1	-1.4%
Lower Light Power Density		82.5	-8.8%	110.8	12.7%	6.5	28.1	34.6	-5.5%
Mitigation Alternative - All Measures Listed Above		80.2	-11.4%	89.3	-9.2%	5.2	27.3	32.6	-11.1%

TABLE 4K

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDINGS I1 - 1 OF 2 SINGLE-FAMILY RESIDENTIAL UNITS

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	2,600	20.8		82.1		4.8	7.1	11.9	
Increased Wall Insulation		20.8	0.0%	80.9	-1.6%	4.7	7.1	11.8	-0.7%
Increased Heating Efficiency		20.9	0.5%	75.3	-8.3%	4.4	7.1	11.5	-3.1%
Increased Cooling Efficiency		20.6	-0.8%	82.1	0.0%	4.8	7.0	11.8	-0.5%
Higher Efficiency Hot Water Heaters		20.8	0.0%	74.9	-8.9%	4.4	7.1	11.5	-3.6%
Energy STAR Electric Appliances		19.3	-7.1%	84.2	2.5%	4.9	6.6	11.5	-3.2%
Lower Light Power Density		20.2	-3.1%	83.3	1.5%	4.9	6.9	11.8	-1.3%
Mitigation Alternative - All Measures Listed Above		18.6	-10.6%	70.6	-14.0%	4.1	6.3	10.5	-12.0%

TABLE 4L

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDINGS I2 - 1 OF 32 DUPLEX RESIDENTIAL BUILDINGS

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	4,984	39.0		133.7		7.8	13.3	21.1	
Increased Wall Insulation		39.0	-0.1%	128.5	-3.8%	7.5	13.3	20.8	-1.5%
Increased Heating Efficiency		39.2	0.4%	122.9	-8.1%	7.2	13.4	20.6	-2.7%
Increased Cooling Efficiency		38.8	-0.7%	133.7	0.0%	7.8	13.2	21.0	-0.4%
Higher Efficiency Hot Water Heaters		39.0	0.0%	120.6	-9.8%	7.1	13.3	20.4	-3.6%
Energy STAR Electric Appliances		36.2	-7.3%	137.5	2.8%	8.0	12.3	20.4	-3.5%
Lower Light Power Density		37.8	-3.2%	135.9	1.6%	8.0	12.9	20.8	-1.4%
Mitigation Alternative - All Measures Listed Above		34.8	-10.8%	114.8	-14.1%	6.7	11.9	18.6	-12.0%

TABLE 4M

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDINGS I3 - 1 OF 17 TRIPLEX RESIDENTIAL BUILDINGS

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	5,235	42.0		149.1		8.7	14.3	23.0	
Increased Wall Insulation		42.0	0.0%	147.2	-1.3%	8.6	14.3	22.9	-0.5%
Increased Heating Efficiency		42.1	0.4%	136.7	-8.3%	8.0	14.4	22.4	-2.9%
Increased Cooling Efficiency		41.7	-0.7%	149.1	0.0%	8.7	14.2	22.9	-0.5%
Higher Efficiency Hot Water Heaters		42.0	0.0%	135.3	-9.2%	7.9	14.3	22.2	-3.5%
Energy STAR Electric Appliances		39.0	-7.1%	153.0	2.7%	9.0	13.3	22.3	-3.4%
Lower Light Power Density		40.7	-3.1%	151.4	1.5%	8.9	13.9	22.7	-1.4%
Mitigation Alternative - All Measures Listed Above		37.5	-10.6%	128.2	-14.0%	7.5	12.8	20.3	-11.9%

TABLE 4N

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING L - 1 OF 2 MF RESIDENTIAL BUILDINGS

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	89,300	703.6		1,672.1		97.9	239.9	337.8	
Increased Roof Insulation		703.6	0.0%	1,652.8	-1.2%	96.8	239.9	336.7	-0.3%
Increased Wall Insulation		703.6	0.0%	1,661.7	-0.6%	97.3	239.9	337.2	-0.2%
Increased Heating Efficiency		704.8	0.2%	1,591.6	-4.8%	93.2	240.3	333.5	-1.3%
Increased Cooling Efficiency		699.8	-0.5%	1,672.1	0.0%	97.9	238.6	336.5	-0.4%
Higher Efficiency Hot Water Heaters		703.6	0.0%	1,420.1	-15.1%	83.1	239.9	323.1	-4.4%
Energy STAR Electric Appliances		654.7	-7.0%	1,683.3	0.7%	98.6	223.2	321.8	-4.7%
Lower Light Power Density		681.5	-3.1%	1,727.0	3.3%	101.1	232.4	333.5	-1.3%
Mitigation Alternative - All Measures Listed Above		630.0	-10.5%	1,382.1	-17.3%	80.9	214.8	295.7	-12.5%

TABLE 4O

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING M - 1 OF 2 MF RESIDENTIAL BUILDINGS

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)[1]	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	100,000	786.4		1,747.8		102.3	268.2	370.5	
Increased Roof Insulation		786.4	0.0%	1,726.7	-1.2%	101.1	268.2	369.3	-0.3%
Increased Wall Insulation		786.3	0.0%	1,736.3	-0.7%	101.7	268.1	369.8	-0.2%
Increased Heating Efficiency		787.6	0.2%	1,657.2	-5.2%	97.0	268.6	365.6	-1.3%
Increased Cooling Efficiency		782.2	-0.5%	1,747.8	0.0%	102.3	266.7	369.0	-0.4%
Higher Efficiency Hot Water Heaters		786.4	0.0%	1,495.8	-14.4%	87.6	268.2	355.7	-4.0%
Energy STAR Electric Appliances		731.6	-7.0%	1,760.9	0.7%	103.1	249.5	352.6	-4.8%
Lower Light Power Density		761.7	-3.1%	1,810.4	3.6%	106.0	259.7	365.7	-1.3%
Mitigation Alternative - All Measures Listed Above		704.0	-10.5%	1,454.6	-16.8%	85.2	240.1	325.2	-12.2%

TABLE 4P

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING N - 1 OF 3 MF RESIDENTIAL BUILDINGS

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	86,000	677.1		1,653.3		96.8	230.9	327.7	
Increased Roof Insulation		677.1	0.0%	1,635.2	-1.1%	95.7	230.9	326.6	-0.3%
Increased Wall Insulation		677.0	0.0%	1,643.3	-0.6%	96.2	230.9	327.1	-0.2%
Increased Heating Efficiency		678.2	0.2%	1,574.1	-4.8%	92.2	231.3	323.4	-1.3%
Increased Cooling Efficiency		673.4	-0.5%	1,653.3	0.0%	96.8	229.6	326.4	-0.4%
Higher Efficiency Hot Water Heaters		677.1	0.0%	1,401.3	-15.2%	82.0	230.9	312.9	-4.5%
Energy STAR Electric Appliances		629.9	-7.0%	1,664.6	0.7%	97.5	214.8	312.3	-4.7%
Lower Light Power Density		655.9	-3.1%	1,707.4	3.3%	100.0	223.6	323.6	-1.2%
Mitigation Alternative - All Measures Listed Above		606.3	-10.5%	1,365.0	-17.4%	79.9	206.7	286.7	-12.5%

TABLE 4Q

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING O - HOTEL

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	64,000	721.3		1,259.2		73.7	245.9	319.7	
Increased Roof Insulation		721.2	0.0%	1,247.5	-0.9%	73.0	245.9	319.0	-0.2%
Increased Wall Insulation		721.4	0.0%	1,221.3	-3.0%	71.5	246.0	317.5	-0.7%
Increased Heating Efficiency		721.3	0.0%	1,237.1	-1.8%	72.4	245.9	318.4	-0.4%
Increased Cooling Efficiency		715.7	-0.8%	1,259.2	0.0%	73.7	244.1	317.8	-0.6%
Higher Efficiency Hot Water Heaters		721.3	0.0%	1,019.2	-19.1%	59.7	245.9	305.6	-4.4%
Energy STAR Electric Appliances		692.4	-4.0%	1,290.4	2.5%	75.6	236.1	311.7	-2.5%
Lower Light Power Density		666.7	-7.6%	1,318.5	4.7%	77.2	227.3	304.5	-4.7%
Mitigation Alternative - All Measures Listed Above		632.8	-12.3%	1,033.9	-17.9%	60.5	215.8	276.3	-13.6%

TABLE 4R

ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDING Q - INDOOR SOCCER FACILITY

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	86,500	740.2		778.7		45.6	252.4	298.0	
Increased Roof Insulation		740.4	0.0%	719.3	-7.6%	42.1	252.5	294.6	-1.2%
Increased Wall Insulation		740.5	0.0%	749.4	-3.8%	43.9	252.5	296.4	-0.5%
Increased Heating Efficiency		740.2	0.0%	760.5	-2.3%	44.5	252.4	296.9	-0.4%
Increased Cooling Efficiency		736.1	-0.6%	778.7	0.0%	45.6	251.0	296.6	-0.5%
Higher Efficiency Hot Water Heaters		740.2	0.0%	684.2	-12.1%	40.1	252.4	292.5	-1.9%
Energy STAR Electric Appliances		719.3	-2.8%	811.2	4.2%	47.5	245.3	292.8	-1.8%
Lower Light Power Density		679.2	-8.2%	873.8	12.2%	51.2	231.6	282.8	-5.1%
Mitigation Alternative - All Measures Listed Above		654.9	-11.5%	700.0	-10.1%	41.0	223.3	264.3	-11.3%

TABLE 4S
ENERGY AND CO_2 MODELING FOR CCC LANCASTER - BUILDINGS R - RETAIL
Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	GLA (sf)	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	73,000	591.7		379.7		22.2	201.8	224.0	
Increased Roof Insulation		592.2	0.1%	336.9	-11.3%	19.7	201.9	221.7	-1.0%
Increased Wall Insulation		591.6	0.0%	352.1	-7.3%	20.6	201.7	222.3	-0.7%
Increased Heating Efficiency		591.7	0.0%	369.4	-2.7%	21.6	201.8	223.4	-0.3%
Increased Cooling Efficiency		587.9	-0.6%	379.7	0.0%	22.2	200.5	222.7	-0.6%
Higher Efficiency Hot Water Heaters		591.7	0.0%	366.7	-3.4%	21.5	201.8	223.2	-0.3%
Energy STAR Electric Appliances		577.0	-2.5%	397.5	4.7%	23.3	196.8	220.0	-1.8%
Lower Light Power Density		517.1	-12.6%	478.3	26.0%	28.0	176.3	204.3	-8.8%
Mitigation Alternative - All Measures Listed Above		499.5	-15.6%	393.4	3.6%	23.0	170.3	193.4	-13.7%

TABLE 4T
ENERGY AND CO_2 MODELING FOR CCC LANCASTER
Outdoor Lighting for Parking Lots and Internal Roadways

Mitigation Measures		Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case - Lighting Zone 2, 0.065 W/SF		854.1		0.0		0.0	291.2	291.2	
Mitigation Alternative - LED Lights 0.035 W/SF		459.9	-46.2%	0.0	0.0%	0.0	156.8	156.8	-46.2%

TABLE 4U
ENERGY AND CO_2 MODELING FOR CCC LANCASTER
Totals for All Buildings and Outdoor Lighting

All Buildings - Combined Mitigation	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)	Energy Use Change (%)
Base Case	13,022.5		40,823.9		2,390.2	4,440.7	6,830.9		
Mitigation Case	11,328.9	-13.0%	34,091.8	-16.5%	1,996.1	3,863.2	5,859.2	-14.2%	-14.7%

TABLE 5

GREENHOUSE GAS (CO_2) EMISSIONS SUMMARY
FOR THE BASE CASE AND PREFERRED ALTERNATIVE
CAPITAL COMMERCE CENTER

(TONS/YEAR)

Source	Base Case	Mitigation Alternative	Change in GHG Emissions
Direct Emissions	2,390.2	1,996.1	-16.5%
Indirect Emissions	4,440.7	3,863.2	-13.0%
Subtotal Direct and Indirect Emissions	6,830.9	5,859.2	-14.2%
Transportation Emissions	2,404.4	2,356.3	-2.0%
Total CO_2 Emissions	9,235.3	8,215.5	-11.0%

4.2 Site Design Mitigation Measures

The Project will adopt all reasonable and feasible site design mitigation measures. The Project is committed to the following mitigation measures:

- ***Sustainable Development*** – The Project reuses a previously developed site, thereby preserving open space.

- ***Design Water Efficient Landscaping*** –Water efficient landscaping will be installed to minimize water use. Drought-resistant and native plants will be used for landscaping. The use of roof rain water will be considered as a source of landscaping water.

- ***Low Impact Development (LID) for Stormwater Design*** – The design integrates landscaping and open space to generate less stormwater runoff. The storm management system will utilize Best Management Practices (BMP).

4.3 Building Design and Operation Mitigation Measures

The eQUEST energy model inputs, including IMC ventilation rates and occupancy, are summarized in Tables 6 and 7. Both Base Case and Mitigation Case Energy Use Intensity (EUI) are provided in Table 8, and the Project's Base Case EUIs are compared to the Pacific Northwest National Laboratory (PNNL) prototype building EUIs, assuming the IECC 2015 Code and Climate Zone 5A. Note that the actual EUI will vary due to differences between the PNNL prototype building and the proposed buildings in terms of building size, number of floors, footprint, building materials, window area, and ventilation rates. In particular, the Project's Base Case has an EUI lower than that of the PNNL benchmark because of the higher energy efficiency requirements of the Massachusetts Amendments and Stretch Code. In addition, the PNNL modeling of an IECC 2015 Code building does not conform to the modeling assumptions required by MEPA in GHG studies.

The Project, as proposed, incorporates the following building energy efficiency measures.

- ***Energy Efficient Windows and Building Envelope –*** For the commercial buildings, building envelope insulation will exceed Code for roof and wall insulation. Roof insulation will be R38. Wall insulation for CMU block walls will be R13ci (U=0.084).

Overall window areas are assumed to be equal to, or less than, the baseline building window area values listed in ASHRAE Table G3.1.1-1 (warehouse 6%, medium office 31%, hotel 34% and retail stand-alone 11%). Window area assumed for the multi-family residential buildings is 24%.
For the single family/duplex/triplex residential buildings, building envelope insulation will exceed Code for wall insulation. Roof insulation will be R49, and a higher value of R60 provides only an insignificant (<1%) reduction in energy use. Wall insulation will be R22+R0ci (U=0.056).

For the multi-family residential buildings, building envelope insulation will exceed Code for roof and wall insulation. Roof insulation will be R49. Wall insulation will be R21+R4ci (U=0.048).

Aggregate wall assembly U and R values are provided in Table 6F.

- ***Cool Roofs*** – A light-colored membrane will be used on all commercial building roofs.

- ***Higher Efficiency Space Heating and Cooling Systems*** – For the residential buildings, the heating/cooling design is an instantaneous, gas-fired combination hot water heater for both space heating and domestic hot water demand (Navien or equivalent) AFUE 95%; a vertical fan-coil unit with hot water and DX coils; and a dedicated rooftop DX condenser unit to provide air conditioning, SEER 14. Heating and cooling efficiency will be better than Code.

  For the warehouse, HVAC heating systems will exceed Code and will have an efficiency of 100% (direct-fired heaters); the warehouse has no cooling. For the other commercial buildings, cooling systems will have an EER rating better than Code. Heating systems will have 95% efficiency. Heating and cooling efficiency will be better than Code.

- ***Seal, Test and Insulate HVAC Supply Ducts*** – HVAC supply ducts will be sealed, leak tested, and insulated to reduce energy losses.

- ***Energy Management Systems*** –The buildings will utilize highly efficient energy management systems (EMS) to track and control energy use in public spaces. Energy needs will be closely monitored and the use of heat, cooling, and lighting will be minimized. The Base Case set points for occupied and unoccupied time periods equal the eQUEST default values.

- ***Energy Efficient Interior Lighting*** – High-efficiency CFL and LED fixtures will be used to reduce interior light power density (LPD). LPD will be better than Code, namely 0.50 W/SF for the warehouse, 0.85 W/SF for light manufacturing, 0.63 W/SF for office, 0.65 for the hotel, 0.70 for the sports arena (indoor soccer facility), and 0.90 for retail. Base Case plug load values in the eQUEST model are from COMNET, except in the case of buildings over 100k SF for which Appendix G values were used.

- ***Energy Efficient Exterior Lighting*** – Energy efficient LED fixtures will be used to light the parking lots and exterior walkways.

- ***Energy STAR Appliances*** – Energy STAR equipment and will be used to reduce plug load wherever possible in the commercial buildings. Energy STAR appliances will be used in the residential buildings.

- ***Hot Water Heaters*** – For all buildings, an instantaneous, gas-fired hot water system with an EF of 0.95 is assumed. All hot water units are better than Code.

- ***Water Conserving Fixtures*** – All buildings will have low-flow toilets, sinks and showerheads.

- ***Recycle Materials*** – The buildings will have dedicated recycling areas, and the Proponent will encourage tenants to collect and recycle cans, bottles, paper and cardboard.

- ***Use Building Materials with Recycled Content, Building Materials that are manufactured in the Region, Use Rapidly Renewable Building Materials, and Use Low-VOC Building Materials*** – Whenever practical, the Project will use environmentally friendly building materials, including materials with recycled content, rapidly renewable building materials, and low-VOC materials. Also when practical, the Project will purchase building materials that are manufactured within the region.

- ***Utility MassSAVE Incentives for Residential Development*** – There is a MassSave program for multifamily high-rise new construction (four stories or higher) that provides financial incentives to qualifying applicants. Incentives are awarded based on annual site energy saved (per kWh and therm). ICF, Inc. administers the MassSAVE Program for National Grid and given information on the concept-level design of the residential buildings, they can provide a preliminary estimate of incentives. Our experience on other recent residential projects has revealed that ICF's response time is about two months from the submittal of an application. Given the time delay, this project uses ICF incentives data from a similar project (Fuller School Site Redevelopment, EEA 15886)[6], namely an estimated incentive of $165/unit for air source heat pumps (ASHPs) added to the proposed design. This incentive totals $82,500 for the 500 high-rise residential units. MassSave also has incentives for new, low-rise residential construction. In case where such units have a master gas meter, incentives are evaluated by the high-rise process. As a conservative estimate, the incentive total for the 117 low-rise units is estimated as $19,305.

  MassSave published, in August 2019, a new incentive structure for Passivehouse design in multi-family mid- and high-rise structures. From data provided by ICF, Inc., a Pre-Construction Pre-Certification payment of $500 per unit will be paid by MassSave for a Passivehouse design, plus monies for soft costs (feasibility and modeling studies). Post-Construction, a building that achieves PHIUS Certification will be paid an additional $2,500/unit. After construction is complete, a Net Performance Bonus is calculated by determining the energy savings of the Passivehouse design relative to a Code baseline building (using factors of $0.75/kWhr and $7.50/therm) and subtracting off any Pre-Construction and Post-Construction per-unit payments that have been made. ICF would perform the Post-Construction energy savings modeling using actual construction drawings.

[6] Personal communication, Vikram Narla, ICF, Inc., February 18, 2019.

DOER has requested that a Passivehouse analysis be performed for the multi-family high-rise and low-rise residential buildings as well as the hotel. Even though the new MassSave incentives do not apply for low-rise residential and hotel structures, for the purpose of the Passivehouse analysis in this report it is assumed that they do. A total 500 high-rise residential units, 117 low-residential units, and 120 hotel units (rooms) are proposed in the various buildings. These sum to 737 units. Thus, for this 737-unit project, the unit-based Pre-Construction payment could be $368,500.

- ***Energy Efficiency Incentives for Commercial Projects*** – The Project's electric and gas suppliers are National Grid, which offer "Whole-Building Approach Customer Incentives" for commercial buildings designed better than Code. Like all rebate programs they impose numerous conditions. The Proponent is pursuing both the design support and customer incentives offered by the utility companies. Whole Building Solutions for Small Buildings (those < 100,000 sf) provides Design Incentives equal to $70 per MWhr and $3.40 per MMBtu in energy savings (beyond Code) and Customer Incentives equal to $350/MWhr and $17 per MMBtu in energy savings, if funds are available from the MassSAVE Project Assistance budget. Application to enter these programs will be made at the beginning of Schematic Design. The Project has also identified possible equipment-specific incentives for high-efficiency HVAC units and lighting.

4.4 Infeasible Efficiency Measures

Other building design and operation mitigation measures were considered for the Project, but were rejected because they are either technically/financially infeasible or inappropriate for the Project:

- ***Reduce Energy Demand by Using Peak Shaving or Load Shifting Strategies*** – These measures are not appropriate for buildings that must use power during peak periods.

- ***Construct Green Roof*** -- The proponent does not consider it economically feasible to construct and maintain a green roof. Green roofs, which consist of layers of gravel, soil and vegetation atop a rubberized water-proof membrane, are expensive to install and maintain. They typically require a steel-reinforced concrete roof that can support a dead weight of 35 lb/sf and the installation cost exclusive of roof redesign is $30/sf.[7] While green roof technology has the potential to improve stormwater management on the Project and reduce overall energy costs, the significant additional costs (over $14 million for the Project) related to the required engineering, construction and installation of the green roof is not economically feasible.

[7] Oberndorfer, Erica, et al., "Green Roofs as Urban Ecosystems: Ecological Structures, Functions and Services," BioScience, Vol. 57, No. 10, November 2007.

- ***Passivehouse Design*** – This section presents both a GHG emissions analysis and cost feasibility analysis, comparing the utility savings and financial premium for Passivehouse Design to the Base Case (a Code-compliant building).

GHG Emissions Analysis of Passivehouse Design

Passivehouse is a set of design principles used to attain a very high level of energy efficiency: super-insulation of the building envelope, high-performance windows, reduced window area, airtight construction to prevent infiltration of outside air, and energy recovery ventilation (ERV). The Passive House Institute U.S. (PHIUS) has developed passive building standards that account for the broad range of climate conditions and other variables in North American climate zones. The result are the PHIUS+ 2015 Passive Building Standards – North America, which provide performance targets for heating and cooling energy use, in units of 1,000 Btu per square foot of interior-conditioned-floor area per year (kBtu/sf-iCFA-yr).

For the project area (Worcester), the PHIUS+ 2015 Passive Building Standards are: (1) heating ≤ 6.2 kBtu/sf-iCFA-yr; (2) cooling ≤ 1.9 kBtu/sf-iCFA-yr; and (3) total energy demand ≤ 6,200 kWh/yr-person, which is generally equivalent to EUI ≤ 20 kBtu/sf-yr.

Passivehouse design was applied to the multi-family high-rise residential buildings (Buildings L, M and N), to the low-rise residential single-family/duplex/triplex buildings (Buildings I), and to the hotel (Building O), by specifying R70 roof insulation, R43 wall insulation, R20 slab insulation, high-performance windows (U=0.25), a reduced window area to 15% of wall area, window shades, a very low wall air infiltration rate of 0.010 cfm/ft^2, ERV with 75% efficiency, and air source heat pumps (ASHPs) with COP=4.5. The eQUEST model for the Mitigation Case was run with these design changes in the residential buildings.

Multi-Family High-Rise Buildings (L, M, N)

The PH Case total heating and cooling energy use in the seven multi-family buildings is heating 2.3 kBtu/sf-iCFA-yr and cooling 1.2 kBtu/sf-iCFA-yr, with total energy use intensity (EUI) ranging from 16.4 to 16.8 kBtu/sf-yr. These results demonstrate the Passivehouse design achieves the three PHIUS+ 2015 Passive Building Standards.

The Base Case shows total electrical demand for the multi-family residential buildings of 5,011 MWhr/year and natural gas demand of 11,799 MMBtu/year, for a total energy demand of 28,897 MMBtu/year. Using the latest EIA Massachusetts Residential rates of $208.60/MWhr and $15.93/MMBtu-gas, annual energy costs for the Base Case are $1,233,253/year or $2,467 per apartment. Using the GHG emission factors, total GHG emissions for the Base Case are 2,400 tons/year CO_2.

The PH Case shows total electrical demand for the multi-family residential buildings of 3,056 MWhr/year and natural gas demand of 0 MMBtu/year, for a total energy demand of 10,428 MMBtu/year. The annual energy costs for the PH Case will be $637,481/year or $1,275 per apartment. Using the GHG emission factors, total GHG emissions for the PH Case are 1,042 tons/year CO_2.

Comparing the modeling results for PH Case to those for the Base Case, the PH Case would reduce total building energy demand by 64% (28,897 MMBtu reduced to 10,428 MMBtu), would reduce annual energy costs by $1,192 per apartment ($2,467/year reduced to $1,275/year), and would reduce GHG emissions by 56% or 1,358 tons/year (2,400 tons/year reduced to 1,042 tons/year).

Single-Family/Duplex/Triplex Buildings (I)

The PH Case total heating and cooling energy use in the low-rise residential buildings is heating 2.2 to 3.2 kBtu/sf-iCFA-yr and cooling 0.8 to 1.0 kBtu/sf-iCFA-yr, with total energy use intensity (EUI) ranging from 17.1 to 19.2 kBtu/sf-yr. These results demonstrate the Passivehouse design achieves the three PHIUS+ 2015 Passive Building Standards.

The Base Case shows total electrical demand for the low-rise residential buildings of 2,000 MWhr/year and natural gas demand of 6,952 MMBtu/year, for a total energy demand of 13,776 MMBtu/year. Using the latest EIA Massachusetts Residential rates of $208.60/MWhr and $15.93/MMBtu-gas, annual energy costs for the Base Case are $527,945/year or $4,512 per home. Using the GHG emission factors, total GHG emissions for the Base Case are 1,089 tons/year CO_2.

The PH Case shows total electrical demand for the low-rise residential buildings of 1,292 MWhr/year and natural gas demand of 0 MMBtu/year, for a total energy demand of 4,408 MMBtu/year. The annual energy costs for the PH Case will be $269,511/year or $2,304 per apartment. Using the GHG emission factors, total GHG emissions for the PH Case are 441 tons/year CO_2.

Comparing the modeling results for PH Case to those for the Base Case, the PH Case would reduce total building energy demand by 68% (13,776 MMBtu reduced to 4,408 MMBtu), would reduce annual energy costs by $2,208 per apartment ($4,512/year reduced to $2,304/year), and would reduce GHG emissions by 59% or 648 tons/year (1,089 tons/year reduced to 441 tons/year).

Hotel (O)

The PH Case total heating and cooling energy use in the hotel is heating 3.2 kBtu/sf-iCFA-yr and cooling 1.9 kBtu/sf-iCFA-yr, with total energy use intensity (EUI) of 14.3 kBtu/sf-yr. These results demonstrate the Passivehouse design achieves the three PHIUS+ 2015 Passive Building Standards.

The Base Case shows total electrical demand for the hotel of 721.3 MWhr/year and natural gas demand of 1,259MMBtu/year, for a total energy demand of 3,720 MMBtu/year. Using the latest EIA Massachusetts Commercial rates of $166.40/MWhr and $9.86/MMBtu-gas, annual energy costs for the Base Case are $132,438/year or $1,104 per hotel-room. Using the GHG emission factors, total GHG emissions for the Base Case are 464 tons/year CO_2.

The PH Case shows total electrical demand for the hotel of 267.5 MWhr/year and natural gas demand of 0 MMBtu/year, for a total energy demand of 913 MMBtu/year. The annual energy

costs for the PH Case will be $44,512/year or $371 per hotel-room. Using the GHG emission factors, total GHG emissions for the PH Case are 92 tons/year CO_2.

Comparing the modeling results for PH Case to those for the Base Case, the PH Case would reduce total building energy demand by 75% (3,720 MMBtu reduced to 913 MMBtu), would reduce annual energy costs by $733 per hotel-room ($1,104/year reduced to $371/year), and would reduce GHG emissions by 80% or 372 tons/year (464tons/year reduced to 92 tons/year).

Cost Feasibility Analysis of Passivehouse Design

To achieve an airtight, super-insulated building envelope that meets the requirements of PHIUS+ 2015, the residential buildings and hotel will have to have a larger roof structure and rafter cavities (to accommodate R70 roof insulation), double stud walls (to accommodate R43 wall insulation), a larger foundation (to provide the same amount of rentable square feet with thicker walls) and a thicker slab (to accommodate R20 insulation). Capital costs of construction will be higher due to these design and structural changes, as well as a more expensive wall design to achieve a super-airtight wall assembly around the building.

The Pembina Institute estimates the cost increment of building to Passivehouse standards is "less than 10%, with the average value being around 6%."[8] The recently published Passive Building Design Guide (PHIUS, 2018, page 44) states: "For commercial and multifamily construction, expect to pay about 5 percent or 6 percent more if your design and construction team is not experienced in passive building and/or PHIUS certified." That being the case for this project, the best estimate of additional cost is 5% over a Code-compliant building.

The Base Case capital construction cost for all the residential and hotel buildings in this analysis (Buildings K, L, M, N and O) is estimated at $160.0 million,[9] and thus the additional capital cost for Passivehouse design will be $8.0 million (5% of $160.0 million). This cost premium will require additional bank financing since almost all potential State subsidies for Passivehouse design are paid after construction is complete. Financing on a commercial loan at 5.5% per annum over 15 years adds approximately 47% to the total cost, so the financed additional capital cost for Passivehouse design is $11.76 million (1.47 times $8.0 million).
There are two types of State subsidies potentially available to the developer to offset the Passivehouse cost premium. These are discussed below.

Alternative Energy Credits (AECs) provide a subsidy for the installation and use of efficient air source heat pumps (see Section 4.5 below),[10] and heat pumps are assumed in the Passivehouse design. The DOER Guideline on Multipliers for Renewable Thermal Generation Units[11] provides "an additional multiplier of 2 (added to the base multiplier of 3)" if the building is

[8] Pembina Institute, "Accelerating Market Transformation for High-Performance Building Enclosures," 2016, p 54.
[9] [636,600 sf high-rise residential space, plus 257,400 sf low-rise residential space, plus 64,000 sf hotel space] at $167/sf for the Base Case buildings. The Mitigation Case construction costs are approximately 1 percent higher.
[10] DOER, "Alternative Portfolio Standard, Guideline on Metering and Calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units – Part 1," December 29, 2017, page 9.
[11] DOER, "Alternative Energy Portfolio Standard, Guideline on Multipliers for Renewable Thermal Generation Units," December 29, 2017, Section 4.

PHIUS+ Certified by PHIUS. For the 617 residential units plus the hotel, total AEC credits over ten years, for both ASHPs and a PHIUS-certified design calculate to a total of $1.463 million. It is important to note AEC income is only paid after a project is constructed and in operation, and the energy savings are certified by the agency. Thus, AEC income would not offset the cost premium at the time of construction and could only be used to help retire bank financing.

MassSave published, in August 2019, a new incentive structure for Passivehouse design in multi-family mid- and high-rise structures. From data provided by ICF, Inc., a Pre-Construction Pre-Certification payment of $500 per unit will be paid by MassSave for a Passivehouse design, plus monies for soft costs (feasibility and modeling studies). Post-Construction, a building that achieves PHIUS Certification will be paid an additional $2,500/unit. Finally, Post-Construction, a Net Performance Bonus is calculated by determining the energy savings of the Passivehouse design relative to a Code baseline building (using factors of $0.75/kWhr and $7.50/therm) and subtracting off any Pre-Construction and Post-Construction per-unit payments that have been made. ICF would perform the Post-Construction energy savings modeling using actual construction drawings.

DOER has requested that a Passivehouse analysis be performed for the multi-family high-rise and low-rise residential buildings as well as the hotel. Even though the new MassSave incentives do not apply for low-rise residential and hotel structures, for the purpose of the Passivehouse analysis in this report it is assumed that they do. A total 500 high-rise residential units, 117 low-residential units, and 120 hotel units (rooms) are proposed in the various buildings. These sum to 737 units. Thus, for this 737-unit project, the unit-based Pre-Construction payment could be $368,500.

For this project, eQUEST modeling of Passivehouse design for all the residential and hotel buildings (Buildings K, L, M, N and O) reveals potential reductions from the Base Case of 3,117 MWhr/yr and 20,010 MMBtu/yr that together calculate to a total incentive of $3.838 million. If Passivehouse design were used in these buildings, a Pre-Construction payment of $368,500 could be used to reduce the increased capital cost of Passivehouse, and a Post-Construction Net Performance Bonus of ($3,838,500 - $368,500) = $3,470,000 could be used to help retire bank financing.

In summary, the maximum potential Pre-Construction MassSave incentive is $368,500 and could reduce the additional capital cost for Passivehouse design of $8.0 million to $7.632 million. With financing costs, the total additional capital cost is $11.218 million. Post-Construction incentives from AECs and MassSave could potentially provide $4.933 million to help retire bank financing ($1.463 million AECs plus MassSave Net Performance Bonus of $3.470 million), but that still leaves a financed additional cost of $6.285 million for Passivehouse design, which cannot be recovered by increasing apartment rents. For that reason, the Proponent considers Passivehouse design to be financially infeasible.

TABLE 6A
SUMMARY OF MODELING ASSUMPTIONS
COMMERCIAL BUILDING A

Energy Efficiency Measure (EEM)	Base Case (Code)[1]	Mitigation Case
Building Envelope (Mass Walls)[4]	Roof R30 Walls R11.4ci Wall Assembly U=0.090	Roof R38 Walls R13ci Wall Assembly U=0.084
Window Glass (Fixed)	U=0.42, DOE Type 2600	Same as Base Case
Skylights	1.5% of roof area	Same as Base Case
Heating Efficiency	88%	100% Direct-fired heaters
Gas-Fired Hot Water Heaters	Storage Tank Heater EF = 0.60	Tankless Heater EF = 0.95
Light Power Density (Whole Bldg. Method) (W/SF)	Warehouse 0.59	Same as Base Case[3]
Electric Plug Load (W/SF)	Warehouse 0.05	Same as Base Case
Parking Lots Lighting Zone 2	60 W/1,000 SF	LED 35 W/1,000 SF
Ventilation Rate[2] (cfm/person)	20.0	Same as Base Case
Occupancy[2] (SF/person)	400	Same as Base Case

[1] ASHRAE 90.1-2013, Section C406.1 code-options 1 and 2.
[2] IMC Table 403.3.
[3] As requested by DOER, LPD is assumed to be the same for the Base and Mitigation Cases even though the Project has committed to an LPD well below Code.
[4] Mass wall R and U values match ASHRAE 90.1 Table A3.1A.

TABLE 6B
SUMMARY OF MODELING ASSUMPTIONS
COMMERCIAL BUILDINGS B AND D

Energy Efficiency Measure (EEM)	Base Case (Code)[1]	Mitigation Case
Building Envelope (Mass Walls)[4]	Roof R30 Walls R11.4ci Wall Assembly U=0.090	Roof R38 Walls R13ci Wall Assembly U=0.084
Window Glass (Fixed)	U=0.42, DOE Type 2600	Same as Base Case
Cooling Efficiency PTAC	EER 10.5	EER 11.0
Heating Efficiency	88%	95%
Gas-Fired Hot Water Heaters	Storage Tank Heater EF = 0.60	Tankless Heater EF = 0.95
Light Power Density (Whole Bldg. Method) (W/SF)	Manufacturing 1.05	Same as Base Case[3]
Electric Plug Load (W/SF)	Manufacturing 0.34	Same as Base Case
Parking Lots Lighting Zone 2	60 W/1,000 SF	LED 35 W/1,000 SF
Ventilation Rate[2] (cfm/person)	10.0	Same as Base Case
Occupancy[2] (SF/person)	200	Same as Base Case

[1] ASHRAE 90.1-2013, Section C406.1 code-options 1 and 2.
[2] IMC Table 403.3. Listed values are for Manufacturing, Office, Hotel, Sports Arena and Retail.
[3] As requested by DOER, LPD is assumed to be the same for the Base and Mitigation Cases even though the Project has committed to an LPD well below Code.
[4] Mass wall R and U values match ASHRAE 90.1 Table A3.1A.

TABLE 6C
SUMMARY OF MODELING ASSUMPTIONS
COMMERCIAL BUILDINGS C, E-H, J, K AND O-R

Energy Efficiency Measure (EEM)	Base Case (Code)[1]	Mitigation Case
Building Envelope (Mass Walls)[3]	Roof R30 Walls R11.4ci Wall Assembly U=0.090	Roof R38 Walls R13ci Wall Assembly U=0.084
Window Glass (Fixed)	U=0.38, DOE Type 2601	Same as Base Case
Cooling Efficiency PTAC	EER 10.5	EER 11.0
Heating Efficiency	88%	95%
Gas-Fired Hot Water Heaters	Storage Tank Heater EF = 0.60	Tankless Heater EF = 0.95
Light Power Density (Whole Bldg. Method) (W/SF)	Manufacturing 1.05 Auto Facility 0.71 Hotel 0.78 Sports Arena 0.82 Retail 1.13	Manufacturing 0.85 Auto Facility 0.60 Hotel 0.65 Sports Arena 0.70 Retail 0.90
Electric Plug Load (W/SF)	Manufacturing 0.34 Auto Facility 0.50 Hotel 1.56 Sports Arena 0.75 Retail 0.70	10% Less For Energy STAR Appliances and Equipment
Parking Lots Lighting Zone 2	60 W/1,000 SF	LED 35 W/1,000 SF
Ventilation Rate[2] (cfm/person)	10.0, 5.0,15.0, 15.0, 7.5	Same as Base Case
Occupancy[2] (SF/person)	200, 200, 250, 150, 66.7	Same as Base Case

[1] 2015 IECC Commercial Code, Section C406.1 code-options 1 and 2.
[2] IMC Table 403.3. Listed values are for Manufacturing, Office, Hotel, Sports Arena and Retail.
[3] Mass wall R and U values match ASHRAE 90.1 Table A3.1A.

TABLE 6D
SUMMARY OF MODELING ASSUMPTIONS
SINGLE-FAMILY/DUPLEX/TRIPLEX RESIDENTIAL BUILDINGS I

Energy Efficiency Measure (EEM)	Base Case (Code)[1]	Mitigation Case
Building Envelope Wood-framed 16" OC	Roof R49 Walls R20+R0ci Wall Assembly U=0.060	Roof R49[3] Walls R22+R0ci Wall Assembly U=0.056
Window Glass (Operable)	U=0.27, DOE Type 2634	Same as Base Case
Gas-Fired Heat	90% AFUE	95% AFUE
Gas-Fired Hot Water Heaters	Storage Tank Heater EF = 0.60	Tankless Heater EF = 0.95
Split System Air Conditioners	SEER 13.0	SEER 14.0
Light Power Density (Whole Bldg. Method)	0.46 W/SF	0.35 W/SF
Electric Plug Load	1.42 W/SF	10% Less for Energy STAR Appliances
Parking Lots Lighting Zone 2	60 W/1,000 SF	LED 35 W/1,000 SF
Ventilation Rate[2]	15 cfm/person	Same as Base Case
Occupancy[2]	500 SF/person	Same as Base Case

[1] 2015 IECC Residential Code with Mass. amendments, plus Energy STAR Certified Homes version 3.1.
[2] IMC Table 403.3.
[3] R60 roof insulation would provide an insignificant (<1%) reduction in energy use.

TABLE 6E
SUMMARY OF MODELING ASSUMPTIONS
MULTI-FAMILY RESIDENTIAL BUILDINGS L, M AND N

Energy Efficiency Measure (EEM)	Base Case (Code)[1]	Mitigation Case
Building Envelope Wood-framed 16" OC	Roof R38 Walls R20+R3.8ci Wall Assembly U=0.051	Roof R49 Walls R21+R4ci Wall Assembly U=0.048
Window Glass (Operable)	U=0.27, DOE Type 2634	Same as Base Case
Gas-Fired Heat	90% AFUE	95% AFUE
Gas-Fired Hot Water Heaters	Storage Tank Heater EF = 0.60	Tankless Heater EF = 0.95
Split System Air Conditioners	SEER 13.0	SEER 14.0
Light Power Density (Whole Bldg. Method)	0.46 W/SF	0.35 W/SF
Electric Plug Load	1.42 W/SF	10% Less for Energy STAR Appliances
Parking Lots Lighting Zone 2	60 W/1,000 SF	LED 35 W/1,000 SF
Ventilation Rate[2]	15 cfm/person	Same as Base Case
Occupancy[2]	333 SF/person	Same as Base Case

[1] 2015 IECC Commercial Code (Group R) with Mass. amendments, plus Energy STAR Certified Homes v3.1.
[2] IMC Table 403.3.

TABLE 6F
AGGREGATE U AND R VALUES FOR BUILDING WALLS

Building Name	Reference Building	Proposed Building
Buildings A, B and D	94% (U=0.090 wall)+ 6% (U=0.42 glass)= **U = 0.1098** **R = 9.10**	94% (U=0.084 wall)+ 6% (U=0.42 glass)= **U = 0.1042** **R = 9.60**
Buildings C, E-H, J, K and Q	94% (U=0.090 wall)+ 6% (U=0.38 glass)= **U = 0.1074** **R = 9.31**	94% (U=0.084 wall)+ 6% (U=0.38 glass)= **U = 0.1018** **R = 9.82**
Building J	69% (U=0.090 wall)+ 31% (U=0.38 glass)= **U = 0.1799** **R = 5.5617**	69% (U=0.084 wall)+ 31% (U=0.38 glass)= **U = 0.1758** **R = 5.69**
Residential Buildings I	76% (U=0.060 wall)+ 24% (U=0.27 glass)= **U = 0.110** **R = 9.06**	76% (U=0.056 wall)+ 24% (U=0.27 glass)= **U = 0.1074** **R = 9.31**
Residential Buildings L-N	76% (U=0.051 wall)+ 24% (U=0.27 glass)= **U = 0.104** **R = 9.66**	76% (U=0.048 wall)+ 24% (U=0.27 glass)= **U = 0.1013** **R = 9.87**
Building O	66% (U=0.090 wall)+ 34% (U=0.38 glass)= **U = 0.18861** **R = 5.30**	66% (U=0.084 wall)+ 34% (U=0.38 glass)= **U = 0.1846** **R = 5.41**
Building R	89% (U=0.090 wall)+ 11% (U=0.38 glass)= **U = 0.1219** **R = 8.20**	89% (U=0.084 wall)+ 11% (U=0.38 glass)= **U = 0.1166** **R = 8.58**

TABLE 7
SUMMARY OF ACTIVITY AREAS

Building Name Floor Area (sf)	eQUEST Activity Type	% Floor Area	External Electrical Loads (MWhr/yr)
Building A	Warehouse	100.0	-
Buildings B-H, K	Manufacturing High-Tech/Bio	100.0	-
Building J	Office/Auto Facility	100.0	-
Building I	Residential	100.0	-
Building L-N	MF Residential Corridor Lobby	90.0 8.0 2.0	Elevators 6.6
Building O	Hotel Rooms Lobby	95.0 5.0	Elevators 6.6
Building Q	Sports Arena Locker Rooms Lobby	85.0 10.0 5.0	-
Building R	Retail	100	-

TABLE 8
COMPARISON OF eQUEST BASE ASND MITIGATION CASES ENERGY USE INTENSITY TO PNNL PROTOTYPE BUILDING EUI FOR THE IECC 2015 CODE

Buildings	Base Case EUI (kBtu/SF)	Mitigation Case EUI (kBtu/SF)	PNNL EUI (kBtu/SF) [1]
Building A - Warehouse (no cooling)	14.2	11.5 -18.7%	18.9
Building B - Manufacturing	23.3	20.8 -10.4%	-
Building C - Manufacturing	27.3	24.2 -11.5%	-
Building D - Manufacturing	22.0	19.5 -11.2%	-
Building E - Manufacturing	25.9	22.9 -11.6%	-
Building F - Manufacturing	27.5	24.4 -11.3%	-
Building G - Manufacturing	28.2	25.1 -11.0%	-
Building H - Manufacturing	28.2	25.1 -11.0%	-
Building K - Manufacturing	28.2	25.1 -11.0%	-
Building J - Office	29.1	35.9 -11.0%	37.9
Building I – Single Family Residential	58.9	51.6 -12.4%	-
Building I – Duplex Residential	53.5	46.9 -12.4%	-
Building I – Triplex Residential	55.8	48.9 -12.3%	-
Building L – MF Residential	45.6	39.5 -13.3%	49.8
Building M– MF Residential	44.3	38.1 -14.0%	49.8
Building N – MF Residential	46.1	38.6 -12.9%	49.8
Building O – Small Hotel	58.1	49.9 -14.1%	64.7
Building Q – Sports Arena	38.2	33.9 -11.3%	-
Building R - Retail	32.9	28.7 -12.8%	48.7

[1] PNNL values are IECC 2015, Zone 5A, adjusted to Boston climate. No PNNL values exist for manufacturing, sports arena, or single-family/duplex/triplex residential use.

4.5 Additional Energy Mitigation Measures

The following energy efficiency measures will be studied further during detailed building design:

On-Site Photovoltaic (PV) System - The proponent affirms its commitment to have "solar-ready" space available for a possible third-party photo-voltaic (PV) installation on the roofs of the project buildings. IECC 2015, with Massachusetts Amendments to Section C402.3, requires that low-rise (three stories or less) commercial buildings have a solar-ready zone equal to 50% of the flat roof area without obstructions (such as rooftop refrigeration and HVAC equipment, access walkways and safety setbacks), and the project will comply with that requirement for Buildings A - J, Q and R.

The usable roof area (URA) is estimated as 50% of the roof areas for all commercial and residential buildings. URA calculates as 1,136,269 sf. PV capacity is calculated as approximately 11.3 MW using the ratio of 10 kW/1,000 sf of useable roof area. Silicon-based solar cell energy conversion efficiencies are in the range of 14-17%, and it depends on multiple factors.

The following cost feasibility analysis assumes the maximum potential of 11.3 MW for the site. The analysis uses the most recent data from the Massachusetts Energy and Environmental Affairs (EEA) website on Qualified Generation Units.[12] The average installed cost for 5^{+} MW size installations starting commercial operation in 2016-2018 is $2.33/W.

DOER replaced SREC-II incentives with the Solar Massachusetts Renewable Target (SMART) Program. Under the new SMART program, a stand-alone rooftop solar system can be built and operated without net-metering, and a 20-year fixed price is set. For National Grid, Block 8[13], projects over 1 MW in size receive an incentive of $0.11695/kWh, to which $0.02/kWh is added for a building-mounted system, yielding a total price of $0.13695/kWh for this feasibility analysis.

Total potential installed capacity of 11.3 MW PV, flat-mounted, is projected to generate 13,458 MWh per year[14], which equates to 4,589 tons per year (tpy) in reduced GHG emissions, which is approximately 78% of the Full Build Mitigation Case CO_2 emissions (see Table 5A).

The economics of a PV installation were calculated using the EEA 2015 Revised SREC II Financial Model (model output is in Appendix C), with the following assumptions:

- PV system size of 11.3 MW
- System cost of $2.33/Watt
- Annual capacity factor of 13.6% (Mass., flush mounted on roof)
- 20-year fixed, capacity-based rate of $0.13695/kWh
- An inverter replacement cost of $0.50/W

[12] DOER, Installed PV Costs for Qualified and Operating Units, data through March 4, 2019.
[13] New Large Project applications in National Grid service area are assigned to Block 8. www.masmartsolar.com.
[14] A 100-kW system produces 119.1 MWh/yr assuming a 13.6% capacity factor.

The calculations assume a reasonable customer discount rate of 6%, federal tax credits and State tax deductions. The calculated Net Present Value of the PV system -$1,618,020 for a 11.3-MW system. The Simple Payback Period is 14 years. Based on market research, almost 90 percent of strong prospects would consider a payback of 4 years, but acceptance begins to drop rapidly once paybacks reach 5 years.[15] The NPV is negative, suggesting a PV system near the maximum size of 11.3 MW is not cost feasible for the Project. A smaller sized system, which would earn a higher incentive price per kWh, may be cost feasible, given the current National Grid incentive structure for a new, large project. The Proponent affirms its commitment to have solar-ready space available for a future third-party PV installation on the Usable Roof Areas.

Cold Climate Air Source Heat Pumps for Heating/Cooling/Domestic Hot Water – This section provides an evaluation of cold-climate air source heat pumps (ASHPs) for the residential and commercial buildings for space heating, cooling and domestic hot water. Thermal AECs are available to subsidize some of the operating cost, and MassSave incentives (discussed on page 29) are available to offset some of the capital cost of ASHPs. MCEC capital cost rebates of $600-$1,000 per unit for VRF ASHPs are available for business owned and installed units. For non-VRF ASHPs, all grant applications must go through the MCEC Residential Program where payments of $500 per unit are available, though that program ended March 20, 2019.

For the residential building ASHPs, the estimated annual AEC income from thermal AECs was calculated using the EEA formula in the "Guideline on Metering and Calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units – Part 1," December 29, 2017:

$$\text{Annual Income} = (3 + (2 \times [(\text{Floor\_Area} - 1500)/1000])) \times 3 \times \$15$$

DOER's spreadsheet applies this on a per apartment basis, not a building basis. Whereas the total floor area of the multi-family, four-story residential buildings (636,600 SF) divided by 500 residential units is less than 1,500 SF, the calculated AEC per unit is $135 per year, or $1,350 per unit over ten years. For the project as a whole (617 housing units), residential ASHP AEC income is $83,295 per year, or $832,950 over ten years. If certain conditions are met the full 10-year income may be available as a lump sum.

For the commercial building ASHPs[16], the estimated annual AEC income from thermal AECs was calculated using the EEA "Formula for Intermediate DX ASHPs,"[17] DOER's "APS-ASHP SQA Worksheets 012618" spreadsheet, and assuming $15 per AEC. Commercial ASHP AEC income is estimated as $56,475 per year, or $564,750 over ten years.

[15] *Assessment of California CHP Market and Policy Options for Increased Penetration*, Final Report, Co-sponsors Public Interest Energy Research Program (PIER) and California Energy Commission, July 2005.

[16] Building A is not included since unconditioned warehouse space would not use an air source heat pump for heating alone.

[17] Department of Energy Resources, "AEPS Guideline on Metering and calculating the Useful Thermal Output of Eligible Renewable Thermal Generation Units – Part 2," June 8, 2016.

An analysis of energy and GHG emission changes associated with heat pumps was done by re-running eQUEST for the Mitigation Case and substituting in air source heat pumps (COP=4.0) for heating and cooling. Heat pump water heaters were also assumed (COP=2.50) so the ASHP model runs are all electric. The eQUEST model output is provided in Appendix A.

For the residential buildings, heating/cooling/hot water ASHPs would increase electricity use by 1,647 MWhr/year, would reduce gas use by 15,767 MMBtu per year, and would result in a decrease of 361 tons/year in Mitigation Case CO_2 emissions. Using the latest Massachusetts Residential rates from the EIA of $208.60/MWhr and $15.93/MMBtu-gas, a project design that used ASHPs for heating/cooling/domestic hot water would *increase* total energy costs for the residential buildings (as a group) by $92,396/year. Potential AEC income of $83,295 per year, could offset the increased fuel cost, though the AEC income would accrue to a different entity (the project owner) than the building tenants who would bear the increased fuel cost. The project will continue to study ASHPs.

For the commercial buildings, heating/cooling/hot water ASHPs would increase electricity use by 727 MWhr/year, would reduce gas use by 7,698 MMBtu per year, and would result in a decrease of 202tons/year in Mitigation Case CO_2 emissions. Using the latest Massachusetts Commercial rates of $166.40/MWhr and $9.86/MMBtu-gas, a project design that used ASHPs for heating/cooling/domestic hot water would *increase* total energy costs for the commercial buildings (as a group) by $45,070/year. Potential AEC income of $56,475 per year could offset the increased fuel cost, though the AEC income would accrue to a different entity (the project owner) than the building tenants who would bear the increased fuel cost. The project will continue to study ASHPs.

4.6 Draft Outline for Tenant Manual

It is assumed at this preliminary stage that the project will construct core-and-shell buildings for the commercial building tenants, and will provide fully finished buildings for the residential tenants. The first three items listed below only apply to commercial leased space that is not built-out by the project.

As part of the design phase of the project, the Proponent will implement a set of tenant guidelines in the Project Tenant Manual, which will either mandate or encourage specific sustainable measures, where applicable, reasonable and/or feasible for specific users. Each tenant and their design team will be provided a copy of the Tenant Manual upon executing a lease. The Tenant Manual will include the following requirements:

- Where heating and cooling systems, or hot water heaters, are not provided by the lessor, the tenant will be required to design such systems with an efficiency equivalent to the Mitigation Case values listed in Table 6.

- Where interior lighting is not provided by the lessor, the tenant will be required to design interior hard-wired lighting systems with light power densities (whole building method) equivalent to the Mitigation Case values in Table 6.

- Where electric appliances are not provided by the lessor, the tenant will be required to install Energy STAR rated appliances, where available and to the extent feasible.

- The Proponent will provide for individualized tenant control and metering of electricity and natural gas, to the extent feasible, to promote increased efficiency.

- The Proponent will provide to tenants a list of amenities within walking distance for tenants to pass on to their employees.

- The Proponent will encourage all tenants to collect and recycle cans, bottles, and paper.

4.7 Transportation Mitigation Measures

There is no regularly scheduled public transportation to the Project site. The nearest public bus stop is the Montachusett Regional Transit Authority (MRTA) Route 8 bus stop at D'Ambrosio Eye Care, 479 Old Union Turnpike, a two mile walk from the Project. We expect the following TDM measures to decrease trips to the site, and which in aggregate it is estimated will reduce CO_2 transportation emissions by 2%.[18]

- ***Preferential Parking –*** The Proponent will provide preferential parking for rideshare, carpool and hybrid vehicles at locations throughout the site.

- ***Electric Vehicle Charging Stations –*** The Proponent will provide electric vehicle charging stations at locations throughout the site.

- ***Sidewalk Connectivity –*** The Proponent will provide connectivity of sidewalk infrastructure along McGovern Boulevard to land uses within the site and Lunenberg Road.

- ***Provide Bicycle Storage*** – The Proponent will provide secure, weather-protected bicycle parking for employees at designated locations within the site. The Proponent will coordinate with tenants to provide showers for employees who commute by bicycle.

- ***Nearby Food and Fuel Service*** – There are three restaurants and food marts within walking distance of the Project buildings. A Mobil gas station is located at the head of McGovern Boulevard.

- ***On-Site Employee Transportation Coordinator (ETC)*** – An ETC will be provided onsite to oversee, implement, monitor and evaluate TDM measures, employed or funded by the Proponent. The ETC will actively registered employees with NuRide, as requested, to encourage ride-sharing. The Proponent, and the ETC, will encourage vanpool and carpooling participation through marketing, events and vanpool formation meetings. The ETC will be responsible for providing all employees who carpool, bicycle or walk to work with an emergency ride home.

[18] Ewing, R. "TDM , Growth Management, and the Other Four Out of Five Trips," Transportation Quarterly, Vol. 47, No. 3, 1993, pp. 343-366.

5.0 LOSS OF CARBON SEQUESTRATION

The amount of carbon released due to tree removal is based on the projected amount of upland forest and forested wetland impacted due to land clearing. While 55 acres of the 471-acre site will be altered, most of the development area was previously cleared and used for a variety of uses including gravel pits, storage piles and haul roads. Thus, the new buildings, parking lots and roadways will reuse areas that are mostly currently devoid of tree cover. Map analysis reveals the project will remove at most 15 acres of mature forest cover.

The MEPA carbon sequestration spreadsheet was used to determine the amount of carbon lost from removal of the trees (stock), as well as from the loss of annual sequestration potential. The estimation of sequestration loss per year due to permanent impacts assumed the affected acreage was 80% hardwoods (oak, pine, and ash) and 20% softwoods (maple, beech, birch). Hardwood and softwood densities per acre on typical southern New England land with forest cover are 1124 ft^3/acre and 425 ft^3/acre, respectively.[19] Detailed calculations are provided in Appendix D. The spreadsheet was expanded to include a conversion of results from metric tonnes to English short tons of carbon.

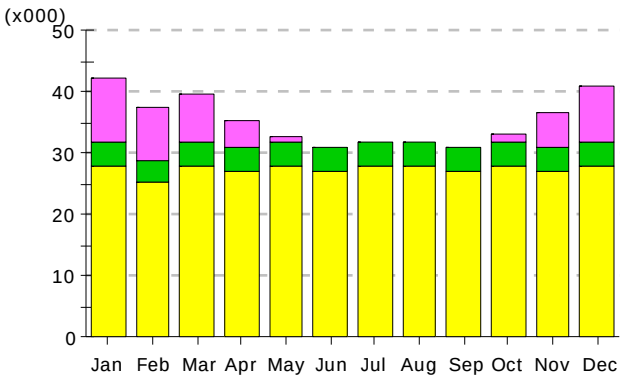
The total potential area of mature forest that will be altered is approximately 15 acres. The calculated amount of lost carbon due to tree removal is 1,005 tons C. The calculated amount of carbon not sequestered due to permanent tree removal is 2.92 tons C/year. This is the annual effect from carbon not sequestered in the stock removed as part of project construction. The project reuses previously developed portions of the site, and the Proponent is committed to minimizing tree removal in all work zones.

[19] U.S. Department of Agriculture, Forest Service, "Forest Resources of Southern New England," Resource Bulletin NE-127, 1993.

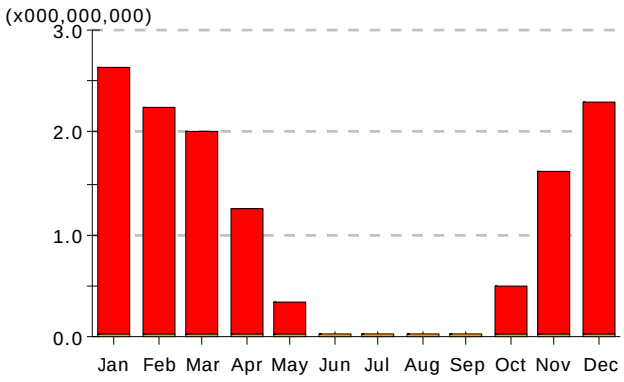
APPENDIX A

EQUEST MODEL OUTPUT

Electric Consumption (kWh)



Gas Consumption (Btu)



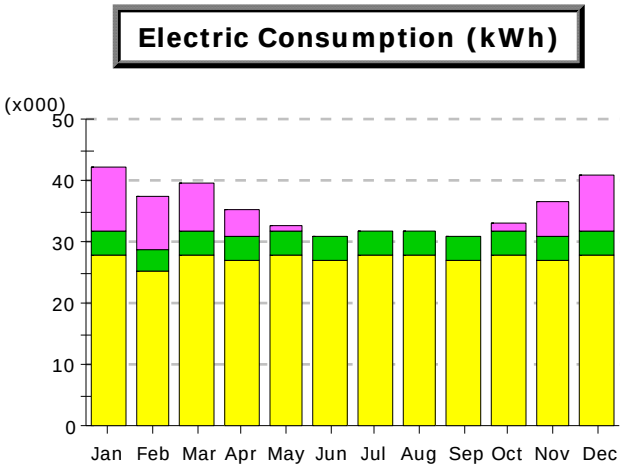


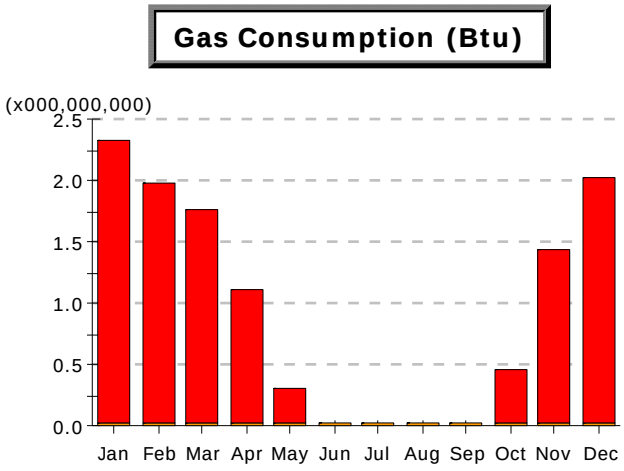
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.51	8.88	7.61	4.34	0.95	-	-	-	-	1.47	5.95	8.89	48.61
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.79	3.42	3.79	3.67	3.79	3.67	3.79	3.79	3.67	3.79	3.67	3.79	44.64
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	27.98	25.28	27.98	27.08	27.98	27.08	27.98	27.98	27.08	27.98	27.08	27.98	329.48
Total	42.29	37.58	39.39	35.09	32.72	30.75	31.77	31.77	30.75	33.25	36.70	40.67	422.74

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.62	2.23	1.98	1.24	0.31	-	-	-	-	0.48	1.61	2.26	12.72
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.03	0.02	0.03	0.30
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2.64	2.26	2.01	1.26	0.33	0.02	0.03	0.03	0.02	0.50	1.63	2.29	13.02





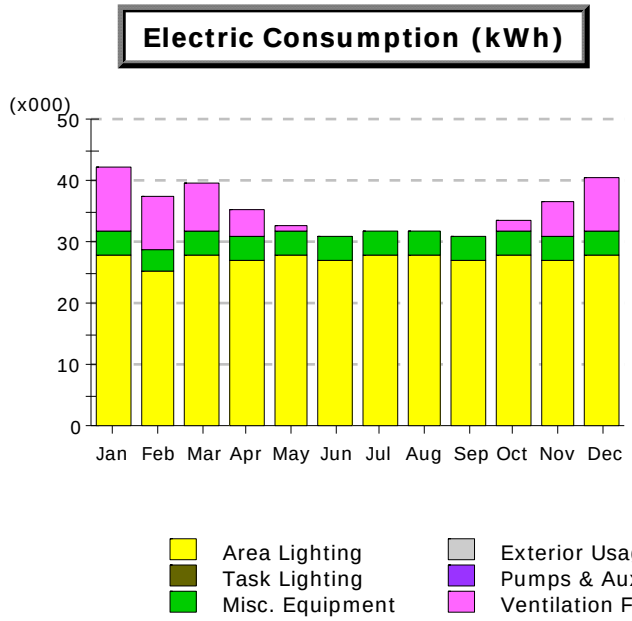


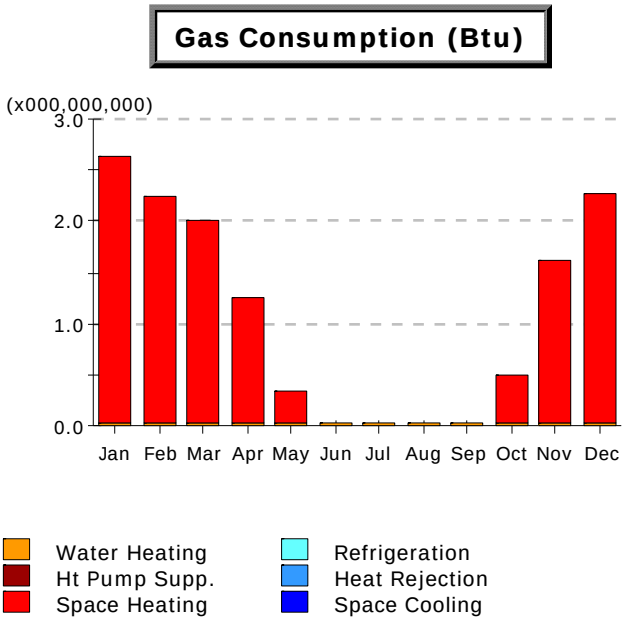
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.51	8.88	7.61	4.34	0.95	-	-	-	-	1.47	5.95	8.89	48.61
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.79	3.42	3.79	3.67	3.79	3.67	3.79	3.79	3.67	3.79	3.67	3.79	44.64
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	27.98	25.28	27.98	27.08	27.98	27.08	27.98	27.98	27.08	27.98	27.08	27.98	329.48
Total	42.29	37.58	39.39	35.09	32.72	30.75	31.77	31.77	30.75	33.25	36.70	40.67	422.74

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.30	1.97	1.74	1.09	0.27	-	-	-	-	0.42	1.41	1.99	11.19
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.03	0.02	0.03	0.30
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2.33	1.99	1.77	1.11	0.29	0.02	0.03	0.03	0.02	0.45	1.44	2.02	11.49





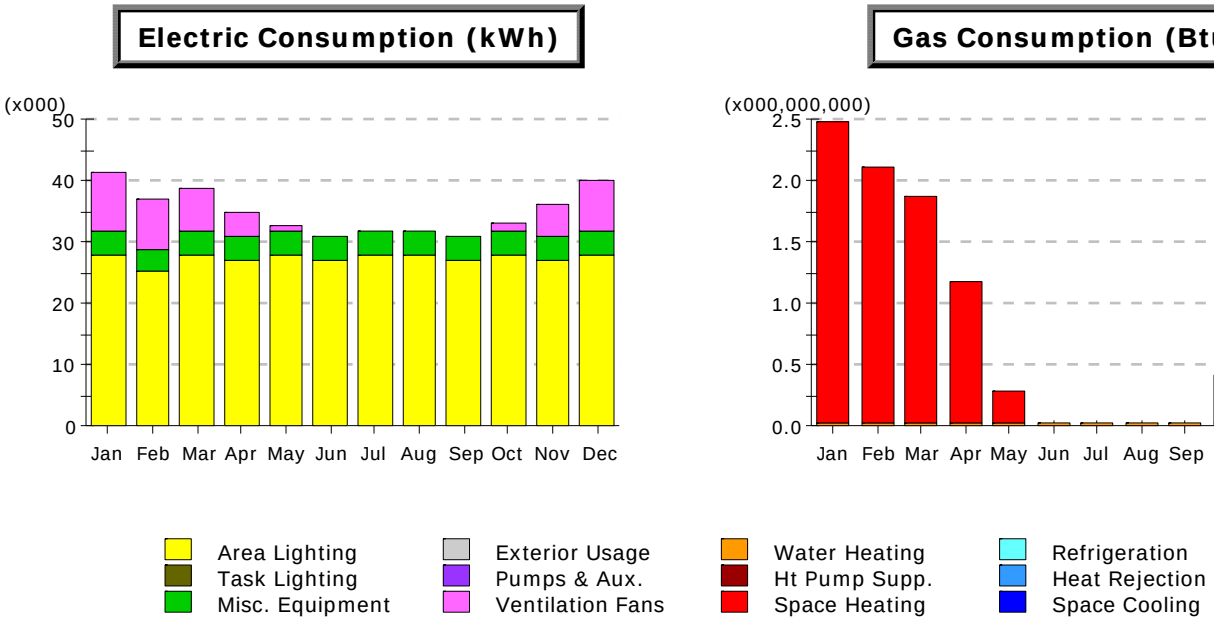


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.47	8.86	7.61	4.36	0.97	-	-	-	-	1.49	5.94	8.86	48.56
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.79	3.42	3.79	3.67	3.79	3.67	3.79	3.79	3.67	3.79	3.67	3.79	44.64
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	27.98	25.28	27.98	27.08	27.98	27.08	27.98	27.98	27.08	27.98	27.08	27.98	329.48
Total	42.24	37.56	39.39	35.11	32.74	30.75	31.77	31.77	30.75	33.27	36.69	40.63	422.68

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.61	2.23	1.98	1.24	0.31	-	-	-	-	0.48	1.60	2.25	12.71
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.21
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2.63	2.24	2.00	1.26	0.33	0.02	0.02	0.02	0.02	0.50	1.62	2.27	12.92



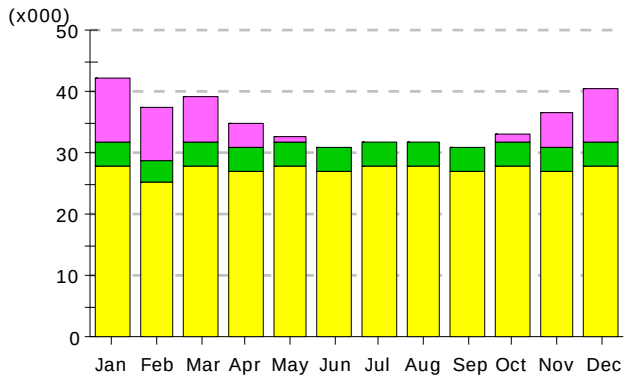
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	9.74	8.22	7.01	3.94	0.80	-	-	-	-	1.17	5.44	8.20	44.53
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.79	3.42	3.79	3.67	3.79	3.67	3.79	3.79	3.67	3.79	3.67	3.79	44.64
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	27.98	25.28	27.98	27.08	27.98	27.08	27.98	27.98	27.08	27.98	27.08	27.98	329.48
Total	41.51	36.92	38.79	34.69	32.58	30.75	31.77	31.77	30.75	32.95	36.19	39.98	418.65

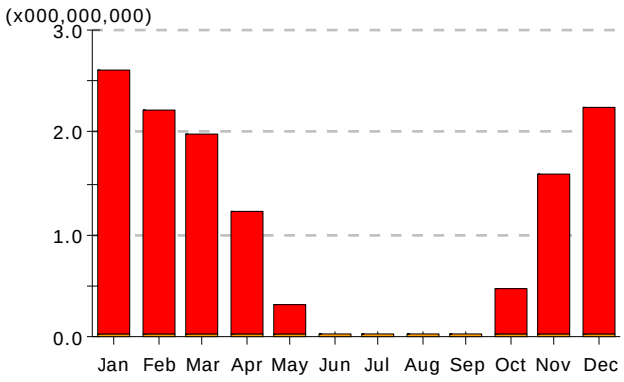
Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.45	2.08	1.85	1.14	0.26	-	-	-	-	0.39	1.49	2.11	11.77
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.03	0.02	0.03	0.30
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2.47	2.11	1.87	1.17	0.29	0.02	0.03	0.03	0.02	0.41	1.52	2.14	12.07

Electric Consumption (kWh)



Gas Consumption (Btu)





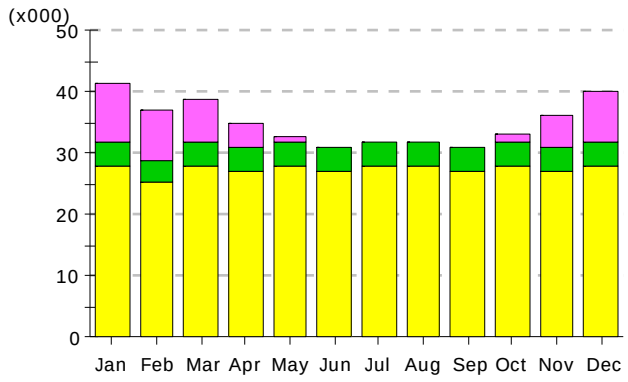
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.32	8.71	7.46	4.23	0.91	-	-	-	-	1.40	5.83	8.72	47.57
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.79	3.42	3.79	3.67	3.79	3.67	3.79	3.79	3.67	3.79	3.67	3.79	44.64
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	27.98	25.28	27.98	27.08	27.98	27.08	27.98	27.98	27.08	27.98	27.08	27.98	329.48
Total	42.10	37.41	39.23	34.98	32.68	30.75	31.77	31.77	30.75	33.17	36.58	40.49	421.70

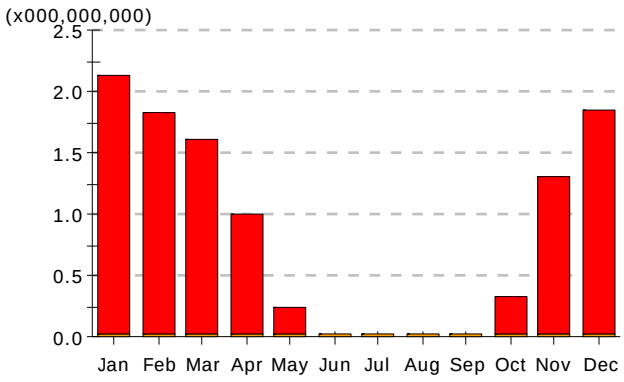
Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.58	2.19	1.95	1.21	0.29	-	-	-	-	0.45	1.58	2.22	12.48
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.03	0.02	0.03	0.30
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2.60	2.22	1.97	1.24	0.32	0.02	0.03	0.03	0.02	0.48	1.60	2.25	12.78

Electric Consumption (kWh)



Gas Consumption (Btu)



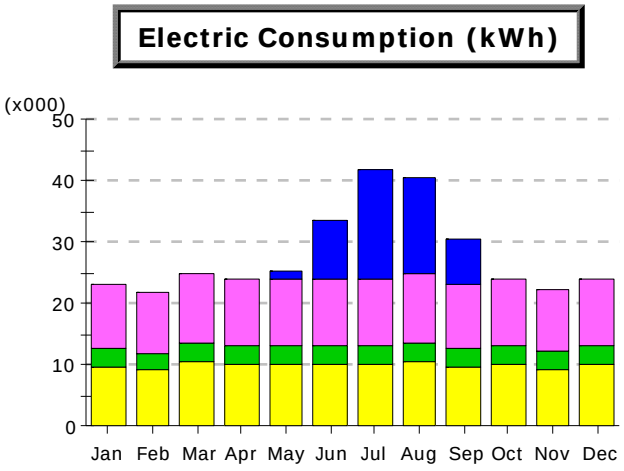


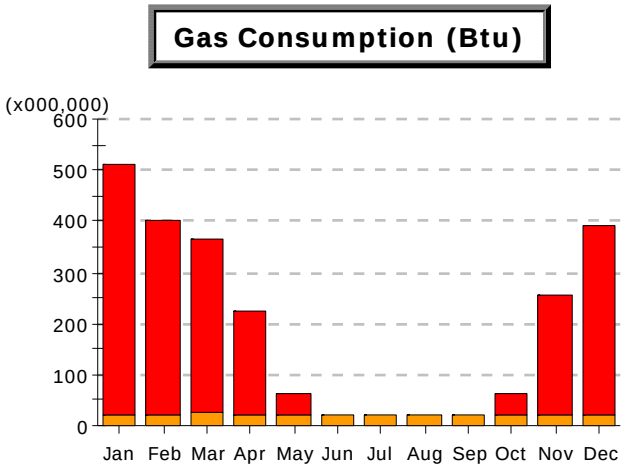
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	9.55	8.05	6.86	3.83	0.76	-	-	-	-	1.10	5.31	8.03	43.48
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.79	3.42	3.79	3.67	3.79	3.67	3.79	3.79	3.67	3.79	3.67	3.79	44.64
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	27.98	25.28	27.98	27.08	27.98	27.08	27.98	27.98	27.08	27.98	27.08	27.98	329.48
Total	41.32	36.75	38.63	34.58	32.54	30.75	31.77	31.77	30.75	32.88	36.06	39.80	417.61

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.11	1.80	1.59	0.98	0.22	-	-	-	-	0.32	1.29	1.82	10.14
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.21
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2.13	1.82	1.61	1.00	0.24	0.02	0.02	0.02	0.02	0.34	1.30	1.84	10.35





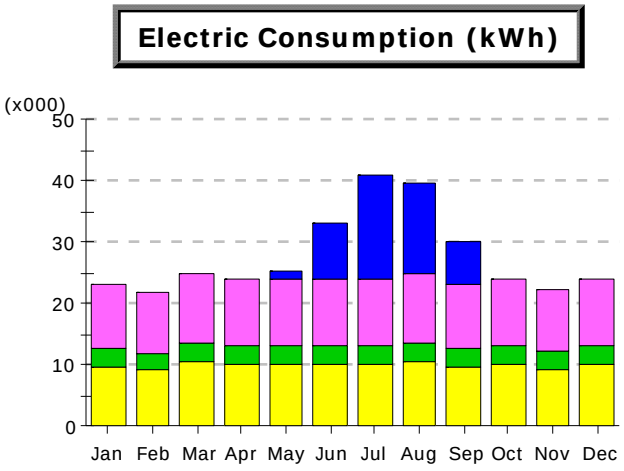


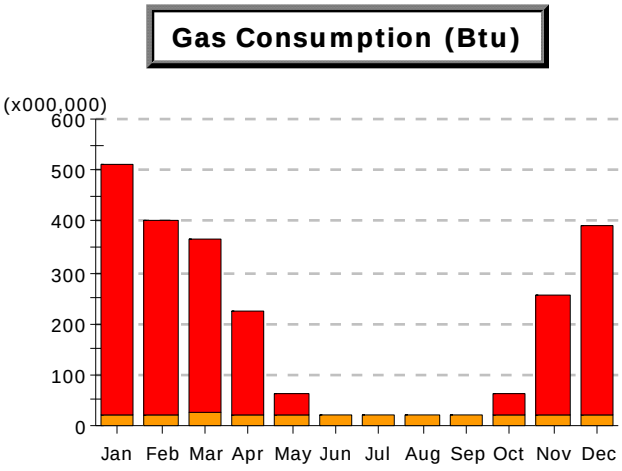
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.28	9.68	17.92	15.84	7.44	0.06	-	-	52.21
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.51	9.79	11.24	10.88	10.88	10.88	10.88	11.24	10.51	10.88	10.15	10.88	128.70
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.88	2.69	3.08	2.98	2.98	2.98	2.98	3.08	2.88	2.98	2.78	2.98	35.30
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.59	8.93	10.25	9.92	9.92	9.92	9.92	10.25	9.59	9.92	9.26	9.92	117.42
Total	23.17	21.57	24.75	23.93	25.09	33.46	41.70	40.41	30.43	23.90	22.35	23.95	334.72

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	489.8	382.1	339.6	198.9	37.3	-	-	-	-	37.3	234.8	369.3	2,089.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	512.0	402.8	363.4	222.0	60.2	22.8	22.7	23.4	21.9	60.0	256.1	392.2	2,359.4





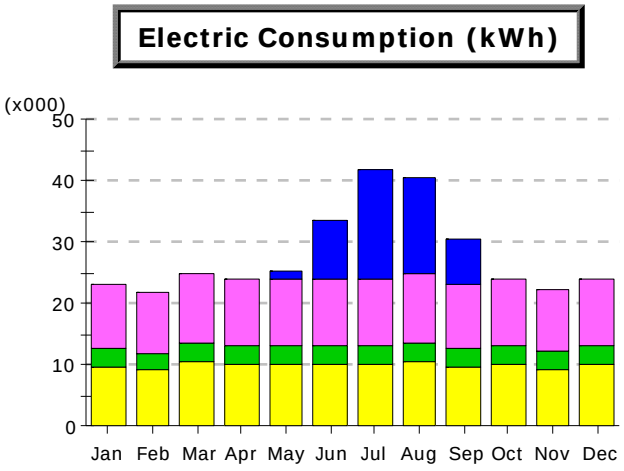


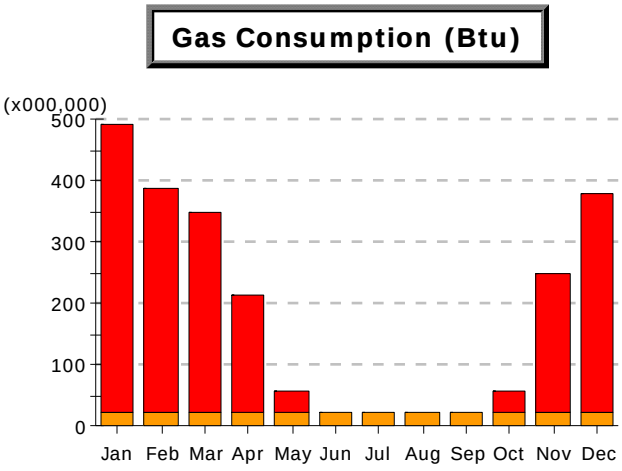
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.21	9.17	16.99	15.01	7.05	0.06	-	-	49.49
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.51	9.79	11.24	10.88	10.88	10.88	10.88	11.24	10.51	10.88	10.15	10.88	128.70
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.88	2.69	3.08	2.98	2.98	2.98	2.98	3.08	2.88	2.98	2.78	2.98	35.30
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.59	8.93	10.25	9.92	9.92	9.92	9.92	10.25	9.59	9.92	9.26	9.92	117.42
Total	23.17	21.57	24.75	23.93	25.03	32.95	40.77	39.59	30.05	23.90	22.35	23.95	332.00

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	489.8	382.1	339.6	198.9	37.3	-	-	-	-	37.3	234.8	369.3	2,089.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	512.0	402.8	363.4	222.0	60.2	22.8	22.7	23.4	21.9	60.0	256.1	392.2	2,359.4





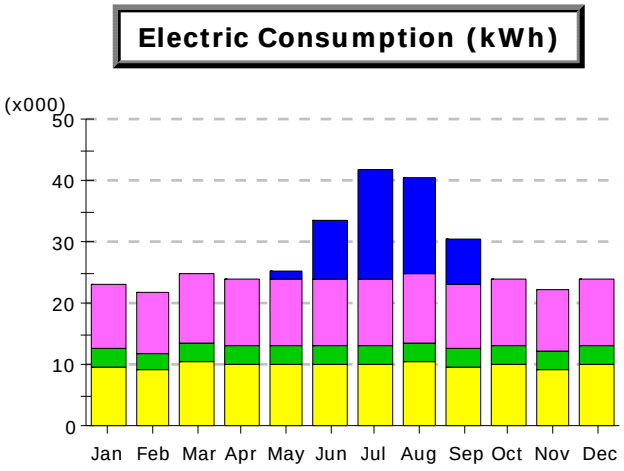


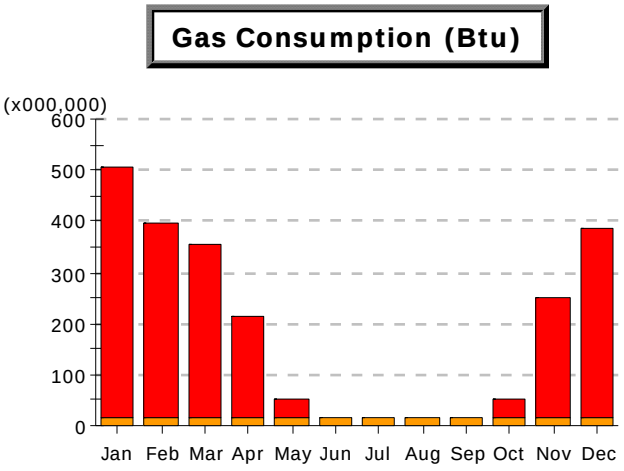
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.28	9.68	17.92	15.84	7.44	0.06	-	-	52.21
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.51	9.79	11.24	10.88	10.88	10.88	10.88	11.24	10.51	10.88	10.15	10.88	128.70
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.88	2.69	3.08	2.98	2.98	2.98	2.98	3.08	2.88	2.98	2.78	2.98	35.30
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.59	8.93	10.25	9.92	9.92	9.92	9.92	10.25	9.59	9.92	9.26	9.92	117.42
Total	23.17	21.57	24.75	23.93	25.09	33.46	41.70	40.41	30.43	23.90	22.35	23.95	334.72

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	470.0	366.6	325.9	190.9	35.8	-	-	-	-	35.8	225.3	354.3	2,004.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	492.2	387.3	349.7	213.9	58.7	22.8	22.7	23.4	21.9	58.5	246.6	377.2	2,274.9





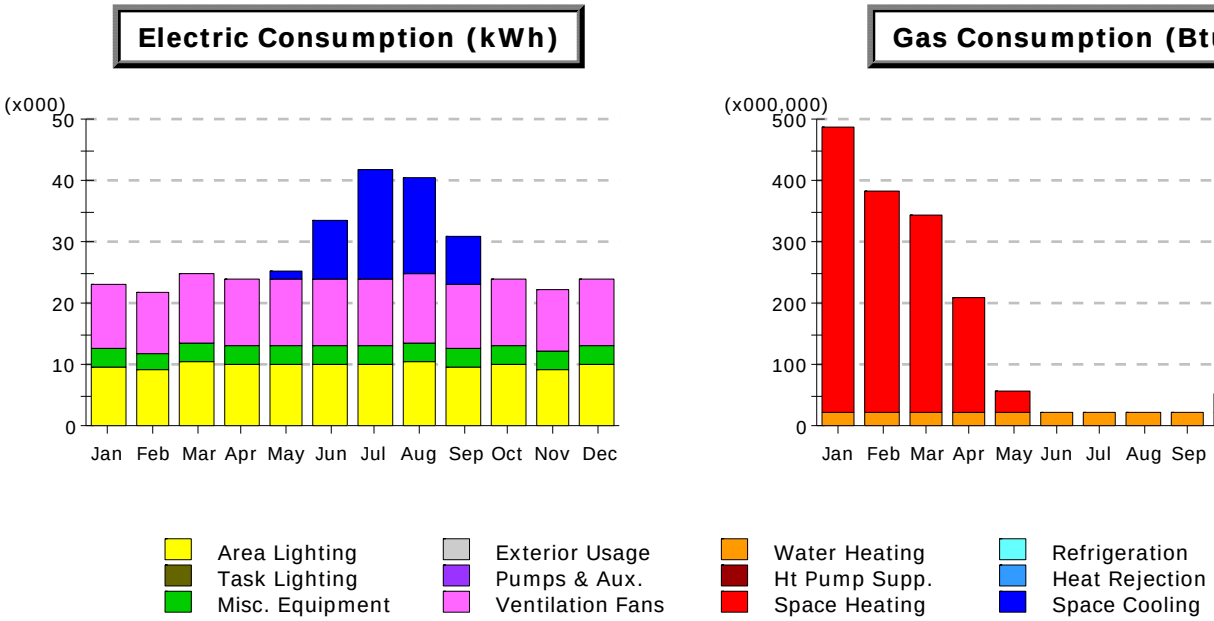


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.28	9.68	17.92	15.84	7.44	0.06	-	-	52.21
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.51	9.79	11.24	10.88	10.88	10.88	10.88	11.24	10.51	10.88	10.15	10.88	128.70
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.88	2.69	3.08	2.98	2.98	2.98	2.98	3.08	2.88	2.98	2.78	2.98	35.30
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.59	8.93	10.25	9.92	9.92	9.92	9.92	10.25	9.59	9.92	9.26	9.92	117.42
Total	23.17	21.57	24.75	23.93	25.09	33.46	41.70	40.41	30.43	23.90	22.35	23.95	334.72

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	489.8	382.1	339.6	198.9	37.3	-	-	-	-	37.3	234.8	369.3	2,089.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	15.6	14.5	16.6	16.1	16.1	16.1	16.1	16.6	15.5	16.1	15.0	16.1	190.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	505.3	396.5	356.2	215.0	53.4	16.1	16.1	16.6	15.5	53.4	249.8	385.4	2,279.4

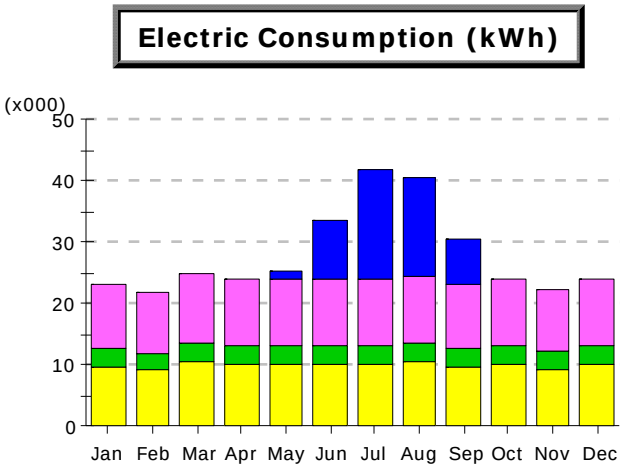


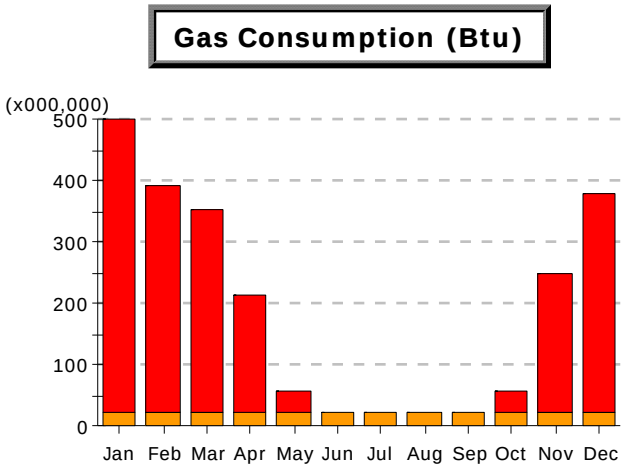
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.37	9.85	17.91	15.93	7.78	0.11	-	-	52.96
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.51	9.79	11.24	10.88	10.88	10.88	10.88	11.24	10.51	10.88	10.15	10.88	128.70
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.88	2.69	3.08	2.98	2.98	2.98	2.98	3.08	2.88	2.98	2.78	2.98	35.30
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.59	8.93	10.25	9.92	9.92	9.92	9.92	10.25	9.59	9.92	9.26	9.92	117.42
Total	23.17	21.57	24.75	23.93	25.19	33.63	41.70	40.51	30.77	23.95	22.35	23.95	335.47

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	463.3	360.4	319.5	184.0	32.0	-	-	-	-	28.3	216.9	345.9	1,950.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	485.5	381.2	343.3	207.0	54.9	22.8	22.7	23.4	21.9	51.0	238.1	368.8	2,220.6





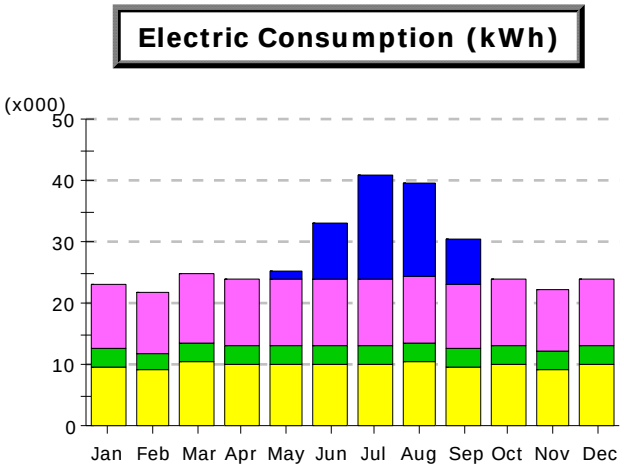


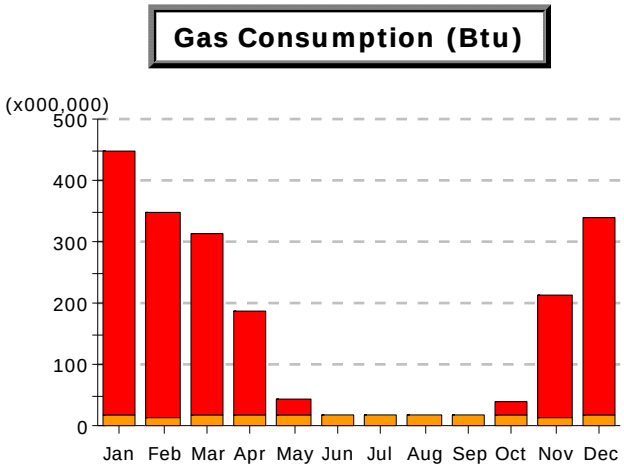
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.34	9.77	17.90	15.86	7.56	0.08	-	-	52.51
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.50	9.78	11.22	10.86	10.86	10.86	10.86	11.22	10.50	10.86	10.14	10.86	128.54
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.88	2.69	3.08	2.98	2.98	2.98	2.98	3.08	2.88	2.98	2.78	2.98	35.30
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.59	8.93	10.25	9.92	9.92	9.92	9.92	10.25	9.59	9.92	9.26	9.92	117.42
Total	23.16	21.56	24.74	23.91	25.14	33.54	41.67	40.42	30.54	23.91	22.33	23.94	334.86

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	476.6	370.7	329.2	190.9	34.4	-	-	-	-	33.1	226.0	357.5	2,018.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	498.8	391.4	353.0	213.9	57.3	22.8	22.7	23.4	21.9	55.8	247.3	380.4	2,288.8





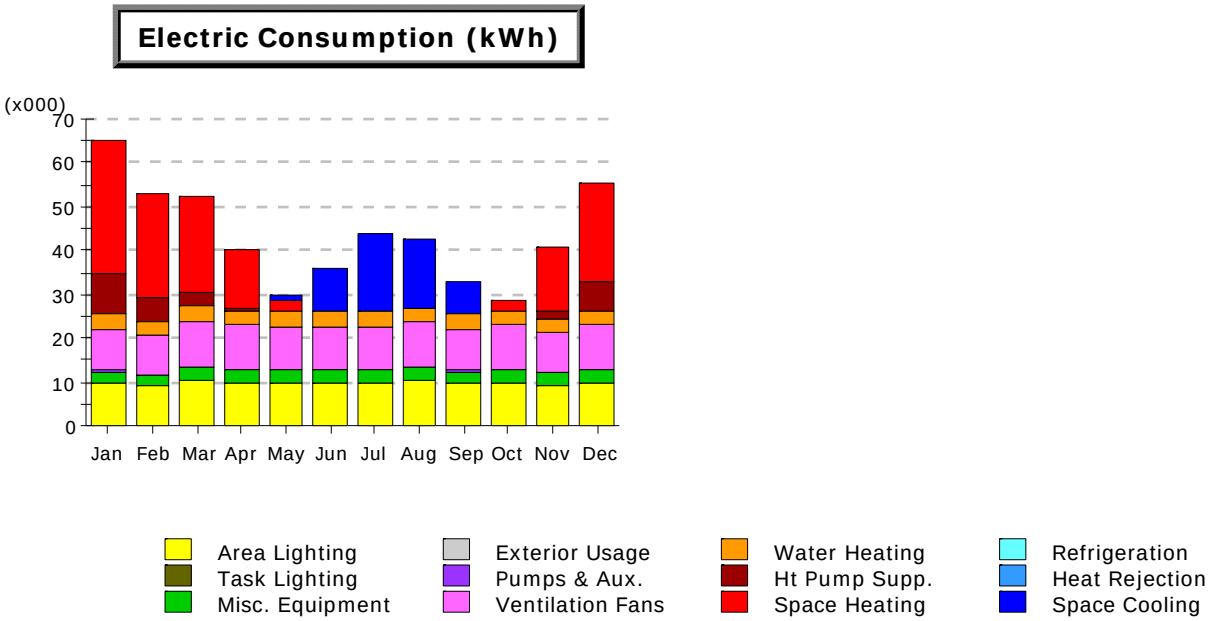


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.38	9.43	16.96	15.12	7.48	0.14	-	-	50.52
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.50	9.78	11.22	10.86	10.86	10.86	10.86	11.22	10.50	10.86	10.14	10.86	128.54
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.88	2.69	3.08	2.98	2.98	2.98	2.98	3.08	2.88	2.98	2.78	2.98	35.30
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.59	8.93	10.25	9.92	9.92	9.92	9.92	10.25	9.59	9.92	9.26	9.92	117.42
Total	23.16	21.56	24.74	23.91	25.18	33.20	40.73	39.68	30.46	23.97	22.33	23.94	332.87

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	431.7	334.8	296.4	169.2	28.2	-	-	-	-	23.5	199.7	321.0	1,804.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	15.6	14.5	16.6	16.1	16.1	16.1	16.1	16.6	15.5	16.1	15.0	16.1	190.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	447.2	349.3	313.0	185.3	44.3	16.1	16.1	16.6	15.5	39.6	214.7	337.1	1,994.9

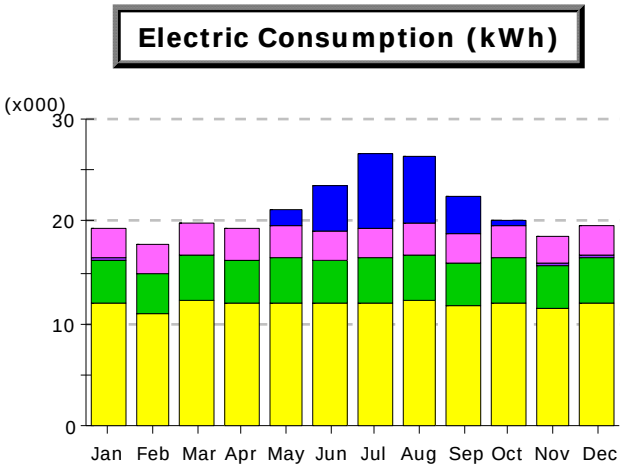


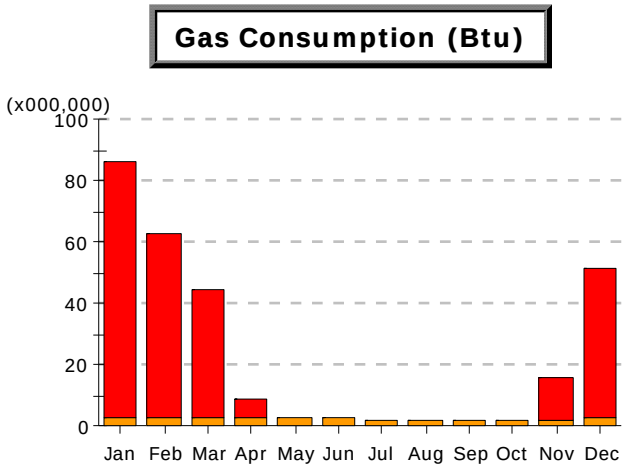
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.27	9.64	17.58	15.63	7.50	0.10	-	-	51.71
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	30.45	24.16	21.84	13.47	2.57	-	-	-	-	2.25	14.96	22.73	132.43
HP Supp.	9.20	5.35	3.46	0.51	-	-	-	-	-	0.01	1.32	6.37	26.21
Hot Water	3.33	3.10	3.56	3.45	3.44	3.43	3.39	3.46	3.24	3.39	3.20	3.43	40.44
Vent. Fans	9.55	8.90	10.21	9.88	9.88	9.88	9.88	10.21	9.55	9.88	9.23	9.88	116.96
Pumps & Aux.	0.08	0.08	0.09	0.09	0.02	-	-	-	0.00	0.05	0.09	0.09	0.60
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.88	2.69	3.08	2.98	2.98	2.98	2.98	3.08	2.88	2.98	2.78	2.98	35.30
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.59	8.93	10.25	9.92	9.92	9.92	9.92	10.25	9.59	9.92	9.26	9.92	117.42
Total	65.09	53.21	52.51	40.31	30.09	35.86	43.76	42.64	32.78	28.59	40.83	55.41	521.07

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													





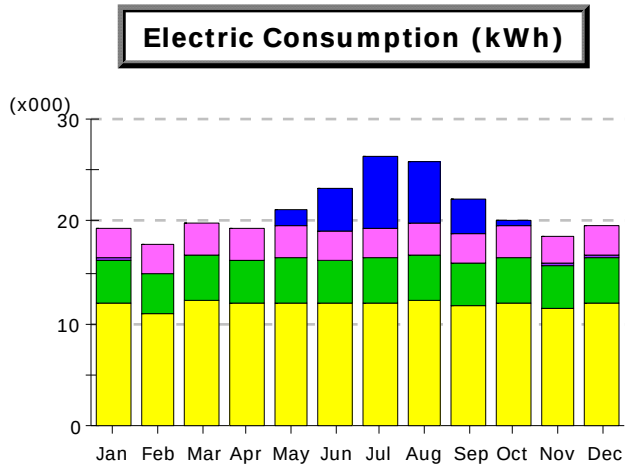


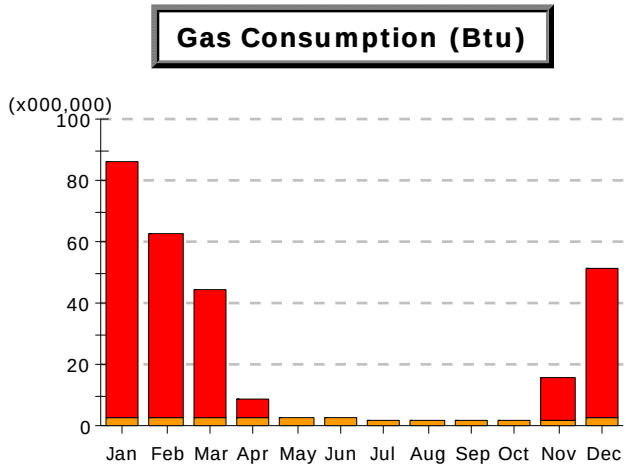
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.07	1.69	4.26	7.25	6.47	3.60	0.56	0.01	-	23.92
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.91	2.71	3.11	3.01	3.01	3.01	3.01	3.11	2.91	3.01	2.81	3.01	35.60
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	4.26	3.88	4.34	4.20	4.30	4.20	4.30	4.34	4.16	4.30	4.12	4.30	50.71
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	11.93	10.93	12.30	11.91	12.12	11.91	12.12	12.30	11.72	12.12	11.54	12.12	143.02
Total	19.29	17.69	19.93	19.32	21.15	23.38	26.68	26.22	22.40	20.05	18.63	19.60	254.33

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	83.65	60.41	41.33	6.01	0.03	-	-	-	-	-	13.21	49.40	254.05
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.39	2.30	2.64	2.52	2.35	2.18	2.04	2.02	1.88	2.02	2.02	2.32	26.69
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	86.04	62.71	43.98	8.52	2.38	2.18	2.04	2.02	1.88	2.02	15.23	51.72	280.74





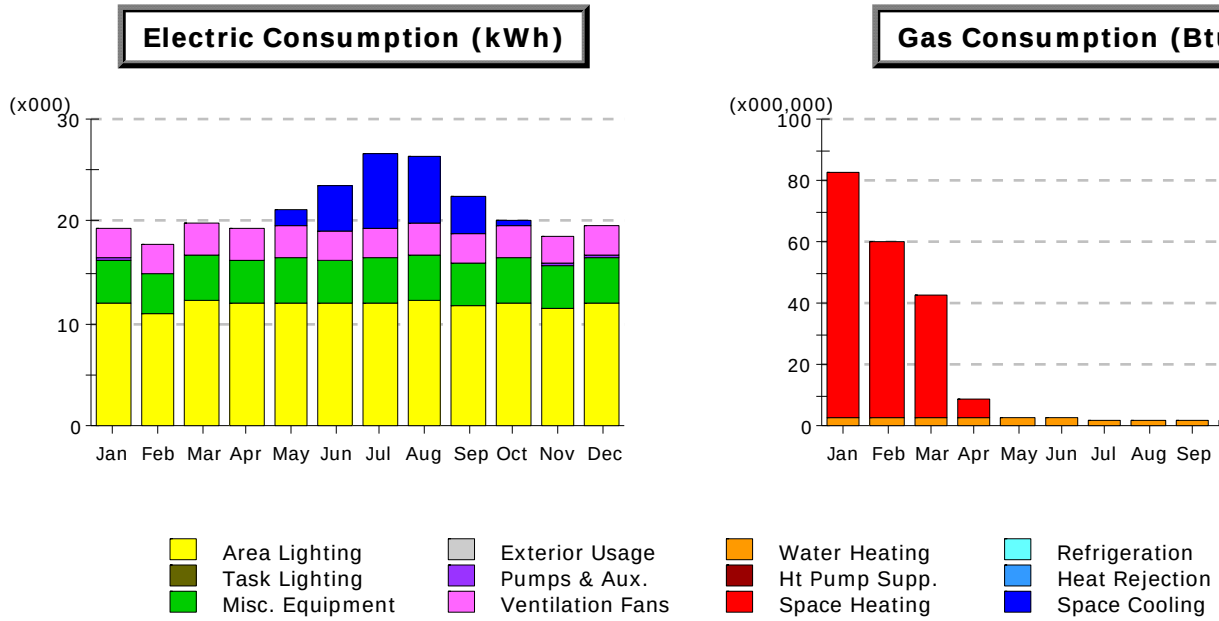


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.06	1.60	4.04	6.88	6.13	3.42	0.53	0.01	-	22.67
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.91	2.71	3.11	3.01	3.01	3.01	3.01	3.11	2.91	3.01	2.81	3.01	35.60
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	4.26	3.88	4.34	4.20	4.30	4.20	4.30	4.34	4.16	4.30	4.12	4.30	50.71
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	11.93	10.93	12.30	11.91	12.12	11.91	12.12	12.30	11.72	12.12	11.54	12.12	143.02
Total	19.29	17.69	19.93	19.32	21.06	23.16	26.30	25.88	22.21	20.02	18.63	19.60	253.08

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	83.65	60.41	41.33	6.01	0.03	-	-	-	-	-	13.21	49.40	254.05
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.39	2.30	2.64	2.52	2.35	2.18	2.04	2.02	1.88	2.02	2.02	2.32	26.69
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	86.04	62.71	43.98	8.52	2.38	2.18	2.04	2.02	1.88	2.02	15.23	51.72	280.74

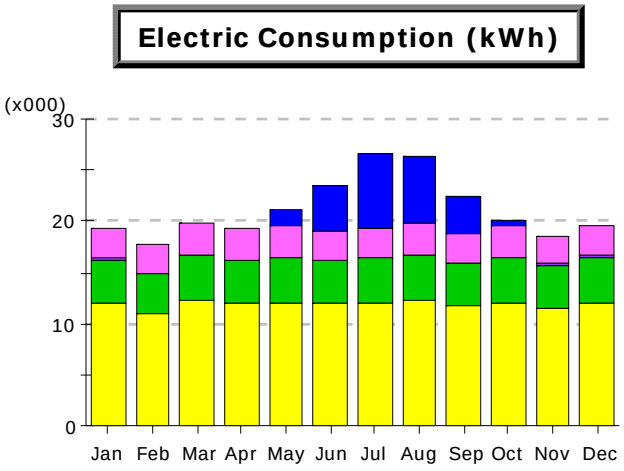


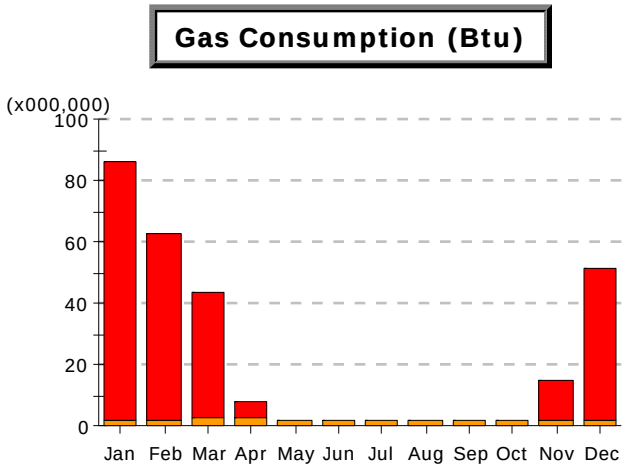
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.07	1.69	4.26	7.25	6.47	3.60	0.56	0.01	-	23.92
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.91	2.71	3.11	3.01	3.01	3.01	3.01	3.11	2.91	3.01	2.81	3.01	35.60
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	4.26	3.88	4.34	4.20	4.30	4.20	4.30	4.34	4.16	4.30	4.12	4.30	50.71
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	11.93	10.93	12.30	11.91	12.12	11.91	12.12	12.30	11.72	12.12	11.54	12.12	143.02
Total	19.29	17.69	19.93	19.32	21.15	23.38	26.68	26.22	22.40	20.05	18.63	19.60	254.33

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	80.27	57.97	39.66	5.77	0.03	-	-	-	-	-	12.67	47.40	243.78
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.39	2.30	2.64	2.52	2.35	2.18	2.04	2.02	1.88	2.02	2.02	2.32	26.69
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	82.66	60.27	42.31	8.28	2.38	2.18	2.04	2.02	1.88	2.02	14.70	49.73	270.46







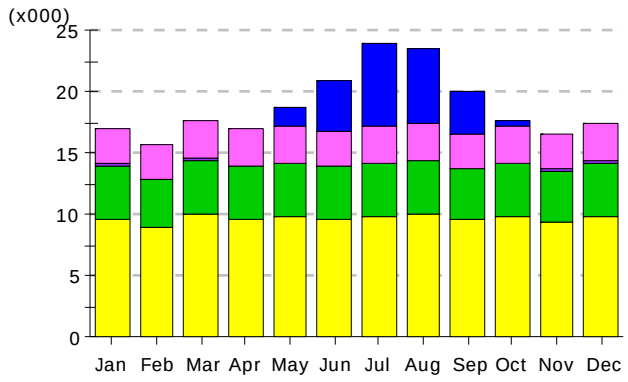
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.07	1.69	4.26	7.25	6.47	3.60	0.56	0.01	-	23.92
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.91	2.71	3.11	3.01	3.01	3.01	3.01	3.11	2.91	3.01	2.81	3.01	35.60
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	4.26	3.88	4.34	4.20	4.30	4.20	4.30	4.34	4.16	4.30	4.12	4.30	50.71
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	11.93	10.93	12.30	11.91	12.12	11.91	12.12	12.30	11.72	12.12	11.54	12.12	143.02
Total	19.29	17.69	19.93	19.32	21.15	23.38	26.68	26.22	22.40	20.05	18.63	19.60	254.33

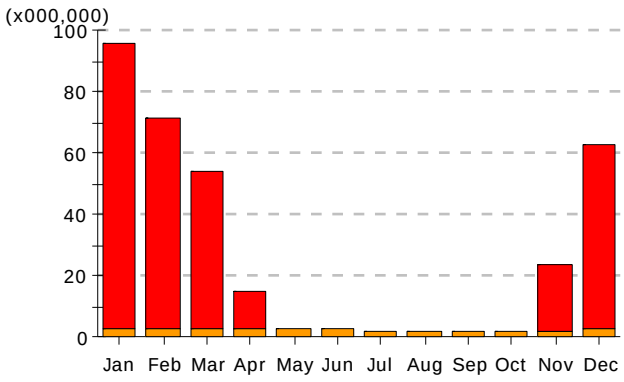
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	83.65	60.41	41.33	6.01	0.03	-	-	-	-	-	13.21	49.40	254.05
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.09	2.01	2.32	2.21	2.06	1.91	1.78	1.76	1.64	1.76	1.76	2.03	23.34
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	85.74	62.43	43.65	8.22	2.09	1.91	1.78	1.76	1.64	1.76	14.97	51.43	277.38

Electric Consumption (kWh)



Gas Consumption (Btu)



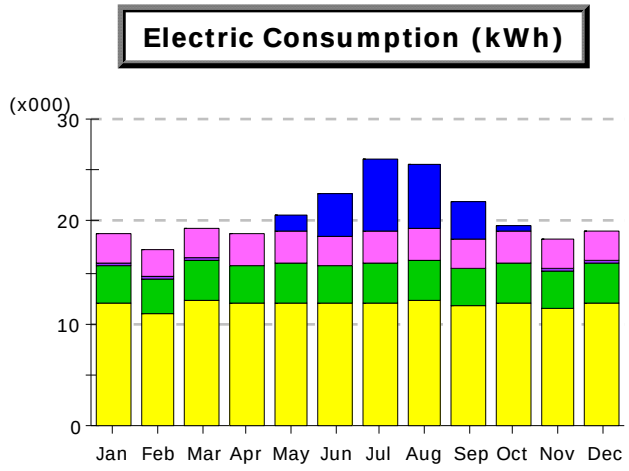


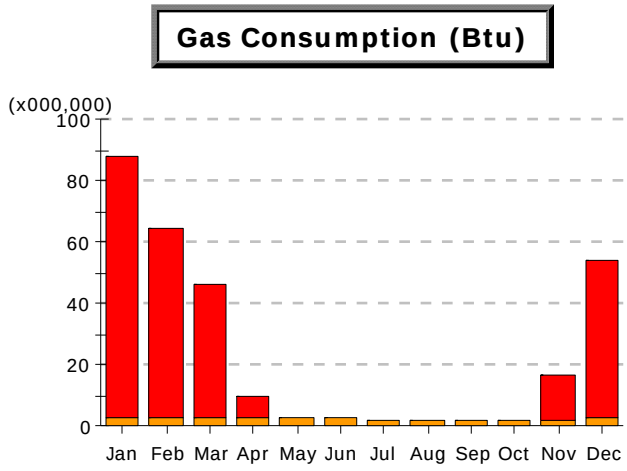
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.01	1.55	3.99	6.80	6.06	3.38	0.52	-	-	22.30
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.91	2.71	3.11	3.01	3.01	3.01	3.01	3.11	2.91	3.01	2.81	3.01	35.60
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	4.26	3.88	4.34	4.20	4.30	4.20	4.30	4.34	4.16	4.30	4.12	4.30	50.71
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.66	8.85	9.96	9.64	9.81	9.64	9.81	9.96	9.49	9.81	9.34	9.81	115.78
Total	17.01	15.60	17.58	17.00	18.70	20.84	23.92	23.47	19.94	17.69	16.42	17.29	225.47

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	93.24	69.20	51.25	11.86	0.27	-	-	-	-	0.00	21.14	60.08	307.03
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.39	2.30	2.64	2.52	2.35	2.18	2.04	2.02	1.88	2.02	2.02	2.32	26.69
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	95.63	71.50	53.89	14.37	2.62	2.18	2.04	2.02	1.88	2.02	23.16	62.40	333.72





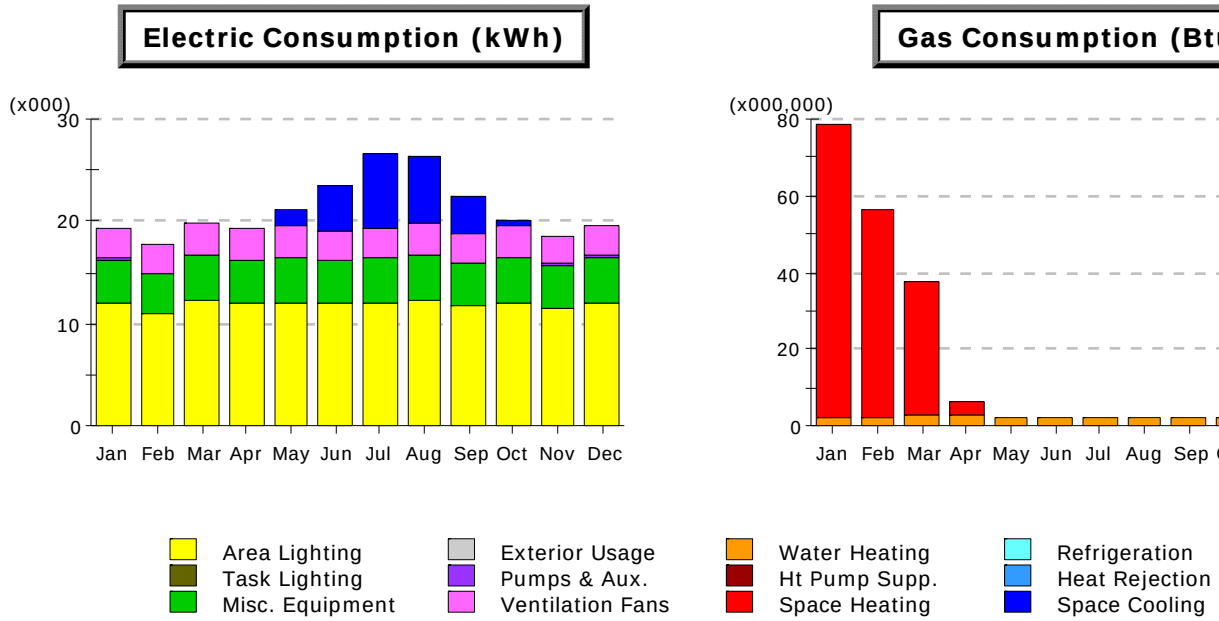


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.05	1.66	4.20	7.15	6.38	3.55	0.55	0.00	-	23.55
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.91	2.71	3.11	3.01	3.01	3.01	3.01	3.11	2.91	3.01	2.81	3.01	35.60
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.76	3.42	3.83	3.70	3.80	3.70	3.80	3.83	3.67	3.80	3.64	3.80	44.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	11.93	10.93	12.30	11.91	12.12	11.91	12.12	12.30	11.72	12.12	11.54	12.12	143.02
Total	18.79	17.23	19.42	18.81	20.61	22.82	26.07	25.62	21.86	19.53	18.14	19.09	248.00

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	85.84	62.40	43.49	7.05	0.05	-	-	-	-	-	14.90	51.69	265.41
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.39	2.30	2.64	2.52	2.35	2.18	2.04	2.02	1.88	2.02	2.02	2.32	26.69
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	88.23	64.70	46.14	9.56	2.40	2.18	2.04	2.02	1.88	2.02	16.92	54.01	292.10

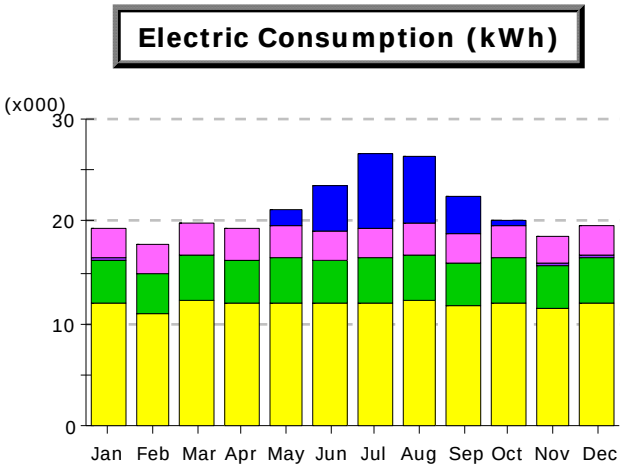


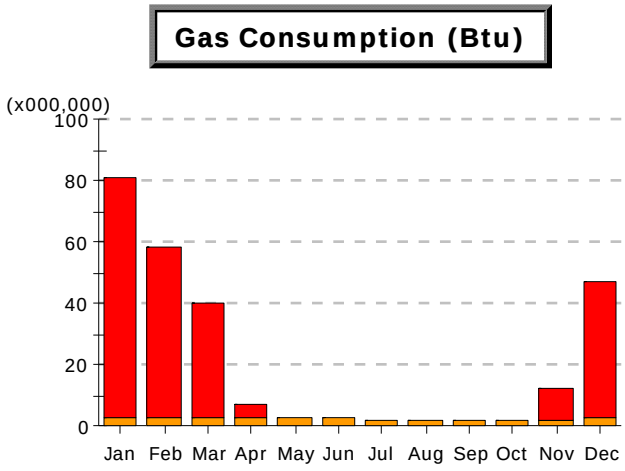
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.10	1.70	4.27	7.25	6.47	3.63	0.57	0.02	-	24.01
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.91	2.71	3.11	3.01	3.01	3.01	3.01	3.11	2.91	3.01	2.81	3.01	35.60
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	4.26	3.88	4.34	4.20	4.30	4.20	4.30	4.34	4.16	4.30	4.12	4.30	50.71
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	11.93	10.93	12.30	11.91	12.12	11.91	12.12	12.30	11.72	12.12	11.54	12.12	143.02
Total	19.29	17.69	19.93	19.36	21.16	23.38	26.67	26.23	22.43	20.06	18.64	19.60	254.43

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	76.06	54.02	35.21	3.95	0.01	-	-	-	-	-	9.38	42.40	221.04
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.39	2.30	2.64	2.51	2.35	2.18	2.04	2.02	1.88	2.02	2.02	2.32	26.68
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	78.45	56.32	37.86	6.46	2.36	2.18	2.04	2.02	1.88	2.02	11.40	44.73	247.72





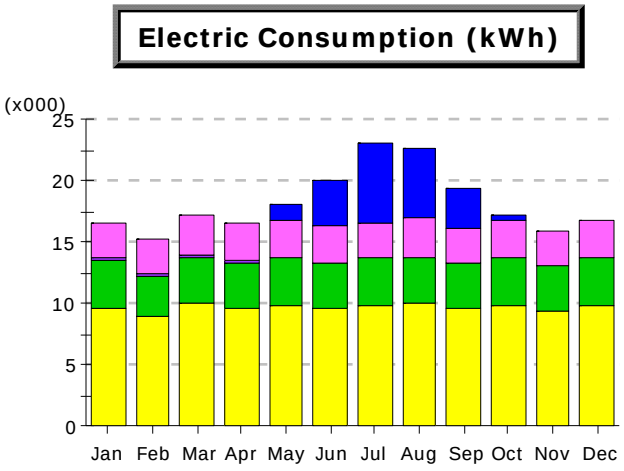


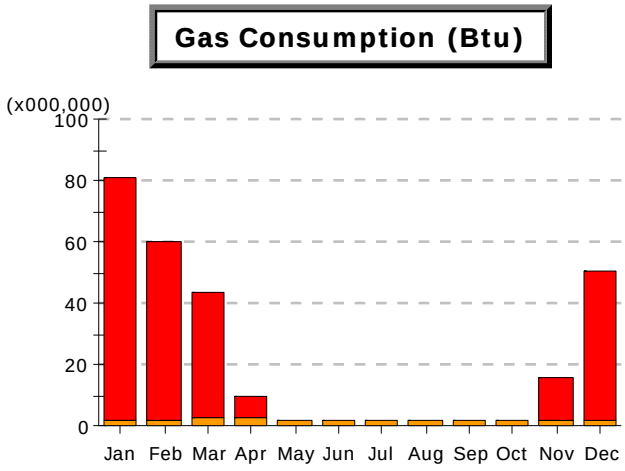
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.09	1.71	4.28	7.24	6.47	3.62	0.57	0.02	-	24.02
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.91	2.71	3.11	3.01	3.01	3.01	3.01	3.11	2.91	3.01	2.81	3.01	35.60
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	4.26	3.88	4.34	4.20	4.30	4.20	4.30	4.34	4.16	4.30	4.12	4.30	50.71
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	11.93	10.93	12.30	11.91	12.12	11.91	12.12	12.30	11.72	12.12	11.54	12.12	143.02
Total	19.29	17.69	19.93	19.35	21.17	23.39	26.67	26.23	22.42	20.06	18.64	19.60	254.43

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	78.16	55.69	36.95	4.48	0.01	-	-	-	-	-	10.31	44.53	230.13
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.39	2.30	2.64	2.51	2.35	2.18	2.04	2.02	1.88	2.02	2.02	2.32	26.68
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	80.55	57.99	39.59	6.99	2.36	2.18	2.04	2.02	1.88	2.02	12.33	46.85	256.81





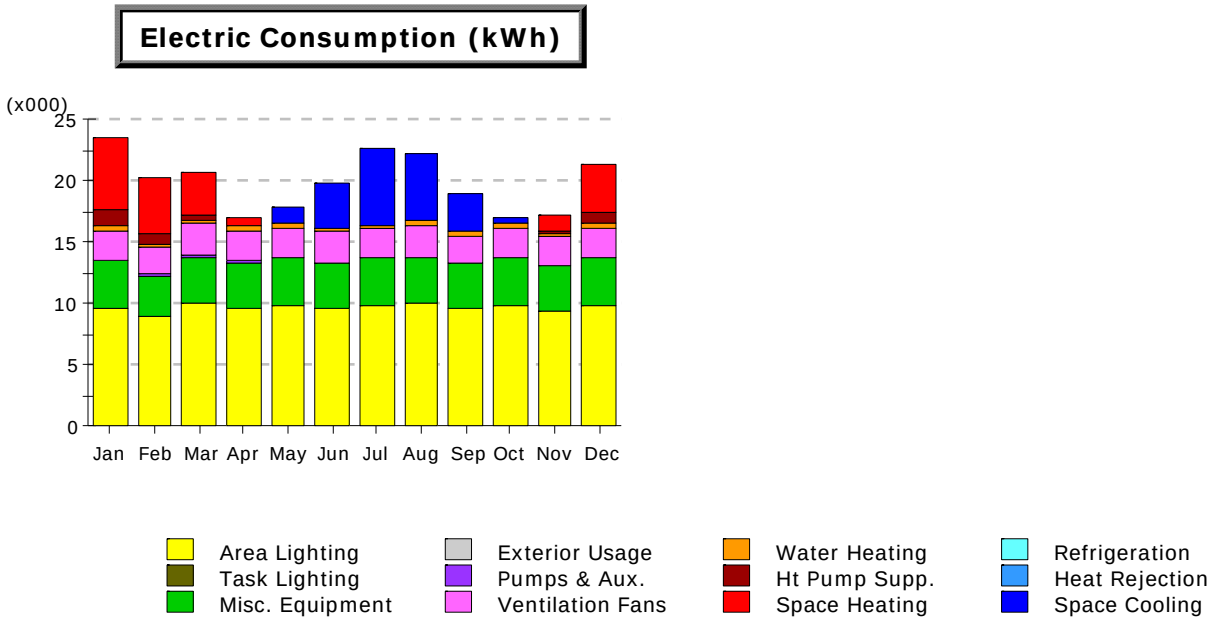


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.02	1.48	3.74	6.33	5.68	3.19	0.50	-	-	20.95
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.91	2.71	3.11	3.01	3.01	3.01	3.01	3.11	2.91	3.01	2.81	3.01	35.60
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.76	3.42	3.83	3.70	3.80	3.70	3.80	3.83	3.67	3.80	3.64	3.80	44.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.66	8.85	9.96	9.64	9.81	9.64	9.81	9.96	9.49	9.81	9.34	9.81	115.78
Total	16.51	15.15	17.07	16.52	18.13	20.10	22.94	22.57	19.27	17.18	15.94	16.79	218.16

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	79.01	57.69	41.24	7.37	0.08	-	-	-	-	-	13.97	48.21	247.57
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.09	2.01	2.32	2.21	2.06	1.91	1.78	1.76	1.64	1.76	1.76	2.03	23.34
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	81.10	59.71	43.56	9.57	2.14	1.91	1.78	1.76	1.64	1.76	15.74	50.24	270.91

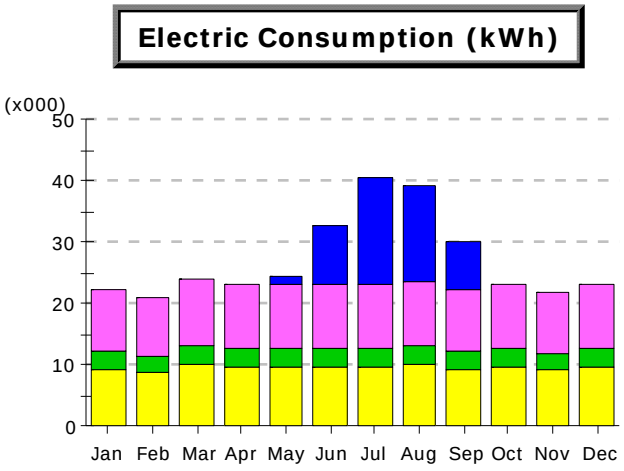


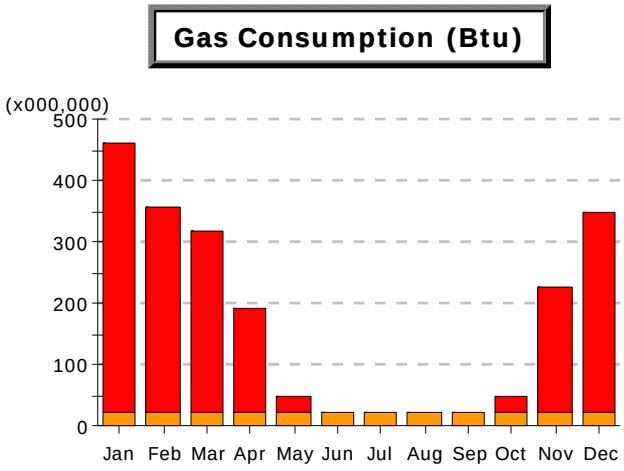
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.01	1.46	3.72	6.28	5.63	3.17	0.50	-	-	20.76
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	5.83	4.47	3.40	0.73	0.01	-	-	-	-	-	1.30	3.76	19.49
HP Supp.	1.49	0.86	0.44	0.04	-	-	-	-	-	-	0.11	0.97	3.92
Hot Water	0.33	0.31	0.35	0.34	0.33	0.32	0.31	0.32	0.30	0.31	0.30	0.33	3.85
Vent. Fans	2.37	2.21	2.53	2.45	2.45	2.45	2.45	2.53	2.37	2.45	2.29	2.45	29.00
Pumps & Aux.	0.09	0.09	0.10	0.12	0.03	-	-	-	0.00	0.06	0.12	0.10	0.72
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.76	3.42	3.83	3.70	3.80	3.70	3.80	3.83	3.67	3.80	3.64	3.80	44.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.66	8.85	9.96	9.64	9.81	9.64	9.81	9.96	9.49	9.81	9.34	9.81	115.78
Total	23.53	20.20	20.62	17.04	17.88	19.83	22.65	22.27	19.00	16.92	17.09	21.22	238.27

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													





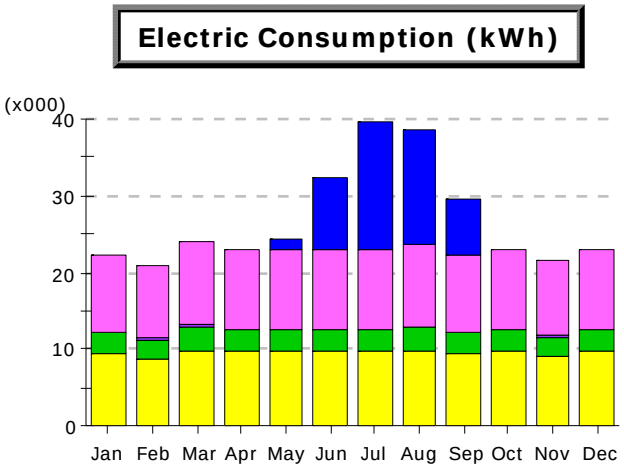


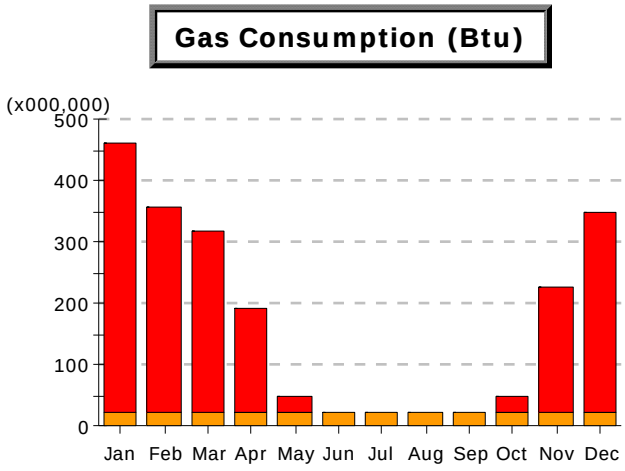
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.55	9.84	17.53	15.59	7.72	0.14	-	-	52.36
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.09	9.40	10.79	10.44	10.44	10.44	10.44	10.79	10.09	10.44	9.74	10.44	123.53
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.79	2.60	2.98	2.88	2.88	2.88	2.88	2.98	2.79	2.88	2.69	2.88	34.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.27	8.63	9.91	9.59	9.59	9.59	9.59	9.91	9.27	9.59	8.95	9.59	113.50
Total	22.33	20.79	23.85	23.06	24.50	32.75	40.44	39.27	29.87	23.11	21.54	23.09	324.61

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	436.6	337.6	295.4	166.5	25.7	-	-	-	-	23.8	203.6	325.4	1,814.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	458.8	358.3	319.2	189.5	48.6	22.8	22.7	23.4	21.9	46.5	224.9	348.3	2,084.9





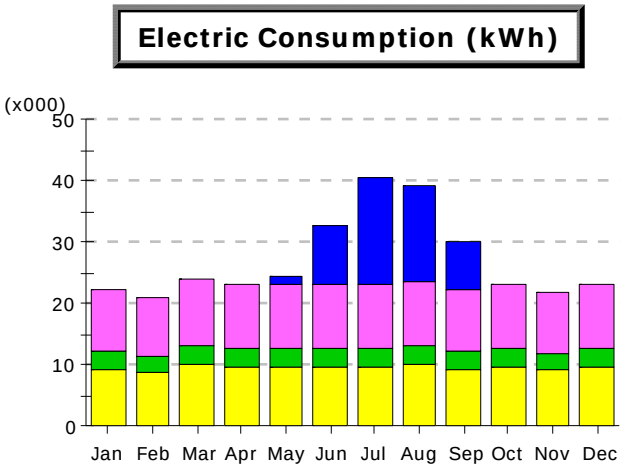


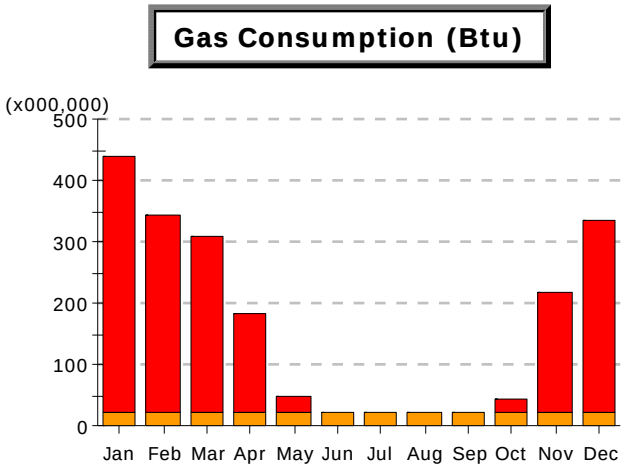
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.47	9.32	16.61	14.78	7.31	0.13	-	-	49.64
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.09	9.40	10.79	10.44	10.44	10.44	10.44	10.79	10.09	10.44	9.74	10.44	123.53
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.79	2.60	2.98	2.88	2.88	2.88	2.88	2.98	2.79	2.88	2.69	2.88	34.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.27	8.63	9.91	9.59	9.59	9.59	9.59	9.91	9.27	9.59	8.95	9.59	113.50
Total	22.33	20.79	23.85	23.06	24.42	32.24	39.53	38.46	29.47	23.10	21.54	23.09	321.88

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	436.6	337.6	295.4	166.5	25.7	-	-	-	-	23.8	203.6	325.4	1,814.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	458.8	358.3	319.2	189.5	48.6	22.8	22.7	23.4	21.9	46.5	224.9	348.3	2,084.9





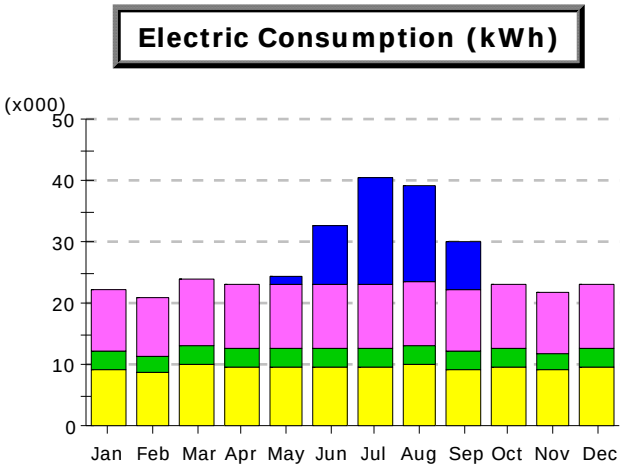


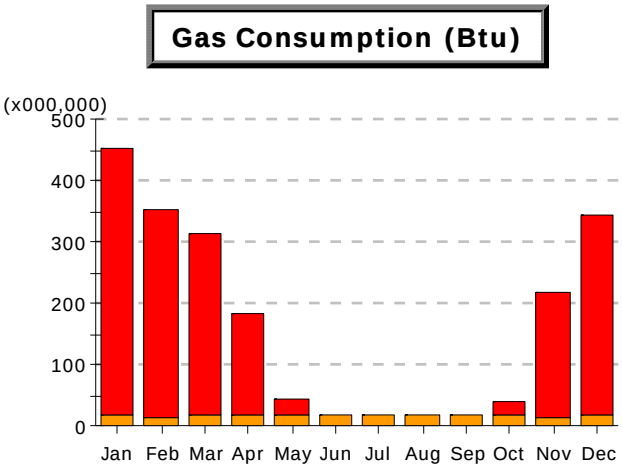
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.55	9.84	17.53	15.59	7.72	0.14	-	-	52.36
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.09	9.40	10.79	10.44	10.44	10.44	10.44	10.79	10.09	10.44	9.74	10.44	123.53
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.79	2.60	2.98	2.88	2.88	2.88	2.88	2.98	2.79	2.88	2.69	2.88	34.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.27	8.63	9.91	9.59	9.59	9.59	9.59	9.91	9.27	9.59	8.95	9.59	113.50
Total	22.33	20.79	23.85	23.06	24.50	32.75	40.44	39.27	29.87	23.11	21.54	23.09	324.61

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	418.9	323.9	283.4	159.8	24.7	-	-	-	-	22.9	195.4	312.2	1,741.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	441.2	344.7	307.2	182.8	47.6	22.8	22.7	23.4	21.9	45.6	216.6	335.1	2,011.5





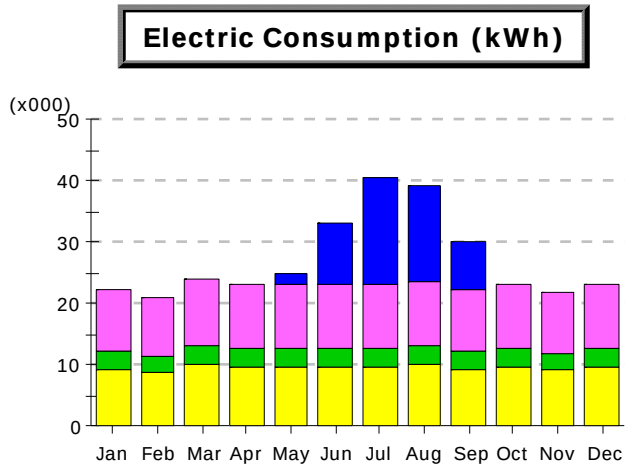


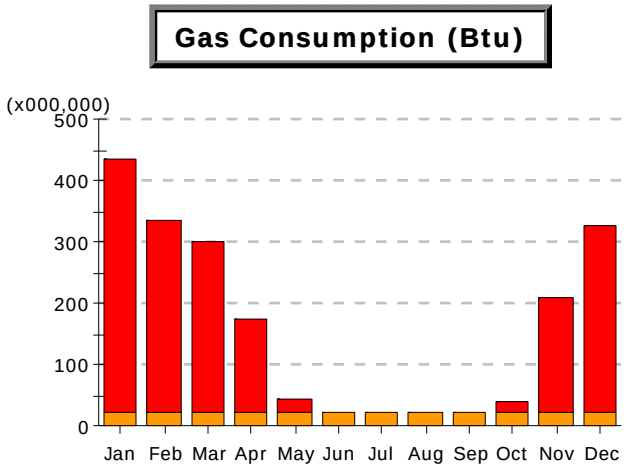
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.55	9.84	17.53	15.59	7.72	0.14	-	-	52.36
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.09	9.40	10.79	10.44	10.44	10.44	10.44	10.79	10.09	10.44	9.74	10.44	123.53
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.79	2.60	2.98	2.88	2.88	2.88	2.88	2.98	2.79	2.88	2.69	2.88	34.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.27	8.63	9.91	9.59	9.59	9.59	9.59	9.91	9.27	9.59	8.95	9.59	113.50
Total	22.33	20.79	23.85	23.06	24.50	32.75	40.44	39.27	29.87	23.11	21.54	23.09	324.61

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	436.6	337.6	295.4	166.5	25.7	-	-	-	-	23.8	203.6	325.4	1,814.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	15.6	14.5	16.6	16.1	16.1	16.1	16.1	16.6	15.5	16.1	15.0	16.1	190.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	452.1	352.0	312.0	182.6	41.8	16.1	16.1	16.6	15.5	39.9	218.6	341.5	2,004.9





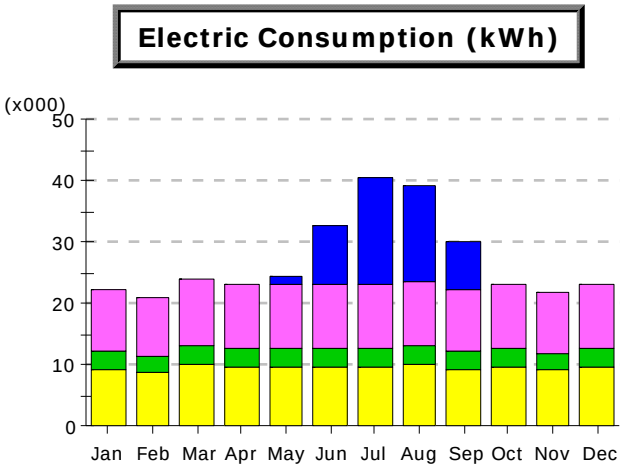


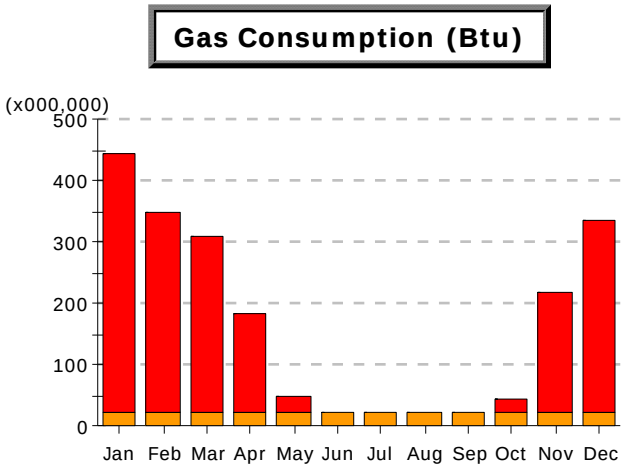
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.67	9.97	17.51	15.67	8.00	0.26	-	-	53.08
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.09	9.40	10.79	10.44	10.44	10.44	10.44	10.79	10.09	10.44	9.74	10.44	123.53
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.79	2.60	2.98	2.88	2.88	2.88	2.88	2.98	2.79	2.88	2.69	2.88	34.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.27	8.63	9.91	9.59	9.59	9.59	9.59	9.91	9.27	9.59	8.95	9.59	113.50
Total	22.33	20.79	23.85	23.06	24.62	32.89	40.43	39.34	30.16	23.23	21.54	23.09	325.33

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	410.4	315.9	275.6	151.7	21.2	-	-	-	-	15.7	186.1	303.3	1,679.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	432.7	336.7	299.4	174.7	44.1	22.8	22.7	23.4	21.9	38.4	207.4	326.2	1,950.3





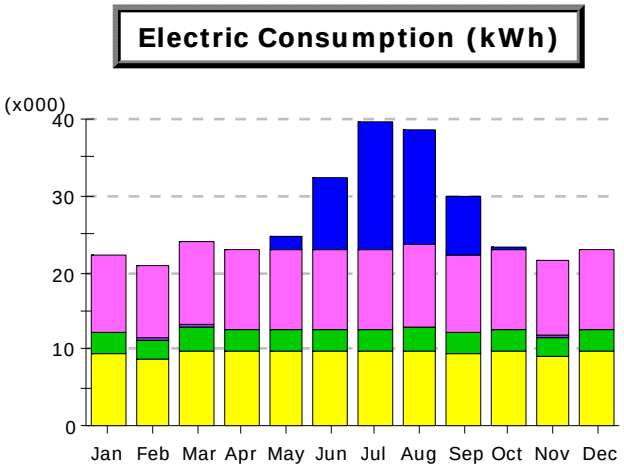


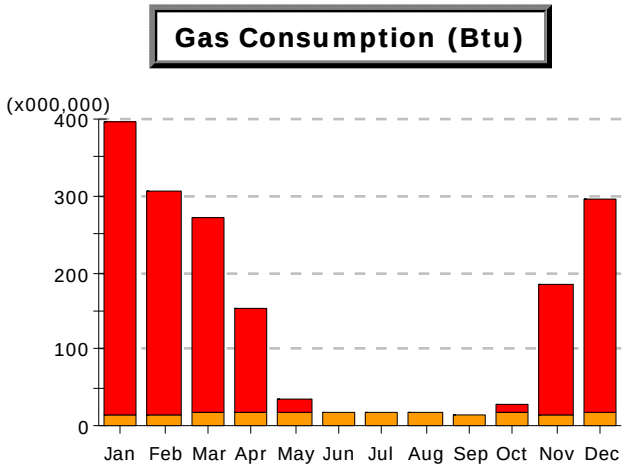
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.62	9.91	17.50	15.61	7.83	0.19	-	-	52.66
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.09	9.39	10.78	10.43	10.43	10.43	10.43	10.78	10.09	10.43	9.74	10.43	123.46
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.79	2.60	2.98	2.88	2.88	2.88	2.88	2.98	2.79	2.88	2.69	2.88	34.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.27	8.63	9.91	9.59	9.59	9.59	9.59	9.91	9.27	9.59	8.95	9.59	113.50
Total	22.33	20.79	23.85	23.05	24.56	32.82	40.41	39.28	29.98	23.16	21.53	23.08	324.84

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	422.6	325.8	284.4	158.8	23.1	-	-	-	-	19.8	194.4	313.6	1,742.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.2	20.7	23.8	23.0	22.9	22.8	22.7	23.4	21.9	22.7	21.3	22.9	270.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	444.8	346.6	308.2	181.8	46.0	22.8	22.7	23.4	21.9	42.5	215.7	336.5	2,012.9





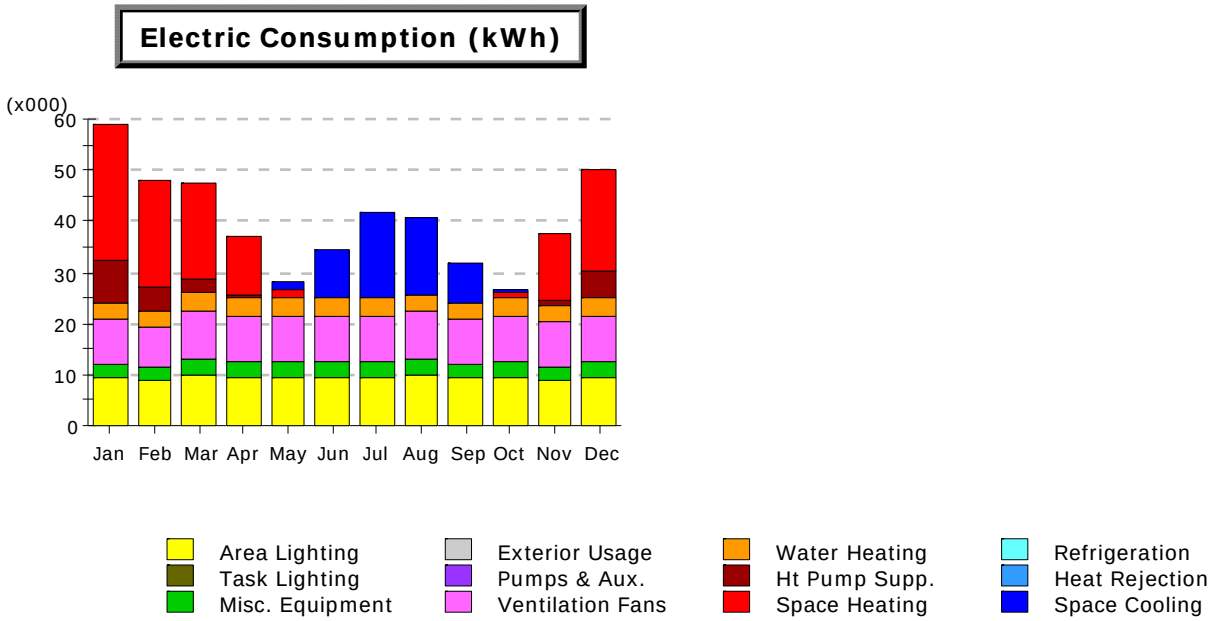


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.68	9.52	16.57	14.86	7.68	0.31	-	-	50.63
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.09	9.39	10.78	10.43	10.43	10.43	10.43	10.78	10.09	10.43	9.74	10.43	123.46
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.79	2.60	2.98	2.88	2.88	2.88	2.88	2.98	2.79	2.88	2.69	2.88	34.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.27	8.63	9.91	9.59	9.59	9.59	9.59	9.91	9.27	9.59	8.95	9.59	113.50
Total	22.33	20.79	23.85	23.05	24.62	32.43	39.48	38.54	29.83	23.28	21.53	23.08	322.80

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	380.2	291.7	254.1	137.5	18.0	-	-	-	-	11.6	169.6	279.6	1,542.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	15.6	14.5	16.6	16.1	16.1	16.1	16.1	16.6	15.5	16.1	15.0	16.1	190.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	395.8	306.2	270.7	153.6	34.0	16.1	16.1	16.6	15.5	27.7	184.6	295.7	1,732.6



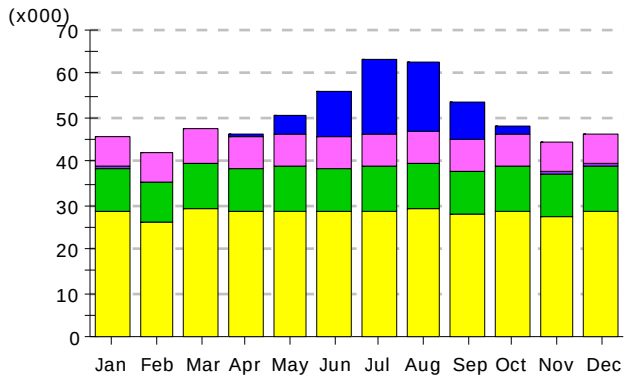
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	1.51	9.55	16.82	15.06	7.60	0.22	-	-	50.76
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	26.83	21.17	18.93	11.40	1.76	-	-	-	-	1.30	12.98	19.97	114.34
HP Supp.	8.07	4.56	2.97	0.40	-	-	-	-	-	0.01	1.11	5.38	22.49
Hot Water	3.30	3.08	3.53	3.42	3.40	3.39	3.38	3.48	3.26	3.38	3.16	3.40	40.18
Vent. Fans	8.72	8.12	9.32	9.02	9.02	9.02	9.02	9.32	8.72	9.02	8.42	9.02	106.75
Pumps & Aux.	0.09	0.08	0.09	0.09	0.03	-	-	-	0.00	0.05	0.09	0.09	0.60
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.79	2.60	2.98	2.88	2.88	2.88	2.88	2.98	2.79	2.88	2.69	2.88	34.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.27	8.63	9.91	9.59	9.59	9.59	9.59	9.91	9.27	9.59	8.95	9.59	113.50
Total	59.06	48.23	47.73	36.80	28.20	34.44	41.70	40.75	31.64	26.46	37.40	50.34	482.75

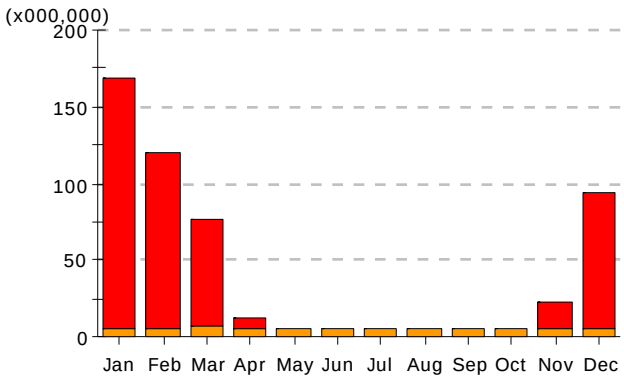
Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

Electric Consumption (kWh)



Gas Consumption (Btu)



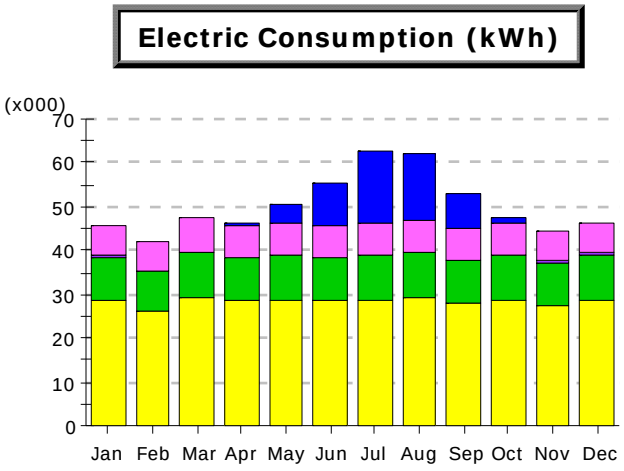


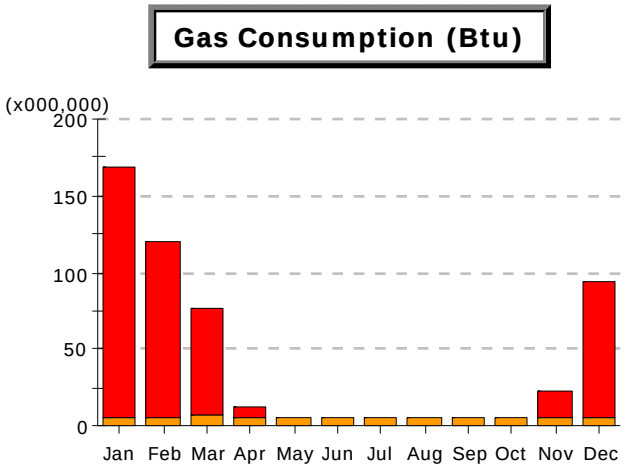
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.36	4.21	10.33	17.19	15.45	8.71	1.40	0.11	-	57.76
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.06	6.57	7.54	7.30	7.30	7.30	7.30	7.54	7.06	7.30	6.81	7.30	86.36
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	10.15	9.24	10.33	10.00	10.24	10.00	10.24	10.33	9.91	10.24	9.82	10.24	120.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.41	26.02	29.30	28.35	28.85	28.35	28.85	29.30	27.91	28.85	27.47	28.85	340.52
Total	45.80	42.00	47.34	46.15	50.64	55.98	63.58	62.62	53.58	47.85	44.36	46.57	606.46

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	163.11	114.80	71.16	6.23	0.01	-	-	-	-	-	17.30	88.27	460.89
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.59	5.39	6.20	5.90	5.50	5.11	4.78	4.71	4.39	4.72	4.72	5.43	62.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	168.70	120.19	77.36	12.12	5.51	5.11	4.78	4.71	4.39	4.72	22.02	93.71	523.33





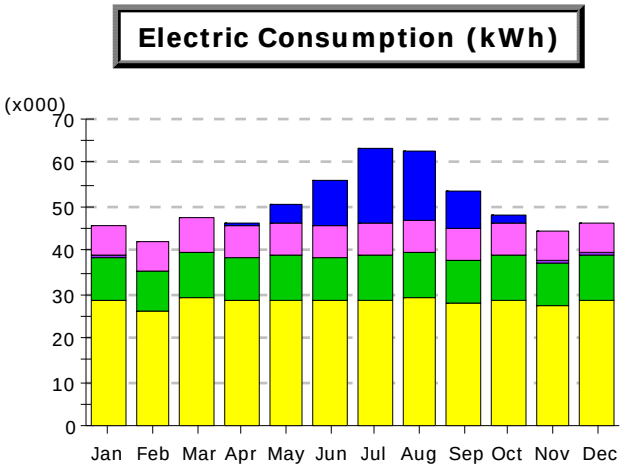


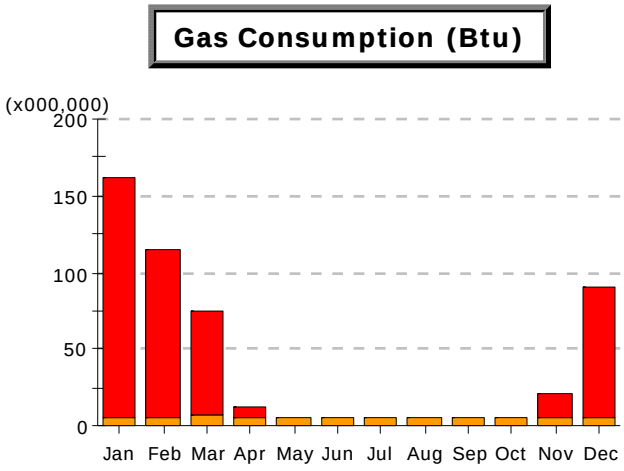
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.34	3.99	9.79	16.29	14.65	8.25	1.33	0.11	-	54.75
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.06	6.57	7.54	7.30	7.30	7.30	7.30	7.54	7.06	7.30	6.81	7.30	86.36
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	10.15	9.24	10.33	10.00	10.24	10.00	10.24	10.33	9.91	10.24	9.82	10.24	120.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.41	26.02	29.30	28.35	28.85	28.35	28.85	29.30	27.91	28.85	27.47	28.85	340.52
Total	45.80	42.00	47.34	46.13	50.42	55.44	62.68	61.81	53.13	47.78	44.35	46.57	603.45

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	163.11	114.80	71.16	6.23	0.01	-	-	-	-	-	17.30	88.27	460.89
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.59	5.39	6.20	5.90	5.50	5.11	4.78	4.71	4.39	4.72	4.72	5.43	62.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	168.70	120.19	77.36	12.12	5.51	5.11	4.78	4.71	4.39	4.72	22.02	93.71	523.33





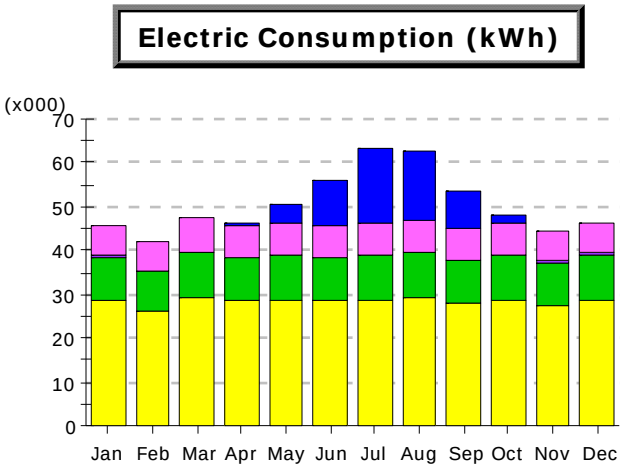


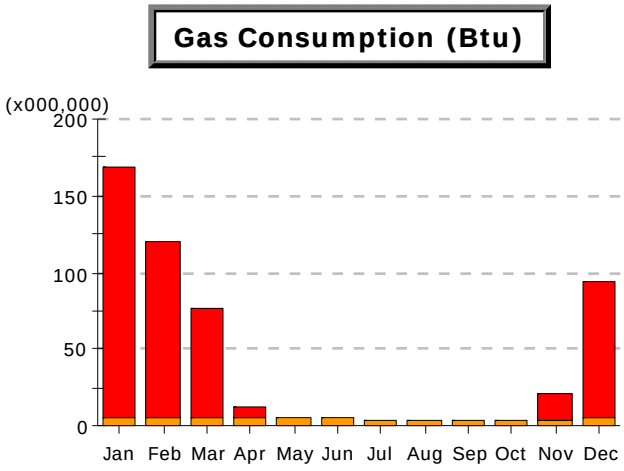
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.36	4.21	10.33	17.19	15.45	8.71	1.40	0.11	-	57.76
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.06	6.57	7.54	7.30	7.30	7.30	7.30	7.54	7.06	7.30	6.81	7.30	86.36
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	10.15	9.24	10.33	10.00	10.24	10.00	10.24	10.33	9.91	10.24	9.82	10.24	120.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.41	26.02	29.30	28.35	28.85	28.35	28.85	29.30	27.91	28.85	27.47	28.85	340.52
Total	45.80	42.00	47.34	46.15	50.64	55.98	63.58	62.62	53.58	47.85	44.36	46.57	606.46

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	156.52	110.16	68.29	5.97	0.01	-	-	-	-	-	16.60	84.70	442.26
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.59	5.39	6.20	5.90	5.50	5.11	4.78	4.71	4.39	4.72	4.72	5.43	62.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	162.11	115.55	74.48	11.87	5.51	5.11	4.78	4.71	4.39	4.72	21.32	90.14	504.70







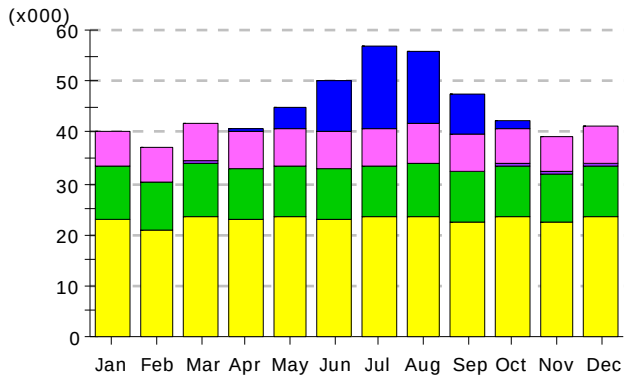
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.36	4.21	10.33	17.19	15.45	8.71	1.40	0.11	-	57.76
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.06	6.57	7.54	7.30	7.30	7.30	7.30	7.54	7.06	7.30	6.81	7.30	86.36
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	10.15	9.24	10.33	10.00	10.24	10.00	10.24	10.33	9.91	10.24	9.82	10.24	120.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.41	26.02	29.30	28.35	28.85	28.35	28.85	29.30	27.91	28.85	27.47	28.85	340.52
Total	45.80	42.00	47.34	46.15	50.64	55.98	63.58	62.62	53.58	47.85	44.36	46.57	606.46

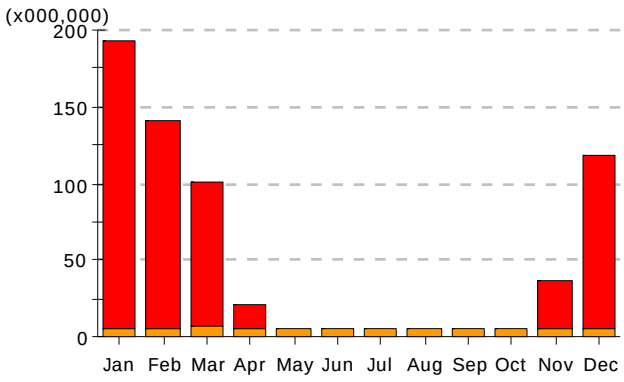
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	163.11	114.80	71.16	6.23	0.01	-	-	-	-	-	17.30	88.27	460.89
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	4.97	4.79	5.52	5.25	4.90	4.55	4.25	4.19	3.90	4.19	4.19	4.83	55.52
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	168.08	119.60	76.68	11.48	4.91	4.55	4.25	4.19	3.90	4.19	21.49	93.10	516.41

Electric Consumption (kWh)



Gas Consumption (Btu)



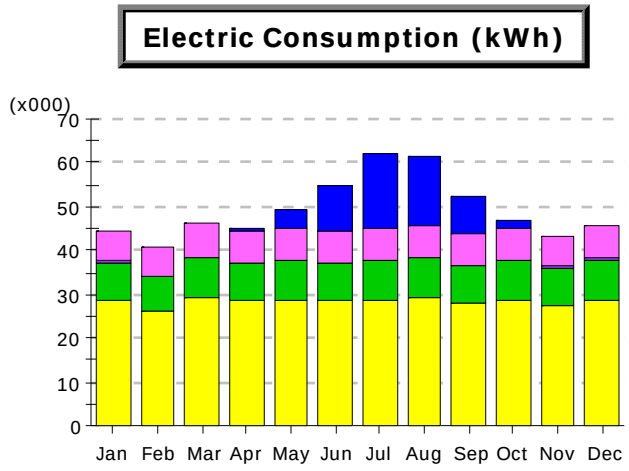


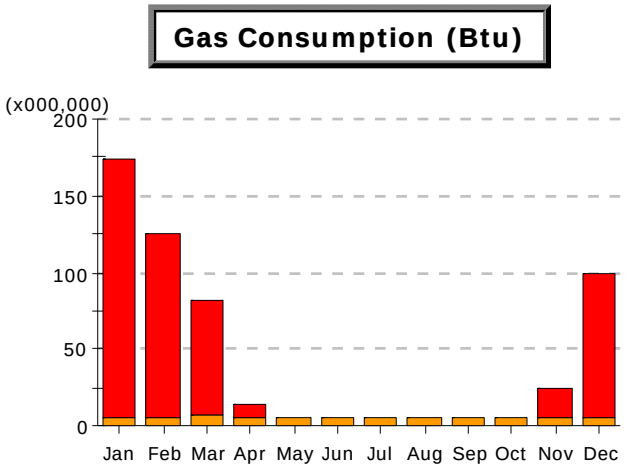
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.16	3.91	9.67	16.11	14.49	8.15	1.30	0.02	-	53.82
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.04	6.55	7.53	7.28	7.28	7.28	7.28	7.53	7.04	7.28	6.80	7.28	86.18
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	10.15	9.24	10.33	10.00	10.24	10.00	10.24	10.33	9.91	10.24	9.82	10.24	120.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	23.00	21.06	23.72	22.95	23.36	22.95	23.36	23.72	22.59	23.36	22.24	23.36	275.66
Total	40.38	37.03	41.74	40.53	44.82	49.90	56.99	56.06	47.70	42.24	39.03	41.05	537.47

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	186.74	136.01	94.68	15.05	0.14	-	-	-	-	-	32.23	113.18	578.03
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.59	5.39	6.20	5.90	5.50	5.11	4.78	4.71	4.39	4.72	4.72	5.43	62.45
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	192.33	141.39	100.88	20.95	5.64	5.11	4.78	4.71	4.39	4.72	36.95	118.62	640.48





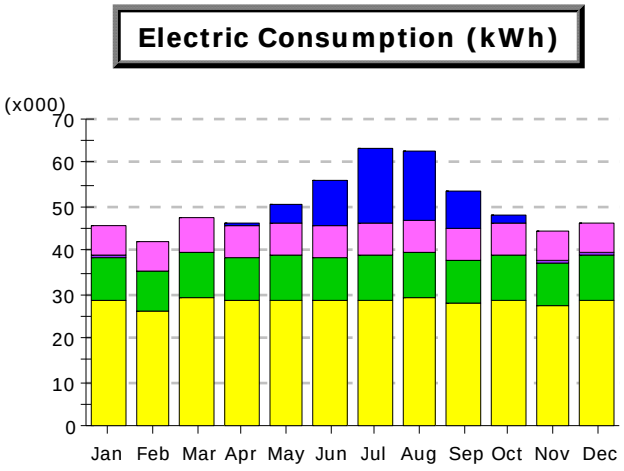


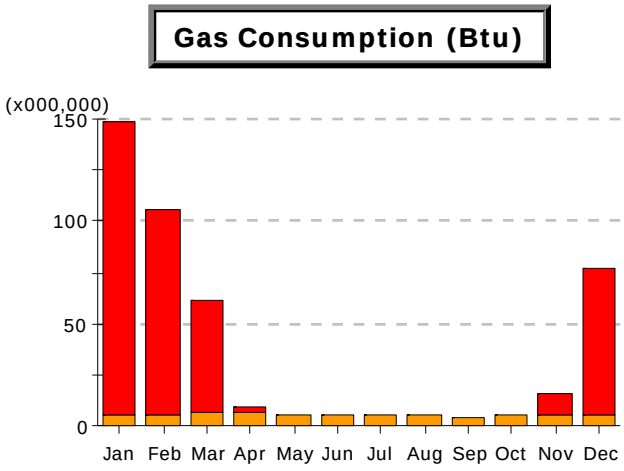
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.32	4.15	10.18	16.94	15.23	8.58	1.38	0.09	-	56.88
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.05	6.57	7.54	7.29	7.29	7.29	7.29	7.54	7.05	7.29	6.81	7.29	86.32
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	8.96	8.15	9.11	8.82	9.04	8.82	9.04	9.11	8.74	9.04	8.66	9.04	106.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.41	26.02	29.30	28.35	28.85	28.35	28.85	29.30	27.91	28.85	27.47	28.85	340.52
Total	44.60	40.91	46.12	44.93	49.36	54.65	62.13	61.18	52.29	46.62	43.18	45.36	591.34

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	168.89	119.38	76.12	7.81	0.01	-	-	-	-	-	20.04	93.63	485.90
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.59	5.39	6.20	5.90	5.50	5.11	4.78	4.71	4.39	4.72	4.72	5.43	62.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	174.48	124.77	82.32	13.71	5.52	5.11	4.78	4.71	4.39	4.72	24.76	99.06	548.34







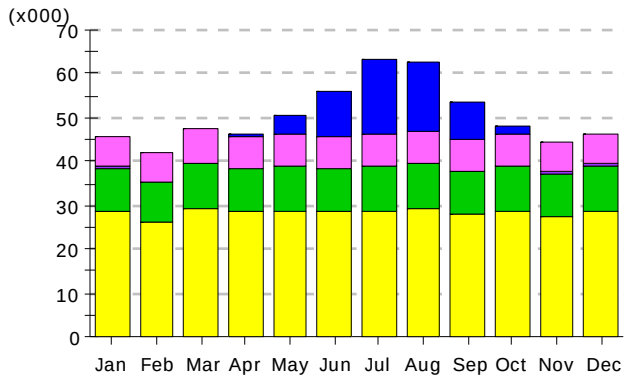
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.41	4.24	10.34	17.17	15.47	8.77	1.42	0.13	-	57.95
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.06	6.57	7.54	7.30	7.30	7.30	7.30	7.54	7.06	7.30	6.81	7.30	86.36
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	10.15	9.24	10.33	10.00	10.24	10.00	10.24	10.33	9.91	10.24	9.82	10.24	120.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.41	26.02	29.30	28.35	28.85	28.35	28.85	29.30	27.91	28.85	27.47	28.85	340.52
Total	45.80	42.00	47.34	46.20	50.66	55.98	63.56	62.63	53.65	47.88	44.38	46.57	606.65

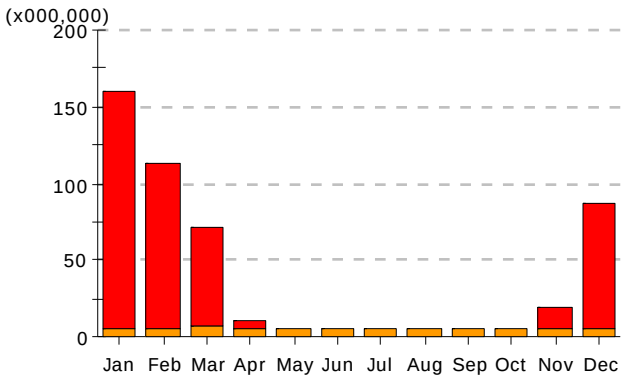
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	143.07	99.69	55.36	3.26	0.01	-	-	-	-	-	10.65	70.90	382.92
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.59	5.39	6.20	5.90	5.50	5.11	4.78	4.71	4.39	4.72	4.72	5.43	62.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	148.65	105.07	61.55	9.15	5.51	5.11	4.78	4.71	4.39	4.72	15.36	76.33	445.36

Electric Consumption (kWh)



Gas Consumption (Btu)





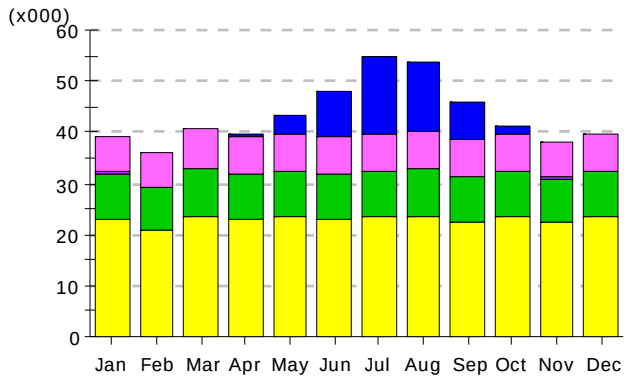
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.39	4.18	10.25	17.05	15.33	8.64	1.39	0.13	-	57.37
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.05	6.57	7.54	7.30	7.30	7.30	7.30	7.54	7.05	7.30	6.81	7.30	86.36
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	10.15	9.24	10.33	10.00	10.24	10.00	10.24	10.33	9.91	10.24	9.82	10.24	120.74
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.41	26.02	29.30	28.35	28.85	28.35	28.85	29.30	27.91	28.85	27.47	28.85	340.52
Total	45.80	42.00	47.34	46.17	50.61	55.90	63.45	62.50	53.51	47.84	44.37	46.56	606.06

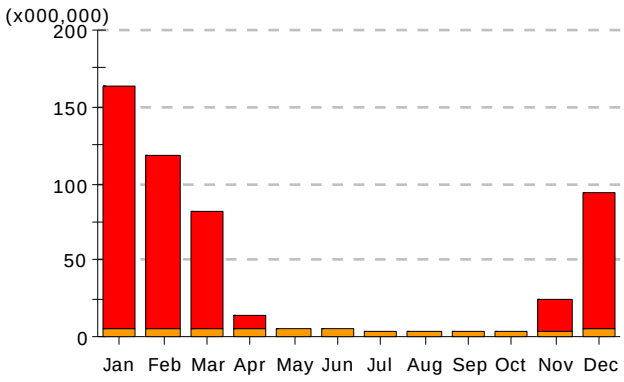
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	154.75	108.10	64.85	4.75	0.01	-	-	-	-	-	14.08	81.03	427.57
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.59	5.39	6.20	5.90	5.50	5.11	4.78	4.71	4.39	4.72	4.72	5.43	62.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	160.34	113.49	71.05	10.64	5.51	5.11	4.78	4.71	4.39	4.72	18.80	86.46	490.01

Electric Consumption (kWh)



Gas Consumption (Btu)



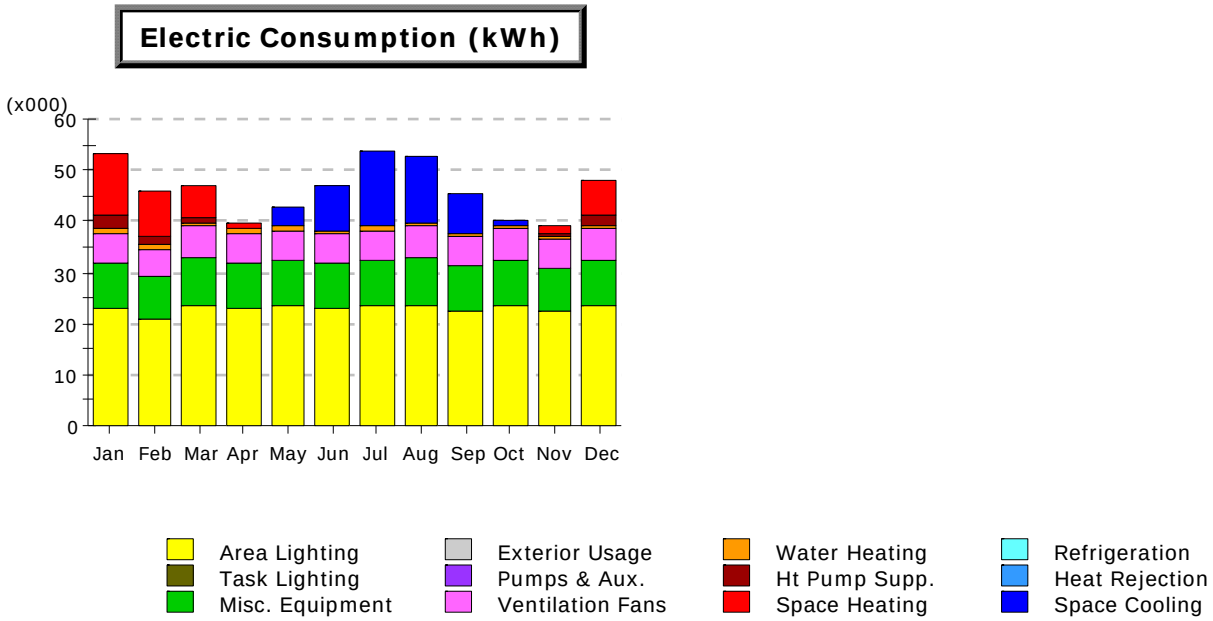


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.21	3.65	8.95	14.88	13.42	7.60	1.23	0.06	-	50.00
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.04	6.55	7.52	7.28	7.28	7.28	7.28	7.52	7.04	7.28	6.79	7.28	86.13
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	8.96	8.15	9.11	8.82	9.04	8.82	9.04	9.11	8.74	9.04	8.66	9.04	106.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	23.00	21.06	23.72	22.95	23.36	22.95	23.36	23.72	22.59	23.36	22.24	23.36	275.66
Total	39.18	35.94	40.53	39.41	43.35	48.00	54.55	53.77	45.97	40.96	37.90	39.84	519.40

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	158.50	113.12	75.61	9.21	0.03	-	-	-	-	-	19.93	89.55	465.95
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	4.97	4.79	5.52	5.25	4.90	4.55	4.25	4.19	3.90	4.19	4.19	4.83	55.52
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	163.47	117.91	81.13	14.46	4.93	4.55	4.25	4.19	3.90	4.19	24.12	94.38	521.48

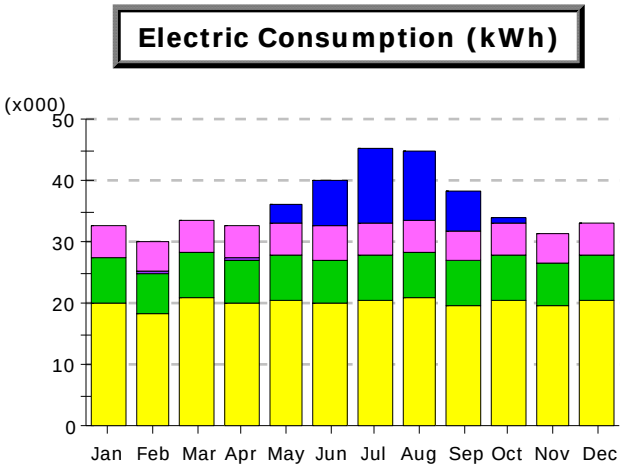


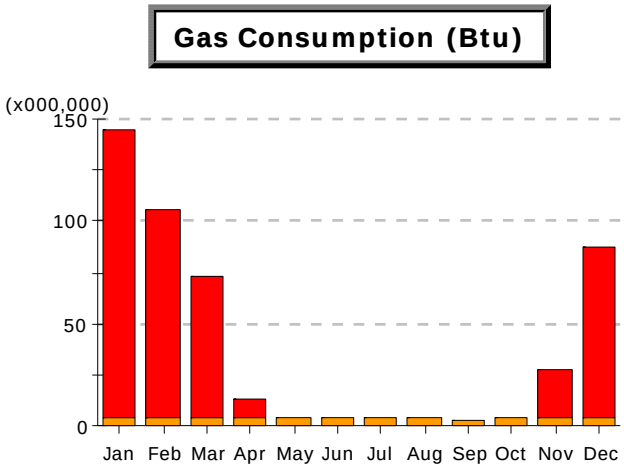
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.15	3.61	8.87	14.74	13.29	7.53	1.21	0.04	-	49.42
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	12.01	9.00	6.43	0.92	0.01	-	-	-	-	-	1.85	7.17	37.38
HP Supp.	2.66	1.65	0.83	0.07	-	-	-	-	-	-	0.17	1.93	7.30
Hot Water	0.66	0.62	0.71	0.68	0.65	0.63	0.62	0.63	0.59	0.62	0.60	0.66	7.66
Vent. Fans	5.71	5.32	6.11	5.91	5.91	5.91	5.91	6.11	5.71	5.91	5.51	5.91	69.91
Pumps & Aux.	0.09	0.09	0.11	0.13	0.03	-	-	-	0.00	0.06	0.12	0.10	0.74
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	8.96	8.15	9.11	8.82	9.04	8.82	9.04	9.11	8.74	9.04	8.66	9.04	106.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	23.00	21.06	23.72	22.95	23.36	22.95	23.36	23.72	22.59	23.36	22.24	23.36	275.66
Total	53.09	45.89	47.01	39.62	42.60	47.18	53.66	52.85	45.17	40.19	39.19	48.17	554.61

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													





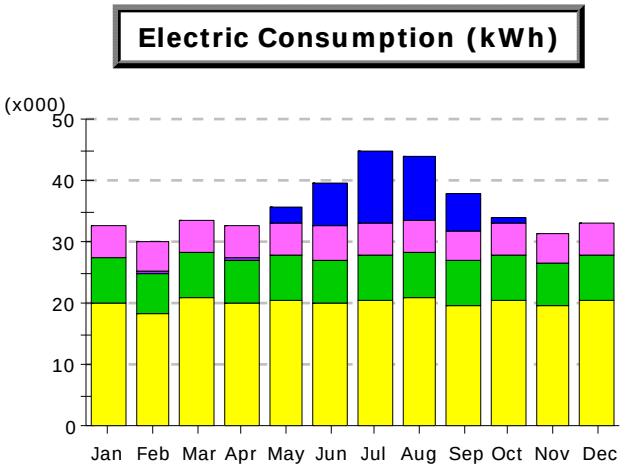


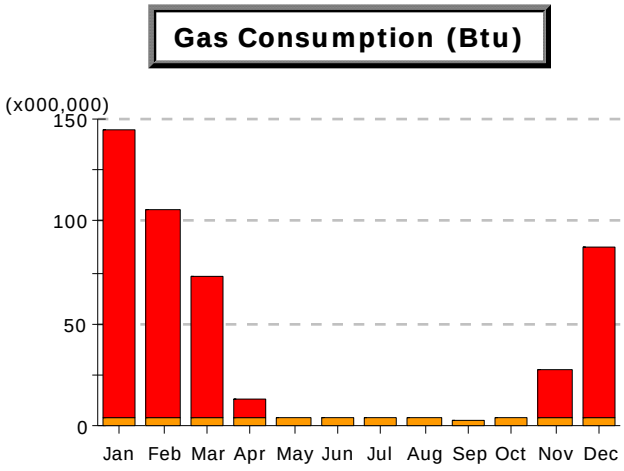
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.16	2.96	7.39	12.43	11.09	6.17	0.96	0.02	-	41.18
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.10	4.75	5.45	5.28	5.28	5.28	5.28	5.45	5.10	5.28	4.93	5.28	62.46
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.19	6.54	7.31	7.08	7.25	7.08	7.25	7.31	7.01	7.25	6.95	7.25	85.48
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	20.12	18.42	20.74	20.07	20.43	20.07	20.43	20.74	19.76	20.43	19.45	20.43	241.08
Total	32.59	29.88	33.68	32.73	35.94	39.82	45.39	44.59	38.05	33.98	31.49	33.13	431.27

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	140.91	101.63	68.25	9.42	0.01	-	-	-	-	-	23.72	83.98	427.91
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.98	3.83	4.41	4.19	3.92	3.64	3.40	3.36	3.13	3.36	3.36	3.87	44.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	144.89	105.47	72.65	13.61	3.92	3.64	3.40	3.36	3.13	3.36	27.08	87.85	472.35





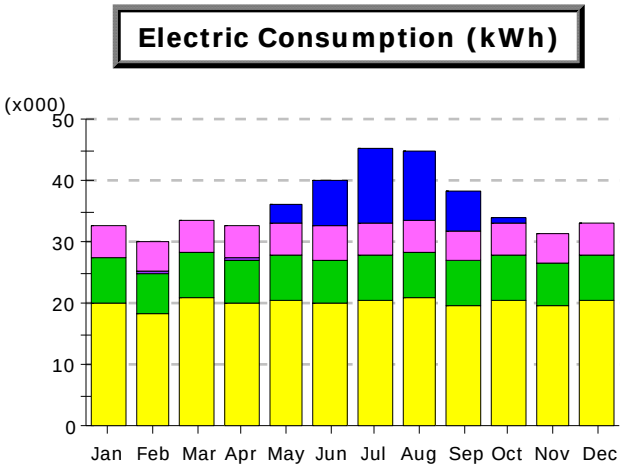


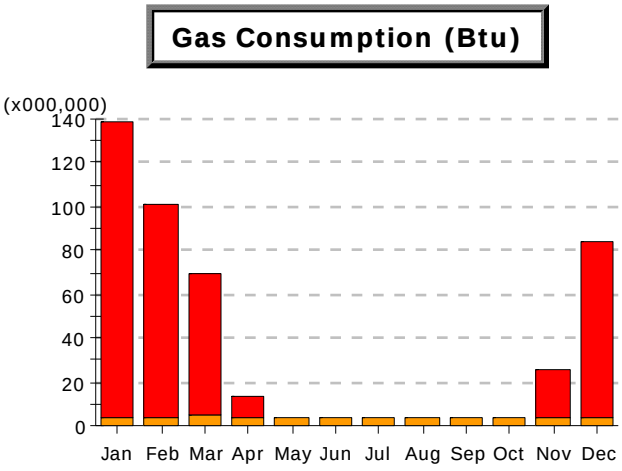
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.15	2.80	7.01	11.78	10.51	5.85	0.91	0.02	-	39.03
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.10	4.75	5.45	5.28	5.28	5.28	5.28	5.45	5.10	5.28	4.93	5.28	62.46
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.19	6.54	7.31	7.08	7.25	7.08	7.25	7.31	7.01	7.25	6.95	7.25	85.48
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	20.12	18.42	20.74	20.07	20.43	20.07	20.43	20.74	19.76	20.43	19.45	20.43	241.08
Total	32.59	29.88	33.68	32.72	35.79	39.43	44.74	44.02	37.73	33.93	31.49	33.13	429.13

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	140.91	101.63	68.25	9.42	0.01	-	-	-	-	-	23.72	83.98	427.91
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.98	3.83	4.41	4.19	3.92	3.64	3.40	3.36	3.13	3.36	3.36	3.87	44.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	144.89	105.47	72.65	13.61	3.92	3.64	3.40	3.36	3.13	3.36	27.08	87.85	472.35





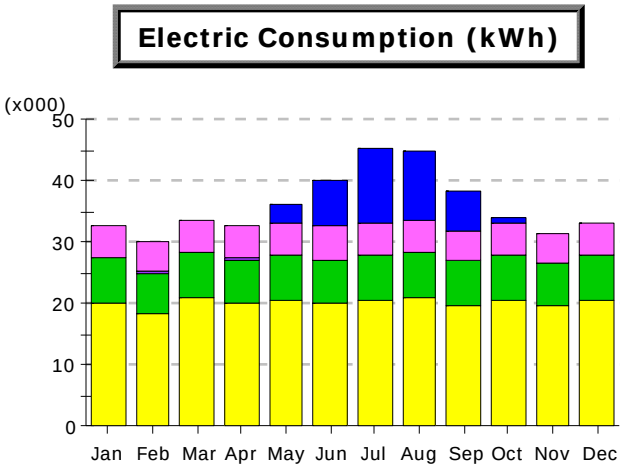


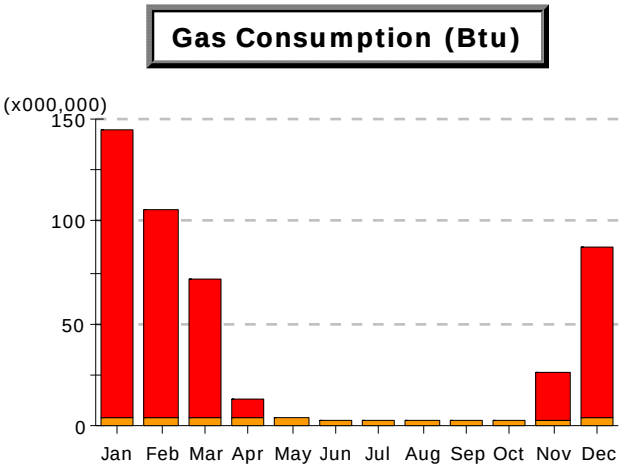
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.16	2.96	7.39	12.43	11.09	6.17	0.96	0.02	-	41.18
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.10	4.75	5.45	5.28	5.28	5.28	5.28	5.45	5.10	5.28	4.93	5.28	62.46
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.19	6.54	7.31	7.08	7.25	7.08	7.25	7.31	7.01	7.25	6.95	7.25	85.48
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	20.12	18.42	20.74	20.07	20.43	20.07	20.43	20.74	19.76	20.43	19.45	20.43	241.08
Total	32.59	29.88	33.68	32.73	35.94	39.82	45.39	44.59	38.05	33.98	31.49	33.13	431.27

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	135.21	97.53	65.49	9.03	0.00	-	-	-	-	-	22.76	80.58	410.61
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.98	3.83	4.41	4.19	3.92	3.64	3.40	3.36	3.13	3.36	3.36	3.87	44.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	139.19	101.36	69.90	13.23	3.92	3.64	3.40	3.36	3.13	3.36	26.12	84.45	455.05





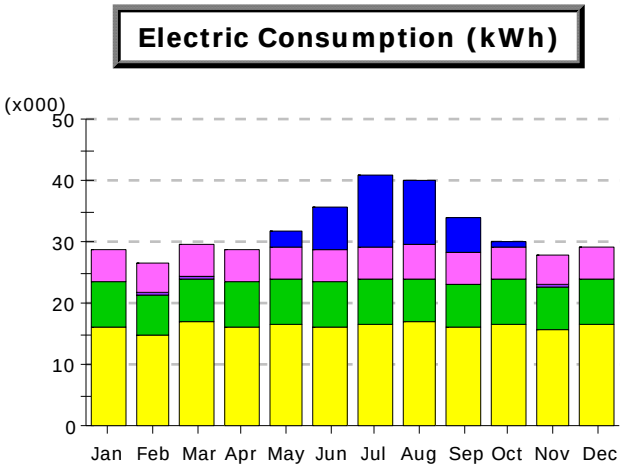


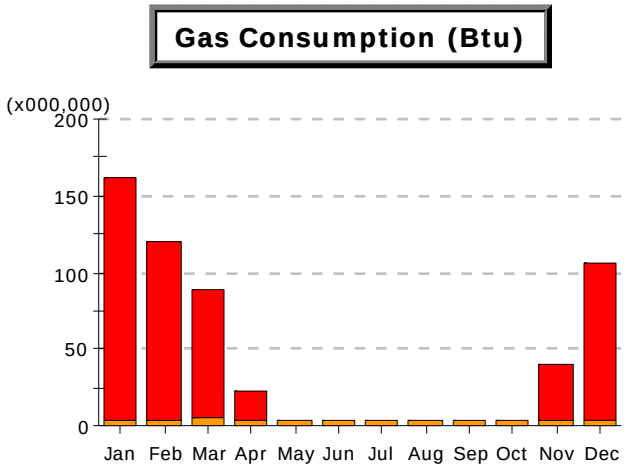
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.16	2.96	7.39	12.43	11.09	6.17	0.96	0.02	-	41.18
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.10	4.75	5.45	5.28	5.28	5.28	5.28	5.45	5.10	5.28	4.93	5.28	62.46
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.19	6.54	7.31	7.08	7.25	7.08	7.25	7.31	7.01	7.25	6.95	7.25	85.48
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	20.12	18.42	20.74	20.07	20.43	20.07	20.43	20.74	19.76	20.43	19.45	20.43	241.08
Total	32.59	29.88	33.68	32.73	35.94	39.82	45.39	44.59	38.05	33.98	31.49	33.13	431.27

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	140.91	101.63	68.25	9.42	0.01	-	-	-	-	-	23.72	83.98	427.91
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.52	3.39	3.91	3.72	3.47	3.22	3.01	2.97	2.76	2.97	2.97	3.42	39.32
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	144.42	105.03	72.15	13.13	3.47	3.22	3.01	2.97	2.76	2.97	26.69	87.40	467.22





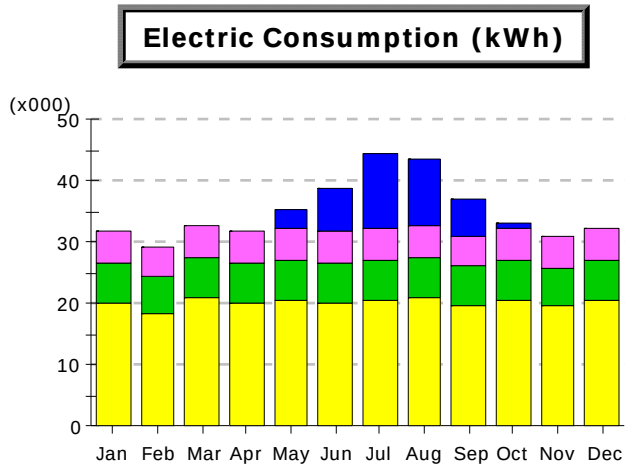


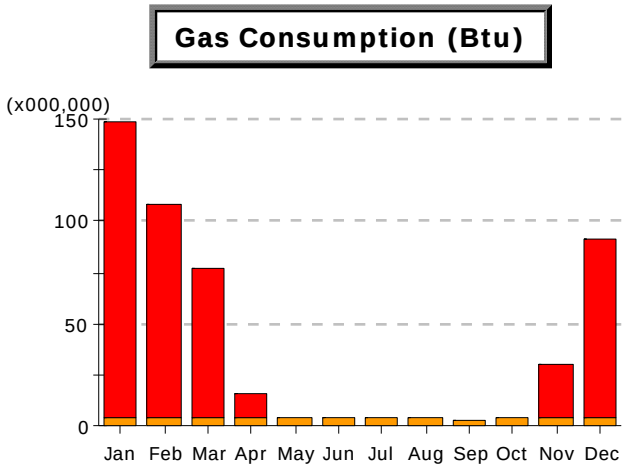
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.05	2.72	6.93	11.67	10.41	5.78	0.88	-	-	38.44
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.09	4.74	5.44	5.26	5.26	5.26	5.26	5.44	5.09	5.26	4.91	5.26	62.30
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.19	6.54	7.31	7.08	7.25	7.08	7.25	7.31	7.01	7.25	6.95	7.25	85.48
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	16.28	14.91	16.79	16.25	16.54	16.25	16.54	16.79	16.00	16.54	15.74	16.54	195.16
Total	28.74	26.36	29.72	28.78	31.81	35.52	40.72	39.95	33.89	29.99	27.76	29.22	382.46

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	157.02	116.57	85.15	18.96	0.15	-	-	-	-	-	37.07	101.84	516.76
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.98	3.83	4.41	4.20	3.92	3.64	3.40	3.36	3.13	3.36	3.36	3.87	44.45
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	161.00	120.40	89.56	23.15	4.07	3.64	3.40	3.36	3.13	3.36	40.44	105.70	561.21







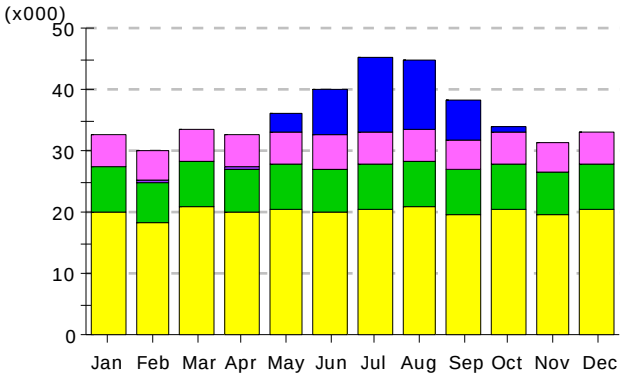
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.13	2.91	7.29	12.26	10.93	6.08	0.94	0.01	-	40.55
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.10	4.75	5.45	5.28	5.28	5.28	5.28	5.45	5.10	5.28	4.92	5.28	62.42
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	6.34	5.77	6.45	6.24	6.40	6.24	6.40	6.45	6.19	6.40	6.13	6.40	75.42
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	20.12	18.42	20.74	20.07	20.43	20.07	20.43	20.74	19.76	20.43	19.45	20.43	241.08
Total	31.74	29.11	32.82	31.86	35.04	38.88	44.36	43.58	37.13	33.10	30.66	32.27	420.56

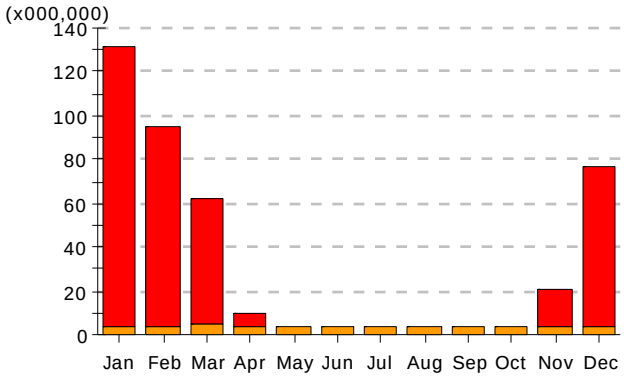
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	144.59	105.01	72.20	11.10	0.02	-	-	-	-	-	26.48	87.81	447.21
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.98	3.83	4.41	4.19	3.92	3.64	3.40	3.36	3.13	3.36	3.36	3.87	44.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	148.56	108.84	76.61	15.29	3.94	3.64	3.40	3.36	3.13	3.36	29.85	91.68	491.65

Electric Consumption (kWh)



Gas Consumption (Btu)



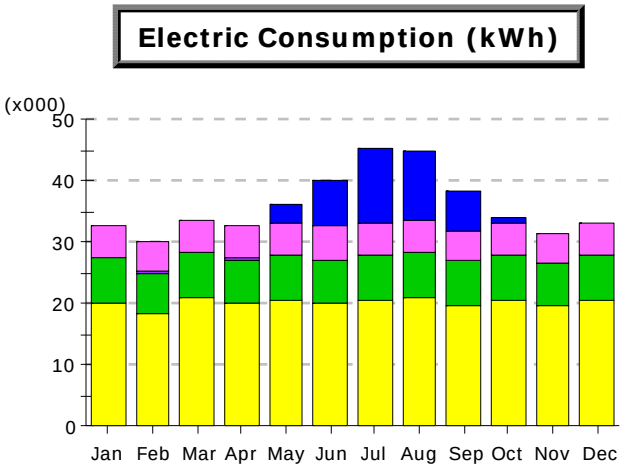


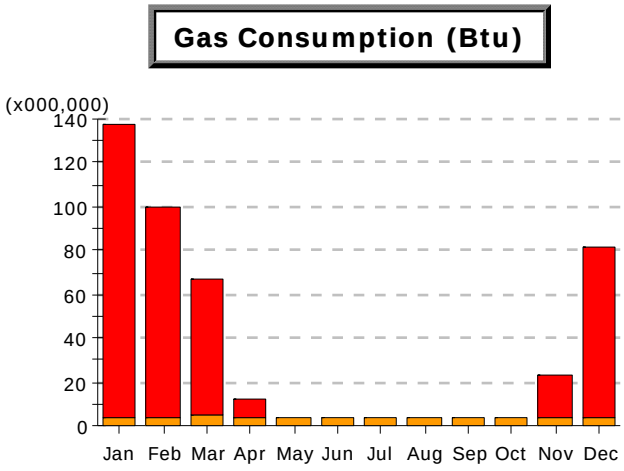
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.21	2.97	7.40	12.42	11.10	6.21	0.98	0.05	-	41.34
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.10	4.75	5.45	5.28	5.28	5.28	5.28	5.45	5.10	5.28	4.93	5.28	62.46
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.19	6.54	7.31	7.08	7.25	7.08	7.25	7.31	7.01	7.25	6.95	7.25	85.48
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	20.12	18.42	20.74	20.07	20.43	20.07	20.43	20.74	19.76	20.43	19.45	20.43	241.08
Total	32.59	29.88	33.68	32.78	35.96	39.82	45.37	44.60	38.09	33.99	31.52	33.13	431.43

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	127.61	90.79	57.81	6.06	-	-	-	-	-	-	17.20	72.32	371.79
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.98	3.83	4.41	4.19	3.92	3.64	3.40	3.36	3.13	3.36	3.36	3.87	44.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	131.59	94.62	62.21	10.25	3.92	3.64	3.40	3.36	3.13	3.36	20.57	76.19	416.22





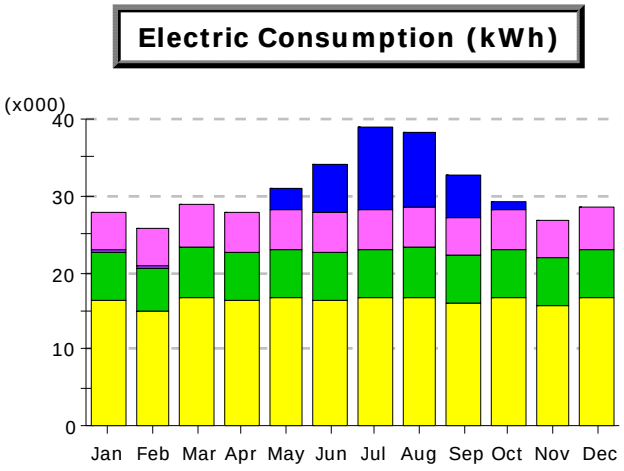


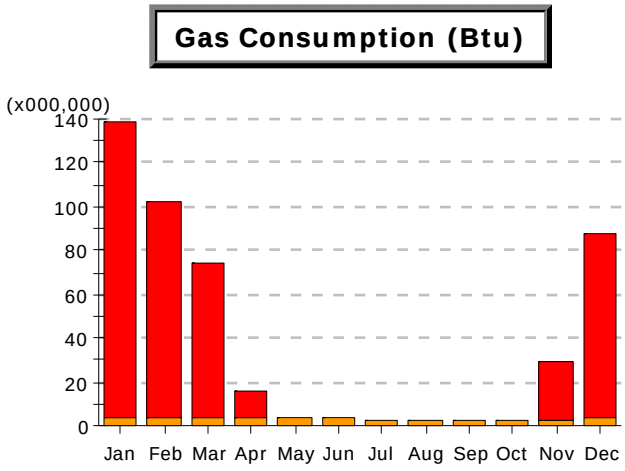
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.19	2.98	7.41	12.42	11.10	6.20	0.97	0.04	-	41.31
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.10	4.75	5.45	5.28	5.28	5.28	5.28	5.45	5.10	5.28	4.93	5.28	62.45
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.19	6.54	7.31	7.08	7.25	7.08	7.25	7.31	7.01	7.25	6.95	7.25	85.48
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	20.12	18.42	20.74	20.07	20.43	20.07	20.43	20.74	19.76	20.43	19.45	20.43	241.08
Total	32.59	29.88	33.68	32.76	35.97	39.84	45.38	44.60	38.07	33.99	31.51	33.13	431.40

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	134.02	95.55	62.76	7.45	-	-	-	-	-	-	20.01	77.98	397.77
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.98	3.83	4.41	4.19	3.92	3.64	3.40	3.36	3.13	3.36	3.36	3.87	44.44
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	138.00	99.38	67.17	11.64	3.92	3.64	3.40	3.36	3.13	3.36	23.37	81.84	442.21





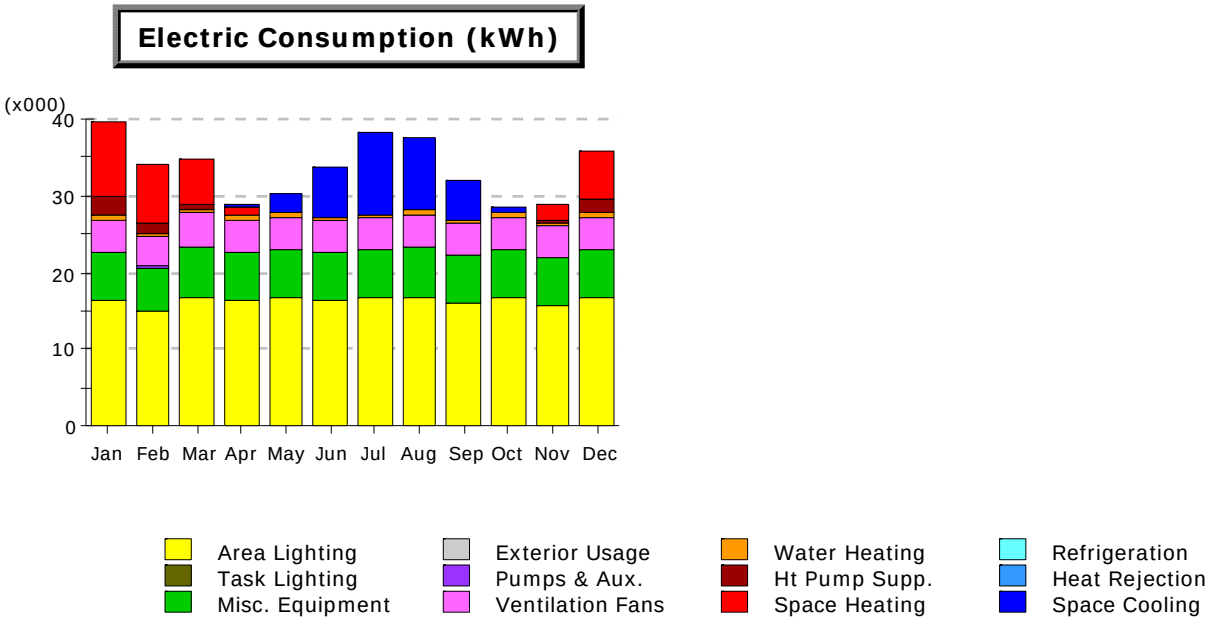


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.07	2.59	6.50	10.88	9.74	5.46	0.86	0.00	-	36.09
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	5.09	4.73	5.44	5.26	5.26	5.26	5.26	5.44	5.09	5.26	4.91	5.26	62.26
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	6.34	5.77	6.45	6.24	6.40	6.24	6.40	6.45	6.19	6.40	6.13	6.40	75.42
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	16.28	14.91	16.79	16.25	16.54	16.25	16.54	16.79	16.00	16.54	15.74	16.54	195.16
Total	27.89	25.59	28.85	27.96	30.82	34.25	39.07	38.42	32.74	29.11	26.94	28.37	370.01

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	135.22	98.81	70.08	12.33	0.04	-	-	-	-	-	26.14	83.73	426.35
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.52	3.39	3.91	3.72	3.47	3.22	3.01	2.97	2.76	2.97	2.97	3.42	39.32
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	138.74	102.20	73.99	16.04	3.51	3.22	3.01	2.97	2.76	2.97	29.10	87.15	465.67



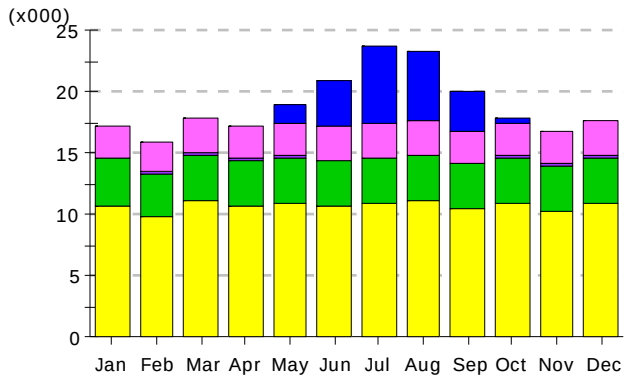
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	2.54	6.42	10.75	9.63	5.40	0.84	-	-	35.62
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.98	7.63	5.77	1.24	0.01	-	-	-	-	-	2.34	6.48	33.46
HP Supp.	2.46	1.46	0.75	0.07	-	-	-	-	-	-	0.21	1.73	6.67
Hot Water	0.49	0.46	0.53	0.51	0.49	0.48	0.46	0.47	0.44	0.47	0.45	0.50	5.75
Vent. Fans	4.10	3.82	4.38	4.24	4.24	4.24	4.24	4.38	4.10	4.24	3.96	4.24	50.19
Pumps & Aux.	0.09	0.09	0.10	0.12	0.03	-	-	-	0.00	0.06	0.12	0.10	0.72
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	6.34	5.77	6.45	6.24	6.40	6.24	6.40	6.45	6.19	6.40	6.13	6.40	75.42
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	16.28	14.91	16.79	16.25	16.54	16.25	16.54	16.79	16.00	16.54	15.74	16.54	195.16
Total	39.75	34.15	34.78	28.71	30.24	33.63	38.39	37.73	32.13	28.54	28.95	35.98	402.99

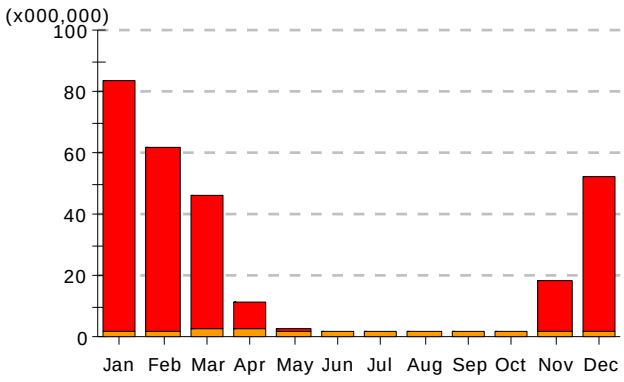
Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

Electric Consumption (kWh)



Gas Consumption (Btu)





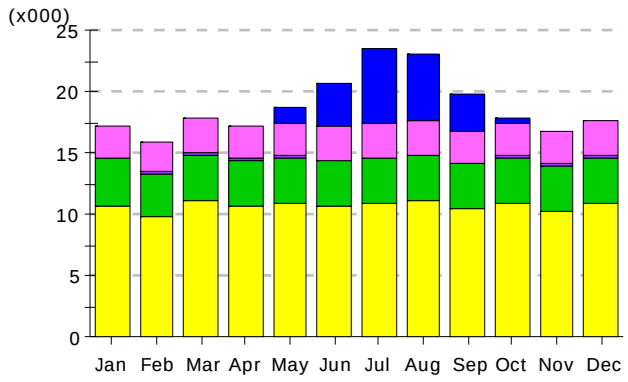
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	1.46	3.75	6.37	5.69	3.17	0.48	0.00	-	20.97
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.60	2.42	2.78	2.69	2.69	2.69	2.69	2.78	2.60	2.69	2.51	2.69	31.78
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.81	3.47	3.87	3.75	3.84	3.75	3.84	3.87	3.72	3.84	3.68	3.84	45.28
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.65	9.76	10.99	10.63	10.82	10.63	10.82	10.99	10.47	10.82	10.30	10.82	127.69
Total	17.24	15.81	17.81	17.25	18.84	20.81	23.72	23.33	19.95	17.89	16.64	17.52	226.81

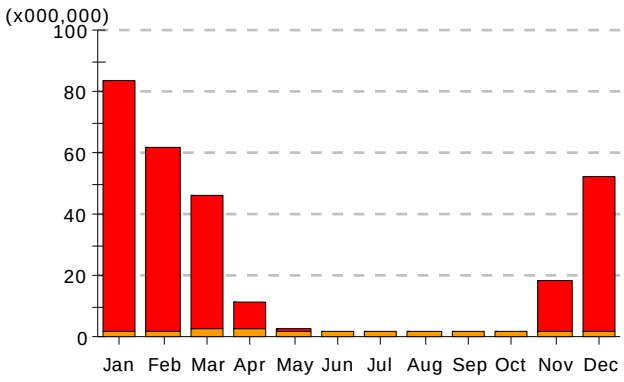
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	80.91	59.65	43.33	9.02	0.22	-	-	-	-	0.01	16.02	49.84	259.00
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.14	2.06	2.37	2.25	2.10	1.96	1.83	1.81	1.69	1.81	1.81	2.08	23.91
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	83.05	61.71	45.70	11.27	2.33	1.96	1.83	1.81	1.69	1.82	17.83	51.92	282.91

Electric Consumption (kWh)



Gas Consumption (Btu)





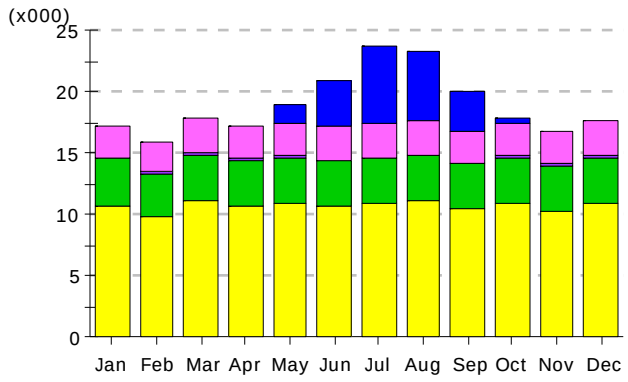
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	1.39	3.55	6.04	5.39	3.01	0.46	0.00	-	19.88
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.60	2.42	2.78	2.69	2.69	2.69	2.69	2.78	2.60	2.69	2.51	2.69	31.78
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.81	3.47	3.87	3.75	3.84	3.75	3.84	3.87	3.72	3.84	3.68	3.84	45.28
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.65	9.76	10.99	10.63	10.82	10.63	10.82	10.99	10.47	10.82	10.30	10.82	127.69
Total	17.24	15.81	17.81	17.25	18.76	20.62	23.39	23.03	19.79	17.86	16.64	17.52	225.72

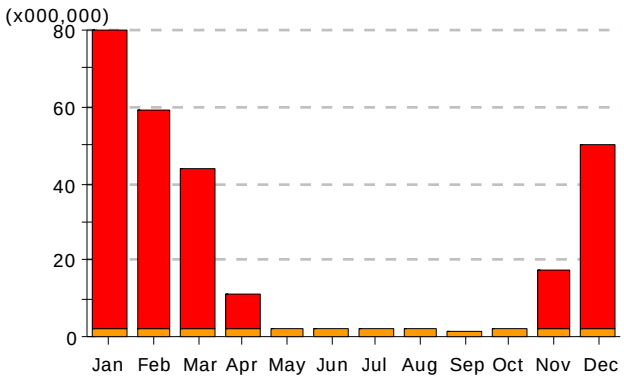
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	80.91	59.65	43.33	9.02	0.22	-	-	-	-	0.01	16.02	49.84	259.00
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.14	2.06	2.37	2.25	2.10	1.96	1.83	1.81	1.69	1.81	1.81	2.08	23.91
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	83.05	61.71	45.70	11.27	2.33	1.96	1.83	1.81	1.69	1.82	17.83	51.92	282.91

Electric Consumption (kWh)



Gas Consumption (Btu)



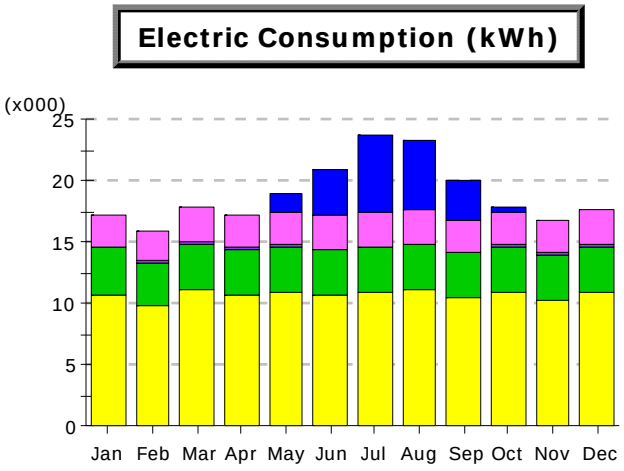


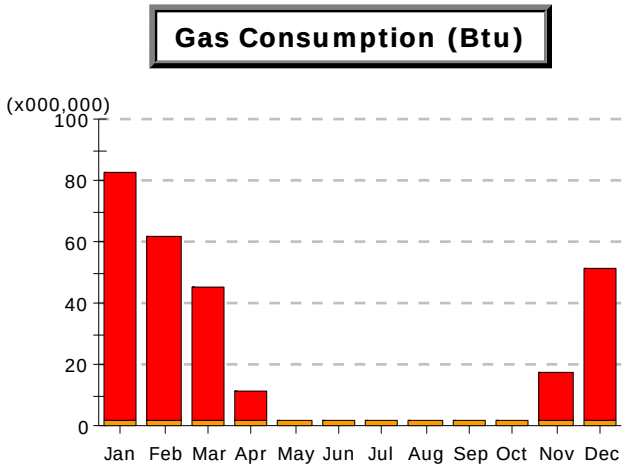
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	1.46	3.75	6.37	5.69	3.17	0.48	0.00	-	20.97
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.60	2.42	2.78	2.69	2.69	2.69	2.69	2.78	2.60	2.69	2.51	2.69	31.78
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.81	3.47	3.87	3.75	3.84	3.75	3.84	3.87	3.72	3.84	3.68	3.84	45.28
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.65	9.76	10.99	10.63	10.82	10.63	10.82	10.99	10.47	10.82	10.30	10.82	127.69
Total	17.24	15.81	17.81	17.25	18.84	20.81	23.72	23.33	19.95	17.89	16.64	17.52	226.81

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	77.64	57.24	41.58	8.65	0.21	-	-	-	-	0.01	15.37	47.82	248.53
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.14	2.06	2.37	2.25	2.10	1.96	1.83	1.81	1.69	1.81	1.81	2.08	23.91
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	79.78	59.30	43.95	10.91	2.32	1.96	1.83	1.81	1.69	1.82	17.18	49.91	272.44





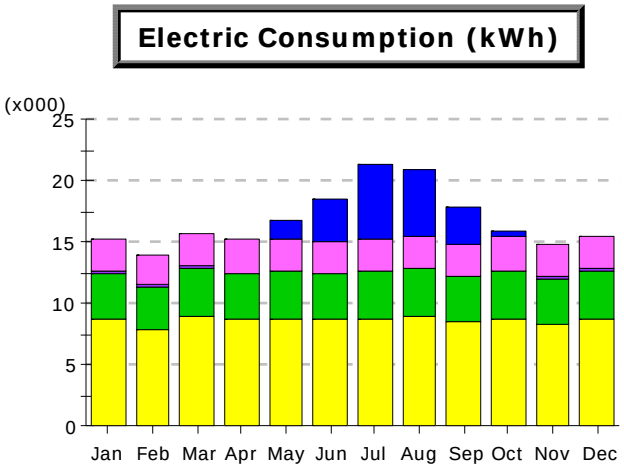


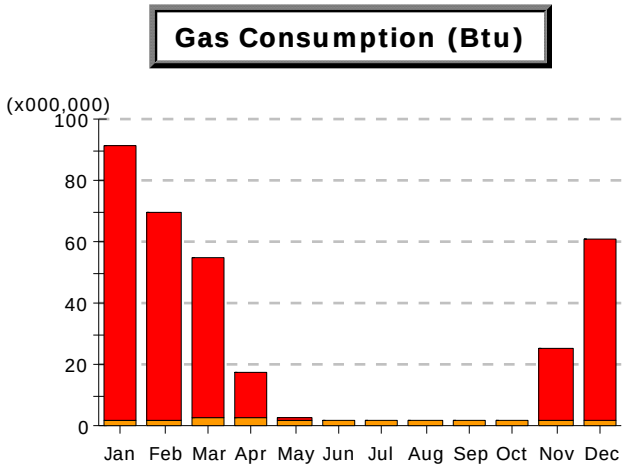
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	1.46	3.75	6.37	5.69	3.17	0.48	0.00	-	20.97
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.60	2.42	2.78	2.69	2.69	2.69	2.69	2.78	2.60	2.69	2.51	2.69	31.78
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.81	3.47	3.87	3.75	3.84	3.75	3.84	3.87	3.72	3.84	3.68	3.84	45.28
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.65	9.76	10.99	10.63	10.82	10.63	10.82	10.99	10.47	10.82	10.30	10.82	127.69
Total	17.24	15.81	17.81	17.25	18.84	20.81	23.72	23.33	19.95	17.89	16.64	17.52	226.81

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	80.91	59.65	43.33	9.02	0.22	-	-	-	-	0.01	16.02	49.84	259.00
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.86	1.80	2.07	1.97	1.84	1.71	1.59	1.57	1.46	1.57	1.57	1.81	20.84
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	82.78	61.45	45.40	10.99	2.06	1.71	1.59	1.57	1.46	1.59	17.59	51.65	279.84





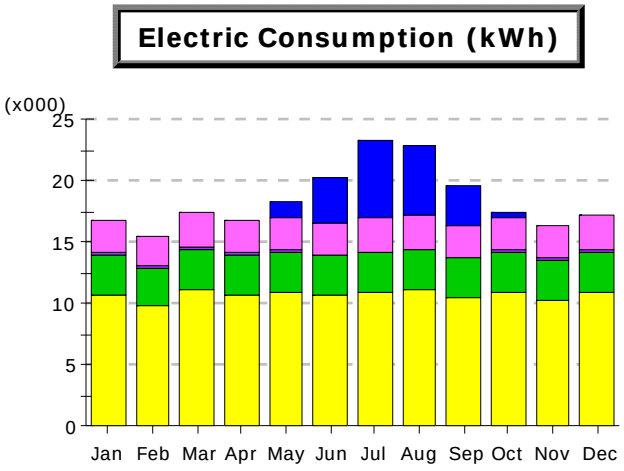


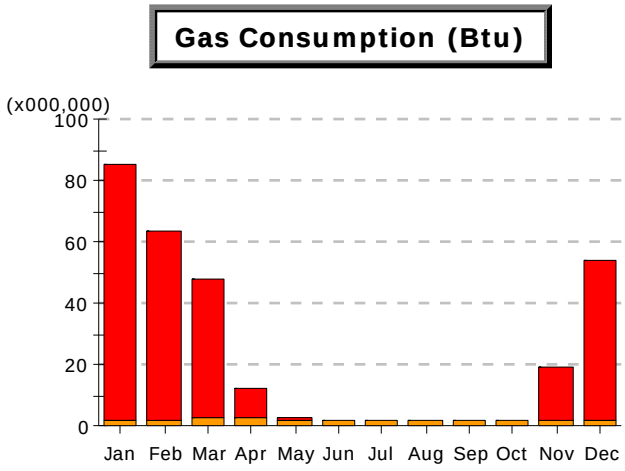
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.01	1.32	3.51	5.97	5.34	2.97	0.44	-	-	19.55
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.60	2.42	2.78	2.69	2.69	2.69	2.69	2.78	2.60	2.69	2.51	2.69	31.78
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.81	3.47	3.87	3.75	3.84	3.75	3.84	3.87	3.72	3.84	3.68	3.84	45.28
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.63	7.90	8.89	8.61	8.76	8.61	8.76	8.89	8.47	8.76	8.34	8.76	103.37
Total	15.21	13.95	15.72	15.19	16.64	18.55	21.26	20.88	17.76	15.78	14.68	15.46	201.06

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	89.38	67.38	51.99	15.28	0.80	-	-	-	-	0.05	23.25	59.20	307.33
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.14	2.06	2.37	2.25	2.11	1.96	1.83	1.81	1.69	1.81	1.81	2.08	23.92
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	91.53	69.44	54.36	17.54	2.90	1.96	1.83	1.81	1.69	1.86	25.06	61.28	331.25







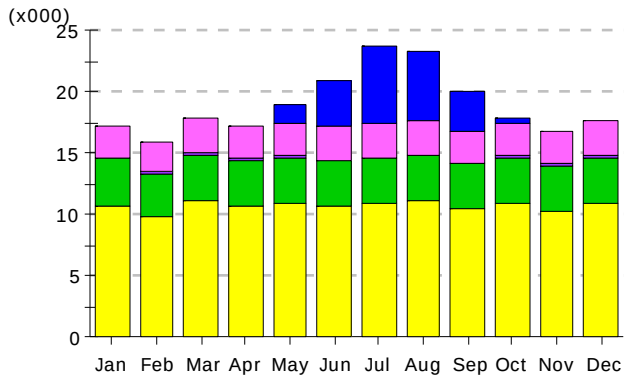
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.03	1.43	3.69	6.28	5.61	3.13	0.47	-	-	20.65
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.60	2.42	2.78	2.69	2.69	2.69	2.69	2.78	2.60	2.69	2.51	2.69	31.78
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.36	3.06	3.42	3.31	3.39	3.31	3.39	3.42	3.28	3.39	3.25	3.39	39.95
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.65	9.76	10.99	10.63	10.82	10.63	10.82	10.99	10.47	10.82	10.30	10.82	127.69
Total	16.79	15.40	17.35	16.80	18.36	20.32	23.18	22.79	19.47	17.43	16.21	17.07	221.16

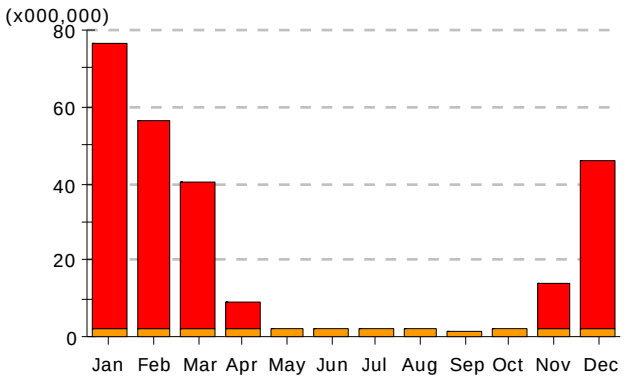
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	82.84	61.38	45.23	10.34	0.29	-	-	-	-	0.02	17.45	52.00	269.56
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.14	2.06	2.37	2.25	2.10	1.96	1.83	1.81	1.69	1.81	1.81	2.08	23.91
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	84.99	63.44	47.60	12.59	2.40	1.96	1.83	1.81	1.69	1.83	19.26	54.08	293.47

Electric Consumption (kWh)



Gas Consumption (Btu)





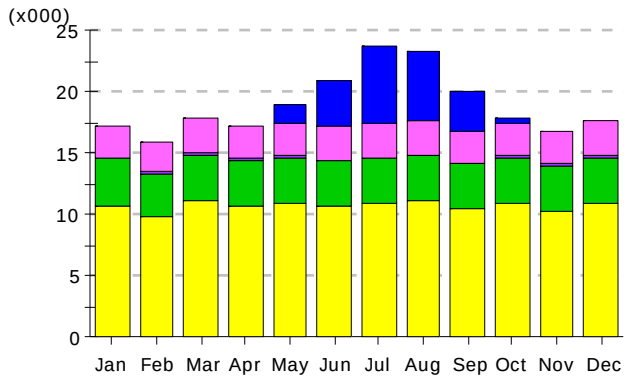
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.06	1.48	3.75	6.37	5.70	3.20	0.49	0.01	-	21.04
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.60	2.42	2.78	2.69	2.69	2.69	2.69	2.78	2.60	2.69	2.51	2.69	31.78
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.81	3.47	3.87	3.75	3.84	3.75	3.84	3.87	3.72	3.84	3.68	3.84	45.28
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.65	9.76	10.99	10.63	10.82	10.63	10.82	10.99	10.47	10.82	10.30	10.82	127.69
Total	17.24	15.81	17.81	17.27	18.85	20.81	23.71	23.33	19.98	17.90	16.65	17.52	226.88

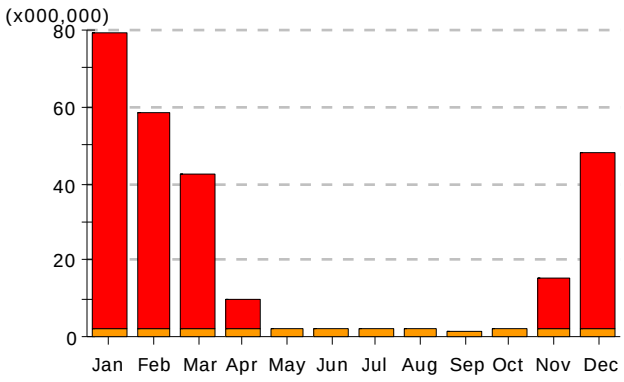
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	74.28	53.99	37.76	6.62	0.10	-	-	-	-	0.00	12.23	43.75	228.74
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.14	2.06	2.37	2.25	2.10	1.96	1.83	1.81	1.69	1.81	1.81	2.08	23.91
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	76.42	56.05	40.13	8.87	2.21	1.96	1.83	1.81	1.69	1.81	14.05	45.83	252.65

Electric Consumption (kWh)



Gas Consumption (Btu)



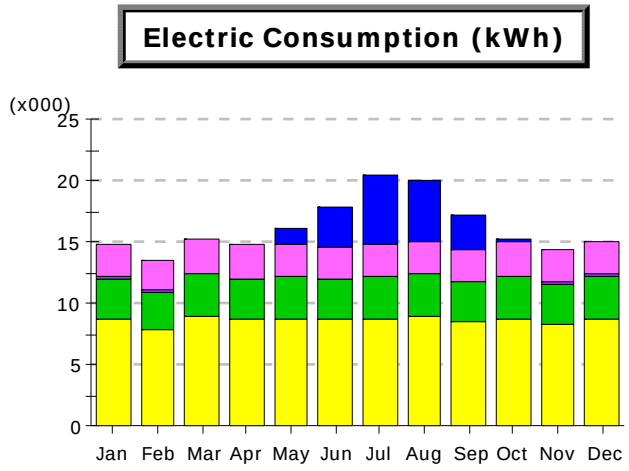


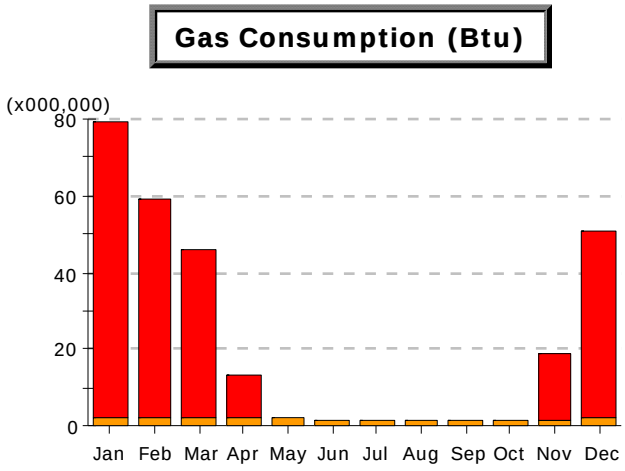
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.05	1.48	3.76	6.37	5.70	3.19	0.49	0.01	-	21.06
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.60	2.42	2.78	2.69	2.69	2.69	2.69	2.78	2.60	2.69	2.51	2.69	31.78
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.81	3.47	3.87	3.75	3.84	3.75	3.84	3.87	3.72	3.84	3.68	3.84	45.28
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.65	9.76	10.99	10.63	10.82	10.63	10.82	10.99	10.47	10.82	10.30	10.82	127.69
Total	17.24	15.81	17.81	17.26	18.86	20.83	23.72	23.33	19.97	17.90	16.65	17.52	226.89

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	76.85	56.11	40.07	7.44	0.14	-	-	-	-	0.00	13.71	46.14	240.47
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.14	2.06	2.37	2.25	2.10	1.96	1.83	1.81	1.69	1.81	1.81	2.08	23.91
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	79.00	58.17	42.44	9.69	2.25	1.96	1.83	1.81	1.69	1.82	15.52	48.22	264.38





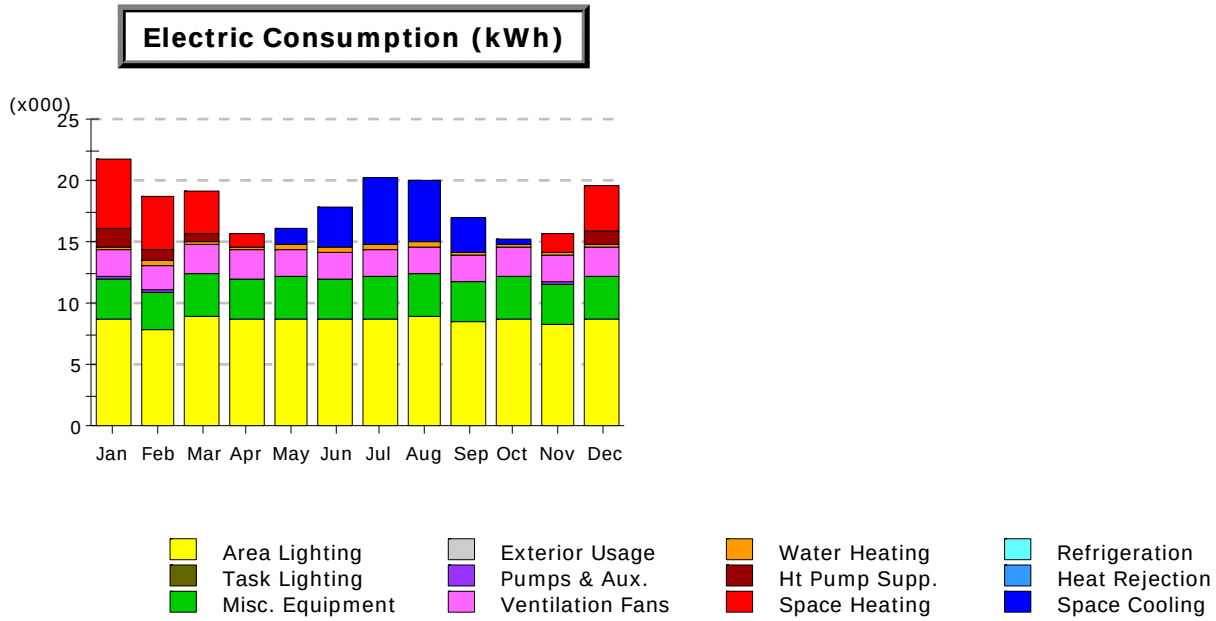


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.01	1.27	3.29	5.57	5.00	2.81	0.43	-	-	18.36
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.60	2.42	2.78	2.69	2.69	2.69	2.69	2.78	2.60	2.69	2.51	2.69	31.78
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.36	3.06	3.42	3.31	3.39	3.31	3.39	3.42	3.28	3.39	3.25	3.39	39.95
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.63	7.90	8.89	8.61	8.76	8.61	8.76	8.89	8.47	8.76	8.34	8.76	103.37
Total	14.76	13.54	15.26	14.75	16.13	17.89	20.40	20.08	17.16	15.32	14.24	15.01	194.55

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	77.35	57.62	43.53	11.04	0.43	-	-	-	-	0.02	17.26	49.16	256.41
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.86	1.80	2.07	1.97	1.84	1.71	1.59	1.57	1.46	1.57	1.57	1.81	20.84
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	79.21	59.42	45.60	13.01	2.27	1.71	1.59	1.57	1.46	1.59	18.83	50.97	277.25

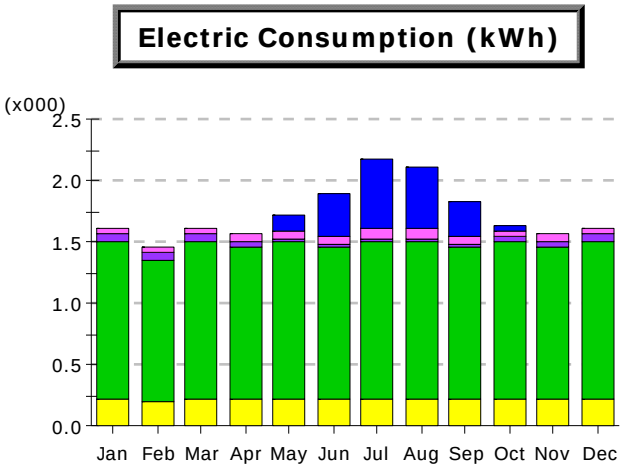


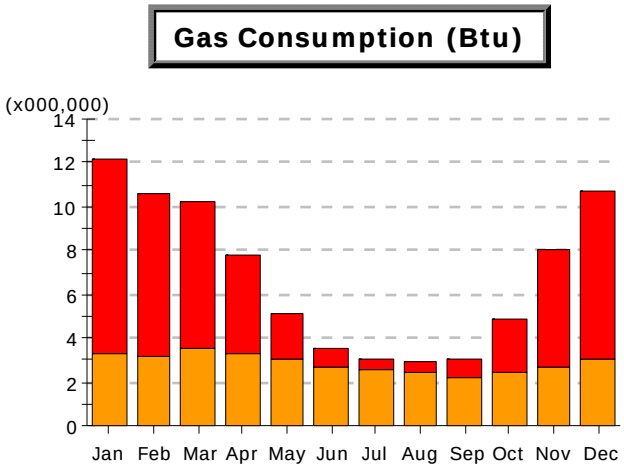
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.00	1.26	3.31	5.58	5.02	2.83	0.42	-	-	18.43
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	5.65	4.40	3.46	1.00	0.05	-	-	-	-	0.00	1.46	3.73	19.75
HP Supp.	1.50	0.91	0.48	0.05	-	-	-	-	-	0.00	0.13	1.03	4.11
Hot Water	0.30	0.28	0.33	0.31	0.30	0.29	0.29	0.29	0.28	0.29	0.28	0.31	3.55
Vent. Fans	2.20	2.05	2.35	2.27	2.27	2.27	2.27	2.35	2.20	2.27	2.12	2.27	26.91
Pumps & Aux.	0.09	0.09	0.10	0.12	0.03	-	-	-	0.00	0.06	0.11	0.10	0.70
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.36	3.06	3.42	3.31	3.39	3.31	3.39	3.42	3.28	3.39	3.25	3.39	39.95
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.63	7.90	8.89	8.61	8.76	8.61	8.76	8.89	8.47	8.76	8.34	8.76	103.37
Total	21.73	18.68	19.03	15.67	16.07	17.80	20.29	19.98	17.05	15.19	15.69	19.59	216.78

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													





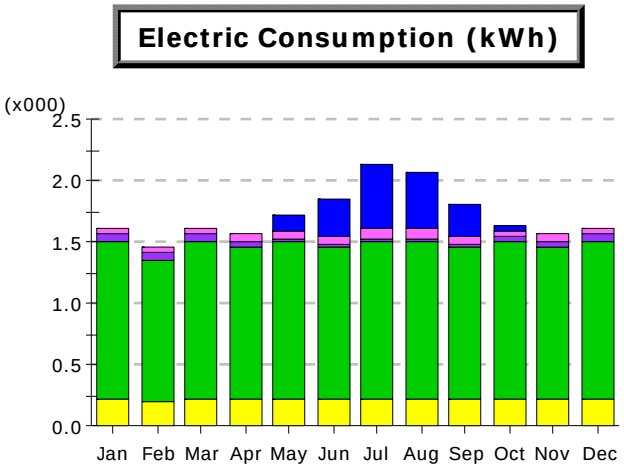


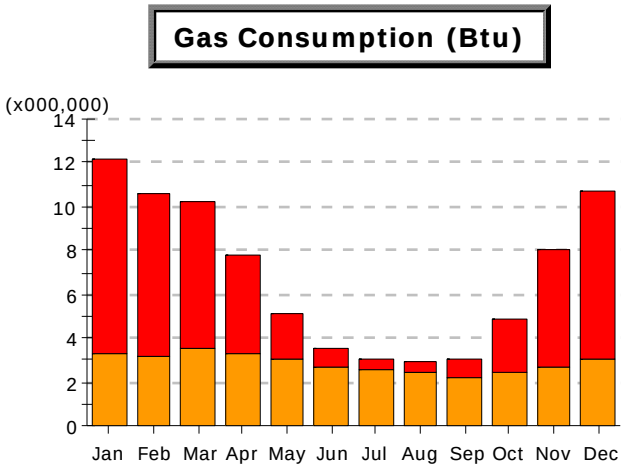
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.01	0.13	0.34	0.58	0.51	0.28	0.04	0.01	0.00	1.91
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.06	0.05	0.06	0.05	0.06	0.07	0.08	0.08	0.06	0.06	0.05	0.06	0.74
Pumps & Aux.	0.06	0.06	0.06	0.05	0.03	0.02	0.03	0.03	0.03	0.04	0.05	0.06	0.52
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.28	1.15	1.28	1.23	1.28	1.24	1.28	1.28	1.24	1.28	1.24	1.28	15.04
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.22	0.20	0.22	0.21	0.22	0.21	0.22	0.22	0.21	0.22	0.22	0.22	2.60
Total	1.62	1.46	1.62	1.57	1.72	1.89	2.18	2.11	1.82	1.63	1.57	1.62	20.80

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	8.89	7.51	6.75	4.41	2.00	0.83	0.54	0.58	0.85	2.33	5.38	7.75	47.81
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.28	3.12	3.49	3.33	3.10	2.70	2.53	2.39	2.25	2.49	2.63	3.01	34.32
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12.17	10.63	10.24	7.74	5.10	3.53	3.07	2.97	3.10	4.82	8.01	10.76	82.14





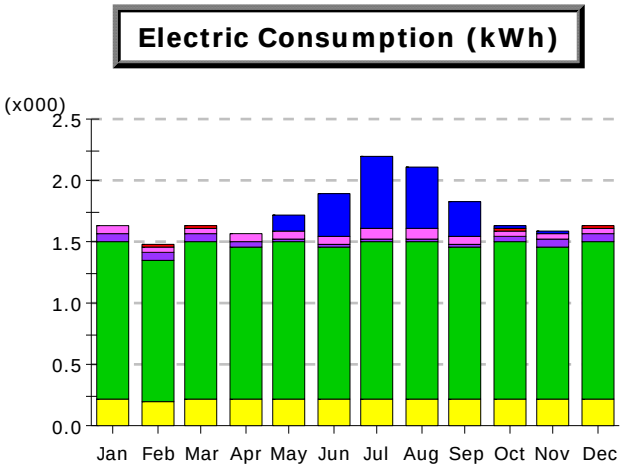


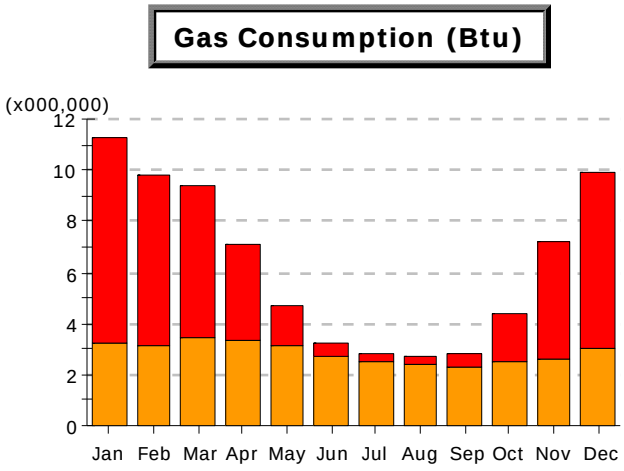
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.01	0.12	0.31	0.53	0.47	0.26	0.04	0.01	0.00	1.75
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.06	0.05	0.06	0.05	0.06	0.07	0.08	0.08	0.06	0.06	0.05	0.06	0.74
Pumps & Aux.	0.06	0.06	0.06	0.05	0.03	0.02	0.03	0.03	0.03	0.04	0.05	0.06	0.52
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.28	1.15	1.28	1.23	1.28	1.24	1.28	1.28	1.24	1.28	1.24	1.28	15.04
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.22	0.20	0.22	0.21	0.22	0.21	0.22	0.22	0.21	0.22	0.22	0.22	2.60
Total	1.62	1.46	1.62	1.56	1.71	1.86	2.13	2.07	1.80	1.63	1.57	1.62	20.64

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	8.89	7.51	6.75	4.41	2.00	0.83	0.54	0.58	0.85	2.33	5.38	7.75	47.81
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.28	3.12	3.49	3.33	3.10	2.70	2.53	2.39	2.25	2.49	2.63	3.01	34.32
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12.17	10.63	10.24	7.74	5.10	3.53	3.07	2.97	3.10	4.82	8.01	10.76	82.14





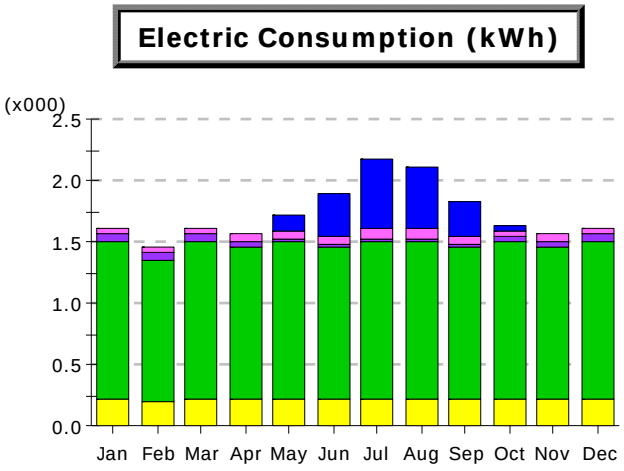


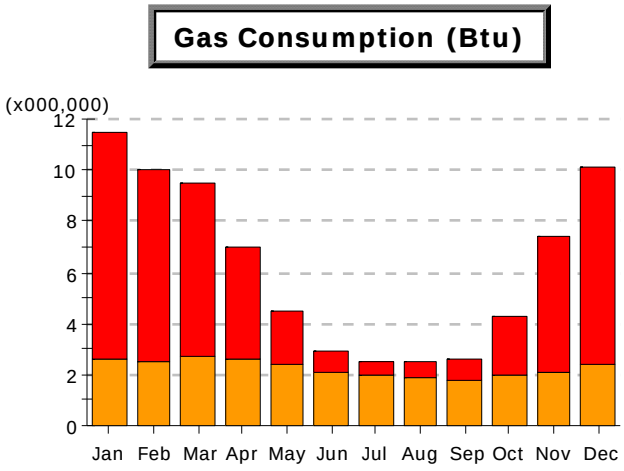
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.01	0.13	0.34	0.58	0.51	0.28	0.04	0.01	0.00	1.91
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.05
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.06	0.05	0.06	0.05	0.06	0.07	0.08	0.08	0.06	0.06	0.05	0.06	0.74
Pumps & Aux.	0.07	0.06	0.06	0.06	0.04	0.03	0.03	0.03	0.03	0.04	0.06	0.06	0.56
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.28	1.15	1.28	1.23	1.28	1.24	1.28	1.28	1.24	1.28	1.24	1.28	15.04
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.22	0.20	0.22	0.21	0.22	0.21	0.22	0.22	0.21	0.22	0.22	0.22	2.60
Total	1.63	1.47	1.63	1.57	1.73	1.89	2.19	2.12	1.83	1.64	1.58	1.63	20.90

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	7.94	6.68	5.92	3.74	1.58	0.57	0.33	0.36	0.58	1.85	4.62	6.86	41.02
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.28	3.12	3.49	3.33	3.10	2.70	2.53	2.39	2.25	2.49	2.63	3.01	34.32
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	11.22	9.79	9.40	7.07	4.68	3.27	2.86	2.75	2.83	4.34	7.25	9.88	75.34





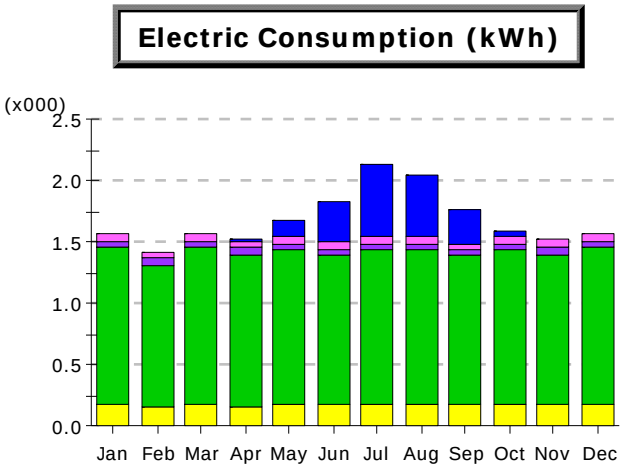


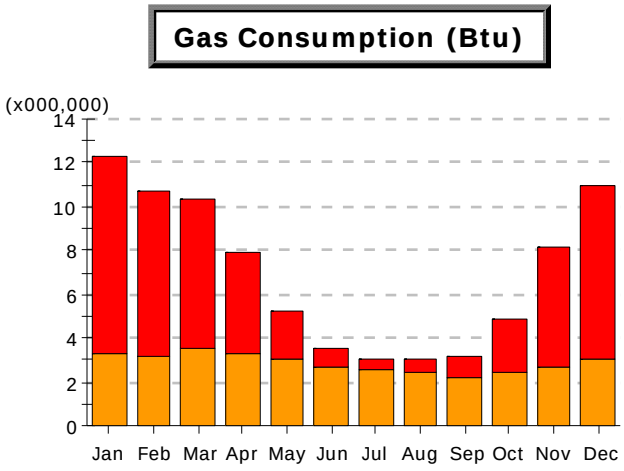
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.01	0.13	0.34	0.58	0.51	0.28	0.04	0.01	0.00	1.91
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.06	0.05	0.06	0.05	0.06	0.07	0.08	0.08	0.06	0.06	0.05	0.06	0.74
Pumps & Aux.	0.06	0.06	0.06	0.05	0.03	0.02	0.03	0.03	0.03	0.04	0.05	0.06	0.52
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.28	1.15	1.28	1.23	1.28	1.24	1.28	1.28	1.24	1.28	1.24	1.28	15.04
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.22	0.20	0.22	0.21	0.22	0.21	0.22	0.22	0.21	0.22	0.22	0.22	2.60
Total	1.62	1.46	1.62	1.57	1.72	1.89	2.18	2.11	1.82	1.63	1.57	1.62	20.80

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	8.89	7.51	6.75	4.41	2.00	0.83	0.54	0.58	0.85	2.33	5.38	7.75	47.81
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.59	2.47	2.76	2.63	2.45	2.13	1.99	1.88	1.77	1.96	2.07	2.37	27.06
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	11.48	9.97	9.51	7.04	4.44	2.96	2.53	2.46	2.62	4.28	7.45	10.12	74.87







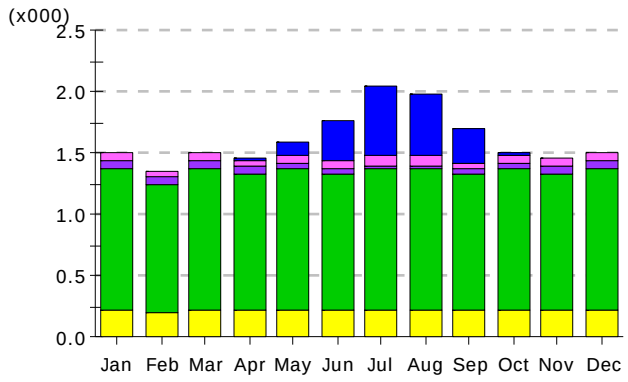
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.01	0.13	0.34	0.57	0.51	0.28	0.04	0.01	0.00	1.88
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.06	0.05	0.06	0.05	0.06	0.07	0.08	0.07	0.06	0.06	0.05	0.06	0.73
Pumps & Aux.	0.06	0.06	0.06	0.05	0.03	0.02	0.03	0.03	0.03	0.04	0.05	0.06	0.52
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.28	1.15	1.28	1.23	1.28	1.24	1.28	1.28	1.24	1.28	1.24	1.28	15.04
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.17	0.15	0.17	0.16	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.17	1.98
Total	1.56	1.41	1.56	1.51	1.67	1.83	2.12	2.05	1.77	1.58	1.52	1.56	20.15

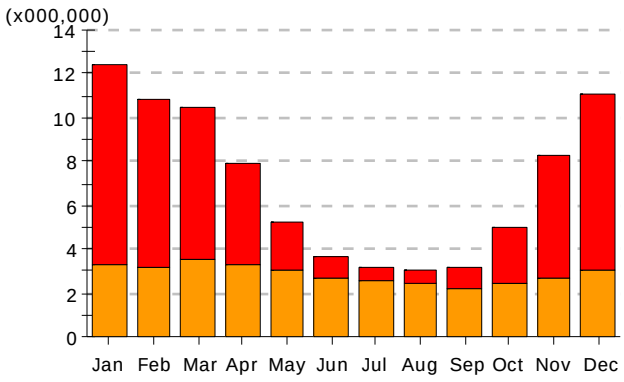
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.05	7.65	6.90	4.54	2.09	0.87	0.57	0.60	0.90	2.42	5.53	7.90	49.02
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.28	3.12	3.49	3.33	3.10	2.70	2.53	2.39	2.25	2.49	2.63	3.01	34.33
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12.33	10.77	10.38	7.87	5.19	3.58	3.10	3.00	3.15	4.91	8.16	10.92	83.34

Electric Consumption (kWh)



Gas Consumption (Btu)



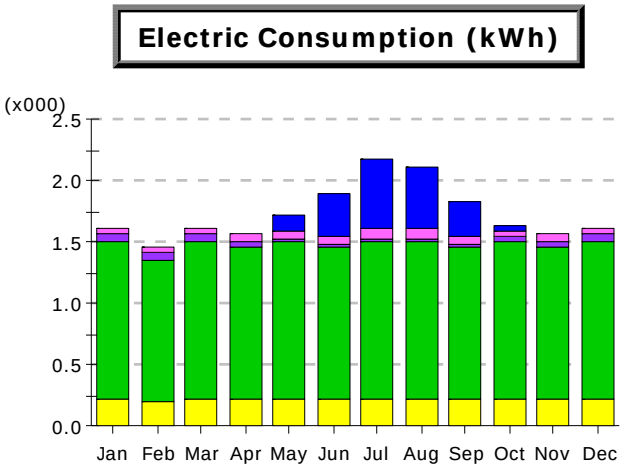


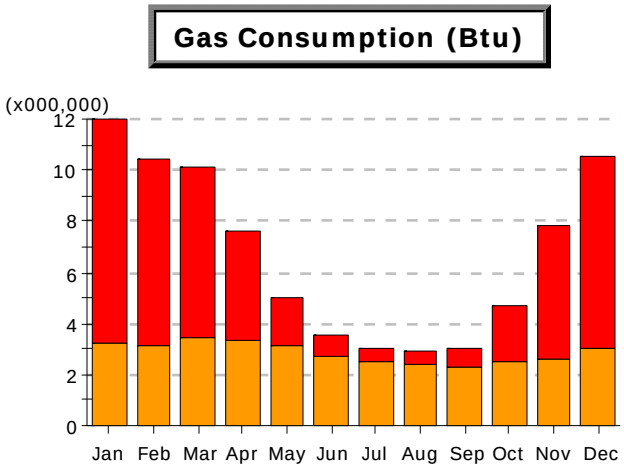
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.01	0.13	0.33	0.57	0.50	0.28	0.04	0.01	0.00	1.86
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.06	0.05	0.06	0.05	0.06	0.07	0.07	0.07	0.06	0.06	0.05	0.06	0.72
Pumps & Aux.	0.06	0.06	0.06	0.05	0.03	0.02	0.03	0.03	0.03	0.04	0.05	0.06	0.52
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.16	1.04	1.16	1.12	1.16	1.12	1.16	1.16	1.12	1.16	1.12	1.16	13.62
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.22	0.20	0.22	0.21	0.22	0.21	0.22	0.22	0.21	0.22	0.22	0.22	2.60
Total	1.50	1.35	1.50	1.45	1.59	1.76	2.04	1.98	1.70	1.51	1.45	1.50	19.32

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.16	7.74	7.00	4.63	2.14	0.91	0.60	0.64	0.93	2.49	5.62	8.01	49.88
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.28	3.12	3.49	3.33	3.10	2.70	2.53	2.39	2.25	2.49	2.63	3.01	34.33
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12.43	10.86	10.49	7.95	5.24	3.62	3.13	3.03	3.18	4.98	8.25	11.03	84.20







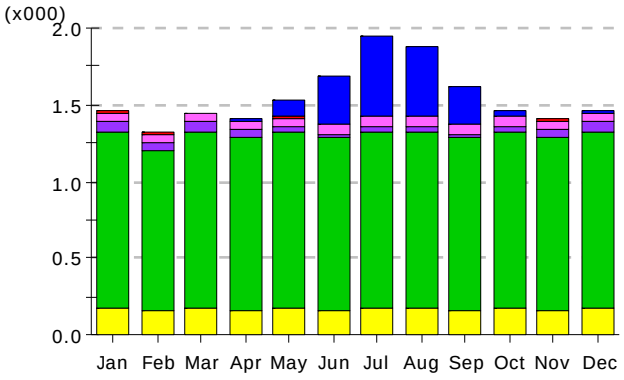
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.01	0.13	0.34	0.58	0.51	0.28	0.04	0.01	0.00	1.90
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.06	0.05	0.06	0.05	0.06	0.07	0.08	0.08	0.06	0.06	0.05	0.06	0.73
Pumps & Aux.	0.06	0.06	0.06	0.05	0.03	0.02	0.03	0.03	0.03	0.04	0.05	0.06	0.52
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.28	1.15	1.28	1.23	1.28	1.24	1.28	1.28	1.24	1.28	1.24	1.28	15.04
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.22	0.20	0.22	0.21	0.22	0.21	0.22	0.22	0.21	0.22	0.22	0.22	2.60
Total	1.62	1.46	1.62	1.56	1.72	1.88	2.18	2.11	1.82	1.63	1.57	1.62	20.79

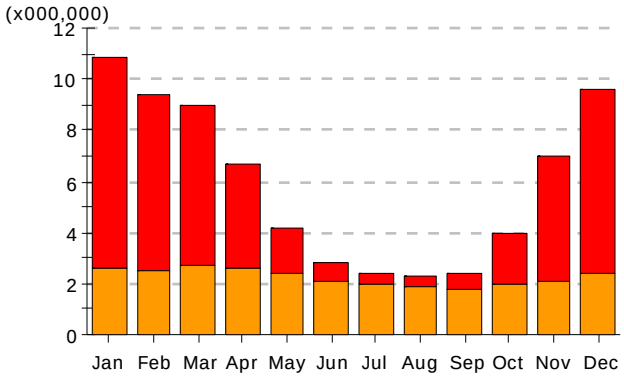
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	8.68	7.32	6.59	4.29	1.92	0.80	0.52	0.56	0.81	2.25	5.23	7.56	46.53
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.28	3.12	3.49	3.33	3.10	2.70	2.53	2.39	2.25	2.49	2.63	3.01	34.32
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	11.96	10.44	10.07	7.62	5.02	3.50	3.05	2.95	3.06	4.74	7.86	10.58	80.85

Electric Consumption (kWh)



Gas Consumption (Btu)



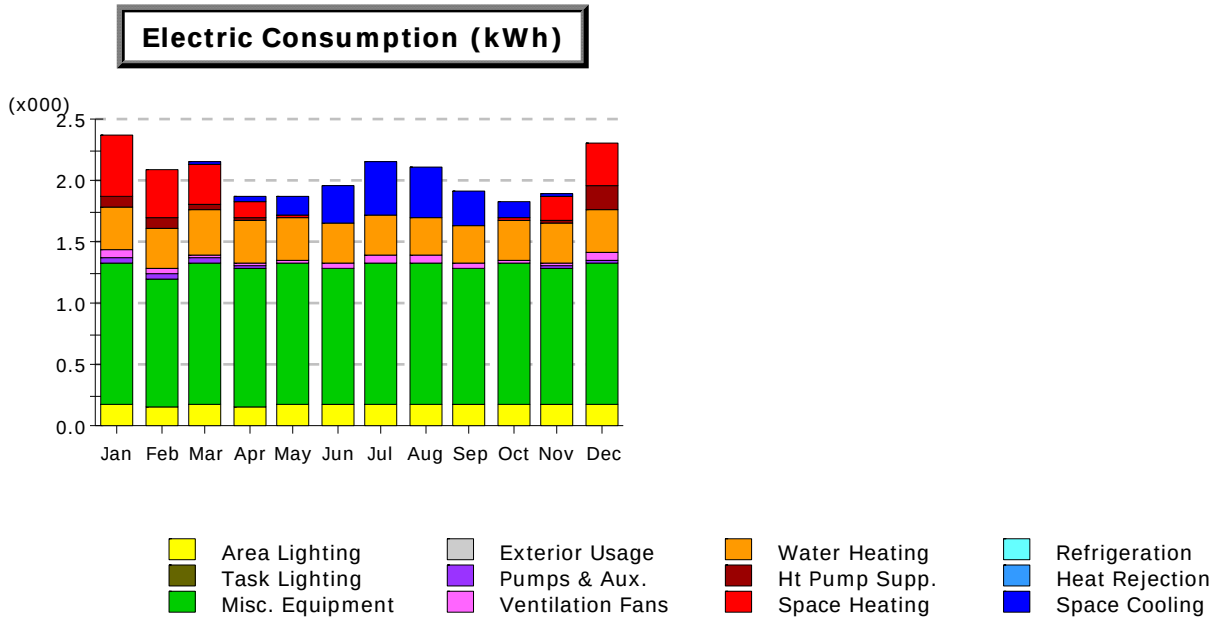


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.01	0.11	0.30	0.51	0.45	0.25	0.03	0.01	0.00	1.68
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.06
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.06	0.05	0.06	0.05	0.06	0.07	0.07	0.07	0.06	0.06	0.05	0.06	0.71
Pumps & Aux.	0.06	0.06	0.06	0.06	0.03	0.03	0.03	0.03	0.03	0.04	0.06	0.06	0.55
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.16	1.04	1.16	1.12	1.16	1.12	1.16	1.16	1.12	1.16	1.12	1.16	13.62
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.17	0.15	0.17	0.16	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.17	1.98
Total	1.45	1.31	1.45	1.40	1.54	1.68	1.94	1.88	1.62	1.46	1.41	1.45	18.60

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	8.28	6.97	6.23	4.01	1.75	0.66	0.39	0.42	0.67	2.05	4.92	7.20	43.57
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	2.59	2.47	2.76	2.63	2.45	2.13	1.99	1.88	1.77	1.96	2.07	2.37	27.06
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	10.87	9.44	8.98	6.65	4.20	2.79	2.38	2.30	2.43	4.01	6.99	9.57	70.63

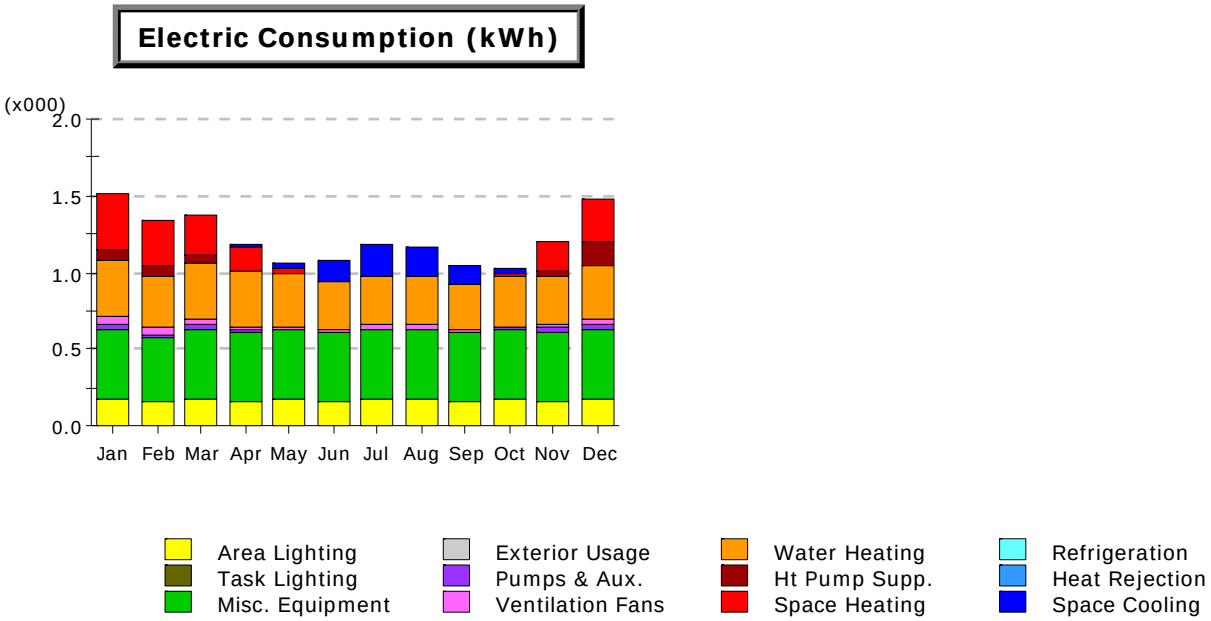


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.00	0.00	0.02	0.03	0.15	0.30	0.44	0.41	0.29	0.12	0.01	0.00	1.78
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.49	0.40	0.32	0.15	0.02	-	-	-	-	0.02	0.20	0.35	1.96
HP Supp.	0.09	0.08	0.05	0.01	0.00	-	-	-	-	0.00	0.02	0.20	0.45
Hot Water	0.36	0.33	0.36	0.35	0.35	0.32	0.32	0.32	0.30	0.32	0.32	0.35	4.00
Vent. Fans	0.07	0.05	0.04	0.02	0.02	0.05	0.07	0.06	0.04	0.02	0.02	0.05	0.52
Pumps & Aux.	0.03	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.16	1.04	1.16	1.12	1.16	1.12	1.16	1.16	1.12	1.16	1.12	1.16	13.62
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.17	0.15	0.17	0.16	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.17	1.98
Total	2.37	2.09	2.15	1.86	1.88	1.95	2.15	2.11	1.92	1.82	1.89	2.31	24.50

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

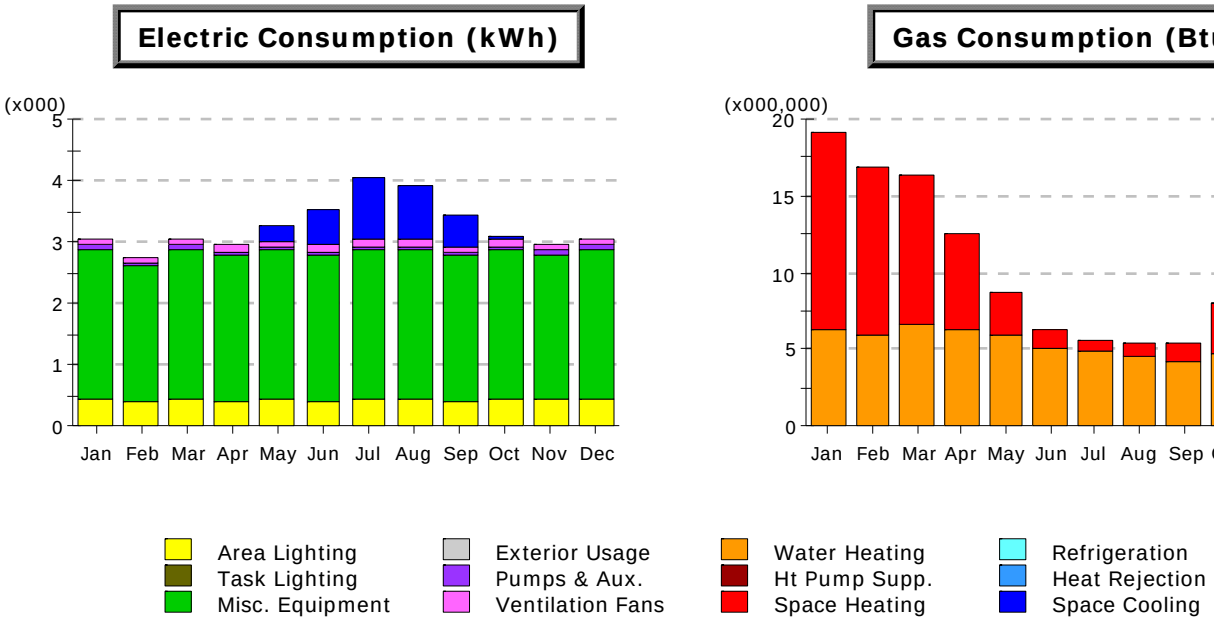


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.00	0.04	0.12	0.21	0.19	0.12	0.03	0.00	-	0.72
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.36	0.31	0.27	0.16	0.04	-	-	-	-	0.03	0.19	0.28	1.64
HP Supp.	0.07	0.07	0.05	0.01	0.00	-	-	-	-	0.00	0.02	0.15	0.37
Hot Water	0.36	0.33	0.37	0.35	0.35	0.32	0.32	0.32	0.30	0.32	0.32	0.35	4.01
Vent. Fans	0.05	0.04	0.03	0.02	0.01	0.02	0.03	0.03	0.02	0.01	0.02	0.04	0.32
Pumps & Aux.	0.03	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.46	0.41	0.46	0.44	0.46	0.44	0.46	0.46	0.44	0.46	0.44	0.46	5.39
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.17	0.15	0.17	0.16	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.17	1.98
Total	1.51	1.34	1.38	1.18	1.06	1.07	1.19	1.16	1.05	1.03	1.20	1.48	14.64

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

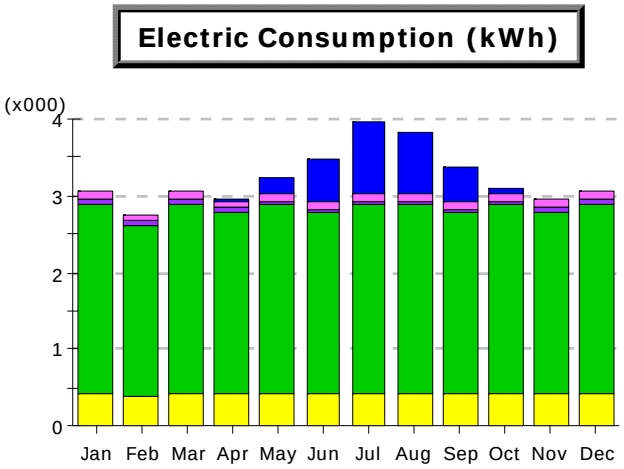


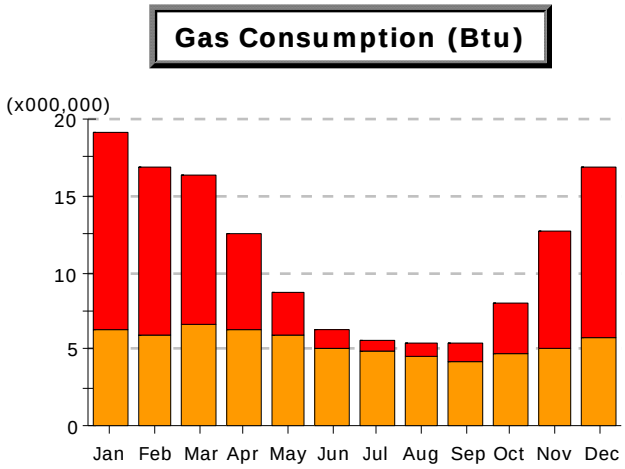
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.22	0.58	1.00	0.88	0.49	0.07	0.01	0.00	3.27
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.09	0.10	0.09	0.10	0.11	0.13	0.12	0.11	0.10	0.10	0.10	1.25
Pumps & Aux.	0.07	0.07	0.07	0.06	0.04	0.03	0.04	0.04	0.04	0.05	0.06	0.07	0.63
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.45	2.22	2.45	2.37	2.45	2.37	2.45	2.45	2.37	2.45	2.38	2.45	28.88
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.42	0.38	0.42	0.41	0.42	0.41	0.42	0.42	0.41	0.42	0.41	0.42	4.99
Total	3.05	2.75	3.05	2.95	3.24	3.52	4.03	3.92	3.42	3.09	2.96	3.05	39.03

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	12.95	10.95	9.79	6.30	2.76	1.11	0.78	0.81	1.16	3.22	7.67	11.21	68.70
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.21	5.91	6.61	6.31	5.87	5.12	4.79	4.53	4.25	4.71	4.97	5.70	64.97
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19.16	16.86	16.40	12.60	8.63	6.23	5.57	5.33	5.41	7.93	12.64	16.91	133.66





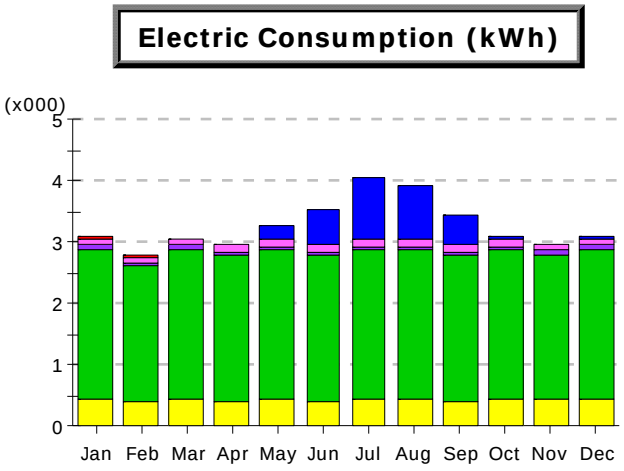


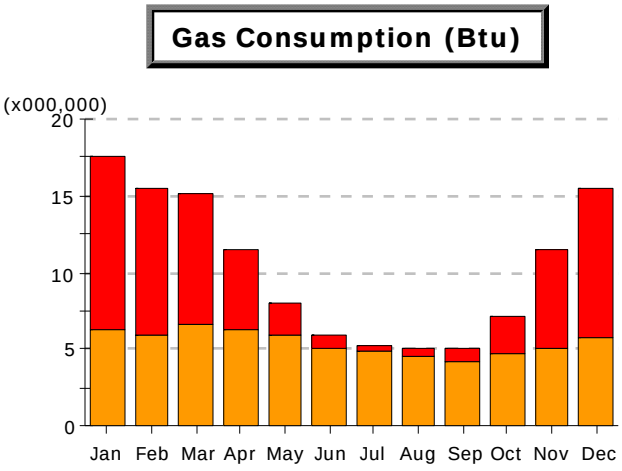
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.20	0.54	0.91	0.81	0.45	0.06	0.01	0.00	3.00
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.09	0.10	0.09	0.10	0.11	0.13	0.12	0.11	0.10	0.10	0.10	1.25
Pumps & Aux.	0.07	0.07	0.07	0.06	0.04	0.03	0.04	0.04	0.04	0.05	0.06	0.07	0.63
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.45	2.22	2.45	2.37	2.45	2.37	2.45	2.45	2.37	2.45	2.38	2.45	28.88
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.42	0.38	0.42	0.41	0.42	0.41	0.42	0.42	0.41	0.42	0.41	0.42	4.99
Total	3.05	2.75	3.05	2.95	3.23	3.47	3.95	3.84	3.38	3.08	2.96	3.05	38.76

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	12.95	10.95	9.79	6.30	2.76	1.11	0.78	0.81	1.16	3.22	7.67	11.21	68.70
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.21	5.91	6.61	6.31	5.87	5.12	4.79	4.53	4.25	4.71	4.97	5.70	64.97
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19.16	16.86	16.40	12.60	8.63	6.23	5.57	5.33	5.41	7.93	12.64	16.91	133.66





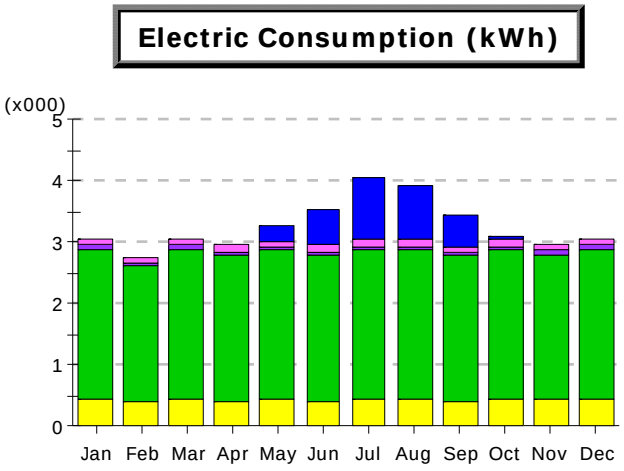


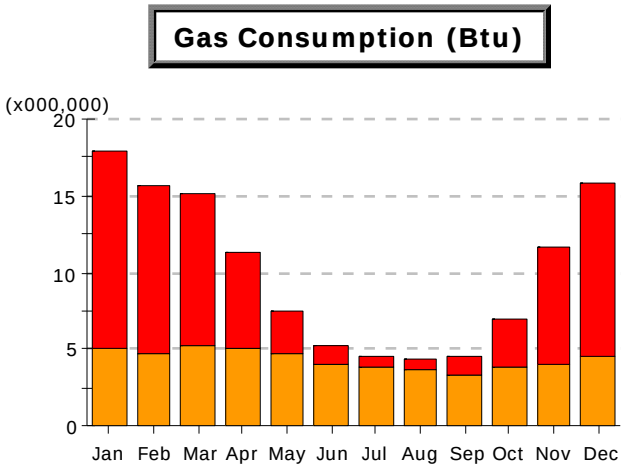
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.22	0.58	1.00	0.88	0.49	0.07	0.01	0.00	3.27
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.09
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.09	0.10	0.09	0.10	0.11	0.13	0.12	0.11	0.10	0.10	0.10	1.25
Pumps & Aux.	0.08	0.07	0.08	0.07	0.05	0.04	0.04	0.04	0.04	0.05	0.07	0.07	0.69
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.45	2.22	2.45	2.37	2.45	2.37	2.45	2.45	2.37	2.45	2.38	2.45	28.88
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.42	0.38	0.42	0.41	0.42	0.41	0.42	0.42	0.41	0.42	0.41	0.42	4.99
Total	3.07	2.77	3.06	2.97	3.25	3.53	4.04	3.92	3.42	3.10	2.98	3.07	39.18

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	11.40	9.61	8.45	5.23	2.11	0.72	0.45	0.47	0.75	2.48	6.45	9.78	57.89
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.21	5.91	6.61	6.31	5.87	5.12	4.79	4.53	4.25	4.71	4.97	5.70	64.97
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17.61	15.52	15.05	11.54	7.98	5.84	5.24	5.00	5.00	7.18	11.43	15.48	122.86





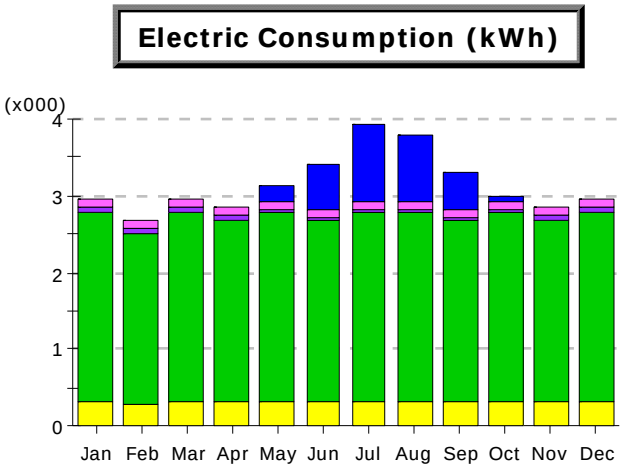


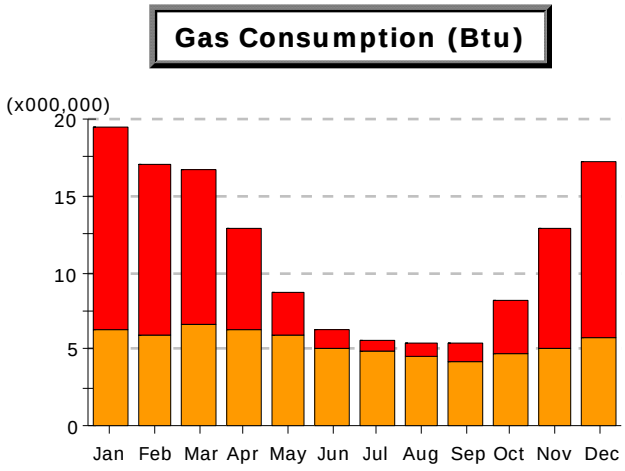
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.22	0.58	1.00	0.88	0.49	0.07	0.01	0.00	3.27
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.09	0.10	0.09	0.10	0.11	0.13	0.12	0.11	0.10	0.10	0.10	1.25
Pumps & Aux.	0.07	0.07	0.07	0.06	0.04	0.03	0.04	0.04	0.04	0.05	0.06	0.07	0.63
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.45	2.22	2.45	2.37	2.45	2.37	2.45	2.45	2.37	2.45	2.38	2.45	28.88
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.42	0.38	0.42	0.41	0.42	0.41	0.42	0.42	0.41	0.42	0.41	0.42	4.99
Total	3.05	2.75	3.05	2.95	3.24	3.52	4.03	3.92	3.42	3.09	2.96	3.05	39.03

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	12.95	10.95	9.79	6.30	2.76	1.11	0.78	0.81	1.16	3.22	7.67	11.21	68.70
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	4.96	4.73	5.28	5.04	4.69	4.09	3.82	3.60	3.38	3.75	3.96	4.55	51.86
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17.91	15.68	15.08	11.34	7.45	5.20	4.60	4.41	4.54	6.97	11.63	15.76	120.56





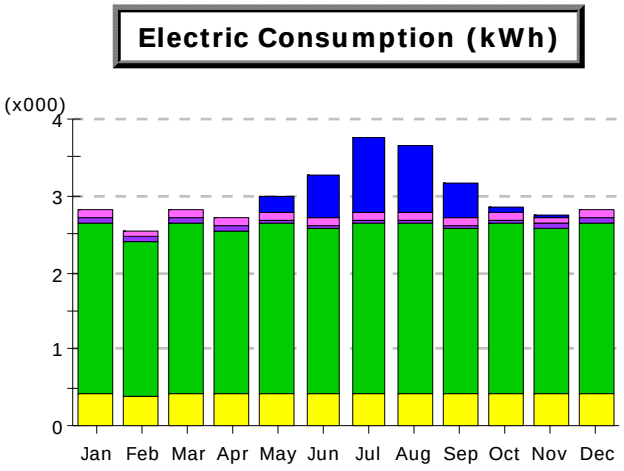


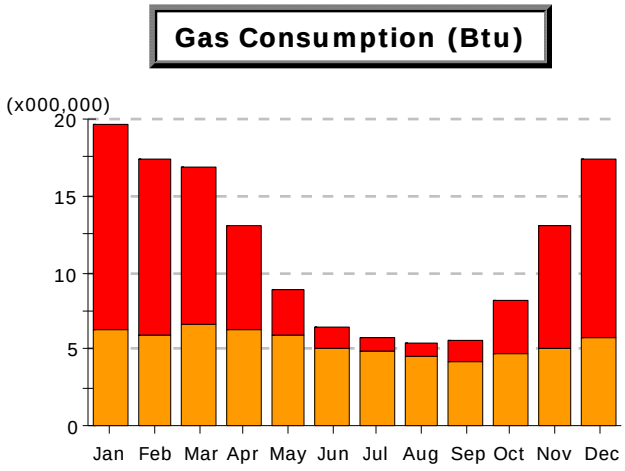
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.22	0.58	0.98	0.87	0.48	0.07	0.01	0.00	3.22
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.09	0.10	0.09	0.10	0.11	0.12	0.12	0.11	0.10	0.09	0.10	1.24
Pumps & Aux.	0.07	0.07	0.07	0.06	0.04	0.03	0.04	0.04	0.04	0.05	0.06	0.07	0.63
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.45	2.22	2.45	2.37	2.45	2.37	2.45	2.45	2.37	2.45	2.38	2.45	28.88
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.32	0.29	0.32	0.31	0.32	0.31	0.32	0.32	0.31	0.32	0.32	0.32	3.80
Total	2.95	2.66	2.95	2.86	3.14	3.41	3.92	3.80	3.31	2.99	2.86	2.95	37.78

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	13.24	11.21	10.06	6.53	2.91	1.20	0.82	0.86	1.22	3.40	7.94	11.49	70.87
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.21	5.91	6.61	6.31	5.87	5.12	4.79	4.53	4.25	4.71	4.97	5.70	64.97
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19.45	17.12	16.67	12.83	8.78	6.32	5.61	5.39	5.47	8.10	12.91	17.19	135.85





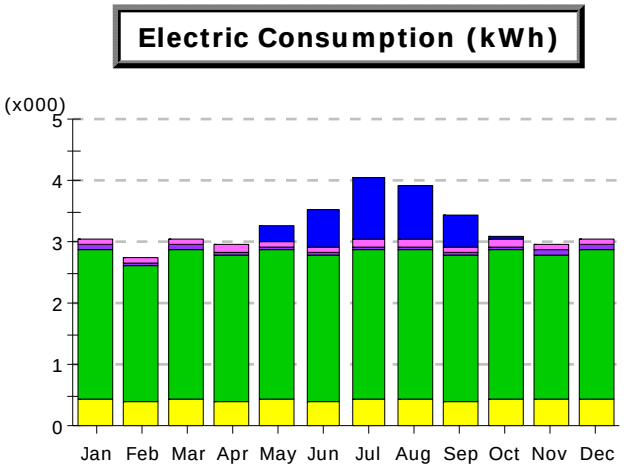


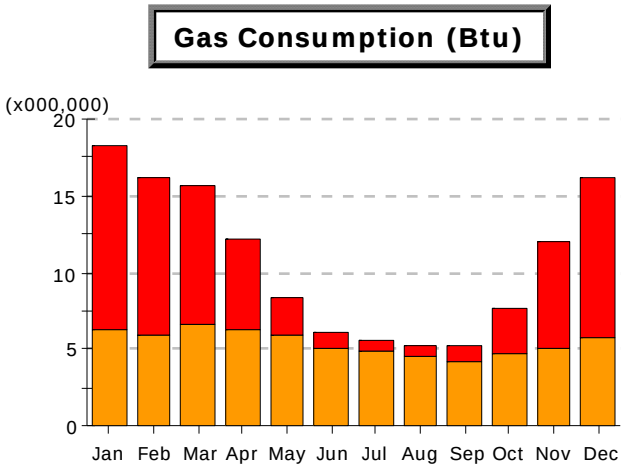
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.22	0.57	0.97	0.86	0.47	0.06	0.01	0.00	3.19
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.09	0.10	0.09	0.10	0.11	0.12	0.12	0.10	0.10	0.09	0.10	1.22
Pumps & Aux.	0.07	0.07	0.07	0.06	0.04	0.03	0.04	0.04	0.03	0.05	0.06	0.07	0.63
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.22	2.01	2.22	2.15	2.22	2.15	2.22	2.22	2.15	2.22	2.15	2.22	26.16
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.42	0.38	0.42	0.41	0.42	0.41	0.42	0.42	0.41	0.42	0.41	0.42	4.99
Total	2.82	2.54	2.82	2.73	3.00	3.27	3.77	3.66	3.17	2.85	2.74	2.82	36.19

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	13.46	11.41	10.26	6.69	3.02	1.27	0.90	0.91	1.29	3.50	8.10	11.70	72.49
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.21	5.91	6.61	6.31	5.87	5.12	4.79	4.53	4.25	4.71	4.97	5.70	64.98
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19.67	17.32	16.87	12.99	8.89	6.38	5.69	5.43	5.54	8.21	13.08	17.40	137.46





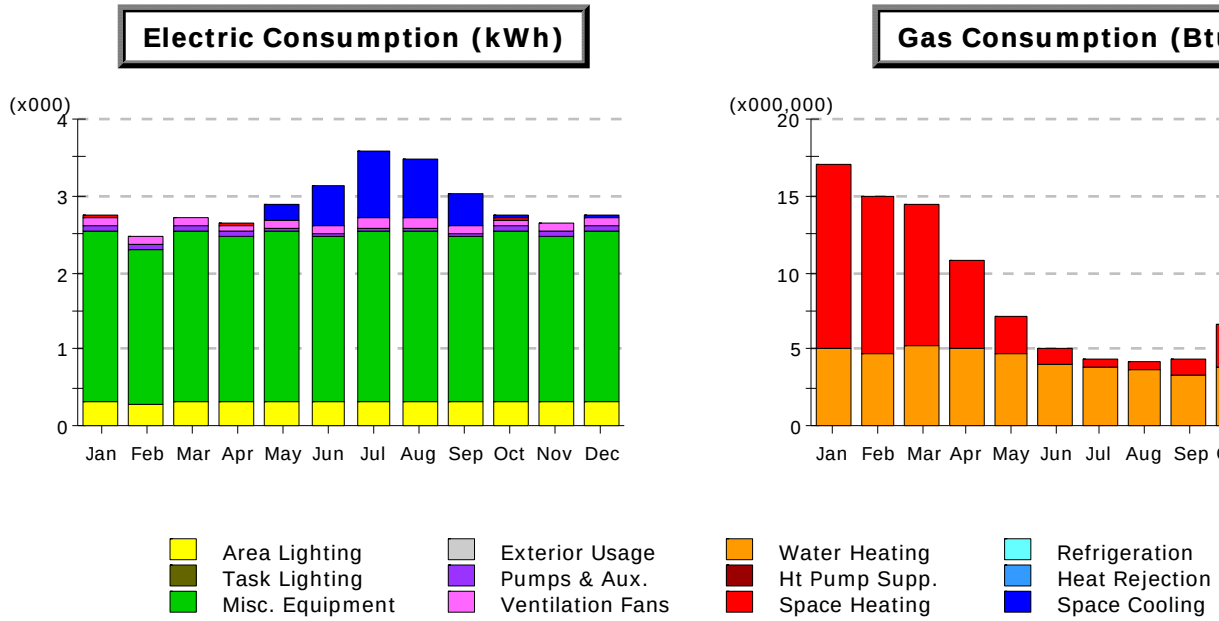


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.22	0.58	0.99	0.88	0.49	0.07	0.01	0.00	3.26
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.09	0.10	0.09	0.10	0.11	0.13	0.12	0.11	0.10	0.09	0.10	1.25
Pumps & Aux.	0.07	0.07	0.07	0.06	0.04	0.03	0.04	0.04	0.03	0.05	0.06	0.07	0.63
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.45	2.22	2.45	2.37	2.45	2.37	2.45	2.45	2.37	2.45	2.38	2.45	28.88
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.42	0.38	0.42	0.41	0.42	0.41	0.42	0.42	0.41	0.42	0.41	0.42	4.99
Total	3.05	2.75	3.05	2.95	3.24	3.52	4.03	3.91	3.42	3.09	2.96	3.05	39.01

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	12.06	10.19	9.10	5.81	2.51	1.02	0.72	0.74	1.03	2.88	7.07	10.41	63.56
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.21	5.91	6.61	6.31	5.87	5.12	4.79	4.53	4.25	4.71	4.97	5.70	64.97
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	18.27	16.10	15.71	12.11	8.39	6.14	5.52	5.27	5.28	7.59	12.04	16.11	128.52

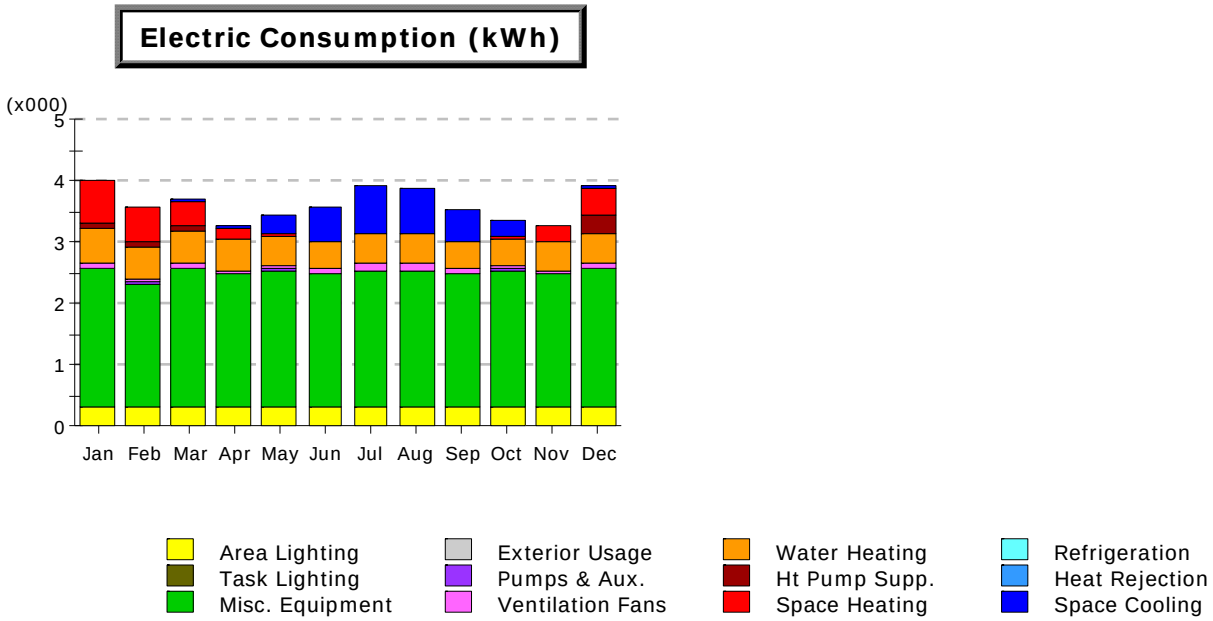


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.20	0.51	0.88	0.78	0.43	0.06	0.01	0.00	2.88
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.09
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.09	0.10	0.09	0.10	0.11	0.12	0.12	0.10	0.10	0.09	0.10	1.20
Pumps & Aux.	0.08	0.07	0.07	0.07	0.05	0.04	0.04	0.04	0.04	0.05	0.07	0.07	0.68
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.22	2.01	2.22	2.15	2.22	2.15	2.22	2.22	2.15	2.22	2.15	2.22	26.16
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.32	0.29	0.32	0.31	0.32	0.31	0.32	0.32	0.31	0.32	0.32	0.32	3.80
Total	2.73	2.47	2.73	2.64	2.89	3.13	3.58	3.48	3.04	2.76	2.65	2.73	34.82

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	12.12	10.23	9.08	5.77	2.44	0.89	0.58	0.59	0.90	2.84	7.05	10.46	62.96
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	4.96	4.73	5.28	5.04	4.69	4.09	3.82	3.60	3.38	3.75	3.96	4.55	51.86
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	17.08	14.96	14.36	10.81	7.14	4.98	4.40	4.20	4.28	6.59	11.01	15.01	114.83

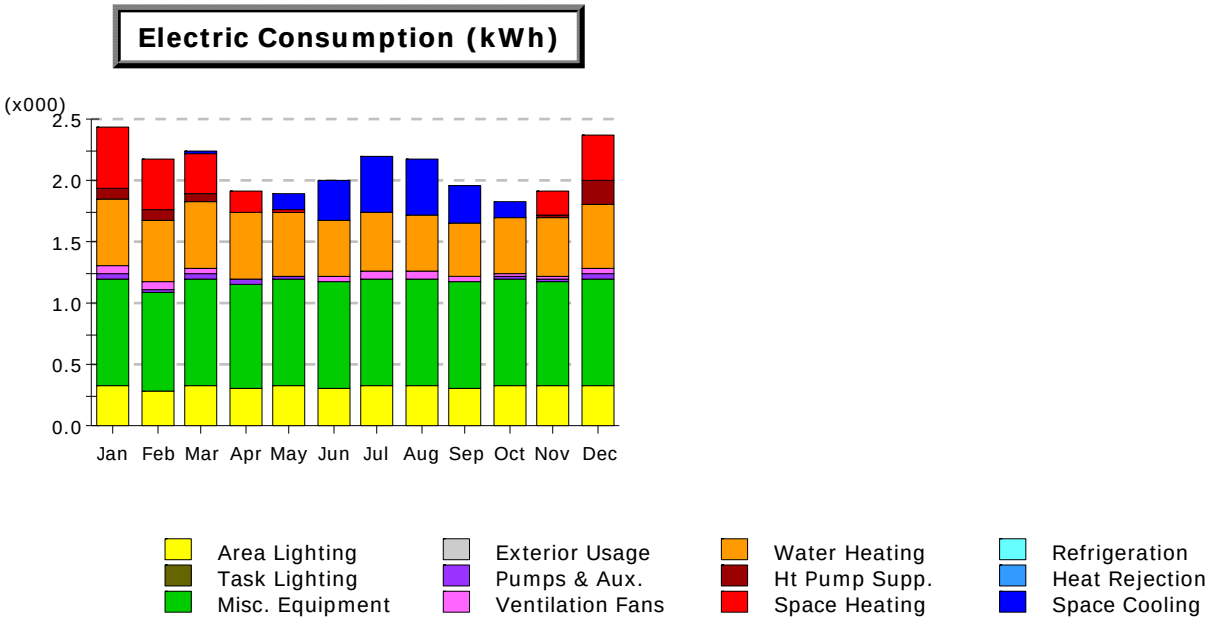


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.00	0.01	0.04	0.07	0.31	0.56	0.79	0.74	0.54	0.26	0.03	0.01	3.35
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.68	0.55	0.43	0.17	0.02	-	-	-	-	0.01	0.23	0.46	2.54
HP Supp.	0.12	0.11	0.06	0.01	0.00	-	-	-	-	0.00	0.02	0.28	0.60
Hot Water	0.53	0.49	0.54	0.52	0.51	0.47	0.47	0.46	0.44	0.47	0.47	0.51	5.86
Vent. Fans	0.09	0.07	0.05	0.02	0.05	0.08	0.12	0.11	0.08	0.04	0.03	0.06	0.81
Pumps & Aux.	0.03	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.22	2.01	2.22	2.15	2.22	2.15	2.22	2.22	2.15	2.22	2.15	2.22	26.16
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.32	0.29	0.32	0.31	0.32	0.31	0.32	0.32	0.31	0.32	0.32	0.32	3.80
Total	4.00	3.55	3.71	3.27	3.43	3.58	3.92	3.85	3.52	3.34	3.27	3.90	43.34

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

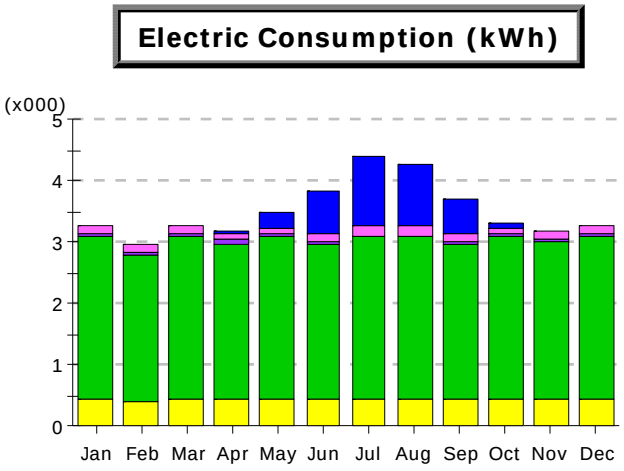


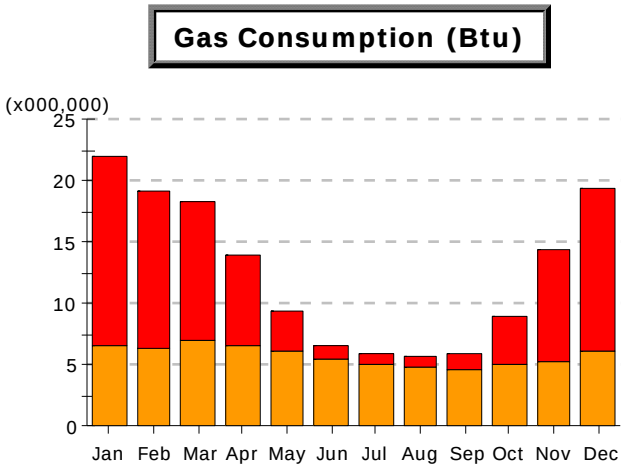
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.00	0.00	0.00	0.01	0.13	0.31	0.46	0.44	0.31	0.12	0.00	0.00	1.79
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.50	0.42	0.34	0.16	0.02	-	-	-	-	0.00	0.21	0.36	2.01
HP Supp.	0.09	0.08	0.05	0.01	0.00	-	-	-	-	-	0.02	0.20	0.46
Hot Water	0.54	0.50	0.55	0.53	0.51	0.47	0.47	0.46	0.44	0.47	0.47	0.51	5.92
Vent. Fans	0.07	0.05	0.04	0.02	0.02	0.05	0.07	0.07	0.05	0.02	0.02	0.05	0.51
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.88	0.79	0.88	0.85	0.88	0.85	0.88	0.88	0.85	0.88	0.85	0.88	10.36
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.32	0.29	0.32	0.31	0.32	0.31	0.32	0.32	0.31	0.32	0.32	0.32	3.80
Total	2.43	2.17	2.23	1.92	1.89	2.00	2.20	2.16	1.96	1.83	1.92	2.36	25.07

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													







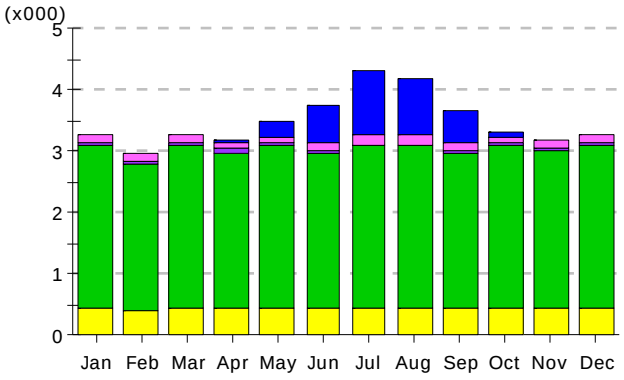
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.26	0.67	1.13	1.00	0.55	0.07	0.01	0.00	3.71
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.11	0.11	0.12	0.13	0.15	0.14	0.12	0.11	0.11	0.11	1.43
Pumps & Aux.	0.08	0.07	0.08	0.07	0.05	0.04	0.04	0.04	0.04	0.05	0.07	0.07	0.69
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.63	2.37	2.63	2.54	2.62	2.54	2.62	2.62	2.54	2.62	2.54	2.63	30.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.45	0.40	0.45	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.44	0.45	5.24
Total	3.26	2.94	3.26	3.16	3.49	3.81	4.38	4.25	3.68	3.31	3.17	3.26	41.98

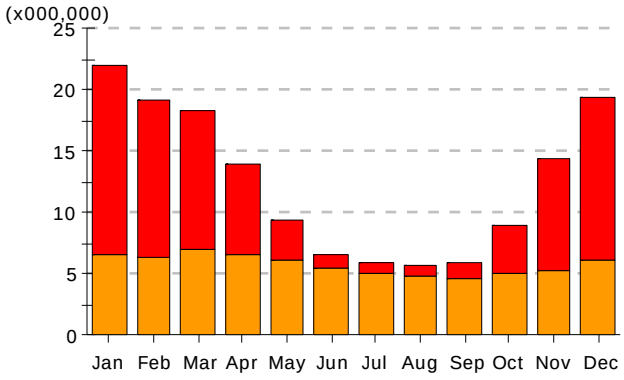
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	15.33	12.88	11.39	7.25	3.17	1.26	0.85	0.91	1.37	3.89	9.23	13.33	80.86
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.52	6.21	6.94	6.62	6.16	5.37	5.02	4.75	4.46	4.94	5.22	5.99	68.20
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	21.85	19.09	18.33	13.87	9.33	6.63	5.87	5.66	5.82	8.83	14.46	19.31	149.06

Electric Consumption (kWh)



Gas Consumption (Btu)





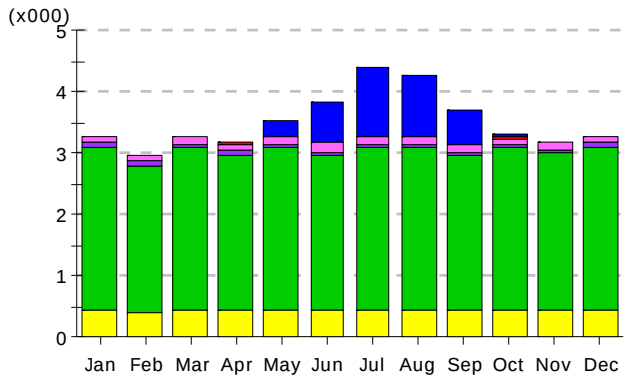
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.24	0.61	1.04	0.91	0.50	0.07	0.01	0.00	3.40
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.11	0.11	0.12	0.13	0.15	0.14	0.12	0.11	0.11	0.11	1.43
Pumps & Aux.	0.08	0.07	0.08	0.07	0.05	0.04	0.04	0.04	0.04	0.05	0.07	0.07	0.69
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.63	2.37	2.63	2.54	2.62	2.54	2.62	2.62	2.54	2.62	2.54	2.63	30.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.45	0.40	0.45	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.44	0.45	5.24
Total	3.26	2.94	3.26	3.16	3.47	3.76	4.29	4.16	3.64	3.30	3.17	3.26	41.67

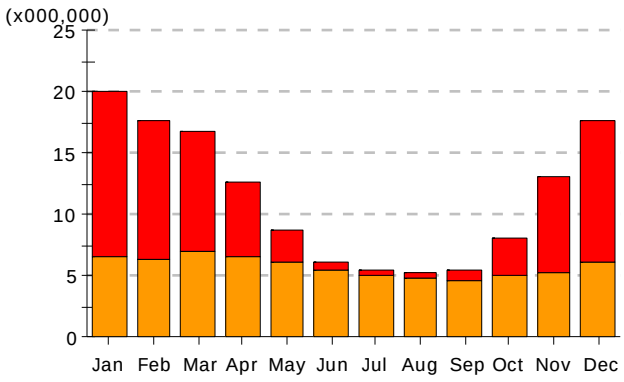
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	15.33	12.88	11.39	7.25	3.17	1.26	0.85	0.91	1.37	3.89	9.23	13.33	80.86
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.52	6.21	6.94	6.62	6.16	5.37	5.02	4.75	4.46	4.94	5.22	5.99	68.20
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	21.85	19.09	18.33	13.87	9.33	6.63	5.87	5.66	5.82	8.83	14.46	19.31	149.06

Electric Consumption (kWh)



Gas Consumption (Btu)



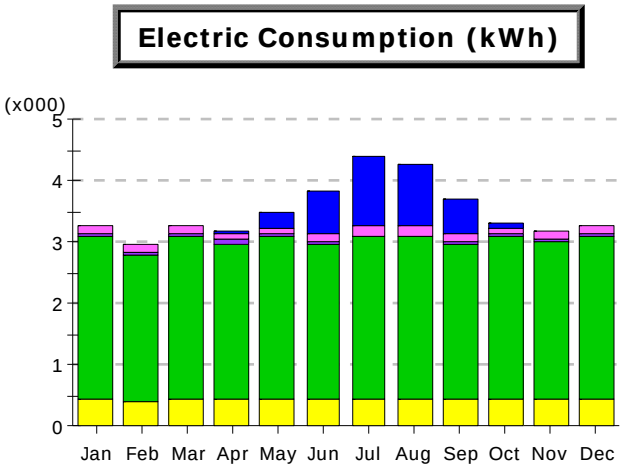


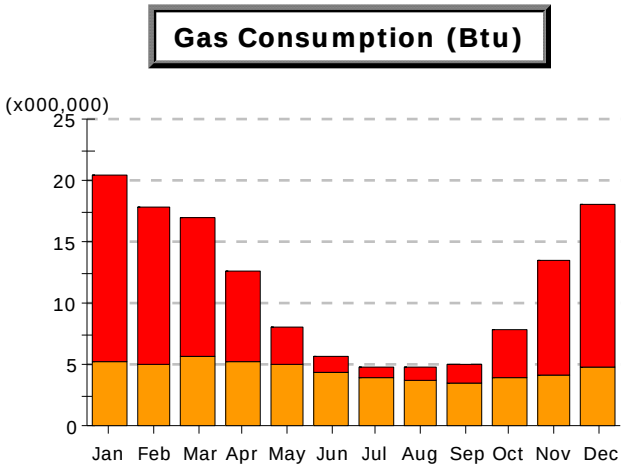
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.26	0.67	1.13	1.00	0.55	0.07	0.01	0.00	3.71
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.10
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.11	0.11	0.12	0.13	0.15	0.14	0.12	0.11	0.11	0.11	1.43
Pumps & Aux.	0.08	0.08	0.08	0.07	0.05	0.04	0.05	0.05	0.05	0.06	0.07	0.08	0.76
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.63	2.37	2.63	2.54	2.62	2.54	2.62	2.62	2.54	2.62	2.54	2.63	30.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.45	0.40	0.45	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.44	0.45	5.24
Total	3.28	2.96	3.28	3.18	3.50	3.82	4.39	4.25	3.69	3.32	3.18	3.28	42.14

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	13.54	11.33	9.85	6.05	2.44	0.83	0.49	0.54	0.90	3.04	7.82	11.67	68.49
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.52	6.21	6.94	6.62	6.16	5.37	5.02	4.75	4.46	4.94	5.22	5.99	68.20
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	20.06	17.54	16.78	12.67	8.61	6.19	5.51	5.29	5.36	7.98	13.04	17.65	136.69





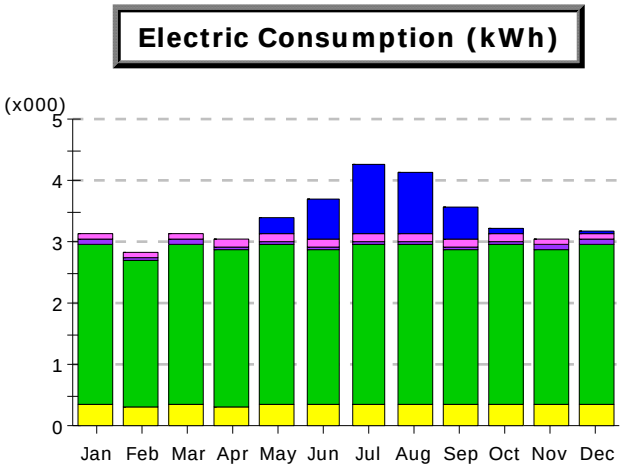


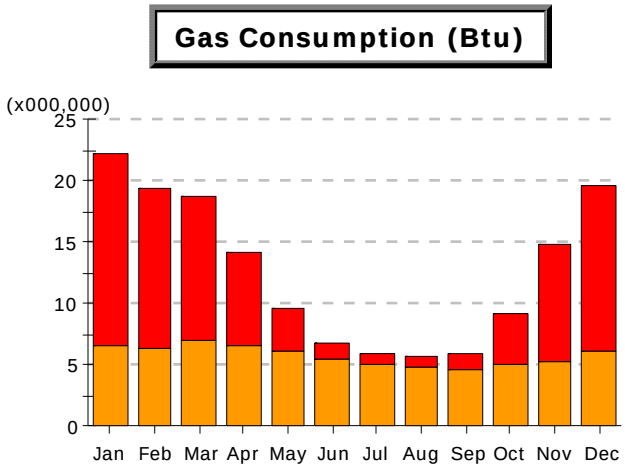
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.26	0.67	1.13	1.00	0.55	0.07	0.01	0.00	3.71
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.11	0.11	0.12	0.13	0.15	0.14	0.12	0.11	0.11	0.11	1.43
Pumps & Aux.	0.08	0.07	0.08	0.07	0.05	0.04	0.04	0.04	0.04	0.05	0.07	0.07	0.69
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.63	2.37	2.63	2.54	2.62	2.54	2.62	2.62	2.54	2.62	2.54	2.63	30.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.45	0.40	0.45	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.44	0.45	5.24
Total	3.26	2.94	3.26	3.16	3.49	3.81	4.38	4.25	3.68	3.31	3.17	3.26	41.98

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	15.33	12.88	11.39	7.25	3.17	1.26	0.85	0.91	1.37	3.89	9.23	13.33	80.86
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.21	4.96	5.55	5.30	4.93	4.29	4.01	3.79	3.55	3.94	4.16	4.78	54.47
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	20.54	17.85	16.94	12.55	8.10	5.55	4.86	4.70	4.92	7.83	13.40	18.10	135.33





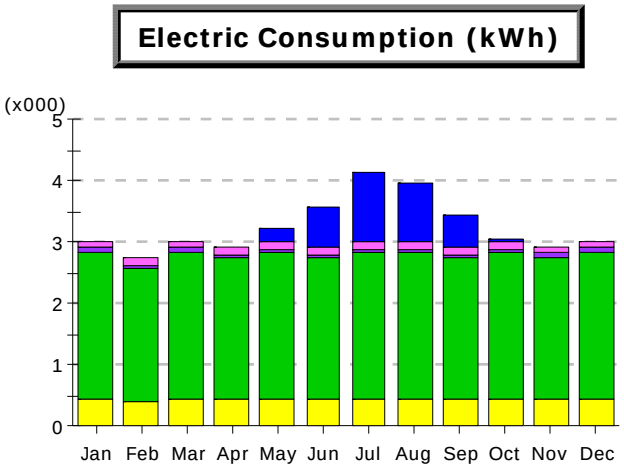


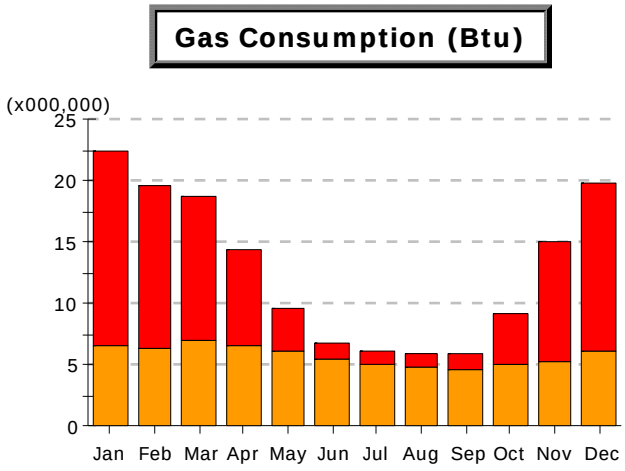
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.25	0.66	1.11	0.98	0.54	0.07	0.01	0.00	3.66
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.11	0.11	0.12	0.13	0.15	0.14	0.12	0.11	0.11	0.11	1.41
Pumps & Aux.	0.08	0.07	0.08	0.07	0.05	0.04	0.04	0.04	0.04	0.05	0.07	0.07	0.69
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.63	2.37	2.63	2.54	2.62	2.54	2.62	2.62	2.54	2.62	2.54	2.63	30.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.34	0.31	0.34	0.32	0.34	0.33	0.34	0.34	0.33	0.34	0.33	0.34	3.99
Total	3.15	2.85	3.15	3.06	3.38	3.70	4.26	4.12	3.57	3.20	3.06	3.15	40.66

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	15.64	13.15	11.68	7.49	3.32	1.33	0.91	0.97	1.44	4.10	9.50	13.62	83.16
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.52	6.21	6.94	6.62	6.16	5.37	5.02	4.75	4.46	4.94	5.22	5.99	68.20
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	22.16	19.36	18.61	14.11	9.49	6.70	5.94	5.72	5.90	9.04	14.73	19.61	151.36





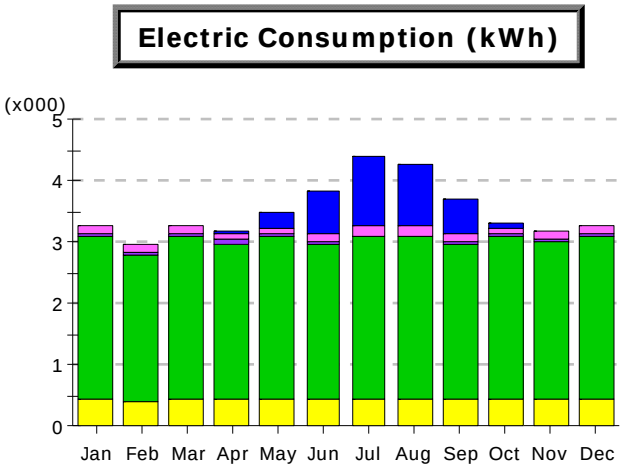


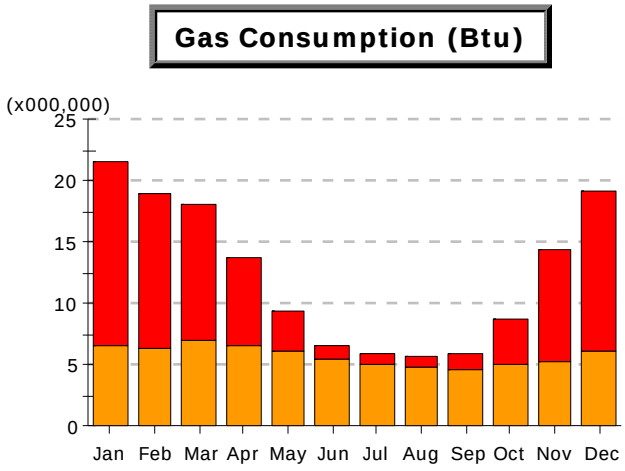
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.25	0.65	1.10	0.97	0.53	0.07	0.01	0.00	3.62
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.11	0.11	0.12	0.13	0.14	0.14	0.12	0.11	0.11	0.11	1.39
Pumps & Aux.	0.08	0.07	0.08	0.07	0.05	0.04	0.04	0.04	0.04	0.05	0.07	0.07	0.69
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.38	2.15	2.38	2.30	2.38	2.31	2.38	2.38	2.31	2.38	2.31	2.38	28.05
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.45	0.40	0.45	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.44	0.45	5.24
Total	3.01	2.72	3.01	2.92	3.24	3.56	4.11	3.97	3.43	3.06	2.93	3.02	38.99

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	15.86	13.34	11.86	7.68	3.43	1.40	0.96	1.03	1.51	4.24	9.69	13.84	84.83
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.52	6.21	6.94	6.62	6.16	5.37	5.02	4.75	4.46	4.94	5.22	5.99	68.20
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	22.38	19.55	18.80	14.30	9.59	6.77	5.98	5.77	5.97	9.18	14.91	19.82	153.03







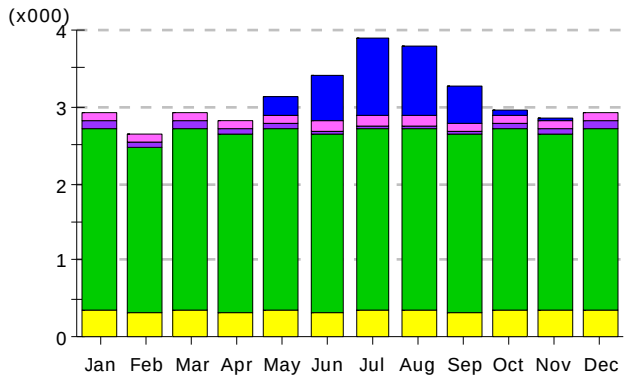
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.26	0.67	1.13	0.99	0.54	0.07	0.01	0.00	3.70
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.11	0.11	0.12	0.13	0.15	0.14	0.12	0.11	0.11	0.11	1.42
Pumps & Aux.	0.08	0.07	0.08	0.07	0.05	0.04	0.04	0.04	0.04	0.05	0.07	0.07	0.69
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.63	2.37	2.63	2.54	2.62	2.54	2.62	2.62	2.54	2.62	2.54	2.63	30.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.45	0.40	0.45	0.43	0.44	0.43	0.44	0.44	0.43	0.44	0.44	0.45	5.24
Total	3.26	2.94	3.26	3.16	3.49	3.81	4.38	4.24	3.68	3.31	3.17	3.26	41.96

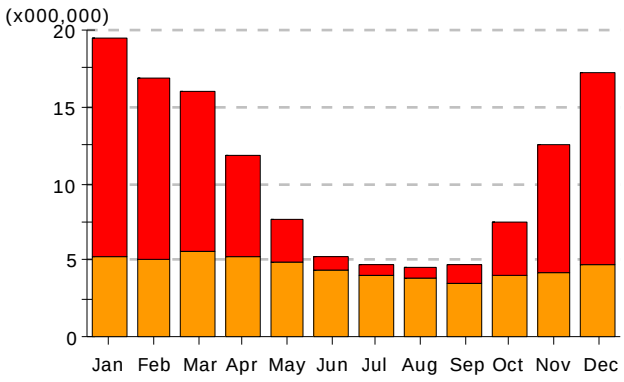
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	15.02	12.62	11.14	7.08	3.08	1.21	0.81	0.89	1.31	3.77	9.02	13.05	78.99
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	6.52	6.21	6.94	6.62	6.16	5.37	5.02	4.75	4.46	4.94	5.22	5.99	68.20
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	21.54	18.83	18.08	13.70	9.24	6.58	5.84	5.63	5.76	8.71	14.24	19.04	147.19

Electric Consumption (kWh)



Gas Consumption (Btu)



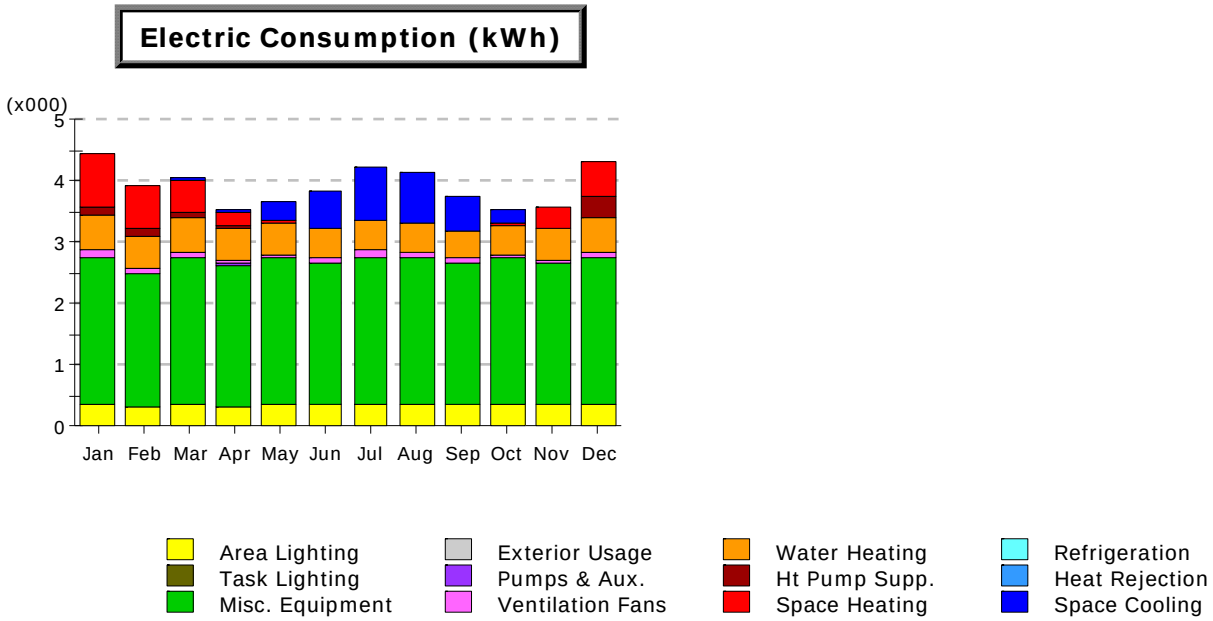


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.02	0.23	0.59	1.00	0.88	0.48	0.07	0.01	0.00	3.26
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.10
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.11	0.11	0.12	0.13	0.14	0.13	0.12	0.11	0.11	0.11	1.37
Pumps & Aux.	0.08	0.07	0.08	0.07	0.05	0.04	0.04	0.04	0.04	0.06	0.07	0.08	0.75
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.38	2.15	2.38	2.30	2.38	2.31	2.38	2.38	2.31	2.38	2.31	2.38	28.05
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.34	0.31	0.34	0.32	0.34	0.33	0.34	0.34	0.33	0.34	0.33	0.34	3.99
Total	2.93	2.64	2.92	2.83	3.12	3.40	3.90	3.78	3.28	2.96	2.84	2.93	37.52

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	14.28	11.97	10.49	6.59	2.76	0.99	0.61	0.66	1.07	3.46	8.44	12.38	73.70
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	5.21	4.96	5.55	5.30	4.93	4.29	4.01	3.79	3.55	3.94	4.16	4.78	54.47
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19.49	16.93	16.04	11.89	7.69	5.28	4.62	4.44	4.62	7.40	12.60	17.16	128.18

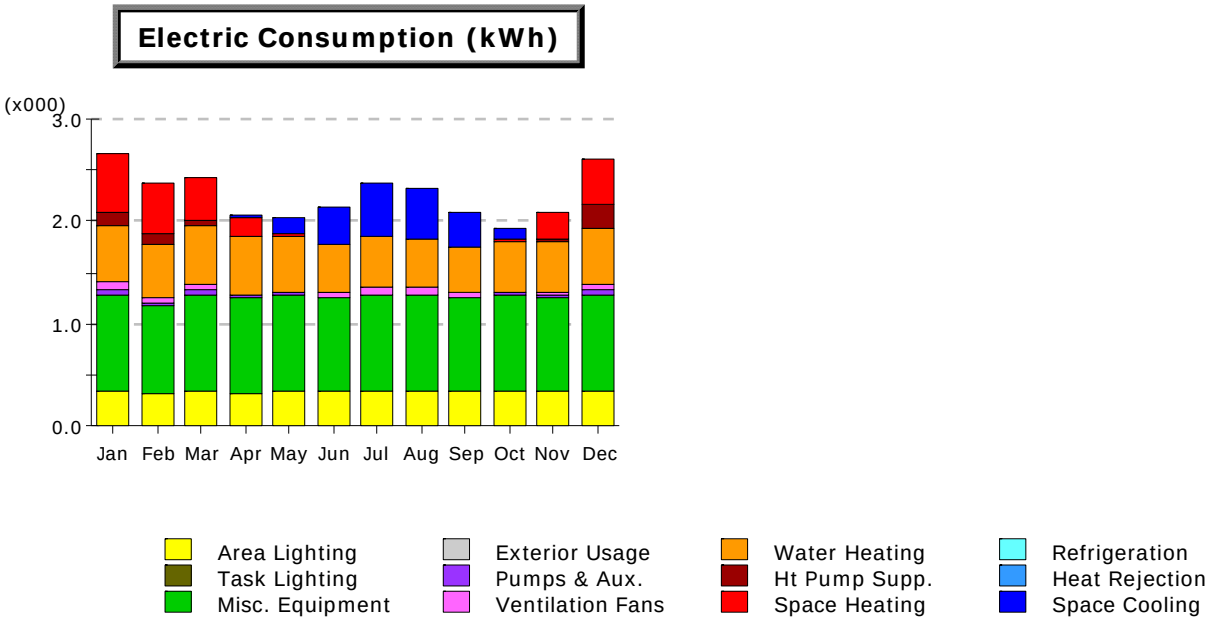


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.00	0.00	0.04	0.07	0.33	0.63	0.88	0.81	0.57	0.26	0.02	0.01	3.62
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.85	0.68	0.54	0.22	0.03	-	-	-	-	0.03	0.33	0.60	3.28
HP Supp.	0.15	0.13	0.08	0.01	0.00	-	-	-	-	0.00	0.03	0.34	0.75
Hot Water	0.56	0.52	0.57	0.54	0.53	0.48	0.48	0.47	0.45	0.48	0.49	0.54	6.13
Vent. Fans	0.11	0.09	0.07	0.03	0.05	0.09	0.13	0.12	0.09	0.04	0.03	0.08	0.94
Pumps & Aux.	0.03	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.38	2.15	2.38	2.30	2.38	2.31	2.38	2.38	2.31	2.38	2.31	2.38	28.05
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.34	0.31	0.34	0.32	0.34	0.33	0.34	0.34	0.33	0.34	0.33	0.34	3.99
Total	4.43	3.92	4.06	3.54	3.66	3.84	4.21	4.12	3.74	3.54	3.58	4.32	46.97

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

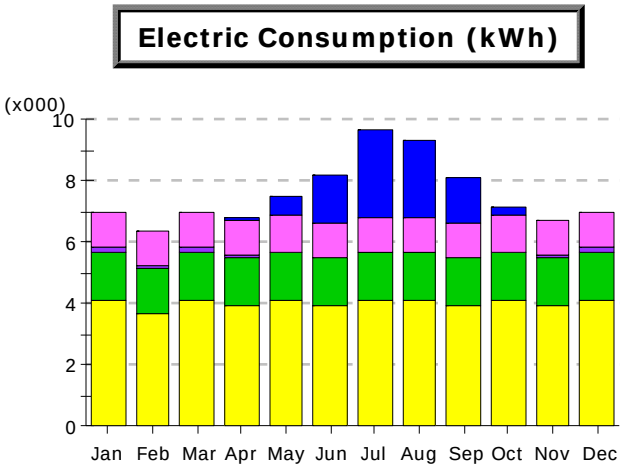


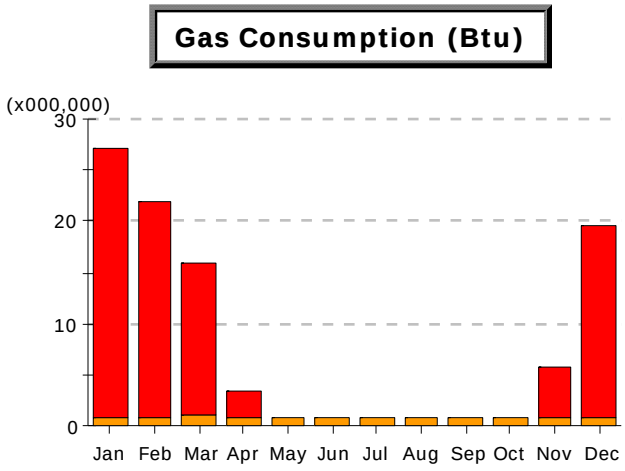
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.00	0.00	0.01	0.01	0.15	0.35	0.52	0.48	0.33	0.11	0.00	0.00	1.98
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.59	0.49	0.40	0.19	0.02	-	-	-	-	0.01	0.27	0.44	2.42
HP Supp.	0.11	0.10	0.07	0.01	0.00	-	-	-	-	0.00	0.03	0.24	0.56
Hot Water	0.56	0.52	0.58	0.55	0.53	0.49	0.48	0.47	0.45	0.49	0.49	0.54	6.16
Vent. Fans	0.08	0.07	0.05	0.02	0.02	0.05	0.08	0.07	0.05	0.02	0.03	0.06	0.61
Pumps & Aux.	0.03	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.95	0.86	0.95	0.92	0.95	0.92	0.95	0.95	0.92	0.95	0.92	0.95	11.17
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.34	0.31	0.34	0.32	0.34	0.33	0.34	0.34	0.33	0.34	0.33	0.34	3.99
Total	2.67	2.38	2.42	2.06	2.02	2.14	2.37	2.32	2.08	1.93	2.10	2.60	27.09

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													





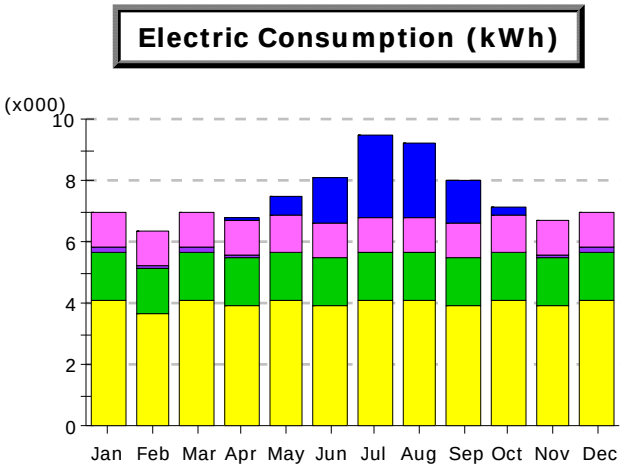


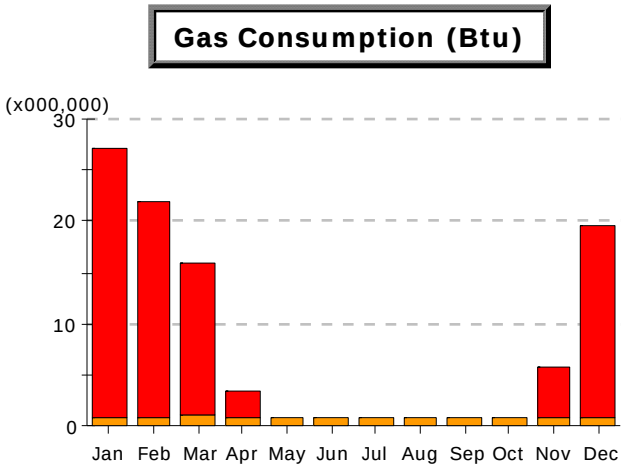
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	0.64	1.61	2.80	2.51	1.47	0.26	0.00	-	9.33
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.17	1.06	1.17	1.13	1.17	1.13	1.17	1.17	1.13	1.17	1.13	1.17	13.76
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.56	1.41	1.56	1.51	1.56	1.51	1.56	1.56	1.51	1.56	1.51	1.56	18.40
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.07	3.68	4.07	3.94	4.07	3.94	4.07	4.07	3.94	4.07	3.94	4.07	47.96
Total	6.99	6.31	6.98	6.77	7.47	8.20	9.61	9.32	8.06	7.12	6.74	6.98	90.53

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	26.16	21.19	14.96	2.50	0.05	-	-	-	-	-	5.10	18.67	88.64
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.90	0.84	0.93	0.88	0.85	0.77	0.74	0.71	0.69	0.74	0.77	0.85	9.67
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	27.06	22.03	15.89	3.39	0.90	0.77	0.74	0.71	0.69	0.74	5.86	19.52	98.31







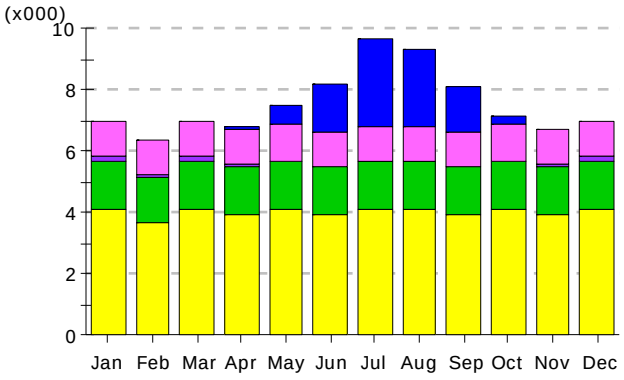
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	0.60	1.53	2.66	2.38	1.39	0.24	0.00	-	8.85
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.17	1.06	1.17	1.13	1.17	1.13	1.17	1.17	1.13	1.17	1.13	1.17	13.76
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.56	1.41	1.56	1.51	1.56	1.51	1.56	1.56	1.51	1.56	1.51	1.56	18.40
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.07	3.68	4.07	3.94	4.07	3.94	4.07	4.07	3.94	4.07	3.94	4.07	47.96
Total	6.99	6.31	6.98	6.77	7.44	8.11	9.46	9.19	7.98	7.11	6.74	6.98	90.05

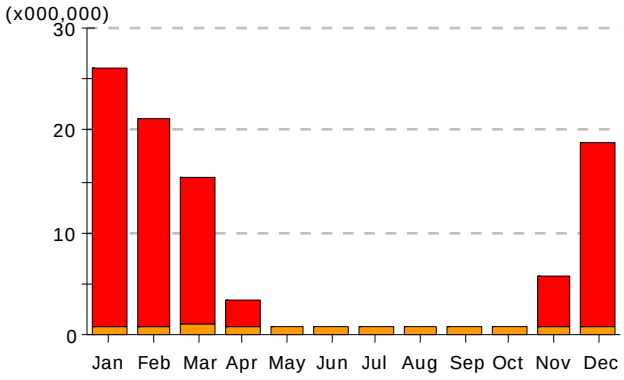
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	26.16	21.19	14.96	2.50	0.05	-	-	-	-	-	5.10	18.67	88.64
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.90	0.84	0.93	0.88	0.85	0.77	0.74	0.71	0.69	0.74	0.77	0.85	9.67
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	27.06	22.03	15.89	3.39	0.90	0.77	0.74	0.71	0.69	0.74	5.86	19.52	98.31

Electric Consumption (kWh)



Gas Consumption (Btu)



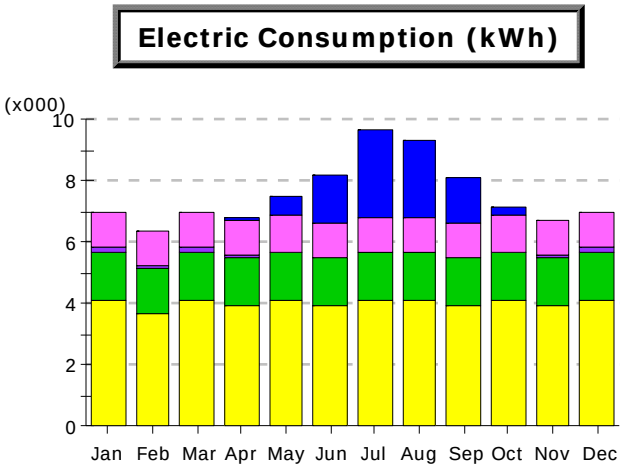


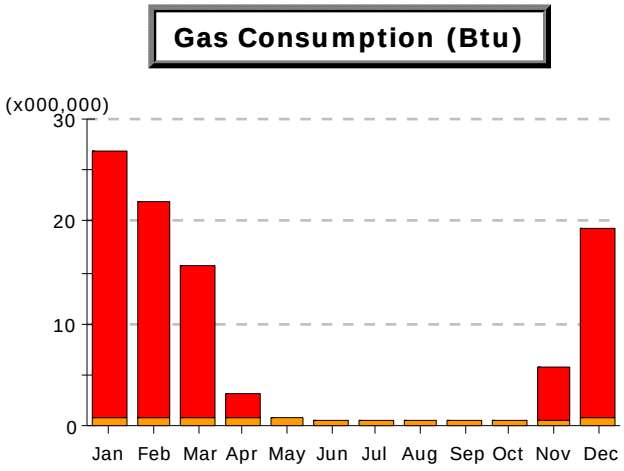
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	0.64	1.61	2.80	2.51	1.47	0.26	0.00	-	9.33
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.17	1.06	1.17	1.13	1.17	1.13	1.17	1.17	1.13	1.17	1.13	1.17	13.76
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.56	1.41	1.56	1.51	1.56	1.51	1.56	1.56	1.51	1.56	1.51	1.56	18.40
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.07	3.68	4.07	3.94	4.07	3.94	4.07	4.07	3.94	4.07	3.94	4.07	47.96
Total	6.99	6.31	6.98	6.77	7.47	8.20	9.61	9.32	8.06	7.12	6.74	6.98	90.53

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	25.11	20.34	14.35	2.40	0.05	-	-	-	-	-	4.89	17.92	85.05
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.90	0.84	0.93	0.88	0.85	0.77	0.74	0.71	0.69	0.74	0.77	0.85	9.67
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	26.01	21.18	15.28	3.28	0.90	0.77	0.74	0.71	0.69	0.74	5.66	18.77	94.72





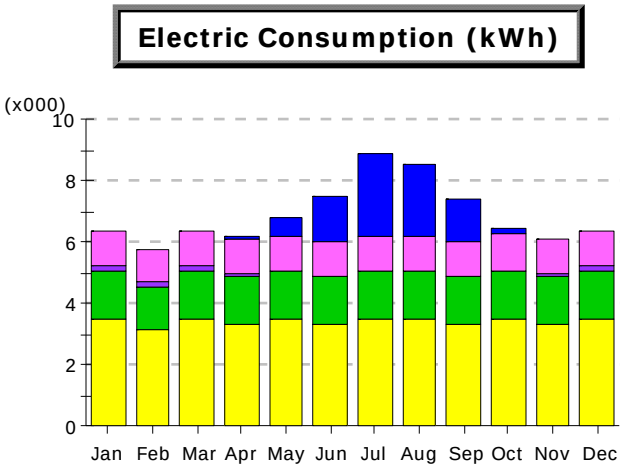


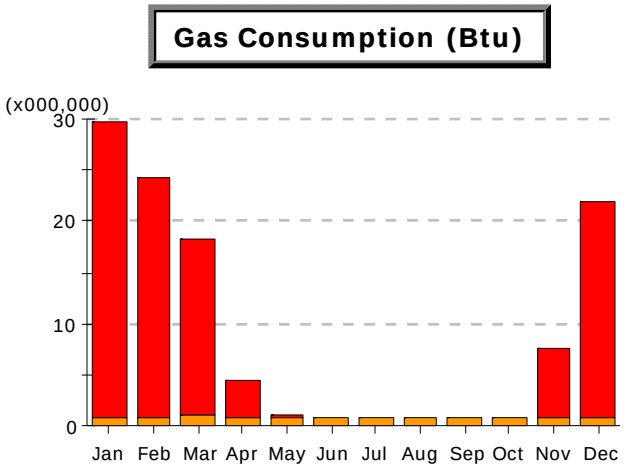
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	0.64	1.61	2.80	2.51	1.47	0.26	0.00	-	9.33
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.17	1.06	1.17	1.13	1.17	1.13	1.17	1.17	1.13	1.17	1.13	1.17	13.76
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.56	1.41	1.56	1.51	1.56	1.51	1.56	1.56	1.51	1.56	1.51	1.56	18.40
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.07	3.68	4.07	3.94	4.07	3.94	4.07	4.07	3.94	4.07	3.94	4.07	47.96
Total	6.99	6.31	6.98	6.77	7.47	8.20	9.61	9.32	8.06	7.12	6.74	6.98	90.53

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	26.16	21.19	14.96	2.50	0.05	-	-	-	-	-	5.10	18.67	88.64
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.75	0.70	0.77	0.74	0.71	0.64	0.62	0.59	0.57	0.61	0.63	0.70	8.02
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	26.91	21.89	15.73	3.24	0.76	0.64	0.62	0.59	0.57	0.61	5.73	19.37	96.65





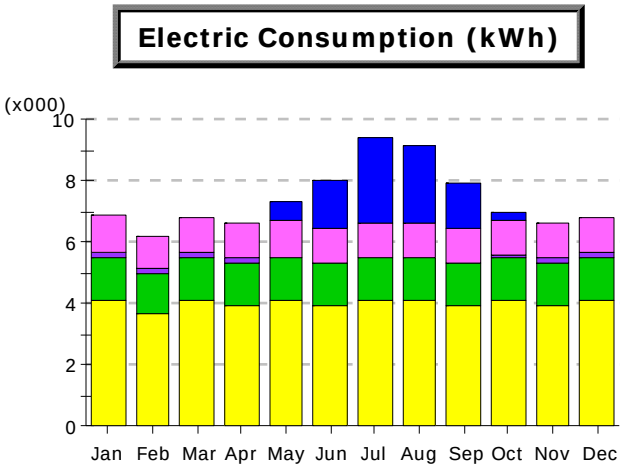


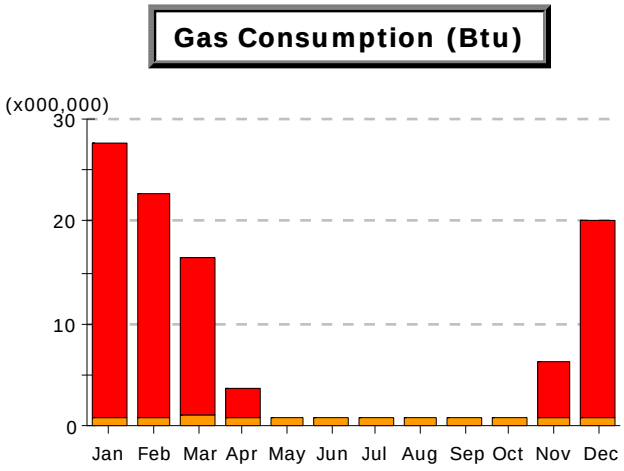
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.03	0.60	1.53	2.67	2.40	1.40	0.24	0.00	-	8.87
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.16	1.05	1.16	1.12	1.16	1.12	1.16	1.16	1.12	1.16	1.12	1.16	13.63
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.56	1.41	1.56	1.51	1.56	1.51	1.56	1.56	1.51	1.56	1.51	1.56	18.40
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	3.44	3.11	3.44	3.33	3.44	3.33	3.44	3.44	3.33	3.44	3.33	3.44	40.53
Total	6.34	5.73	6.34	6.13	6.79	7.50	8.84	8.56	7.37	6.46	6.11	6.33	82.52

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	28.82	23.53	17.23	3.67	0.13	-	-	-	-	-	6.71	21.09	101.17
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.90	0.84	0.93	0.88	0.85	0.77	0.74	0.71	0.69	0.74	0.77	0.85	9.67
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	29.72	24.37	18.16	4.55	0.98	0.77	0.74	0.71	0.69	0.74	7.47	21.93	110.84





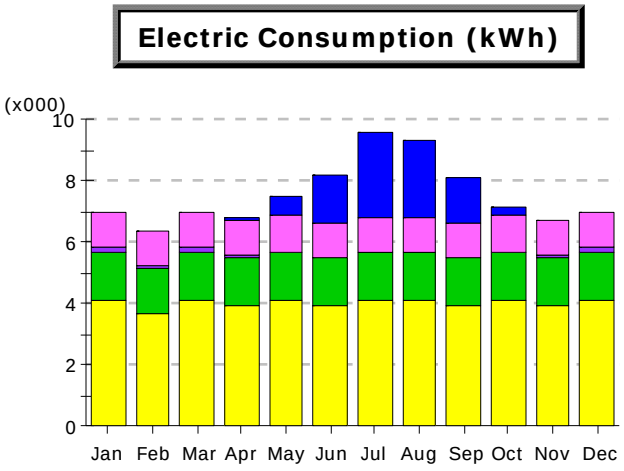


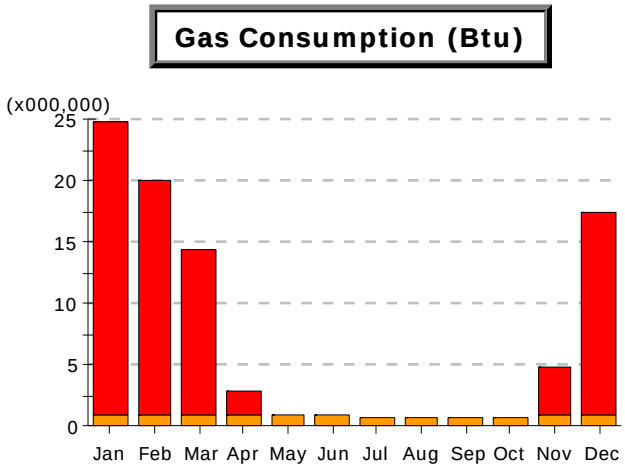
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	0.63	1.59	2.77	2.49	1.45	0.25	0.00	-	9.22
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.17	1.05	1.17	1.13	1.17	1.13	1.17	1.17	1.13	1.17	1.13	1.17	13.73
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.41	1.27	1.41	1.36	1.41	1.36	1.41	1.41	1.36	1.41	1.36	1.41	16.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.07	3.68	4.07	3.94	4.07	3.94	4.07	4.07	3.94	4.07	3.94	4.07	47.96
Total	6.83	6.17	6.82	6.61	7.30	8.02	9.42	9.13	7.89	6.96	6.58	6.82	88.55

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	26.81	21.75	15.49	2.77	0.06	-	-	-	-	-	5.49	19.27	91.64
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.90	0.84	0.93	0.88	0.85	0.77	0.74	0.71	0.69	0.74	0.77	0.85	9.67
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	27.71	22.59	16.42	3.66	0.91	0.77	0.74	0.71	0.69	0.74	6.25	20.12	101.31





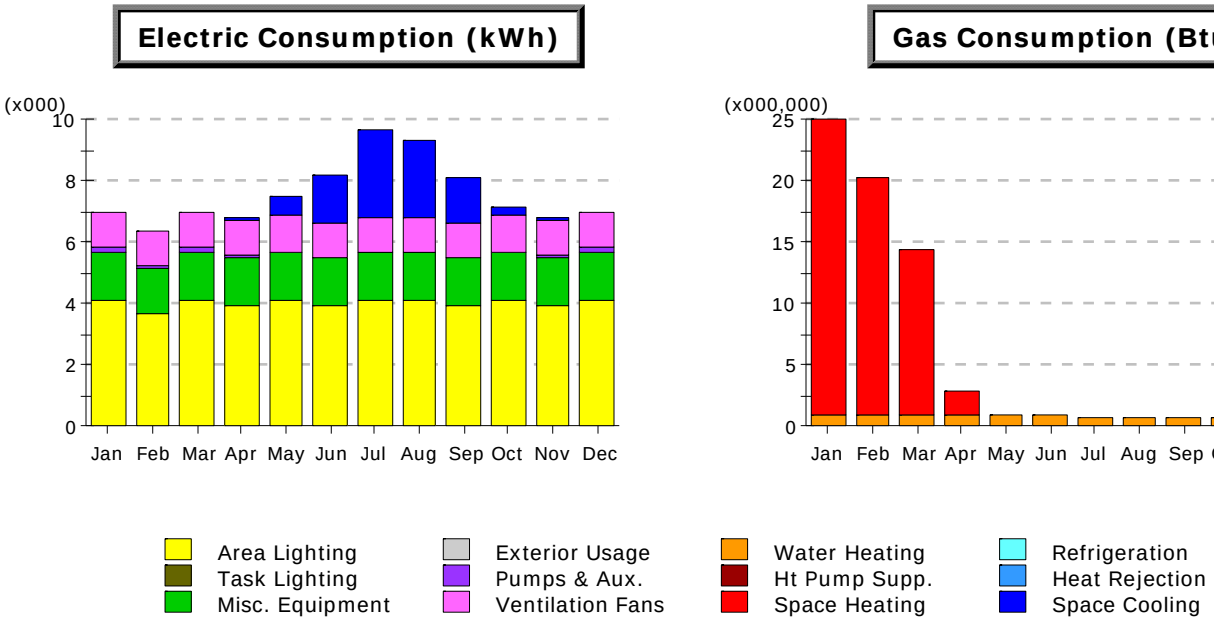


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	0.64	1.61	2.80	2.52	1.48	0.26	0.00	-	9.35
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.17	1.06	1.17	1.13	1.17	1.13	1.17	1.17	1.13	1.17	1.13	1.17	13.76
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.56	1.41	1.56	1.51	1.56	1.51	1.56	1.56	1.51	1.56	1.51	1.56	18.40
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.07	3.68	4.07	3.94	4.07	3.94	4.07	4.07	3.94	4.07	3.94	4.07	47.96
Total	6.99	6.31	6.98	6.77	7.48	8.20	9.61	9.32	8.06	7.12	6.74	6.98	90.56

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	23.85	19.23	13.31	1.89	0.03	-	-	-	-	-	4.06	16.62	78.99
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.90	0.84	0.93	0.88	0.85	0.77	0.74	0.71	0.69	0.74	0.77	0.85	9.67
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	24.75	20.07	14.24	2.77	0.88	0.77	0.74	0.71	0.69	0.74	4.83	17.47	88.65

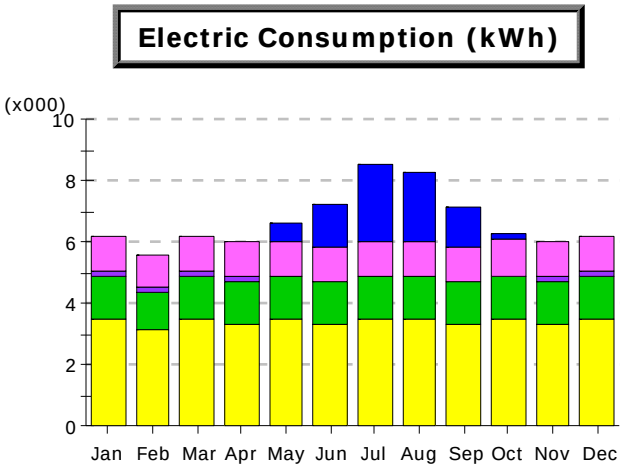


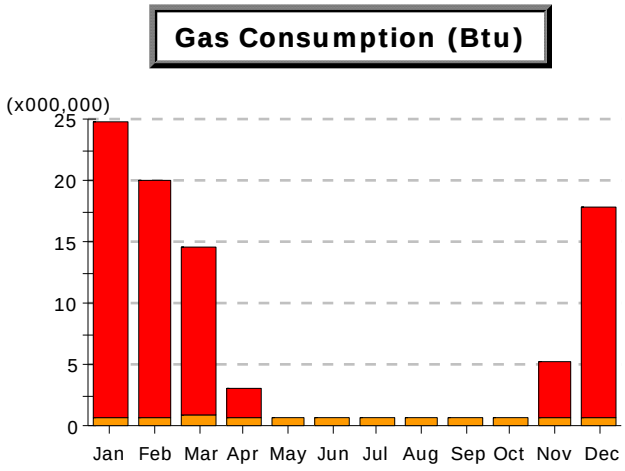
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.04	0.65	1.62	2.81	2.52	1.48	0.26	0.00	-	9.38
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.17	1.06	1.17	1.13	1.17	1.13	1.17	1.17	1.13	1.17	1.13	1.17	13.79
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.56	1.41	1.56	1.51	1.56	1.51	1.56	1.56	1.51	1.56	1.51	1.56	18.40
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.07	3.68	4.07	3.94	4.07	3.94	4.07	4.07	3.94	4.07	3.94	4.07	47.96
Total	6.99	6.32	6.98	6.78	7.48	8.21	9.61	9.33	8.07	7.13	6.74	6.98	90.61

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	24.10	19.27	13.34	1.89	0.03	-	-	-	-	-	4.10	16.76	79.49
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.90	0.84	0.93	0.88	0.85	0.77	0.74	0.71	0.69	0.74	0.77	0.85	9.67
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	25.00	20.11	14.27	2.77	0.88	0.77	0.74	0.71	0.69	0.74	4.86	17.61	89.16





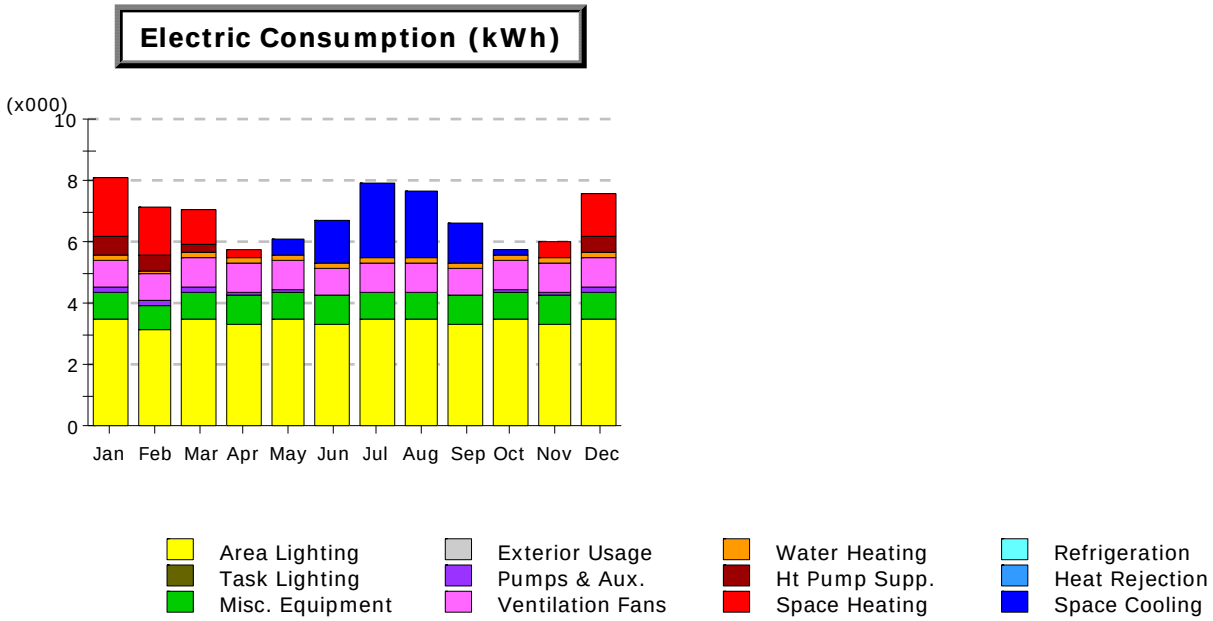


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.03	0.57	1.45	2.50	2.26	1.33	0.23	0.00	-	8.37
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.16	1.05	1.16	1.12	1.16	1.12	1.16	1.16	1.12	1.16	1.12	1.16	13.64
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.41	1.27	1.41	1.36	1.41	1.36	1.41	1.41	1.36	1.41	1.36	1.41	16.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	3.44	3.11	3.44	3.33	3.44	3.33	3.44	3.44	3.33	3.44	3.33	3.44	40.53
Total	6.19	5.59	6.18	5.99	6.61	7.26	8.51	8.26	7.14	6.30	5.96	6.18	80.18

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	23.98	19.31	13.84	2.38	0.05	-	-	-	-	-	4.65	17.07	81.28
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.75	0.70	0.77	0.74	0.71	0.64	0.62	0.59	0.57	0.61	0.63	0.70	8.02
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	24.73	20.01	14.62	3.11	0.76	0.64	0.62	0.59	0.57	0.61	5.28	17.77	89.30



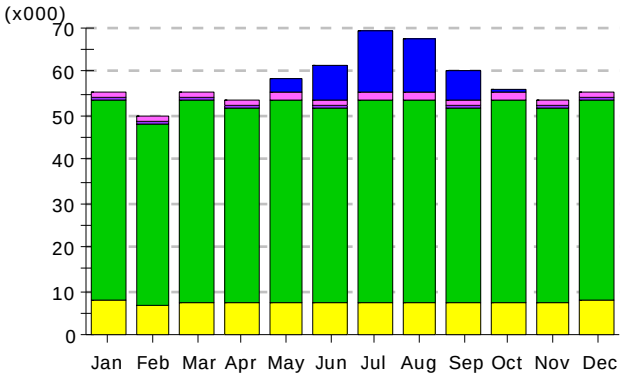
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.02	0.53	1.38	2.39	2.15	1.26	0.22	0.00	-	7.95
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.91	1.55	1.19	0.26	0.01	-	-	-	-	-	0.47	1.33	6.72
HP Supp.	0.59	0.49	0.26	0.02	-	-	-	-	-	-	0.05	0.60	2.01
Hot Water	0.17	0.16	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.17	1.98
Vent. Fans	0.95	0.86	0.95	0.92	0.95	0.92	0.95	0.95	0.92	0.95	0.92	0.95	11.19
Pumps & Aux.	0.10	0.10	0.12	0.13	0.03	-	-	-	0.00	0.06	0.13	0.11	0.78
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.94	0.85	0.94	0.91	0.94	0.91	0.94	0.94	0.91	0.94	0.91	0.94	11.04
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	3.44	3.11	3.44	3.33	3.44	3.33	3.44	3.44	3.33	3.44	3.33	3.44	40.53
Total	8.10	7.11	7.07	5.75	6.07	6.69	7.88	7.65	6.58	5.78	5.97	7.55	82.20

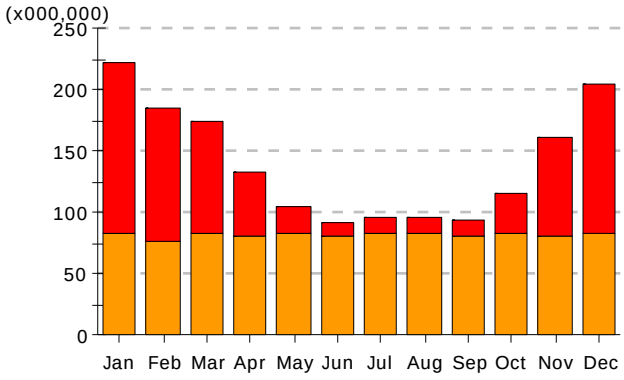
Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

Electric Consumption (kWh)



Gas Consumption (Btu)



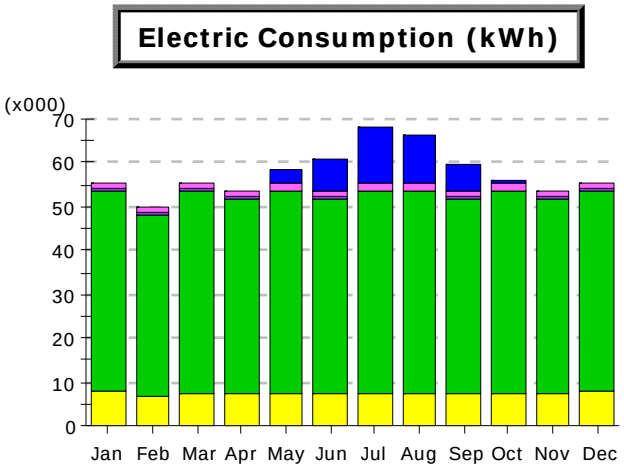


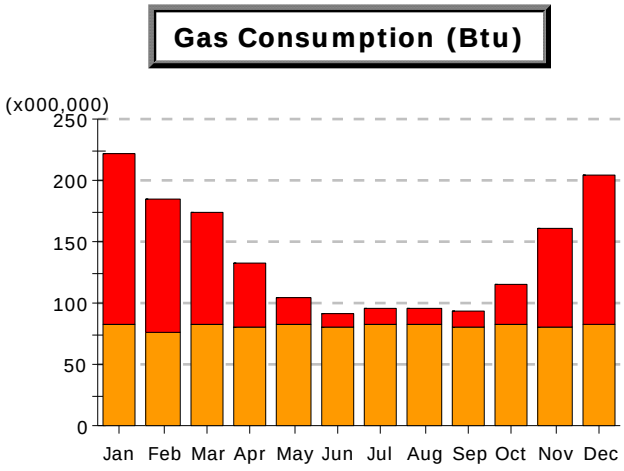
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.25	3.17	8.18	14.18	12.39	6.74	0.91	0.14	0.05	46.04
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.38	1.24	1.38	1.33	1.43	1.45	1.50	1.51	1.43	1.42	1.33	1.37	16.77
Pumps & Aux.	0.40	0.37	0.40	0.37	0.31	0.29	0.29	0.29	0.29	0.33	0.38	0.40	4.12
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	45.93	41.48	45.92	44.40	45.91	44.45	45.90	45.91	44.45	45.90	44.49	45.93	540.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.61	6.87	7.61	7.29	7.57	7.38	7.56	7.57	7.38	7.56	7.43	7.61	89.43
Total	55.32	49.96	55.33	53.63	58.40	61.74	69.44	67.67	60.28	56.12	53.77	55.36	697.02

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	138.6	108.8	89.5	50.9	20.6	9.9	12.9	12.0	12.1	30.7	80.3	121.7	688.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	222.1	184.3	173.0	131.7	104.2	90.8	96.5	95.6	93.0	114.3	161.2	205.3	1,672.1





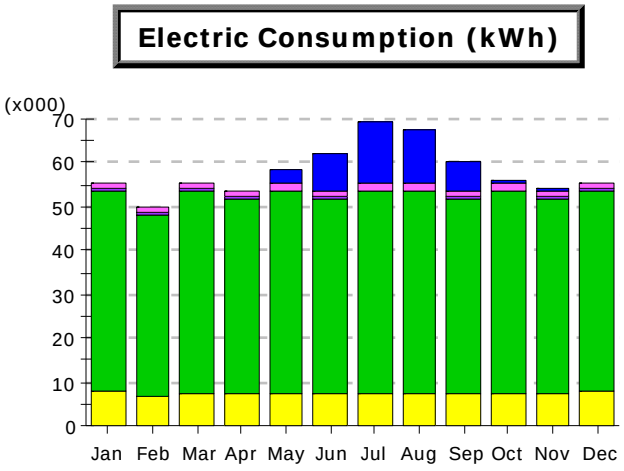


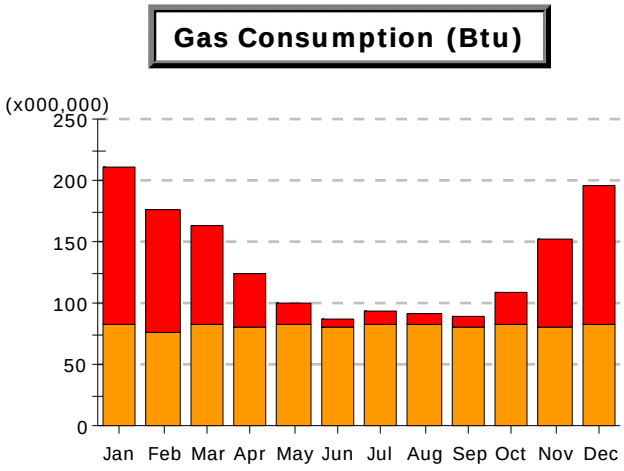
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.02	0.23	2.91	7.50	13.01	11.36	6.18	0.83	0.13	0.05	42.22
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.38	1.24	1.38	1.33	1.43	1.45	1.50	1.51	1.43	1.42	1.33	1.37	16.77
Pumps & Aux.	0.40	0.37	0.40	0.37	0.31	0.29	0.29	0.29	0.29	0.33	0.38	0.40	4.12
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	45.93	41.48	45.92	44.40	45.91	44.45	45.90	45.91	44.45	45.90	44.49	45.93	540.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.61	6.87	7.61	7.29	7.57	7.38	7.56	7.57	7.38	7.56	7.43	7.61	89.43
Total	55.32	49.96	55.33	53.61	58.13	61.06	68.27	66.64	59.72	56.04	53.76	55.36	693.21

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	138.6	108.8	89.5	50.9	20.6	9.9	12.9	12.0	12.1	30.7	80.3	121.7	688.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	222.1	184.3	173.0	131.7	104.2	90.8	96.5	95.6	93.0	114.3	161.2	205.3	1,672.1





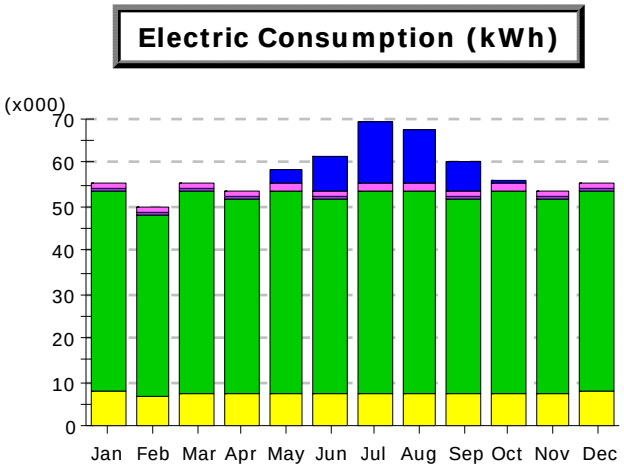


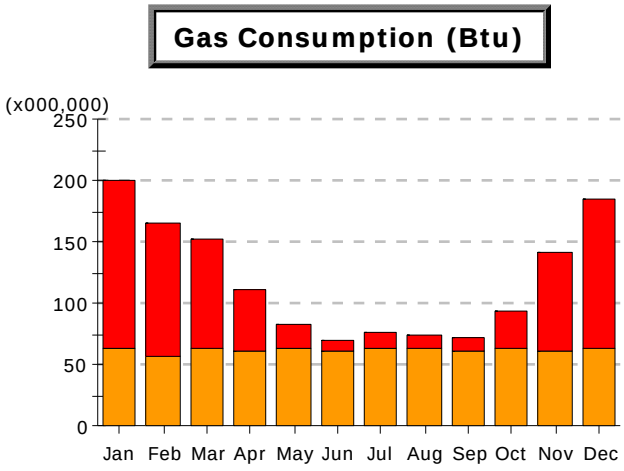
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.25	3.17	8.18	14.18	12.39	6.74	0.91	0.14	0.05	46.04
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.11	0.09	0.08	0.06	0.03	0.02	0.03	0.02	0.02	0.04	0.08	0.11	0.70
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.38	1.24	1.38	1.33	1.43	1.45	1.50	1.51	1.43	1.42	1.33	1.37	16.77
Pumps & Aux.	0.44	0.40	0.44	0.41	0.35	0.32	0.33	0.33	0.33	0.37	0.42	0.44	4.59
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	45.93	41.48	45.92	44.40	45.91	44.45	45.90	45.91	44.45	45.90	44.49	45.93	540.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.61	6.87	7.61	7.29	7.57	7.38	7.56	7.57	7.38	7.56	7.43	7.61	89.43
Total	55.47	50.09	55.46	53.73	58.47	61.80	69.51	67.73	60.34	56.20	53.89	55.51	698.20

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	127.7	99.6	79.9	43.3	16.4	6.9	9.1	8.5	8.8	25.0	70.8	111.5	607.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	211.3	175.1	163.5	124.2	100.0	87.8	92.7	92.1	89.6	108.6	151.7	195.1	1,591.6







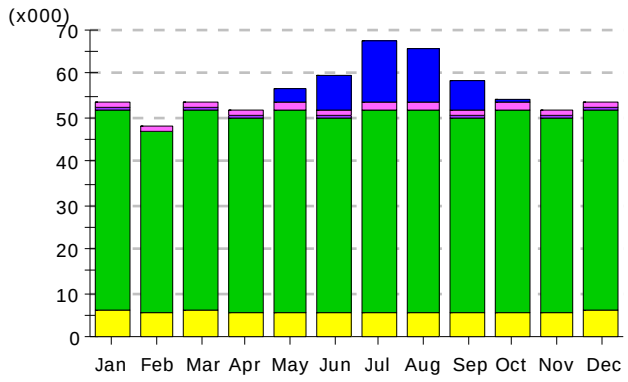
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.25	3.17	8.18	14.18	12.39	6.74	0.91	0.14	0.05	46.04
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.38	1.24	1.38	1.33	1.43	1.45	1.50	1.51	1.43	1.42	1.33	1.37	16.77
Pumps & Aux.	0.40	0.37	0.40	0.37	0.31	0.29	0.29	0.29	0.29	0.33	0.38	0.40	4.12
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	45.93	41.48	45.92	44.40	45.91	44.45	45.90	45.91	44.45	45.90	44.49	45.93	540.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.61	6.87	7.61	7.29	7.57	7.38	7.56	7.57	7.38	7.56	7.43	7.61	89.43
Total	55.32	49.96	55.33	53.63	58.40	61.74	69.44	67.67	60.28	56.12	53.77	55.36	697.02

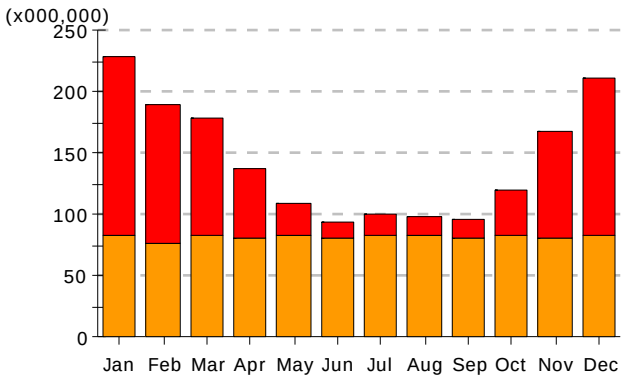
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	138.6	108.8	89.5	50.9	20.6	9.9	12.9	12.0	12.1	30.7	80.3	121.7	688.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	62.2	56.2	62.2	60.2	62.2	60.2	62.2	62.2	60.2	62.2	60.2	62.2	732.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	200.7	165.0	151.6	111.0	82.8	70.1	75.1	74.2	72.3	92.9	140.5	183.9	1,420.1

Electric Consumption (kWh)



Gas Consumption (Btu)



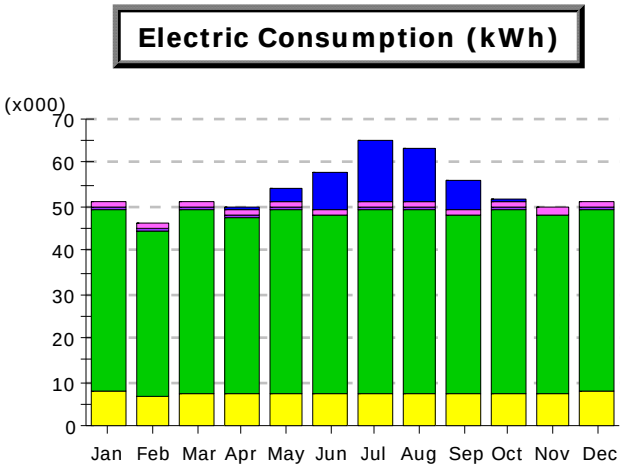


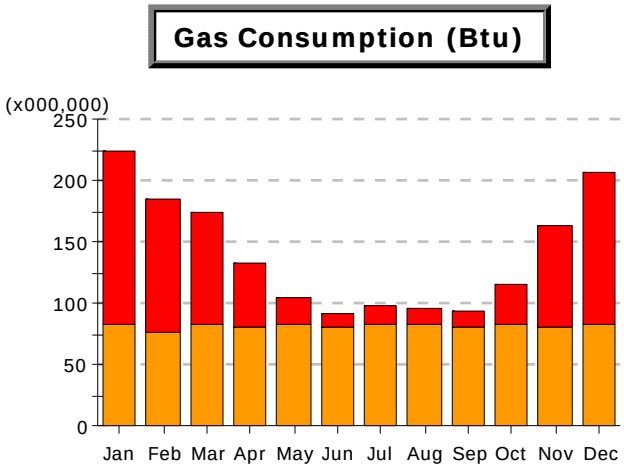
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.24	3.13	8.07	14.02	12.24	6.66	0.90	0.14	0.05	45.46
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.37	1.23	1.37	1.32	1.42	1.43	1.48	1.49	1.41	1.41	1.33	1.37	16.64
Pumps & Aux.	0.40	0.37	0.40	0.37	0.31	0.28	0.29	0.29	0.29	0.33	0.38	0.40	4.10
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	45.93	41.48	45.92	44.40	45.91	44.45	45.90	45.91	44.45	45.90	44.49	45.93	540.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.79	5.23	5.79	5.54	5.76	5.61	5.75	5.76	5.61	5.75	5.65	5.79	68.05
Total	53.49	48.31	53.51	51.88	56.52	59.84	67.45	65.69	58.42	54.28	51.99	53.54	674.92

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	144.5	114.1	95.3	55.9	24.4	12.9	16.1	15.3	15.4	35.3	86.1	127.7	743.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	228.1	189.6	178.9	136.8	107.9	93.8	99.6	98.9	96.3	118.9	167.0	211.3	1,727.0







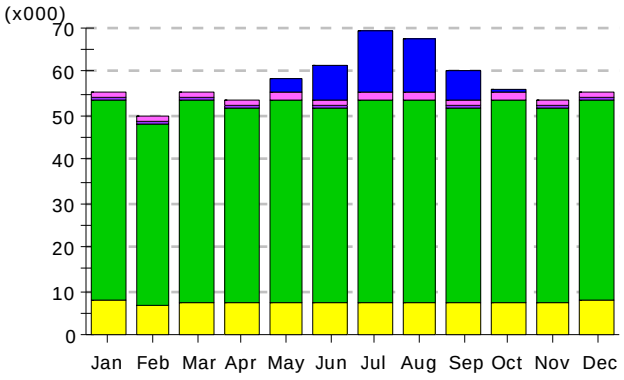
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.24	3.16	8.15	14.14	12.35	6.72	0.90	0.14	0.05	45.87
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.37	1.24	1.38	1.33	1.43	1.45	1.49	1.50	1.42	1.41	1.33	1.37	16.73
Pumps & Aux.	0.40	0.37	0.40	0.37	0.31	0.29	0.29	0.29	0.29	0.33	0.38	0.40	4.11
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	41.79	37.74	41.78	40.40	41.77	40.44	41.76	41.77	40.44	41.76	40.48	41.79	491.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.61	6.87	7.61	7.29	7.57	7.38	7.56	7.57	7.38	7.56	7.43	7.61	89.43
Total	51.17	46.22	51.19	49.62	54.24	57.69	65.25	63.48	56.24	51.97	49.76	51.22	648.05

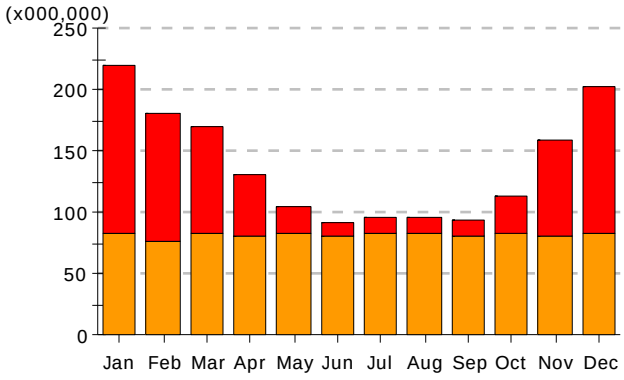
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	139.8	109.9	90.7	51.9	21.3	10.5	13.5	12.7	12.7	31.6	81.6	123.1	699.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	223.4	185.4	174.3	132.8	104.8	91.4	97.1	96.2	93.6	115.2	162.5	206.6	1,683.3

Electric Consumption (kWh)



Gas Consumption (Btu)



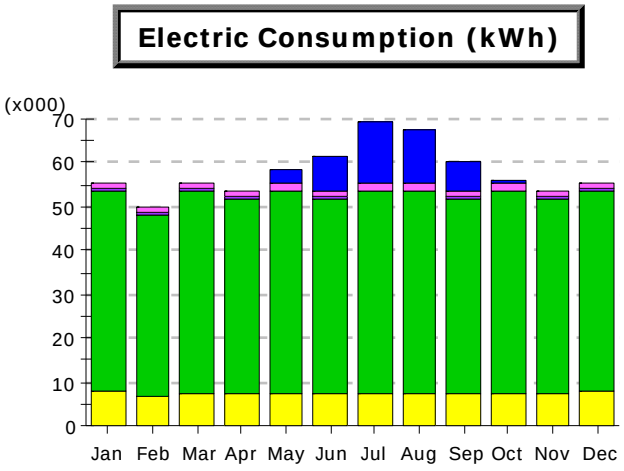


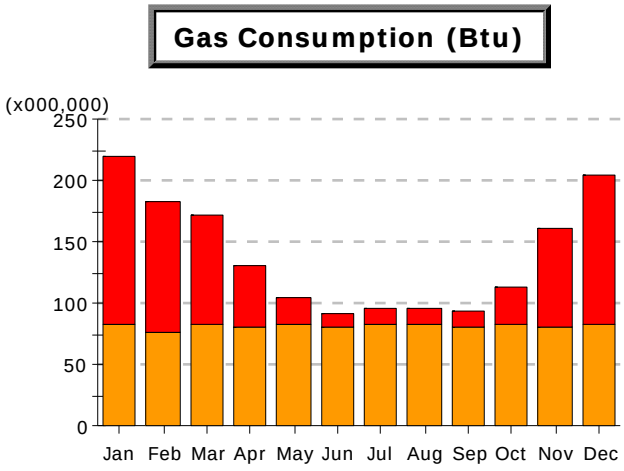
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.25	3.18	8.17	14.17	12.38	6.75	0.91	0.14	0.05	46.02
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.37	1.24	1.38	1.33	1.43	1.45	1.50	1.51	1.43	1.42	1.33	1.37	16.77
Pumps & Aux.	0.40	0.37	0.40	0.37	0.31	0.29	0.29	0.29	0.29	0.33	0.38	0.40	4.11
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	45.93	41.48	45.92	44.40	45.91	44.45	45.90	45.91	44.45	45.90	44.49	45.93	540.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.61	6.87	7.61	7.29	7.57	7.38	7.56	7.57	7.38	7.56	7.43	7.61	89.43
Total	55.32	49.96	55.33	53.63	58.40	61.73	69.43	67.66	60.29	56.12	53.77	55.36	697.00

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	135.0	105.9	86.8	49.0	19.8	9.7	13.0	11.9	11.7	29.4	78.0	118.6	668.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	218.6	181.4	170.4	129.9	103.4	90.5	96.5	95.5	92.6	113.0	158.9	202.1	1,652.8





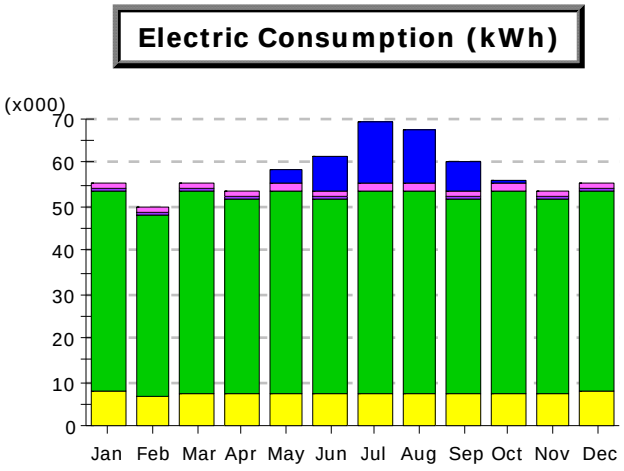


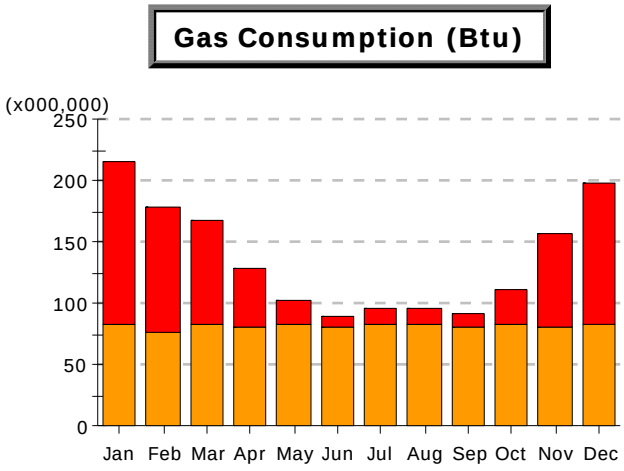
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.25	3.17	8.17	14.17	12.38	6.74	0.91	0.14	0.05	46.01
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.37	1.24	1.38	1.33	1.43	1.45	1.50	1.51	1.43	1.41	1.33	1.37	16.76
Pumps & Aux.	0.40	0.37	0.40	0.37	0.31	0.29	0.29	0.29	0.29	0.33	0.38	0.40	4.11
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	45.93	41.48	45.92	44.40	45.91	44.45	45.90	45.91	44.45	45.90	44.49	45.93	540.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.61	6.87	7.61	7.29	7.57	7.38	7.56	7.57	7.38	7.56	7.43	7.61	89.43
Total	55.32	49.96	55.33	53.63	58.39	61.73	69.43	67.66	60.28	56.12	53.77	55.36	696.97

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	136.8	107.3	88.0	49.8	20.2	9.7	12.9	11.9	11.9	30.0	79.1	120.0	677.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	220.4	182.8	171.6	130.7	103.7	90.6	96.4	95.5	92.8	113.6	160.0	203.6	1,661.7





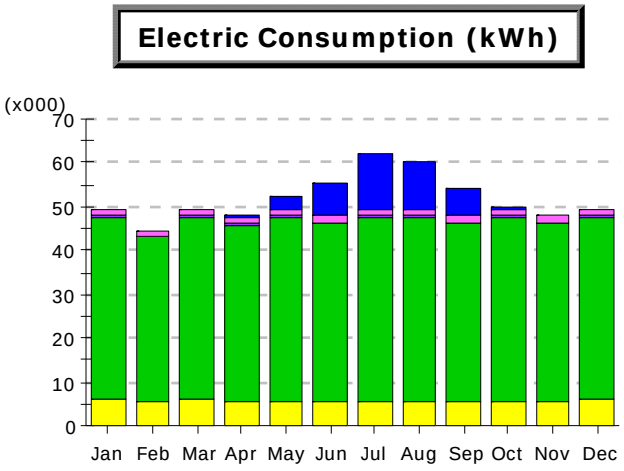


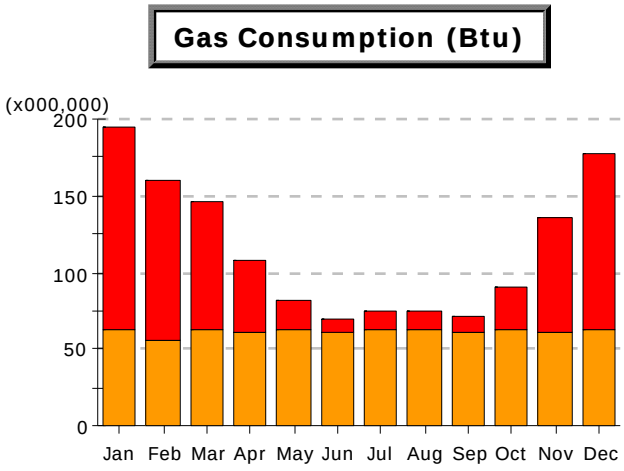
Electric Consumption (kWh x000)

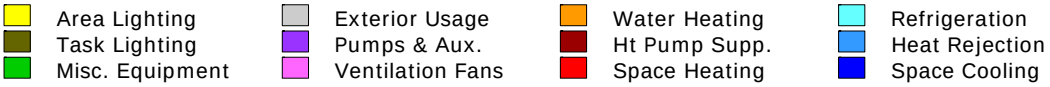
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.25	3.19	8.19	14.19	12.41	6.76	0.91	0.14	0.05	46.11
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.37	1.24	1.38	1.33	1.44	1.46	1.50	1.51	1.43	1.42	1.33	1.37	16.80
Pumps & Aux.	0.40	0.37	0.40	0.37	0.31	0.29	0.29	0.29	0.29	0.33	0.38	0.40	4.11
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	45.93	41.48	45.92	44.40	45.91	44.45	45.90	45.91	44.45	45.90	44.49	45.93	540.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.61	6.87	7.61	7.29	7.57	7.38	7.56	7.57	7.38	7.56	7.43	7.61	89.43
Total	55.32	49.96	55.34	53.64	58.41	61.76	69.45	67.69	60.30	56.13	53.77	55.36	697.12

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	130.9	102.5	83.7	46.7	18.7	9.2	12.7	11.6	11.2	27.9	75.4	115.3	645.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	214.5	178.0	167.3	127.6	102.3	90.1	96.3	95.2	92.0	111.5	156.3	198.8	1,629.7





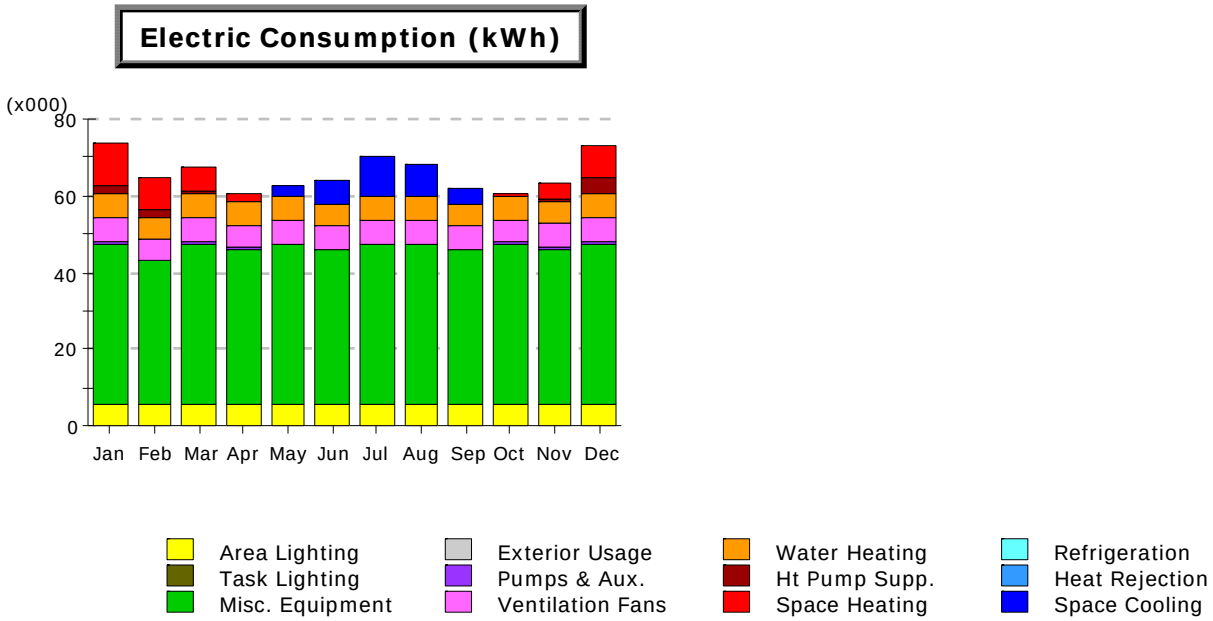


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.02	0.22	2.86	7.36	12.80	11.18	6.09	0.82	0.13	0.05	41.52
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.11	0.09	0.09	0.06	0.04	0.03	0.03	0.03	0.03	0.05	0.08	0.11	0.75
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.37	1.23	1.37	1.32	1.42	1.42	1.47	1.48	1.41	1.40	1.33	1.37	16.59
Pumps & Aux.	0.44	0.40	0.44	0.41	0.35	0.32	0.33	0.33	0.33	0.37	0.41	0.44	4.57
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	41.79	37.74	41.78	40.40	41.77	40.44	41.76	41.77	40.44	41.76	40.48	41.79	491.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.79	5.23	5.79	5.54	5.76	5.61	5.75	5.76	5.61	5.75	5.65	5.79	68.05
Total	49.50	44.70	49.49	47.95	52.18	55.18	62.15	60.55	53.90	50.16	48.09	49.53	623.37

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	131.8	103.2	83.9	47.0	19.4	9.5	12.5	11.8	11.7	28.5	75.2	115.8	650.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	62.2	56.2	62.2	60.2	62.2	60.2	62.2	62.2	60.2	62.2	60.2	62.2	732.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	194.0	159.3	146.0	107.2	81.6	69.7	74.6	73.9	71.8	90.7	135.3	177.9	1,382.1

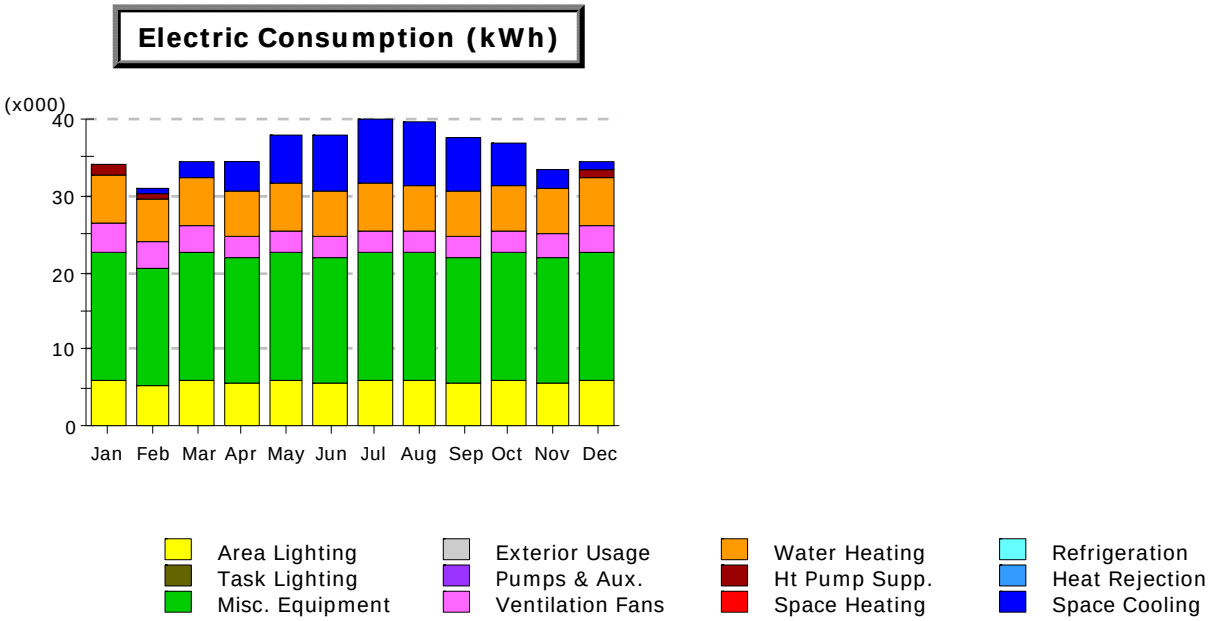


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.17	2.36	5.86	10.30	8.41	3.97	0.47	0.01	0.01	31.57
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	11.05	8.58	6.40	1.93	0.11	-	-	-	0.00	0.25	4.58	7.90	40.79
HP Supp.	2.11	1.69	0.94	0.15	0.01	-	-	-	-	0.00	0.49	4.60	9.99
Hot Water	6.21	5.61	6.21	6.01	6.23	5.98	6.14	6.10	5.90	6.12	5.97	6.21	72.68
Vent. Fans	6.16	5.56	6.16	5.90	6.12	5.97	6.12	6.12	5.97	6.12	6.01	6.16	72.39
Pumps & Aux.	0.34	0.35	0.44	0.50	0.12	-	-	-	0.02	0.23	0.41	0.40	2.81
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	41.79	37.74	41.78	40.40	41.77	40.44	41.76	41.77	40.44	41.76	40.48	41.79	491.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.79	5.23	5.79	5.54	5.76	5.61	5.75	5.76	5.61	5.75	5.65	5.79	68.05
Total	73.44	64.76	67.73	60.60	62.47	63.86	70.08	68.16	61.91	60.71	63.61	72.85	790.19

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

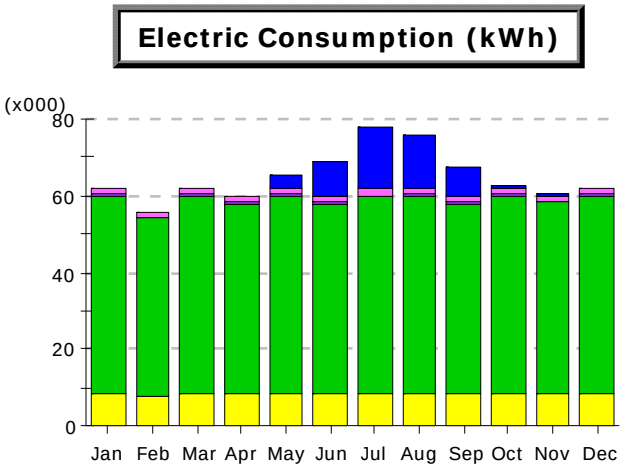


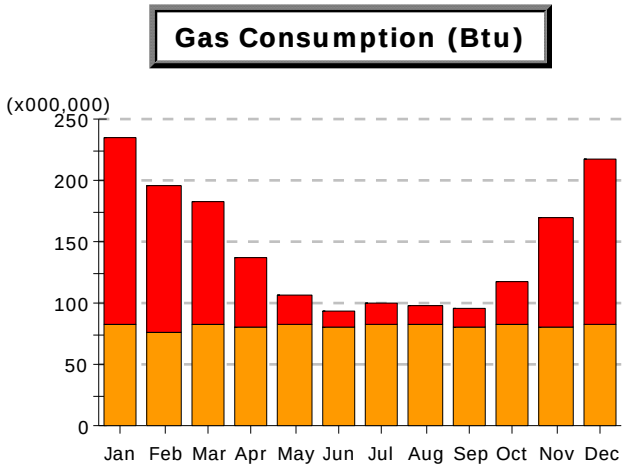
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.21	0.51	1.88	3.77	6.30	7.41	8.37	8.06	6.98	5.46	2.38	0.90	52.22
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.01	-	-	-	-	-	-	-	-	-	-	0.01	0.02
HP Supp.	1.21	0.83	0.00	-	-	-	-	-	-	-	0.00	1.09	3.13
Hot Water	6.22	5.62	6.23	6.03	6.23	5.98	6.13	6.10	5.90	6.12	5.97	6.22	72.75
Vent. Fans	4.01	3.50	3.67	2.83	2.77	2.73	2.84	2.82	2.71	2.76	3.14	3.66	37.44
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	16.76	15.14	16.76	16.21	16.75	16.22	16.75	16.75	16.22	16.75	16.24	16.76	197.33
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.79	5.23	5.79	5.54	5.76	5.61	5.75	5.76	5.61	5.75	5.65	5.79	68.05
Total	34.21	30.82	34.33	34.38	37.81	37.96	39.85	39.50	37.42	36.84	33.38	34.43	430.94

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													





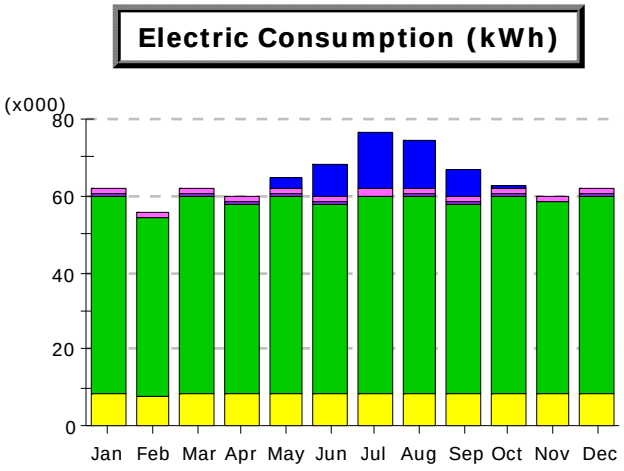


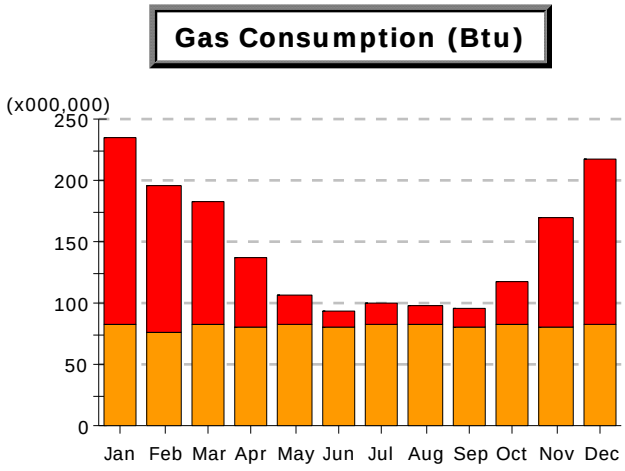
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.05	0.27	3.52	9.09	15.79	13.80	7.52	1.01	0.16	0.06	51.28
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.54	1.39	1.54	1.49	1.60	1.61	1.66	1.68	1.59	1.58	1.49	1.54	18.71
Pumps & Aux.	0.44	0.40	0.44	0.40	0.35	0.32	0.33	0.33	0.32	0.36	0.41	0.43	4.53
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	51.40	46.43	51.40	49.69	51.38	49.75	51.37	51.38	49.75	51.37	49.79	51.40	605.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.52	7.70	8.52	8.16	8.47	8.26	8.47	8.47	8.26	8.47	8.32	8.52	100.15
Total	61.90	55.91	61.94	60.02	65.33	69.03	77.62	75.66	67.45	62.80	60.18	61.96	779.80

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	152.2	119.9	99.4	56.8	23.5	11.8	15.4	14.2	14.1	34.2	88.4	133.9	763.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	235.8	195.3	182.9	137.7	107.1	92.7	98.9	97.8	95.0	117.7	169.3	217.5	1,747.8





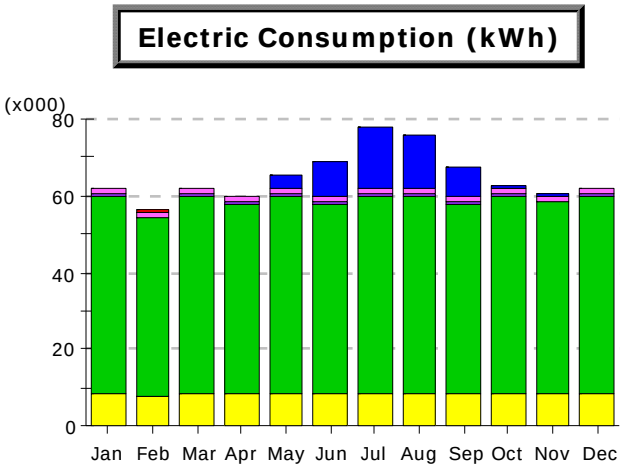


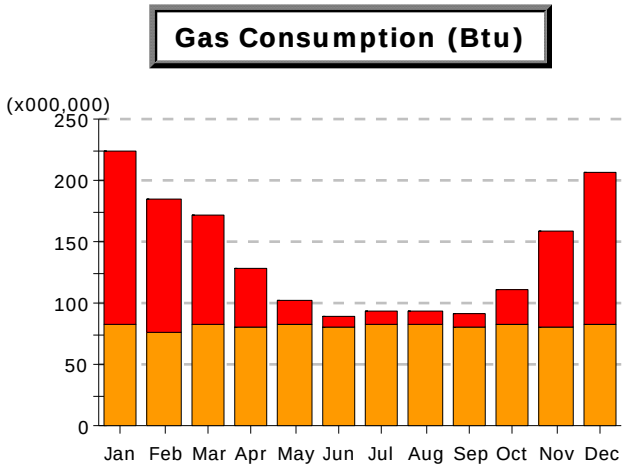
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.05	0.25	3.23	8.34	14.48	12.66	6.90	0.93	0.14	0.05	47.03
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.54	1.39	1.54	1.49	1.60	1.61	1.66	1.68	1.59	1.58	1.49	1.54	18.71
Pumps & Aux.	0.44	0.40	0.44	0.40	0.35	0.32	0.33	0.33	0.32	0.36	0.41	0.43	4.53
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	51.40	46.43	51.40	49.69	51.38	49.75	51.37	51.38	49.75	51.37	49.79	51.40	605.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.52	7.70	8.52	8.16	8.47	8.26	8.47	8.47	8.26	8.47	8.32	8.52	100.15
Total	61.90	55.91	61.94	60.00	65.03	68.28	76.32	74.52	66.83	62.72	60.17	61.95	775.55

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	152.2	119.9	99.4	56.8	23.5	11.8	15.4	14.2	14.1	34.2	88.4	133.9	763.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	235.8	195.3	182.9	137.7	107.1	92.7	98.9	97.8	95.0	117.7	169.3	217.5	1,747.8





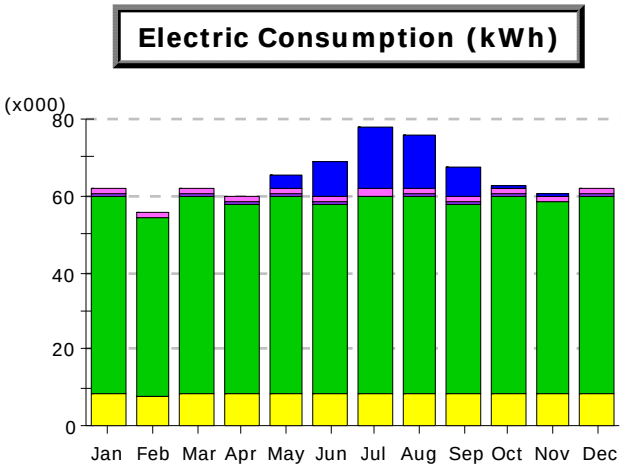


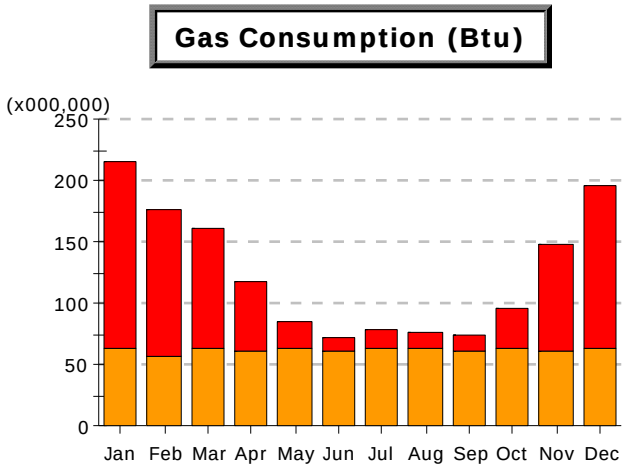
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.05	0.27	3.52	9.09	15.79	13.80	7.52	1.01	0.16	0.06	51.28
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.12	0.10	0.09	0.07	0.04	0.02	0.03	0.03	0.03	0.05	0.09	0.12	0.79
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.54	1.39	1.54	1.49	1.60	1.61	1.66	1.68	1.59	1.58	1.49	1.54	18.71
Pumps & Aux.	0.48	0.43	0.47	0.44	0.39	0.36	0.37	0.37	0.36	0.40	0.45	0.47	4.99
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	51.40	46.43	51.40	49.69	51.38	49.75	51.37	51.38	49.75	51.37	49.79	51.40	605.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.52	7.70	8.52	8.16	8.47	8.26	8.47	8.47	8.26	8.47	8.32	8.52	100.15
Total	62.07	56.05	62.07	60.12	65.40	69.09	77.69	75.73	67.51	62.89	60.31	62.11	781.04

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	140.3	109.6	88.6	48.3	18.7	8.2	11.0	10.2	10.2	27.7	77.8	122.6	673.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	223.9	185.0	172.2	129.2	102.2	89.1	94.5	93.8	91.1	111.3	158.7	206.2	1,657.2





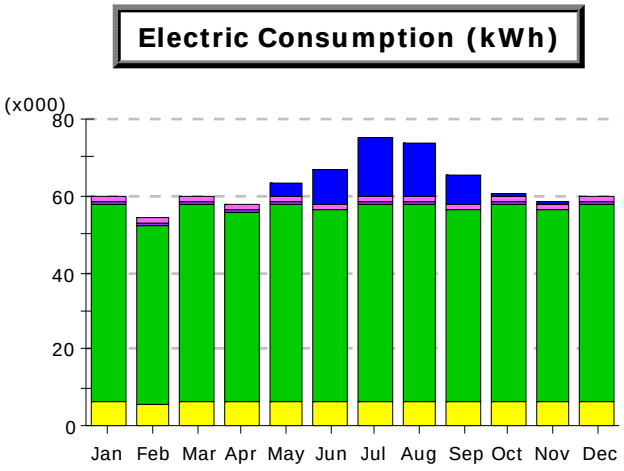


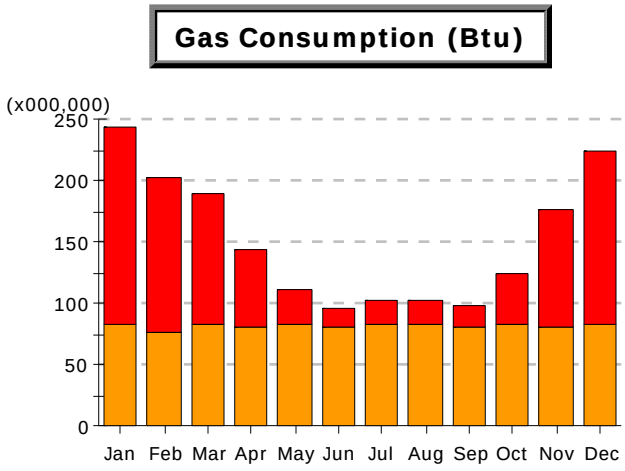
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.05	0.27	3.52	9.09	15.79	13.80	7.52	1.01	0.16	0.06	51.28
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.54	1.39	1.54	1.49	1.60	1.61	1.66	1.68	1.59	1.58	1.49	1.54	18.71
Pumps & Aux.	0.44	0.40	0.44	0.40	0.35	0.32	0.33	0.33	0.32	0.36	0.41	0.43	4.53
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	51.40	46.43	51.40	49.69	51.38	49.75	51.37	51.38	49.75	51.37	49.79	51.40	605.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.52	7.70	8.52	8.16	8.47	8.26	8.47	8.47	8.26	8.47	8.32	8.52	100.15
Total	61.90	55.91	61.94	60.02	65.33	69.03	77.62	75.66	67.45	62.80	60.18	61.96	779.80

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	152.2	119.9	99.4	56.8	23.5	11.8	15.4	14.2	14.1	34.2	88.4	133.9	763.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	62.2	56.2	62.2	60.2	62.2	60.2	62.2	62.2	60.2	62.2	60.2	62.2	732.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	214.4	176.0	161.5	117.0	85.7	72.0	77.5	76.4	74.2	96.3	148.5	196.1	1,495.8





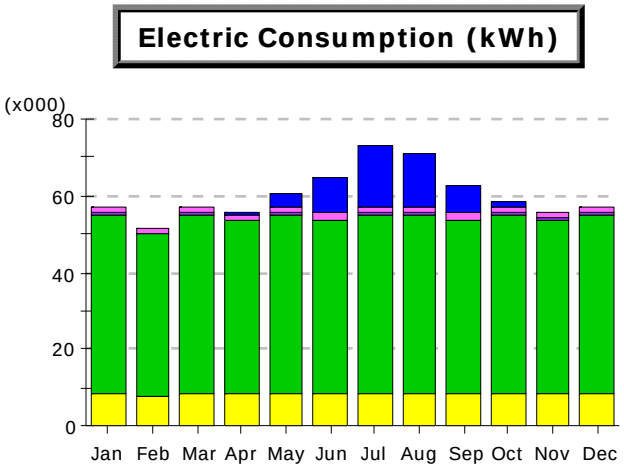


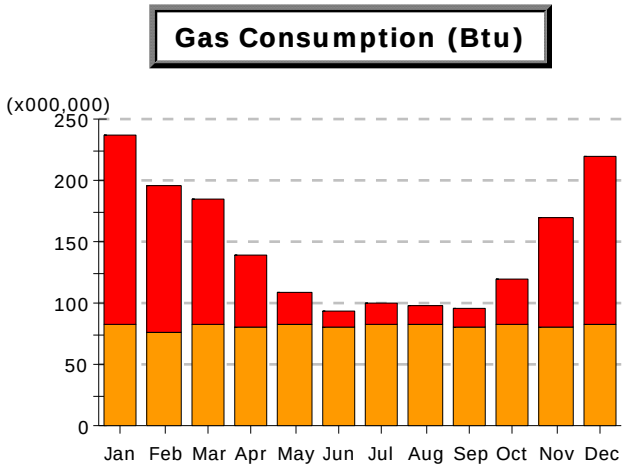
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.05	0.27	3.47	8.97	15.62	13.64	7.44	1.00	0.16	0.06	50.67
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.53	1.38	1.54	1.48	1.58	1.59	1.64	1.66	1.58	1.57	1.49	1.53	18.58
Pumps & Aux.	0.44	0.40	0.43	0.40	0.35	0.32	0.33	0.33	0.32	0.36	0.41	0.43	4.52
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	51.40	46.43	51.40	49.69	51.38	49.75	51.37	51.38	49.75	51.37	49.79	51.40	605.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	6.48	5.86	6.48	6.21	6.45	6.28	6.44	6.45	6.28	6.44	6.33	6.48	76.20
Total	59.86	54.06	59.90	58.06	63.23	66.92	75.41	73.45	65.37	60.75	58.18	59.91	755.10

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	159.1	125.9	105.9	62.6	27.8	15.3	19.1	18.0	17.9	39.4	94.8	140.6	826.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	242.7	201.3	189.4	143.5	111.4	96.1	102.7	101.5	98.8	123.0	175.7	224.2	1,810.4







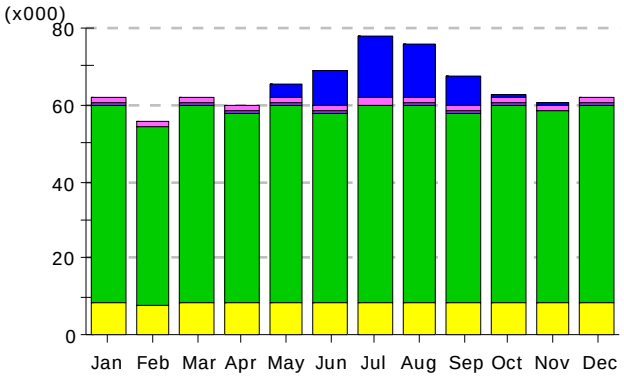
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.05	0.27	3.51	9.06	15.74	13.75	7.50	1.01	0.16	0.06	51.10
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.54	1.38	1.54	1.48	1.59	1.60	1.66	1.67	1.59	1.58	1.49	1.54	18.67
Pumps & Aux.	0.44	0.40	0.44	0.40	0.35	0.32	0.33	0.33	0.32	0.36	0.41	0.43	4.53
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	46.77	42.24	46.76	45.21	46.75	45.26	46.74	46.75	45.26	46.74	45.30	46.77	550.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.52	7.70	8.52	8.16	8.47	8.26	8.47	8.47	8.26	8.47	8.32	8.52	100.15
Total	57.27	51.72	57.30	55.53	60.67	64.50	72.93	70.97	62.93	58.16	55.68	57.32	724.98

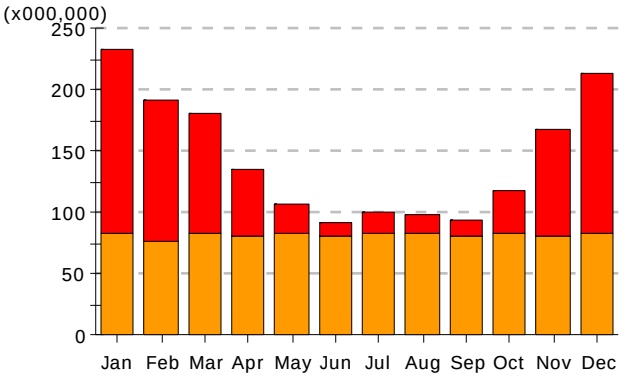
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	153.8	121.2	100.8	58.1	24.3	12.4	16.0	14.9	14.8	35.2	89.7	135.4	776.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	237.4	196.7	184.4	138.9	107.9	93.3	99.6	98.5	95.7	118.8	170.6	219.0	1,760.9

Electric Consumption (kWh)



Gas Consumption (Btu)



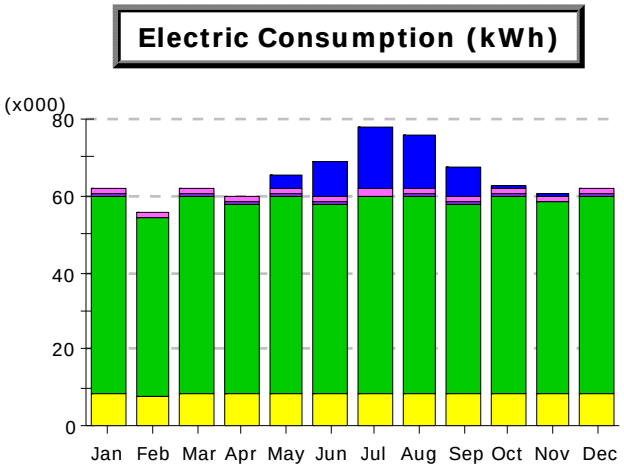


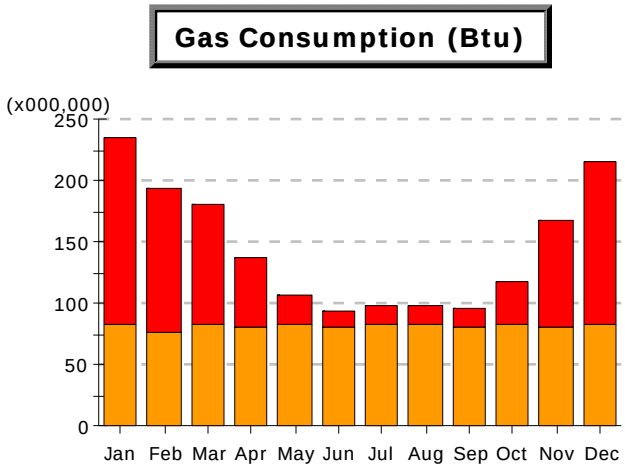
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.27	3.52	9.08	15.78	13.80	7.53	1.01	0.16	0.06	51.26
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.54	1.39	1.54	1.49	1.60	1.61	1.66	1.68	1.60	1.59	1.49	1.54	18.72
Pumps & Aux.	0.44	0.40	0.44	0.40	0.35	0.32	0.33	0.33	0.32	0.36	0.41	0.43	4.53
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	51.40	46.43	51.40	49.69	51.38	49.75	51.37	51.38	49.75	51.37	49.79	51.40	605.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.52	7.70	8.52	8.16	8.47	8.26	8.47	8.47	8.26	8.47	8.32	8.52	100.15
Total	61.90	55.91	61.94	60.02	65.33	69.02	77.61	75.66	67.46	62.81	60.18	61.96	779.79

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	148.3	116.6	96.4	54.9	22.7	11.5	15.4	14.2	13.7	32.8	85.8	130.4	742.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	231.9	192.0	180.0	135.8	106.2	92.4	99.0	97.7	94.6	116.4	166.6	214.0	1,726.7







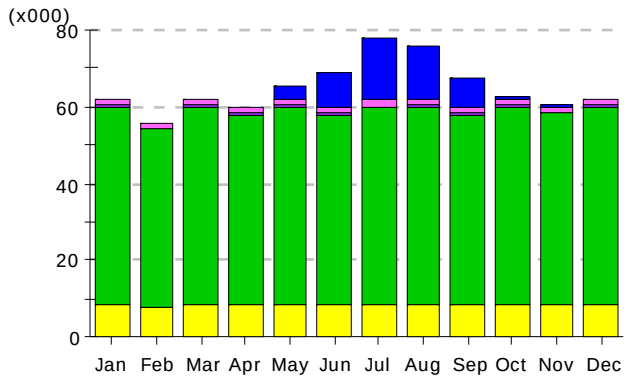
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.05	0.27	3.52	9.08	15.77	13.79	7.52	1.01	0.16	0.06	51.24
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.54	1.38	1.54	1.49	1.60	1.61	1.66	1.67	1.59	1.58	1.49	1.54	18.70
Pumps & Aux.	0.44	0.40	0.44	0.40	0.35	0.32	0.33	0.33	0.32	0.36	0.41	0.43	4.53
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	51.40	46.43	51.40	49.69	51.38	49.75	51.37	51.38	49.75	51.37	49.79	51.40	605.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.52	7.70	8.52	8.16	8.47	8.26	8.47	8.47	8.26	8.47	8.32	8.52	100.15
Total	61.90	55.91	61.94	60.02	65.32	69.02	77.61	75.65	67.44	62.80	60.18	61.95	779.74

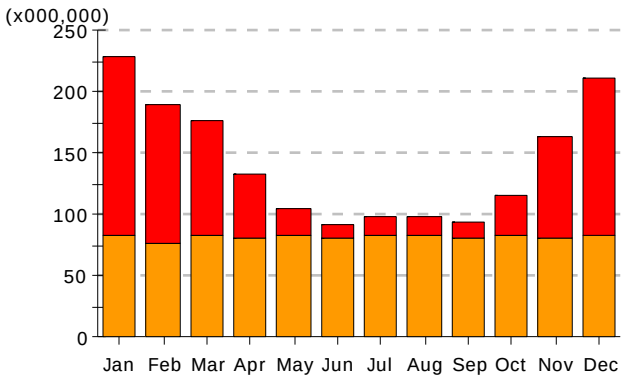
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	150.3	118.1	97.8	55.7	23.0	11.6	15.3	14.1	13.8	33.4	87.0	132.1	752.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	233.8	193.6	181.4	136.6	106.6	92.5	98.9	97.7	94.7	117.0	167.9	215.6	1,736.3

Electric Consumption (kWh)



Gas Consumption (Btu)



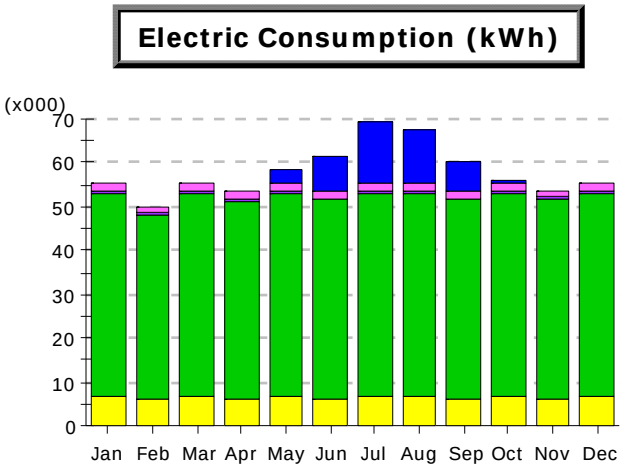


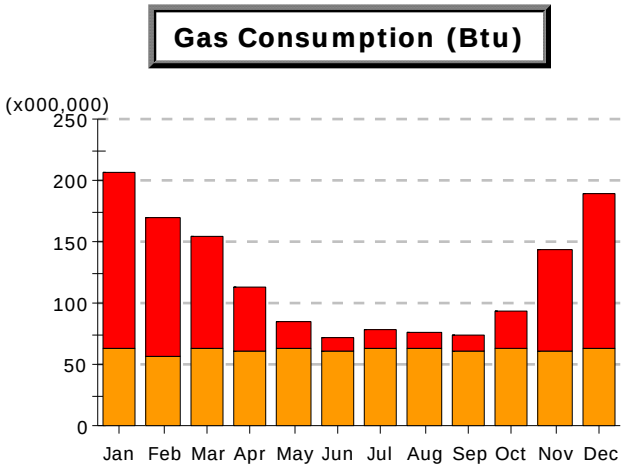
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.05	0.28	3.54	9.10	15.79	13.81	7.54	1.02	0.16	0.06	51.35
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.54	1.38	1.55	1.49	1.60	1.61	1.66	1.68	1.60	1.59	1.49	1.54	18.73
Pumps & Aux.	0.44	0.40	0.44	0.40	0.35	0.32	0.33	0.33	0.32	0.36	0.41	0.43	4.53
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	51.40	46.43	51.40	49.69	51.38	49.75	51.37	51.38	49.75	51.37	49.79	51.40	605.13
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	8.52	7.70	8.52	8.16	8.47	8.26	8.47	8.47	8.26	8.47	8.32	8.52	100.15
Total	61.90	55.91	61.94	60.02	65.34	69.05	77.63	75.68	67.47	62.81	60.18	61.95	779.88

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	144.1	112.9	92.9	52.4	21.4	11.0	15.1	13.6	13.0	31.1	82.8	126.8	717.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	227.7	188.4	176.5	133.2	105.0	91.9	98.6	97.2	93.9	114.7	163.7	210.4	1,701.2





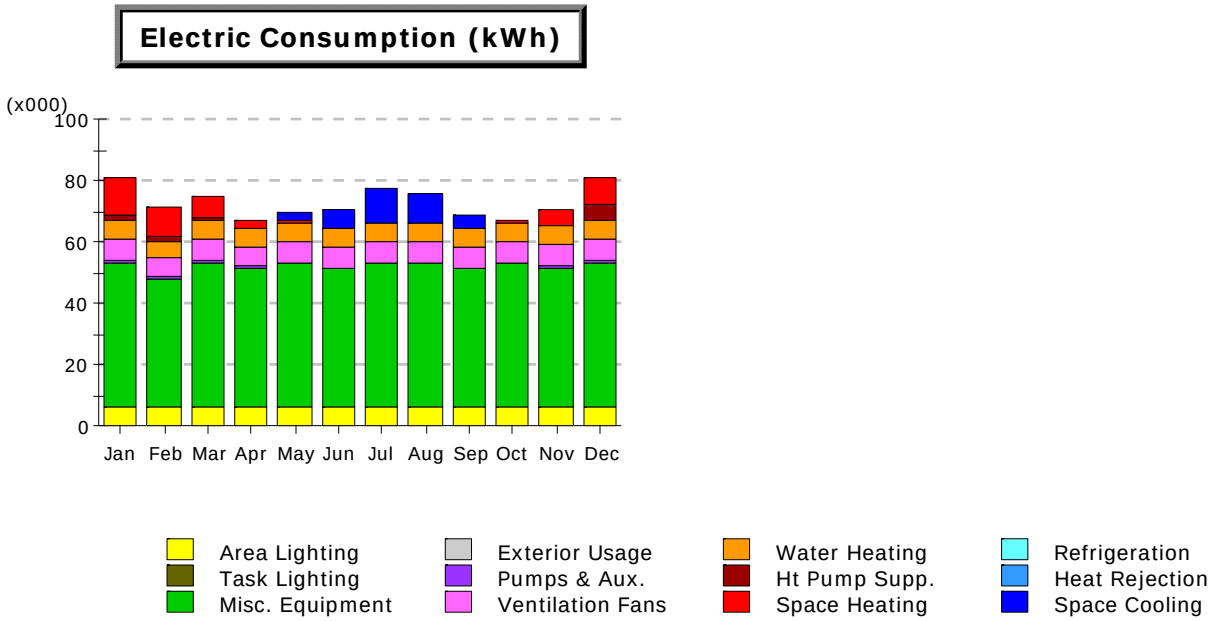


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.25	3.17	8.19	14.26	12.46	6.80	0.91	0.14	0.05	46.29
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.12	0.10	0.10	0.07	0.04	0.03	0.04	0.04	0.03	0.05	0.09	0.12	0.84
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.53	1.38	1.54	1.48	1.58	1.58	1.63	1.65	1.58	1.57	1.49	1.53	18.54
Pumps & Aux.	0.48	0.43	0.47	0.44	0.38	0.36	0.37	0.37	0.36	0.40	0.45	0.47	4.97
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	46.77	42.24	46.76	45.21	46.75	45.26	46.74	46.75	45.26	46.74	45.30	46.77	550.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	6.48	5.86	6.48	6.21	6.45	6.28	6.44	6.45	6.28	6.44	6.33	6.48	76.20
Total	55.38	50.01	55.39	53.65	58.37	61.70	69.48	67.70	60.31	56.12	53.81	55.42	697.36

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	145.0	113.7	93.1	52.6	22.2	11.5	15.1	14.0	13.7	31.8	82.7	127.4	722.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	62.2	56.2	62.2	60.2	62.2	60.2	62.2	62.2	60.2	62.2	60.2	62.2	732.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	207.1	169.8	155.2	112.8	84.4	71.6	77.2	76.2	73.8	94.0	142.8	189.6	1,454.6

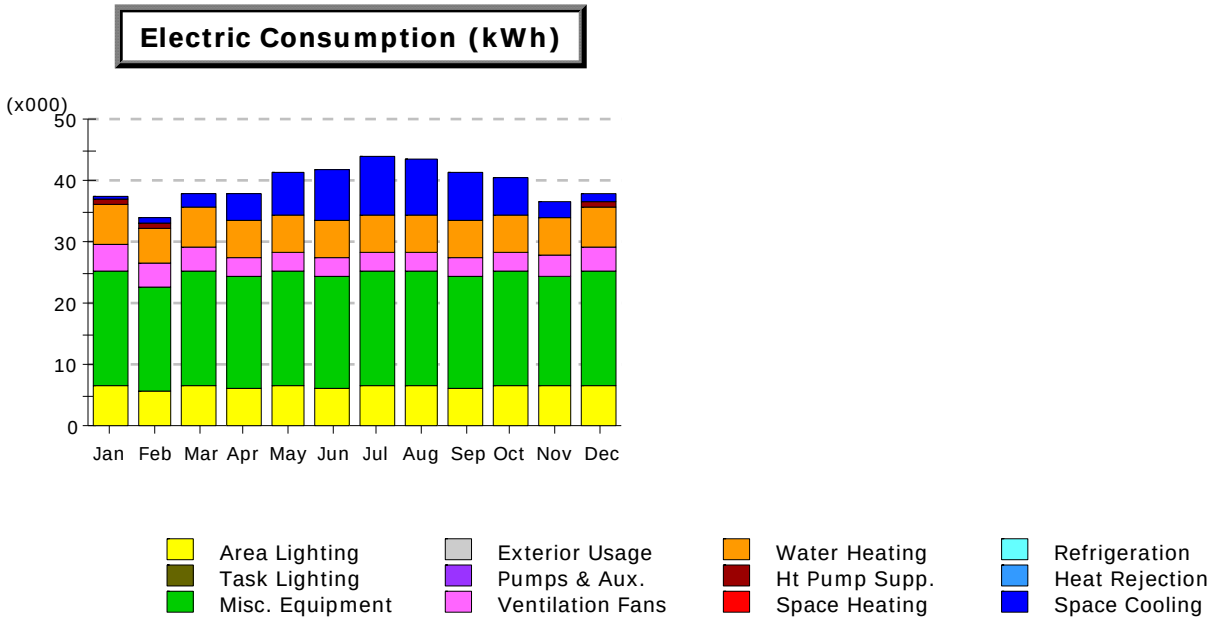


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.02	0.18	2.59	6.47	11.43	9.32	4.40	0.51	0.01	-	34.93
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	12.14	9.42	7.06	2.15	0.12	-	-	-	-	0.28	4.95	8.65	44.75
HP Supp.	2.29	1.85	1.03	0.16	0.01	-	-	-	-	0.00	0.53	5.04	10.91
Hot Water	6.21	5.61	6.21	6.01	6.23	5.99	6.15	6.12	5.91	6.14	5.99	6.21	72.76
Vent. Fans	6.91	6.24	6.91	6.63	6.88	6.70	6.88	6.88	6.70	6.88	6.74	6.91	81.27
Pumps & Aux.	0.36	0.38	0.46	0.51	0.12	-	-	-	0.02	0.24	0.44	0.42	2.96
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	46.77	42.24	46.76	45.21	46.75	45.26	46.74	46.75	45.26	46.74	45.30	46.77	550.53
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	6.48	5.86	6.48	6.21	6.45	6.28	6.44	6.45	6.28	6.44	6.33	6.48	76.20
Total	81.16	71.59	74.92	67.07	69.13	70.72	77.64	75.50	68.58	67.22	70.29	80.48	874.30

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

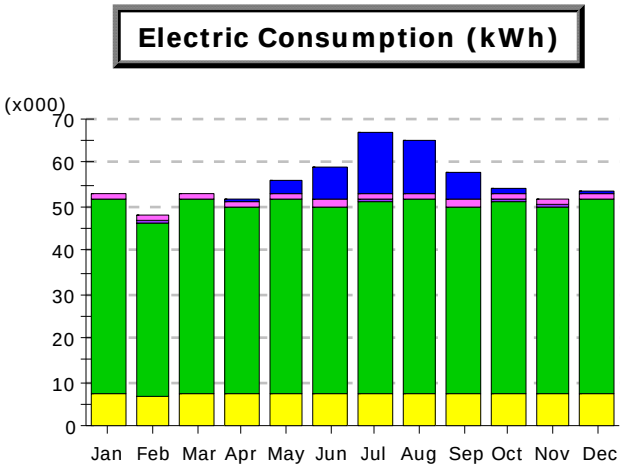


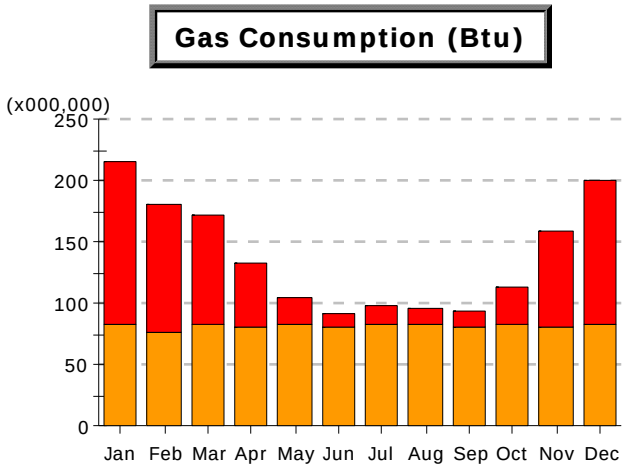
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.24	0.64	2.14	4.21	6.99	8.21	9.26	8.93	7.74	6.09	2.74	1.06	58.26
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.01	-	-	-	-	-	-	-	-	-	-	0.01	0.02
HP Supp.	1.05	0.79	-	-	-	-	-	-	-	-	-	1.08	2.93
Hot Water	6.22	5.62	6.23	6.03	6.23	5.99	6.15	6.12	5.91	6.14	5.98	6.22	72.84
Vent. Fans	4.48	3.90	4.09	3.16	3.10	3.06	3.17	3.16	3.04	3.09	3.50	4.09	41.85
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	18.74	16.93	18.74	18.12	18.73	18.14	18.73	18.73	18.14	18.73	18.15	18.74	220.63
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	6.48	5.86	6.48	6.21	6.45	6.28	6.44	6.45	6.28	6.44	6.33	6.48	76.20
Total	37.23	33.73	37.68	37.73	41.51	41.69	43.75	43.39	41.12	40.49	36.71	37.70	472.73

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													





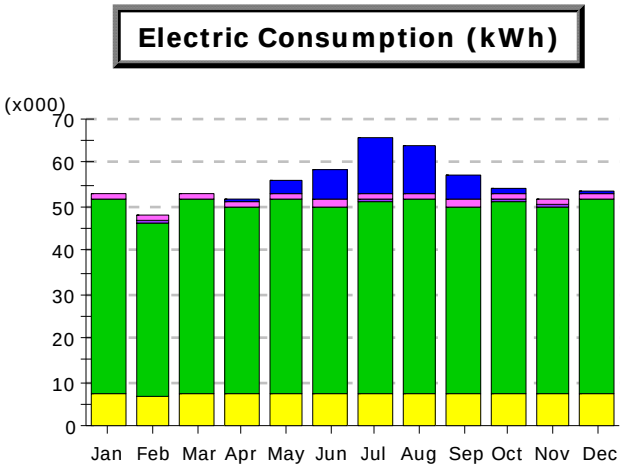


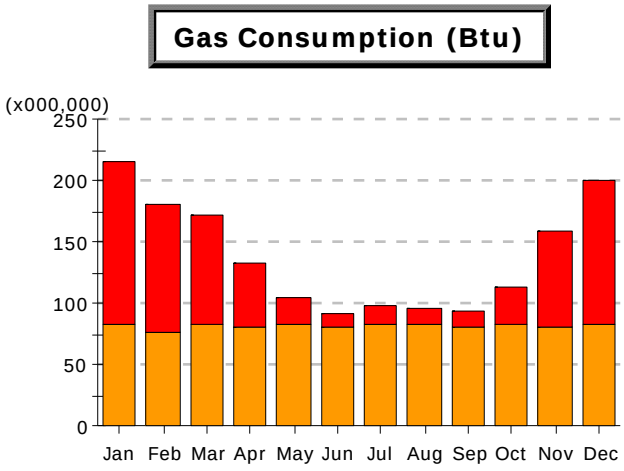
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.24	3.02	7.81	13.59	11.90	6.53	0.89	0.14	0.05	44.19
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.34	1.29	1.37	1.38	1.43	1.44	1.38	1.38	1.29	1.33	16.17
Pumps & Aux.	0.40	0.36	0.39	0.36	0.30	0.28	0.29	0.29	0.28	0.32	0.37	0.39	4.02
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	44.17	39.89	44.16	42.70	44.15	42.75	44.14	44.15	42.75	44.14	42.79	44.17	519.97
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.33	6.62	7.32	7.02	7.29	7.10	7.28	7.29	7.10	7.28	7.16	7.33	86.13
Total	53.23	48.07	53.26	51.60	56.13	59.31	66.73	65.07	58.04	54.02	51.74	53.27	670.48

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	131.9	104.3	87.5	50.9	21.4	10.7	13.7	12.6	12.7	30.3	77.0	116.2	669.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	215.5	179.8	171.1	131.7	105.0	91.6	97.3	96.2	93.5	113.9	157.9	199.8	1,653.3







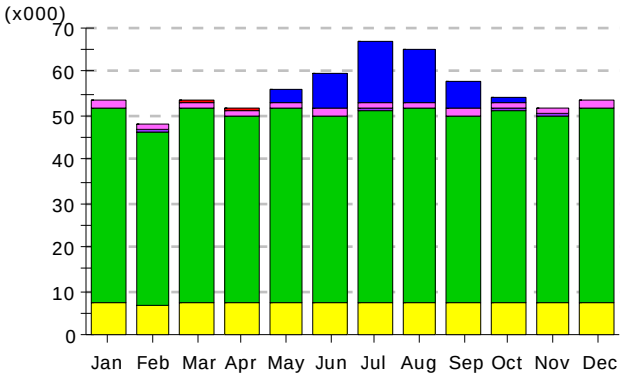
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.22	2.77	7.16	12.46	10.92	5.99	0.81	0.13	0.05	40.53
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.34	1.29	1.37	1.38	1.43	1.44	1.38	1.38	1.29	1.33	16.17
Pumps & Aux.	0.40	0.36	0.39	0.36	0.30	0.28	0.29	0.29	0.28	0.32	0.37	0.39	4.02
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	44.17	39.89	44.16	42.70	44.15	42.75	44.14	44.15	42.75	44.14	42.79	44.17	519.97
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.33	6.62	7.32	7.02	7.29	7.10	7.28	7.29	7.10	7.28	7.16	7.33	86.13
Total	53.23	48.07	53.25	51.58	55.88	58.67	65.60	64.08	57.50	53.94	51.73	53.27	666.82

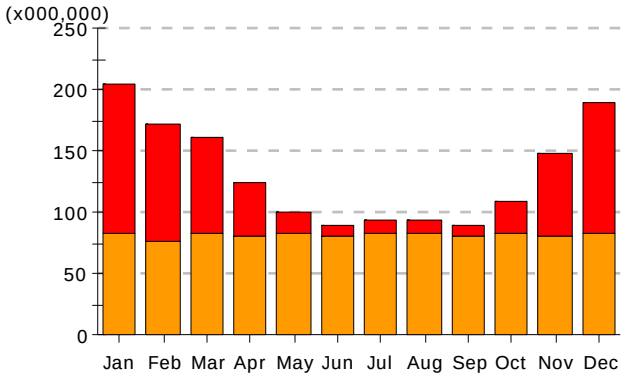
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	131.9	104.3	87.5	50.9	21.4	10.7	13.7	12.6	12.7	30.3	77.0	116.2	669.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	215.5	179.8	171.1	131.7	105.0	91.6	97.3	96.2	93.5	113.9	157.9	199.8	1,653.3

Electric Consumption (kWh)



Gas Consumption (Btu)



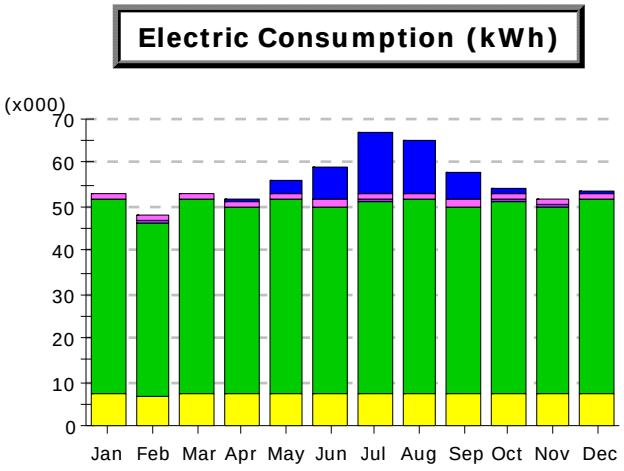


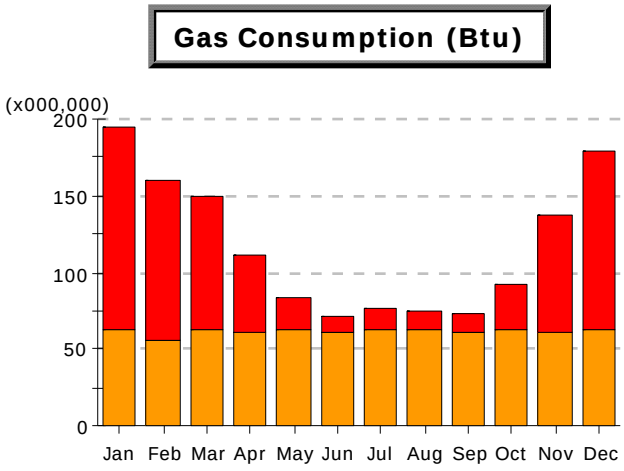
Electric Consumption (kWh x000)

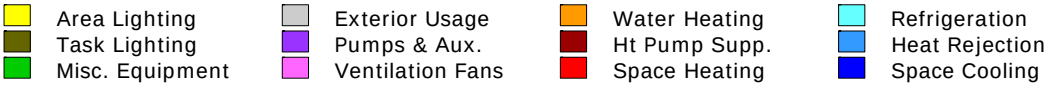
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.24	3.02	7.81	13.59	11.90	6.53	0.89	0.14	0.05	44.19
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.11	0.09	0.08	0.06	0.03	0.02	0.03	0.02	0.02	0.04	0.08	0.10	0.69
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.34	1.29	1.37	1.38	1.43	1.44	1.38	1.38	1.29	1.33	16.17
Pumps & Aux.	0.43	0.40	0.43	0.40	0.34	0.32	0.32	0.32	0.32	0.36	0.41	0.43	4.48
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	44.17	39.89	44.16	42.70	44.15	42.75	44.14	44.15	42.75	44.14	42.79	44.17	519.97
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.33	6.62	7.32	7.02	7.29	7.10	7.28	7.29	7.10	7.28	7.16	7.33	86.13
Total	53.38	48.20	53.38	51.70	56.20	59.37	66.79	65.13	58.10	54.10	51.86	53.41	671.63

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	121.5	95.4	78.1	43.4	17.1	7.6	9.8	9.1	9.2	24.6	67.8	106.4	590.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	205.1	170.8	161.7	124.2	100.7	88.5	93.4	92.7	90.1	108.2	148.7	190.0	1,574.1





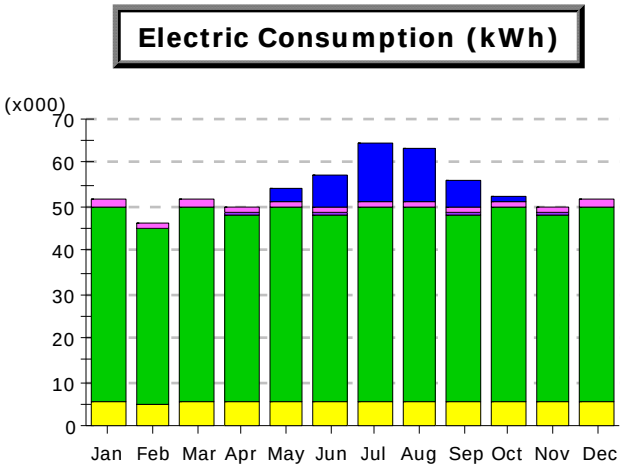


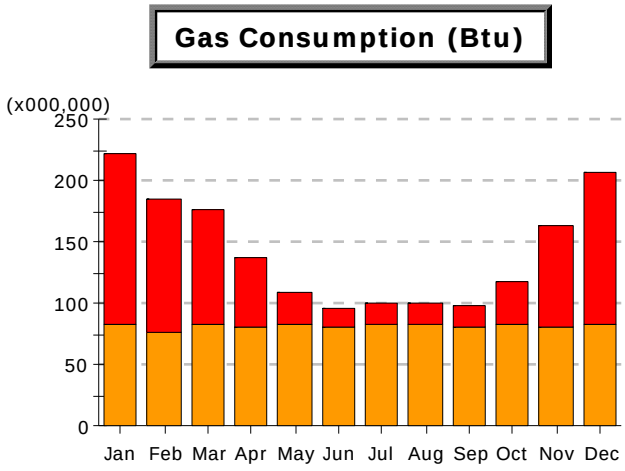
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.24	3.02	7.81	13.59	11.90	6.53	0.89	0.14	0.05	44.19
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.34	1.29	1.37	1.38	1.43	1.44	1.38	1.38	1.29	1.33	16.17
Pumps & Aux.	0.40	0.36	0.39	0.36	0.30	0.28	0.29	0.29	0.28	0.32	0.37	0.39	4.02
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	44.17	39.89	44.16	42.70	44.15	42.75	44.14	44.15	42.75	44.14	42.79	44.17	519.97
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.33	6.62	7.32	7.02	7.29	7.10	7.28	7.29	7.10	7.28	7.16	7.33	86.13
Total	53.23	48.07	53.26	51.60	56.13	59.31	66.73	65.07	58.04	54.02	51.74	53.27	670.48

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	131.9	104.3	87.5	50.9	21.4	10.7	13.7	12.6	12.7	30.3	77.0	116.2	669.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	62.2	56.2	62.2	60.2	62.2	60.2	62.2	62.2	60.2	62.2	60.2	62.2	732.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	194.1	160.5	149.7	111.0	83.5	70.9	75.8	74.8	72.8	92.5	137.2	178.4	1,401.3





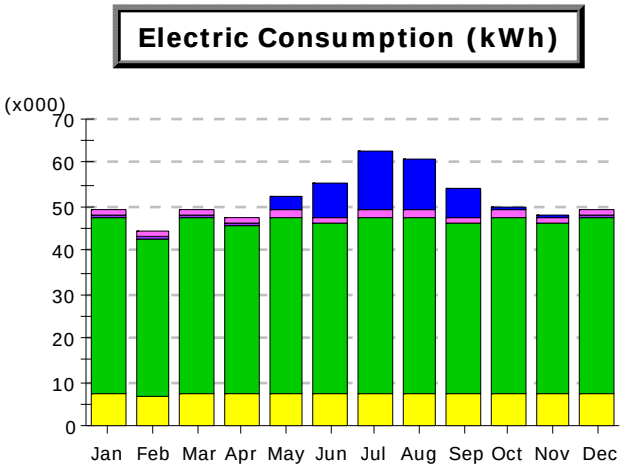


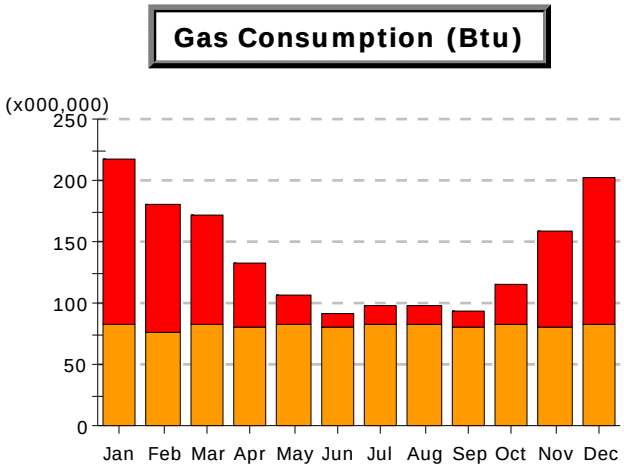
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.23	2.98	7.71	13.45	11.77	6.45	0.87	0.14	0.05	43.69
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.33	1.28	1.36	1.36	1.41	1.43	1.37	1.37	1.29	1.33	16.07
Pumps & Aux.	0.39	0.36	0.39	0.36	0.30	0.28	0.28	0.28	0.28	0.32	0.37	0.39	4.01
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	44.17	39.89	44.16	42.70	44.15	42.75	44.14	44.15	42.75	44.14	42.79	44.17	519.97
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.58	5.04	5.57	5.34	5.55	5.40	5.54	5.55	5.40	5.54	5.45	5.58	65.53
Total	51.47	46.49	51.50	49.92	54.34	57.50	64.82	63.18	56.25	52.25	50.03	51.52	649.26

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	137.7	109.4	93.2	55.8	25.2	13.8	17.0	15.9	16.0	34.8	82.5	122.0	723.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	221.2	184.9	176.8	136.7	108.8	94.7	100.6	99.5	96.9	118.4	163.4	205.6	1,707.4





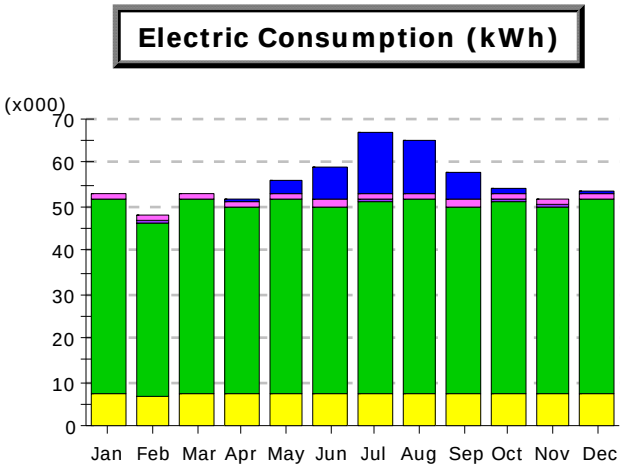


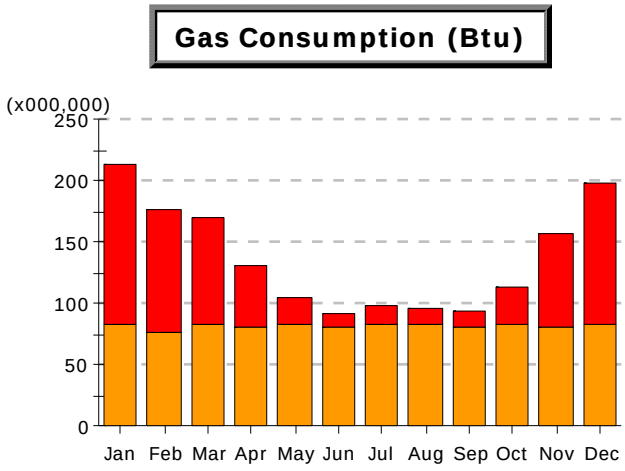
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.24	3.00	7.78	13.55	11.87	6.50	0.88	0.14	0.05	44.04
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.34	1.28	1.37	1.37	1.42	1.44	1.38	1.38	1.29	1.33	16.14
Pumps & Aux.	0.40	0.36	0.39	0.36	0.30	0.28	0.28	0.28	0.28	0.32	0.37	0.39	4.02
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	40.18	36.29	40.18	38.85	40.16	38.89	40.16	40.16	38.89	40.16	38.92	40.18	473.02
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.33	6.62	7.32	7.02	7.29	7.10	7.28	7.29	7.10	7.28	7.16	7.33	86.13
Total	49.24	44.47	49.27	47.74	52.13	55.42	62.69	61.04	54.15	50.02	47.88	49.28	623.34

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	133.1	105.4	88.9	51.9	22.2	11.3	14.2	13.3	13.3	31.2	78.1	117.5	680.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	216.7	180.9	172.5	132.8	105.8	92.2	97.8	96.9	94.2	114.8	159.0	201.1	1,664.6





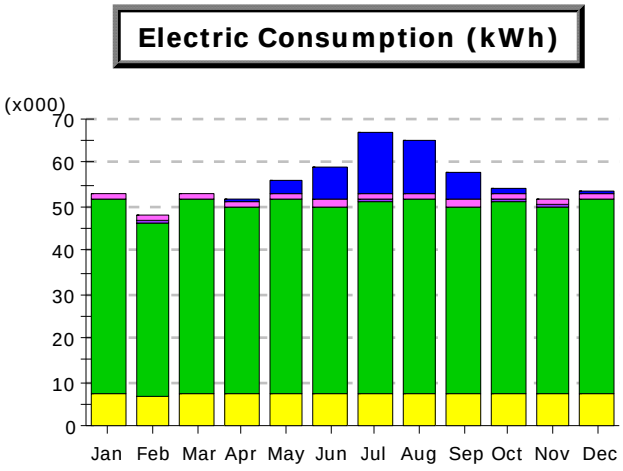


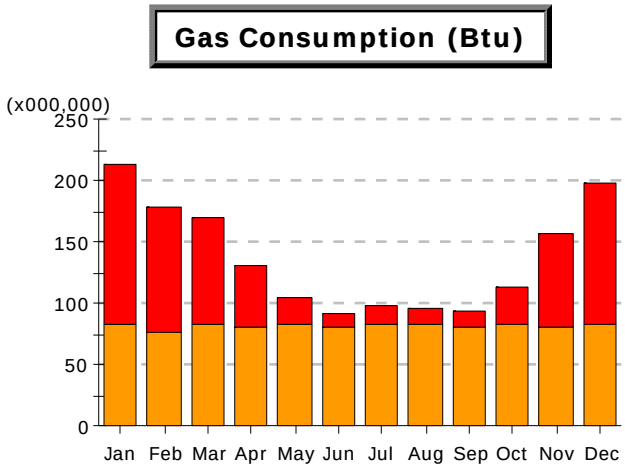
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.24	3.02	7.80	13.58	11.90	6.53	0.89	0.14	0.05	44.17
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.34	1.29	1.37	1.38	1.42	1.44	1.39	1.38	1.30	1.33	16.18
Pumps & Aux.	0.40	0.36	0.39	0.36	0.30	0.28	0.29	0.29	0.28	0.32	0.37	0.39	4.02
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	44.17	39.89	44.16	42.70	44.15	42.75	44.14	44.15	42.75	44.14	42.79	44.17	519.97
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.33	6.62	7.32	7.02	7.29	7.10	7.28	7.29	7.10	7.28	7.16	7.33	86.13
Total	53.23	48.08	53.25	51.60	56.13	59.31	66.71	65.07	58.05	54.02	51.74	53.27	670.47

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	128.6	101.5	85.0	49.2	20.6	10.4	13.7	12.6	12.3	29.1	74.8	113.3	651.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	212.1	177.0	168.6	130.1	104.2	91.3	97.3	96.2	93.2	112.7	155.6	196.9	1,635.2







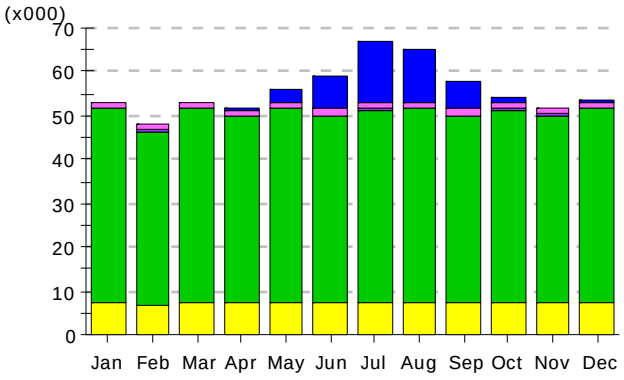
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.24	3.02	7.80	13.57	11.89	6.52	0.89	0.14	0.05	44.15
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.34	1.29	1.37	1.38	1.42	1.44	1.38	1.38	1.29	1.33	16.16
Pumps & Aux.	0.40	0.36	0.39	0.36	0.30	0.28	0.28	0.28	0.28	0.32	0.37	0.39	4.02
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	44.17	39.89	44.16	42.70	44.15	42.75	44.14	44.15	42.75	44.14	42.79	44.17	519.97
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.33	6.62	7.32	7.02	7.29	7.10	7.28	7.29	7.10	7.28	7.16	7.33	86.13
Total	53.23	48.07	53.26	51.60	56.13	59.31	66.71	65.06	58.03	54.01	51.74	53.27	670.43

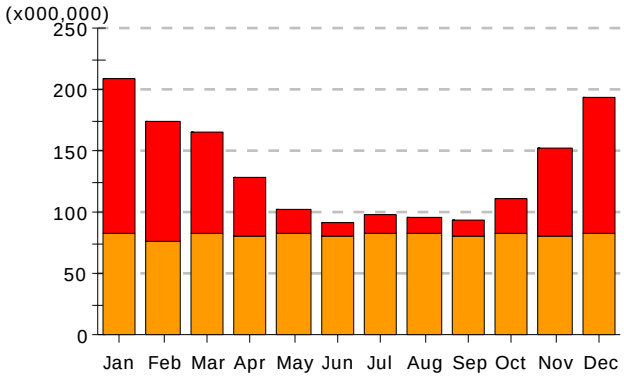
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	130.3	102.7	86.2	49.9	20.9	10.5	13.6	12.6	12.4	29.6	75.8	114.7	659.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	213.9	178.2	169.8	130.7	104.5	91.4	97.2	96.1	93.3	113.2	156.7	198.3	1,643.3

Electric Consumption (kWh)



Gas Consumption (Btu)



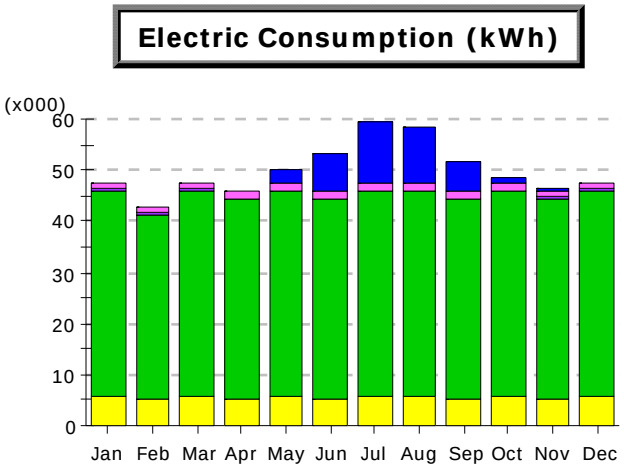


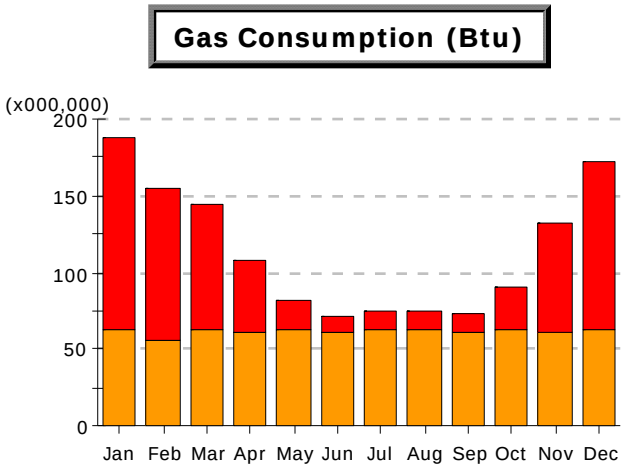
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.03	0.24	3.03	7.82	13.59	11.91	6.54	0.89	0.14	0.05	44.24
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.34	1.29	1.38	1.38	1.43	1.44	1.39	1.39	1.29	1.33	16.19
Pumps & Aux.	0.40	0.36	0.39	0.36	0.30	0.28	0.28	0.28	0.28	0.32	0.37	0.39	4.02
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	44.17	39.89	44.16	42.70	44.15	42.75	44.14	44.15	42.75	44.14	42.79	44.17	519.97
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.33	6.62	7.32	7.02	7.29	7.10	7.28	7.29	7.10	7.28	7.16	7.33	86.13
Total	53.23	48.07	53.25	51.61	56.15	59.33	66.73	65.08	58.06	54.03	51.74	53.27	670.54

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	124.8	98.2	81.9	46.9	19.5	9.9	13.4	12.1	11.7	27.7	72.2	110.1	628.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	83.6	75.5	83.6	80.9	83.6	80.9	83.6	83.6	80.9	83.6	80.9	83.6	984.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	208.4	173.7	165.5	127.8	103.1	90.8	97.0	95.7	92.6	111.2	153.0	193.6	1,612.4





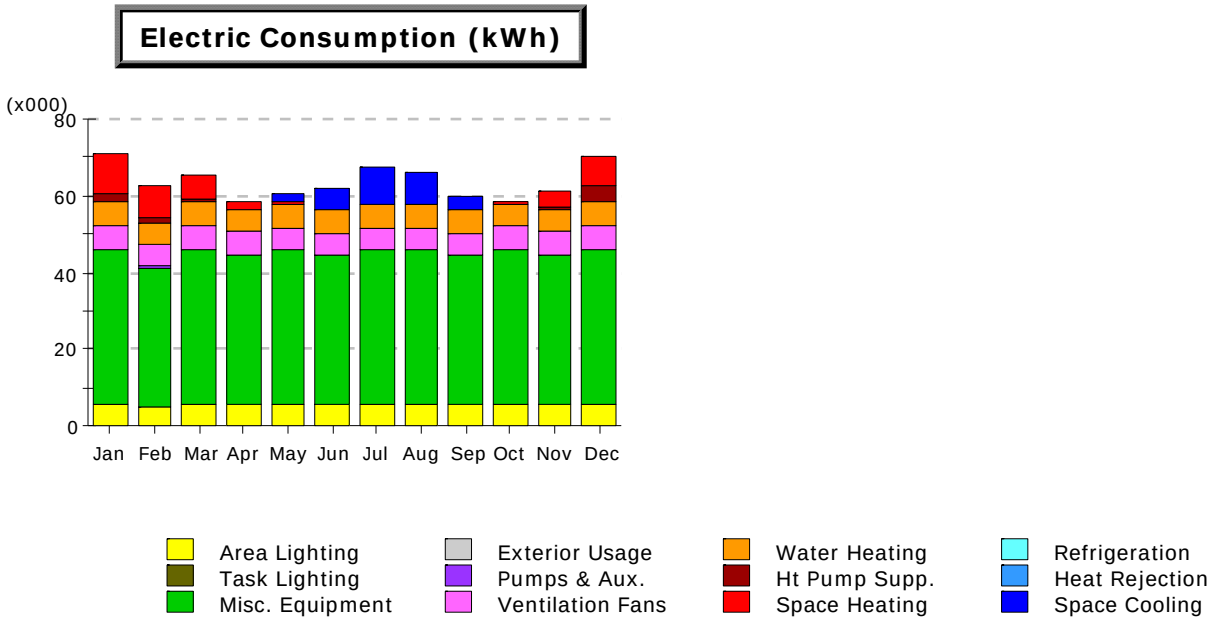


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.04	0.21	2.72	7.04	12.28	10.76	5.90	0.80	0.12	0.05	39.91
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.11	0.09	0.08	0.06	0.04	0.03	0.03	0.03	0.03	0.05	0.08	0.10	0.74
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.33	1.20	1.33	1.28	1.36	1.36	1.40	1.42	1.37	1.37	1.29	1.33	16.03
Pumps & Aux.	0.43	0.39	0.43	0.40	0.34	0.31	0.32	0.32	0.32	0.36	0.41	0.43	4.46
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	40.18	36.29	40.18	38.85	40.16	38.89	40.16	40.16	38.89	40.16	38.92	40.18	473.02
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.58	5.04	5.57	5.34	5.55	5.40	5.54	5.55	5.40	5.54	5.45	5.58	65.53
Total	47.63	43.01	47.63	46.14	50.17	53.03	59.74	58.24	51.91	48.28	46.27	47.66	599.69

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	125.5	98.8	82.0	47.1	20.2	10.5	13.4	12.5	12.3	28.1	72.0	110.5	633.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	62.2	56.2	62.2	60.2	62.2	60.2	62.2	62.2	60.2	62.2	60.2	62.2	732.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	187.7	155.0	144.2	107.3	82.4	70.6	75.6	74.7	72.4	90.3	132.1	172.7	1,365.0

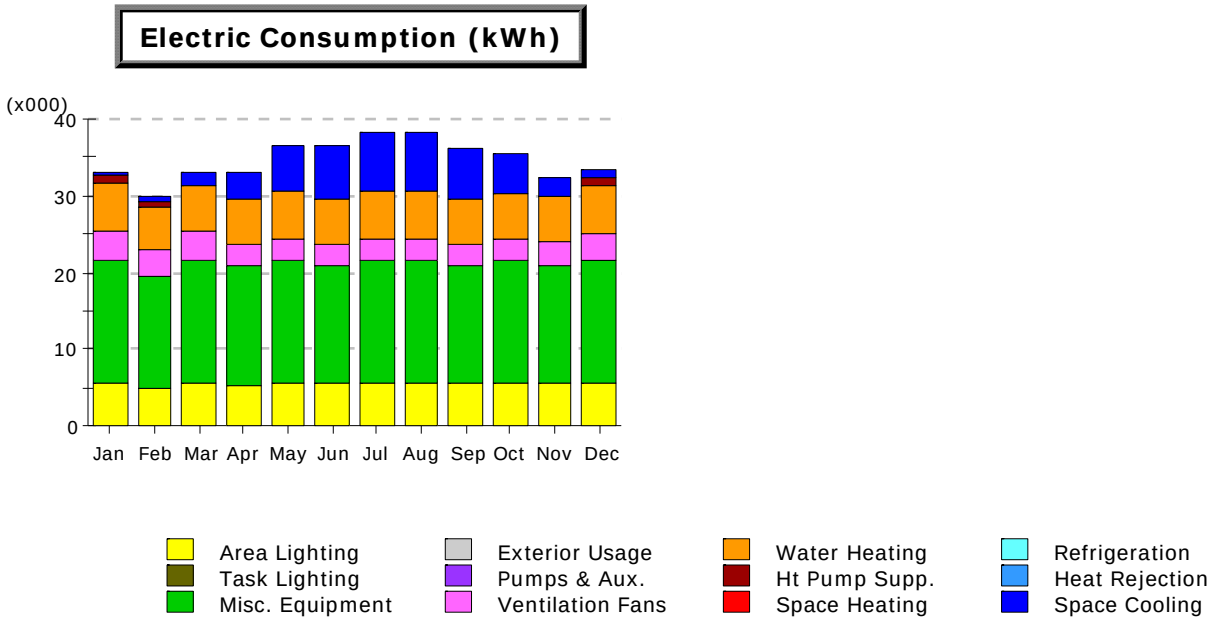


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.02	0.16	2.19	5.52	9.80	8.01	3.81	0.47	0.01	-	29.97
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	10.48	8.16	6.22	1.97	0.11	-	-	-	-	0.26	4.31	7.46	38.97
HP Supp.	1.99	1.61	0.91	0.15	0.01	-	-	-	-	0.00	0.46	4.37	9.50
Hot Water	6.21	5.61	6.21	6.01	6.23	5.98	6.13	6.10	5.89	6.12	5.97	6.21	72.65
Vent. Fans	6.00	5.42	6.00	5.75	5.96	5.82	5.96	5.96	5.82	5.96	5.85	6.00	70.50
Pumps & Aux.	0.36	0.38	0.46	0.51	0.12	-	-	-	0.02	0.24	0.44	0.42	2.96
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	40.18	36.29	40.18	38.85	40.16	38.89	40.16	40.16	38.89	40.16	38.92	40.18	473.02
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.58	5.04	5.57	5.34	5.55	5.40	5.54	5.55	5.40	5.54	5.45	5.58	65.53
Total	70.79	62.51	65.56	58.73	60.33	61.60	67.59	65.78	59.83	58.75	61.40	70.22	763.10

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

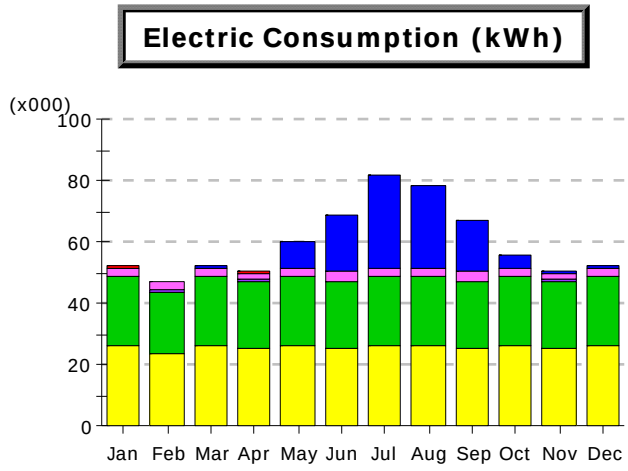


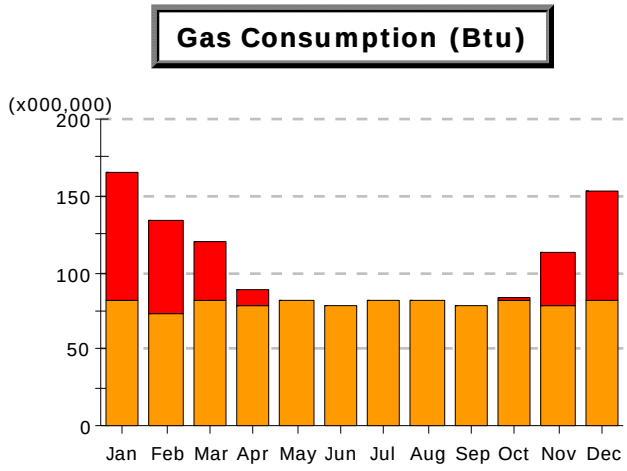
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.24	0.54	1.73	3.53	5.95	7.02	7.93	7.67	6.67	5.24	2.33	0.91	49.75
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.01	-	-	-	-	-	-	-	-	-	-	0.01	0.01
HP Supp.	1.05	0.74	-	-	-	-	-	-	-	-	-	0.99	2.78
Hot Water	6.22	5.62	6.23	6.03	6.23	5.98	6.13	6.09	5.89	6.12	5.97	6.22	72.72
Vent. Fans	3.87	3.37	3.55	2.73	2.67	2.63	2.73	2.72	2.61	2.66	3.02	3.53	36.07
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	16.10	14.54	16.10	15.56	16.09	15.58	16.09	16.09	15.58	16.09	15.59	16.10	189.52
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.58	5.04	5.57	5.34	5.55	5.40	5.54	5.55	5.40	5.54	5.45	5.58	65.53
Total	33.06	29.84	33.17	33.19	36.48	36.61	38.42	38.12	36.16	35.65	32.35	33.33	416.38

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													







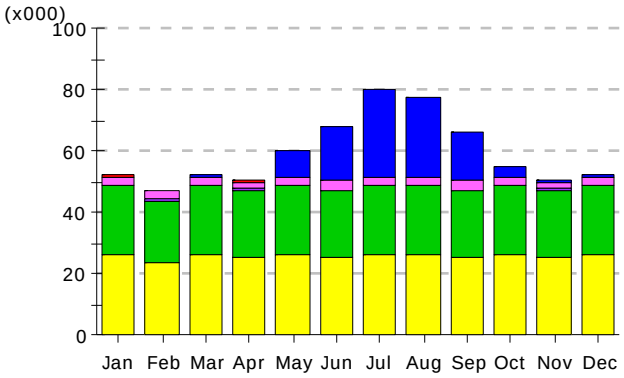
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.07	0.84	8.60	18.74	29.94	26.86	16.57	3.70	0.43	0.19	105.92
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.23	0.17	0.12	0.03	0.00	-	-	-	-	0.01	0.11	0.20	0.85
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.52	2.29	2.60	2.57	2.82	2.78	2.76	2.77	2.72	2.71	2.45	2.52	31.52
Pumps & Aux.	0.72	0.65	0.72	0.68	0.63	0.59	0.61	0.61	0.60	0.65	0.68	0.72	7.87
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	22.28	20.13	22.28	21.57	22.28	21.57	22.28	22.28	21.57	22.28	21.57	22.28	262.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.00	23.48	26.00	25.16	26.00	25.16	26.00	26.00	25.16	26.00	25.16	26.00	306.11
Total	51.76	46.72	51.78	50.84	60.33	68.84	81.60	78.53	66.61	55.35	50.39	51.90	714.65

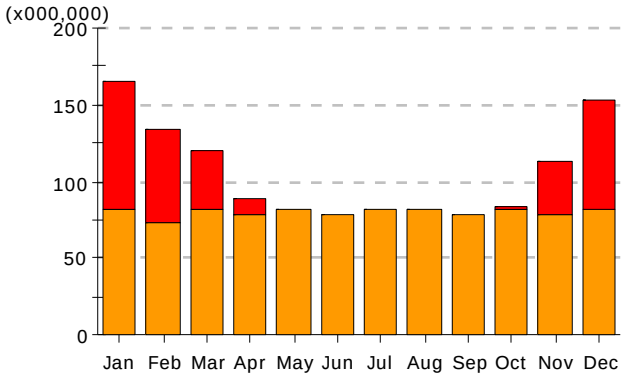
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	83.9	59.6	37.7	8.9	0.5	-	-	-	-	2.5	34.1	71.8	299.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	81.5	73.7	81.5	78.9	81.5	78.9	81.5	81.5	78.9	81.5	78.9	81.5	960.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	165.4	133.3	119.2	87.9	82.1	78.9	81.5	81.5	78.9	84.1	113.1	153.3	1,259.2

Electric Consumption (kWh)



Gas Consumption (Btu)



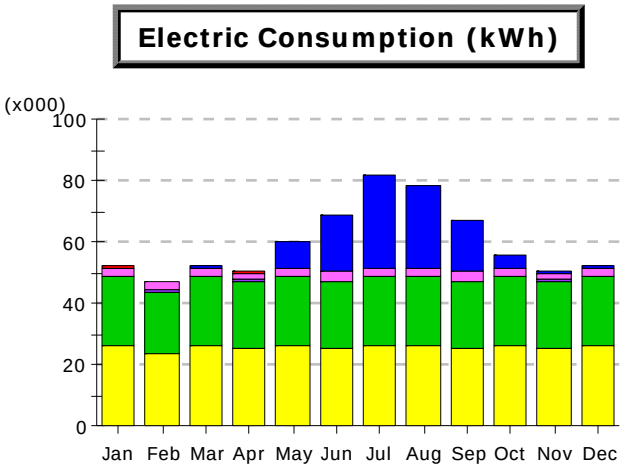


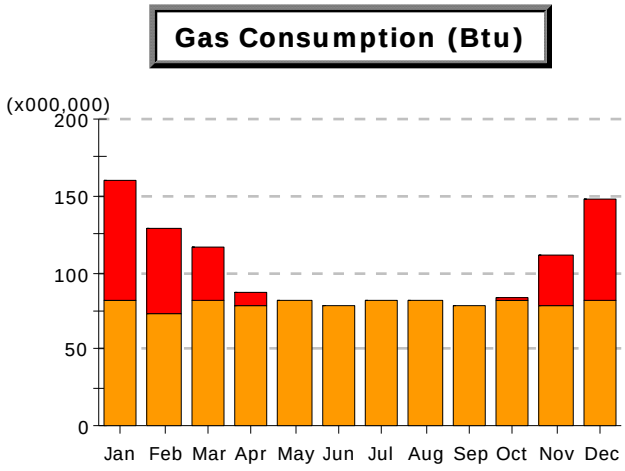
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.06	0.79	8.15	17.76	28.38	25.46	15.70	3.51	0.40	0.18	100.40
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.23	0.17	0.12	0.03	0.00	-	-	-	-	0.01	0.11	0.20	0.85
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.52	2.29	2.60	2.57	2.82	2.78	2.76	2.77	2.72	2.71	2.45	2.52	31.52
Pumps & Aux.	0.72	0.65	0.72	0.68	0.63	0.59	0.61	0.61	0.60	0.65	0.68	0.72	7.87
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	22.28	20.13	22.28	21.57	22.28	21.57	22.28	22.28	21.57	22.28	21.57	22.28	262.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.00	23.48	26.00	25.16	26.00	25.16	26.00	26.00	25.16	26.00	25.16	26.00	306.11
Total	51.76	46.72	51.78	50.80	59.89	67.86	80.04	77.13	65.74	55.15	50.36	51.89	709.13

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	83.9	59.6	37.7	8.9	0.5	-	-	-	-	2.5	34.1	71.8	299.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	81.5	73.7	81.5	78.9	81.5	78.9	81.5	81.5	78.9	81.5	78.9	81.5	960.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	165.4	133.3	119.2	87.9	82.1	78.9	81.5	81.5	78.9	84.1	113.1	153.3	1,259.2





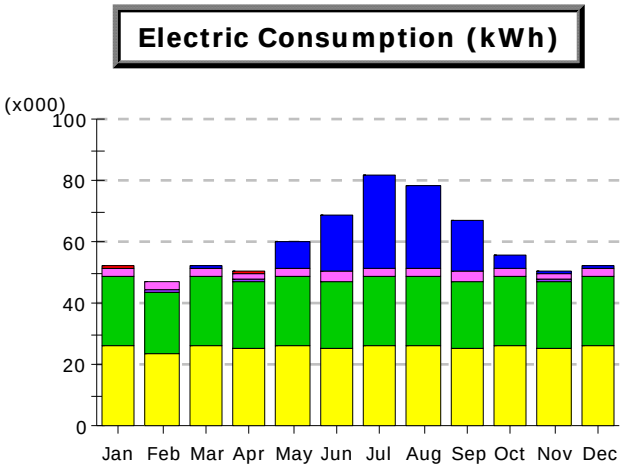


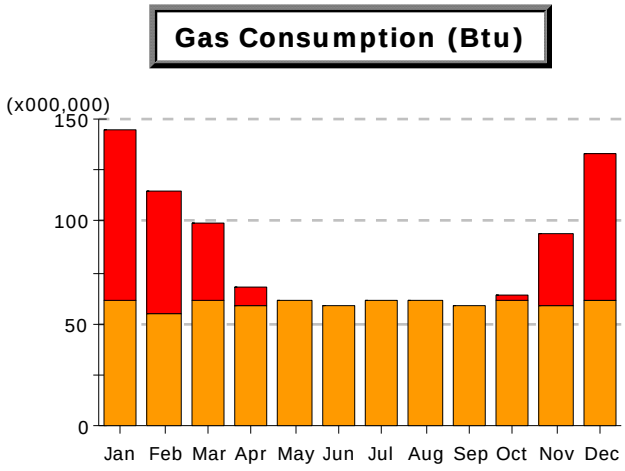
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.07	0.84	8.60	18.74	29.94	26.86	16.57	3.70	0.43	0.19	105.92
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.23	0.17	0.12	0.03	0.00	-	-	-	-	0.01	0.11	0.20	0.85
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.52	2.29	2.60	2.57	2.82	2.78	2.76	2.77	2.72	2.71	2.45	2.52	31.52
Pumps & Aux.	0.72	0.65	0.72	0.68	0.63	0.59	0.61	0.61	0.60	0.65	0.68	0.72	7.87
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	22.28	20.13	22.28	21.57	22.28	21.57	22.28	22.28	21.57	22.28	21.57	22.28	262.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.00	23.48	26.00	25.16	26.00	25.16	26.00	26.00	25.16	26.00	25.16	26.00	306.11
Total	51.76	46.72	51.78	50.84	60.33	68.84	81.60	78.53	66.61	55.35	50.39	51.90	714.65

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	77.7	55.2	34.9	8.3	0.5	-	-	-	-	2.3	31.6	66.5	277.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	81.5	73.7	81.5	78.9	81.5	78.9	81.5	81.5	78.9	81.5	78.9	81.5	960.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	159.2	128.9	116.4	87.2	82.1	78.9	81.5	81.5	78.9	83.9	110.5	148.0	1,237.1





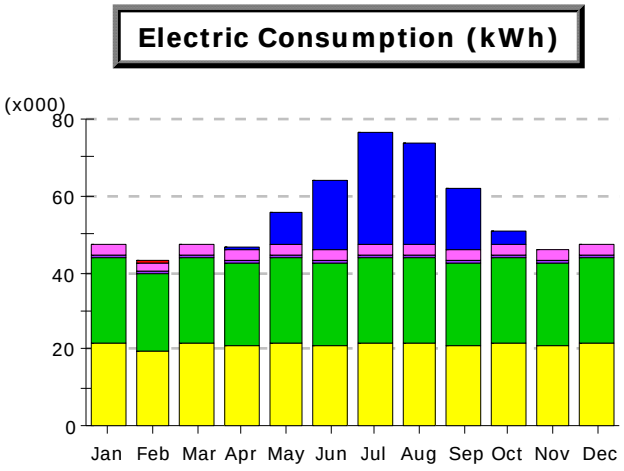


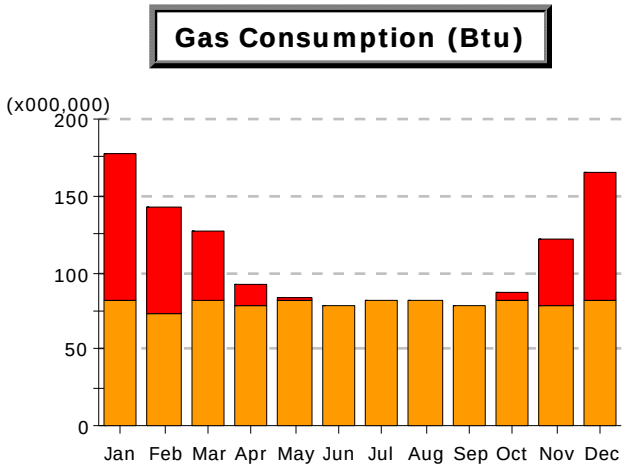
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.07	0.84	8.60	18.74	29.94	26.86	16.57	3.70	0.43	0.19	105.92
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.23	0.17	0.12	0.03	0.00	-	-	-	-	0.01	0.11	0.20	0.85
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.52	2.29	2.60	2.57	2.82	2.78	2.76	2.77	2.72	2.71	2.45	2.52	31.52
Pumps & Aux.	0.72	0.65	0.72	0.68	0.63	0.59	0.61	0.61	0.60	0.65	0.68	0.72	7.87
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	22.28	20.13	22.28	21.57	22.28	21.57	22.28	22.28	21.57	22.28	21.57	22.28	262.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.00	23.48	26.00	25.16	26.00	25.16	26.00	26.00	25.16	26.00	25.16	26.00	306.11
Total	51.76	46.72	51.78	50.84	60.33	68.84	81.60	78.53	66.61	55.35	50.39	51.90	714.65

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	83.9	59.6	37.7	8.9	0.5	-	-	-	-	2.5	34.1	71.8	299.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	61.2	55.2	61.2	59.2	61.2	59.2	61.2	61.2	59.2	61.2	59.2	61.2	720.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	145.0	114.9	98.8	68.1	61.7	59.2	61.2	61.2	59.2	63.7	93.3	132.9	1,019.2





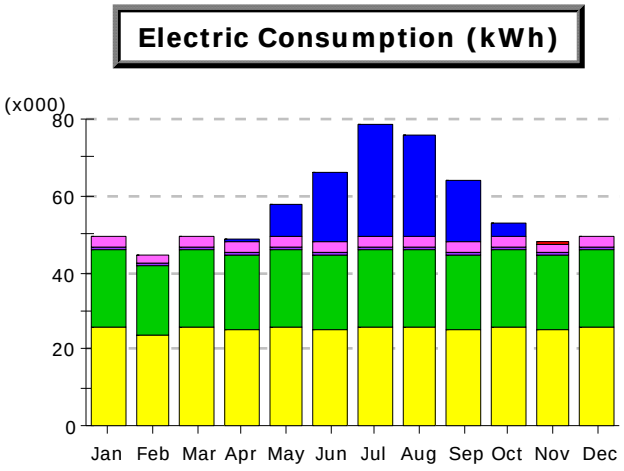


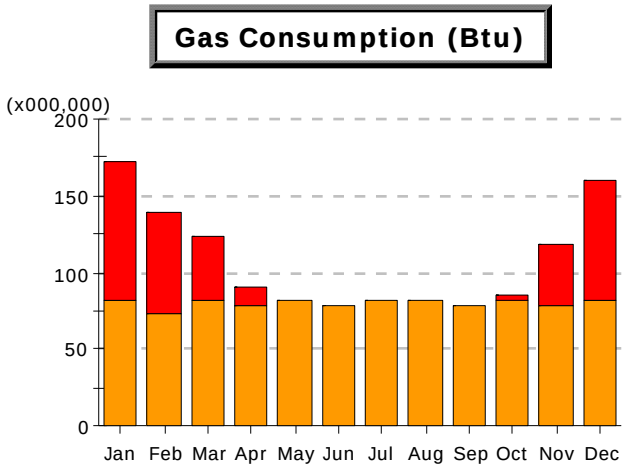
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.06	0.81	8.35	18.23	29.17	26.17	16.10	3.59	0.42	0.19	103.08
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.25	0.18	0.14	0.04	0.00	-	-	0.00	-	0.01	0.13	0.22	0.99
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.49	2.26	2.56	2.52	2.72	2.68	2.69	2.69	2.63	2.63	2.42	2.49	30.79
Pumps & Aux.	0.72	0.65	0.71	0.67	0.62	0.59	0.61	0.61	0.59	0.64	0.68	0.71	7.79
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	22.28	20.13	22.28	21.57	22.28	21.57	22.28	22.28	21.57	22.28	21.57	22.28	262.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	21.67	19.57	21.67	20.97	21.67	20.97	21.67	21.67	20.97	21.67	20.97	21.67	255.09
Total	47.41	42.79	47.43	46.58	55.65	64.03	76.41	73.42	61.85	50.82	46.18	47.56	660.11

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	95.7	69.6	46.2	13.7	1.5	-	-	0.2	-	4.6	43.6	83.3	358.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	81.5	73.7	81.5	78.9	81.5	78.9	81.5	81.5	78.9	81.5	78.9	81.5	960.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	177.3	143.3	127.7	92.6	83.0	78.9	81.5	81.7	78.9	86.1	122.5	164.9	1,318.5





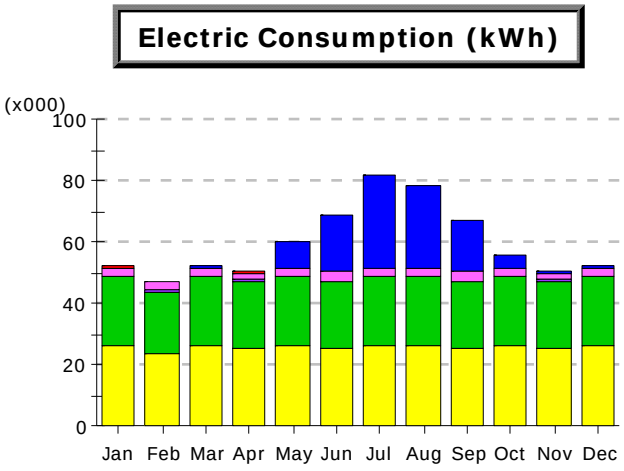


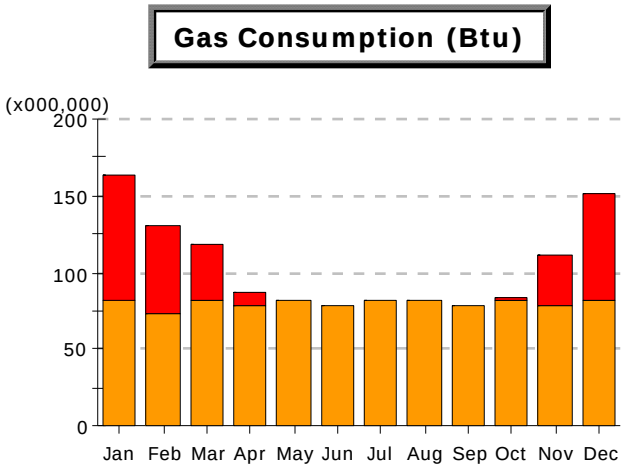
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.06	0.83	8.46	18.46	29.52	26.49	16.31	3.64	0.42	0.19	104.39
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.24	0.18	0.13	0.04	0.00	-	-	-	-	0.01	0.12	0.21	0.93
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.51	2.28	2.58	2.54	2.76	2.73	2.72	2.73	2.67	2.66	2.43	2.51	31.11
Pumps & Aux.	0.72	0.65	0.71	0.68	0.63	0.59	0.61	0.61	0.59	0.64	0.68	0.71	7.83
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	20.00	18.06	20.00	19.35	20.00	19.35	20.00	20.00	19.35	20.00	19.35	20.00	235.47
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.00	23.48	26.00	25.16	26.00	25.16	26.00	26.00	25.16	26.00	25.16	26.00	306.11
Total	49.46	44.65	49.48	48.59	57.86	66.29	78.85	75.82	64.09	52.95	48.17	49.61	685.82

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	90.1	64.9	42.2	11.4	1.0	-	-	-	-	3.5	39.2	77.9	330.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	81.5	73.7	81.5	78.9	81.5	78.9	81.5	81.5	78.9	81.5	78.9	81.5	960.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	171.7	138.6	123.7	90.3	82.5	78.9	81.5	81.5	78.9	85.1	118.2	159.5	1,290.4





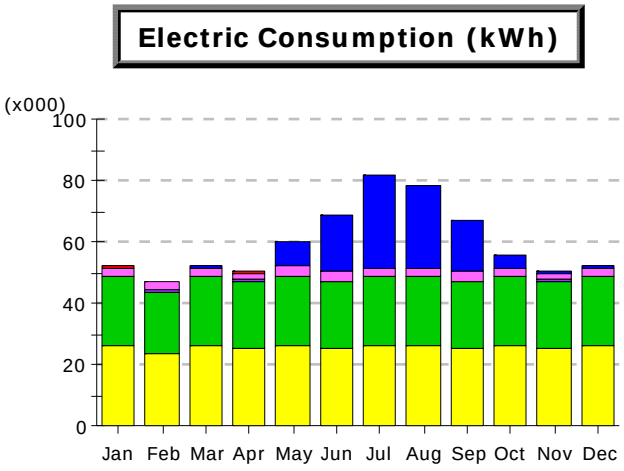


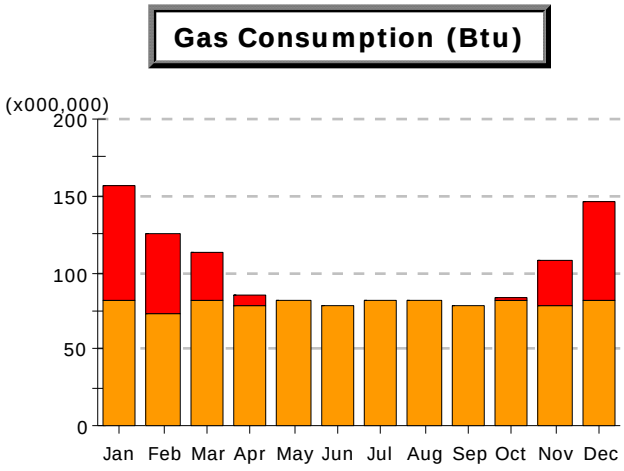
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.07	0.84	8.60	18.74	29.93	26.86	16.57	3.71	0.43	0.19	105.93
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.23	0.16	0.11	0.02	0.00	-	-	-	-	0.01	0.10	0.19	0.83
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.52	2.29	2.60	2.57	2.82	2.78	2.76	2.77	2.72	2.71	2.45	2.52	31.53
Pumps & Aux.	0.72	0.65	0.72	0.68	0.63	0.59	0.61	0.61	0.60	0.65	0.68	0.72	7.87
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	22.28	20.13	22.28	21.57	22.28	21.57	22.28	22.28	21.57	22.28	21.57	22.28	262.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.00	23.48	26.00	25.16	26.00	25.16	26.00	26.00	25.16	26.00	25.16	26.00	306.11
Total	51.76	46.72	51.78	50.84	60.34	68.84	81.59	78.53	66.62	55.35	50.38	51.90	714.64

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	81.5	57.6	35.9	7.9	0.4	-	-	-	-	1.9	32.6	69.6	287.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	81.5	73.7	81.5	78.9	81.5	78.9	81.5	81.5	78.9	81.5	78.9	81.5	960.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	163.0	131.3	117.4	86.8	82.0	78.9	81.5	81.5	78.9	83.4	111.5	151.1	1,247.5





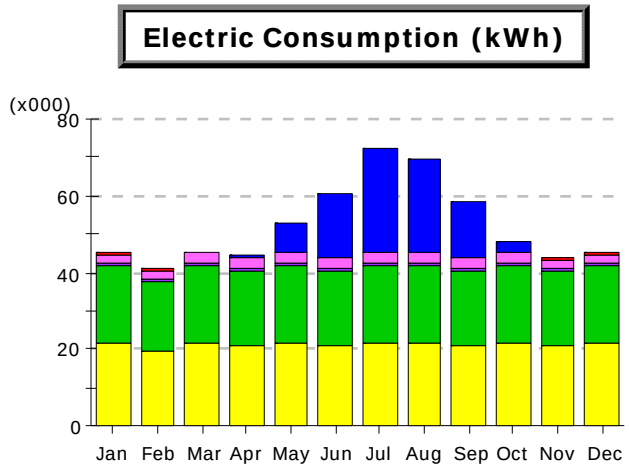


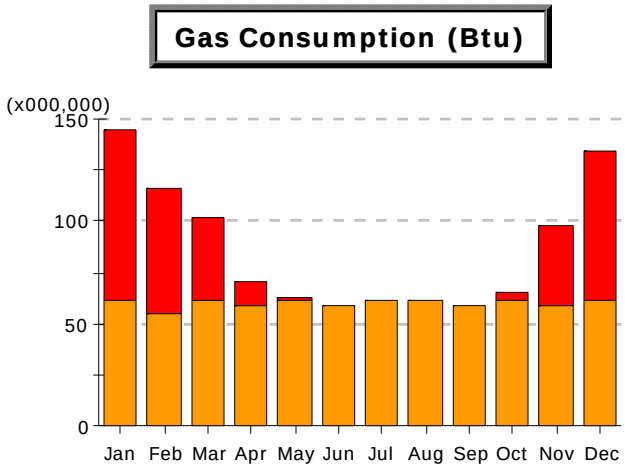
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.07	0.85	8.64	18.77	29.92	26.88	16.61	3.73	0.43	0.19	106.08
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.22	0.15	0.10	0.02	0.00	-	-	-	-	0.01	0.09	0.18	0.76
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.53	2.30	2.62	2.59	2.84	2.79	2.76	2.77	2.73	2.73	2.45	2.52	31.63
Pumps & Aux.	0.72	0.65	0.72	0.68	0.63	0.59	0.61	0.61	0.60	0.65	0.68	0.72	7.87
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	22.28	20.13	22.28	21.57	22.28	21.57	22.28	22.28	21.57	22.28	21.57	22.28	262.38
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.00	23.48	26.00	25.16	26.00	25.16	26.00	26.00	25.16	26.00	25.16	26.00	306.11
Total	51.75	46.71	51.78	50.86	60.40	68.88	81.58	78.54	66.67	55.39	50.38	51.89	714.84

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	75.0	52.2	32.1	6.8	0.4	-	-	-	-	1.8	29.2	63.8	261.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	81.5	73.7	81.5	78.9	81.5	78.9	81.5	81.5	78.9	81.5	78.9	81.5	960.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	156.5	125.8	113.7	85.7	81.9	78.9	81.5	81.5	78.9	83.3	108.1	145.3	1,221.3





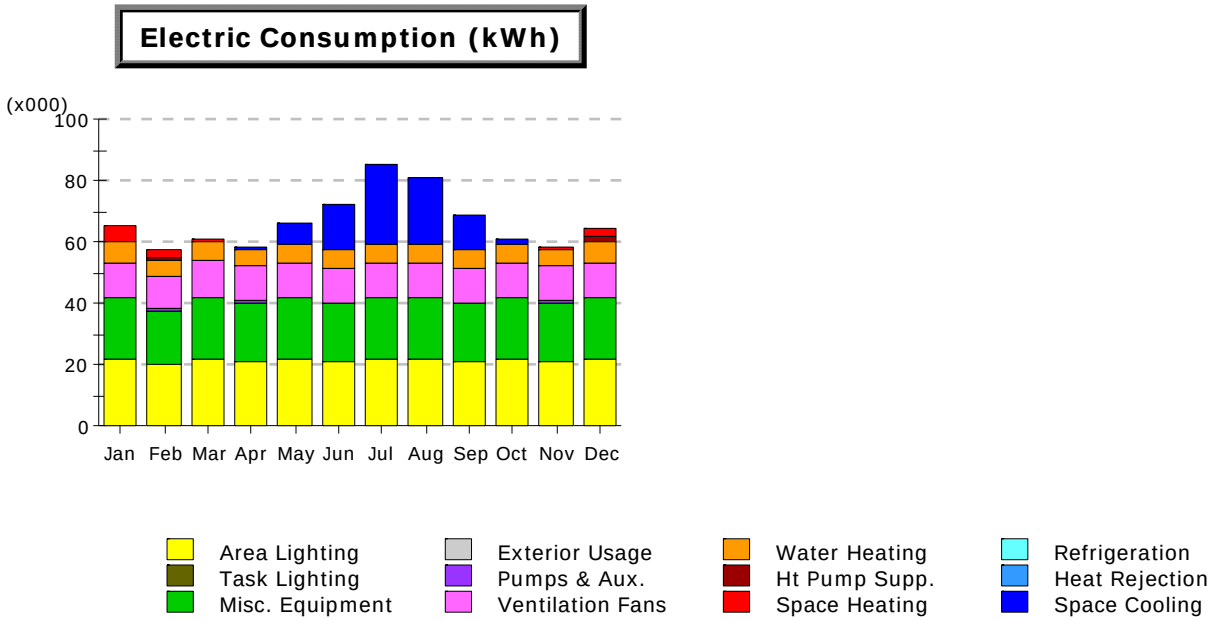


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.06	0.77	7.82	17.05	27.25	24.47	15.07	3.37	0.39	0.18	96.44
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.24	0.18	0.13	0.04	0.00	-	0.00	0.00	-	0.01	0.13	0.21	0.95
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.48	2.26	2.55	2.51	2.70	2.64	2.65	2.65	2.59	2.61	2.41	2.48	30.53
Pumps & Aux.	0.71	0.65	0.71	0.67	0.62	0.58	0.60	0.60	0.59	0.64	0.67	0.71	7.76
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	20.00	18.06	20.00	19.35	20.00	19.35	20.00	20.00	19.35	20.00	19.35	20.00	235.47
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	21.67	19.57	21.67	20.97	21.67	20.97	21.67	21.67	20.97	21.67	20.97	21.67	255.09
Total	45.10	40.71	45.12	44.31	52.81	60.60	72.17	69.39	58.57	48.30	43.92	45.24	626.24

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	84.0	60.3	40.1	11.9	1.2	-	0.1	0.6	-	4.0	38.5	73.3	313.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	61.2	55.2	61.2	59.2	61.2	59.2	61.2	61.2	59.2	61.2	59.2	61.2	720.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	145.2	115.5	101.2	71.1	62.3	59.2	61.2	61.8	59.2	65.1	97.7	134.4	1,033.9

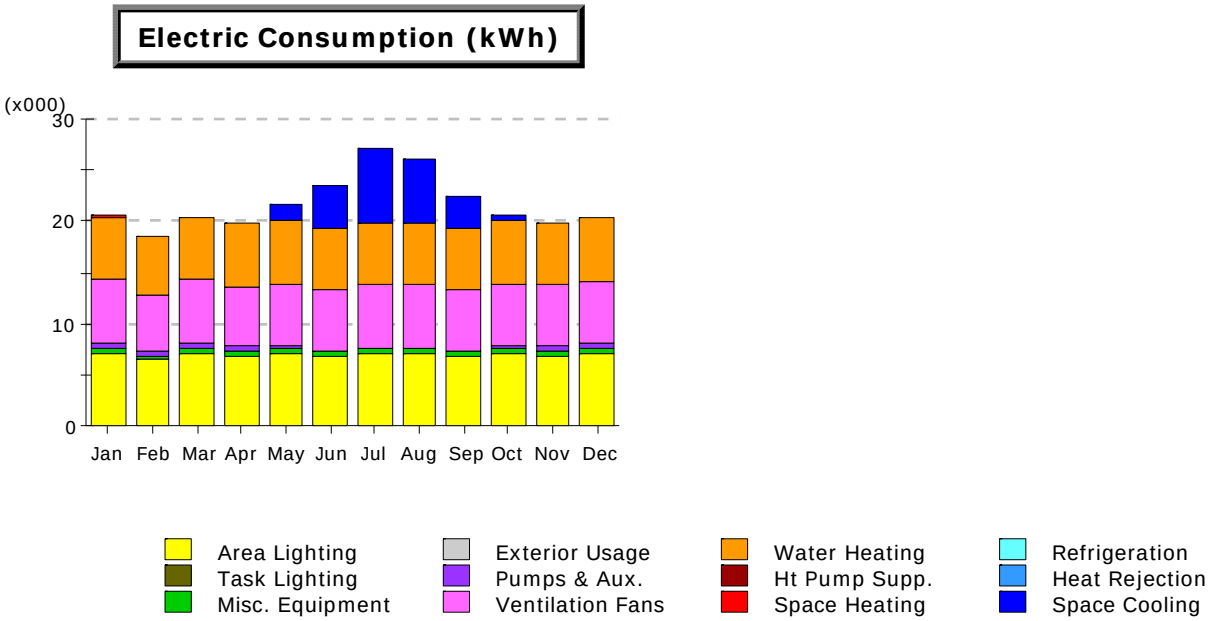


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.68	6.42	14.94	25.83	21.70	11.27	1.76	0.19	-	82.79
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	5.13	3.13	0.93	0.03	-	-	-	-	-	-	0.37	2.63	12.23
HP Supp.	0.62	0.51	0.11	0.00	-	-	-	-	-	-	0.04	2.11	3.39
Hot Water	6.22	5.62	6.22	6.03	6.23	6.03	6.23	6.23	6.03	6.23	6.03	6.22	73.31
Vent. Fans	11.36	10.26	11.36	10.99	11.36	10.99	11.36	11.36	10.99	11.36	10.99	11.36	133.76
Pumps & Aux.	0.39	0.40	0.48	0.43	0.09	-	-	-	0.01	0.18	0.43	0.43	2.84
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	20.00	18.06	20.00	19.35	20.00	19.35	20.00	20.00	19.35	20.00	19.35	20.00	235.47
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	21.67	19.57	21.67	20.97	21.67	20.97	21.67	21.67	20.97	21.67	20.97	21.67	255.09
Total	65.39	57.55	60.76	58.48	65.76	72.28	85.09	80.96	68.62	61.19	58.37	64.42	798.87

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

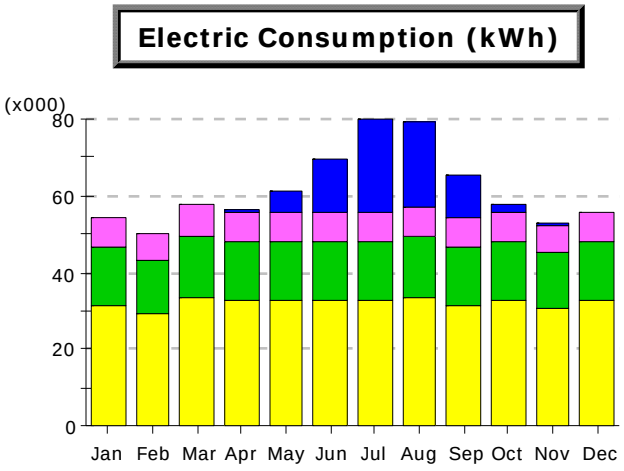


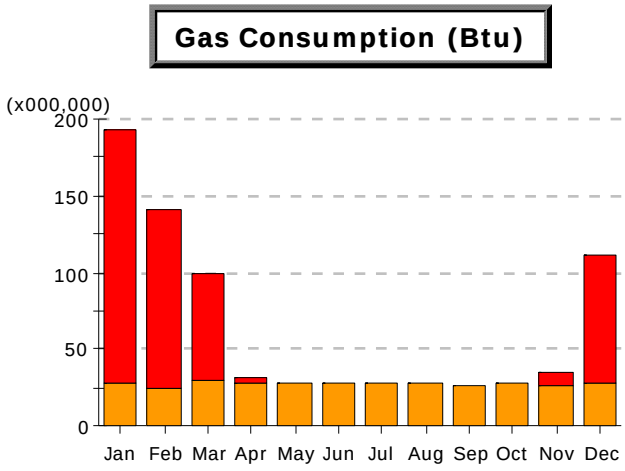
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.19	1.75	4.12	7.19	6.07	3.18	0.49	0.05	-	23.04
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.02	0.00	-	-	-	-	-	-	-	-	-	0.00	0.02
HP Supp.	0.00	0.00	-	-	-	-	-	-	-	-	-	0.00	0.01
Hot Water	6.23	5.62	6.23	6.03	6.23	6.03	6.23	6.23	6.03	6.23	6.03	6.23	73.31
Vent. Fans	6.08	5.49	6.08	5.88	6.08	5.88	6.08	6.08	5.88	6.08	5.88	6.08	71.58
Pumps & Aux.	0.54	0.50	0.52	0.43	0.09	-	-	-	0.01	0.18	0.45	0.52	3.25
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.48	0.43	0.48	0.46	0.48	0.46	0.48	0.48	0.46	0.48	0.46	0.48	5.61
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.14	6.45	7.14	6.91	7.14	6.91	7.14	7.14	6.91	7.14	6.91	7.14	84.10
Total	20.49	18.50	20.45	19.90	21.77	23.40	27.12	26.00	22.47	20.59	19.78	20.44	260.91

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													





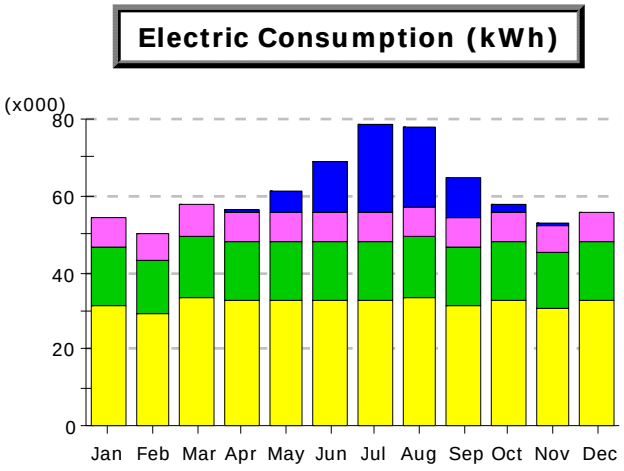


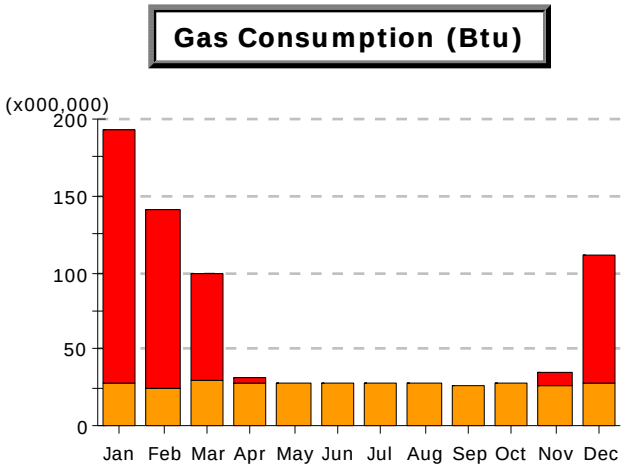
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.48	5.62	14.14	24.06	21.66	11.69	1.71	0.16	-	79.51
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.52	7.00	8.04	7.78	7.78	7.78	7.78	8.04	7.52	7.78	7.26	7.78	92.04
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	15.13	13.86	15.61	15.10	15.37	15.10	15.37	15.61	14.86	15.37	14.63	15.37	181.36
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	31.56	29.38	33.72	32.63	32.64	32.63	32.64	33.72	31.55	32.64	30.47	32.64	386.22
Total	54.39	50.40	57.54	56.14	61.43	69.65	79.84	79.02	65.62	57.55	52.67	55.96	740.22

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	166.65	115.77	71.07	3.49	-	-	-	-	-	-	9.44	83.65	450.07
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	26.98	25.17	28.90	27.94	27.83	27.72	27.63	28.49	26.65	27.62	25.87	27.82	328.63
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	193.63	140.94	99.98	31.43	27.83	27.72	27.63	28.49	26.65	27.62	35.30	111.47	778.70





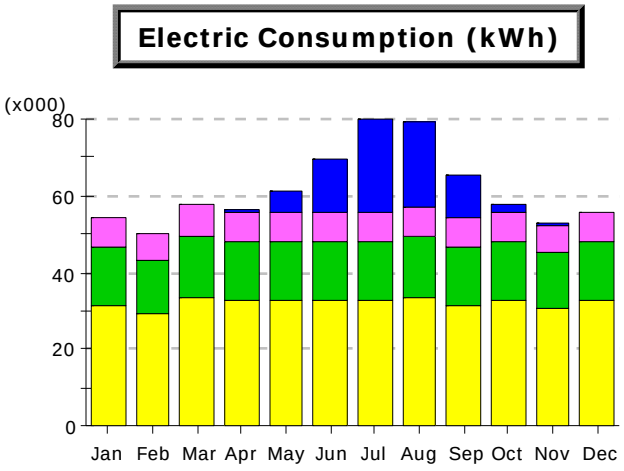


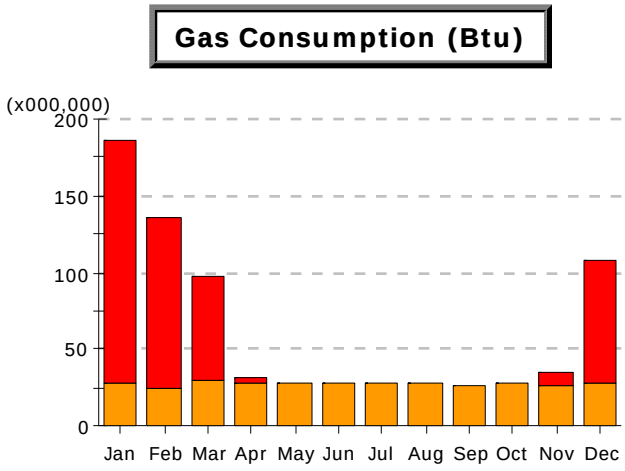
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.46	5.33	13.40	22.81	20.53	11.08	1.62	0.16	-	75.37
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.52	7.00	8.04	7.78	7.78	7.78	7.78	8.04	7.52	7.78	7.26	7.78	92.04
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	15.13	13.86	15.61	15.10	15.37	15.10	15.37	15.61	14.86	15.37	14.63	15.37	181.36
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	31.56	29.38	33.72	32.63	32.64	32.63	32.64	33.72	31.55	32.64	30.47	32.64	386.22
Total	54.39	50.40	57.54	56.11	61.14	68.91	78.59	77.89	65.02	57.46	52.66	55.96	736.07

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	166.65	115.77	71.07	3.49	-	-	-	-	-	-	9.44	83.65	450.07
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	26.98	25.17	28.90	27.94	27.83	27.72	27.63	28.49	26.65	27.62	25.87	27.82	328.63
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	193.63	140.94	99.98	31.43	27.83	27.72	27.63	28.49	26.65	27.62	35.30	111.47	778.70





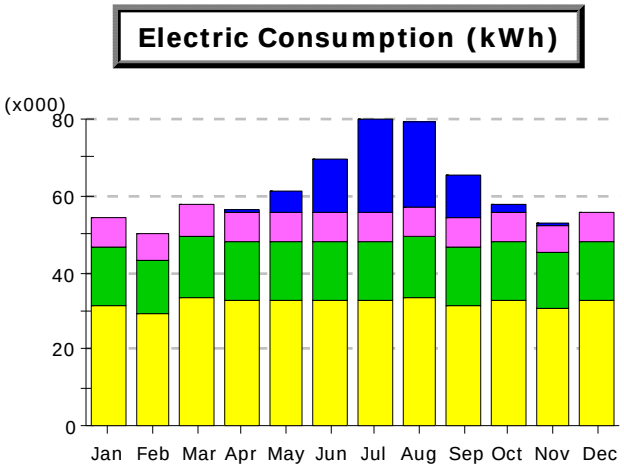


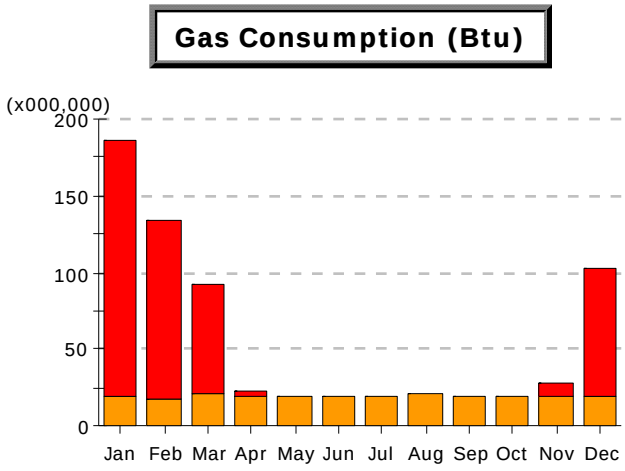
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.48	5.62	14.14	24.06	21.66	11.69	1.71	0.16	-	79.51
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.52	7.00	8.04	7.78	7.78	7.78	7.78	8.04	7.52	7.78	7.26	7.78	92.04
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	15.13	13.86	15.61	15.10	15.37	15.10	15.37	15.61	14.86	15.37	14.63	15.37	181.36
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	31.56	29.38	33.72	32.63	32.64	32.63	32.64	33.72	31.55	32.64	30.47	32.64	386.22
Total	54.39	50.40	57.54	56.14	61.43	69.65	79.84	79.02	65.62	57.55	52.67	55.96	740.22

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	159.91	111.09	68.20	3.35	-	-	-	-	-	-	9.06	80.27	431.87
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	26.98	25.17	28.90	27.94	27.83	27.72	27.63	28.49	26.65	27.62	25.87	27.82	328.63
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	186.90	136.26	97.10	31.29	27.83	27.72	27.63	28.49	26.65	27.62	34.92	108.08	760.50





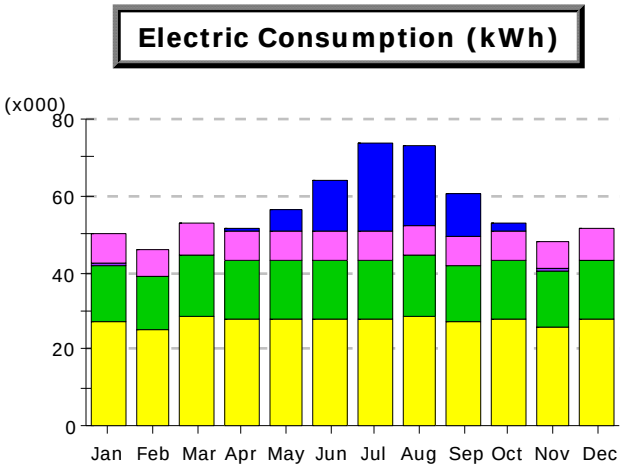


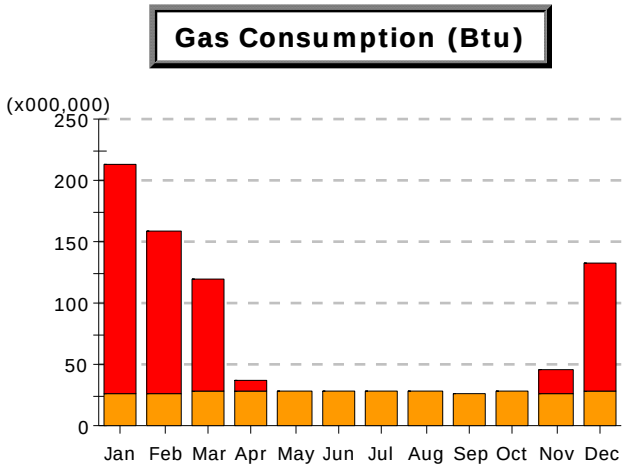
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.48	5.62	14.14	24.06	21.66	11.69	1.71	0.16	-	79.51
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.52	7.00	8.04	7.78	7.78	7.78	7.78	8.04	7.52	7.78	7.26	7.78	92.04
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	15.13	13.86	15.61	15.10	15.37	15.10	15.37	15.61	14.86	15.37	14.63	15.37	181.36
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	31.56	29.38	33.72	32.63	32.64	32.63	32.64	33.72	31.55	32.64	30.47	32.64	386.22
Total	54.39	50.40	57.54	56.14	61.43	69.65	79.84	79.02	65.62	57.55	52.67	55.96	740.22

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	166.65	115.77	71.07	3.49	-	-	-	-	-	-	9.44	83.65	450.07
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	19.13	17.82	20.45	19.79	19.79	19.78	19.78	20.44	19.12	19.78	18.47	19.79	234.14
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	185.78	133.58	91.53	23.28	19.79	19.78	19.78	20.44	19.12	19.78	27.90	103.44	684.21





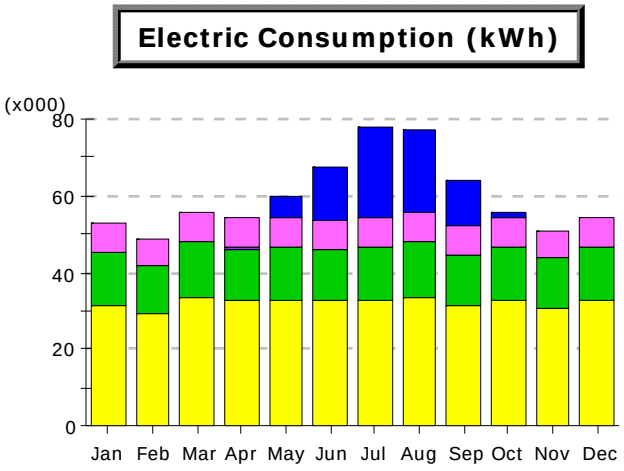


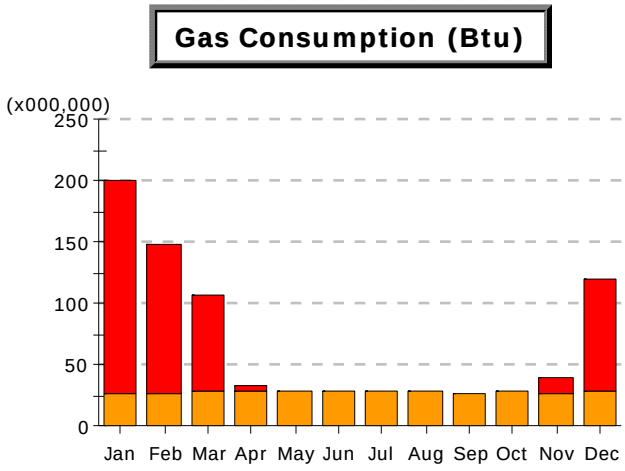
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.30	5.28	13.39	22.86	20.56	11.07	1.60	0.10	-	75.16
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.51	6.99	8.02	7.76	7.76	7.76	7.76	8.02	7.51	7.76	7.25	7.76	91.88
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	15.13	13.86	15.61	15.10	15.37	15.10	15.37	15.61	14.86	15.37	14.63	15.37	181.36
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.94	25.08	28.78	27.86	27.86	27.86	27.86	28.78	26.93	27.86	26.01	27.86	329.70
Total	49.76	46.09	52.59	51.17	56.31	64.12	73.86	72.97	60.37	52.65	48.13	51.17	679.18

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	186.53	134.48	90.71	9.11	-	-	-	-	-	-	19.39	104.94	545.16
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	26.98	25.17	28.90	27.94	27.83	27.72	27.63	28.49	26.65	27.62	25.87	27.82	328.64
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	213.51	159.65	119.61	37.05	27.83	27.72	27.63	28.49	26.65	27.62	45.26	132.75	873.79





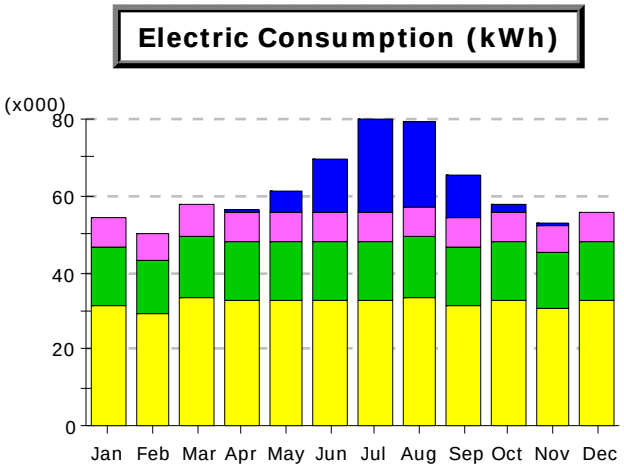


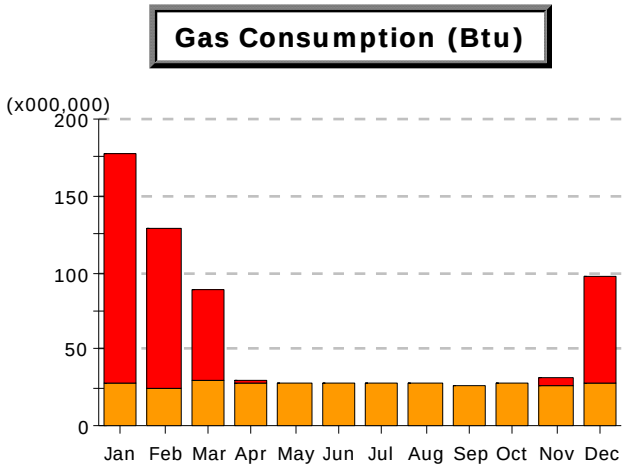
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.42	5.50	13.88	23.64	21.28	11.47	1.67	0.15	-	78.01
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.51	7.00	8.03	7.77	7.77	7.77	7.77	8.03	7.51	7.77	7.26	7.77	91.98
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	13.51	12.38	13.94	13.49	13.73	13.49	13.73	13.94	13.28	13.73	13.07	13.73	162.02
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	31.56	29.38	33.72	32.63	32.64	32.63	32.64	33.72	31.55	32.64	30.47	32.64	386.22
Total	52.77	48.92	55.87	54.46	59.67	67.78	77.78	76.97	63.82	55.87	51.09	54.31	719.32

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	174.10	122.30	77.95	5.21	-	-	-	-	-	-	12.23	90.80	482.60
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	26.98	25.17	28.90	27.94	27.83	27.72	27.63	28.49	26.65	27.62	25.87	27.82	328.63
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	201.08	147.48	106.86	33.16	27.83	27.72	27.63	28.49	26.65	27.62	38.09	118.62	811.24





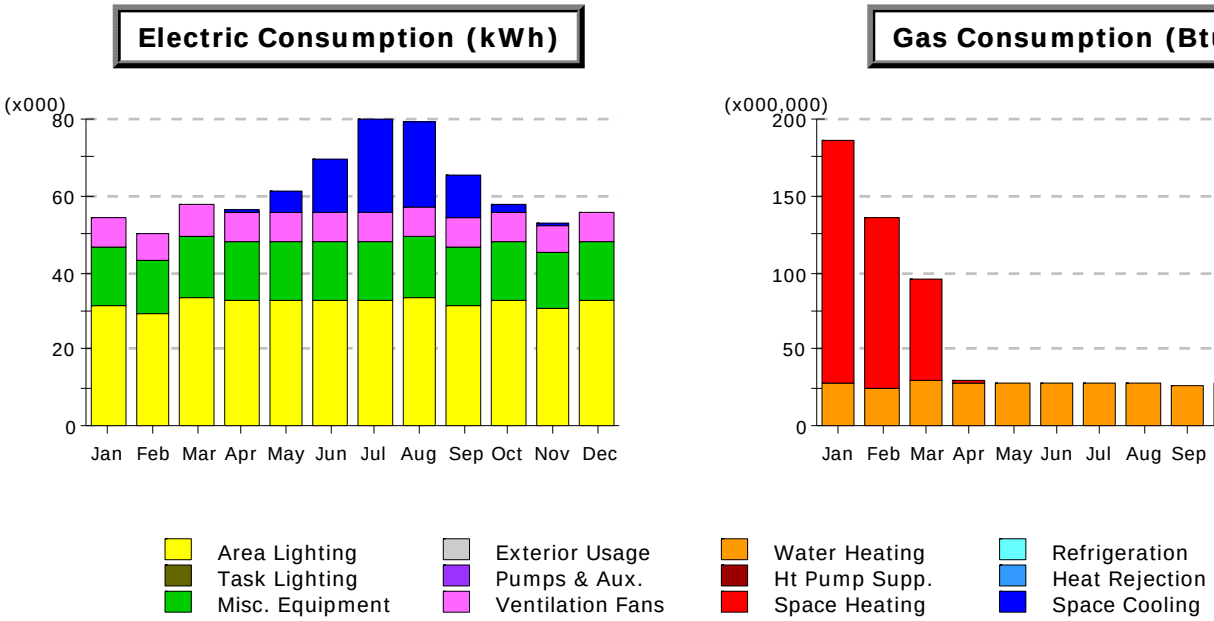


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.53	5.64	14.13	24.03	21.66	11.74	1.73	0.18	-	79.64
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.52	7.00	8.04	7.78	7.78	7.78	7.78	8.04	7.52	7.78	7.26	7.78	92.04
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	15.13	13.86	15.61	15.10	15.37	15.10	15.37	15.61	14.86	15.37	14.63	15.37	181.36
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	31.56	29.38	33.72	32.63	32.64	32.63	32.64	33.72	31.55	32.64	30.47	32.64	386.22
Total	54.39	50.40	57.54	56.18	61.45	69.64	79.82	79.02	65.68	57.57	52.69	55.96	740.35

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	150.28	103.70	59.94	1.52	-	-	-	-	-	-	5.08	70.14	390.66
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	26.98	25.17	28.90	27.94	27.83	27.72	27.63	28.49	26.65	27.62	25.87	27.82	328.63
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	177.26	128.87	88.85	29.46	27.83	27.72	27.63	28.49	26.65	27.62	30.94	97.96	719.29

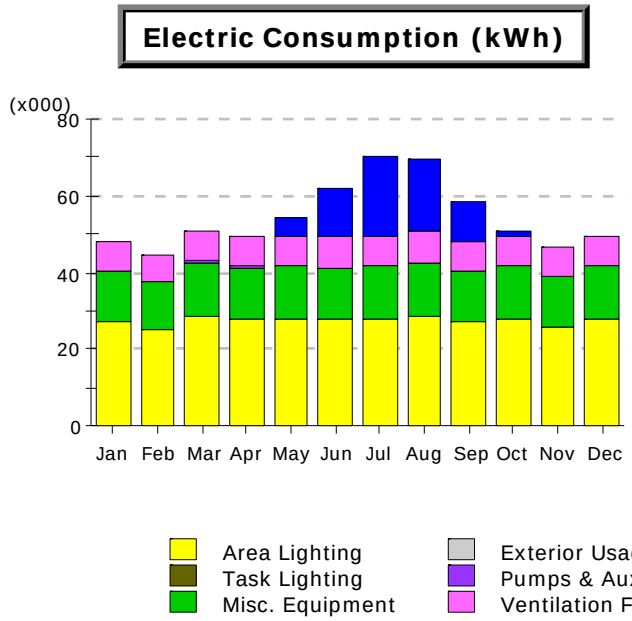


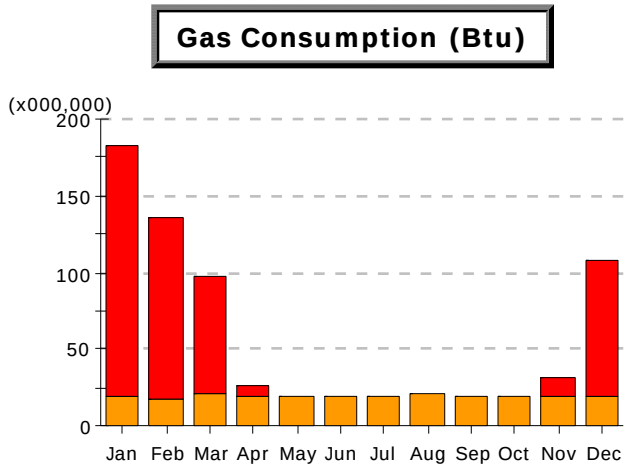
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.51	5.66	14.17	24.06	21.68	11.72	1.73	0.18	-	79.70
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.53	7.01	8.04	7.78	7.78	7.78	7.78	8.04	7.53	7.78	7.27	7.78	92.12
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	15.13	13.86	15.61	15.10	15.37	15.10	15.37	15.61	14.86	15.37	14.63	15.37	181.36
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	31.56	29.38	33.72	32.63	32.64	32.63	32.64	33.72	31.55	32.64	30.47	32.64	386.22
Total	54.40	50.41	57.54	56.17	61.48	69.69	79.85	79.05	65.67	57.58	52.69	55.96	740.49

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	158.81	109.67	65.99	2.30	-	-	-	-	-	-	6.99	77.05	420.81
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	26.98	25.17	28.90	27.94	27.83	27.72	27.63	28.49	26.65	27.62	25.87	27.82	328.63
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	185.80	134.84	94.89	30.25	27.83	27.72	27.63	28.49	26.65	27.62	32.85	104.86	749.44



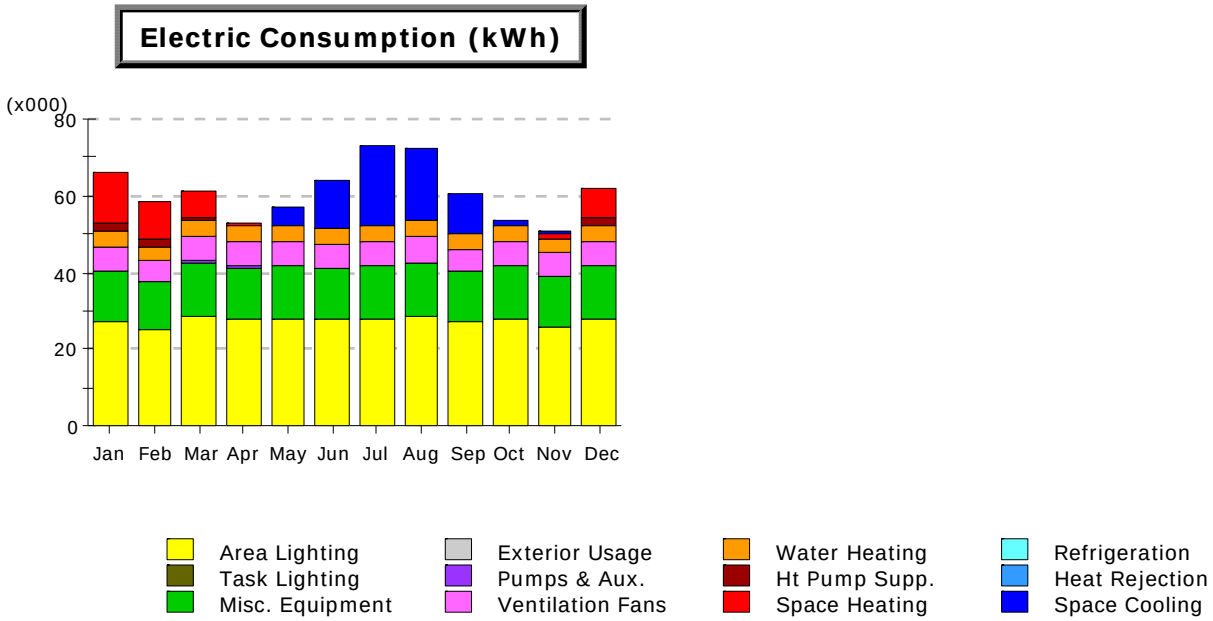


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.31	4.96	12.48	21.24	19.16	10.38	1.52	0.12	-	70.17
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.51	6.99	8.03	7.77	7.77	7.77	7.77	8.03	7.51	7.77	7.25	7.77	91.91
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	13.51	12.38	13.94	13.49	13.73	13.49	13.73	13.94	13.28	13.73	13.07	13.73	162.02
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.94	25.08	28.78	27.86	27.86	27.86	27.86	28.78	26.93	27.86	26.01	27.86	329.70
Total	48.15	44.61	50.93	49.57	54.34	61.59	70.60	69.91	58.10	50.94	46.60	49.53	654.88

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	163.64	117.30	77.51	6.32	-	-	-	-	-	-	12.94	88.17	465.88
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	19.13	17.82	20.45	19.79	19.79	19.78	19.78	20.44	19.12	19.78	18.47	19.79	234.14
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	182.77	135.11	97.96	26.12	19.79	19.78	19.78	20.44	19.12	19.78	31.41	107.96	700.02



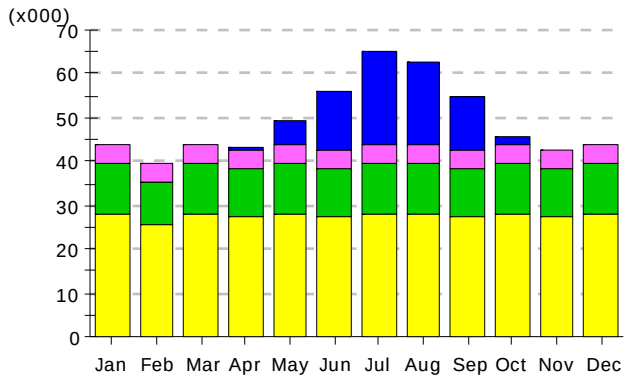
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.25	4.89	12.37	21.08	19.00	10.28	1.50	0.09	-	69.46
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	13.08	9.76	6.90	0.72	-	-	-	-	-	-	1.44	7.27	39.16
HP Supp.	2.40	1.62	0.86	0.06	-	-	-	-	-	-	0.14	2.38	7.46
Hot Water	4.02	3.74	4.30	4.16	4.16	4.12	4.06	4.11	3.84	4.06	3.85	4.14	48.57
Vent. Fans	6.01	5.59	6.42	6.21	6.21	6.21	6.21	6.42	6.01	6.21	5.80	6.21	73.52
Pumps & Aux.	0.08	0.08	0.10	0.13	0.03	-	-	-	0.00	0.06	0.13	0.10	0.71
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	13.51	12.38	13.94	13.49	13.73	13.49	13.73	13.94	13.28	13.73	13.07	13.73	162.02
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.94	25.08	28.78	27.86	27.86	27.86	27.86	28.78	26.93	27.86	26.01	27.86	329.70
Total	66.03	58.25	61.31	52.88	56.89	64.05	72.94	72.25	60.34	53.43	50.53	61.70	730.60

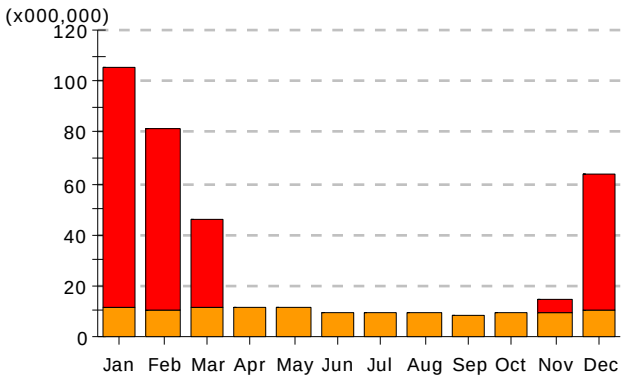
Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

Electric Consumption (kWh)



Gas Consumption (Btu)





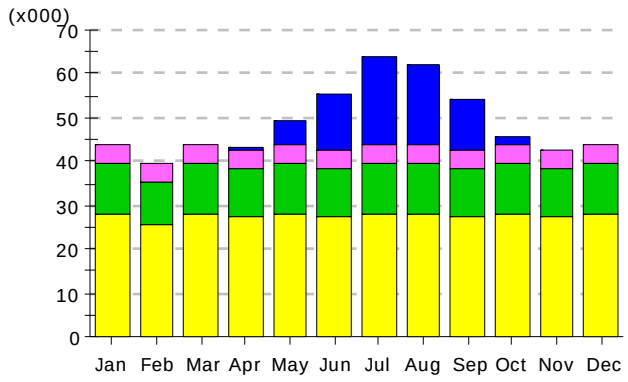
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.60	5.47	13.31	21.06	18.99	11.92	1.90	0.17	-	73.43
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.13
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.09	10.02	11.09	10.73	11.09	10.73	11.09	11.09	10.73	11.09	10.73	11.09	130.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.23	25.50	28.23	27.32	28.23	27.32	28.23	28.23	27.32	28.23	27.32	28.23	332.39
Total	44.04	39.78	44.04	43.21	49.47	55.89	65.07	62.99	54.50	45.92	42.78	44.04	591.73

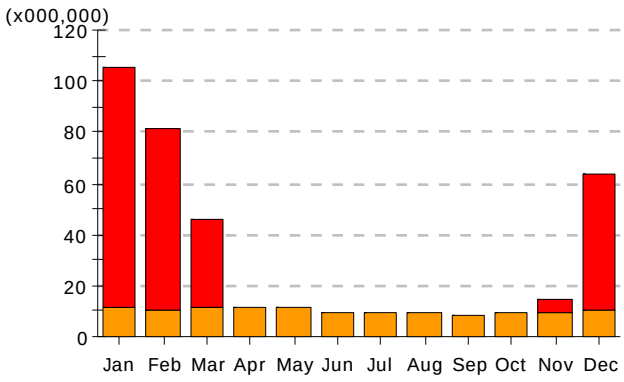
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	93.67	70.19	33.50	0.08	-	-	-	-	-	-	5.10	53.08	255.61
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.55	10.80	11.99	11.41	11.00	9.89	9.54	9.11	8.78	9.43	9.77	10.85	124.13
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	105.21	80.99	45.49	11.49	11.00	9.89	9.54	9.11	8.78	9.43	14.87	63.93	379.74

Electric Consumption (kWh)



Gas Consumption (Btu)





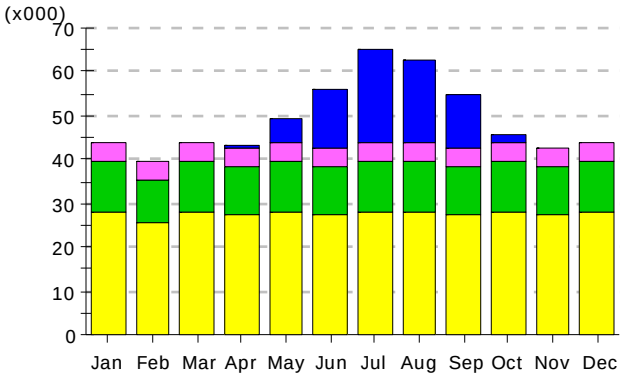
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.57	5.18	12.61	19.97	18.00	11.30	1.81	0.16	-	69.60
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.13
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.09	10.02	11.09	10.73	11.09	10.73	11.09	11.09	10.73	11.09	10.73	11.09	130.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.23	25.50	28.23	27.32	28.23	27.32	28.23	28.23	27.32	28.23	27.32	28.23	332.39
Total	44.04	39.78	44.04	43.18	49.19	55.19	63.97	62.00	53.88	45.82	42.78	44.04	587.90

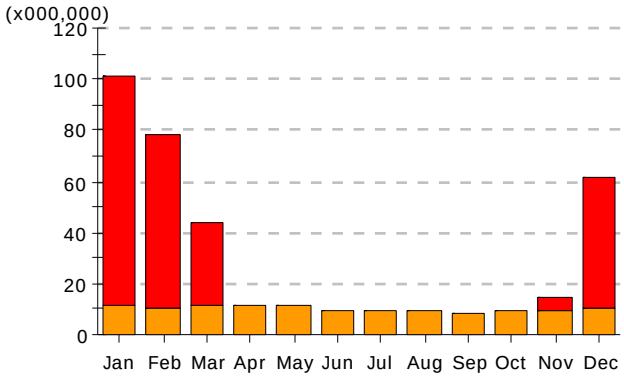
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	93.67	70.19	33.50	0.08	-	-	-	-	-	-	5.10	53.08	255.61
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.55	10.80	11.99	11.41	11.00	9.89	9.54	9.11	8.78	9.43	9.77	10.85	124.13
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	105.21	80.99	45.49	11.49	11.00	9.89	9.54	9.11	8.78	9.43	14.87	63.93	379.74

Electric Consumption (kWh)



Gas Consumption (Btu)





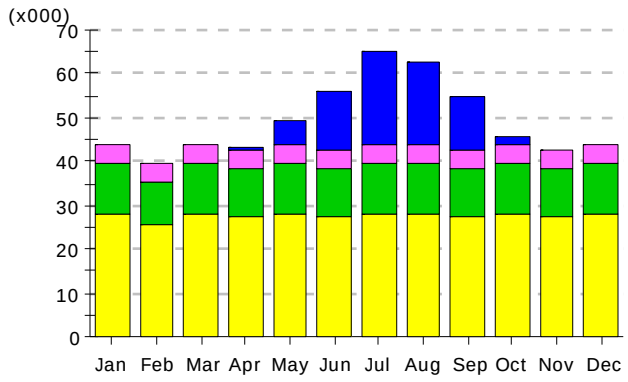
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.60	5.47	13.31	21.06	18.99	11.92	1.90	0.17	-	73.43
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.13
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.09	10.02	11.09	10.73	11.09	10.73	11.09	11.09	10.73	11.09	10.73	11.09	130.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.23	25.50	28.23	27.32	28.23	27.32	28.23	28.23	27.32	28.23	27.32	28.23	332.39
Total	44.04	39.78	44.04	43.21	49.47	55.89	65.07	62.99	54.50	45.92	42.78	44.04	591.73

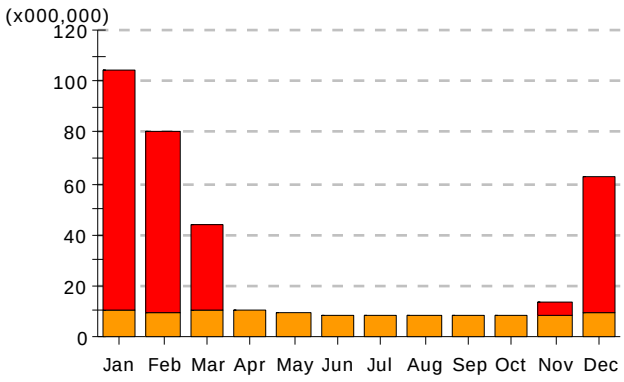
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	89.88	67.35	32.14	0.08	-	-	-	-	-	-	4.89	50.93	245.28
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.55	10.80	11.99	11.41	11.00	9.89	9.54	9.11	8.78	9.43	9.77	10.85	124.13
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	101.43	78.16	44.14	11.49	11.00	9.89	9.54	9.11	8.78	9.43	14.66	61.78	369.40

Electric Consumption (kWh)



Gas Consumption (Btu)





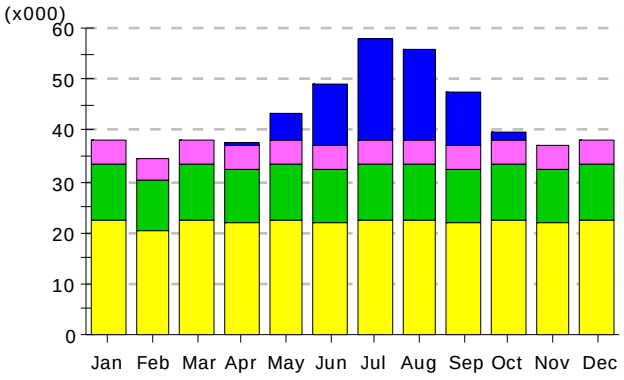
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.60	5.47	13.31	21.06	18.99	11.92	1.90	0.17	-	73.43
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.13
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.09	10.02	11.09	10.73	11.09	10.73	11.09	11.09	10.73	11.09	10.73	11.09	130.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.23	25.50	28.23	27.32	28.23	27.32	28.23	28.23	27.32	28.23	27.32	28.23	332.39
Total	44.04	39.78	44.04	43.21	49.47	55.89	65.07	62.99	54.50	45.92	42.78	44.04	591.73

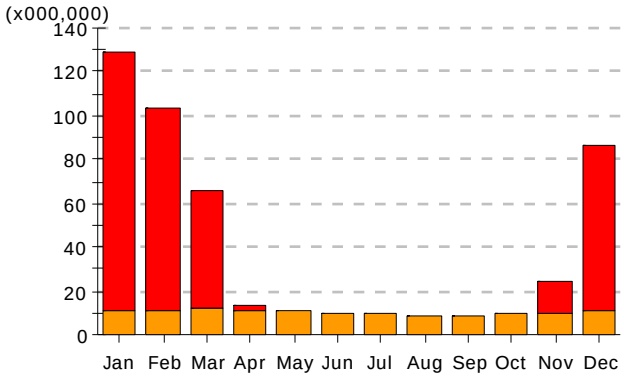
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	93.67	70.19	33.50	0.08	-	-	-	-	-	-	5.10	53.08	255.61
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	10.33	9.67	10.73	10.22	9.85	8.85	8.54	8.15	7.85	8.43	8.73	9.71	111.06
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	104.00	79.86	44.23	10.30	9.85	8.85	8.54	8.15	7.85	8.43	13.83	62.78	366.67

Electric Consumption (kWh)



Gas Consumption (Btu)





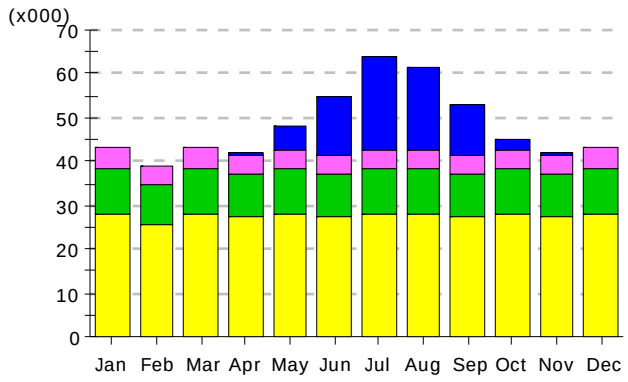
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.54	4.87	11.95	19.47	17.57	10.23	1.62	0.15	-	66.41
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.13
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.09	10.02	11.09	10.73	11.09	10.73	11.09	11.09	10.73	11.09	10.73	11.09	130.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	22.48	20.31	22.48	21.76	22.48	21.76	22.48	22.48	21.76	22.48	21.76	22.48	264.74
Total	38.29	34.59	38.29	37.59	43.14	48.97	57.73	55.83	47.25	39.89	37.20	38.29	517.05

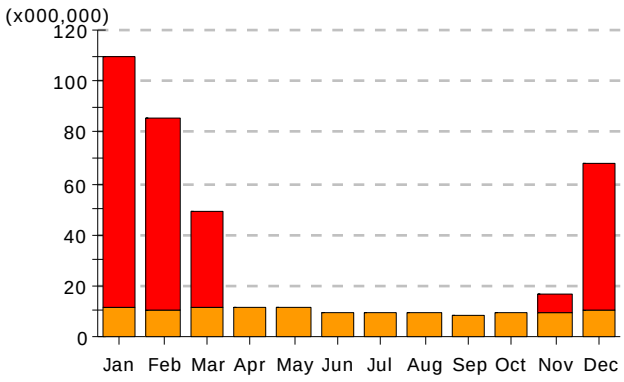
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	117.22	92.07	53.30	1.60	-	-	-	-	-	-	14.01	76.00	354.21
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.55	10.80	11.99	11.41	11.00	9.89	9.54	9.11	8.78	9.43	9.77	10.85	124.13
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	128.76	102.87	65.29	13.01	11.00	9.89	9.54	9.11	8.78	9.43	23.78	86.86	478.34

Electric Consumption (kWh)



Gas Consumption (Btu)





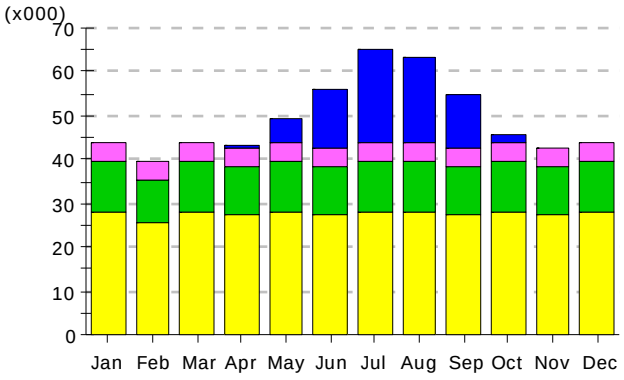
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.59	5.27	13.04	20.79	18.72	11.37	1.84	0.17	-	71.78
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.13
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	9.98	9.01	9.98	9.66	9.98	9.66	9.98	9.98	9.66	9.98	9.66	9.98	117.50
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.23	25.50	28.23	27.32	28.23	27.32	28.23	28.23	27.32	28.23	27.32	28.23	332.39
Total	42.93	38.78	42.93	42.13	48.17	54.54	63.68	61.62	52.88	44.74	41.71	42.93	577.03

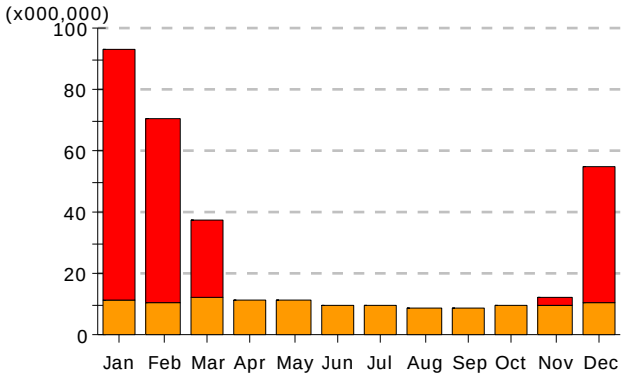
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	98.16	74.31	37.03	0.19	-	-	-	-	-	-	6.54	57.19	273.42
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.55	10.80	11.99	11.41	11.00	9.89	9.54	9.11	8.78	9.43	9.77	10.85	124.13
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	109.71	85.11	49.02	11.60	11.00	9.89	9.54	9.11	8.78	9.43	16.31	68.05	397.54

Electric Consumption (kWh)



Gas Consumption (Btu)





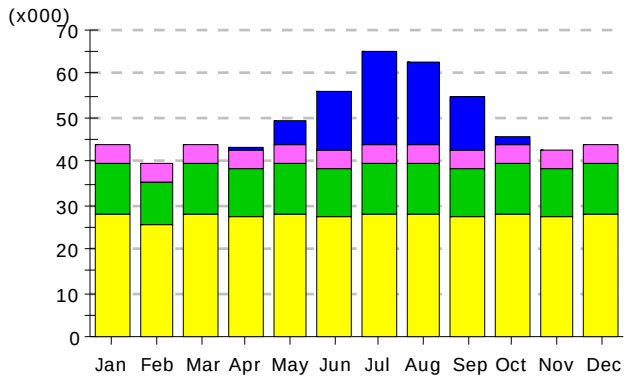
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.61	5.50	13.42	21.09	19.04	12.14	1.94	0.18	-	73.92
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.13
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.09	10.02	11.09	10.73	11.09	10.73	11.09	11.09	10.73	11.09	10.73	11.09	130.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.23	25.50	28.23	27.32	28.23	27.32	28.23	28.23	27.32	28.23	27.32	28.23	332.39
Total	44.04	39.78	44.04	43.22	49.51	56.01	65.09	63.04	54.73	45.95	42.79	44.04	592.22

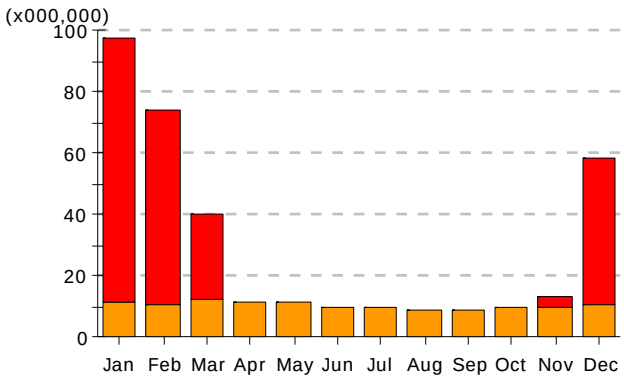
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	81.44	59.91	25.24	-	-	-	-	-	-	-	2.22	43.94	212.75
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.55	10.80	11.99	11.41	11.00	9.89	9.54	9.11	8.78	9.43	9.77	10.85	124.12
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	92.99	70.71	37.22	11.41	11.00	9.89	9.54	9.11	8.78	9.43	11.99	54.80	336.87

Electric Consumption (kWh)



Gas Consumption (Btu)





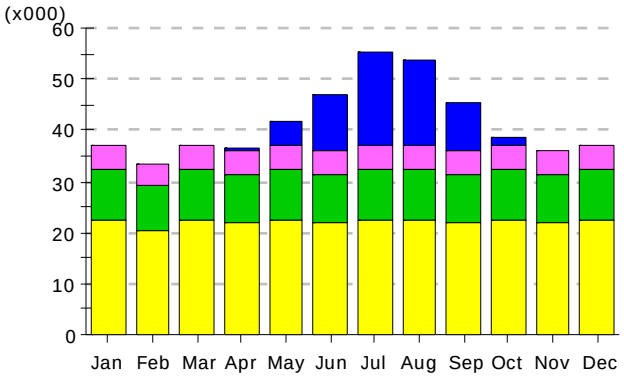
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.61	5.47	13.34	20.94	18.91	11.91	1.91	0.17	-	73.27
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.13
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	11.09	10.02	11.09	10.73	11.09	10.73	11.09	11.09	10.73	11.09	10.73	11.09	130.56
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	28.23	25.50	28.23	27.32	28.23	27.32	28.23	28.23	27.32	28.23	27.32	28.23	332.39
Total	44.04	39.78	44.04	43.22	49.48	55.93	64.94	62.91	54.49	45.92	42.79	44.04	591.57

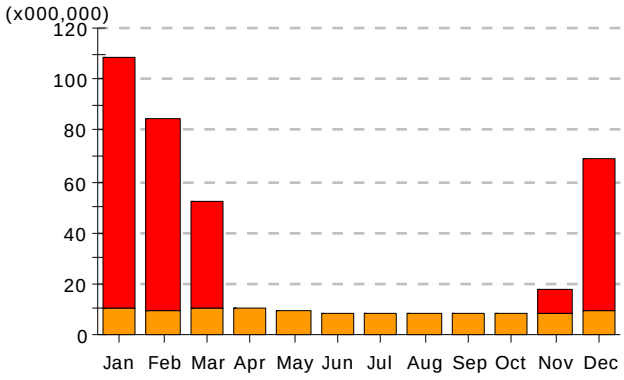
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	86.00	63.45	27.73	-	-	-	-	-	-	-	3.37	47.47	228.01
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.55	10.80	11.99	11.41	11.00	9.89	9.54	9.11	8.78	9.43	9.77	10.85	124.12
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	97.54	74.25	39.72	11.41	11.00	9.89	9.54	9.11	8.78	9.43	13.13	58.32	352.14

Electric Consumption (kWh)



Gas Consumption (Btu)



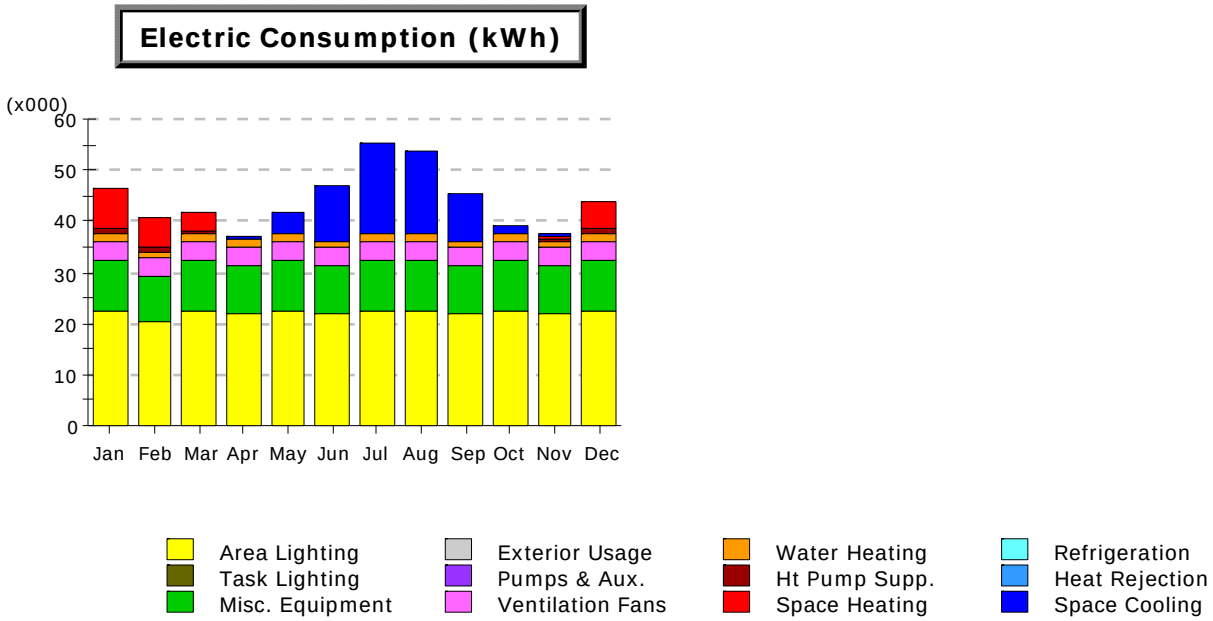


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.52	4.57	11.10	18.09	16.37	9.58	1.54	0.15	-	61.90
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.68	4.23	4.68	4.53	4.68	4.53	4.68	4.68	4.53	4.68	4.53	4.68	55.13
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	9.98	9.01	9.98	9.66	9.98	9.66	9.98	9.98	9.66	9.98	9.66	9.98	117.50
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	22.48	20.31	22.48	21.76	22.48	21.76	22.48	22.48	21.76	22.48	21.76	22.48	264.74
Total	37.18	33.59	37.18	36.49	41.72	47.04	55.24	53.52	45.53	38.70	36.13	37.18	499.49

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	98.03	75.18	40.96	0.31	-	-	-	-	-	-	8.49	59.39	282.35
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	10.33	9.67	10.73	10.22	9.85	8.85	8.54	8.15	7.85	8.43	8.73	9.71	111.05
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	108.36	84.84	51.69	10.53	9.85	8.85	8.54	8.15	7.85	8.43	17.22	69.10	393.40



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.51	4.53	10.89	17.90	16.22	9.40	1.52	0.14	-	61.11
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	7.64	5.99	3.59	0.07	-	-	-	-	-	-	0.90	4.86	23.05
HP Supp.	1.18	0.87	0.39	0.00	-	-	-	-	-	-	0.07	1.28	3.80
Hot Water	1.25	1.15	1.27	1.21	1.21	1.13	1.14	1.12	1.09	1.14	1.14	1.22	14.05
Vent. Fans	3.75	3.38	3.75	3.63	3.75	3.63	3.75	3.75	3.63	3.75	3.63	3.75	44.11
Pumps & Aux.	0.02	0.02	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.17
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	9.98	9.01	9.98	9.66	9.98	9.66	9.98	9.98	9.66	9.98	9.66	9.98	117.50
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	22.48	20.31	22.48	21.76	22.48	21.76	22.48	22.48	21.76	22.48	21.76	22.48	264.74
Total	46.30	40.74	41.48	36.86	41.95	47.07	55.24	53.55	45.53	38.88	37.32	43.59	528.52

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

APPENDIX B

TRANSPORTATION EMISSION CALCULATIONS

TABLE B-1
Vehicle Miles Traveled (VMT) in the Mesoscale Study Area

Link I.D.	Link Length (feet)	Link Descriptor	Average Daily Traffic (ADT) (vehicles/day)				Vehicle Miles Traveled (VMT) (miles/day)			
			2019 Existing	2026 No-Build	2026 Full Build w/o mitigation	2026 Full Build w/mitigation*	2019 Existing	2026 No-Build	2026 Full Build w/o mitigation	2026 Full Build w/mitigation*
1	1,250	Main Street from Shirley Road to Lunenberg Road	20,420	22,150	25,170	25,110	4,834	5,244	5,959	5,945
2	12,920	Lunenberg Road from Main Street to McGovern Blvd	9,190	10,130	13,400	13,335	22,488	24,788	32,789	32,629
3	750	McGovern Blvd	1,350	2,110	9,560	9,411	192	300	1,358	1,337
4	3,690	Lunenberg Road from McGovern Blvd to Old Union Turnpike	9,950	11,150	15,990	15,893	6,954	7,792	11,175	11,107
5	4,610	Old Union Turnpike from Lunenberg Road to Route 2 East Ramps	8,010	8,630	9,500	9,483	6,994	7,535	8,295	8,279
6	1,000	Union Turnpike from Route 2 East Ramps to Harvard Stree	4,580	5,070	6,370	6,344	867	960	1,206	1,202
7	1,900	Mechanic Street from Harvard Street to White Pond Road	7,890	8,510	10,000	9,970	2,839	3,062	3,598	3,588
8	2,250	Mechanic Street from White Pond Road to Johnny Appleseed Lane	7,880	8,490	9,980	9,950	3,358	3,618	4,253	4,240
9	4,920	Johnny Appleseed Lane	730	730	1,910	1,886	680	680	1,780	1,758
					VMT (miles/day):		49,206	53,979	70,413	70,084

*Mitigation assumes an 2.0% reduction in the total project-generated traffic due to the implementation of proposed Transporation Demand Management (TDM).

TABLE B-2
Mesoscale Study Area
Total Daily Volatile Organic Compound (VOC) Emissions

		MOVES VOC Emission Rate (gram/mile)		Vehicle Miles Traveled (VMT) (miles/day)				Mesoscale VOC Emissions (kg/day)			
Link I.D.	Speed (mph)	2019	2026	2019 Existing	2026 No-Build	2026 Full Build w/o mitigation	2026 Full Build w/mitigation*	2019 Existing	2026 No-Build	2026 Full Build w/o mitigation	2026 Full Build w/mitigation*
1	30	0.49	0.38	4,834	5,244	5,959	5,945	2.36	1.99	2.26	2.25
2	50	0.12	0.09	22,488	24,788	32,789	32,629	2.81	2.23	2.94	2.93
3	25	0.75	0.85	192	300	1,358	1,337	0.14	0.25	1.15	1.13
4	50	0.21	0.17	6,954	7,792	11,175	11,107	1.48	1.29	1.86	1.85
5	40	0.20	0.15	6,994	7,535	8,295	8,279	1.40	1.10	1.22	1.21
6	40	0.56	0.45	867	960	1,206	1,202	0.48	0.43	0.54	0.54
7	40	0.34	0.26	2,839	3,062	3,598	3,588	0.97	0.80	0.94	0.94
8	40	0.30	0.23	3,358	3,618	4,253	4,240	1.02	0.84	0.98	0.98
9	25	0.23	0.15	680	680	1,780	1,758	0.16	0.10	0.27	0.27
					Total Daily VOC Emissions (kg/day):			10.829	9.040	12.167	12.104

*Mitigation assumes an 2.0% reduction in the total project-generated traffic due to the implementation of proposed Transporation Demand Management (TDM).

TABLE B-3
Mesoscale Study Area
Total Daily (NOx) Emissions

		MOVES NOx Emission Rate (gram/mile)		Vehicle Miles Traveled (VMT) (miles/day)				Mesoscale NOx Emissions (kg/day)			
Link I.D.	Speed (mph)	2019	2026	2019 Existing	2026 No-Build	2026 Full Build w/o mitigation	2026 Full Build w/mitigation*	2019 Existing	2026 No-Build	2026 Full Build w/o mitigation	2026 Full Build w/mitigation*
1	30	0.35	0.18	4,834	5,244	5,959	5,945	1.71	0.95	1.08	1.08
2	50	0.33	0.18	22,488	24,788	32,789	32,629	7.42	4.49	5.94	5.91
3	25	0.38	0.27	192	300	1,358	1,337	0.07	0.08	0.37	0.37
4	50	0.33	0.18	6,954	7,792	11,175	11,107	2.30	1.44	2.06	2.05
5	40	0.33	0.17	6,994	7,535	8,295	8,279	2.32	1.31	1.44	1.44
6	40	0.33	0.18	867	960	1,206	1,202	0.29	0.17	0.22	0.21
7	40	0.33	0.17	2,839	3,062	3,598	3,588	0.94	0.53	0.63	0.63
8	40	0.33	0.17	3,358	3,618	4,253	4,240	1.11	0.63	0.74	0.74
9	25	0.38	0.18	680	680	1,780	1,758	0.26	0.12	0.31	0.31
					Total Daily NOx Emissions (kg/day):			16.420	9.727	12.795	12.733

*Mitigation assumes an 2.0% reduction in the total project-generated traffic due to the implementation of proposed Transporation Demand Management (TDM).

TABLE B-4
Mesoscale Study Area
Total Daily Carbon Dioxide (CO_2) Emissions

		MOVES CO2 Emission Rate (gram/mile)		Vehicle Miles Traveled (VMT) (miles/day)				Mesoscale CO2 Emissions (kg/day)			
Link I.D.	Speed (mph)	2019	2026	2019 Existing	2026 No-Build	2026 Full Build w/o mitigation	2026 Full Build w/mitigation*	2019 Existing	2026 No-Build	2026 Full Build w/o mitigation	2026 Full Build w/mitigation*
1	30	430.32	386.03	4,834	5,244	5,959	5,945	2,080.29	2,024.26	2,300.26	2,294.74
2	50	370.27	337.56	22,488	24,788	32,789	32,629	8,326.50	8,367.36	11,068.37	11,014.35
3	25	477.86	616.56	192	300	1,358	1,337	91.64	184.79	837.26	824.22
4	50	370.27	343.17	6,954	7,792	11,175	11,107	2,574.74	2,674.08	3,834.85	3,811.64
5	40	389.34	346.76	6,994	7,535	8,295	8,279	2,722.90	2,612.82	2,876.22	2,870.95
6	40	389.34	356.28	867	960	1,206	1,202	337.73	342.11	429.83	428.08
7	40	389.34	347.14	2,839	3,062	3,598	3,588	1,105.42	1,063.05	1,249.18	1,245.46
8	40	389.34	346.76	3,358	3,618	4,253	4,240	1,307.39	1,254.56	1,474.73	1,470.33
9	25	477.86	394.48	680	680	1,780	1,758	325.05	268.34	702.09	693.42
					Total Daily CO_2 Emissions (kg/day):			18,871.65	18,791.39	24,772.81	24,653.18

*Mitigation assumes an 2.0% reduction in project trips due toTDMs.

APPENDIX C

PV COST CALCULATION SPREADSHEETS

Solar Photovoltaic Project Simple Financial Model

RPS Solar Carve-Out II Program v1.0

DATA ENTRY AND FINANCIAL SUMMARY

Key

Entry Cells →

Calculation Cells (Not for Entry)

Pre-populated entries in these cells are for sample purposes only and do not reflect information or opinions of DOER. Users should enter values that are specific to their own projects or market information.

Select Taxable or Non-Taxable Entity: Taxable

Project and Customer Cost Assumptions

Solar Photovoltaic System Size	11300000	Watts (DC STC)
Total System Cost/Watt	$ 2.330	$/Watt (DC STC)
Total System Cost →	$ 26,329,000.00	

CEC Rebate Assumptions

Rebate$ per/Watt	$ -	$/Watt (DC STC)
Total Rebate		

Project Performance and Savings/ Cost Assumptions

Annual Net Capacity Factor	13.60%	kW (DC STC) to kWh AC
Annual Production Degradation	0.50%	%
Project Life	25	Years
Depreciation Life	20	Years
Electricity Revenue (Avoided Costs)	$ 0.14	$/kWh
Electricity Revenue (Avoided Costs) Annual Adjustor	0.0%	%
Solar Renewable Energy Certificate (SREC) Auction Price	$ -	$/kWh
SREC Factor	0.0	
SREC Term (40 Quarters)	20	Years (must be equal to or less than project life)
SREC Revenue Annual Adjustor	0.0%	%
SREC Contract Price		$/kWh
SREC Contract Term		Years (must be equal to or less than project life)
Post SREC Term REC Value	$ -	$/kWh
Annual Operations and Maintenance Cost Factor	$ 19.00	$/kW/Year
Annual Operations and Maintenance Cost	$ 214,700	$/Year
Annual Operations and Maintenance Adjustor	3.0%	%
Future Inverter Replacement Cost	$ 0.50	$/Watt (DC STC)
Inverter Life, Replace Every X Years	10	Year (must be equal to or less than project life)

Tax Assumptions

Federal Tax Rate	35%							
State Tax Rate	10%							
Effective Tax Rate	42%							
Federal Tax Credit	30%							
State Tax Deduction	100%							
5 Year Accelerated Depreciation Schedule (MACRS)	20.00%	32.00%	19.20%	11.52%	11.52%	5.76%		
Depreciation	20.00%	32.00%	19.20%	11.52%	11.52%	5.76%	0.00%	
Asset Basis								
Gross Cost	$ 26,329,000							
Rebate	$ -							
Less 50% of Federal Tax Credit	$ (3,949,350)							
Asset Basis	$ 22,379,650							

Financing Assumptions

% Financed w/ Cash	100%	
% Financed w/ Loan	0%	
Loan Interest Rate	7.00%	
Loan Period	20	Years (must be equal to or less than project life)
Net Cost	$ 26,329,000	
Customer Discount Rate	6.00%	
Loan	$ -	

Solar Project Financial Analysis Summary

Net Present Value	$ (1,618,030)
Simple Payback (100% Cash only)	Year 14
Estimated Return on Equity	4.2%

Disclaimer: This Unofficial Cash Flow Model is intended to provide non-residential entities that are considering the purchase and installation of solar energy equipment with a general understanding of possible financial implications of such purchase and installation. Those entities interested in learning more about the financial implications of the purchase and installation of solar energy equipment are urged to consult their own tax and financial experts. The information contained in the Unofficial Cash Flow Model may not be relied on by anyone for any purposes. Furthermore, the information contained in this model does not necessarily reflect the views of the Department of Energy Resources or the Commonwealth of Massachusetts, and reference to any specific method does not constitute an implied or expressed recommendation or endorsement of it. Neither the Department of Energy Resources nor the Commonwealth of Massachusetts make any warranties or representations, expressed or implied, as to the usefulness, completeness, or accuracy of any processes, methods or other information contained, described, disclosed, or referred to in this model. Finally, neither the Department of Energy Resources nor the Commonwealth of Massachusetts makes any representation that the use of any product, apparatus, process, method, or other information will not infringe privately owned property rights and assumes no liability of any kind or nature for any loss, injury, or damage directly or indirectly resulting from, or occurring in connection with, the use of information contained, described, disclosed, or referred to in this Unofficial Cash Flow Model.

Solar Photovoltaic Project Simple Financial Model
PRO FORMA AND PRODUCTION

Project Output	Start-Up 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
Annual Generation (kWh)		13,462,368	13,395,056	13,328,081	13,261,440	13,195,133	13,129,158	13,063,512	12,998,194	12,933,203	12,868,537	12,804,195	12,740,174	12,676,473	12,613,090
FINANCIAL SCHEDULES															
INCOME STATEMENT															
Electricity Revenue (Avoided Cost)		$ 1,843,671	$ 1,834,453	$ 1,825,281	$ 1,816,154	$ 1,807,074	$ 1,798,038	$ 1,789,048	$ 1,780,103	$ 1,771,202	$ 1,762,346	$ 1,753,534	$ 1,744,767	$ 1,736,043	$ 1,727,363
CEC Rebate	$ -														
SREC Auction Revenue		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SREC Contract Revenue		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue (Avoided Costs)	$ -	$ 1,843,671	$ 1,834,453	$ 1,825,281	$ 1,816,154	$ 1,807,074	$ 1,798,038	$ 1,789,048	$ 1,780,103	$ 1,771,202	$ 1,762,346	$ 1,753,534	$ 1,744,767	$ 1,736,043	$ 1,727,363
Replace Inverter?	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
Operations & Maintenance Costs		$ (214,700)	$ (221,141)	$ (227,775)	$ (234,608)	$ (241,647)	$ (248,896)	$ (256,363)	$ (264,054)	$ (271,976)	$ (280,135)	$ (288,539)	$ (297,195)	$ (306,111)	$ (315,294)
Inverter Replacement Cost		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (5,650,000)	$ -	$ -	$ -	$ -
Total Operating Expenses	$ -	$ (214,700)	$ (221,141)	$ (227,775)	$ (234,608)	$ (241,647)	$ (248,896)	$ (256,363)	$ (264,054)	$ (271,976)	$ (5,930,135)	$ (288,539)	$ (297,195)	$ (306,111)	$ (315,294)
EBITDA	$ -	$ 1,628,971	$ 1,613,312	$ 1,597,505	$ 1,581,546	$ 1,565,427	$ 1,549,142	$ 1,532,685	$ 1,516,049	$ 1,499,227	$ (4,167,789)	$ 1,464,996	$ 1,447,572	$ 1,429,932	$ 1,412,069
Federal Depreciation Expense		$ (4,475,930)	$ (7,161,488)	$ (4,296,893)	$ (2,578,136)	$ (2,578,136)	$ (1,289,068)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBIT	$ -	$ (2,846,959)	$ (5,548,176)	$ (2,699,387)	$ (996,590)	$ (1,012,709)	$ 260,074	$ 1,532,685	$ 1,516,049	$ 1,499,227	$ (4,167,789)	$ 1,464,996	$ 1,447,572	$ 1,429,932	$ 1,412,069
Interest Expense		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBT	$ -	$ (2,846,959)	$ (5,548,176)	$ (2,699,387)	$ (996,590)	$ (1,012,709)	$ 260,074	$ 1,532,685	$ 1,516,049	$ 1,499,227	$ (4,167,789)	$ 1,464,996	$ 1,447,572	$ 1,429,932	$ 1,412,069
Federal taxes saved/(paid)	$ -	$ 1,053,450	$ 1,998,328	$ 1,000,698	$ 404,161	$ 409,238	$ (36,806)	$ (482,796)	$ (477,555)	$ (472,256)	$ 1,458,726	$ (461,474)	$ (455,985)	$ (450,429)	$ (444,802)
State taxes saved/(paid) [can not deduct federal depreciation expense]	$ -	$ (162,897)	$ (161,331)	$ (159,751)	$ (158,155)	$ (156,543)	$ (154,914)	$ (153,268)	$ (151,605)	$ (149,923)	$ 416,779	$ (146,500)	$ (144,757)	$ (142,993)	$ (141,207)
Net Income	**$ -**	**$ (1,956,406)**	**$ (3,711,180)**	**$ (1,858,440)**	**$ (750,584)**	**$ (760,014)**	**$ 68,354**	**$ 896,621**	**$ 886,889**	**$ 877,048**	**$ (2,292,284)**	**$ 857,022**	**$ 846,829**	**$ 836,510**	**$ 826,060**
CASH FLOW STATEMENT															
Cash From Operations															
Net Income	$ -	$ (1,956,406)	$ (3,711,180)	$ (1,858,440)	$ (750,584)	$ (760,014)	$ 68,354	$ 896,621	$ 886,889	$ 877,048	$ (2,292,284)	$ 857,022	$ 846,829	$ 836,510	$ 826,060
Federal Depreciation Expense	$ -	$ 4,475,930	$ 7,161,488	$ 4,296,893	$ 2,578,136	$ 2,578,136	$ 1,289,068	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Operations	$ -	$ 2,519,524	$ 3,450,308	$ 2,438,453	$ 1,827,552	$ 1,818,122	$ 1,357,422	$ 896,621	$ 886,889	$ 877,048	$ (2,292,284)	$ 857,022	$ 846,829	$ 836,510	$ 826,060
Cash From Investing															
Installed PV Cost	$ (26,329,000)														
One Time State Solar Investment Tax Deduction (Actual Cash Value)	$ 1,843,030														
One Time Federal Solar Investment Tax Credit	$ 7,898,700														
Cash Flow From Investing	$ (16,587,270)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash From Financing															
Loan Disbursement	$ -														
Loan Repayment (Principle)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Financing	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Cash Flow	**$ (16,587,270)**	**$ 2,519,524**	**$ 3,450,308**	**$ 2,438,453**	**$ 1,827,552**	**$ 1,818,122**	**$ 1,357,422**	**$ 896,621**	**$ 886,889**	**$ 877,048**	**$ (2,292,284)**	**$ 857,022**	**$ 846,829**	**$ 836,510**	**$ 826,060**
Cumulative Cash Flow	**$ (16,587,270)**	**$ (14,067,746)**	**$ (10,617,438)**	**$ (8,178,985)**	**$ (6,351,433)**	**$ (4,533,311)**	**$ (3,175,889)**	**$ (2,279,268)**	**$ (1,392,380)**	**$ (515,332)**	**$ (2,807,616)**	**$ (1,950,594)**	**$ (1,103,764)**	**$ (267,254)**	**$ 558,806**
Simple Payback		$ 1	$ 2	$ 3	$ 4	$ 5	$ 6	$ 7	$ 8	$ 9	$ 10	$ 11	$ 12	$ 13	$ 14
Net Investment	$ (16,587,270)	$ (14,067,746)	$ (10,617,438)	$ (8,178,985)	$ (6,351,433)	$ (4,533,311)	$ (3,175,889)	$ (2,279,268)	$ (1,392,380)	$ (515,332)	$ (2,807,616)	$ (1,950,594)	$ (1,103,764)	$ (267,254)	$ 558,806
Simple Payback Year	**14**														14

APPENDIX D

CARBON SQUESTRATION CALCULATION

red = input site-specific data

Upland forest land cleare 15 acres

STOCK

Aboveground stock

Forest-type group	Volume of all softwood (cuft/ac)	Volume of all softwood tops (cuft/ac)	Specific gravity of softwoods[1]	Volume of all hardwood (cuft/ac)	Volume of all hardwood tops (cuft/ac)	Specific gravity of hardwoods[1]	Aboveground carbon (tonnes C/ac)	Acres	Total aboveground stock (tonnes C)
White & red pine / Hemlock	0	0	0.361	0	0	0.510	0	0	**0**
Spruce / Fir / Tamarack / Cedar	0	0	0.353	0	0	0.481	0	0	**0**
Pitch pine / Oak[2]	0	0	0.470	0	0	0.494	0	0	**0**
Scots pine / Norway spruce / Othe	0	0	0.355	0	0	0.496	0	0	**0**
White pine / Red oak / White ash	340.0	0	0.361	899.2	0	0.510	16.45	12.0	**197**
Oak / Hickory / Poplar / Blk. Wal	0.0	0	0.388	0.0	0	0.534	0	0	**0**
Atlantic white cedar[4]	0.0	0	0.441	0.0	0	0.484	0	0	**0**
Elm / ash / cottonwood / river bir	0.0	0	0.358	0.0	0	0.470	0	0	**0**
Maple / beech / birch / basswood	85.0	0	0.369	224.8	0	0.518	4.18	3.0	**13**
Aspen / birch	0	0	0.353	0	0	0.428	0	0	**0**
Other hardwoods[5]	0	0	0.367	0	0	0.488	0	0	**0**
Nonstocked	0	0	-	0	0	-	2.0	0	**0**
Total								15.0	**210**

Belowground stock

Forest-type group	Standard understory stock (tonnes/ac)[6]	Belowground live carbon (tonnes/ac)[7]	Soil carbon (tonnes C/ac)[8] Normal productivity[9]	Soil carbon (tonnes C/ac)[8] Low productivity[9]	Acres Normal productivity	Acres Low productivity	Total belowground stock (tonnes C)	Total stock, above & belowground (tonnes C)	Total stock, above & belowground (tons C)
White & red pine / Hemlock	0.063	0.06	87	64	0	0	**0**	0	0
Spruce / Fir / Tamarack / Cedar	0.056	0.06	86	62	0	0	**0**	0	0
Pitch pine / Oak	0.127	0.13	41	30	0	0	**0**	0	0
Scots pine / Norway spruce / Othe	0.063	0.06	87	63	0	0	**0**	0	0
White pine / Red oak / White ash	0.101	3.39	37	27	9.2	0.8	**393**	591	651
Oak / Hickory / Poplar / Blk. Wal	0.074	0.07	38	28	0	0.0	**0**	0	0
Atlantic white cedar[4]	0.069	0.07	68	49	0	0.0	**0**	0	0
Elm / ash / cottonwood / river bir	0.072	0.07	53	38	0	0.0	**0**	0	0
Maple / beech / birch / basswood	0.068	0.90	62	45	4.6	0.4	**309**	321	354
Aspen / birch	0.084	0.08	106	77	0	0	**0**	0	0
Other hardwoods[5]	0.070	0.07	44	32	0	0	**0**	0	0
Nonstocked	0.082	0.47	44	32	0	0	**0**	0	0
Total						15	**702**	**912**	**1,005**

1. From Smith et al, 2006. *Methods for Calculating Forest Ecosystem and Harvested Carbon with Standard Estimates for Forest Types of the United States* . USDA Forest Service General Technical Report NE-343.
2. Pitch pine / oak forest type uses hardwood specific gravity from loblolly-shortleaf pine southeastern type
3. Scots pine/Norway spruce/other exotics forest type uses hardwood specific gravity and understory stock from average of Spruce-fir and White-red-jack pine forest types. Soil carbon values are an average of white/red pine and spruce/fir
4. Atlantic white cedar fores type uses specific gravity and understory values from the oak-gum-cypress southeastern forest type
5. Other hardwoods uses average values for hardwood dominated forest types
6. An average of understory stock in all stand size classes. (FIA)
7. Calculated as 20% of aboveground (Barford et al, 2001)
8. Values from Heath et al., 2003. Carbon Trends in U.S.Forestlands: A Context for the Role of Soils in Forest Carbon Sequestration. In: *The Potential of U.S. Forest Soils to Sequester Carbon and mitigate the Greenhouse Effect* . 2003.
9. Normal/low productivity soils from MA DOER Renewable Energy Portfolio Stanard - 225 CMR 14.00 Forest Derived Eligible Biomass Woody Fuel Guideline (see soil tab), which used NRCS soil data.
Low productivity soils have soil carbon content 20% lower than values in Heath et al. Normal productivity soils are all soils not classified as low productivity ; soil carbon content is estimated to be 10% above values in Heath et al.

Future belowground sequestration

Forest type group	County	Soil map unit symbol	Soil component	Soil productivity	Soil seqestration (tonnes C/ac/yr)[1]	Belowground live sequestration (tonnes C/ac/yr)[2]	Acres	Total annual belowground sequestration (tonnes C/yr)	x50 years (tonnes C)	Total above & below ground sequestration (tonnes C/yr)	Total above & below ground sequestration (tons C/yr)
White & red pine / hemlock											
	Find soil type in Soil productiviy tab.			Normal productivity	0.09		0				
	If listed, use Low Productivity; all others use Normal			Low productivity	0.06		0				
Spruce/fir/tamarack/cedar											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
Pitch pine/oak											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
Scots pine/Norway spruce/other exotic softwoods											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
White pine/red oak/white ash						0.0278		**1.7076**	**85.38**	**2.65**	**2.92**
				Normal productivity	0.09		13.8				
				Low productivity	0.06		1.2				
Oak / Hickory / Poplar / Blk. Walnut; Cherry / W. ash / Ylw. poplar											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
Atlantic white cedar											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
Elm/ash/cottonwood/river birch/sycamore											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
Maple/beech/birch/basswood											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
Aspen/birch											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
Other hardwoods											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
Nonstocked											
				Normal productivity	0.09		0				
				Low productivity	0.06		0				
TOTAL						**0**	15	**1.7076**	**85.38**	**2.65**	**2.92**

1. Soil carbon sequestration estimated at 0.08 tonnes C/ac/yr (Post and Kwon, 2000; Hooker and Compton, 2003; O'Donnell 2007). Soils classified in DOER biomass harvest restrictions as Normal productivity soils +10%; low productivity soils -20%
2. Belowground sequestration is 20% of aboveground sequestration (Barford et al., 2001).

APPENDIX H: DRAINAGE REPORT

- Drainage Report for Capital Commerce Center (Prepared by Bohler Engineering, dated November 15, 2019)

DRAINAGE REPORT

For

Capital Group Properties

PROPOSED

"Capital Commerce Center"

McGovern Blvd & Lunenburg Road
Lancaster, Massachusetts
Worcester County

Prepared by:

BOHLER ENGINEERING
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900 TEL.

John A. Kucich
Massachusetts P.E. Lic. # 41530

BOHLER
ENGINEERING

November 15, 2019

#W181228

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 3
On-Site Soil Information 3
Design Point Descriptions 4
II. EXISTING SITE CONDITIONS 5
Existing Site Description 5
Existing Collection and Conveyance 5
III. PROPOSED SITE CONDITIONS 6
Proposed Development Site Conditions 6
Proposed Development Collection and Conveyance 6
IV. METHODOLOGY 7
Peak Flow Calculations 7
V. STORMWATER MANAGEMENT STANDARDS 7
Standard #1: No New Untreated Discharges 7
Standard #2: Peak Rate Attenuation 8
Standard #3: Recharge 8
Standard #4: Water Quality 8
Standard #5: Land Use with Higher Potential Pollutant Loads 8
Standard #6: Critical Areas 9
Standard #7: Redevelopment 9
Standard #8: Construction Period Pollution Prevention, Erosion, and Sedimentation Control 9
Standard #9: Operation and Maintenance Plan (O&M Plan) 9
Standard #10: Prohibition of Illicit Discharges 10
VI. SUMMARY 10

LIST OF TABLES

Table 1: Design Point Peak Runoff Rate Summary* 4
Table 2: Rainfall Intensities 7
Table 3: Design Point Peak Runoff Rate Summary* 10

APPENDICIES

APPENDIX A: MASSACHUSETTS STORMWATER MANAGEMENT CHECKLIST
APPENDIX B: PROJECT LOCATION MAPS
- USGS MAP
- FEMA FIRMETTE

APPENDIX C: SOIL AND WETLAND INFORMATION
- NCRS CUSTOM SOIL RESOURCE REPORT

APPENDIX D: EXISTING CONDITIONS HYDROLOGIC ANALYSIS
- EXISTING CONDITIONS DRAINAGE MAP
- EXISTING CONDITIONS HYDROCAD COMPUTATIONS

APPENDIX E: PROPOSED CONDITIONS HYDROLOGIC ANALYSIS
- PROPOSED CONDITIONS DRAINAGE MAP
- PROPOSED CONDITIONS HYRDOCAD CALCULATIONS

APPENDIX F: OPERATION AND MAINTENANCE
- STORMWATER OPERATION AND MAINTENACE PLAN
- INSPECTION REPORT
- INSPECTION AND MAINTENANCE LOG FORM
- LONG-TERM POLLUTION PREVENTION PLAN
- ILLICIT DISCHARGE STATEMENT
- SPILL PREVENTION

I. EXECUTIVE SUMMARY

This report examines the changes in drainage that can be expected as the result of the proposed 3,056,500 SF of mixed-use development, including industrial space, residential units, a hotel, recreation facilities, and retail. Additional construction work includes the construction of a primary access road, paved parking areas, associated utility infrastructure, stormwater management components, sidewalks, landscaping and lighting.

The subject property (the "Site") contains approximately 471± acres of land and is bordered by woods, wetlands, and residences to the north, Interstate 190 to the west, woods, wetlands and the North Nashua River to the south, and Lunenburg Road and Kimball Farm to the east. A portion of the Site to the east was recently developed as part of the Lancaster Crossing development project with a Dunkin', Mobil Gas Station, and soccer fields with associated driveways, parking areas, utilities, and stormwater management systems. The existing JB Hunt Trucking facility remains in the eastern portion of the Site with access from Lunenburg Road. A portion of the Site to the west, located off Johnny Appleseed Lane, consists of an existing residence, horse barn, horse track, and associated parking areas and utilities, as well as undeveloped areas consisting of woods and fields. A small piece of land on the westernmost edge of the Site is located within the City line in Leominster. The remaining portion of the overall Site consists of a gravel pit and gravel access roads, as well as undeveloped fields, woodland, and wetlands. A small parcel of land, located in the central portion of the Site, is land-locked and is not included as part of the Project.

This report addresses a comparative analysis of the pre- and post-development site runoff conditions. Additionally, this report provides calculations documenting the design of the proposed stormwater conveyance/management system as illustrated within the accompanying Preferred Master Plan prepared by Bohler Engineering. The project will also provide erosion and sedimentation controls during the demolition and construction periods, as well as long term stabilization of the site.

On-Site Soil Information

The majority of the soils at the site are mapped as Hinckley Loamy Sand and Merrimac Fine Sandy Loam which are both classified by the Natural Resource Conservation Service (NRCS) with Hydrologic Soil Group (HSG) "A". Portions of the eastern side of the site are mapped as

Woodbridge fine sandy loam and Paxton fine sandy loam, which are classified as HSG "C" and HSG "C/D" respectively. Refer to **Appendix C** for additional information.

Design Point Descriptions

For the purposes of this analysis the pre- and post-development drainage conditions were analyzed at three (3) design points (DP1, DP2, & DP3) which are identified as onsite wetland areas and streams where stormwater runoff currently drains to under existing conditions. The first design point (DP1) is associated with the wetland system at the southwestern portion of the site. The second design point (DP2) is associated with the intermittent stream at the southeastern portion of the site. The third design point (DP3) is associated with the McGovern Brook that crosses the site and also includes the northern wetland system that drains to the north edge of the McGovern Brook offsite. The project proposed to develop areas within all the watershed that contribute flow to the design points.

A summary of the existing and proposed conditions peak runoff rates for the 2-, 10-, 25-, and 100-year storms can be found in **Table 1** below. Refer to the Drainage Area Maps in **Appendices D & E** for a graphical representation of the drainage areas.

Table 1: Design Point Peak Runoff Rate Summary*

Point of Analysis	2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP1	3.30	2.09	**-1.21**	28.57	19.96	**-8.61**	53.09	36.41	**-16.68**	100.70	66.02	**-34.68**
DP2	6.14	0.00	**-6.14**	22.33	1.04	**-21.29**	33.22	1.94	**-31.28**	51.08	5.93	**-45.15**
DP3	16.65	5.86	**-10.79**	81.83	40.06	**-41.77**	132.66	71.51	**-61.15**	222.25	129.24	**-93.01**

**Flows are represented in cubic feet per second (cfs)*

II. EXISTING SITE CONDITIONS

Existing Site Description

The subject property (the "Site") contains approximately 471± acres of land and is bordered by woods, wetlands, and residences to the north, Interstate 190 to the west, woods, wetlands and the North Nashua River to the south, and Lunenburg Road and Kimball Farm to the east. A portion of the Site to the east was recently developed as part of the Lancaster Crossing development project with a Dunkin', Mobil Gas Station, and soccer fields with associated driveways, parking areas, utilities, and stormwater management systems. The existing JB Hunt Trucking facility remains in the eastern portion of the Site with access from Lunenburg Road. A portion of the Site to the west, located off Johnny Appleseed Lane, consists of an existing residence, horse barn, horse track, and associated parking areas and utilities, as well as undeveloped areas consisting of woods and fields. A small piece of land on the westernmost edge of the Site is located within the City line in Leominster. The remaining portion of the overall Site consists of a gravel pit and gravel access roads, as well as undeveloped fields, woodland, and wetlands. A small parcel of land, located in the central portion of the Site, is land-locked and is not included as part of the Project.

Existing Collection and Conveyance

Stormwater generated onsite flows overland to one of three (3) onsite wetland systems or the McGovern Brook. The two wetland systems to the south of the site flow offsite to the south and is associated with the Nashua River Watershed. The wetland system to the north of the site flow offsite to the start of the McGovern Brook. The McGovern Brook flows through the site and connects to the Nashua River to the south of the site. Runoff for the eastern portion of the site is collected by stormwater management systems associated with the recently constructed developments along Lunenburg Road. Elevations onsite range from a maximum of 420 feet at the western edge of the property to 280 feet at the southern end of the McGovern Brook. Slopes onsite range from approximately 1.0% to 30%.

III. PROPOSED SITE CONDITIONS

Proposed Development Site Conditions

The proposed project consists of the construction of approximately 3,056,500 SF of mixed-use development, including industrial space, residential units, a hotel, recreation facilities, and retail. Additional construction work includes the construction of a primary access road, paved parking areas, associated utility infrastructure, stormwater management components, sidewalks, landscaping and lighting.

Proposed Development Collection and Conveyance

The proposed development is designed to provide underground stormwater conveyance and management systems for each of the individual building lots as well as within the proposed roadway. Runoff generated on the site will be collected in a series of deep-sump, hooded catch basins associated with the separate drainage systems. Flows will be directed to water quality units for additional treatment prior to discharge to forebays and surface infiltration systems or isolator rows and subsurface infiltration systems. Pretreatment will be provided by deep -sump, hooded catch basins, proprietary water quality units, and forebays or isolator rows. The infiltration basins will provide peak rate attenuation, stormwater recharge and water quality treatment. Overflow from the basins will discharge to the wetland systems located onsite.

The best management practices (BMPs) incorporated into the proposed stormwater management system have been designed to meet the Stormwater Standards for new development and redevelopment, as applicable. In addition, a Stormwater Operation and Maintenance (O&M) Plan, attached in **Appendix F**, has been developed which includes scheduled maintenance and periodic inspections of stormwater management systems.

The project has been designed to maintain existing drainage watersheds to the greatest extent possible and with the same design points as described in **Section II** above. The project proposes to impact all design points.

Refer to **Table 1** for proposed conditions peak rates of runoff. For additional hydrologic information, refer to **Appendix E**. Refer to the Drainage Area Maps in the appendices of this report for a graphical representation of the existing and proposed drainage areas.

IV. METHODOLOGY

Peak Flow Calculations

Methodology utilized to design the proposed stormwater management system includes compliance with the guidelines set forth in the latest edition of the Massachusetts DEP Stormwater Handbook. The pre- and post-development runoff rates being discharged from the site were computed using the HydroCAD computer program. The drainage area and outlet information were entered into the program, which routes storm flows based on NRCS TR-20 and TR-55 methods. The other components of the model were determined following standard NRCS procedures for Curve Numbers (CNs) and times of concentrations documented in the appendices of this report. The rainfall data utilized and listed below in **Table 2** below for stormwater calculations is based on Technical Paper-40. Refer to **Appendix F** for more information.

Table 2: Rainfall Intensities

Frequency	2 year	10 year	25 year	100 year
Rainfall* (inches)	3.00	4.50	5.30	6.50

*Values derived from Hydrology Handbook for Conservation Commissioners prepared by Mass DEP (TP-40 Maps)

The proposed stormwater management as designed will provide a decrease in peak rates of runoff from the proposed facility for the 2-, 10-, 25- and 100-year design storm events. Additionally, the proposed project meets the MADEP Stormwater Management standards as described further below.

V. STORMWATER MANAGEMENT STANDARDS

The site is considered a mix of new development and redevelopment and is designed in accordance with the Massachusetts Stormwater Management Standards as outlined below.

Standard #1: No New Untreated Discharges

The project has been designed so that runoff from the proposed impervious areas shall be collected and passed through the proposed drainage system for treatment prior to discharge. Therefore, there are no new untreated discharges proposed as part of the project.

Standard #2: Peak Rate Attenuation

As outlined in **Table 1**, the development of the site and the proposed stormwater management system have been designed so that post-development peak rates of runoff are below pre-development conditions for the 2-, 10-, 25- and 100-year storm events at all design points.

Standard #3: Recharge

Stormwater runoff from the site will be collected and diverted to fifteen (15) proposed surface infiltration basins and twenty-one (21) subsurface infiltration basins. The project as proposed will involve the creation of approximately 160 acres of new impervious area and is required to infiltrate 309,173 cubic feet of stormwater as defined in Stormwater Standard 3. The proposed underground and surface infiltration basins will provide sufficient below the lowest outlet to provide the required groundwater recharge.

The DEP Stormwater Standards require that the infiltration BMP drains completely within 72 hours of the end of the storm event and provide four (4) foot separation to estimate seasonal high groundwater. It's anticipated that all stormwater infiltration systems will be designed to comply with both of these requirements.

Standard #4: Water Quality

Water quality treatment is provided via deep sump catch basins, proprietary water quality units, forebays and infiltration basins. The project as proposed will include approximately 160 acres or impervious area in total and is required to treat 664,305 cubic feet of water quality volume as defined in Stormwater Standard 4. The proposed infiltration basins will provide the required water quality volume below the lowest outlet for water quality treatment.

Standard #5: Land Use with Higher Potential Pollutant Loads

The proposed project involves "Land Uses with Higher Potential Pollutant Loads". Accordingly, the project will provide 44% TSS removal prior to infiltration, and proprietary treatment units (oil grit separators) are proposed within each treatment train.

Standard #6: Critical Areas

Vernal pools (PVPs) were identified in the southwestern corner of the Site by EcoTec, Inc. during their site investigation on May 2018. Additionally, the southern portion of the site is identified as an Undefined Area of Critical Environmental Concern per online GIS mapping. Stormwater management systems will be designed for the 1-inch water quality volume, will provide 44% TSS removal prior to infiltration, and will provide a minimum of 80% TSS removal. Stormwater systems will be designed in accordance with Volume 2 of the Stormwater Handbook.

Standard #7: Redevelopment

This project is considered a mix of new development and redevelopment; however, the site has been designed as if it is a new development. The project has been designed to meet the Stormwater Standards.

Standard #8: Construction Period Pollution Prevention, Erosion, and Sedimentation Control

The proposed project will provide construction period erosion and sedimentation controls as indicated within the site plan set provided for this project. This includes a proposed construction exit, protection for stormwater inlets, protection around temporary material stock piles and various other techniques as outlined on the erosion and sediment control sheets. Additionally, the project is required to file a Notice of Intent with the US EPA and implement a Stormwater Pollution Prevention Plan (SWPPP) during the construction period. The SWPPP will be prepared prior to the start of construction and will be implemented by the site contractor under the guidance and responsibility of the project's proponent.

Standard #9: Operation and Maintenance Plan (O&M Plan)

An Operation and Maintenance (O&M) Plan for this site has been prepared and is included in **Appendix F** of this report. The O&M Plan outlines procedures and time tables for the long-term operation and maintenance of the proposed site stormwater management system, including initial inspections upon completion of construction, and periodic monitoring of the system components, in accordance with established practices and the manufacturer's recommendations. The O&M Plan includes a list of responsible parties for inspections and maintenance.

Standard #10: Prohibition of Illicit Discharges

The proposed stormwater system will only convey allowable non-stormwater discharges (firefighting waters, irrigation, air conditioning condensates, etc.) and will not contain any illicit discharges from prohibited sources. An Illicit Discharge Statement is included in **Appendix F** of this report.

VI. SUMMARY

In summary, the proposed stormwater management system illustrated on the drawings prepared by Bohler Engineering results in a reduction in peak rates of runoff from the Site when compared to pre-development conditions for the 2-, 10-, 25- and 100-year storm frequencies. The project will improve the quality of stormwater discharge from the site compared to the existing condition and meets the MADEP Stormwater Management Standards as described herein. The pre-development versus post-development peak discharge rates comparisons are contained in **Table 3** below:

Table 3: Design Point Peak Runoff Rate Summary*

Point of Analysis	2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP1	3.30	2.09	**-1.21**	28.57	19.96	**-8.61**	53.09	36.41	**-16.68**	100.70	66.02	**-34.68**
DP2	6.14	0.00	**-6.14**	22.33	1.04	**-21.29**	33.22	1.94	**-31.28**	51.08	5.93	**-45.15**
DP3	16.65	5.86	**-10.79**	81.83	40.06	**-41.77**	132.66	71.51	**-61.15**	222.25	129.24	**-93.01**

**Flows are represented in cubic feet per second (cfs)*

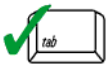
APPENDIX A: MASSACHUSETTS STORMWATER MANAGEMENT CHECKLIST

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

---

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☐ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☒ Other (describe): Surface & Subsurface Infiltration Basins

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☒ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☒ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☒ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☒ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☒ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

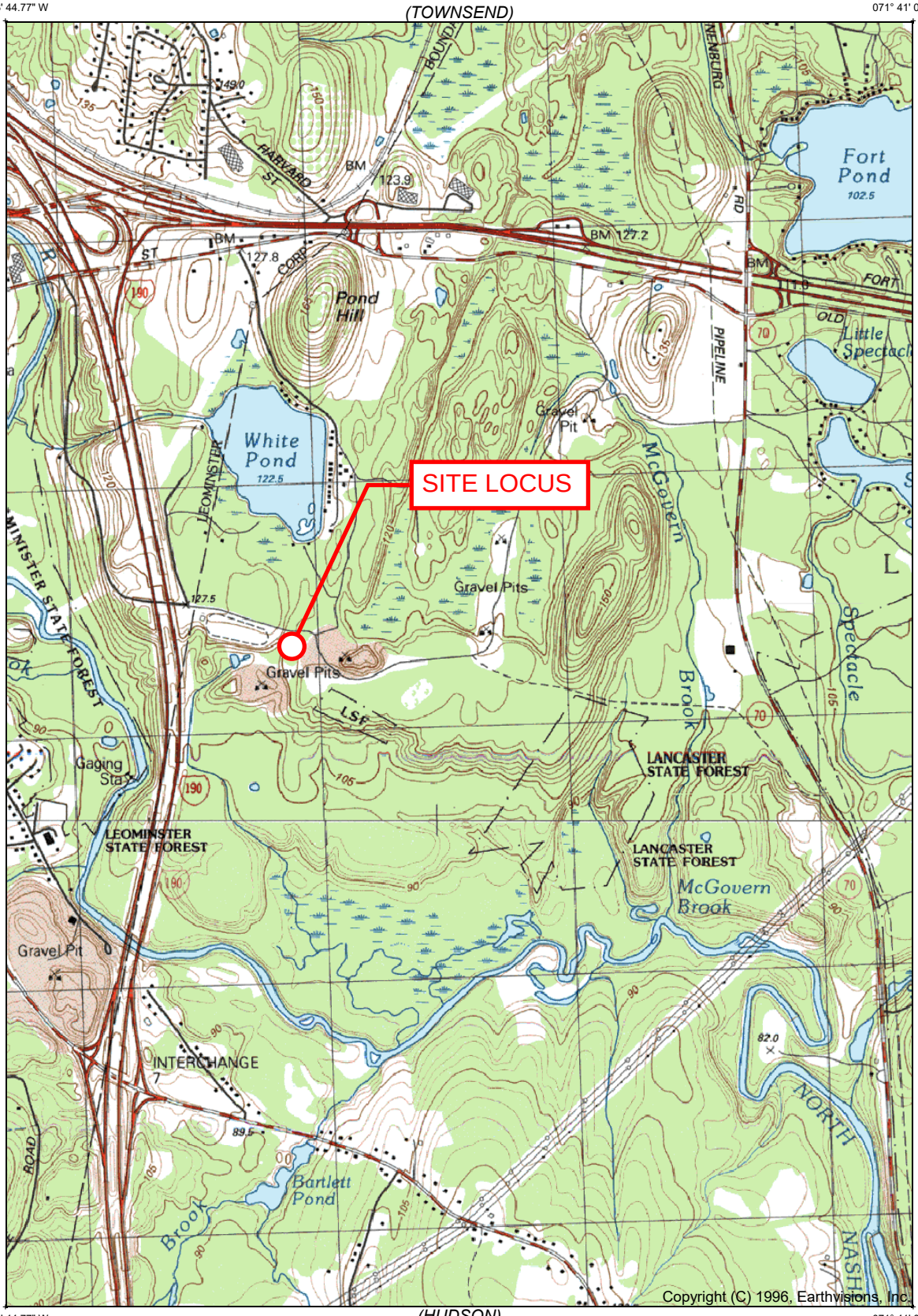
APPENDIX B: PROJECT LOCATION MAPS

- *USGS MAP*
- *FEMA FIRMETTE*

(ASHBURNHAM) (TOWNSEND) (LOWELL)

071° 43' 44.77" W
042° 31' 44.44" N

071° 41' 04.33" W
042° 31' 44.44" N



(FITCHBURG) (BILLERICA)

042° 28' 56.87" N
071° 43' 44.77" W

(HUDSON)

042° 28' 56.87" N
071° 41' 04.33" W

(STERLING) (MAYNARD)

Declination

MN GN

GN 1.82° W
MN 14.81° W

SCALE 1:24000

0 1
MILE

0 1000
YARDS

0 1
KILOMETER

CONTOUR INTERVAL 3 METERS
NATIONAL GEODETIC VERTICAL DATUM 1929

NOTES TO USERS

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Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Massachusetts State Plane Mainland Zone (FIPS zone 2001). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from digital orthophotography. Base map files were provided in digital format by Massachusetts Geographic Information Systems (MassGIS). Ortho imagery was produced at a scale of 1:5,000. Aerial photography is dated April 2005.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

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LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% Annual Chance Floodplain Boundary
	0.2% Annual Chance Floodplain Boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
	Culvert
	Bridge
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
4989000 M	1000-meter ticks: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection
4980 000m N	1000-meter Universal Transverse Mercator grid values, zone 19N
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
July 4, 2011

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

PANEL 0289E

FIRM

FLOOD INSURANCE RATE MAP

WORCESTER COUNTY, MASSACHUSETTS (ALL JURISDICTIONS)

PANEL 289 OF 1075

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LANCASTER, TOWN OF	250312	0289	E
LEOMINSTER, CITY OF	250314	0289	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25027C0289E

EFFECTIVE DATE
JULY 4, 2011

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NOTES TO USERS

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Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

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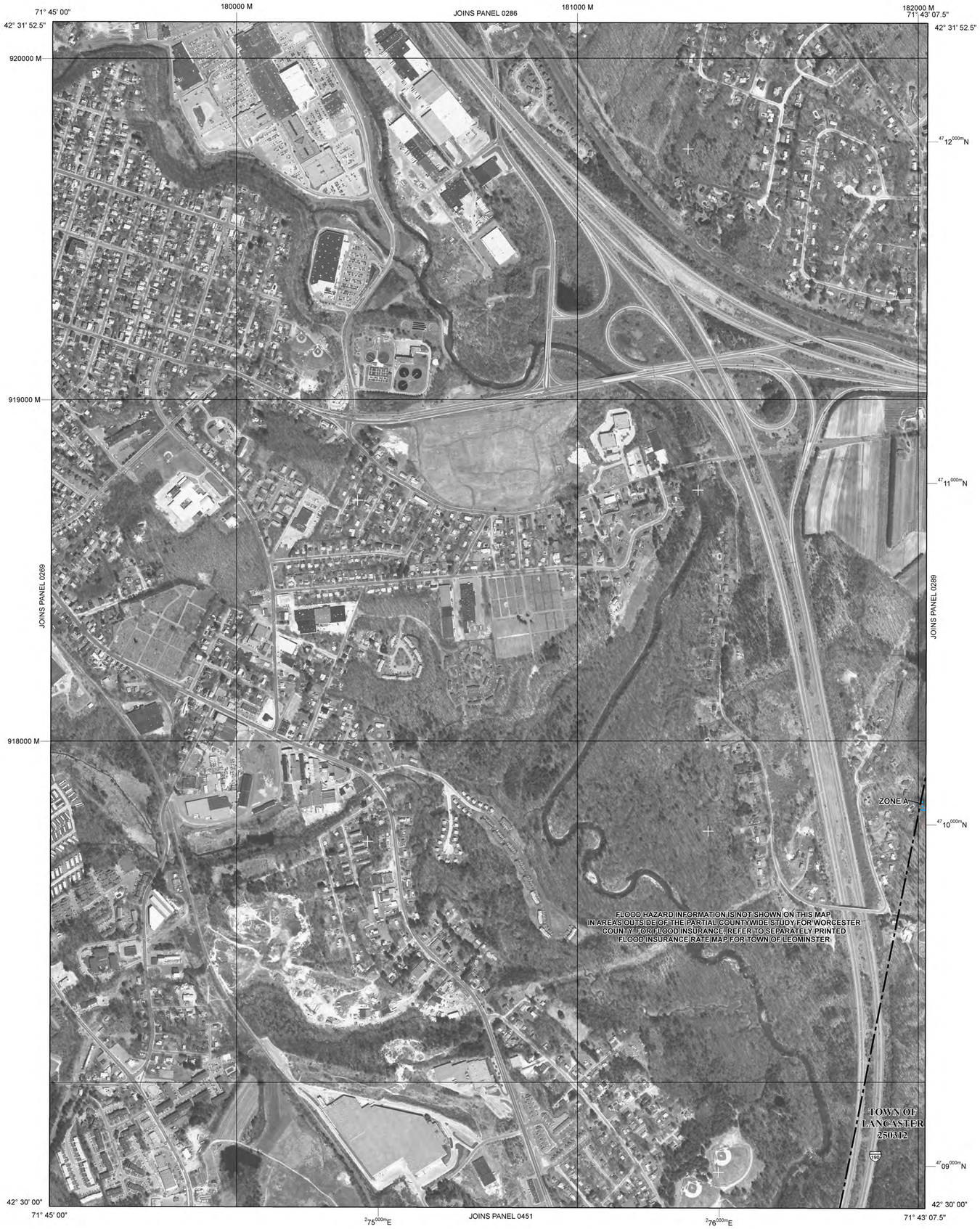
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LEGEND

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ZONE A	No Base Flood Elevations determined.
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ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
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ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

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- 0.2% Annual Chance Floodplain Boundary
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- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

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- Culvert
- Bridge
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July 4, 2011

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250 0 500 1000 FEET
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NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0288E

FIRM

FLOOD INSURANCE RATE MAP

WORCESTER COUNTY, MASSACHUSETTS
(ALL JURISDICTIONS)

PANEL 288 OF 1075
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
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LEOMINSTER, CITY OF	250314	0288	E

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Federal Emergency Management Agency

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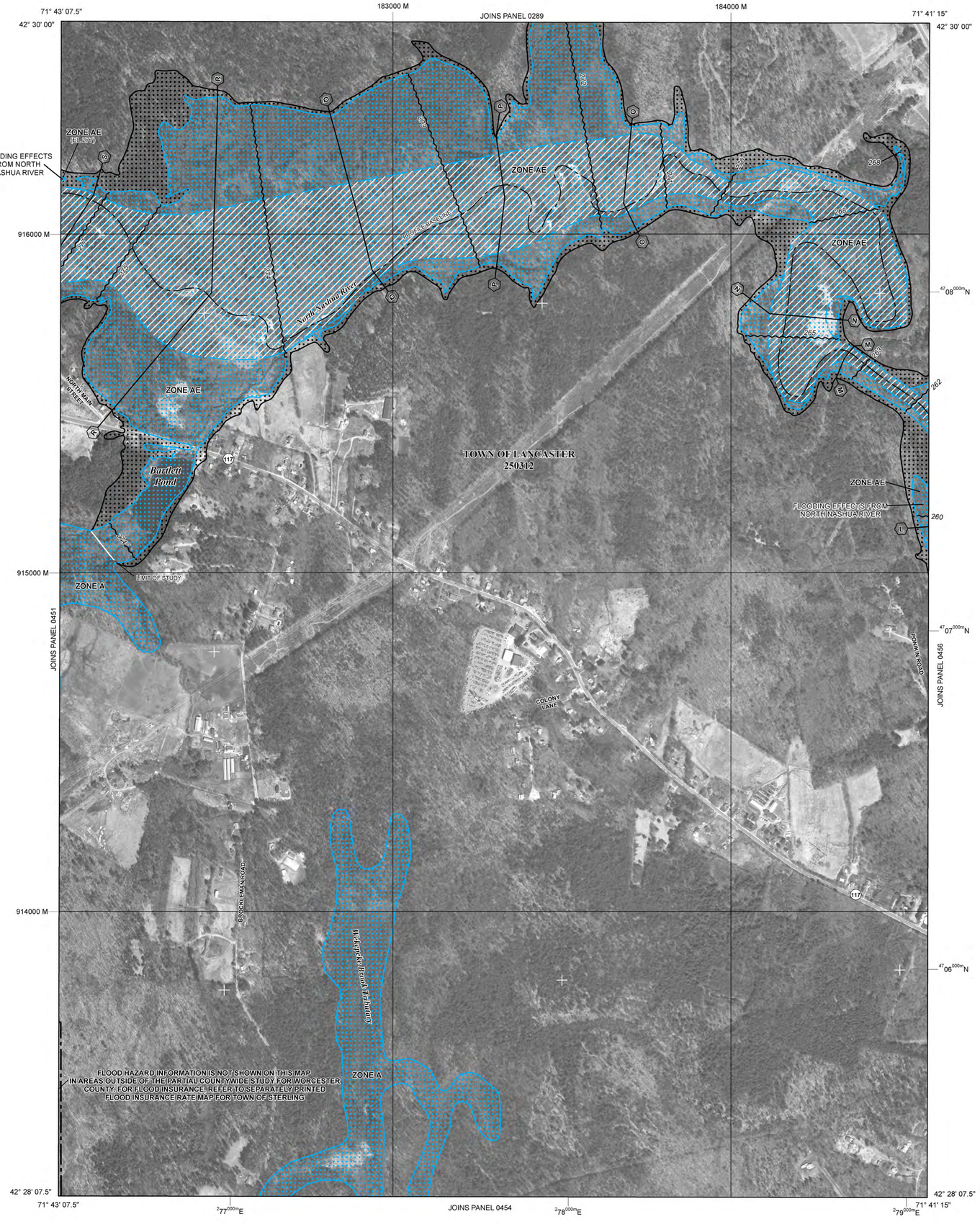
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LEGEND

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ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4989000 M — 1000-meter ticks: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection
- 4980000mN — 1000-meter Universal Transverse Mercator grid values, zone 19N
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
July 4, 2011

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0452E

FIRM

FLOOD INSURANCE RATE MAP

WORCESTER COUNTY, MASSACHUSETTS (ALL JURISDICTIONS)

PANEL 452 OF 1075
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LANCASTER, TOWN OF	250312	0452	E
STERLING, TOWN OF	250336	0452	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25027C0452E

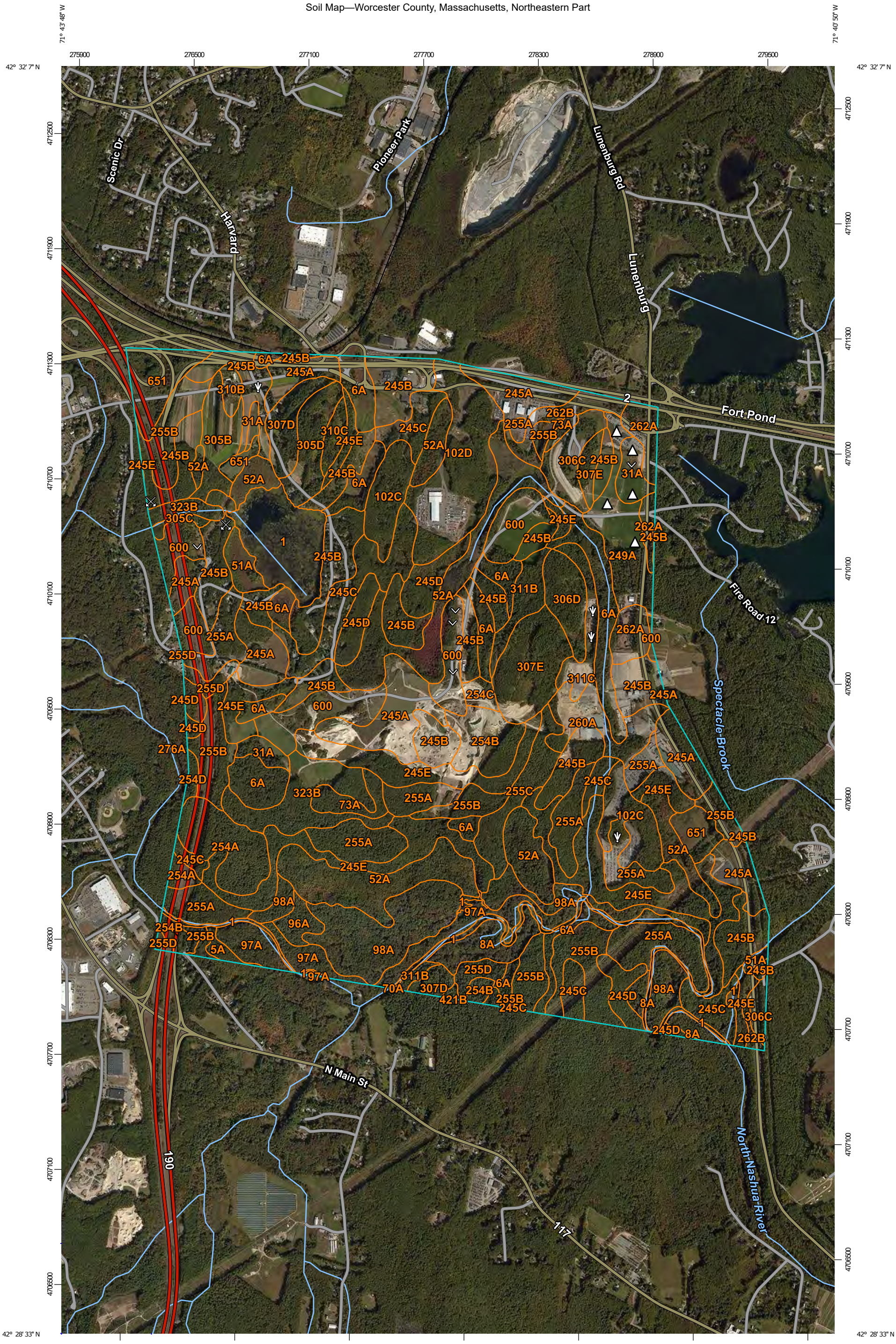
EFFECTIVE DATE
JULY 4, 2011

Federal Emergency Management Agency

APPENDIX C: SOIL AND WETLAND INFORMATION

- *NCRS CUSTOM SOIL RESOURCE REPORT*

Soil Map—Worcester County, Massachusetts, Northeastern Part



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 13, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

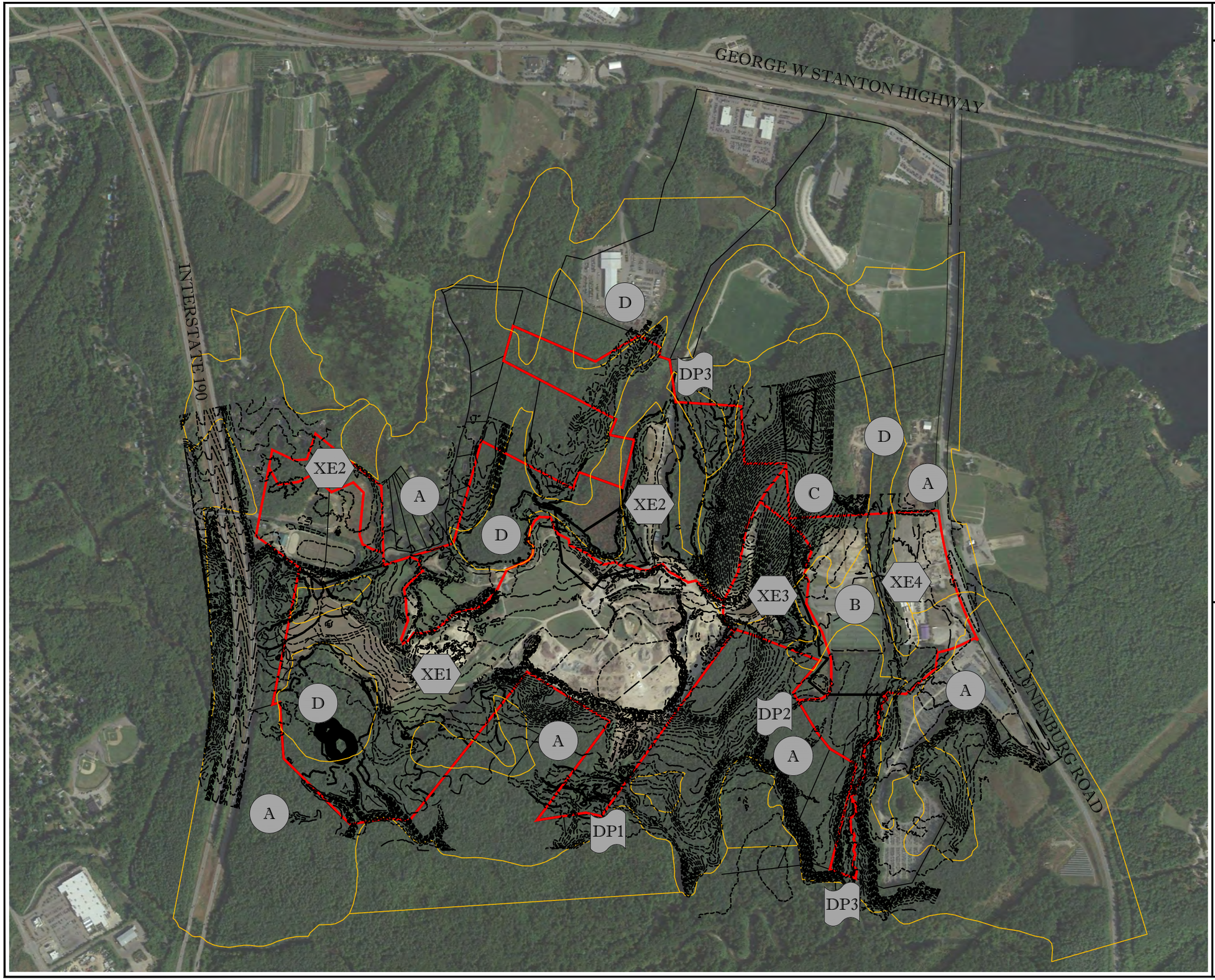
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	74.0	3.3%
5A	Saco silt loam, 0 to 3 percent slopes	4.0	0.2%
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	117.2	5.2%
8A	Limerick silt loam, 0 to 3 percent slopes	30.2	1.3%
31A	Walpole sandy loam, 0 to 3 percent slopes	20.9	0.9%
51A	Swansea muck, 0 to 1 percent slopes	12.2	0.5%
52A	Freetown muck, 0 to 1 percent slopes	167.2	7.4%
70A	Ridgebury fine sandy loam, 0 to 3 percent slopes	0.0	0.0%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	14.6	0.6%
96A	Hadley very fine sandy loam, 0 to 3 percent slopes	8.8	0.4%
97A	Suncook loamy fine sand, 0 to 3 percent slopes	46.7	2.1%
98A	Winooski very fine sandy loam, 0 to 3 percent slopes	99.0	4.4%
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	48.1	2.1%
102D	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	71.1	3.1%
245A	Hinckley loamy sand, 0 to 3 percent slopes	131.0	5.8%
245B	Hinckley loamy sand, 3 to 8 percent slopes	247.0	10.9%
245C	Hinckley loamy sand, 8 to 15 percent slopes	82.5	3.6%
245D	Hinckley loamy sand, 15 to 25 percent slopes	42.0	1.8%
245E	Hinckley loamy sand, 25 to 35 percent slopes	173.3	7.6%
249A	Deerfield loamy fine sand, 0 to 3 percent slopes	38.1	1.7%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	40.5	1.8%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	36.4	1.6%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	5.7	0.3%
254D	Merrimac fine sandy loam, 15 to 25 percent slopes	3.3	0.1%
255A	Windsor loamy sand, 0 to 3 percent slopes	130.8	5.8%
255B	Windsor loamy sand, 3 to 8 percent slopes	112.6	5.0%
255C	Windsor loamy sand, 8 to 15 percent slopes	25.3	1.1%
255D	Windsor loamy sand, 15 to 25 percent slopes	14.5	0.6%
260A	Sudbury fine sandy loam, 0 to 3 percent slopes	28.3	1.2%
262A	Quonset loamy sand, 0 to 3 percent slopes	30.0	1.3%
262B	Quonset loamy sand, 3 to 8 percent slopes	18.0	0.8%
276A	Ninigret fine sandy loam, 0 to 3 percent slopes	0.0	0.0%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	22.7	1.0%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	3.1	0.1%
305D	Paxton fine sandy loam, 15 to 25 percent slopes	24.1	1.1%
306C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	26.3	1.2%
306D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	21.5	0.9%
307D	Paxton fine sandy loam, 15 to 25 percent slopes, extremely stony	24.8	1.1%
307E	Paxton fine sandy loam, 25 to 35 percent slopes, extremely stony	48.0	2.1%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	5.6	0.2%
310C	Woodbridge fine sandy loam, 8 to 15 percent slopes	7.6	0.3%
311B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	18.8	0.8%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
311C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	16.9	0.7%
323B	Poquonock loamy sand, 3 to 8 percent slopes, very stony	49.1	2.2%
421B	Canton fine sandy loam, 0 to 8 percent slopes, very stony	1.3	0.1%
600	Pits, gravel	88.2	3.9%
651	Udorthents, smoothed	42.6	1.9%
Totals for Area of Interest		**2,273.9**	**100.0%**

APPENDIX D: EXISTING CONDITIONS HYDROLOGIC ANALYSIS

- *EXISTING CONDITIONS DRAINAGE MAP*
- *EXISTING CONDITIONS HYDROCAD COMPUTATIONS*



LEGEND

OVERALL BOUNDARY

HYDROLOGIC SOIL GROUP BOUNDARY

DP# DESIGN POINT

X#.# SUBCATCHMENT

X HYDROLOGIC SOIL GROUP RATING

EXISTING DRAINAGE WATERSHED MAP

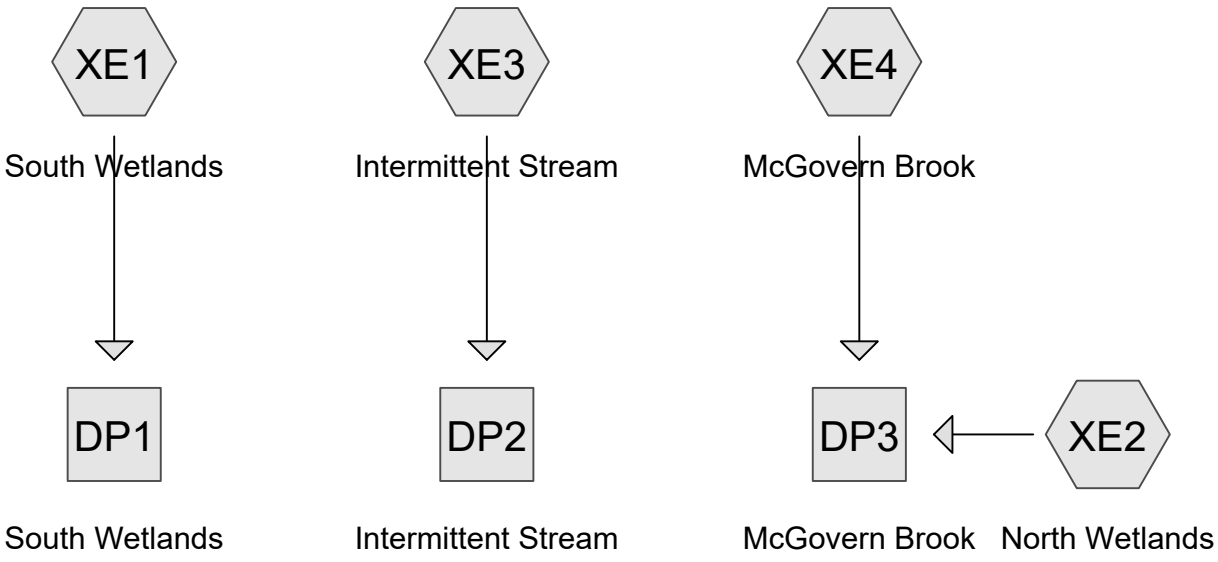
CAPITAL COMMERCE CENTER
LANCASTER, MASSACHUSETTS

PREPARED BY

BOHLER ENGINEERING

N
W E
S

SCALE: 1"=1,000'
DATE: NOVEMBER 15, 2019



Subcat Reach Pond Link

Routing Diagram for Existing Conditions-3 DP
Prepared by Bohler Engineering, Printed 11/6/2019
HydroCAD® 10.00-21 s/n 08311 © 2018 HydroCAD Software Solutions LLC

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
77.270	7.470	1.540	3.460	0.000	89.740	>75% Grass cover, Good	XE1, XE2, XE3, XE4
63.830	1.500	9.680	0.000	0.000	75.010	Dirt roads	XE1, XE2, XE3, XE4
3.670	2.930	0.360	0.330	0.000	7.290	Paved parking	XE1, XE4
11.780	4.920	0.000	1.790	0.000	18.490	Urban commercial, 85% imp	XE4
1.050	0.000	0.000	0.190	0.000	1.240	Water Surface	XE1, XE3
161.000	8.860	33.190	82.340	0.000	285.390	Woods, Good	XE1, XE2, XE3, XE4
318.600	**25.680**	**44.770**	**88.110**	**0.000**	**477.160**	**TOTAL AREA**	

Summary for Subcatchment XE1: South Wetlands

Runoff = 3.30 cfs @ 15.43 hrs, Volume= 1.946 af, Depth> 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

Area (ac)	CN	Description
3.670	98	Paved parking, HSG A
74.510	30	Woods, Good, HSG A
59.940	39	>75% Grass cover, Good, HSG A
0.190	98	Water Surface, HSG A
58.500	72	Dirt roads, HSG A
30.160	77	Woods, Good, HSG D
3.220	80	>75% Grass cover, Good, HSG D
0.190	98	Water Surface, HSG D
230.380	51	Weighted Average
226.330		98.24% Pervious Area
4.050		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
15.1	235	0.0027	0.26		**Shallow Concentrated Flow, Natural Woods** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Paved Drive** Paved Kv= 20.3 fps
1.1	235	0.0300	3.52		**Shallow Concentrated Flow, Paved Area** Paved Kv= 20.3 fps
0.8	125	0.3000	2.74		**Shallow Concentrated Flow, Sloped Woods** Woodland Kv= 5.0 fps
36.3	1,722	0.0250	0.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
92.1	2,397	Total			

Summary for Subcatchment XE2: North Wetlands

Runoff = 2.65 cfs @ 13.40 hrs, Volume= 1.461 af, Depth> 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

Area (ac)	CN	Description
11.800	39	>75% Grass cover, Good, HSG A
5.330	72	Dirt roads, HSG A
60.910	30	Woods, Good, HSG A
17.770	70	Woods, Good, HSG C
44.760	77	Woods, Good, HSG D
140.570	52	Weighted Average
140.570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	76	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.6	116	0.3600	3.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
41.7	242	Total			

Summary for Subcatchment XE3: Intermittent Stream

Runoff = 6.14 cfs @ 12.45 hrs, Volume= 0.997 af, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

Area (ac)	CN	Description
5.150	30	Woods, Good, HSG A
2.270	39	>75% Grass cover, Good, HSG A
0.860	98	Water Surface, HSG A
2.990	55	Woods, Good, HSG B
9.880	70	Woods, Good, HSG C
1.540	74	>75% Grass cover, Good, HSG C
5.180	87	Dirt roads, HSG C
27.870	63	Weighted Average
27.010		96.91% Pervious Area
0.860		3.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0400	0.05		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	312	0.1700	2.06		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.6	254	0.0550	1.17		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.9	616	Total			

Summary for Subcatchment XE4: McGovern Brook

Runoff = 15.38 cfs @ 12.70 hrs, Volume= 3.014 af, Depth> 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

Area (ac)	CN	Description
20.430	30	Woods, Good, HSG A
3.260	39	>75% Grass cover, Good, HSG A
11.780	89	Urban commercial, 85% imp, HSG A
2.930	98	Paved parking, HSG B
5.870	55	Woods, Good, HSG B
7.470	61	>75% Grass cover, Good, HSG B
1.500	82	Dirt roads, HSG B
4.920	92	Urban commercial, 85% imp, HSG B
0.360	98	Paved parking, HSG C
5.540	70	Woods, Good, HSG C
4.500	87	Dirt roads, HSG C
0.240	80	>75% Grass cover, Good, HSG D
1.790	95	Urban commercial, 85% imp, HSG D
0.330	98	Paved parking, HSG D
7.420	77	Woods, Good, HSG D
78.340	64	Weighted Average
59.003		75.32% Pervious Area
19.337		24.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.0	50	0.0080	0.03		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
5.1	153	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.9	176	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.5	79	0.2800	2.65		**Shallow Concentrated Flow, Steep Woods** Woodland Kv= 5.0 fps
40.5	458	Total			

Summary for Reach DP1: South Wetlands

Inflow Area = 230.380 ac, 1.76% Impervious, Inflow Depth > 0.10" for 2 Year event
Inflow = 3.30 cfs @ 15.43 hrs, Volume= 1.946 af
Outflow = 3.30 cfs @ 15.43 hrs, Volume= 1.946 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Intermittent Stream

Inflow Area = 27.870 ac, 3.09% Impervious, Inflow Depth > 0.43" for 2 Year event
Inflow = 6.14 cfs @ 12.45 hrs, Volume= 0.997 af
Outflow = 6.14 cfs @ 12.45 hrs, Volume= 0.997 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach DP3: McGovern Brook

Inflow Area = 218.910 ac, 8.83% Impervious, Inflow Depth > 0.25" for 2 Year event
Inflow = 16.65 cfs @ 12.74 hrs, Volume= 4.476 af
Outflow = 16.65 cfs @ 12.74 hrs, Volume= 4.476 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment XE1: South Wetlands

Runoff = 28.57 cfs @ 13.58 hrs, Volume= 10.045 af, Depth> 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.50"

Area (ac)	CN	Description
3.670	98	Paved parking, HSG A
74.510	30	Woods, Good, HSG A
59.940	39	>75% Grass cover, Good, HSG A
0.190	98	Water Surface, HSG A
58.500	72	Dirt roads, HSG A
30.160	77	Woods, Good, HSG D
3.220	80	>75% Grass cover, Good, HSG D
0.190	98	Water Surface, HSG D
230.380	51	Weighted Average
226.330		98.24% Pervious Area
4.050		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
15.1	235	0.0027	0.26		**Shallow Concentrated Flow, Natural Woods** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Paved Drive** Paved Kv= 20.3 fps
1.1	235	0.0300	3.52		**Shallow Concentrated Flow, Paved Area** Paved Kv= 20.3 fps
0.8	125	0.3000	2.74		**Shallow Concentrated Flow, Sloped Woods** Woodland Kv= 5.0 fps
36.3	1,722	0.0250	0.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
92.1	2,397	Total			

Summary for Subcatchment XE2: North Wetlands

Runoff = 31.27 cfs @ 12.75 hrs, Volume= 6.827 af, Depth> 0.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.50"

Area (ac)	CN	Description
11.800	39	>75% Grass cover, Good, HSG A
5.330	72	Dirt roads, HSG A
60.910	30	Woods, Good, HSG A
17.770	70	Woods, Good, HSG C
44.760	77	Woods, Good, HSG D
140.570	52	Weighted Average
140.570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	76	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.6	116	0.3600	3.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
41.7	242	Total			

Summary for Subcatchment XE3: Intermittent Stream

Runoff = 22.43 cfs @ 12.36 hrs, Volume= 2.774 af, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.50"

Area (ac)	CN	Description
5.150	30	Woods, Good, HSG A
2.270	39	>75% Grass cover, Good, HSG A
0.860	98	Water Surface, HSG A
2.990	55	Woods, Good, HSG B
9.880	70	Woods, Good, HSG C
1.540	74	>75% Grass cover, Good, HSG C
5.180	87	Dirt roads, HSG C
27.870	63	Weighted Average
27.010		96.91% Pervious Area
0.860		3.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0400	0.05		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	312	0.1700	2.06		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.6	254	0.0550	1.17		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.9	616	Total			

Summary for Subcatchment XE4: McGovern Brook

Runoff = 51.97 cfs @ 12.62 hrs, Volume= 8.167 af, Depth> 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.50"

Area (ac)	CN	Description
20.430	30	Woods, Good, HSG A
3.260	39	>75% Grass cover, Good, HSG A
11.780	89	Urban commercial, 85% imp, HSG A
2.930	98	Paved parking, HSG B
5.870	55	Woods, Good, HSG B
7.470	61	>75% Grass cover, Good, HSG B
1.500	82	Dirt roads, HSG B
4.920	92	Urban commercial, 85% imp, HSG B
0.360	98	Paved parking, HSG C
5.540	70	Woods, Good, HSG C
4.500	87	Dirt roads, HSG C
0.240	80	>75% Grass cover, Good, HSG D
1.790	95	Urban commercial, 85% imp, HSG D
0.330	98	Paved parking, HSG D
7.420	77	Woods, Good, HSG D
78.340	64	Weighted Average
59.003		75.32% Pervious Area
19.337		24.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.0	50	0.0080	0.03		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
5.1	153	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.9	176	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.5	79	0.2800	2.65		**Shallow Concentrated Flow, Steep Woods** Woodland Kv= 5.0 fps
40.5	458	Total			

Summary for Reach DP1: South Wetlands

Inflow Area = 230.380 ac, 1.76% Impervious, Inflow Depth > 0.52" for 10 Year event
Inflow = 28.57 cfs @ 13.58 hrs, Volume= 10.045 af
Outflow = 28.57 cfs @ 13.58 hrs, Volume= 10.045 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Intermittent Stream

Inflow Area = 27.870 ac, 3.09% Impervious, Inflow Depth > 1.19" for 10 Year event
Inflow = 22.43 cfs @ 12.36 hrs, Volume= 2.774 af
Outflow = 22.43 cfs @ 12.36 hrs, Volume= 2.774 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach DP3: McGovern Brook

Inflow Area = 218.910 ac, 8.83% Impervious, Inflow Depth > 0.82" for 10 Year event
Inflow = 81.83 cfs @ 12.67 hrs, Volume= 14.993 af
Outflow = 81.83 cfs @ 12.67 hrs, Volume= 14.993 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment XE1: South Wetlands

Runoff = 53.09 cfs @ 13.47 hrs, Volume= 16.269 af, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.30"

Area (ac)	CN	Description
3.670	98	Paved parking, HSG A
74.510	30	Woods, Good, HSG A
59.940	39	>75% Grass cover, Good, HSG A
0.190	98	Water Surface, HSG A
58.500	72	Dirt roads, HSG A
30.160	77	Woods, Good, HSG D
3.220	80	>75% Grass cover, Good, HSG D
0.190	98	Water Surface, HSG D
230.380	51	Weighted Average
226.330		98.24% Pervious Area
4.050		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
15.1	235	0.0027	0.26		**Shallow Concentrated Flow, Natural Woods** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Paved Drive** Paved Kv= 20.3 fps
1.1	235	0.0300	3.52		**Shallow Concentrated Flow, Paved Area** Paved Kv= 20.3 fps
0.8	125	0.3000	2.74		**Shallow Concentrated Flow, Sloped Woods** Woodland Kv= 5.0 fps
36.3	1,722	0.0250	0.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
92.1	2,397	Total			

Summary for Subcatchment XE2: North Wetlands

Runoff = 57.99 cfs @ 12.70 hrs, Volume= 10.855 af, Depth> 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.30"

Area (ac)	CN	Description
11.800	39	>75% Grass cover, Good, HSG A
5.330	72	Dirt roads, HSG A
60.910	30	Woods, Good, HSG A
17.770	70	Woods, Good, HSG C
44.760	77	Woods, Good, HSG D
140.570	52	Weighted Average
140.570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	76	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.6	116	0.3600	3.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
41.7	242	Total			

Summary for Subcatchment XE3: Intermittent Stream

Runoff = 33.22 cfs @ 12.35 hrs, Volume= 3.930 af, Depth> 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.30"

Area (ac)	CN	Description
5.150	30	Woods, Good, HSG A
2.270	39	>75% Grass cover, Good, HSG A
0.860	98	Water Surface, HSG A
2.990	55	Woods, Good, HSG B
9.880	70	Woods, Good, HSG C
1.540	74	>75% Grass cover, Good, HSG C
5.180	87	Dirt roads, HSG C
27.870	63	Weighted Average
27.010		96.91% Pervious Area
0.860		3.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0400	0.05		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	312	0.1700	2.06		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.6	254	0.0550	1.17		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.9	616	Total			

Summary for Subcatchment XE4: McGovern Brook

Runoff = 75.87 cfs @ 12.60 hrs, Volume= 11.487 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.30"

Area (ac)	CN	Description
20.430	30	Woods, Good, HSG A
3.260	39	>75% Grass cover, Good, HSG A
11.780	89	Urban commercial, 85% imp, HSG A
2.930	98	Paved parking, HSG B
5.870	55	Woods, Good, HSG B
7.470	61	>75% Grass cover, Good, HSG B
1.500	82	Dirt roads, HSG B
4.920	92	Urban commercial, 85% imp, HSG B
0.360	98	Paved parking, HSG C
5.540	70	Woods, Good, HSG C
4.500	87	Dirt roads, HSG C
0.240	80	>75% Grass cover, Good, HSG D
1.790	95	Urban commercial, 85% imp, HSG D
0.330	98	Paved parking, HSG D
7.420	77	Woods, Good, HSG D
78.340	64	Weighted Average
59.003		75.32% Pervious Area
19.337		24.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.0	50	0.0080	0.03		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
5.1	153	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.9	176	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.5	79	0.2800	2.65		**Shallow Concentrated Flow, Steep Woods** Woodland Kv= 5.0 fps
40.5	458	Total			

Summary for Reach DP1: South Wetlands

Inflow Area = 230.380 ac, 1.76% Impervious, Inflow Depth > 0.85" for 25 Year event
Inflow = 53.09 cfs @ 13.47 hrs, Volume= 16.269 af
Outflow = 53.09 cfs @ 13.47 hrs, Volume= 16.269 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Intermittent Stream

Inflow Area = 27.870 ac, 3.09% Impervious, Inflow Depth > 1.69" for 25 Year event
Inflow = 33.22 cfs @ 12.35 hrs, Volume= 3.930 af
Outflow = 33.22 cfs @ 12.35 hrs, Volume= 3.930 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach DP3: McGovern Brook

Inflow Area = 218.910 ac, 8.83% Impervious, Inflow Depth > 1.22" for 25 Year event
Inflow = 132.66 cfs @ 12.65 hrs, Volume= 22.343 af
Outflow = 132.66 cfs @ 12.65 hrs, Volume= 22.343 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment XE1: South Wetlands

Runoff = 100.70 cfs @ 13.39 hrs, Volume= 27.479 af, Depth> 1.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=6.50"

Area (ac)	CN	Description
3.670	98	Paved parking, HSG A
74.510	30	Woods, Good, HSG A
59.940	39	>75% Grass cover, Good, HSG A
0.190	98	Water Surface, HSG A
58.500	72	Dirt roads, HSG A
30.160	77	Woods, Good, HSG D
3.220	80	>75% Grass cover, Good, HSG D
0.190	98	Water Surface, HSG D
230.380	51	Weighted Average
226.330		98.24% Pervious Area
4.050		1.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
15.1	235	0.0027	0.26		**Shallow Concentrated Flow, Natural Woods** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Paved Drive** Paved Kv= 20.3 fps
1.1	235	0.0300	3.52		**Shallow Concentrated Flow, Paved Area** Paved Kv= 20.3 fps
0.8	125	0.3000	2.74		**Shallow Concentrated Flow, Sloped Woods** Woodland Kv= 5.0 fps
36.3	1,722	0.0250	0.79		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
92.1	2,397	Total			

Summary for Subcatchment XE2: North Wetlands

Runoff = 108.23 cfs @ 12.66 hrs, Volume= 18.038 af, Depth> 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=6.50"

Area (ac)	CN	Description
11.800	39	>75% Grass cover, Good, HSG A
5.330	72	Dirt roads, HSG A
60.910	30	Woods, Good, HSG A
17.770	70	Woods, Good, HSG C
44.760	77	Woods, Good, HSG D
140.570	52	Weighted Average
140.570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	76	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.6	116	0.3600	3.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
41.7	242	Total			

Summary for Subcatchment XE3: Intermittent Stream

Runoff = 51.08 cfs @ 12.34 hrs, Volume= 5.850 af, Depth> 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=6.50"

Area (ac)	CN	Description
5.150	30	Woods, Good, HSG A
2.270	39	>75% Grass cover, Good, HSG A
0.860	98	Water Surface, HSG A
2.990	55	Woods, Good, HSG B
9.880	70	Woods, Good, HSG C
1.540	74	>75% Grass cover, Good, HSG C
5.180	87	Dirt roads, HSG C
27.870	63	Weighted Average
27.010		96.91% Pervious Area
0.860		3.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0400	0.05		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	312	0.1700	2.06		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
3.6	254	0.0550	1.17		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
22.9	616	Total			

Summary for Subcatchment XE4: McGovern Brook

Runoff = 115.25 cfs @ 12.58 hrs, Volume= 16.978 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=6.50"

Area (ac)	CN	Description
20.430	30	Woods, Good, HSG A
3.260	39	>75% Grass cover, Good, HSG A
11.780	89	Urban commercial, 85% imp, HSG A
2.930	98	Paved parking, HSG B
5.870	55	Woods, Good, HSG B
7.470	61	>75% Grass cover, Good, HSG B
1.500	82	Dirt roads, HSG B
4.920	92	Urban commercial, 85% imp, HSG B
0.360	98	Paved parking, HSG C
5.540	70	Woods, Good, HSG C
4.500	87	Dirt roads, HSG C
0.240	80	>75% Grass cover, Good, HSG D
1.790	95	Urban commercial, 85% imp, HSG D
0.330	98	Paved parking, HSG D
7.420	77	Woods, Good, HSG D
78.340	64	Weighted Average
59.003		75.32% Pervious Area
19.337		24.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.0	50	0.0080	0.03		**Sheet Flow, Natural Woods** Woods: Dense underbrush n= 0.800 P2= 3.00"
5.1	153	0.0100	0.50		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
2.9	176	0.0400	1.00		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
0.5	79	0.2800	2.65		**Shallow Concentrated Flow, Steep Woods** Woodland Kv= 5.0 fps
40.5	458	Total			

Summary for Reach DP1: South Wetlands

Inflow Area = 230.380 ac, 1.76% Impervious, Inflow Depth > 1.43" for 100 Year event
Inflow = 100.70 cfs @ 13.39 hrs, Volume= 27.479 af
Outflow = 100.70 cfs @ 13.39 hrs, Volume= 27.479 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Intermittent Stream

Inflow Area = 27.870 ac, 3.09% Impervious, Inflow Depth > 2.52" for 100 Year event
Inflow = 51.08 cfs @ 12.34 hrs, Volume= 5.850 af
Outflow = 51.08 cfs @ 12.34 hrs, Volume= 5.850 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

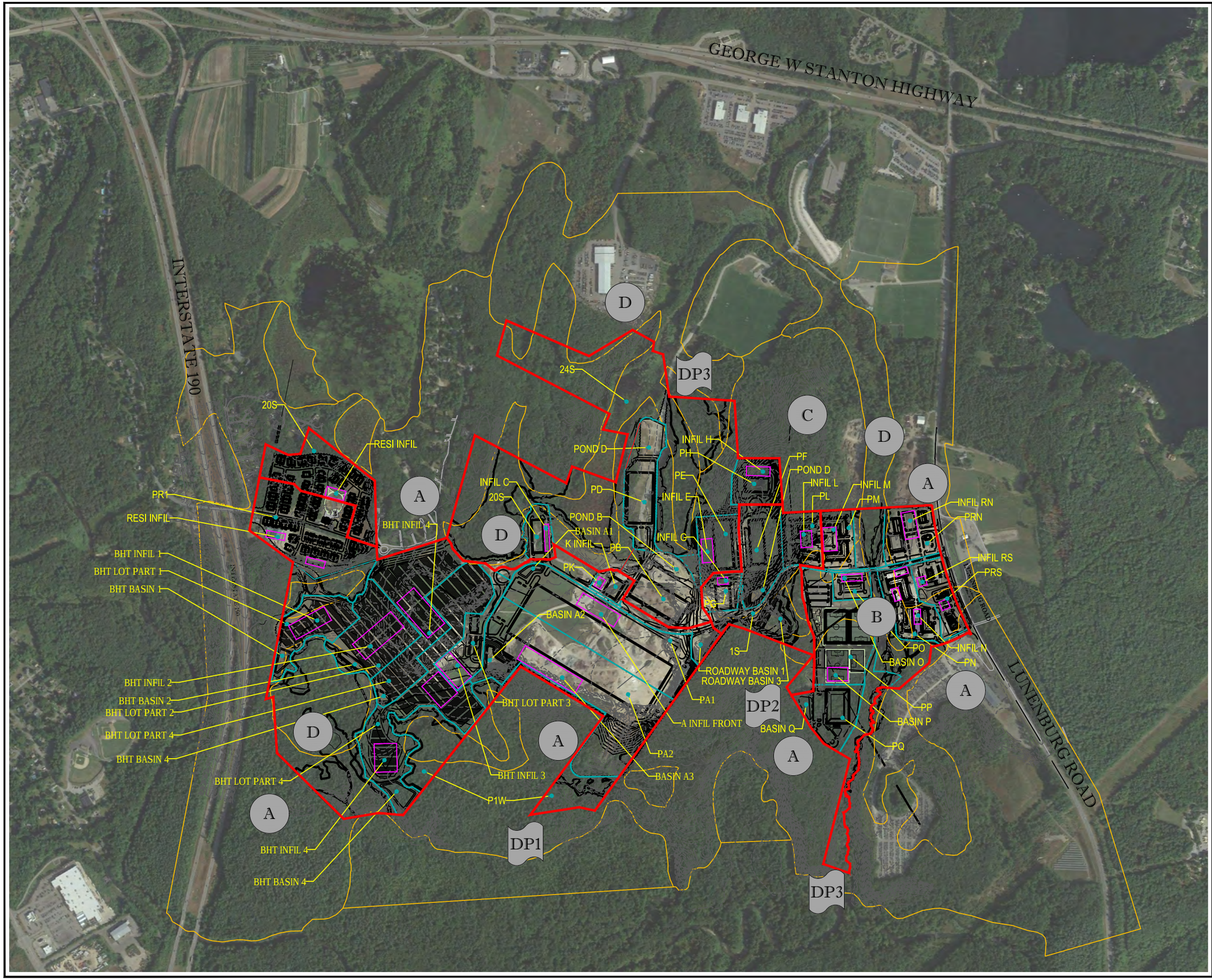
Summary for Reach DP3: McGovern Brook

Inflow Area = 218.910 ac, 8.83% Impervious, Inflow Depth > 1.92" for 100 Year event
Inflow = 222.25 cfs @ 12.62 hrs, Volume= 35.016 af
Outflow = 222.25 cfs @ 12.62 hrs, Volume= 35.016 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

APPENDIX E: PROPOSED CONDITIONS HYDROLOGIC ANALYSIS

- *PROPOSED CONDITIONS DRAINAGE MAP*
- *PROPOSED CONDITIONS HYRDOCAD CALCULATIONS*



LEGEND

- OVERALL BOUNDARY
- SUBCATCHMENT BOUNDARY
- HYDROLOGIC SOIL GROUP BOUNDARY
- DP# — DESIGN POINT
- X — HYDROLOGIC SOIL GROUP RATING

PROPOSED DRAINAGE WATERSHED MAP

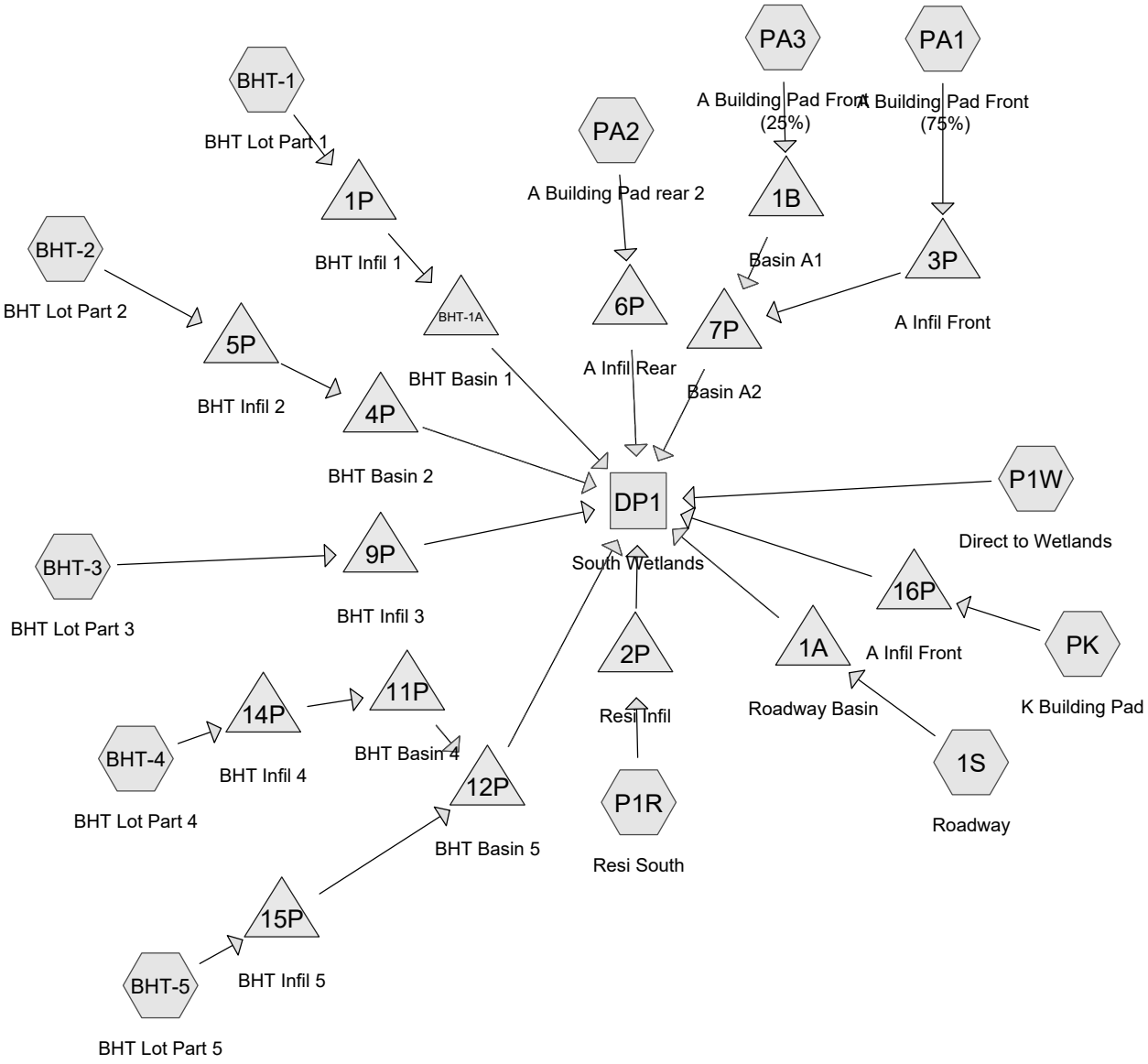
PROJECT ADDRESS
PROJECT TOWN, STATE

PREPARED BY

BOHLER ENGINEERING

N
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SCALE: 1"=1,000'
DATE: NOVEMBER 15, 2019



Routing Diagram for Prop Cond. DP1

Prepared by Bohler Engineering, Printed 11/6/2019

HydroCAD® 10.00-21 s/n 08311 © 2018 HydroCAD Software Solutions LLC

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
41.629	0.000	0.000	2.666	0.000	44.295	>75% Grass cover, Good	1S, BHT-1, BHT-2, BHT-3, BHT-4, BHT-5, P1R, P1W, PA1, PA2, PA3, PK
10.625	0.000	0.000	0.488	0.000	11.113	Basin	1S, BHT-1, BHT-2, BHT-3, BHT-4, BHT-5, PA1, PA2, PA3
78.857	0.000	0.000	0.691	0.000	79.548	Paved parking	1S, BHT-1, BHT-2, BHT-3, BHT-4, BHT-5, P1R, PA1, PA2, PA3, PK
28.218	0.000	0.000	0.000	0.000	28.218	Roofs	BHT-3, P1R, PA1, PA2, PK
30.693	0.000	0.000	29.487	0.000	60.180	Woods, Good	BHT-1, BHT-2, BHT-3, BHT-4, BHT-5, P1R, P1W
190.022	**0.000**	**0.000**	**33.332**	**0.000**	**223.354**	**TOTAL AREA**	

Summary for Subcatchment 1S: Roadway

Runoff = 3.18 cfs @ 12.03 hrs, Volume= 0.291 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
*	1.256	98	Basin, HSG A
	1.925	98	Paved parking, HSG A
	4.275	39	>75% Grass cover, Good, HSG A
	7.456	64	Weighted Average
	4.275		57.34% Pervious Area
	3.181		42.66% Impervious Area

Summary for Subcatchment BHT-1: BHT Lot Part 1

Runoff = 16.87 cfs @ 12.09 hrs, Volume= 1.222 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
*	0.280	98	Basin, HSG A
	0.020	30	Woods, Good, HSG A
	6.290	98	Paved parking, HSG A
	1.720	39	>75% Grass cover, Good, HSG A
	0.380	80	>75% Grass cover, Good, HSG D
	0.080	98	Paved parking, HSG D
*	0.060	98	Basin, HSG D
	8.830	86	Weighted Average
	2.120		24.01% Pervious Area
	6.710		75.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-2: BHT Lot Part 2

Runoff = 23.00 cfs @ 12.09 hrs, Volume= 1.666 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
*	0.402	98	Basin, HSG A
	0.034	30	Woods, Good, HSG A
	8.904	98	Paved parking, HSG A
	2.440	39	>75% Grass cover, Good, HSG A
	0.054	80	>75% Grass cover, Good, HSG D
	0.118	98	Paved parking, HSG D
*	0.083	98	Basin, HSG D
	12.035	86	Weighted Average
	2.528		21.01% Pervious Area
	9.507		78.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-3: BHT Lot Part 3

Runoff = 14.26 cfs @ 12.09 hrs, Volume= 1.033 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
	0.331	98	Roofs, HSG A
*	0.229	98	Basin, HSG A
	0.019	30	Woods, Good, HSG A
	5.074	98	Paved parking, HSG A
	1.390	39	>75% Grass cover, Good, HSG A
	0.306	80	>75% Grass cover, Good, HSG D
	0.068	98	Paved parking, HSG D
*	0.047	98	Basin, HSG D
	7.464	86	Weighted Average
	1.715		22.98% Pervious Area
	5.749		77.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-4: BHT Lot Part 4

Runoff = 34.91 cfs @ 12.09 hrs, Volume= 2.529 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
*	0.587	98	Basin, HSG A
	0.050	30	Woods, Good, HSG A
	12.995	98	Paved parking, HSG A
	3.561	39	>75% Grass cover, Good, HSG A
	0.783	80	>75% Grass cover, Good, HSG D
	0.173	98	Paved parking, HSG D
*	0.121	98	Basin, HSG D
	18.270	86	Weighted Average
	4.394		24.05% Pervious Area
	13.876		75.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-5: BHT Lot Part 5

Runoff = 52.66 cfs @ 12.09 hrs, Volume= 3.814 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
*	0.857	98	Basin, HSG A
	0.073	30	Woods, Good, HSG A
	19.860	98	Paved parking, HSG A
	5.196	39	>75% Grass cover, Good, HSG A
	1.143	80	>75% Grass cover, Good, HSG D
	0.252	98	Paved parking, HSG D
*	0.177	98	Basin, HSG D
	27.558	86	Weighted Average
	6.412		23.27% Pervious Area
	21.146		76.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment P1R: Resi South

Runoff = 2.09 cfs @ 12.32 hrs, Volume= 0.408 af, Depth> 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
3.782	98	Roofs, HSG A
2.793	98	Paved parking, HSG A
10.019	39	>75% Grass cover, Good, HSG A
3.356	30	Woods, Good, HSG A
19.950	57	Weighted Average
13.375		67.04% Pervious Area
6.575		32.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment P1W: Direct to Wetlands

Runoff = 2.00 cfs @ 12.92 hrs, Volume= 0.810 af, Depth> 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
27.141	30	Woods, Good, HSG A
1.392	39	>75% Grass cover, Good, HSG A
29.487	77	Woods, Good, HSG D
58.020	54	Weighted Average
58.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1360	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
31.7	824	0.0300	0.43		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
37.6	874	Total			

Summary for Subcatchment PA1: A Building Pad Front (75%)

Runoff = 56.27 cfs @ 12.09 hrs, Volume= 4.100 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
11.708	98	Roofs, HSG A
7.433	98	Paved parking, HSG A
* 2.630	98	Basin, HSG A
4.146	39	>75% Grass cover, Good, HSG A
25.917	89	Weighted Average
4.146		16.00% Pervious Area
21.771		84.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PA2: A Building Pad rear 2

Runoff = 61.22 cfs @ 12.09 hrs, Volume= 4.439 af, Depth> 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
	11.708	98	Roofs, HSG A
	9.911	98	Paved parking, HSG A
*	3.507	98	Basin, HSG A
	5.528	39	>75% Grass cover, Good, HSG A
	30.654	87	Weighted Average
	5.528		18.03% Pervious Area
	25.126		81.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PA3: A Building Pad Front (25%)

Runoff = 7.09 cfs @ 12.10 hrs, Volume= 0.518 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
	2.478	98	Paved parking, HSG A
*	0.877	98	Basin, HSG A
	1.382	39	>75% Grass cover, Good, HSG A
	4.737	81	Weighted Average
	1.382		29.17% Pervious Area
	3.355		70.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PK: K Building Pad

Runoff = 4.29 cfs @ 12.09 hrs, Volume= 0.311 af, Depth> 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.689	98	Roofs, HSG A
1.194	98	Paved parking, HSG A
0.580	39	>75% Grass cover, Good, HSG A
2.463	84	Weighted Average
0.580		23.55% Pervious Area
1.883		76.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP1: South Wetlands

Inflow Area = 223.354 ac, 53.22% Impervious, Inflow Depth > 0.04" for 2 YR event
Inflow = 2.09 cfs @ 12.92 hrs, Volume= 0.820 af
Outflow = 2.09 cfs @ 12.92 hrs, Volume= 0.820 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1A: Roadway Basin

Inflow Area = 7.456 ac, 42.66% Impervious, Inflow Depth > 0.47" for 2 YR event
Inflow = 3.18 cfs @ 12.03 hrs, Volume= 0.291 af
Outflow = 2.24 cfs @ 12.12 hrs, Volume= 0.291 af, Atten= 30%, Lag= 5.4 min
Discarded = 2.24 cfs @ 12.12 hrs, Volume= 0.291 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 403.02' @ 12.12 hrs Surf.Area= 1.125 ac Storage= 0.018 af

Plug-Flow detention time= 6.0 min calculated for 0.291 af (100% of inflow)
Center-of-Mass det. time= 4.9 min (906.4 - 901.4)

Volume	Invert	Avail.Storage	Storage Description
#1	403.00'	2.379 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
403.00	1.124	0.000	0.000
404.00	1.189	1.156	1.156
405.00	1.256	1.222	2.379

Device	Routing	Invert	Outlet Devices
#1	Discarded	403.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	400.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 400.00' / 399.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

#3	Device 2	403.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	404.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.73 cfs @ 12.12 hrs HW=403.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.73 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=403.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=403.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 1B: Basin A1

Inflow Area = 4.737 ac, 70.83% Impervious, Inflow Depth > 1.31" for 2 YR event
Inflow = 7.09 cfs @ 12.10 hrs, Volume= 0.518 af
Outflow = 0.82 cfs @ 12.96 hrs, Volume= 0.517 af, Atten= 88%, Lag= 51.6 min
Discarded = 0.82 cfs @ 12.96 hrs, Volume= 0.517 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 382.57' @ 12.96 hrs Surf.Area= 0.339 ac Storage= 0.187 af

Plug-Flow detention time= 86.9 min calculated for 0.516 af (100% of inflow)
Center-of-Mass det. time= 85.3 min (927.5 - 842.2)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	1.138 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
382.00	0.315	0.000	0.000
383.00	0.357	0.336	0.336
384.00	0.401	0.379	0.715
385.00	0.445	0.423	1.138

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	381.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 381.00' / 380.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	383.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	383.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	384.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.82 cfs @ 12.96 hrs HW=382.57' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.82 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 4.93 cfs potential flow)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 1P: BHT Infil 1

Inflow Area = 8.830 ac, 75.99% Impervious, Inflow Depth > 1.66" for 2 YR event
Inflow = 16.87 cfs @ 12.09 hrs, Volume= 1.222 af
Outflow = 4.90 cfs @ 12.45 hrs, Volume= 1.221 af, Atten= 71%, Lag= 21.7 min
Discarded = 4.03 cfs @ 11.90 hrs, Volume= 1.163 af
Primary = 0.87 cfs @ 12.45 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 340.40' @ 12.45 hrs Surf.Area= 1.659 ac Storage= 0.266 af

Plug-Flow detention time= 15.8 min calculated for 1.219 af (100% of inflow)
Center-of-Mass det. time= 15.2 min (840.0 - 824.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	340.00'	1.437 af	**167.75'W x 430.82'L x 3.50'H Field A** 5.807 af Overall - 2.215 af Embedded = 3.592 af x 40.0% Voids
#2A	340.50'	2.215 af	**ADS_StormTech SC-740 +Cap** x 2100 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Rows of 60 Chambers
		3.652 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	340.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	340.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 340.00' / 339.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=4.03 cfs @ 11.90 hrs HW=340.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 4.03 cfs)

Primary OutFlow Max=0.86 cfs @ 12.45 hrs HW=340.40' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.86 cfs @ 1.70 fps)

Summary for Pond 2P: Resi Infil

Inflow Area = 19.950 ac, 32.96% Impervious, Inflow Depth > 0.25" for 2 YR event
Inflow = 2.09 cfs @ 12.32 hrs, Volume= 0.408 af
Outflow = 2.00 cfs @ 12.40 hrs, Volume= 0.407 af, Atten= 5%, Lag= 4.4 min
Discarded = 2.00 cfs @ 12.40 hrs, Volume= 0.407 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 390.03' @ 12.40 hrs Surf.Area= 0.953 ac Storage= 0.012 af

Plug-Flow detention time= 4.2 min calculated for 0.407 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (954.0 - 950.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	390.00'	0.829 af	**144.00'W x 288.42'L x 3.50'H Field A** 3.337 af Overall - 1.266 af Embedded = 2.071 af x 40.0% Voids
#2A	390.50'	1.266 af	**ADS_StormTech SC-740 +Cap** x 1200 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 40 Chambers
		2.094 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	390.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	391.50'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 391.50' / 391.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=2.32 cfs @ 12.40 hrs HW=390.03' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 2.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=390.00' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Summary for Pond 3P: A Infil Front

Inflow Area = 25.917 ac, 84.00% Impervious, Inflow Depth > 1.90" for 2 YR event
Inflow = 56.27 cfs @ 12.09 hrs, Volume= 4.100 af
Outflow = 6.08 cfs @ 12.89 hrs, Volume= 4.096 af, Atten= 89%, Lag= 48.2 min
Discarded = 5.75 cfs @ 11.65 hrs, Volume= 4.051 af
Primary = 0.33 cfs @ 12.89 hrs, Volume= 0.045 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 376.01' @ 12.89 hrs Surf.Area= 2.366 ac Storage= 1.502 af

Plug-Flow detention time= 89.1 min calculated for 4.088 af (100% of inflow)
Center-of-Mass det. time= 88.4 min (901.5 - 813.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	2.046 af	**144.00'W x 715.62'L x 3.50'H Field A** 8.280 af Overall - 3.164 af Embedded = 5.116 af x 40.0% Voids
#2A	375.50'	3.164 af	**ADS_StormTech SC-740 +Cap** x 3000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 100 Chambers
		5.210 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.75'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.75' / 375.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=5.75 cfs @ 11.65 hrs HW=375.04' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 5.75 cfs)

Primary OutFlow Max=0.33 cfs @ 12.89 hrs HW=376.01' (Free Discharge)
↑└**2=Culvert** (Inlet Controls 0.33 cfs @ 1.37 fps)

Summary for Pond 4P: BHT Basin 2

Inflow Area = 12.035 ac, 78.99% Impervious, Inflow Depth = 0.00" for 2 YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 347.00' @ 0.00 hrs Surf.Area= 0.260 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	347.00'	0.978 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
347.00	0.260	0.000	0.000
348.00	0.303	0.281	0.281
349.00	0.348	0.325	0.607
350.00	0.394	0.371	0.978

Device	Routing	Invert	Outlet Devices
#1	Discarded	347.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	344.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.00' / 343.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	348.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	349.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.00 cfs of 0.63 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
↑—**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
↑—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
↑—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: BHT Infil 2

Inflow Area =	12.035 ac, 78.99% Impervious, Inflow Depth >	1.66"	for 2 YR event	
Inflow =	23.00 cfs @	12.09 hrs, Volume=	1.666 af	
Outflow =	3.75 cfs @	11.80 hrs, Volume=	1.664 af, Atten= 84%, Lag= 0.0 min	
Discarded =	3.75 cfs @	11.80 hrs, Volume=	1.664 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.64' @ 12.60 hrs Surf.Area= 1.542 ac Storage= 0.499 af

Plug-Flow detention time= 40.2 min calculated for 1.661 af (100% of inflow)
Center-of-Mass det. time= 39.6 min (864.4 - 824.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	1.336 af	**144.00'W x 466.42'L x 3.50'H Field A** 5.397 af Overall - 2.057 af Embedded = 3.340 af x 40.0% Voids
#2A	350.50'	2.057 af	**ADS_StormTech SC-740 +Cap** x 1950 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 65 Chambers
		3.393 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900

n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=3.75 cfs @ 11.80 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 3.75 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=350.00' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Summary for Pond 6P: A Infil Rear

Inflow Area = 30.654 ac, 81.97% Impervious, Inflow Depth > 1.74" for 2 YR event
Inflow = 61.22 cfs @ 12.09 hrs, Volume= 4.439 af
Outflow = 7.12 cfs @ 12.85 hrs, Volume= 4.435 af, Atten= 88%, Lag= 45.4 min
Discarded = 7.03 cfs @ 11.70 hrs, Volume= 4.425 af
Primary = 0.09 cfs @ 12.85 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 375.90' @ 12.85 hrs Surf.Area= 2.893 ac Storage= 1.564 af

Plug-Flow detention time= 76.2 min calculated for 4.425 af (100% of inflow)
Center-of-Mass det. time= 75.5 min (896.6 - 821.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	2.500 af	**167.75'W x 751.22'L x 3.50'H Field A** 10.125 af Overall - 3.876 af Embedded = 6.250 af x 40.0% Voids
#2A	375.50'	3.876 af	**ADS_StormTech SC-740 +Cap** x 3675 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Rows of 105 Chambers
		6.376 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.75'	**18.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.75' / 375.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Discarded OutFlow Max=7.03 cfs @ 11.70 hrs HW=375.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 7.03 cfs)

Primary OutFlow Max=0.09 cfs @ 12.85 hrs HW=375.90' (Free Discharge)
2=Culvert (Inlet Controls 0.09 cfs @ 1.03 fps)

Summary for Pond 7P: Basin A2

Inflow Area = 30.654 ac, 81.97% Impervious, Inflow Depth = 0.02" for 2 YR event
Inflow = 0.33 cfs @ 12.89 hrs, Volume= 0.045 af
Outflow = 0.32 cfs @ 13.07 hrs, Volume= 0.045 af, Atten= 3%, Lag= 10.5 min
Discarded = 0.32 cfs @ 13.07 hrs, Volume= 0.045 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 357.00' @ 13.07 hrs Surf.Area= 1.463 ac Storage= 0.004 af

Plug-Flow detention time= 8.9 min calculated for 0.045 af (100% of inflow)
Center-of-Mass det. time= 9.0 min (809.9 - 800.9)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	4.738 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
357.00	1.463	0.000	0.000
358.00	1.540	1.501	1.501
359.00	1.618	1.579	3.080
360.00	1.698	1.658	4.738

Device	Routing	Invert	Outlet Devices
#1	Discarded	357.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	355.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 355.00' / 354.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	358.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	359.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=3.56 cfs @ 13.07 hrs HW=357.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 3.56 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=357.00' (Free Discharge)
↑—**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
↑—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=357.00' (Free Discharge)
↑—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: BHT Infil 3

Inflow Area = 7.464 ac, 77.02% Impervious, Inflow Depth > 1.66" for 2 YR event
Inflow = 14.26 cfs @ 12.09 hrs, Volume= 1.033 af
Outflow = 3.84 cfs @ 11.90 hrs, Volume= 1.032 af, Atten= 73%, Lag= 0.0 min
Discarded = 3.84 cfs @ 11.90 hrs, Volume= 1.032 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.35' @ 12.47 hrs Surf.Area= 1.581 ac Storage= 0.222 af

Plug-Flow detention time= 15.4 min calculated for 1.032 af (100% of inflow)
Center-of-Mass det. time= 14.8 min (839.6 - 824.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	1.370 af	**191.50'W x 359.62'L x 3.50'H Field A** 5.533 af Overall - 2.109 af Embedded = 3.424 af x 40.0% Voids
#2A	350.50'	2.109 af	**ADS_StormTech SC-740 +Cap** x 2000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 40 Rows of 50 Chambers
		3.479 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.50'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.50' / 349.50' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=3.84 cfs @ 11.90 hrs HW=350.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 3.84 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=350.00' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Summary for Pond 11P: BHT Basin 4

Inflow Area = 18.270 ac, 75.95% Impervious, Inflow Depth = 0.00" for 2 YR event
Inflow = 0.02 cfs @ 12.56 hrs, Volume= 0.001 af
Outflow = 0.02 cfs @ 12.71 hrs, Volume= 0.001 af, Atten= 17%, Lag= 9.2 min
Discarded = 0.02 cfs @ 12.71 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 347.00' @ 12.71 hrs Surf.Area= 0.257 ac Storage= 0.000 af

Plug-Flow detention time= 8.9 min calculated for 0.001 af (100% of inflow)
Center-of-Mass det. time= 8.9 min (767.5 - 758.5)

Volume	Invert	Avail.Storage	Storage Description
#1	347.00'	0.911 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
347.00	0.257	0.000	0.000
348.00	0.287	0.272	0.272
349.00	0.319	0.303	0.575
350.00	0.352	0.336	0.911

Device	Routing	Invert	Outlet Devices
#1	Discarded	347.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	344.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.00' / 343.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	348.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	349.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.62 cfs @ 12.71 hrs HW=347.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.62 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: BHT Basin 5

Inflow Area = 45.828 ac, 76.42% Impervious, Inflow Depth = 0.02" for 2 YR event
Inflow = 0.73 cfs @ 12.59 hrs, Volume= 0.089 af
Outflow = 0.70 cfs @ 12.81 hrs, Volume= 0.089 af, Atten= 5%, Lag= 13.2 min
Discarded = 0.70 cfs @ 12.81 hrs, Volume= 0.089 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 317.01' @ 12.81 hrs Surf.Area= 1.073 ac Storage= 0.009 af

Plug-Flow detention time= 9.2 min calculated for 0.089 af (100% of inflow)
Center-of-Mass det. time= 9.0 min (792.7 - 783.7)

Volume	Invert	Avail.Storage	Storage Description
#1	317.00'	3.517 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
317.00	1.072	0.000	0.000
318.00	1.138	1.105	1.105
319.00	1.206	1.172	2.277
320.00	1.274	1.240	3.517

Device	Routing	Invert	Outlet Devices
#1	Discarded	317.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	314.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 314.00' / 313.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	317.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	319.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.61 cfs @ 12.81 hrs HW=317.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.61 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=317.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=317.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 14P: BHT Infil 4

Inflow Area = 18.270 ac, 75.95% Impervious, Inflow Depth > 1.66" for 2 YR event
Inflow = 34.91 cfs @ 12.09 hrs, Volume= 2.529 af
Outflow = 6.71 cfs @ 12.56 hrs, Volume= 2.526 af, Atten= 81%, Lag= 27.8 min
Discarded = 6.69 cfs @ 11.85 hrs, Volume= 2.526 af
Primary = 0.02 cfs @ 12.56 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.56' @ 12.56 hrs Surf.Area= 2.754 ac Storage= 0.692 af

Plug-Flow detention time= 29.3 min calculated for 2.521 af (100% of inflow)
Center-of-Mass det. time= 28.7 min (853.5 - 824.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	2.380 af	**239.00'W x 502.02'L x 3.50'H Field A** 9.640 af Overall - 3.691 af Embedded = 5.949 af x 40.0% Voids
#2A	350.50'	3.691 af	**ADS_StormTech SC-740 +Cap** x 3500 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 50 Rows of 70 Chambers
		6.071 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.50'	**30.0" Round Culvert**
			L= 50.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 350.50' / 349.50' S= 0.0200 '/' Cc= 0.900
			n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=6.69 cfs @ 11.85 hrs HW=350.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 6.69 cfs)

Primary OutFlow Max=0.02 cfs @ 12.56 hrs HW=350.56' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.02 cfs @ 0.65 fps)

Summary for Pond 15P: BHT Infil 5

Inflow Area = 27.558 ac, 76.73% Impervious, Inflow Depth > 1.66" for 2 YR event
Inflow = 52.66 cfs @ 12.09 hrs, Volume= 3.814 af
Outflow = 8.85 cfs @ 12.59 hrs, Volume= 3.811 af, Atten= 83%, Lag= 29.9 min
Discarded = 8.12 cfs @ 11.75 hrs, Volume= 3.722 af
Primary = 0.73 cfs @ 12.59 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.67' @ 12.59 hrs Surf.Area= 3.340 ac Storage= 1.153 af

Plug-Flow detention time= 40.9 min calculated for 3.811 af (100% of inflow)
Center-of-Mass det. time= 40.4 min (865.2 - 824.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	2.884 af	**239.00'W x 608.82'L x 3.50'H Field A**
			11.691 af Overall - 4.482 af Embedded = 7.209 af x 40.0% Voids
#2A	350.50'	4.482 af	**ADS_StormTech SC-740 +Cap** x 4250 Inside #1
			Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf
			Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
			50 Rows of 85 Chambers
		7.366 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.30'	**30.0" Round Culvert**
			L= 50.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 350.30' / 349.50' S= 0.0160 '/' Cc= 0.900
			n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=8.12 cfs @ 11.75 hrs HW=350.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 8.12 cfs)

Primary OutFlow Max=0.73 cfs @ 12.59 hrs HW=350.67' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.73 cfs @ 1.63 fps)

Summary for Pond 16P: A Infil Front

Inflow Area = 2.463 ac, 76.45% Impervious, Inflow Depth > 1.51" for 2 YR event
Inflow = 4.29 cfs @ 12.09 hrs, Volume= 0.311 af
Outflow = 0.45 cfs @ 11.70 hrs, Volume= 0.311 af, Atten= 90%, Lag= 0.0 min
Discarded = 0.45 cfs @ 11.70 hrs, Volume= 0.311 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 376.01' @ 13.01 hrs Surf.Area= 0.184 ac Storage= 0.115 af

Plug-Flow detention time= 94.8 min calculated for 0.310 af (100% of inflow)
Center-of-Mass det. time= 93.9 min (925.9 - 832.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	0.163 af	**72.75'W x 110.42'L x 3.50'H Field A** 0.645 af Overall - 0.237 af Embedded = 0.408 af x 40.0% Voids
#2A	375.50'	0.237 af	**ADS_StormTech SC-740 +Cap** x 225 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 15 Rows of 15 Chambers
		0.401 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	377.00'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 377.00' S= -0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=0.45 cfs @ 11.70 hrs HW=375.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=375.00' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Summary for Pond BHT-1A: BHT Basin 1

Inflow Area = 8.830 ac, 75.99% Impervious, Inflow Depth > 0.08" for 2 YR event
Inflow = 0.87 cfs @ 12.45 hrs, Volume= 0.058 af
Outflow = 0.78 cfs @ 12.60 hrs, Volume= 0.058 af, Atten= 10%, Lag= 8.7 min
Discarded = 0.78 cfs @ 12.60 hrs, Volume= 0.058 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 337.02' @ 12.60 hrs Surf.Area= 21,331 sf Storage= 420 cf

Plug-Flow detention time= 8.9 min calculated for 0.058 af (100% of inflow)
Center-of-Mass det. time= 8.9 min (768.2 - 759.3)

Volume	Invert	Avail.Storage	Storage Description
#1	337.00'	73,890 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.00	21,288	0	0
338.00	23,484	22,386	22,386
339.00	25,738	24,611	46,997
340.00	28,047	26,893	73,890

Device	Routing	Invert	Outlet Devices
#1	Discarded	337.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	335.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 335.00' / 334.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	338.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	339.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.19 cfs @ 12.60 hrs HW=337.02' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 1S: Roadway

Runoff = 11.68 cfs @ 12.01 hrs, Volume= 0.786 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
*	1.256	98	Basin, HSG A
	1.925	98	Paved parking, HSG A
	4.275	39	>75% Grass cover, Good, HSG A
	7.456	64	Weighted Average
	4.275		57.34% Pervious Area
	3.181		42.66% Impervious Area

Summary for Subcatchment BHT-1: BHT Lot Part 1

Runoff = 30.15 cfs @ 12.09 hrs, Volume= 2.208 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
*	0.280	98	Basin, HSG A
	0.020	30	Woods, Good, HSG A
	6.290	98	Paved parking, HSG A
	1.720	39	>75% Grass cover, Good, HSG A
	0.380	80	>75% Grass cover, Good, HSG D
	0.080	98	Paved parking, HSG D
*	0.060	98	Basin, HSG D
	8.830	86	Weighted Average
	2.120		24.01% Pervious Area
	6.710		75.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-2: BHT Lot Part 2

Runoff = 41.09 cfs @ 12.09 hrs, Volume= 3.010 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
*	0.402	98	Basin, HSG A
	0.034	30	Woods, Good, HSG A
	8.904	98	Paved parking, HSG A
	2.440	39	>75% Grass cover, Good, HSG A
	0.054	80	>75% Grass cover, Good, HSG D
	0.118	98	Paved parking, HSG D
*	0.083	98	Basin, HSG D
	12.035	86	Weighted Average
	2.528		21.01% Pervious Area
	9.507		78.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-3: BHT Lot Part 3

Runoff = 25.49 cfs @ 12.09 hrs, Volume= 1.867 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
	0.331	98	Roofs, HSG A
*	0.229	98	Basin, HSG A
	0.019	30	Woods, Good, HSG A
	5.074	98	Paved parking, HSG A
	1.390	39	>75% Grass cover, Good, HSG A
	0.306	80	>75% Grass cover, Good, HSG D
	0.068	98	Paved parking, HSG D
*	0.047	98	Basin, HSG D
	7.464	86	Weighted Average
	1.715		22.98% Pervious Area
	5.749		77.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-4: BHT Lot Part 4

Runoff = 62.38 cfs @ 12.09 hrs, Volume= 4.569 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
*	0.587	98	Basin, HSG A
	0.050	30	Woods, Good, HSG A
	12.995	98	Paved parking, HSG A
	3.561	39	>75% Grass cover, Good, HSG A
	0.783	80	>75% Grass cover, Good, HSG D
	0.173	98	Paved parking, HSG D
*	0.121	98	Basin, HSG D
	18.270	86	Weighted Average
	4.394		24.05% Pervious Area
	13.876		75.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-5: BHT Lot Part 5

Runoff = 94.09 cfs @ 12.09 hrs, Volume= 6.891 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
*	0.857	98	Basin, HSG A
	0.073	30	Woods, Good, HSG A
	19.860	98	Paved parking, HSG A
	5.196	39	>75% Grass cover, Good, HSG A
	1.143	80	>75% Grass cover, Good, HSG D
	0.252	98	Paved parking, HSG D
*	0.177	98	Basin, HSG D
	27.558	86	Weighted Average
	6.412		23.27% Pervious Area
	21.146		76.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment P1R: Resi South

Runoff = 15.39 cfs @ 12.11 hrs, Volume= 1.410 af, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
3.782	98	Roofs, HSG A
2.793	98	Paved parking, HSG A
10.019	39	>75% Grass cover, Good, HSG A
3.356	30	Woods, Good, HSG A
19.950	57	Weighted Average
13.375		67.04% Pervious Area
6.575		32.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment P1W: Direct to Wetlands

Runoff = 17.29 cfs @ 12.66 hrs, Volume= 3.295 af, Depth> 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
27.141	30	Woods, Good, HSG A
1.392	39	>75% Grass cover, Good, HSG A
29.487	77	Woods, Good, HSG D
58.020	54	Weighted Average
58.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1360	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
31.7	824	0.0300	0.43		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
37.6	874	Total			

Summary for Subcatchment PA1: A Building Pad Front (75%)

Runoff = 95.69 cfs @ 12.09 hrs, Volume= 7.111 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
11.708	98	Roofs, HSG A
7.433	98	Paved parking, HSG A
* 2.630	98	Basin, HSG A
4.146	39	>75% Grass cover, Good, HSG A
25.917	89	Weighted Average
4.146		16.00% Pervious Area
21.771		84.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PA2: A Building Pad rear 2

Runoff = 107.56 cfs @ 12.09 hrs, Volume= 7.910 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
	11.708	98	Roofs, HSG A
	9.911	98	Paved parking, HSG A
*	3.507	98	Basin, HSG A
	5.528	39	>75% Grass cover, Good, HSG A
	30.654	87	Weighted Average
	5.528		18.03% Pervious Area
	25.126		81.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PA3: A Building Pad Front (25%)

Runoff = 13.87 cfs @ 12.09 hrs, Volume= 1.005 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
	2.478	98	Paved parking, HSG A
*	0.877	98	Basin, HSG A
	1.382	39	>75% Grass cover, Good, HSG A
	4.737	81	Weighted Average
	1.382		29.17% Pervious Area
	3.355		70.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PK: K Building Pad

Runoff = 7.94 cfs @ 12.09 hrs, Volume= 0.578 af, Depth> 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.689	98	Roofs, HSG A
1.194	98	Paved parking, HSG A
0.580	39	>75% Grass cover, Good, HSG A
2.463	84	Weighted Average
0.580		23.55% Pervious Area
1.883		76.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP1: South Wetlands

Inflow Area = 223.354 ac, 53.22% Impervious, Inflow Depth > 0.22" for 10 YR event
Inflow = 19.96 cfs @ 12.66 hrs, Volume= 4.055 af
Outflow = 19.96 cfs @ 12.66 hrs, Volume= 4.055 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1A: Roadway Basin

Inflow Area = 7.456 ac, 42.66% Impervious, Inflow Depth > 1.27" for 10 YR event
Inflow = 11.68 cfs @ 12.01 hrs, Volume= 0.786 af
Outflow = 2.75 cfs @ 12.43 hrs, Volume= 0.785 af, Atten= 76%, Lag= 25.2 min
Discarded = 2.75 cfs @ 12.43 hrs, Volume= 0.785 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 403.15' @ 12.43 hrs Surf.Area= 1.134 ac Storage= 0.167 af

Plug-Flow detention time= 17.6 min calculated for 0.784 af (100% of inflow)
Center-of-Mass det. time= 16.7 min (881.9 - 865.2)

Volume	Invert	Avail.Storage	Storage Description
#1	403.00'	2.379 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
403.00	1.124	0.000	0.000
404.00	1.189	1.156	1.156
405.00	1.256	1.222	2.379

Device	Routing	Invert	Outlet Devices
#1	Discarded	403.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	400.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 400.00' / 399.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

#3	Device 2	403.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	404.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.75 cfs @ 12.43 hrs HW=403.15' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.75 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=403.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=403.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 1B: Basin A1

Inflow Area = 4.737 ac, 70.83% Impervious, Inflow Depth > 2.55" for 10 YR event
Inflow = 13.87 cfs @ 12.09 hrs, Volume= 1.005 af
Outflow = 1.01 cfs @ 13.74 hrs, Volume= 0.982 af, Atten= 93%, Lag= 98.8 min
Discarded = 0.90 cfs @ 13.74 hrs, Volume= 0.952 af
Primary = 0.10 cfs @ 13.74 hrs, Volume= 0.030 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 383.32' @ 13.74 hrs Surf.Area= 0.371 ac Storage= 0.453 af

Plug-Flow detention time= 211.1 min calculated for 0.982 af (98% of inflow)
Center-of-Mass det. time= 197.9 min (1,020.9 - 823.1)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	1.138 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
382.00	0.315	0.000	0.000
383.00	0.357	0.336	0.336
384.00	0.401	0.379	0.715
385.00	0.445	0.423	1.138

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	381.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 381.00' / 380.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	383.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	383.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	384.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.90 cfs @ 13.74 hrs HW=383.32' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.90 cfs)

Primary OutFlow Max=0.10 cfs @ 13.74 hrs HW=383.32' (Free Discharge)
└**2=Culvert** (Passes 0.10 cfs of 19.45 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.10 cfs @ 2.13 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 1P: BHT Infil 1

Inflow Area = 8.830 ac, 75.99% Impervious, Inflow Depth > 3.00" for 10 YR event
Inflow = 30.15 cfs @ 12.09 hrs, Volume= 2.208 af
Outflow = 6.61 cfs @ 12.51 hrs, Volume= 2.206 af, Atten= 78%, Lag= 25.3 min
Discarded = 4.03 cfs @ 11.70 hrs, Volume= 1.876 af
Primary = 2.58 cfs @ 12.51 hrs, Volume= 0.331 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 340.71' @ 12.51 hrs Surf.Area= 1.659 ac Storage= 0.628 af

Plug-Flow detention time= 31.0 min calculated for 2.206 af (100% of inflow)
Center-of-Mass det. time= 30.5 min (838.5 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	340.00'	1.437 af	**167.75'W x 430.82'L x 3.50'H Field A** 5.807 af Overall - 2.215 af Embedded = 3.592 af x 40.0% Voids
#2A	340.50'	2.215 af	**ADS_StormTech SC-740 +Cap** x 2100 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Rows of 60 Chambers
		3.652 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	340.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	340.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 340.00' / 339.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=4.03 cfs @ 11.70 hrs HW=340.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 4.03 cfs)

Primary OutFlow Max=2.58 cfs @ 12.51 hrs HW=340.71' (Free Discharge)
└**2=Culvert** (Inlet Controls 2.58 cfs @ 2.26 fps)

Summary for Pond 2P: Resi Infil

Inflow Area = 19.950 ac, 32.96% Impervious, Inflow Depth > 0.85" for 10 YR event
Inflow = 15.39 cfs @ 12.11 hrs, Volume= 1.410 af
Outflow = 2.32 cfs @ 12.00 hrs, Volume= 1.408 af, Atten= 85%, Lag= 0.0 min
Discarded = 2.32 cfs @ 12.00 hrs, Volume= 1.408 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 390.74' @ 13.19 hrs Surf.Area= 0.953 ac Storage= 0.389 af

Plug-Flow detention time= 65.5 min calculated for 1.408 af (100% of inflow)
Center-of-Mass det. time= 64.6 min (958.8 - 894.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	390.00'	0.829 af	**144.00'W x 288.42'L x 3.50'H Field A** 3.337 af Overall - 1.266 af Embedded = 2.071 af x 40.0% Voids
#2A	390.50'	1.266 af	**ADS_StormTech SC-740 +Cap** x 1200 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 40 Chambers
		2.094 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	390.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	391.50'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 391.50' / 391.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=2.32 cfs @ 12.00 hrs HW=390.05' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 2.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=390.00' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Summary for Pond 3P: A Infil Front

Inflow Area = 25.917 ac, 84.00% Impervious, Inflow Depth > 3.29" for 10 YR event
Inflow = 95.69 cfs @ 12.09 hrs, Volume= 7.111 af
Outflow = 9.85 cfs @ 12.89 hrs, Volume= 7.106 af, Atten= 90%, Lag= 48.3 min
Discarded = 5.75 cfs @ 11.15 hrs, Volume= 6.068 af
Primary = 4.10 cfs @ 12.89 hrs, Volume= 1.038 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 376.73' @ 12.89 hrs Surf.Area= 2.366 ac Storage= 2.878 af

Plug-Flow detention time= 138.1 min calculated for 7.106 af (100% of inflow)
Center-of-Mass det. time= 137.6 min (935.2 - 797.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	2.046 af	**144.00'W x 715.62'L x 3.50'H Field A** 8.280 af Overall - 3.164 af Embedded = 5.116 af x 40.0% Voids
#2A	375.50'	3.164 af	**ADS_StormTech SC-740 +Cap** x 3000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 100 Chambers
		5.210 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.75'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.75' / 375.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=5.75 cfs @ 11.15 hrs HW=375.04' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 5.75 cfs)

Primary OutFlow Max=4.10 cfs @ 12.89 hrs HW=376.73' (Free Discharge)
↑└**2=Culvert** (Inlet Controls 4.10 cfs @ 2.67 fps)

Summary for Pond 4P: BHT Basin 2

Inflow Area = 12.035 ac, 78.99% Impervious, Inflow Depth = 0.01" for 10 YR event
Inflow = 0.12 cfs @ 13.01 hrs, Volume= 0.014 af
Outflow = 0.12 cfs @ 13.18 hrs, Volume= 0.014 af, Atten= 4%, Lag= 10.3 min
Discarded = 0.12 cfs @ 13.18 hrs, Volume= 0.014 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 347.01' @ 13.18 hrs Surf.Area= 0.260 ac Storage= 0.001 af

Plug-Flow detention time= 8.9 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 8.9 min (807.5 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1	347.00'	0.978 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
347.00	0.260	0.000	0.000
348.00	0.303	0.281	0.281
349.00	0.348	0.325	0.607
350.00	0.394	0.371	0.978

Device	Routing	Invert	Outlet Devices
#1	Discarded	347.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	344.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.00' / 343.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	348.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	349.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.63 cfs @ 13.18 hrs HW=347.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.63 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: BHT Infil 2

Inflow Area = 12.035 ac, 78.99% Impervious, Inflow Depth > 3.00" for 10 YR event
Inflow = 41.09 cfs @ 12.09 hrs, Volume= 3.010 af
Outflow = 3.87 cfs @ 13.01 hrs, Volume= 3.007 af, Atten= 91%, Lag= 55.1 min
Discarded = 3.75 cfs @ 11.60 hrs, Volume= 2.993 af
Primary = 0.12 cfs @ 13.01 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.15' @ 13.01 hrs Surf.Area= 1.542 ac Storage= 1.155 af

Plug-Flow detention time= 109.1 min calculated for 3.001 af (100% of inflow)
Center-of-Mass det. time= 108.4 min (916.4 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	1.336 af	**144.00'W x 466.42'L x 3.50'H Field A** 5.397 af Overall - 2.057 af Embedded = 3.340 af x 40.0% Voids
#2A	350.50'	2.057 af	**ADS_StormTech SC-740 +Cap** x 1950 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 65 Chambers
		3.393 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900

n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=3.75 cfs @ 11.60 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 3.75 cfs)

Primary OutFlow Max=0.12 cfs @ 13.01 hrs HW=351.15' (Free Discharge)
2=Culvert (Inlet Controls 0.12 cfs @ 1.03 fps)

Summary for Pond 6P: A Infil Rear

Inflow Area = 30.654 ac, 81.97% Impervious, Inflow Depth > 3.10" for 10 YR event
Inflow = 107.56 cfs @ 12.09 hrs, Volume= 7.910 af
Outflow = 9.66 cfs @ 13.04 hrs, Volume= 7.904 af, Atten= 91%, Lag= 57.3 min
Discarded = 7.03 cfs @ 11.30 hrs, Volume= 7.166 af
Primary = 2.63 cfs @ 13.04 hrs, Volume= 0.737 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 376.61' @ 13.04 hrs Surf.Area= 2.893 ac Storage= 3.253 af

Plug-Flow detention time= 146.7 min calculated for 7.887 af (100% of inflow)
Center-of-Mass det. time= 145.8 min (950.5 - 804.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	2.500 af	**167.75'W x 751.22'L x 3.50'H Field A** 10.125 af Overall - 3.876 af Embedded = 6.250 af x 40.0% Voids
#2A	375.50'	3.876 af	**ADS_StormTech SC-740 +Cap** x 3675 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Rows of 105 Chambers
		6.376 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.75'	**18.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.75' / 375.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Discarded OutFlow Max=7.03 cfs @ 11.30 hrs HW=375.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 7.03 cfs)

Primary OutFlow Max=2.63 cfs @ 13.04 hrs HW=376.61' (Free Discharge)
2=Culvert (Inlet Controls 2.63 cfs @ 2.50 fps)

Summary for Pond 7P: Basin A2

Inflow Area = 30.654 ac, 81.97% Impervious, Inflow Depth = 0.42" for 10 YR event
Inflow = 4.19 cfs @ 12.91 hrs, Volume= 1.068 af
Outflow = 3.57 cfs @ 13.80 hrs, Volume= 1.068 af, Atten= 15%, Lag= 53.5 min
Discarded = 3.57 cfs @ 13.80 hrs, Volume= 1.068 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 357.06' @ 13.80 hrs Surf.Area= 1.467 ac Storage= 0.083 af

Plug-Flow detention time= 12.1 min calculated for 1.068 af (100% of inflow)
Center-of-Mass det. time= 12.0 min (861.4 - 849.4)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	4.738 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
357.00	1.463	0.000	0.000
358.00	1.540	1.501	1.501
359.00	1.618	1.579	3.080
360.00	1.698	1.658	4.738

Device	Routing	Invert	Outlet Devices
#1	Discarded	357.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	355.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 355.00' / 354.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	358.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	359.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=3.57 cfs @ 13.80 hrs HW=357.06' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 3.57 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=357.00' (Free Discharge)
↑—**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
↑—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=357.00' (Free Discharge)
↑—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: BHT Infil 3

Inflow Area = 7.464 ac, 77.02% Impervious, Inflow Depth > 3.00" for 10 YR event
Inflow = 25.49 cfs @ 12.09 hrs, Volume= 1.867 af
Outflow = 4.04 cfs @ 12.59 hrs, Volume= 1.865 af, Atten= 84%, Lag= 30.0 min
Discarded = 3.84 cfs @ 11.75 hrs, Volume= 1.848 af
Primary = 0.20 cfs @ 12.59 hrs, Volume= 0.017 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.69' @ 12.59 hrs Surf.Area= 1.581 ac Storage= 0.574 af

Plug-Flow detention time= 43.3 min calculated for 1.865 af (100% of inflow)
Center-of-Mass det. time= 42.8 min (850.8 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	1.370 af	**191.50'W x 359.62'L x 3.50'H Field A** 5.533 af Overall - 2.109 af Embedded = 3.424 af x 40.0% Voids
#2A	350.50'	2.109 af	**ADS_StormTech SC-740 +Cap** x 2000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 40 Rows of 50 Chambers
		3.479 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.50'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.50' / 349.50' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=3.84 cfs @ 11.75 hrs HW=350.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 3.84 cfs)

Primary OutFlow Max=0.20 cfs @ 12.59 hrs HW=350.69' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.20 cfs @ 1.17 fps)

Summary for Pond 11P: BHT Basin 4

Inflow Area = 18.270 ac, 75.95% Impervious, Inflow Depth = 0.11" for 10 YR event
Inflow = 1.07 cfs @ 12.72 hrs, Volume= 0.174 af
Outflow = 0.64 cfs @ 13.95 hrs, Volume= 0.174 af, Atten= 40%, Lag= 73.4 min
Discarded = 0.64 cfs @ 13.95 hrs, Volume= 0.174 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 347.16' @ 13.95 hrs Surf.Area= 0.262 ac Storage= 0.042 af

Plug-Flow detention time= 31.8 min calculated for 0.174 af (100% of inflow)
Center-of-Mass det. time= 31.6 min (837.9 - 806.3)

Volume	Invert	Avail.Storage	Storage Description
#1	347.00'	0.911 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
347.00	0.257	0.000	0.000
348.00	0.287	0.272	0.272
349.00	0.319	0.303	0.575
350.00	0.352	0.336	0.911

Device	Routing	Invert	Outlet Devices
#1	Discarded	347.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	344.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.00' / 343.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	348.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	349.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.64 cfs @ 13.95 hrs HW=347.16' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.64 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: BHT Basin 5

Inflow Area = 45.828 ac, 76.42% Impervious, Inflow Depth = 0.21" for 10 YR event
Inflow = 3.63 cfs @ 12.72 hrs, Volume= 0.817 af
Outflow = 2.62 cfs @ 13.99 hrs, Volume= 0.817 af, Atten= 28%, Lag= 76.2 min
Discarded = 2.62 cfs @ 13.99 hrs, Volume= 0.817 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 317.11' @ 13.99 hrs Surf.Area= 1.079 ac Storage= 0.114 af

Plug-Flow detention time= 20.5 min calculated for 0.816 af (100% of inflow)
Center-of-Mass det. time= 20.5 min (852.2 - 831.8)

Volume	Invert	Avail.Storage	Storage Description
#1	317.00'	3.517 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
317.00	1.072	0.000	0.000
318.00	1.138	1.105	1.105
319.00	1.206	1.172	2.277
320.00	1.274	1.240	3.517

Device	Routing	Invert	Outlet Devices
#1	Discarded	317.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	314.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 314.00' / 313.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	317.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	319.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.62 cfs @ 13.99 hrs HW=317.11' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.62 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=317.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=317.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 14P: BHT Infil 4

Inflow Area = 18.270 ac, 75.95% Impervious, Inflow Depth > 3.00" for 10 YR event
Inflow = 62.38 cfs @ 12.09 hrs, Volume= 4.569 af
Outflow = 7.76 cfs @ 12.72 hrs, Volume= 4.565 af, Atten= 88%, Lag= 38.0 min
Discarded = 6.69 cfs @ 11.65 hrs, Volume= 4.391 af
Primary = 1.07 cfs @ 12.72 hrs, Volume= 0.174 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.95' @ 12.72 hrs Surf.Area= 2.754 ac Storage= 1.602 af

Plug-Flow detention time= 73.4 min calculated for 4.565 af (100% of inflow)
Center-of-Mass det. time= 72.9 min (880.9 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	2.380 af	**239.00'W x 502.02'L x 3.50'H Field A** 9.640 af Overall - 3.691 af Embedded = 5.949 af x 40.0% Voids
#2A	350.50'	3.691 af	**ADS_StormTech SC-740 +Cap** x 3500 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 50 Rows of 70 Chambers
		6.071 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.50'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.50' / 349.50' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=6.69 cfs @ 11.65 hrs HW=350.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 6.69 cfs)

Primary OutFlow Max=1.06 cfs @ 12.72 hrs HW=350.95' (Free Discharge)
└**2=Culvert** (Inlet Controls 1.06 cfs @ 1.80 fps)

Summary for Pond 15P: BHT Infil 5

Inflow Area = 27.558 ac, 76.73% Impervious, Inflow Depth > 3.00" for 10 YR event
Inflow = 94.09 cfs @ 12.09 hrs, Volume= 6.891 af
Outflow = 11.75 cfs @ 12.72 hrs, Volume= 6.886 af, Atten= 88%, Lag= 37.8 min
Discarded = 8.12 cfs @ 11.55 hrs, Volume= 6.068 af
Primary = 3.63 cfs @ 12.72 hrs, Volume= 0.817 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.15' @ 12.72 hrs Surf.Area= 3.340 ac Storage= 2.507 af

Plug-Flow detention time= 83.6 min calculated for 6.886 af (100% of inflow)
Center-of-Mass det. time= 83.0 min (891.0 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	2.884 af	**239.00'W x 608.82'L x 3.50'H Field A** 11.691 af Overall - 4.482 af Embedded = 7.209 af x 40.0% Voids
#2A	350.50'	4.482 af	**ADS_StormTech SC-740 +Cap** x 4250 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 50 Rows of 85 Chambers
		7.366 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.30'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.30' / 349.50' S= 0.0160 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=8.12 cfs @ 11.55 hrs HW=350.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 8.12 cfs)

Primary OutFlow Max=3.63 cfs @ 12.72 hrs HW=351.15' (Free Discharge)
└**2=Culvert** (Inlet Controls 3.63 cfs @ 2.47 fps)

Summary for Pond 16P: A Infil Front

Inflow Area = 2.463 ac, 76.45% Impervious, Inflow Depth > 2.81" for 10 YR event
Inflow = 7.94 cfs @ 12.09 hrs, Volume= 0.578 af
Outflow = 0.50 cfs @ 13.97 hrs, Volume= 0.525 af, Atten= 94%, Lag= 112.9 min
Discarded = 0.45 cfs @ 11.30 hrs, Volume= 0.519 af
Primary = 0.05 cfs @ 13.97 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.10' @ 13.97 hrs Surf.Area= 0.184 ac Storage= 0.270 af

Plug-Flow detention time= 246.8 min calculated for 0.524 af (91% of inflow)
Center-of-Mass det. time= 202.3 min (1,016.5 - 814.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	0.163 af	**72.75'W x 110.42'L x 3.50'H Field A** 0.645 af Overall - 0.237 af Embedded = 0.408 af x 40.0% Voids
#2A	375.50'	0.237 af	**ADS_StormTech SC-740 +Cap** x 225 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 15 Rows of 15 Chambers
		0.401 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	377.00'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 377.00' S= -0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=0.45 cfs @ 11.30 hrs HW=375.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=0.05 cfs @ 13.97 hrs HW=377.10' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.05 cfs @ 0.85 fps)

Summary for Pond BHT-1A: BHT Basin 1

Inflow Area = 8.830 ac, 75.99% Impervious, Inflow Depth > 0.45" for 10 YR event
Inflow = 2.58 cfs @ 12.51 hrs, Volume= 0.331 af
Outflow = 1.22 cfs @ 13.76 hrs, Volume= 0.331 af, Atten= 53%, Lag= 74.7 min
Discarded = 1.22 cfs @ 13.76 hrs, Volume= 0.331 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 337.24' @ 13.76 hrs Surf.Area= 21,821 sf Storage= 5,235 cf

Plug-Flow detention time= 45.2 min calculated for 0.331 af (100% of inflow)
Center-of-Mass det. time= 45.2 min (825.8 - 780.6)

Volume	Invert	Avail.Storage	Storage Description
#1	337.00'	73,890 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.00	21,288	0	0
338.00	23,484	22,386	22,386
339.00	25,738	24,611	46,997
340.00	28,047	26,893	73,890

Device	Routing	Invert	Outlet Devices
#1	Discarded	337.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	335.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 335.00' / 334.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	338.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	339.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.22 cfs @ 13.76 hrs HW=337.24' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 1S: Roadway

Runoff = 17.08 cfs @ 12.01 hrs, Volume= 1.105 af, Depth> 1.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	1.256	98	Basin, HSG A
	1.925	98	Paved parking, HSG A
	4.275	39	>75% Grass cover, Good, HSG A
	7.456	64	Weighted Average
	4.275		57.34% Pervious Area
	3.181		42.66% Impervious Area

Summary for Subcatchment BHT-1: BHT Lot Part 1

Runoff = 37.32 cfs @ 12.09 hrs, Volume= 2.756 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	0.280	98	Basin, HSG A
	0.020	30	Woods, Good, HSG A
	6.290	98	Paved parking, HSG A
	1.720	39	>75% Grass cover, Good, HSG A
	0.380	80	>75% Grass cover, Good, HSG D
	0.080	98	Paved parking, HSG D
*	0.060	98	Basin, HSG D
	8.830	86	Weighted Average
	2.120		24.01% Pervious Area
	6.710		75.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-2: BHT Lot Part 2

Runoff = 50.86 cfs @ 12.09 hrs, Volume= 3.756 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	0.402	98	Basin, HSG A
	0.034	30	Woods, Good, HSG A
	8.904	98	Paved parking, HSG A
	2.440	39	>75% Grass cover, Good, HSG A
	0.054	80	>75% Grass cover, Good, HSG D
	0.118	98	Paved parking, HSG D
*	0.083	98	Basin, HSG D
	12.035	86	Weighted Average
	2.528		21.01% Pervious Area
	9.507		78.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-3: BHT Lot Part 3

Runoff = 31.55 cfs @ 12.09 hrs, Volume= 2.329 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
	0.331	98	Roofs, HSG A
*	0.229	98	Basin, HSG A
	0.019	30	Woods, Good, HSG A
	5.074	98	Paved parking, HSG A
	1.390	39	>75% Grass cover, Good, HSG A
	0.306	80	>75% Grass cover, Good, HSG D
	0.068	98	Paved parking, HSG D
*	0.047	98	Basin, HSG D
	7.464	86	Weighted Average
	1.715		22.98% Pervious Area
	5.749		77.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-4: BHT Lot Part 4

Runoff = 77.21 cfs @ 12.09 hrs, Volume= 5.702 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	0.587	98	Basin, HSG A
	0.050	30	Woods, Good, HSG A
	12.995	98	Paved parking, HSG A
	3.561	39	>75% Grass cover, Good, HSG A
	0.783	80	>75% Grass cover, Good, HSG D
	0.173	98	Paved parking, HSG D
*	0.121	98	Basin, HSG D
	18.270	86	Weighted Average
	4.394		24.05% Pervious Area
	13.876		75.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-5: BHT Lot Part 5

Runoff = 116.47 cfs @ 12.09 hrs, Volume= 8.600 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
*	0.857	98	Basin, HSG A
	0.073	30	Woods, Good, HSG A
	19.860	98	Paved parking, HSG A
	5.196	39	>75% Grass cover, Good, HSG A
	1.143	80	>75% Grass cover, Good, HSG D
	0.252	98	Paved parking, HSG D
*	0.177	98	Basin, HSG D
	27.558	86	Weighted Average
	6.412		23.27% Pervious Area
	21.146		76.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment P1R: Resi South

Runoff = 25.51 cfs @ 12.11 hrs, Volume= 2.105 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
3.782	98	Roofs, HSG A
2.793	98	Paved parking, HSG A
10.019	39	>75% Grass cover, Good, HSG A
3.356	30	Woods, Good, HSG A
19.950	57	Weighted Average
13.375		67.04% Pervious Area
6.575		32.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment P1W: Direct to Wetlands

Runoff = 30.28 cfs @ 12.62 hrs, Volume= 5.098 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
27.141	30	Woods, Good, HSG A
1.392	39	>75% Grass cover, Good, HSG A
29.487	77	Woods, Good, HSG D
58.020	54	Weighted Average
58.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1360	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
31.7	824	0.0300	0.43		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
37.6	874	Total			

Summary for Subcatchment PA1: A Building Pad Front (75%)

Runoff = 116.69 cfs @ 12.09 hrs, Volume= 8.762 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
	11.708	98	Roofs, HSG A
	7.433	98	Paved parking, HSG A
*	2.630	98	Basin, HSG A
	4.146	39	>75% Grass cover, Good, HSG A
	25.917	89	Weighted Average
	4.146		16.00% Pervious Area
	21.771		84.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PA2: A Building Pad rear 2

Runoff = 132.46 cfs @ 12.09 hrs, Volume= 9.829 af, Depth> 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
	11.708	98	Roofs, HSG A
	9.911	98	Paved parking, HSG A
*	3.507	98	Basin, HSG A
	5.528	39	>75% Grass cover, Good, HSG A
	30.654	87	Weighted Average
	5.528		18.03% Pervious Area
	25.126		81.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PA3: A Building Pad Front (25%)

Runoff = 17.64 cfs @ 12.09 hrs, Volume= 1.283 af, Depth> 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
	2.478	98	Paved parking, HSG A
*	0.877	98	Basin, HSG A
	1.382	39	>75% Grass cover, Good, HSG A
	4.737	81	Weighted Average
	1.382		29.17% Pervious Area
	3.355		70.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PK: K Building Pad

Runoff = 9.93 cfs @ 12.09 hrs, Volume= 0.727 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.689	98	Roofs, HSG A
1.194	98	Paved parking, HSG A
0.580	39	>75% Grass cover, Good, HSG A
2.463	84	Weighted Average
0.580		23.55% Pervious Area
1.883		76.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP1: South Wetlands

Inflow Area = 223.354 ac, 53.22% Impervious, Inflow Depth > 0.37" for 25 YR event
Inflow = 36.41 cfs @ 12.62 hrs, Volume= 6.875 af
Outflow = 36.41 cfs @ 12.62 hrs, Volume= 6.875 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1A: Roadway Basin

Inflow Area = 7.456 ac, 42.66% Impervious, Inflow Depth > 1.78" for 25 YR event
Inflow = 17.08 cfs @ 12.01 hrs, Volume= 1.105 af
Outflow = 2.77 cfs @ 12.50 hrs, Volume= 1.104 af, Atten= 84%, Lag= 29.5 min
Discarded = 2.77 cfs @ 12.50 hrs, Volume= 1.104 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 403.27' @ 12.50 hrs Surf.Area= 1.141 ac Storage= 0.301 af

Plug-Flow detention time= 34.0 min calculated for 1.101 af (100% of inflow)
Center-of-Mass det. time= 33.2 min (887.6 - 854.4)

Volume	Invert	Avail.Storage	Storage Description
#1	403.00'	2.379 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
403.00	1.124	0.000	0.000
404.00	1.189	1.156	1.156
405.00	1.256	1.222	2.379

Device	Routing	Invert	Outlet Devices
#1	Discarded	403.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	400.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 400.00' / 399.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

#3	Device 2	403.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	404.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.77 cfs @ 12.50 hrs HW=403.27' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.77 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=403.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=403.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 1B: Basin A1

Inflow Area = 4.737 ac, 70.83% Impervious, Inflow Depth > 3.25" for 25 YR event
Inflow = 17.64 cfs @ 12.09 hrs, Volume= 1.283 af
Outflow = 1.13 cfs @ 13.95 hrs, Volume= 1.119 af, Atten= 94%, Lag= 111.7 min
Discarded = 0.95 cfs @ 13.95 hrs, Volume= 1.029 af
Primary = 0.19 cfs @ 13.95 hrs, Volume= 0.090 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 383.74' @ 13.95 hrs Surf.Area= 0.389 ac Storage= 0.611 af

Plug-Flow detention time= 248.6 min calculated for 1.119 af (87% of inflow)
Center-of-Mass det. time= 191.1 min (1,007.1 - 816.1)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	1.138 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
382.00	0.315	0.000	0.000
383.00	0.357	0.336	0.336
384.00	0.401	0.379	0.715
385.00	0.445	0.423	1.138

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	381.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 381.00' / 380.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	383.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	383.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	384.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.95 cfs @ 13.95 hrs HW=383.74' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.95 cfs)

Primary OutFlow Max=0.19 cfs @ 13.95 hrs HW=383.74' (Free Discharge)
└**2=Culvert** (Passes 0.19 cfs of 22.76 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.19 cfs @ 3.77 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 1P: BHT Infil 1

Inflow Area = 8.830 ac, 75.99% Impervious, Inflow Depth > 3.75" for 25 YR event
Inflow = 37.32 cfs @ 12.09 hrs, Volume= 2.756 af
Outflow = 7.70 cfs @ 12.52 hrs, Volume= 2.753 af, Atten= 79%, Lag= 25.9 min
Discarded = 4.03 cfs @ 11.65 hrs, Volume= 2.211 af
Primary = 3.66 cfs @ 12.52 hrs, Volume= 0.543 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 340.85' @ 12.52 hrs Surf.Area= 1.659 ac Storage= 0.832 af

Plug-Flow detention time= 37.8 min calculated for 2.753 af (100% of inflow)
Center-of-Mass det. time= 37.3 min (839.0 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	340.00'	1.437 af	**167.75'W x 430.82'L x 3.50'H Field A** 5.807 af Overall - 2.215 af Embedded = 3.592 af x 40.0% Voids
#2A	340.50'	2.215 af	**ADS_StormTech SC-740 +Cap** x 2100 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Rows of 60 Chambers
		3.652 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	340.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	340.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 340.00' / 339.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=4.03 cfs @ 11.65 hrs HW=340.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 4.03 cfs)

Primary OutFlow Max=3.66 cfs @ 12.52 hrs HW=340.85' (Free Discharge)
└**2=Culvert** (Inlet Controls 3.66 cfs @ 2.48 fps)

Summary for Pond 2P: Resi Infil

Inflow Area = 19.950 ac, 32.96% Impervious, Inflow Depth > 1.27" for 25 YR event
Inflow = 25.51 cfs @ 12.11 hrs, Volume= 2.105 af
Outflow = 2.32 cfs @ 11.85 hrs, Volume= 2.102 af, Atten= 91%, Lag= 0.0 min
Discarded = 2.32 cfs @ 11.85 hrs, Volume= 2.102 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 391.26' @ 14.37 hrs Surf.Area= 0.953 ac Storage= 0.804 af

Plug-Flow detention time= 156.6 min calculated for 2.102 af (100% of inflow)
Center-of-Mass det. time= 155.8 min (1,035.5 - 879.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	390.00'	0.829 af	**144.00'W x 288.42'L x 3.50'H Field A** 3.337 af Overall - 1.266 af Embedded = 2.071 af x 40.0% Voids
#2A	390.50'	1.266 af	**ADS_StormTech SC-740 +Cap** x 1200 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 40 Chambers
		2.094 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	390.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	391.50'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 391.50' / 391.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=2.32 cfs @ 11.85 hrs HW=390.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 2.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=390.00' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Summary for Pond 3P: A Infil Front

Inflow Area = 25.917 ac, 84.00% Impervious, Inflow Depth > 4.06" for 25 YR event
Inflow = 116.69 cfs @ 12.09 hrs, Volume= 8.762 af
Outflow = 13.19 cfs @ 12.78 hrs, Volume= 8.755 af, Atten= 89%, Lag= 41.4 min
Discarded = 5.75 cfs @ 10.75 hrs, Volume= 6.792 af
Primary = 7.44 cfs @ 12.78 hrs, Volume= 1.963 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.15' @ 12.78 hrs Surf.Area= 2.366 ac Storage= 3.596 af

Plug-Flow detention time= 146.0 min calculated for 8.737 af (100% of inflow)
Center-of-Mass det. time= 145.2 min (937.1 - 791.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	2.046 af	**144.00'W x 715.62'L x 3.50'H Field A** 8.280 af Overall - 3.164 af Embedded = 5.116 af x 40.0% Voids
#2A	375.50'	3.164 af	**ADS_StormTech SC-740 +Cap** x 3000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 100 Chambers
		5.210 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.75'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.75' / 375.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=5.75 cfs @ 10.75 hrs HW=375.04' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 5.75 cfs)

Primary OutFlow Max=7.44 cfs @ 12.78 hrs HW=377.15' (Free Discharge)
↑└**2=Culvert** (Inlet Controls 7.44 cfs @ 3.18 fps)

Summary for Pond 4P: BHT Basin 2

Inflow Area = 12.035 ac, 78.99% Impervious, Inflow Depth = 0.18" for 25 YR event
Inflow = 0.98 cfs @ 13.00 hrs, Volume= 0.184 af
Outflow = 0.65 cfs @ 14.21 hrs, Volume= 0.184 af, Atten= 34%, Lag= 72.7 min
Discarded = 0.65 cfs @ 14.21 hrs, Volume= 0.184 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 347.14' @ 14.21 hrs Surf.Area= 0.266 ac Storage= 0.038 af

Plug-Flow detention time= 27.7 min calculated for 0.184 af (100% of inflow)
Center-of-Mass det. time= 27.6 min (851.3 - 823.7)

Volume	Invert	Avail.Storage	Storage Description
#1	347.00'	0.978 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
347.00	0.260	0.000	0.000
348.00	0.303	0.281	0.281
349.00	0.348	0.325	0.607
350.00	0.394	0.371	0.978

Device	Routing	Invert	Outlet Devices
#1	Discarded	347.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	344.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.00' / 343.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	348.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	349.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.65 cfs @ 14.21 hrs HW=347.14' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.65 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: BHT Infil 2

Inflow Area = 12.035 ac, 78.99% Impervious, Inflow Depth > 3.75" for 25 YR event
Inflow = 50.86 cfs @ 12.09 hrs, Volume= 3.756 af
Outflow = 4.73 cfs @ 13.00 hrs, Volume= 3.753 af, Atten= 91%, Lag= 54.8 min
Discarded = 3.75 cfs @ 11.40 hrs, Volume= 3.569 af
Primary = 0.98 cfs @ 13.00 hrs, Volume= 0.184 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.43' @ 13.00 hrs Surf.Area= 1.542 ac Storage= 1.505 af

Plug-Flow detention time= 134.2 min calculated for 3.745 af (100% of inflow)
Center-of-Mass det. time= 133.5 min (935.2 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	1.336 af	**144.00'W x 466.42'L x 3.50'H Field A** 5.397 af Overall - 2.057 af Embedded = 3.340 af x 40.0% Voids
#2A	350.50'	2.057 af	**ADS_StormTech SC-740 +Cap** x 1950 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 65 Chambers
		3.393 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900

n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=3.75 cfs @ 11.40 hrs HW=350.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 3.75 cfs)

Primary OutFlow Max=0.98 cfs @ 13.00 hrs HW=351.43' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 0.98 cfs @ 1.76 fps)

Summary for Pond 6P: A Infil Rear

Inflow Area = 30.654 ac, 81.97% Impervious, Inflow Depth > 3.85" for 25 YR event
Inflow = 132.46 cfs @ 12.09 hrs, Volume= 9.829 af
Outflow = 11.92 cfs @ 13.02 hrs, Volume= 9.821 af, Atten= 91%, Lag= 56.0 min
Discarded = 7.03 cfs @ 11.00 hrs, Volume= 8.224 af
Primary = 4.89 cfs @ 13.02 hrs, Volume= 1.597 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.03' @ 13.02 hrs Surf.Area= 2.893 ac Storage= 4.164 af

Plug-Flow detention time= 165.7 min calculated for 9.821 af (100% of inflow)
Center-of-Mass det. time= 165.2 min (963.8 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	2.500 af	**167.75'W x 751.22'L x 3.50'H Field A** 10.125 af Overall - 3.876 af Embedded = 6.250 af x 40.0% Voids
#2A	375.50'	3.876 af	**ADS_StormTech SC-740 +Cap** x 3675 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Rows of 105 Chambers
		6.376 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.75'	**18.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.75' / 375.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Discarded OutFlow Max=7.03 cfs @ 11.00 hrs HW=375.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 7.03 cfs)

Primary OutFlow Max=4.89 cfs @ 13.02 hrs HW=377.03' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 4.89 cfs @ 3.04 fps)

Summary for Pond 7P: Basin A2

Inflow Area = 30.654 ac, 81.97% Impervious, Inflow Depth = 0.80" for 25 YR event
Inflow = 7.61 cfs @ 12.79 hrs, Volume= 2.053 af
Outflow = 3.63 cfs @ 15.35 hrs, Volume= 2.053 af, Atten= 52%, Lag= 153.6 min
Discarded = 3.63 cfs @ 15.35 hrs, Volume= 2.053 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 357.42' @ 15.35 hrs Surf.Area= 1.496 ac Storage= 0.624 af

Plug-Flow detention time= 80.7 min calculated for 2.049 af (100% of inflow)
Center-of-Mass det. time= 80.5 min (940.0 - 859.5)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	4.738 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
357.00	1.463	0.000	0.000
358.00	1.540	1.501	1.501
359.00	1.618	1.579	3.080
360.00	1.698	1.658	4.738

Device	Routing	Invert	Outlet Devices
#1	Discarded	357.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	355.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 355.00' / 354.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	358.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	359.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=3.63 cfs @ 15.35 hrs HW=357.42' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 3.63 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=357.00' (Free Discharge)
↑—**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
↑—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=357.00' (Free Discharge)
↑—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: BHT Infil 3

Inflow Area = 7.464 ac, 77.02% Impervious, Inflow Depth > 3.75" for 25 YR event
Inflow = 31.55 cfs @ 12.09 hrs, Volume= 2.329 af
Outflow = 4.46 cfs @ 12.62 hrs, Volume= 2.328 af, Atten= 86%, Lag= 31.9 min
Discarded = 3.84 cfs @ 11.70 hrs, Volume= 2.252 af
Primary = 0.62 cfs @ 12.62 hrs, Volume= 0.076 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.84' @ 12.62 hrs Surf.Area= 1.581 ac Storage= 0.772 af

Plug-Flow detention time= 58.2 min calculated for 2.328 af (100% of inflow)
Center-of-Mass det. time= 57.7 min (859.4 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	1.370 af	**191.50'W x 359.62'L x 3.50'H Field A** 5.533 af Overall - 2.109 af Embedded = 3.424 af x 40.0% Voids
#2A	350.50'	2.109 af	**ADS_StormTech SC-740 +Cap** x 2000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 40 Rows of 50 Chambers
		3.479 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.50'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.50' / 349.50' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=3.84 cfs @ 11.70 hrs HW=350.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 3.84 cfs)

Primary OutFlow Max=0.61 cfs @ 12.62 hrs HW=350.84' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.61 cfs @ 1.56 fps)

Summary for Pond 11P: BHT Basin 4

Inflow Area = 18.270 ac, 75.95% Impervious, Inflow Depth = 0.31" for 25 YR event
Inflow = 2.29 cfs @ 12.78 hrs, Volume= 0.466 af
Outflow = 0.69 cfs @ 15.34 hrs, Volume= 0.466 af, Atten= 70%, Lag= 154.1 min
Discarded = 0.69 cfs @ 15.34 hrs, Volume= 0.466 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 347.92' @ 15.34 hrs Surf.Area= 0.285 ac Storage= 0.249 af

Plug-Flow detention time= 159.9 min calculated for 0.466 af (100% of inflow)
Center-of-Mass det. time= 160.1 min (984.5 - 824.4)

Volume	Invert	Avail.Storage	Storage Description
#1	347.00'	0.911 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
347.00	0.257	0.000	0.000
348.00	0.287	0.272	0.272
349.00	0.319	0.303	0.575
350.00	0.352	0.336	0.911

Device	Routing	Invert	Outlet Devices
#1	Discarded	347.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	344.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.00' / 343.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	348.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	349.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.69 cfs @ 15.34 hrs HW=347.92' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.69 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: BHT Basin 5

Inflow Area = 45.828 ac, 76.42% Impervious, Inflow Depth = 0.40" for 25 YR event
Inflow = 6.08 cfs @ 12.73 hrs, Volume= 1.532 af
Outflow = 2.68 cfs @ 15.33 hrs, Volume= 1.532 af, Atten= 56%, Lag= 156.3 min
Discarded = 2.68 cfs @ 15.33 hrs, Volume= 1.532 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 317.49' @ 15.33 hrs Surf.Area= 1.104 ac Storage= 0.536 af

Plug-Flow detention time= 93.4 min calculated for 1.529 af (100% of inflow)
Center-of-Mass det. time= 93.3 min (938.9 - 845.6)

Volume	Invert	Avail.Storage	Storage Description
#1	317.00'	3.517 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
317.00	1.072	0.000	0.000
318.00	1.138	1.105	1.105
319.00	1.206	1.172	2.277
320.00	1.274	1.240	3.517

Device	Routing	Invert	Outlet Devices
#1	Discarded	317.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	314.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 314.00' / 313.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	317.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	319.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.68 cfs @ 15.33 hrs HW=317.49' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.68 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=317.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=317.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 14P: BHT Infil 4

Inflow Area = 18.270 ac, 75.95% Impervious, Inflow Depth > 3.75" for 25 YR event
Inflow = 77.21 cfs @ 12.09 hrs, Volume= 5.702 af
Outflow = 8.98 cfs @ 12.78 hrs, Volume= 5.697 af, Atten= 88%, Lag= 41.2 min
Discarded = 6.69 cfs @ 11.50 hrs, Volume= 5.231 af
Primary = 2.29 cfs @ 12.78 hrs, Volume= 0.466 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.16' @ 12.78 hrs Surf.Area= 2.754 ac Storage= 2.102 af

Plug-Flow detention time= 91.1 min calculated for 5.697 af (100% of inflow)
Center-of-Mass det. time= 90.6 min (892.3 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	2.380 af	**239.00'W x 502.02'L x 3.50'H Field A** 9.640 af Overall - 3.691 af Embedded = 5.949 af x 40.0% Voids
#2A	350.50'	3.691 af	**ADS_StormTech SC-740 +Cap** x 3500 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 50 Rows of 70 Chambers
		6.071 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.50'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.50' / 349.50' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=6.69 cfs @ 11.50 hrs HW=350.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 6.69 cfs)

Primary OutFlow Max=2.29 cfs @ 12.78 hrs HW=351.16' (Free Discharge)
└**2=Culvert** (Inlet Controls 2.29 cfs @ 2.19 fps)

Summary for Pond 15P: BHT Infil 5

Inflow Area = 27.558 ac, 76.73% Impervious, Inflow Depth > 3.75" for 25 YR event
Inflow = 116.47 cfs @ 12.09 hrs, Volume= 8.600 af
Outflow = 14.20 cfs @ 12.73 hrs, Volume= 8.594 af, Atten= 88%, Lag= 38.1 min
Discarded = 8.12 cfs @ 11.35 hrs, Volume= 7.062 af
Primary = 6.08 cfs @ 12.73 hrs, Volume= 1.532 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.42' @ 12.73 hrs Surf.Area= 3.340 ac Storage= 3.254 af

Plug-Flow detention time= 97.8 min calculated for 8.594 af (100% of inflow)
Center-of-Mass det. time= 97.3 min (899.0 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	2.884 af	**239.00'W x 608.82'L x 3.50'H Field A** 11.691 af Overall - 4.482 af Embedded = 7.209 af x 40.0% Voids
#2A	350.50'	4.482 af	**ADS_StormTech SC-740 +Cap** x 4250 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 50 Rows of 85 Chambers
		7.366 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.30'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.30' / 349.50' S= 0.0160 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=8.12 cfs @ 11.35 hrs HW=350.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 8.12 cfs)

Primary OutFlow Max=6.08 cfs @ 12.73 hrs HW=351.42' (Free Discharge)
└**2=Culvert** (Inlet Controls 6.08 cfs @ 2.85 fps)

Summary for Pond 16P: A Infil Front

Inflow Area = 2.463 ac, 76.45% Impervious, Inflow Depth > 3.54" for 25 YR event
Inflow = 9.93 cfs @ 12.09 hrs, Volume= 0.727 af
Outflow = 1.30 cfs @ 12.67 hrs, Volume= 0.643 af, Atten= 87%, Lag= 35.0 min
Discarded = 0.45 cfs @ 10.90 hrs, Volume= 0.539 af
Primary = 0.86 cfs @ 12.67 hrs, Volume= 0.104 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.43' @ 12.67 hrs Surf.Area= 0.184 ac Storage= 0.309 af

Plug-Flow detention time= 216.0 min calculated for 0.642 af (88% of inflow)
Center-of-Mass det. time= 162.8 min (970.5 - 807.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	0.163 af	**72.75'W x 110.42'L x 3.50'H Field A** 0.645 af Overall - 0.237 af Embedded = 0.408 af x 40.0% Voids
#2A	375.50'	0.237 af	**ADS_StormTech SC-740 +Cap** x 225 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 15 Rows of 15 Chambers
		0.401 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	377.00'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 377.00' S= -0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=0.45 cfs @ 10.90 hrs HW=375.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=0.85 cfs @ 12.67 hrs HW=377.42' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.85 cfs @ 1.75 fps)

Summary for Pond BHT-1A: BHT Basin 1

Inflow Area = 8.830 ac, 75.99% Impervious, Inflow Depth > 0.74" for 25 YR event
Inflow = 3.66 cfs @ 12.52 hrs, Volume= 0.543 af
Outflow = 1.25 cfs @ 14.35 hrs, Volume= 0.543 af, Atten= 66%, Lag= 110.0 min
Discarded = 1.25 cfs @ 14.35 hrs, Volume= 0.543 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 337.52' @ 14.35 hrs Surf.Area= 22,427 sf Storage= 11,333 cf

Plug-Flow detention time= 92.1 min calculated for 0.542 af (100% of inflow)
Center-of-Mass det. time= 92.0 min (882.7 - 790.7)

Volume	Invert	Avail.Storage	Storage Description
#1	337.00'	73,890 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.00	21,288	0	0
338.00	23,484	22,386	22,386
339.00	25,738	24,611	46,997
340.00	28,047	26,893	73,890

Device	Routing	Invert	Outlet Devices
#1	Discarded	337.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	335.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 335.00' / 334.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	338.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	339.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.25 cfs @ 14.35 hrs HW=337.52' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.25 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 1S: Roadway

Runoff = 25.93 cfs @ 12.01 hrs, Volume= 1.632 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
*	1.256	98	Basin, HSG A
	1.925	98	Paved parking, HSG A
	4.275	39	>75% Grass cover, Good, HSG A
	7.456	64	Weighted Average
	4.275		57.34% Pervious Area
	3.181		42.66% Impervious Area

Summary for Subcatchment BHT-1: BHT Lot Part 1

Runoff = 48.07 cfs @ 12.09 hrs, Volume= 3.593 af, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
*	0.280	98	Basin, HSG A
	0.020	30	Woods, Good, HSG A
	6.290	98	Paved parking, HSG A
	1.720	39	>75% Grass cover, Good, HSG A
	0.380	80	>75% Grass cover, Good, HSG D
	0.080	98	Paved parking, HSG D
*	0.060	98	Basin, HSG D
	8.830	86	Weighted Average
	2.120		24.01% Pervious Area
	6.710		75.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-2: BHT Lot Part 2

Runoff = 65.52 cfs @ 12.09 hrs, Volume= 4.897 af, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
*	0.402	98	Basin, HSG A
	0.034	30	Woods, Good, HSG A
	8.904	98	Paved parking, HSG A
	2.440	39	>75% Grass cover, Good, HSG A
	0.054	80	>75% Grass cover, Good, HSG D
	0.118	98	Paved parking, HSG D
*	0.083	98	Basin, HSG D
	12.035	86	Weighted Average
	2.528		21.01% Pervious Area
	9.507		78.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-3: BHT Lot Part 3

Runoff = 40.63 cfs @ 12.09 hrs, Volume= 3.037 af, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
	0.331	98	Roofs, HSG A
*	0.229	98	Basin, HSG A
	0.019	30	Woods, Good, HSG A
	5.074	98	Paved parking, HSG A
	1.390	39	>75% Grass cover, Good, HSG A
	0.306	80	>75% Grass cover, Good, HSG D
	0.068	98	Paved parking, HSG D
*	0.047	98	Basin, HSG D
	7.464	86	Weighted Average
	1.715		22.98% Pervious Area
	5.749		77.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-4: BHT Lot Part 4

Runoff = 99.46 cfs @ 12.09 hrs, Volume= 7.434 af, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
*	0.587	98	Basin, HSG A
	0.050	30	Woods, Good, HSG A
	12.995	98	Paved parking, HSG A
	3.561	39	>75% Grass cover, Good, HSG A
	0.783	80	>75% Grass cover, Good, HSG D
	0.173	98	Paved parking, HSG D
*	0.121	98	Basin, HSG D
	18.270	86	Weighted Average
	4.394		24.05% Pervious Area
	13.876		75.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment BHT-5: BHT Lot Part 5

Runoff = 150.02 cfs @ 12.09 hrs, Volume= 11.213 af, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
*	0.857	98	Basin, HSG A
	0.073	30	Woods, Good, HSG A
	19.860	98	Paved parking, HSG A
	5.196	39	>75% Grass cover, Good, HSG A
	1.143	80	>75% Grass cover, Good, HSG D
	0.252	98	Paved parking, HSG D
*	0.177	98	Basin, HSG D
	27.558	86	Weighted Average
	6.412		23.27% Pervious Area
	21.146		76.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment P1R: Resi South

Runoff = 42.84 cfs @ 12.10 hrs, Volume= 3.300 af, Depth> 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
3.782	98	Roofs, HSG A
2.793	98	Paved parking, HSG A
10.019	39	>75% Grass cover, Good, HSG A
3.356	30	Woods, Good, HSG A
19.950	57	Weighted Average
13.375		67.04% Pervious Area
6.575		32.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment P1W: Direct to Wetlands

Runoff = 53.78 cfs @ 12.59 hrs, Volume= 8.262 af, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
27.141	30	Woods, Good, HSG A
1.392	39	>75% Grass cover, Good, HSG A
29.487	77	Woods, Good, HSG D
58.020	54	Weighted Average
58.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1360	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
31.7	824	0.0300	0.43		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
37.6	874	Total			

Summary for Subcatchment PA1: A Building Pad Front (75%)

Runoff = 148.03 cfs @ 12.09 hrs, Volume= 11.268 af, Depth> 5.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
11.708	98	Roofs, HSG A
7.433	98	Paved parking, HSG A
* 2.630	98	Basin, HSG A
4.146	39	>75% Grass cover, Good, HSG A
25.917	89	Weighted Average
4.146		16.00% Pervious Area
21.771		84.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PA2: A Building Pad rear 2

Runoff = 169.73 cfs @ 12.09 hrs, Volume= 12.756 af, Depth> 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
	11.708	98	Roofs, HSG A
	9.911	98	Paved parking, HSG A
*	3.507	98	Basin, HSG A
	5.528	39	>75% Grass cover, Good, HSG A
	30.654	87	Weighted Average
	5.528		18.03% Pervious Area
	25.126		81.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PA3: A Building Pad Front (25%)

Runoff = 23.38 cfs @ 12.09 hrs, Volume= 1.713 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
	2.478	98	Paved parking, HSG A
*	0.877	98	Basin, HSG A
	1.382	39	>75% Grass cover, Good, HSG A
	4.737	81	Weighted Average
	1.382		29.17% Pervious Area
	3.355		70.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PK: K Building Pad

Runoff = 12.93 cfs @ 12.09 hrs, Volume= 0.957 af, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.689	98	Roofs, HSG A
1.194	98	Paved parking, HSG A
0.580	39	>75% Grass cover, Good, HSG A
2.463	84	Weighted Average
0.580		23.55% Pervious Area
1.883		76.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP1: South Wetlands

Inflow Area = 223.354 ac, 53.22% Impervious, Inflow Depth > 0.74" for 100 YR event
Inflow = 66.02 cfs @ 12.58 hrs, Volume= 13.755 af
Outflow = 66.02 cfs @ 12.58 hrs, Volume= 13.755 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1A: Roadway Basin

Inflow Area = 7.456 ac, 42.66% Impervious, Inflow Depth > 2.63" for 100 YR event
Inflow = 25.93 cfs @ 12.01 hrs, Volume= 1.632 af
Outflow = 2.81 cfs @ 12.80 hrs, Volume= 1.630 af, Atten= 89%, Lag= 47.9 min
Discarded = 2.81 cfs @ 12.80 hrs, Volume= 1.630 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 403.48' @ 12.80 hrs Surf.Area= 1.155 ac Storage= 0.552 af

Plug-Flow detention time= 71.7 min calculated for 1.630 af (100% of inflow)
Center-of-Mass det. time= 71.0 min (913.6 - 842.6)

Volume	Invert	Avail.Storage	Storage Description
#1	403.00'	2.379 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
403.00	1.124	0.000	0.000
404.00	1.189	1.156	1.156
405.00	1.256	1.222	2.379

Device	Routing	Invert	Outlet Devices
#1	Discarded	403.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	400.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 400.00' / 399.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

#3	Device 2	403.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	404.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.81 cfs @ 12.80 hrs HW=403.48' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.81 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=403.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 24.68 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=403.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 1B: Basin A1

Inflow Area = 4.737 ac, 70.83% Impervious, Inflow Depth > 4.34" for 100 YR event
Inflow = 23.38 cfs @ 12.09 hrs, Volume= 1.713 af
Outflow = 4.25 cfs @ 12.56 hrs, Volume= 1.446 af, Atten= 82%, Lag= 28.2 min
Discarded = 0.98 cfs @ 12.56 hrs, Volume= 1.106 af
Primary = 2.19 cfs @ 12.56 hrs, Volume= 0.305 af
Secondary = 1.08 cfs @ 12.56 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 384.08' @ 12.56 hrs Surf.Area= 0.404 ac Storage= 0.746 af

Plug-Flow detention time= 221.3 min calculated for 1.443 af (84% of inflow)
Center-of-Mass det. time= 156.5 min (964.3 - 807.9)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	1.138 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
382.00	0.315	0.000	0.000
383.00	0.357	0.336	0.336
384.00	0.401	0.379	0.715
385.00	0.445	0.423	1.138

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	381.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 381.00' / 380.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	383.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	383.90'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	384.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.98 cfs @ 12.56 hrs HW=384.08' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.98 cfs)

Primary OutFlow Max=2.17 cfs @ 12.56 hrs HW=384.08' (Free Discharge)
└**2=Culvert** (Passes 2.17 cfs of 25.22 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.23 cfs @ 4.70 fps)
  └**4=Orifice/Grate** (Weir Controls 1.94 cfs @ 1.37 fps)

Secondary OutFlow Max=1.05 cfs @ 12.56 hrs HW=384.08' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Weir Controls 1.05 cfs @ 0.69 fps)

Summary for Pond 1P: BHT Infil 1

Inflow Area = 8.830 ac, 75.99% Impervious, Inflow Depth > 4.88" for 100 YR event
Inflow = 48.07 cfs @ 12.09 hrs, Volume= 3.593 af
Outflow = 9.63 cfs @ 12.52 hrs, Volume= 3.590 af, Atten= 80%, Lag= 26.1 min
Discarded = 4.03 cfs @ 11.45 hrs, Volume= 2.659 af
Primary = 5.60 cfs @ 12.52 hrs, Volume= 0.931 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 341.07' @ 12.52 hrs Surf.Area= 1.659 ac Storage= 1.139 af

Plug-Flow detention time= 45.3 min calculated for 3.590 af (100% of inflow)
Center-of-Mass det. time= 44.8 min (839.2 - 794.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	340.00'	1.437 af	**167.75'W x 430.82'L x 3.50'H Field A** 5.807 af Overall - 2.215 af Embedded = 3.592 af x 40.0% Voids
#2A	340.50'	2.215 af	**ADS_StormTech SC-740 +Cap** x 2100 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Rows of 60 Chambers
		3.652 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	340.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	340.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 340.00' / 339.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=4.03 cfs @ 11.45 hrs HW=340.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 4.03 cfs)

Primary OutFlow Max=5.59 cfs @ 12.52 hrs HW=341.07' (Free Discharge)
└**2=Culvert** (Inlet Controls 5.59 cfs @ 2.78 fps)

Summary for Pond 2P: Resi Infil

Inflow Area = 19.950 ac, 32.96% Impervious, Inflow Depth > 1.99" for 100 YR event
Inflow = 42.84 cfs @ 12.10 hrs, Volume= 3.300 af
Outflow = 3.52 cfs @ 14.15 hrs, Volume= 2.796 af, Atten= 92%, Lag= 122.9 min
Discarded = 2.32 cfs @ 11.70 hrs, Volume= 2.408 af
Primary = 1.21 cfs @ 14.15 hrs, Volume= 0.389 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 392.16' @ 14.15 hrs Surf.Area= 0.953 ac Storage= 1.454 af

Plug-Flow detention time= 243.6 min calculated for 2.791 af (85% of inflow)
Center-of-Mass det. time= 176.4 min (1,041.4 - 865.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	390.00'	0.829 af	**144.00'W x 288.42'L x 3.50'H Field A** 3.337 af Overall - 1.266 af Embedded = 2.071 af x 40.0% Voids
#2A	390.50'	1.266 af	**ADS_StormTech SC-740 +Cap** x 1200 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 40 Chambers
		2.094 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	390.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	391.50'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 391.50' / 391.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=2.32 cfs @ 11.70 hrs HW=390.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 2.32 cfs)

Primary OutFlow Max=1.21 cfs @ 14.15 hrs HW=392.16' (Free Discharge)
↑**2=Culvert** (Inlet Controls 1.21 cfs @ 2.19 fps)

Summary for Pond 3P: A Infil Front

Inflow Area = 25.917 ac, 84.00% Impervious, Inflow Depth > 5.22" for 100 YR event
Inflow = 148.03 cfs @ 12.09 hrs, Volume= 11.268 af
Outflow = 18.92 cfs @ 12.66 hrs, Volume= 11.140 af, Atten= 87%, Lag= 34.2 min
Discarded = 5.75 cfs @ 10.15 hrs, Volume= 7.525 af
Primary = 13.18 cfs @ 12.66 hrs, Volume= 3.615 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.97' @ 12.66 hrs Surf.Area= 2.366 ac Storage= 4.706 af

Plug-Flow detention time= 151.6 min calculated for 11.117 af (99% of inflow)
Center-of-Mass det. time= 144.3 min (929.4 - 785.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	2.046 af	**144.00'W x 715.62'L x 3.50'H Field A** 8.280 af Overall - 3.164 af Embedded = 5.116 af x 40.0% Voids
#2A	375.50'	3.164 af	**ADS_StormTech SC-740 +Cap** x 3000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 100 Chambers
		5.210 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.75'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.75' / 375.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=5.75 cfs @ 10.15 hrs HW=375.04' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 5.75 cfs)

Primary OutFlow Max=13.17 cfs @ 12.66 hrs HW=377.97' (Free Discharge)
↑└**2=Culvert** (Inlet Controls 13.17 cfs @ 4.19 fps)

Summary for Pond 4P: BHT Basin 2

Inflow Area = 12.035 ac, 78.99% Impervious, Inflow Depth = 0.72" for 100 YR event
Inflow = 3.46 cfs @ 12.81 hrs, Volume= 0.724 af
Outflow = 0.88 cfs @ 15.72 hrs, Volume= 0.714 af, Atten= 74%, Lag= 174.6 min
Discarded = 0.79 cfs @ 15.72 hrs, Volume= 0.709 af
Primary = 0.09 cfs @ 15.72 hrs, Volume= 0.005 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 348.52' @ 15.72 hrs Surf.Area= 0.326 ac Storage= 0.445 af

Plug-Flow detention time= 248.7 min calculated for 0.714 af (99% of inflow)
Center-of-Mass det. time= 245.8 min (1,079.2 - 833.3)

Volume	Invert	Avail.Storage	Storage Description
#1	347.00'	0.978 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
347.00	0.260	0.000	0.000
348.00	0.303	0.281	0.281
349.00	0.348	0.325	0.607
350.00	0.394	0.371	0.978

Device	Routing	Invert	Outlet Devices
#1	Discarded	347.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	344.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.00' / 343.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	348.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	349.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.79 cfs @ 15.72 hrs HW=348.52' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.79 cfs)

Primary OutFlow Max=0.07 cfs @ 15.72 hrs HW=348.52' (Free Discharge)
└**2=Culvert** (Passes 0.07 cfs of 33.74 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 0.07 cfs @ 0.46 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: BHT Infil 2

Inflow Area = 12.035 ac, 78.99% Impervious, Inflow Depth > 4.88" for 100 YR event
Inflow = 65.52 cfs @ 12.09 hrs, Volume= 4.897 af
Outflow = 7.21 cfs @ 12.81 hrs, Volume= 4.893 af, Atten= 89%, Lag= 43.6 min
Discarded = 3.75 cfs @ 11.05 hrs, Volume= 4.169 af
Primary = 3.46 cfs @ 12.81 hrs, Volume= 0.724 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.83' @ 12.81 hrs Surf.Area= 1.542 ac Storage= 1.983 af

Plug-Flow detention time= 145.1 min calculated for 4.893 af (100% of inflow)
Center-of-Mass det. time= 144.7 min (939.0 - 794.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	1.336 af	**144.00'W x 466.42'L x 3.50'H Field A** 5.397 af Overall - 2.057 af Embedded = 3.340 af x 40.0% Voids
#2A	350.50'	2.057 af	**ADS_StormTech SC-740 +Cap** x 1950 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 65 Chambers
		3.393 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900

n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=3.75 cfs @ 11.05 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 3.75 cfs)

Primary OutFlow Max=3.46 cfs @ 12.81 hrs HW=351.83' (Free Discharge)
2=Culvert (Inlet Controls 3.46 cfs @ 2.44 fps)

Summary for Pond 6P: A Infil Rear

Inflow Area = 30.654 ac, 81.97% Impervious, Inflow Depth > 4.99" for 100 YR event
Inflow = 169.73 cfs @ 12.09 hrs, Volume= 12.756 af
Outflow = 14.88 cfs @ 13.03 hrs, Volume= 12.163 af, Atten= 91%, Lag= 56.5 min
Discarded = 7.03 cfs @ 10.40 hrs, Volume= 8.957 af
Primary = 7.85 cfs @ 13.03 hrs, Volume= 3.205 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.87' @ 13.03 hrs Surf.Area= 2.893 ac Storage= 5.633 af

Plug-Flow detention time= 191.5 min calculated for 12.137 af (95% of inflow)
Center-of-Mass det. time= 165.3 min (956.7 - 791.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	2.500 af	**167.75'W x 751.22'L x 3.50'H Field A** 10.125 af Overall - 3.876 af Embedded = 6.250 af x 40.0% Voids
#2A	375.50'	3.876 af	**ADS_StormTech SC-740 +Cap** x 3675 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 35 Rows of 105 Chambers
		6.376 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.75'	**18.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.75' / 375.25' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Discarded OutFlow Max=7.03 cfs @ 10.40 hrs HW=375.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 7.03 cfs)

Primary OutFlow Max=7.85 cfs @ 13.03 hrs HW=377.86' (Free Discharge)
2=Culvert (Inlet Controls 7.85 cfs @ 4.44 fps)

Summary for Pond 7P: Basin A2

Inflow Area = 30.654 ac, 81.97% Impervious, Inflow Depth = 1.55" for 100 YR event
Inflow = 16.37 cfs @ 12.57 hrs, Volume= 3.955 af
Outflow = 3.81 cfs @ 16.50 hrs, Volume= 3.668 af, Atten= 77%, Lag= 235.6 min
Discarded = 3.81 cfs @ 16.50 hrs, Volume= 3.668 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 358.37' @ 16.50 hrs Surf.Area= 1.569 ac Storage= 2.083 af

Plug-Flow detention time= 239.8 min calculated for 3.660 af (93% of inflow)
Center-of-Mass det. time= 220.7 min (1,083.0 - 862.3)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	4.738 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
357.00	1.463	0.000	0.000
358.00	1.540	1.501	1.501
359.00	1.618	1.579	3.080
360.00	1.698	1.658	4.738

Device	Routing	Invert	Outlet Devices
#1	Discarded	357.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	355.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 355.00' / 354.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	358.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	359.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=3.81 cfs @ 16.50 hrs HW=358.37' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 3.81 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=357.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=357.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: BHT Infil 3

Inflow Area = 7.464 ac, 77.02% Impervious, Inflow Depth > 4.88" for 100 YR event
Inflow = 40.63 cfs @ 12.09 hrs, Volume= 3.037 af
Outflow = 5.47 cfs @ 12.64 hrs, Volume= 3.035 af, Atten= 87%, Lag= 32.9 min
Discarded = 3.84 cfs @ 11.55 hrs, Volume= 2.771 af
Primary = 1.63 cfs @ 12.64 hrs, Volume= 0.264 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.06' @ 12.64 hrs Surf.Area= 1.581 ac Storage= 1.064 af

Plug-Flow detention time= 74.1 min calculated for 3.035 af (100% of inflow)
Center-of-Mass det. time= 73.6 min (867.9 - 794.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	1.370 af	**191.50'W x 359.62'L x 3.50'H Field A** 5.533 af Overall - 2.109 af Embedded = 3.424 af x 40.0% Voids
#2A	350.50'	2.109 af	**ADS_StormTech SC-740 +Cap** x 2000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 40 Rows of 50 Chambers
		3.479 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.50'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.50' / 349.50' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=3.84 cfs @ 11.55 hrs HW=350.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 3.84 cfs)

Primary OutFlow Max=1.63 cfs @ 12.64 hrs HW=351.06' (Free Discharge)
↑**2=Culvert** (Inlet Controls 1.63 cfs @ 2.00 fps)

Summary for Pond 11P: BHT Basin 4

Inflow Area = 18.270 ac, 75.95% Impervious, Inflow Depth = 0.77" for 100 YR event
Inflow = 4.94 cfs @ 12.75 hrs, Volume= 1.166 af
Outflow = 3.45 cfs @ 14.12 hrs, Volume= 1.111 af, Atten= 30%, Lag= 82.3 min
Discarded = 0.75 cfs @ 14.12 hrs, Volume= 0.696 af
Primary = 2.70 cfs @ 14.12 hrs, Volume= 0.415 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 348.72' @ 14.12 hrs Surf.Area= 0.310 ac Storage= 0.487 af

Plug-Flow detention time= 175.5 min calculated for 1.108 af (95% of inflow)
Center-of-Mass det. time= 166.5 min (1,007.1 - 840.5)

Volume	Invert	Avail.Storage	Storage Description
#1	347.00'	0.911 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
347.00	0.257	0.000	0.000
348.00	0.287	0.272	0.272
349.00	0.319	0.303	0.575
350.00	0.352	0.336	0.911

Device	Routing	Invert	Outlet Devices
#1	Discarded	347.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	344.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.00' / 343.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	348.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	349.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.75 cfs @ 14.12 hrs HW=348.72' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.75 cfs)

Primary OutFlow Max=2.69 cfs @ 14.12 hrs HW=348.72' (Free Discharge)
└**2=Culvert** (Passes 2.69 cfs of 34.76 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 2.69 cfs @ 1.53 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=347.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: BHT Basin 5

Inflow Area = 45.828 ac, 76.42% Impervious, Inflow Depth = 0.87" for 100 YR event
Inflow = 10.79 cfs @ 12.68 hrs, Volume= 3.331 af
Outflow = 9.15 cfs @ 14.53 hrs, Volume= 3.331 af, Atten= 15%, Lag= 111.2 min
Discarded = 2.75 cfs @ 14.53 hrs, Volume= 1.974 af
Primary = 6.40 cfs @ 14.53 hrs, Volume= 1.358 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 317.89' @ 14.53 hrs Surf.Area= 1.131 ac Storage= 0.982 af

Plug-Flow detention time= 92.8 min calculated for 3.331 af (100% of inflow)
Center-of-Mass det. time= 92.7 min (954.0 - 861.3)

Volume	Invert	Avail.Storage	Storage Description
#1	317.00'	3.517 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
317.00	1.072	0.000	0.000
318.00	1.138	1.105	1.105
319.00	1.206	1.172	2.277
320.00	1.274	1.240	3.517

Device	Routing	Invert	Outlet Devices
#1	Discarded	317.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	314.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 314.00' / 313.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	317.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	319.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.75 cfs @ 14.53 hrs HW=317.89' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.75 cfs)

Primary OutFlow Max=6.40 cfs @ 14.53 hrs HW=317.89' (Free Discharge)
└**2=Culvert** (Passes 6.40 cfs of 30.32 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 6.40 cfs @ 2.04 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=317.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 14P: BHT Infil 4

Inflow Area = 18.270 ac, 75.95% Impervious, Inflow Depth > 4.88" for 100 YR event
Inflow = 99.46 cfs @ 12.09 hrs, Volume= 7.434 af
Outflow = 11.63 cfs @ 12.75 hrs, Volume= 7.428 af, Atten= 88%, Lag= 39.7 min
Discarded = 6.69 cfs @ 11.25 hrs, Volume= 6.262 af
Primary = 4.94 cfs @ 12.75 hrs, Volume= 1.166 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.50' @ 12.75 hrs Surf.Area= 2.754 ac Storage= 2.855 af

Plug-Flow detention time= 107.9 min calculated for 7.428 af (100% of inflow)
Center-of-Mass det. time= 107.4 min (901.8 - 794.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	2.380 af	**239.00'W x 502.02'L x 3.50'H Field A** 9.640 af Overall - 3.691 af Embedded = 5.949 af x 40.0% Voids
#2A	350.50'	3.691 af	**ADS_StormTech SC-740 +Cap** x 3500 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 50 Rows of 70 Chambers
		6.071 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.50'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.50' / 349.50' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=6.69 cfs @ 11.25 hrs HW=350.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 6.69 cfs)

Primary OutFlow Max=4.94 cfs @ 12.75 hrs HW=351.50' (Free Discharge)
└**2=Culvert** (Inlet Controls 4.94 cfs @ 2.69 fps)

Summary for Pond 15P: BHT Infil 5

Inflow Area = 27.558 ac, 76.73% Impervious, Inflow Depth > 4.88" for 100 YR event
Inflow = 150.02 cfs @ 12.09 hrs, Volume= 11.213 af
Outflow = 18.91 cfs @ 12.68 hrs, Volume= 11.204 af, Atten= 87%, Lag= 35.3 min
Discarded = 8.12 cfs @ 10.95 hrs, Volume= 8.287 af
Primary = 10.79 cfs @ 12.68 hrs, Volume= 2.917 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.86' @ 12.68 hrs Surf.Area= 3.340 ac Storage= 4.386 af

Plug-Flow detention time= 110.9 min calculated for 11.181 af (100% of inflow)
Center-of-Mass det. time= 110.2 min (904.5 - 794.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	2.884 af	**239.00'W x 608.82'L x 3.50'H Field A** 11.691 af Overall - 4.482 af Embedded = 7.209 af x 40.0% Voids
#2A	350.50'	4.482 af	**ADS_StormTech SC-740 +Cap** x 4250 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 50 Rows of 85 Chambers
		7.366 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.30'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.30' / 349.50' S= 0.0160 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf

Discarded OutFlow Max=8.12 cfs @ 10.95 hrs HW=350.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 8.12 cfs)

Primary OutFlow Max=10.79 cfs @ 12.68 hrs HW=351.86' (Free Discharge)
└**2=Culvert** (Inlet Controls 10.79 cfs @ 3.36 fps)

Summary for Pond 16P: A Infil Front

Inflow Area = 2.463 ac, 76.45% Impervious, Inflow Depth > 4.66" for 100 YR event
Inflow = 12.93 cfs @ 12.09 hrs, Volume= 0.957 af
Outflow = 4.07 cfs @ 12.41 hrs, Volume= 0.839 af, Atten= 68%, Lag= 19.3 min
Discarded = 0.45 cfs @ 10.30 hrs, Volume= 0.567 af
Primary = 3.63 cfs @ 12.41 hrs, Volume= 0.272 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.92' @ 12.41 hrs Surf.Area= 0.184 ac Storage= 0.357 af

Plug-Flow detention time= 173.6 min calculated for 0.837 af (87% of inflow)
Center-of-Mass det. time= 118.0 min (918.0 - 800.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	375.00'	0.163 af	**72.75'W x 110.42'L x 3.50'H Field A** 0.645 af Overall - 0.237 af Embedded = 0.408 af x 40.0% Voids
#2A	375.50'	0.237 af	**ADS_StormTech SC-740 +Cap** x 225 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 15 Rows of 15 Chambers
		0.401 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	375.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	377.00'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 377.00' S= -0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=0.45 cfs @ 10.30 hrs HW=375.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=3.60 cfs @ 12.41 hrs HW=377.92' (Free Discharge)
↑**2=Culvert** (Inlet Controls 3.60 cfs @ 2.57 fps)

Summary for Pond BHT-1A: BHT Basin 1

Inflow Area = 8.830 ac, 75.99% Impervious, Inflow Depth > 1.27" for 100 YR event
Inflow = 5.60 cfs @ 12.52 hrs, Volume= 0.931 af
Outflow = 1.32 cfs @ 15.08 hrs, Volume= 0.931 af, Atten= 76%, Lag= 153.5 min
Discarded = 1.32 cfs @ 15.08 hrs, Volume= 0.931 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 338.07' @ 15.08 hrs Surf.Area= 23,638 sf Storage= 24,001 cf

Plug-Flow detention time= 181.4 min calculated for 0.929 af (100% of inflow)
Center-of-Mass det. time= 181.5 min (982.8 - 801.3)

Volume	Invert	Avail.Storage	Storage Description
#1	337.00'	73,890 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

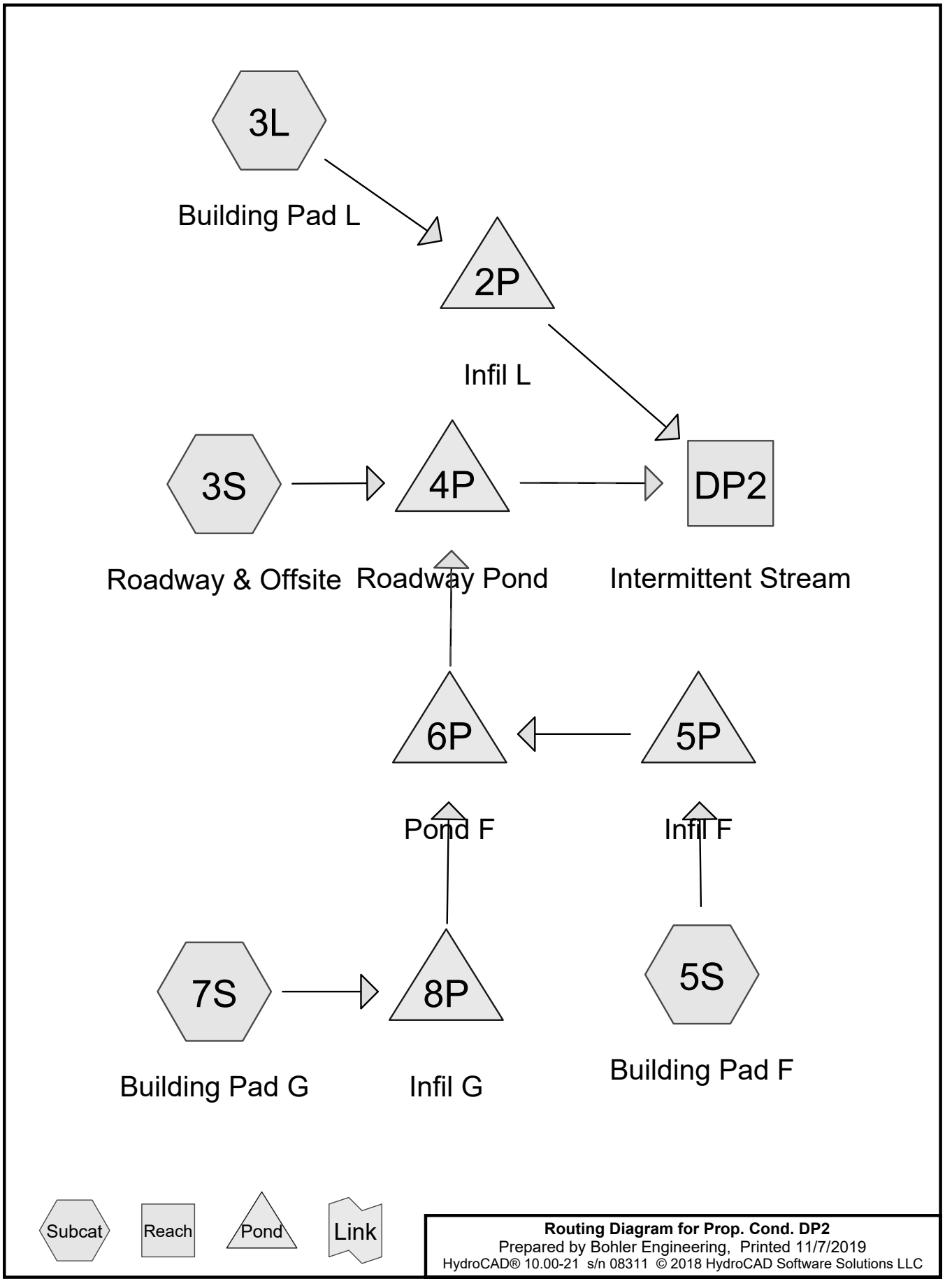
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.00	21,288	0	0
338.00	23,484	22,386	22,386
339.00	25,738	24,611	46,997
340.00	28,047	26,893	73,890

Device	Routing	Invert	Outlet Devices
#1	Discarded	337.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	335.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 335.00' / 334.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	338.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	339.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.32 cfs @ 15.08 hrs HW=338.07' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.32 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)



Routing Diagram for Prop. Cond. DP2
Prepared by Bohler Engineering, Printed 11/7/2019
HydroCAD® 10.00-21 s/n 08311 © 2018 HydroCAD Software Solutions LLC

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.637	0.756	9.678	0.000	0.000	12.071	>75% Grass cover, Good	3L, 3S, 5S, 7S
1.089	0.000	0.383	0.000	0.000	1.472	Basin, 0% imp	3S, 5S
0.781	0.371	6.827	0.000	0.000	7.979	Paved parking	3L, 3S, 5S, 7S
0.000	0.000	0.861	0.000	0.000	0.861	Roofs	7S
0.000	0.137	2.745	0.000	0.000	2.882	Unconnected roofs	3L, 5S
4.603	2.082	0.000	0.000	0.000	6.685	Woods, Good	3S
8.110	**3.346**	**20.494**	**0.000**	**0.000**	**31.950**	**TOTAL AREA**	

Summary for Subcatchment 3L: Building Pad L

Runoff = 12.94 cfs @ 12.09 hrs, Volume= 0.946 af, Depth> 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.137	98	Unconnected roofs, HSG B
0.371	98	Paved parking, HSG B
0.167	61	>75% Grass cover, Good, HSG B
1.119	98	Unconnected roofs, HSG C
2.368	98	Paved parking, HSG C
1.567	74	>75% Grass cover, Good, HSG C
5.729	90	Weighted Average
1.734		30.27% Pervious Area
3.995		69.73% Impervious Area
1.256		31.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Roadway & Offsite

Runoff = 0.88 cfs @ 12.37 hrs, Volume= 0.206 af, Depth> 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
*	1.089	98	Basin, 0% imp, HSG A
	0.403	98	Paved parking, HSG A
	4.603	30	Woods, Good, HSG A
	1.548	39	>75% Grass cover, Good, HSG A
	2.082	55	Woods, Good, HSG B
	0.589	61	>75% Grass cover, Good, HSG B
	0.892	98	Paved parking, HSG C
	1.529	74	>75% Grass cover, Good, HSG C
	12.735	55	Weighted Average
	11.440		89.83% Pervious Area
	1.295		10.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Building Pad F

Runoff = 18.12 cfs @ 12.09 hrs, Volume= 1.312 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
1.626	98	Unconnected roofs, HSG C
* 0.383	98	Basin, 0% imp, HSG C
2.368	98	Paved parking, HSG C
5.548	74	>75% Grass cover, Good, HSG C
9.925	85	Weighted Average
5.931		59.76% Pervious Area
3.994		40.24% Impervious Area
1.626		40.71% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Building Pad G

Runoff = 8.04 cfs @ 12.09 hrs, Volume= 0.588 af, Depth> 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.378	98	Paved parking, HSG A
0.089	39	>75% Grass cover, Good, HSG A
0.861	98	Roofs, HSG C
1.199	98	Paved parking, HSG C
1.034	74	>75% Grass cover, Good, HSG C
3.561	90	Weighted Average
1.123		31.54% Pervious Area
2.438		68.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP2: Intermittent Stream

Inflow Area = 31.950 ac, 36.69% Impervious, Inflow Depth = 0.00" for 2 YR event
Inflow = 0.00 cfs @ 14.28 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 14.28 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Infil L

Inflow Area = 5.729 ac, 69.73% Impervious, Inflow Depth > 1.98" for 2 YR event
Inflow = 12.94 cfs @ 12.09 hrs, Volume= 0.946 af
Outflow = 0.72 cfs @ 14.28 hrs, Volume= 0.840 af, Atten= 94%, Lag= 131.6 min
Discarded = 0.72 cfs @ 11.25 hrs, Volume= 0.839 af
Primary = 0.00 cfs @ 14.28 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 349.03' @ 14.28 hrs Surf.Area= 0.698 ac Storage= 0.452 af

Plug-Flow detention time= 257.8 min calculated for 0.840 af (89% of inflow)
Center-of-Mass det. time= 205.1 min (1,014.0 - 808.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	348.00'	0.608 af	**120.25'W x 252.82'L x 3.50'H Field A** 2.443 af Overall - 0.923 af Embedded = 1.520 af x 40.0% Voids
#2A	348.50'	0.923 af	**ADS_StormTech SC-740 +Cap** x 875 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 25 Rows of 35 Chambers
		1.531 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	348.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	349.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 349.00' / 348.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.72 cfs @ 11.25 hrs HW=348.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.72 cfs)

Primary OutFlow Max=0.00 cfs @ 14.28 hrs HW=349.03' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.00 cfs @ 0.46 fps)

Summary for Pond 4P: Roadway Pond

Inflow Area = 26.221 ac, 29.47% Impervious, Inflow Depth > 0.09" for 2 YR event
Inflow = 0.88 cfs @ 12.37 hrs, Volume= 0.206 af
Outflow = 0.72 cfs @ 12.50 hrs, Volume= 0.205 af, Atten= 18%, Lag= 7.9 min
Discarded = 0.72 cfs @ 12.50 hrs, Volume= 0.205 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 352.01' @ 12.50 hrs Surf.Area= 40,305 sf Storage= 388 cf

Plug-Flow detention time= 8.9 min calculated for 0.205 af (99% of inflow)
Center-of-Mass det. time= 6.4 min (975.3 - 968.9)

Volume	Invert	Avail.Storage	Storage Description
#1	352.00'	131,459 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.00	40,283	0	0
353.00	42,609	41,446	41,446
354.00	44,992	43,801	85,247
355.00	47,432	46,212	131,459

Device	Routing	Invert	Outlet Devices
#1	Discarded	352.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.00' / 349.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	353.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	354.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.25 cfs @ 12.50 hrs HW=352.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.25 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: Infil F

Inflow Area = 9.925 ac, 40.24% Impervious, Inflow Depth > 1.59" for 2 YR event
Inflow = 18.12 cfs @ 12.09 hrs, Volume= 1.312 af
Outflow = 0.74 cfs @ 15.69 hrs, Volume= 0.592 af, Atten= 96%, Lag= 216.0 min
Discarded = 0.26 cfs @ 10.45 hrs, Volume= 0.307 af
Primary = 0.48 cfs @ 15.69 hrs, Volume= 0.284 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 416.32' @ 15.69 hrs Surf.Area= 0.953 ac Storage= 0.844 af

Plug-Flow detention time= 323.8 min calculated for 0.592 af (45% of inflow)
Center-of-Mass det. time= 204.3 min (1,032.8 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	415.00'	0.829 af	**144.00'W x 288.42'L x 3.50'H Field A** 3.337 af Overall - 1.266 af Embedded = 2.071 af x 40.0% Voids
#2A	415.50'	1.266 af	**ADS_StormTech SC-740 +Cap** x 1200 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 40 Chambers
		2.094 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	415.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	416.00'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 416.00' / 415.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=0.26 cfs @ 10.45 hrs HW=415.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.48 cfs @ 15.69 hrs HW=416.32' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 0.48 cfs @ 1.51 fps)

Summary for Pond 6P: Pond F

Inflow Area = 13.486 ac, 47.69% Impervious, Inflow Depth > 0.28" for 2 YR event
Inflow = 0.52 cfs @ 15.83 hrs, Volume= 0.309 af
Outflow = 0.14 cfs @ 23.75 hrs, Volume= 0.123 af, Atten= 73%, Lag= 475.6 min
Discarded = 0.14 cfs @ 23.75 hrs, Volume= 0.123 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.37' @ 23.75 hrs Surf.Area= 22,568 sf Storage= 8,136 cf

Plug-Flow detention time= 225.3 min calculated for 0.122 af (40% of inflow)
Center-of-Mass det. time= 63.3 min (1,123.7 - 1,060.4)

Volume	Invert	Avail.Storage	Storage Description
#1	377.00'	74,419 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
377.00	21,861	0	0
378.00	23,791	22,826	22,826
379.00	25,781	24,786	47,612
380.00	27,832	26,807	74,419

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	375.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 374.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	378.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	379.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.14 cfs @ 23.75 hrs HW=377.37' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Infil G

Inflow Area = 3.561 ac, 68.46% Impervious, Inflow Depth > 1.98" for 2 YR event
Inflow = 8.04 cfs @ 12.09 hrs, Volume= 0.588 af
Outflow = 0.20 cfs @ 17.21 hrs, Volume= 0.217 af, Atten= 98%, Lag= 307.1 min
Discarded = 0.15 cfs @ 10.05 hrs, Volume= 0.192 af
Primary = 0.05 cfs @ 17.21 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 401.12' @ 17.21 hrs Surf.Area= 0.560 ac Storage= 0.403 af

Plug-Flow detention time= 313.4 min calculated for 0.216 af (37% of inflow)
Center-of-Mass det. time= 189.2 min (998.1 - 808.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	400.00'	0.489 af	**96.50'W x 252.82'L x 3.50'H Field A** 1.960 af Overall - 0.738 af Embedded = 1.222 af x 40.0% Voids
#2A	400.50'	0.738 af	**ADS_StormTech SC-740 +Cap** x 700 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 35 Chambers
		1.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	400.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	401.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 401.00' / 400.50' S= 0.0100 '/' Cc= 0.900

n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.15 cfs @ 10.05 hrs HW=400.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.05 cfs @ 17.21 hrs HW=401.12' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 0.05 cfs @ 0.91 fps)

Summary for Subcatchment 3L: Building Pad L

Runoff = 21.66 cfs @ 12.09 hrs, Volume= 1.620 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.137	98	Unconnected roofs, HSG B
0.371	98	Paved parking, HSG B
0.167	61	>75% Grass cover, Good, HSG B
1.119	98	Unconnected roofs, HSG C
2.368	98	Paved parking, HSG C
1.567	74	>75% Grass cover, Good, HSG C
5.729	90	Weighted Average
1.734		30.27% Pervious Area
3.995		69.73% Impervious Area
1.256		31.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Roadway & Offsite

Runoff = 7.91 cfs @ 12.12 hrs, Volume= 0.787 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
*	1.089	98	Basin, 0% imp, HSG A
	0.403	98	Paved parking, HSG A
	4.603	30	Woods, Good, HSG A
	1.548	39	>75% Grass cover, Good, HSG A
	2.082	55	Woods, Good, HSG B
	0.589	61	>75% Grass cover, Good, HSG B
	0.892	98	Paved parking, HSG C
	1.529	74	>75% Grass cover, Good, HSG C
	12.735	55	Weighted Average
	11.440		89.83% Pervious Area
	1.295		10.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Building Pad F

Runoff = 32.94 cfs @ 12.09 hrs, Volume= 2.404 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
1.626	98	Unconnected roofs, HSG C
* 0.383	98	Basin, 0% imp, HSG C
2.368	98	Paved parking, HSG C
5.548	74	>75% Grass cover, Good, HSG C
9.925	85	Weighted Average
5.931		59.76% Pervious Area
3.994		40.24% Impervious Area
1.626		40.71% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Building Pad G

Runoff = 13.46 cfs @ 12.09 hrs, Volume= 1.007 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.378	98	Paved parking, HSG A
0.089	39	>75% Grass cover, Good, HSG A
0.861	98	Roofs, HSG C
1.199	98	Paved parking, HSG C
1.034	74	>75% Grass cover, Good, HSG C
3.561	90	Weighted Average
1.123		31.54% Pervious Area
2.438		68.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP2: Intermittent Stream

Inflow Area = 31.950 ac, 36.69% Impervious, Inflow Depth = 0.13" for 10 YR event
Inflow = 1.04 cfs @ 13.14 hrs, Volume= 0.343 af
Outflow = 1.04 cfs @ 13.14 hrs, Volume= 0.343 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Infil L

Inflow Area = 5.729 ac, 69.73% Impervious, Inflow Depth > 3.39" for 10 YR event
Inflow = 21.66 cfs @ 12.09 hrs, Volume= 1.620 af
Outflow = 1.75 cfs @ 13.14 hrs, Volume= 1.268 af, Atten= 92%, Lag= 63.1 min
Discarded = 0.72 cfs @ 10.15 hrs, Volume= 0.925 af
Primary = 1.04 cfs @ 13.14 hrs, Volume= 0.343 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 349.60' @ 13.14 hrs Surf.Area= 0.698 ac Storage= 0.776 af

Plug-Flow detention time= 232.4 min calculated for 1.265 af (78% of inflow)
Center-of-Mass det. time= 154.4 min (948.3 - 793.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	348.00'	0.608 af	**120.25'W x 252.82'L x 3.50'H Field A** 2.443 af Overall - 0.923 af Embedded = 1.520 af x 40.0% Voids
#2A	348.50'	0.923 af	**ADS_StormTech SC-740 +Cap** x 875 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 25 Rows of 35 Chambers
		1.531 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	348.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	349.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 349.00' / 348.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.72 cfs @ 10.15 hrs HW=348.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.72 cfs)

Primary OutFlow Max=1.04 cfs @ 13.14 hrs HW=349.60' (Free Discharge)
↑**2=Culvert** (Inlet Controls 1.04 cfs @ 2.09 fps)

Summary for Pond 4P: Roadway Pond

Inflow Area = 26.221 ac, 29.47% Impervious, Inflow Depth > 0.66" for 10 YR event
Inflow = 7.91 cfs @ 12.12 hrs, Volume= 1.448 af
Outflow = 2.27 cfs @ 12.59 hrs, Volume= 1.442 af, Atten= 71%, Lag= 28.6 min
Discarded = 2.27 cfs @ 12.59 hrs, Volume= 1.442 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 352.16' @ 12.59 hrs Surf.Area= 40,645 sf Storage= 6,298 cf

Plug-Flow detention time= 15.1 min calculated for 1.442 af (100% of inflow)
Center-of-Mass det. time= 13.1 min (1,011.3 - 998.2)

Volume	Invert	Avail.Storage	Storage Description
#1	352.00'	131,459 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.00	40,283	0	0
353.00	42,609	41,446	41,446
354.00	44,992	43,801	85,247
355.00	47,432	46,212	131,459

Device	Routing	Invert	Outlet Devices
#1	Discarded	352.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.00' / 349.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	353.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	354.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.27 cfs @ 12.59 hrs HW=352.16' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: Infil F

Inflow Area = 9.925 ac, 40.24% Impervious, Inflow Depth > 2.91" for 10 YR event
Inflow = 32.94 cfs @ 12.09 hrs, Volume= 2.404 af
Outflow = 3.59 cfs @ 12.88 hrs, Volume= 1.613 af, Atten= 89%, Lag= 47.2 min
Discarded = 0.26 cfs @ 8.95 hrs, Volume= 0.341 af
Primary = 3.33 cfs @ 12.88 hrs, Volume= 1.271 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 416.88' @ 12.88 hrs Surf.Area= 0.953 ac Storage= 1.258 af

Plug-Flow detention time= 237.3 min calculated for 1.613 af (67% of inflow)
Center-of-Mass det. time= 139.8 min (951.0 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	415.00'	0.829 af	**144.00'W x 288.42'L x 3.50'H Field A** 3.337 af Overall - 1.266 af Embedded = 2.071 af x 40.0% Voids
#2A	415.50'	1.266 af	**ADS_StormTech SC-740 +Cap** x 1200 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 40 Chambers
		2.094 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	415.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	416.00'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 416.00' / 415.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=0.26 cfs @ 8.95 hrs HW=415.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=3.33 cfs @ 12.88 hrs HW=416.88' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 3.33 cfs @ 2.52 fps)

Summary for Pond 6P: Pond F

Inflow Area = 13.486 ac, 47.69% Impervious, Inflow Depth > 1.46" for 10 YR event
Inflow = 4.05 cfs @ 12.95 hrs, Volume= 1.643 af
Outflow = 1.93 cfs @ 16.42 hrs, Volume= 0.812 af, Atten= 52%, Lag= 207.9 min
Discarded = 0.16 cfs @ 16.42 hrs, Volume= 0.150 af
Primary = 1.78 cfs @ 16.42 hrs, Volume= 0.662 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 378.67' @ 16.42 hrs Surf.Area= 25,117 sf Storage= 39,115 cf

Plug-Flow detention time= 292.9 min calculated for 0.812 af (49% of inflow)
Center-of-Mass det. time= 154.9 min (1,108.1 - 953.2)

Volume	Invert	Avail.Storage	Storage Description
#1	377.00'	74,419 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
377.00	21,861	0	0
378.00	23,791	22,826	22,826
379.00	25,781	24,786	47,612
380.00	27,832	26,807	74,419

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	375.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 374.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	378.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	379.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.16 cfs @ 16.42 hrs HW=378.67' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=1.77 cfs @ 16.42 hrs HW=378.67' (Free Discharge)
└**2=Culvert** (Passes 1.77 cfs of 29.00 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 1.77 cfs @ 1.33 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Infil G

Inflow Area = 3.561 ac, 68.46% Impervious, Inflow Depth > 3.39" for 10 YR event
Inflow = 13.46 cfs @ 12.09 hrs, Volume= 1.007 af
Outflow = 0.92 cfs @ 13.59 hrs, Volume= 0.584 af, Atten= 93%, Lag= 90.1 min
Discarded = 0.15 cfs @ 8.55 hrs, Volume= 0.212 af
Primary = 0.77 cfs @ 13.59 hrs, Volume= 0.372 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 401.51' @ 13.59 hrs Surf.Area= 0.560 ac Storage= 0.580 af

Plug-Flow detention time= 268.7 min calculated for 0.582 af (58% of inflow)
Center-of-Mass det. time= 164.9 min (958.7 - 793.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	400.00'	0.489 af	**96.50'W x 252.82'L x 3.50'H Field A** 1.960 af Overall - 0.738 af Embedded = 1.222 af x 40.0% Voids
#2A	400.50'	0.738 af	**ADS_StormTech SC-740 +Cap** x 700 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 35 Chambers
		1.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	400.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	401.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 401.00' / 400.50' S= 0.0100 '/' Cc= 0.900

n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.15 cfs @ 8.55 hrs HW=400.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.77 cfs @ 13.59 hrs HW=401.51' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.77 cfs @ 1.92 fps)

Summary for Subcatchment 3L: Building Pad L

Runoff = 26.29 cfs @ 12.09 hrs, Volume= 1.988 af, Depth> 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.137	98	Unconnected roofs, HSG B
0.371	98	Paved parking, HSG B
0.167	61	>75% Grass cover, Good, HSG B
1.119	98	Unconnected roofs, HSG C
2.368	98	Paved parking, HSG C
1.567	74	>75% Grass cover, Good, HSG C
5.729	90	Weighted Average
1.734		30.27% Pervious Area
3.995		69.73% Impervious Area
1.256		31.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Roadway & Offsite

Runoff = 13.93 cfs @ 12.11 hrs, Volume= 1.201 af, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
* 1.089	98	Basin, 0% imp, HSG A
0.403	98	Paved parking, HSG A
4.603	30	Woods, Good, HSG A
1.548	39	>75% Grass cover, Good, HSG A
2.082	55	Woods, Good, HSG B
0.589	61	>75% Grass cover, Good, HSG B
0.892	98	Paved parking, HSG C
1.529	74	>75% Grass cover, Good, HSG C
12.735	55	Weighted Average
11.440		89.83% Pervious Area
1.295		10.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Building Pad F

Runoff = 40.98 cfs @ 12.09 hrs, Volume= 3.013 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
1.626	98	Unconnected roofs, HSG C
* 0.383	98	Basin, 0% imp, HSG C
2.368	98	Paved parking, HSG C
5.548	74	>75% Grass cover, Good, HSG C
9.925	85	Weighted Average
5.931		59.76% Pervious Area
3.994		40.24% Impervious Area
1.626		40.71% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Building Pad G

Runoff = 16.34 cfs @ 12.09 hrs, Volume= 1.235 af, Depth> 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.378	98	Paved parking, HSG A
0.089	39	>75% Grass cover, Good, HSG A
0.861	98	Roofs, HSG C
1.199	98	Paved parking, HSG C
1.034	74	>75% Grass cover, Good, HSG C
3.561	90	Weighted Average
1.123		31.54% Pervious Area
2.438		68.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP2: Intermittent Stream

Inflow Area = 31.950 ac, 36.69% Impervious, Inflow Depth = 0.23" for 25 YR event
Inflow = 1.94 cfs @ 12.89 hrs, Volume= 0.622 af
Outflow = 1.94 cfs @ 12.89 hrs, Volume= 0.622 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Infil L

Inflow Area = 5.729 ac, 69.73% Impervious, Inflow Depth > 4.16" for 25 YR event
Inflow = 26.29 cfs @ 12.09 hrs, Volume= 1.988 af
Outflow = 2.66 cfs @ 12.89 hrs, Volume= 1.584 af, Atten= 90%, Lag= 48.0 min
Discarded = 0.72 cfs @ 9.55 hrs, Volume= 0.963 af
Primary = 1.94 cfs @ 12.89 hrs, Volume= 0.622 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 349.92' @ 12.89 hrs Surf.Area= 0.698 ac Storage= 0.940 af

Plug-Flow detention time= 213.5 min calculated for 1.584 af (80% of inflow)
Center-of-Mass det. time= 137.8 min (926.1 - 788.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	348.00'	0.608 af	**120.25'W x 252.82'L x 3.50'H Field A** 2.443 af Overall - 0.923 af Embedded = 1.520 af x 40.0% Voids
#2A	348.50'	0.923 af	**ADS_StormTech SC-740 +Cap** x 875 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 25 Rows of 35 Chambers
		1.531 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	348.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	349.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 349.00' / 348.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.72 cfs @ 9.55 hrs HW=348.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.72 cfs)

Primary OutFlow Max=1.94 cfs @ 12.89 hrs HW=349.92' (Free Discharge)
↑**2=Culvert** (Inlet Controls 1.94 cfs @ 2.57 fps)

Summary for Pond 4P: Roadway Pond

Inflow Area = 26.221 ac, 29.47% Impervious, Inflow Depth > 1.20" for 25 YR event
Inflow = 13.93 cfs @ 12.11 hrs, Volume= 2.629 af
Outflow = 2.36 cfs @ 17.78 hrs, Volume= 2.331 af, Atten= 83%, Lag= 340.0 min
Discarded = 2.36 cfs @ 17.78 hrs, Volume= 2.331 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 352.87' @ 17.78 hrs Surf.Area= 42,295 sf Storage= 35,716 cf

Plug-Flow detention time= 163.0 min calculated for 2.331 af (89% of inflow)
Center-of-Mass det. time= 117.0 min (1,078.4 - 961.4)

Volume	Invert	Avail.Storage	Storage Description
#1	352.00'	131,459 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.00	40,283	0	0
353.00	42,609	41,446	41,446
354.00	44,992	43,801	85,247
355.00	47,432	46,212	131,459

Device	Routing	Invert	Outlet Devices
#1	Discarded	352.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.00' / 349.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	353.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	354.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.36 cfs @ 17.78 hrs HW=352.87' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: Infil F

Inflow Area = 9.925 ac, 40.24% Impervious, Inflow Depth > 3.64" for 25 YR event
Inflow = 40.98 cfs @ 12.09 hrs, Volume= 3.013 af
Outflow = 6.54 cfs @ 12.59 hrs, Volume= 2.197 af, Atten= 84%, Lag= 29.8 min
Discarded = 0.26 cfs @ 8.35 hrs, Volume= 0.356 af
Primary = 6.28 cfs @ 12.59 hrs, Volume= 1.841 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 417.26' @ 12.59 hrs Surf.Area= 0.953 ac Storage= 1.517 af

Plug-Flow detention time= 209.6 min calculated for 2.192 af (73% of inflow)
Center-of-Mass det. time= 121.8 min (926.6 - 804.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	415.00'	0.829 af	**144.00'W x 288.42'L x 3.50'H Field A** 3.337 af Overall - 1.266 af Embedded = 2.071 af x 40.0% Voids
#2A	415.50'	1.266 af	**ADS_StormTech SC-740 +Cap** x 1200 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 40 Chambers
		2.094 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	415.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	416.00'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 416.00' / 415.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=0.26 cfs @ 8.35 hrs HW=415.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=6.28 cfs @ 12.59 hrs HW=417.26' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 6.28 cfs @ 3.02 fps)

Summary for Pond 6P: Pond F

Inflow Area = 13.486 ac, 47.69% Impervious, Inflow Depth > 2.15" for 25 YR event
Inflow = 7.67 cfs @ 12.61 hrs, Volume= 2.419 af
Outflow = 4.17 cfs @ 14.62 hrs, Volume= 1.581 af, Atten= 46%, Lag= 120.9 min
Discarded = 0.16 cfs @ 14.62 hrs, Volume= 0.153 af
Primary = 4.02 cfs @ 14.62 hrs, Volume= 1.428 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 378.79' @ 14.62 hrs Surf.Area= 25,356 sf Storage= 42,153 cf

Plug-Flow detention time= 206.3 min calculated for 1.578 af (65% of inflow)
Center-of-Mass det. time= 101.6 min (1,030.4 - 928.8)

Volume	Invert	Avail.Storage	Storage Description
#1	377.00'	74,419 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
377.00	21,861	0	0
378.00	23,791	22,826	22,826
379.00	25,781	24,786	47,612
380.00	27,832	26,807	74,419

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	375.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 374.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	378.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	379.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.16 cfs @ 14.62 hrs HW=378.79' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=4.01 cfs @ 14.62 hrs HW=378.79' (Free Discharge)
└**2=Culvert** (Passes 4.01 cfs of 29.72 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 4.01 cfs @ 1.75 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Infil G

Inflow Area = 3.561 ac, 68.46% Impervious, Inflow Depth > 4.16" for 25 YR event
Inflow = 16.34 cfs @ 12.09 hrs, Volume= 1.235 af
Outflow = 1.60 cfs @ 12.92 hrs, Volume= 0.799 af, Atten= 90%, Lag= 49.9 min
Discarded = 0.15 cfs @ 7.90 hrs, Volume= 0.221 af
Primary = 1.45 cfs @ 12.92 hrs, Volume= 0.578 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 401.74' @ 12.92 hrs Surf.Area= 0.560 ac Storage= 0.681 af

Plug-Flow detention time= 245.9 min calculated for 0.798 af (65% of inflow)
Center-of-Mass det. time= 148.9 min (937.2 - 788.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	400.00'	0.489 af	**96.50'W x 252.82'L x 3.50'H Field A** 1.960 af Overall - 0.738 af Embedded = 1.222 af x 40.0% Voids
#2A	400.50'	0.738 af	**ADS_StormTech SC-740 +Cap** x 700 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 35 Chambers
		1.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	400.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	401.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 401.00' / 400.50' S= 0.0100 '/' Cc= 0.900

n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.15 cfs @ 7.90 hrs HW=400.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=1.45 cfs @ 12.92 hrs HW=401.74' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 1.45 cfs @ 2.32 fps)

Summary for Subcatchment 3L: Building Pad L

Runoff = 33.19 cfs @ 12.09 hrs, Volume= 2.545 af, Depth> 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.137	98	Unconnected roofs, HSG B
0.371	98	Paved parking, HSG B
0.167	61	>75% Grass cover, Good, HSG B
1.119	98	Unconnected roofs, HSG C
2.368	98	Paved parking, HSG C
1.567	74	>75% Grass cover, Good, HSG C
5.729	90	Weighted Average
1.734		30.27% Pervious Area
3.995		69.73% Impervious Area
1.256		31.44% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Roadway & Offsite

Runoff = 24.40 cfs @ 12.10 hrs, Volume= 1.922 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
*	1.089	98	Basin, 0% imp, HSG A
	0.403	98	Paved parking, HSG A
	4.603	30	Woods, Good, HSG A
	1.548	39	>75% Grass cover, Good, HSG A
	2.082	55	Woods, Good, HSG B
	0.589	61	>75% Grass cover, Good, HSG B
	0.892	98	Paved parking, HSG C
	1.529	74	>75% Grass cover, Good, HSG C
	12.735	55	Weighted Average
	11.440		89.83% Pervious Area
	1.295		10.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Building Pad F

Runoff = 53.07 cfs @ 12.09 hrs, Volume= 3.947 af, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
1.626	98	Unconnected roofs, HSG C
* 0.383	98	Basin, 0% imp, HSG C
2.368	98	Paved parking, HSG C
5.548	74	>75% Grass cover, Good, HSG C
9.925	85	Weighted Average
5.931		59.76% Pervious Area
3.994		40.24% Impervious Area
1.626		40.71% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Building Pad G

Runoff = 20.63 cfs @ 12.09 hrs, Volume= 1.582 af, Depth> 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.378	98	Paved parking, HSG A
0.089	39	>75% Grass cover, Good, HSG A
0.861	98	Roofs, HSG C
1.199	98	Paved parking, HSG C
1.034	74	>75% Grass cover, Good, HSG C
3.561	90	Weighted Average
1.123		31.54% Pervious Area
2.438		68.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP2: Intermittent Stream

Inflow Area = 31.950 ac, 36.69% Impervious, Inflow Depth > 0.75" for 100 YR event
Inflow = 5.93 cfs @ 15.25 hrs, Volume= 2.001 af
Outflow = 5.93 cfs @ 15.25 hrs, Volume= 2.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Infil L

Inflow Area = 5.729 ac, 69.73% Impervious, Inflow Depth > 5.33" for 100 YR event
Inflow = 33.19 cfs @ 12.09 hrs, Volume= 2.545 af
Outflow = 3.71 cfs @ 12.77 hrs, Volume= 2.084 af, Atten= 89%, Lag= 41.0 min
Discarded = 0.72 cfs @ 8.85 hrs, Volume= 1.010 af
Primary = 2.99 cfs @ 12.77 hrs, Volume= 1.074 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.50' @ 12.77 hrs Surf.Area= 0.698 ac Storage= 1.218 af

Plug-Flow detention time= 200.3 min calculated for 2.080 af (82% of inflow)
Center-of-Mass det. time= 130.1 min (911.8 - 781.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	348.00'	0.608 af	**120.25'W x 252.82'L x 3.50'H Field A** 2.443 af Overall - 0.923 af Embedded = 1.520 af x 40.0% Voids
#2A	348.50'	0.923 af	**ADS_StormTech SC-740 +Cap** x 875 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 25 Rows of 35 Chambers
		1.531 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	348.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	349.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 349.00' / 348.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.72 cfs @ 8.85 hrs HW=348.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.72 cfs)

Primary OutFlow Max=2.99 cfs @ 12.77 hrs HW=350.50' (Free Discharge)
↑**2=Culvert** (Inlet Controls 2.99 cfs @ 3.80 fps)

Summary for Pond 4P: Roadway Pond

Inflow Area = 26.221 ac, 29.47% Impervious, Inflow Depth > 2.08" for 100 YR event
Inflow = 24.40 cfs @ 12.10 hrs, Volume= 4.539 af
Outflow = 6.42 cfs @ 15.37 hrs, Volume= 3.404 af, Atten= 74%, Lag= 196.2 min
Discarded = 2.48 cfs @ 15.37 hrs, Volume= 2.477 af
Primary = 3.94 cfs @ 15.37 hrs, Volume= 0.927 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 353.78' @ 15.37 hrs Surf.Area= 44,474 sf Storage= 75,532 cf

Plug-Flow detention time= 206.9 min calculated for 3.404 af (75% of inflow)
Center-of-Mass det. time= 119.9 min (1,046.4 - 926.5)

Volume	Invert	Avail.Storage	Storage Description
#1	352.00'	131,459 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.00	40,283	0	0
353.00	42,609	41,446	41,446
354.00	44,992	43,801	85,247
355.00	47,432	46,212	131,459

Device	Routing	Invert	Outlet Devices
#1	Discarded	352.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.00' / 349.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	353.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	354.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.48 cfs @ 15.37 hrs HW=353.78' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.48 cfs)

Primary OutFlow Max=3.93 cfs @ 15.37 hrs HW=353.78' (Free Discharge)
└**2=Culvert** (Passes 3.93 cfs of 29.70 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 3.93 cfs @ 1.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: Infil F

Inflow Area = 9.925 ac, 40.24% Impervious, Inflow Depth > 4.77" for 100 YR event
Inflow = 53.07 cfs @ 12.09 hrs, Volume= 3.947 af
Outflow = 12.10 cfs @ 12.50 hrs, Volume= 3.098 af, Atten= 77%, Lag= 24.4 min
Discarded = 0.26 cfs @ 7.45 hrs, Volume= 0.375 af
Primary = 11.84 cfs @ 12.50 hrs, Volume= 2.723 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 417.97' @ 12.50 hrs Surf.Area= 0.953 ac Storage= 1.894 af

Plug-Flow detention time= 183.5 min calculated for 3.098 af (78% of inflow)
Center-of-Mass det. time= 105.2 min (902.4 - 797.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	415.00'	0.829 af	**144.00'W x 288.42'L x 3.50'H Field A** 3.337 af Overall - 1.266 af Embedded = 2.071 af x 40.0% Voids
#2A	415.50'	1.266 af	**ADS_StormTech SC-740 +Cap** x 1200 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 40 Chambers
		2.094 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	415.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	416.00'	**24.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 416.00' / 415.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Discarded OutFlow Max=0.26 cfs @ 7.45 hrs HW=415.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=11.83 cfs @ 12.50 hrs HW=417.97' (Free Discharge)
└**2=Culvert** (Inlet Controls 11.83 cfs @ 3.78 fps)

Summary for Pond 6P: Pond F

Inflow Area = 13.486 ac, 47.69% Impervious, Inflow Depth > 3.22" for 100 YR event
Inflow = 14.22 cfs @ 12.51 hrs, Volume= 3.621 af
Outflow = 8.67 cfs @ 13.59 hrs, Volume= 2.773 af, Atten= 39%, Lag= 65.1 min
Discarded = 0.16 cfs @ 13.59 hrs, Volume= 0.156 af
Primary = 8.51 cfs @ 13.59 hrs, Volume= 2.617 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 378.97' @ 13.59 hrs Surf.Area= 25,727 sf Storage= 46,912 cf

Plug-Flow detention time= 146.0 min calculated for 2.767 af (76% of inflow)
Center-of-Mass det. time= 66.6 min (973.9 - 907.3)

Volume	Invert	Avail.Storage	Storage Description
#1	377.00'	74,419 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
377.00	21,861	0	0
378.00	23,791	22,826	22,826
379.00	25,781	24,786	47,612
380.00	27,832	26,807	74,419

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	375.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 374.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	378.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	379.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.16 cfs @ 13.59 hrs HW=378.97' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=8.50 cfs @ 13.59 hrs HW=378.97' (Free Discharge)
└**2=Culvert** (Passes 8.50 cfs of 30.79 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 8.50 cfs @ 2.25 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Infil G

Inflow Area = 3.561 ac, 68.46% Impervious, Inflow Depth > 5.33" for 100 YR event
Inflow = 20.63 cfs @ 12.09 hrs, Volume= 1.582 af
Outflow = 2.58 cfs @ 12.67 hrs, Volume= 1.130 af, Atten= 87%, Lag= 34.7 min
Discarded = 0.15 cfs @ 7.00 hrs, Volume= 0.232 af
Primary = 2.43 cfs @ 12.67 hrs, Volume= 0.898 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 402.16' @ 12.67 hrs Surf.Area= 0.560 ac Storage= 0.852 af

Plug-Flow detention time= 226.7 min calculated for 1.127 af (71% of inflow)
Center-of-Mass det. time= 138.0 min (919.7 - 781.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	400.00'	0.489 af	**96.50'W x 252.82'L x 3.50'H Field A** 1.960 af Overall - 0.738 af Embedded = 1.222 af x 40.0% Voids
#2A	400.50'	0.738 af	**ADS_StormTech SC-740 +Cap** x 700 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 35 Chambers
		1.227 af	Total Available Storage

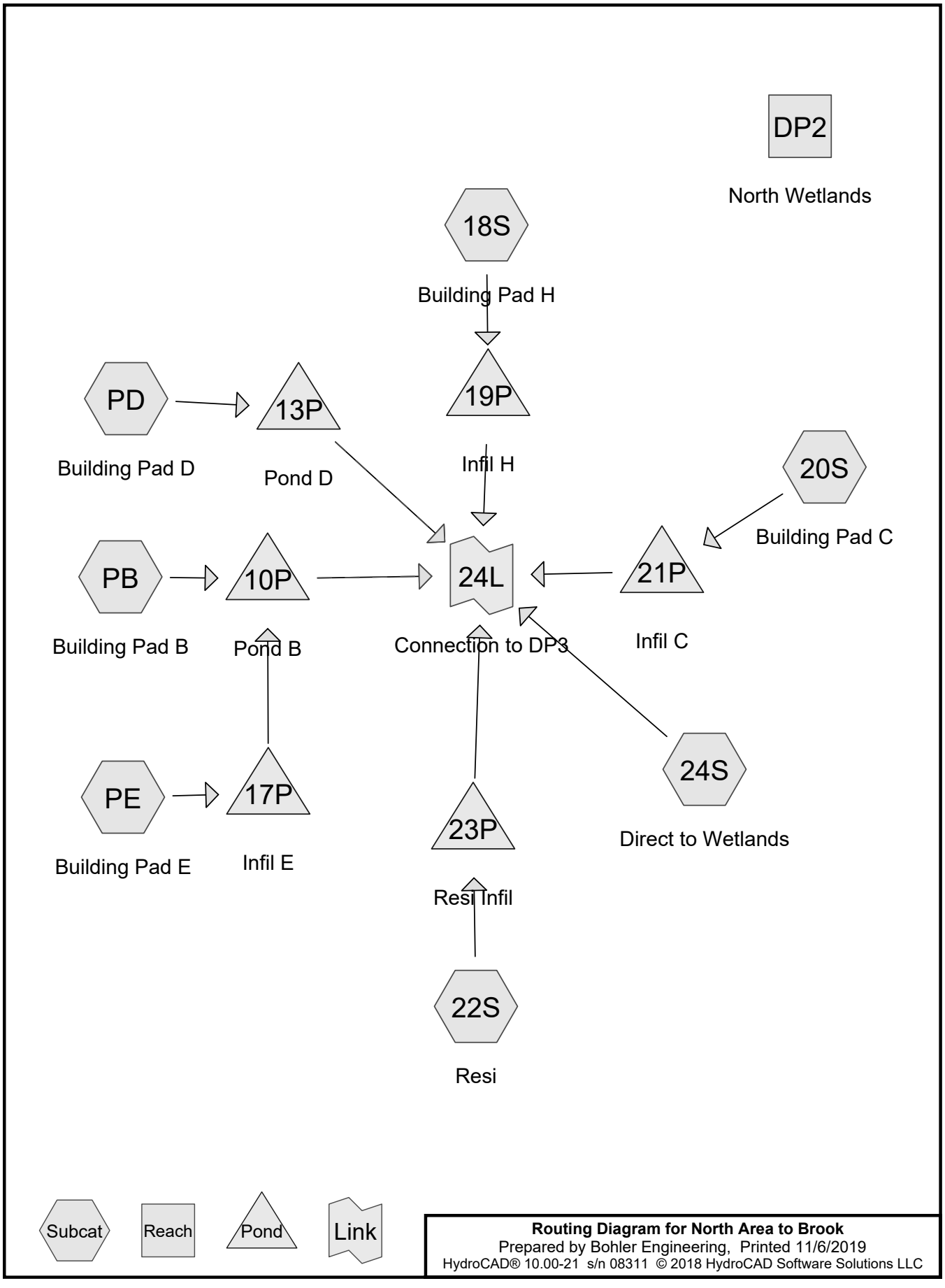
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	400.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	401.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 401.00' / 400.50' S= 0.0100 '/' Cc= 0.900

n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.15 cfs @ 7.00 hrs HW=400.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=2.43 cfs @ 12.67 hrs HW=402.16' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 2.43 cfs @ 3.09 fps)



Routing Diagram for North Area to Brook
Prepared by Bohler Engineering, Printed 11/6/2019
HydroCAD® 10.00-21 s/n 08311 © 2018 HydroCAD Software Solutions LLC

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
15.694	0.000	5.385	0.000	0.000	21.079	>75% Grass cover, Good	18S, 20S, 22S, 24S, PB, PD, PE
3.410	0.000	0.000	0.000	0.000	3.410	Basin, 0% imp	PB, PD
6.920	0.000	1.740	0.000	0.000	8.660	Paved parking	18S, 20S, 22S, PB
0.000	0.000	2.297	0.000	0.000	2.297	Roofs	PE
2.270	0.000	2.602	0.000	0.000	4.872	Unconnected pavement	PD, PE
10.780	0.000	0.860	0.000	0.000	11.640	Unconnected roofs	18S, 20S, 22S, PB, PD
42.750	0.000	6.590	44.870	0.000	94.210	Woods, Good	18S, 20S, 22S, 24S
81.824	**0.000**	**19.474**	**44.870**	**0.000**	**146.168**	**TOTAL AREA**	

Summary for Subcatchment 18S: Building Pad H

Runoff = 10.66 cfs @ 12.09 hrs, Volume= 0.772 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.860	98	Unconnected roofs, HSG C
1.740	98	Paved parking, HSG C
0.130	70	Woods, Good, HSG C
3.110	74	>75% Grass cover, Good, HSG C
5.840	85	Weighted Average
3.240		55.48% Pervious Area
2.600		44.52% Impervious Area
0.860		33.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 20S: Building Pad C

Runoff = 4.95 cfs @ 12.10 hrs, Volume= 0.365 af, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.960	98	Unconnected roofs, HSG A
0.050	30	Woods, Good, HSG A
1.440	98	Paved parking, HSG A
1.090	39	>75% Grass cover, Good, HSG A
0.050	74	>75% Grass cover, Good, HSG C
0.100	70	Woods, Good, HSG C
3.690	79	Weighted Average
1.290		34.96% Pervious Area
2.400		65.04% Impervious Area
0.960		40.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 22S: Resi

Runoff = 1.55 cfs @ 12.32 hrs, Volume= 0.301 af, Depth> 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
3.040	98	Unconnected roofs, HSG A
2.080	98	Paved parking, HSG A
6.250	39	>75% Grass cover, Good, HSG A
3.360	30	Woods, Good, HSG A
14.730	57	Weighted Average
9.610		65.24% Pervious Area
5.120		34.76% Impervious Area
3.040		59.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 24S: Direct to Wetlands

Runoff = 5.06 cfs @ 12.89 hrs, Volume= 1.685 af, Depth> 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
39.340	30	Woods, Good, HSG A
2.785	39	>75% Grass cover, Good, HSG A
44.870	77	Woods, Good, HSG D
6.360	70	Woods, Good, HSG C
0.660	74	>75% Grass cover, Good, HSG C
94.015	56	Weighted Average
94.015		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	76	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	116	0.3600	3.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
41.7	242	Total			

Summary for Subcatchment PB: Building Pad B

Runoff = 17.67 cfs @ 12.10 hrs, Volume= 1.287 af, Depth> 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
	3.440	98	Unconnected roofs, HSG A
*	1.420	98	Basin, 0% imp, HSG A
	3.400	98	Paved parking, HSG A
	2.950	39	>75% Grass cover, Good, HSG A
	11.210	82	Weighted Average
	4.370		38.98% Pervious Area
	6.840		61.02% Impervious Area
	3.440		50.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PD: Building Pad D

Runoff = 16.94 cfs @ 12.09 hrs, Volume= 1.230 af, Depth> 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
	3.340	98	Unconnected roofs, HSG A
*	1.990	98	Basin, 0% imp, HSG A
	2.270	98	Unconnected pavement, HSG A
	2.576	39	>75% Grass cover, Good, HSG A
	0.040	74	>75% Grass cover, Good, HSG C
	10.216	83	Weighted Average
	4.606		45.09% Pervious Area
	5.610		54.91% Impervious Area
	5.610		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PE: Building Pad E

Runoff = 15.71 cfs @ 12.09 hrs, Volume= 1.164 af, Depth> 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
2.297	98	Roofs, HSG C
2.602	98	Unconnected pavement, HSG C
1.525	74	>75% Grass cover, Good, HSG C
0.043	39	>75% Grass cover, Good, HSG A
6.467	92	Weighted Average
1.568		24.25% Pervious Area
4.899		75.75% Impervious Area
2.602		53.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP2: North Wetlands

Summary for Pond 10P: Pond B

Inflow Area = 17.677 ac, 66.41% Impervious, Inflow Depth > 0.87" for 2 YR event
Inflow = 17.67 cfs @ 12.10 hrs, Volume= 1.287 af
Outflow = 2.99 cfs @ 12.61 hrs, Volume= 1.284 af, Atten= 83%, Lag= 30.8 min
Discarded = 2.99 cfs @ 12.61 hrs, Volume= 1.284 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 382.32' @ 12.61 hrs Surf.Area= 53,541 sf Storage= 16,998 cf

Plug-Flow detention time= 42.7 min calculated for 1.284 af (100% of inflow)
Center-of-Mass det. time= 41.3 min (880.2 - 838.8)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	171,281 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
382.00	52,589	0	0
383.00	55,561	54,075	54,075
384.00	58,589	57,075	111,150
385.00	61,673	60,131	171,281

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	380.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 380.00' / 379.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	383.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

#4	Secondary	384.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=2.99 cfs @ 12.61 hrs HW=382.32' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 2.99 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: Pond D

Inflow Area = 10.216 ac, 54.91% Impervious, Inflow Depth > 1.45" for 2 YR event
Inflow = 16.94 cfs @ 12.09 hrs, Volume= 1.230 af
Outflow = 4.30 cfs @ 12.50 hrs, Volume= 1.228 af, Atten= 75%, Lag= 24.3 min
Discarded = 4.30 cfs @ 12.50 hrs, Volume= 1.228 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.17' @ 12.50 hrs Surf.Area= 77,064 sf Storage= 12,957 cf

Plug-Flow detention time= 21.5 min calculated for 1.225 af (100% of inflow)
Center-of-Mass det. time= 20.2 min (855.6 - 835.4)

Volume	Invert	Avail.Storage	Storage Description
#1	377.00'	244,566 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
377.00	76,505	0	0
378.00	79,818	78,162	78,162
379.00	83,188	81,503	159,665
380.00	86,615	84,902	244,566

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 374.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	378.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	379.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=4.30 cfs @ 12.50 hrs HW=377.17' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 4.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 17P: Infil E

Inflow Area = 6.467 ac, 75.75% Impervious, Inflow Depth > 2.16" for 2 YR event
Inflow = 15.71 cfs @ 12.09 hrs, Volume= 1.164 af
Outflow = 1.70 cfs @ 11.65 hrs, Volume= 1.163 af, Atten= 89%, Lag= 0.0 min
Discarded = 1.70 cfs @ 11.65 hrs, Volume= 1.163 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 410.96' @ 12.85 hrs Surf.Area= 0.698 ac Storage= 0.415 af

Plug-Flow detention time= 80.6 min calculated for 1.163 af (100% of inflow)
Center-of-Mass det. time= 80.1 min (879.7 - 799.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	410.00'	0.608 af	**120.25'W x 252.82'L x 3.50'H Field A** 2.443 af Overall - 0.923 af Embedded = 1.520 af x 40.0% Voids
#2A	410.50'	0.923 af	**ADS_StormTech SC-740 +Cap** x 875 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 25 Rows of 35 Chambers
		1.531 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	411.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 411.00' / 410.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.70 cfs @ 11.65 hrs HW=410.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.70 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=410.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Summary for Pond 19P: Infil H

Inflow Area = 5.840 ac, 44.52% Impervious, Inflow Depth > 1.59" for 2 YR event
Inflow = 10.66 cfs @ 12.09 hrs, Volume= 0.772 af
Outflow = 1.36 cfs @ 11.75 hrs, Volume= 0.771 af, Atten= 87%, Lag= 0.0 min
Discarded = 1.36 cfs @ 11.75 hrs, Volume= 0.771 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 422.81' @ 12.78 hrs Surf.Area= 0.560 ac Storage= 0.260 af

Plug-Flow detention time= 64.4 min calculated for 0.771 af (100% of inflow)
Center-of-Mass det. time= 63.8 min (892.3 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	422.00'	0.489 af	**96.50'W x 252.82'L x 3.50'H Field A** 1.960 af Overall - 0.738 af Embedded = 1.222 af x 40.0% Voids
#2A	422.50'	0.738 af	**ADS_StormTech SC-740 +Cap** x 700 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 35 Chambers
		1.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	422.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	424.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 424.00' / 423.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.36 cfs @ 11.75 hrs HW=422.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 1.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=422.00' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Summary for Pond 21P: Infil C

Inflow Area = 3.690 ac, 65.04% Impervious, Inflow Depth > 1.19" for 2 YR event
Inflow = 4.95 cfs @ 12.10 hrs, Volume= 0.365 af
Outflow = 0.98 cfs @ 11.90 hrs, Volume= 0.365 af, Atten= 80%, Lag= 0.0 min
Discarded = 0.98 cfs @ 11.90 hrs, Volume= 0.365 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 380.54' @ 12.57 hrs Surf.Area= 0.405 ac Storage= 0.096 af

Plug-Flow detention time= 28.6 min calculated for 0.364 af (100% of inflow)
Center-of-Mass det. time= 27.9 min (876.7 - 848.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	380.00'	0.355 af	**49.00'W x 359.62'L x 3.50'H Field A** 1.416 af Overall - 0.527 af Embedded = 0.889 af x 40.0% Voids
#2A	380.50'	0.527 af	**ADS_StormTech SC-740 +Cap** x 500 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Rows of 50 Chambers
		0.883 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	380.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	381.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 381.00' / 380.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.98 cfs @ 11.90 hrs HW=380.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.98 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=380.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Summary for Pond 23P: Resi Infil

Inflow Area = 14.730 ac, 34.76% Impervious, Inflow Depth > 0.25" for 2 YR event
Inflow = 1.55 cfs @ 12.32 hrs, Volume= 0.301 af
Outflow = 1.48 cfs @ 12.40 hrs, Volume= 0.301 af, Atten= 4%, Lag= 4.3 min
Discarded = 1.47 cfs @ 12.40 hrs, Volume= 0.300 af
Primary = 0.00 cfs @ 12.40 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 410.03' @ 12.40 hrs Surf.Area= 0.718 ac Storage= 0.008 af

Plug-Flow detention time= 4.2 min calculated for 0.301 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (954.0 - 950.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	410.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	410.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers
		1.575 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	410.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 410.00' / 409.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.74 cfs @ 12.40 hrs HW=410.03' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=0.00 cfs @ 12.40 hrs HW=410.03' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.00 cfs @ 0.46 fps)

Summary for Link 24L: Connection to DP3

Inflow Area = 146.168 ac, 18.79% Impervious, Inflow Depth > 0.14" for 2 YR event
Inflow = 5.06 cfs @ 12.89 hrs, Volume= 1.686 af
Primary = 5.06 cfs @ 12.89 hrs, Volume= 1.686 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 18S: Building Pad H

Runoff = 19.38 cfs @ 12.09 hrs, Volume= 1.415 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.860	98	Unconnected roofs, HSG C
1.740	98	Paved parking, HSG C
0.130	70	Woods, Good, HSG C
3.110	74	>75% Grass cover, Good, HSG C
5.840	85	Weighted Average
3.240		55.48% Pervious Area
2.600		44.52% Impervious Area
0.860		33.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 20S: Building Pad C

Runoff = 10.08 cfs @ 12.09 hrs, Volume= 0.730 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.960	98	Unconnected roofs, HSG A
0.050	30	Woods, Good, HSG A
1.440	98	Paved parking, HSG A
1.090	39	>75% Grass cover, Good, HSG A
0.050	74	>75% Grass cover, Good, HSG C
0.100	70	Woods, Good, HSG C
3.690	79	Weighted Average
1.290		34.96% Pervious Area
2.400		65.04% Impervious Area
0.960		40.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 22S: Resi

Runoff = 11.37 cfs @ 12.11 hrs, Volume= 1.041 af, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
3.040	98	Unconnected roofs, HSG A
2.080	98	Paved parking, HSG A
6.250	39	>75% Grass cover, Good, HSG A
3.360	30	Woods, Good, HSG A
14.730	57	Weighted Average
9.610		65.24% Pervious Area
5.120		34.76% Impervious Area
3.040		59.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 24S: Direct to Wetlands

Runoff = 32.73 cfs @ 12.70 hrs, Volume= 6.139 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
39.340	30	Woods, Good, HSG A
2.785	39	>75% Grass cover, Good, HSG A
44.870	77	Woods, Good, HSG D
6.360	70	Woods, Good, HSG C
0.660	74	>75% Grass cover, Good, HSG C
94.015	56	Weighted Average
94.015		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	76	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	116	0.3600	3.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
41.7	242	Total			

Summary for Subcatchment PB: Building Pad B

Runoff = 33.92 cfs @ 12.09 hrs, Volume= 2.460 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
	3.440	98	Unconnected roofs, HSG A
*	1.420	98	Basin, 0% imp, HSG A
	3.400	98	Paved parking, HSG A
	2.950	39	>75% Grass cover, Good, HSG A
	11.210	82	Weighted Average
	4.370		38.98% Pervious Area
	6.840		61.02% Impervious Area
	3.440		50.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PD: Building Pad D

Runoff = 31.92 cfs @ 12.09 hrs, Volume= 2.318 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
	3.340	98	Unconnected roofs, HSG A
*	1.990	98	Basin, 0% imp, HSG A
	2.270	98	Unconnected pavement, HSG A
	2.576	39	>75% Grass cover, Good, HSG A
	0.040	74	>75% Grass cover, Good, HSG C
	10.216	83	Weighted Average
	4.606		45.09% Pervious Area
	5.610		54.91% Impervious Area
	5.610		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PE: Building Pad E

Runoff = 25.51 cfs @ 12.09 hrs, Volume= 1.940 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
2.297	98	Roofs, HSG C
2.602	98	Unconnected pavement, HSG C
1.525	74	>75% Grass cover, Good, HSG C
0.043	39	>75% Grass cover, Good, HSG A
6.467	92	Weighted Average
1.568		24.25% Pervious Area
4.899		75.75% Impervious Area
2.602		53.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP2: North Wetlands

Summary for Pond 10P: Pond B

Inflow Area = 17.677 ac, 66.41% Impervious, Inflow Depth > 1.80" for 10 YR event
Inflow = 33.92 cfs @ 12.09 hrs, Volume= 2.644 af
Outflow = 3.08 cfs @ 13.82 hrs, Volume= 2.640 af, Atten= 91%, Lag= 103.4 min
Discarded = 3.08 cfs @ 13.82 hrs, Volume= 2.640 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 382.86' @ 13.82 hrs Surf.Area= 55,158 sf Storage= 46,560 cf

Plug-Flow detention time= 141.8 min calculated for 2.634 af (100% of inflow)
Center-of-Mass det. time= 140.4 min (960.7 - 820.3)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	171,281 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
382.00	52,589	0	0
383.00	55,561	54,075	54,075
384.00	58,589	57,075	111,150
385.00	61,673	60,131	171,281

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	380.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 380.00' / 379.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	383.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

#4	Secondary	384.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=3.08 cfs @ 13.82 hrs HW=382.86' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 3.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: Pond D

Inflow Area = 10.216 ac, 54.91% Impervious, Inflow Depth > 2.72" for 10 YR event
Inflow = 31.92 cfs @ 12.09 hrs, Volume= 2.318 af
Outflow = 4.35 cfs @ 12.67 hrs, Volume= 2.314 af, Atten= 86%, Lag= 34.8 min
Discarded = 4.35 cfs @ 12.67 hrs, Volume= 2.314 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.44' @ 12.67 hrs Surf.Area= 77,963 sf Storage= 33,995 cf

Plug-Flow detention time= 59.9 min calculated for 2.309 af (100% of inflow)
Center-of-Mass det. time= 58.6 min (875.9 - 817.3)

Volume	Invert	Avail.Storage	Storage Description
#1	377.00'	244,566 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
377.00	76,505	0	0
378.00	79,818	78,162	78,162
379.00	83,188	81,503	159,665
380.00	86,615	84,902	244,566

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 374.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	378.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	379.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=4.35 cfs @ 12.67 hrs HW=377.44' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 4.35 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 17P: Infil E

Inflow Area = 6.467 ac, 75.75% Impervious, Inflow Depth > 3.60" for 10 YR event
Inflow = 25.51 cfs @ 12.09 hrs, Volume= 1.940 af
Outflow = 2.67 cfs @ 12.85 hrs, Volume= 1.938 af, Atten= 90%, Lag= 45.7 min
Discarded = 1.70 cfs @ 11.20 hrs, Volume= 1.754 af
Primary = 0.97 cfs @ 12.85 hrs, Volume= 0.184 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 411.58' @ 12.85 hrs Surf.Area= 0.698 ac Storage= 0.763 af

Plug-Flow detention time= 130.9 min calculated for 1.934 af (100% of inflow)
Center-of-Mass det. time= 130.2 min (915.8 - 785.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	410.00'	0.608 af	**120.25'W x 252.82'L x 3.50'H Field A** 2.443 af Overall - 0.923 af Embedded = 1.520 af x 40.0% Voids
#2A	410.50'	0.923 af	**ADS_StormTech SC-740 +Cap** x 875 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 25 Rows of 35 Chambers
		1.531 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	411.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 411.00' / 410.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.70 cfs @ 11.20 hrs HW=410.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.70 cfs)

Primary OutFlow Max=0.97 cfs @ 12.85 hrs HW=411.58' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.97 cfs @ 2.05 fps)

Summary for Pond 19P: Infil H

Inflow Area = 5.840 ac, 44.52% Impervious, Inflow Depth > 2.91" for 10 YR event
Inflow = 19.38 cfs @ 12.09 hrs, Volume= 1.415 af
Outflow = 1.36 cfs @ 11.40 hrs, Volume= 1.413 af, Atten= 93%, Lag= 0.0 min
Discarded = 1.36 cfs @ 11.40 hrs, Volume= 1.413 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 423.57' @ 13.68 hrs Surf.Area= 0.560 ac Storage= 0.608 af

Plug-Flow detention time= 174.5 min calculated for 1.410 af (100% of inflow)
Center-of-Mass det. time= 173.6 min (984.8 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	422.00'	0.489 af	**96.50'W x 252.82'L x 3.50'H Field A** 1.960 af Overall - 0.738 af Embedded = 1.222 af x 40.0% Voids
#2A	422.50'	0.738 af	**ADS_StormTech SC-740 +Cap** x 700 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 35 Chambers
		1.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	422.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	424.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 424.00' / 423.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.36 cfs @ 11.40 hrs HW=422.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 1.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=422.00' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Summary for Pond 21P: Infil C

Inflow Area = 3.690 ac, 65.04% Impervious, Inflow Depth > 2.37" for 10 YR event
Inflow = 10.08 cfs @ 12.09 hrs, Volume= 0.730 af
Outflow = 1.00 cfs @ 13.04 hrs, Volume= 0.729 af, Atten= 90%, Lag= 56.7 min
Discarded = 0.98 cfs @ 11.70 hrs, Volume= 0.728 af
Primary = 0.02 cfs @ 13.04 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 381.07' @ 13.04 hrs Surf.Area= 0.405 ac Storage= 0.276 af

Plug-Flow detention time= 104.5 min calculated for 0.728 af (100% of inflow)
Center-of-Mass det. time= 103.7 min (932.4 - 828.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	380.00'	0.355 af	**49.00'W x 359.62'L x 3.50'H Field A** 1.416 af Overall - 0.527 af Embedded = 0.889 af x 40.0% Voids
#2A	380.50'	0.527 af	**ADS_StormTech SC-740 +Cap** x 500 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Rows of 50 Chambers
		0.883 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	380.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	381.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 381.00' / 380.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.98 cfs @ 11.70 hrs HW=380.05' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.98 cfs)

Primary OutFlow Max=0.02 cfs @ 13.04 hrs HW=381.07' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.02 cfs @ 0.73 fps)

Summary for Pond 23P: Resi Infil

Inflow Area = 14.730 ac, 34.76% Impervious, Inflow Depth > 0.85" for 10 YR event
Inflow = 11.37 cfs @ 12.11 hrs, Volume= 1.041 af
Outflow = 2.88 cfs @ 12.60 hrs, Volume= 1.039 af, Atten= 75%, Lag= 29.5 min
Discarded = 1.74 cfs @ 12.00 hrs, Volume= 0.866 af
Primary = 1.13 cfs @ 12.60 hrs, Volume= 0.173 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 410.64' @ 12.60 hrs Surf.Area= 0.718 ac Storage= 0.228 af

Plug-Flow detention time= 27.9 min calculated for 1.037 af (100% of inflow)
Center-of-Mass det. time= 27.0 min (921.2 - 894.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	410.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	410.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers
		1.575 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	410.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 410.00' / 409.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.74 cfs @ 12.00 hrs HW=410.05' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=1.13 cfs @ 12.60 hrs HW=410.64' (Free Discharge)
↑**2=Culvert** (Inlet Controls 1.13 cfs @ 2.15 fps)

Summary for Link 24L: Connection to DP3

Inflow Area = 146.168 ac, 18.79% Impervious, Inflow Depth > 0.52" for 10 YR event
Inflow = 33.87 cfs @ 12.70 hrs, Volume= 6.314 af
Primary = 33.87 cfs @ 12.70 hrs, Volume= 6.314 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 18S: Building Pad H

Runoff = 24.11 cfs @ 12.09 hrs, Volume= 1.773 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.860	98	Unconnected roofs, HSG C
1.740	98	Paved parking, HSG C
0.130	70	Woods, Good, HSG C
3.110	74	>75% Grass cover, Good, HSG C
5.840	85	Weighted Average
3.240		55.48% Pervious Area
2.600		44.52% Impervious Area
0.860		33.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 20S: Building Pad C

Runoff = 12.98 cfs @ 12.09 hrs, Volume= 0.941 af, Depth> 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.960	98	Unconnected roofs, HSG A
0.050	30	Woods, Good, HSG A
1.440	98	Paved parking, HSG A
1.090	39	>75% Grass cover, Good, HSG A
0.050	74	>75% Grass cover, Good, HSG C
0.100	70	Woods, Good, HSG C
3.690	79	Weighted Average
1.290		34.96% Pervious Area
2.400		65.04% Impervious Area
0.960		40.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 22S: Resi

Runoff = 18.84 cfs @ 12.11 hrs, Volume= 1.554 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
3.040	98	Unconnected roofs, HSG A
2.080	98	Paved parking, HSG A
6.250	39	>75% Grass cover, Good, HSG A
3.360	30	Woods, Good, HSG A
14.730	57	Weighted Average
9.610		65.24% Pervious Area
5.120		34.76% Impervious Area
3.040		59.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 24S: Direct to Wetlands

Runoff = 54.61 cfs @ 12.66 hrs, Volume= 9.277 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
39.340	30	Woods, Good, HSG A
2.785	39	>75% Grass cover, Good, HSG A
44.870	77	Woods, Good, HSG D
6.360	70	Woods, Good, HSG C
0.660	74	>75% Grass cover, Good, HSG C
94.015	56	Weighted Average
94.015		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	76	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	116	0.3600	3.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
41.7	242	Total			

Summary for Subcatchment PB: Building Pad B

Runoff = 42.91 cfs @ 12.09 hrs, Volume= 3.126 af, Depth> 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
	3.440	98	Unconnected roofs, HSG A
*	1.420	98	Basin, 0% imp, HSG A
	3.400	98	Paved parking, HSG A
	2.950	39	>75% Grass cover, Good, HSG A
	11.210	82	Weighted Average
	4.370		38.98% Pervious Area
	6.840		61.02% Impervious Area
	3.440		50.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PD: Building Pad D

Runoff = 40.15 cfs @ 12.09 hrs, Volume= 2.932 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
	3.340	98	Unconnected roofs, HSG A
*	1.990	98	Basin, 0% imp, HSG A
	2.270	98	Unconnected pavement, HSG A
	2.576	39	>75% Grass cover, Good, HSG A
	0.040	74	>75% Grass cover, Good, HSG C
	10.216	83	Weighted Average
	4.606		45.09% Pervious Area
	5.610		54.91% Impervious Area
	5.610		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PE: Building Pad E

Runoff = 30.70 cfs @ 12.09 hrs, Volume= 2.360 af, Depth> 4.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
2.297	98	Roofs, HSG C
2.602	98	Unconnected pavement, HSG C
1.525	74	>75% Grass cover, Good, HSG C
0.043	39	>75% Grass cover, Good, HSG A
6.467	92	Weighted Average
1.568		24.25% Pervious Area
4.899		75.75% Impervious Area
2.602		53.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP2: North Wetlands

Summary for Pond 10P: Pond B

Inflow Area = 17.677 ac, 66.41% Impervious, Inflow Depth > 2.40" for 25 YR event
Inflow = 42.97 cfs @ 12.09 hrs, Volume= 3.530 af
Outflow = 3.15 cfs @ 14.68 hrs, Volume= 3.474 af, Atten= 93%, Lag= 155.3 min
Discarded = 3.15 cfs @ 14.68 hrs, Volume= 3.474 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 383.29' @ 14.68 hrs Surf.Area= 56,445 sf Storage= 70,422 cf

Plug-Flow detention time= 219.3 min calculated for 3.474 af (98% of inflow)
Center-of-Mass det. time= 209.9 min (1,025.1 - 815.2)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	171,281 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
382.00	52,589	0	0
383.00	55,561	54,075	54,075
384.00	58,589	57,075	111,150
385.00	61,673	60,131	171,281

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	380.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 380.00' / 379.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	383.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

#4	Secondary	384.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=3.15 cfs @ 14.68 hrs HW=383.29' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 3.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: Pond D

Inflow Area = 10.216 ac, 54.91% Impervious, Inflow Depth > 3.44" for 25 YR event
Inflow = 40.15 cfs @ 12.09 hrs, Volume= 2.932 af
Outflow = 4.38 cfs @ 12.87 hrs, Volume= 2.927 af, Atten= 89%, Lag= 47.0 min
Discarded = 4.38 cfs @ 12.87 hrs, Volume= 2.927 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.61' @ 12.87 hrs Surf.Area= 78,515 sf Storage= 47,019 cf

Plug-Flow detention time= 86.9 min calculated for 2.921 af (100% of inflow)
Center-of-Mass det. time= 85.6 min (896.2 - 810.6)

Volume	Invert	Avail.Storage	Storage Description
#1	377.00'	244,566 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
377.00	76,505	0	0
378.00	79,818	78,162	78,162
379.00	83,188	81,503	159,665
380.00	86,615	84,902	244,566

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 374.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	378.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	379.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=4.38 cfs @ 12.87 hrs HW=377.61' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 4.38 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 17P: Infil E

Inflow Area = 6.467 ac, 75.75% Impervious, Inflow Depth > 4.38" for 25 YR event
Inflow = 30.70 cfs @ 12.09 hrs, Volume= 2.360 af
Outflow = 3.61 cfs @ 12.71 hrs, Volume= 2.359 af, Atten= 88%, Lag= 37.6 min
Discarded = 1.70 cfs @ 10.75 hrs, Volume= 1.955 af
Primary = 1.92 cfs @ 12.71 hrs, Volume= 0.404 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 411.91' @ 12.71 hrs Surf.Area= 0.698 ac Storage= 0.936 af

Plug-Flow detention time= 135.6 min calculated for 2.359 af (100% of inflow)
Center-of-Mass det. time= 135.1 min (915.5 - 780.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	410.00'	0.608 af	**120.25'W x 252.82'L x 3.50'H Field A** 2.443 af Overall - 0.923 af Embedded = 1.520 af x 40.0% Voids
#2A	410.50'	0.923 af	**ADS_StormTech SC-740 +Cap** x 875 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 25 Rows of 35 Chambers
		1.531 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	411.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 411.00' / 410.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.70 cfs @ 10.75 hrs HW=410.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.70 cfs)

Primary OutFlow Max=1.92 cfs @ 12.71 hrs HW=411.91' (Free Discharge)
└**2=Culvert** (Inlet Controls 1.92 cfs @ 2.56 fps)

Summary for Pond 19P: Infil H

Inflow Area = 5.840 ac, 44.52% Impervious, Inflow Depth > 3.64" for 25 YR event
Inflow = 24.11 cfs @ 12.09 hrs, Volume= 1.773 af
Outflow = 1.39 cfs @ 14.09 hrs, Volume= 1.620 af, Atten= 94%, Lag= 119.7 min
Discarded = 1.36 cfs @ 11.20 hrs, Volume= 1.615 af
Primary = 0.03 cfs @ 14.09 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 424.10' @ 14.09 hrs Surf.Area= 0.560 ac Storage= 0.827 af

Plug-Flow detention time= 245.5 min calculated for 1.620 af (91% of inflow)
Center-of-Mass det. time= 202.1 min (1,006.9 - 804.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	422.00'	0.489 af	**96.50'W x 252.82'L x 3.50'H Field A** 1.960 af Overall - 0.738 af Embedded = 1.222 af x 40.0% Voids
#2A	422.50'	0.738 af	**ADS_StormTech SC-740 +Cap** x 700 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 35 Chambers
		1.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	422.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	424.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 424.00' / 423.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.36 cfs @ 11.20 hrs HW=422.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 1.36 cfs)

Primary OutFlow Max=0.03 cfs @ 14.09 hrs HW=424.10' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.03 cfs @ 0.84 fps)

Summary for Pond 21P: Infil C

Inflow Area = 3.690 ac, 65.04% Impervious, Inflow Depth > 3.06" for 25 YR event
Inflow = 12.98 cfs @ 12.09 hrs, Volume= 0.941 af
Outflow = 1.39 cfs @ 12.93 hrs, Volume= 0.940 af, Atten= 89%, Lag= 50.4 min
Discarded = 0.98 cfs @ 11.55 hrs, Volume= 0.873 af
Primary = 0.41 cfs @ 12.93 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 381.36' @ 12.93 hrs Surf.Area= 0.405 ac Storage= 0.370 af

Plug-Flow detention time= 126.0 min calculated for 0.940 af (100% of inflow)
Center-of-Mass det. time= 125.5 min (946.9 - 821.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	380.00'	0.355 af	**49.00'W x 359.62'L x 3.50'H Field A** 1.416 af Overall - 0.527 af Embedded = 0.889 af x 40.0% Voids
#2A	380.50'	0.527 af	**ADS_StormTech SC-740 +Cap** x 500 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Rows of 50 Chambers
		0.883 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	380.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	381.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 381.00' / 380.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.98 cfs @ 11.55 hrs HW=380.04' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.98 cfs)

Primary OutFlow Max=0.41 cfs @ 12.93 hrs HW=381.36' (Free Discharge)
↑└**2=Culvert** (Inlet Controls 0.41 cfs @ 1.61 fps)

Summary for Pond 23P: Resi Infil

Inflow Area = 14.730 ac, 34.76% Impervious, Inflow Depth > 1.27" for 25 YR event
Inflow = 18.84 cfs @ 12.11 hrs, Volume= 1.554 af
Outflow = 3.78 cfs @ 12.65 hrs, Volume= 1.552 af, Atten= 80%, Lag= 32.7 min
Discarded = 1.74 cfs @ 11.85 hrs, Volume= 1.096 af
Primary = 2.03 cfs @ 12.65 hrs, Volume= 0.456 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 410.96' @ 12.65 hrs Surf.Area= 0.718 ac Storage= 0.422 af

Plug-Flow detention time= 45.6 min calculated for 1.552 af (100% of inflow)
Center-of-Mass det. time= 44.8 min (924.5 - 879.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	410.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	410.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers
		1.575 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	410.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 410.00' / 409.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.74 cfs @ 11.85 hrs HW=410.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=2.03 cfs @ 12.65 hrs HW=410.96' (Free Discharge)
└**2=Culvert** (Inlet Controls 2.03 cfs @ 2.63 fps)

Summary for Link 24L: Connection to DP3

Inflow Area = 146.168 ac, 18.79% Impervious, Inflow Depth > 0.80" for 25 YR event
Inflow = 57.03 cfs @ 12.66 hrs, Volume= 9.805 af
Primary = 57.03 cfs @ 12.66 hrs, Volume= 9.805 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 18S: Building Pad H

Runoff = 31.23 cfs @ 12.09 hrs, Volume= 2.323 af, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.860	98	Unconnected roofs, HSG C
1.740	98	Paved parking, HSG C
0.130	70	Woods, Good, HSG C
3.110	74	>75% Grass cover, Good, HSG C
5.840	85	Weighted Average
3.240		55.48% Pervious Area
2.600		44.52% Impervious Area
0.860		33.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 20S: Building Pad C

Runoff = 17.41 cfs @ 12.09 hrs, Volume= 1.269 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.960	98	Unconnected roofs, HSG A
0.050	30	Woods, Good, HSG A
1.440	98	Paved parking, HSG A
1.090	39	>75% Grass cover, Good, HSG A
0.050	74	>75% Grass cover, Good, HSG C
0.100	70	Woods, Good, HSG C
3.690	79	Weighted Average
1.290		34.96% Pervious Area
2.400		65.04% Impervious Area
0.960		40.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 22S: Resi

Runoff = 31.63 cfs @ 12.10 hrs, Volume= 2.437 af, Depth> 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
3.040	98	Unconnected roofs, HSG A
2.080	98	Paved parking, HSG A
6.250	39	>75% Grass cover, Good, HSG A
3.360	30	Woods, Good, HSG A
14.730	57	Weighted Average
9.610		65.24% Pervious Area
5.120		34.76% Impervious Area
3.040		59.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 24S: Direct to Wetlands

Runoff = 93.09 cfs @ 12.63 hrs, Volume= 14.709 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
39.340	30	Woods, Good, HSG A
2.785	39	>75% Grass cover, Good, HSG A
44.870	77	Woods, Good, HSG D
6.360	70	Woods, Good, HSG C
0.660	74	>75% Grass cover, Good, HSG C
94.015	56	Weighted Average
94.015		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	50	0.0050	0.02		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.00"
2.5	76	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	116	0.3600	3.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
41.7	242	Total			

Summary for Subcatchment PB: Building Pad B

Runoff = 56.52 cfs @ 12.09 hrs, Volume= 4.153 af, Depth> 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
	3.440	98	Unconnected roofs, HSG A
*	1.420	98	Basin, 0% imp, HSG A
	3.400	98	Paved parking, HSG A
	2.950	39	>75% Grass cover, Good, HSG A
	11.210	82	Weighted Average
	4.370		38.98% Pervious Area
	6.840		61.02% Impervious Area
	3.440		50.29% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PD: Building Pad D

Runoff = 52.58 cfs @ 12.09 hrs, Volume= 3.877 af, Depth> 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
	3.340	98	Unconnected roofs, HSG A
*	1.990	98	Basin, 0% imp, HSG A
	2.270	98	Unconnected pavement, HSG A
	2.576	39	>75% Grass cover, Good, HSG A
	0.040	74	>75% Grass cover, Good, HSG C
	10.216	83	Weighted Average
	4.606		45.09% Pervious Area
	5.610		54.91% Impervious Area
	5.610		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PE: Building Pad E

Runoff = 38.42 cfs @ 12.09 hrs, Volume= 2.995 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
2.297	98	Roofs, HSG C
2.602	98	Unconnected pavement, HSG C
1.525	74	>75% Grass cover, Good, HSG C
0.043	39	>75% Grass cover, Good, HSG A
6.467	92	Weighted Average
1.568		24.25% Pervious Area
4.899		75.75% Impervious Area
2.602		53.11% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP2: North Wetlands

Summary for Pond 10P: Pond B

Inflow Area = 17.677 ac, 66.41% Impervious, Inflow Depth > 3.35" for 100 YR event
Inflow = 57.24 cfs @ 12.09 hrs, Volume= 4.941 af
Outflow = 5.99 cfs @ 13.91 hrs, Volume= 4.289 af, Atten= 90%, Lag= 109.2 min
Discarded = 3.22 cfs @ 13.91 hrs, Volume= 3.702 af
Primary = 2.77 cfs @ 13.91 hrs, Volume= 0.586 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 383.72' @ 13.91 hrs Surf.Area= 57,752 sf Storage= 95,075 cf

Plug-Flow detention time= 229.5 min calculated for 4.280 af (87% of inflow)
Center-of-Mass det. time= 176.7 min (988.4 - 811.7)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	171,281 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
382.00	52,589	0	0
383.00	55,561	54,075	54,075
384.00	58,589	57,075	111,150
385.00	61,673	60,131	171,281

Device	Routing	Invert	Outlet Devices
#1	Discarded	382.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	380.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 380.00' / 379.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	383.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

#4	Secondary	384.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=3.22 cfs @ 13.91 hrs HW=383.72' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 3.22 cfs)

Primary OutFlow Max=2.77 cfs @ 13.91 hrs HW=383.72' (Free Discharge)
└**2=Culvert** (Passes 2.77 cfs of 29.35 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 2.77 cfs @ 1.55 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=382.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: Pond D

Inflow Area = 10.216 ac, 54.91% Impervious, Inflow Depth > 4.55" for 100 YR event
Inflow = 52.58 cfs @ 12.09 hrs, Volume= 3.877 af
Outflow = 4.43 cfs @ 13.11 hrs, Volume= 3.870 af, Atten= 92%, Lag= 61.5 min
Discarded = 4.43 cfs @ 13.11 hrs, Volume= 3.870 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 377.87' @ 13.11 hrs Surf.Area= 79,404 sf Storage= 68,207 cf

Plug-Flow detention time= 131.4 min calculated for 3.870 af (100% of inflow)
Center-of-Mass det. time= 130.3 min (933.0 - 802.7)

Volume	Invert	Avail.Storage	Storage Description
#1	377.00'	244,566 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
377.00	76,505	0	0
378.00	79,818	78,162	78,162
379.00	83,188	81,503	159,665
380.00	86,615	84,902	244,566

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	375.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 375.00' / 374.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	378.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	379.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=4.43 cfs @ 13.11 hrs HW=377.87' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 4.43 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=377.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 17P: Infil E

Inflow Area = 6.467 ac, 75.75% Impervious, Inflow Depth > 5.56" for 100 YR event
Inflow = 38.42 cfs @ 12.09 hrs, Volume= 2.995 af
Outflow = 4.69 cfs @ 12.67 hrs, Volume= 2.993 af, Atten= 88%, Lag= 35.2 min
Discarded = 1.70 cfs @ 10.20 hrs, Volume= 2.205 af
Primary = 3.00 cfs @ 12.67 hrs, Volume= 0.788 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 412.51' @ 12.67 hrs Surf.Area= 0.698 ac Storage= 1.220 af

Plug-Flow detention time= 142.3 min calculated for 2.993 af (100% of inflow)
Center-of-Mass det. time= 141.8 min (916.2 - 774.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	410.00'	0.608 af	**120.25'W x 252.82'L x 3.50'H Field A** 2.443 af Overall - 0.923 af Embedded = 1.520 af x 40.0% Voids
#2A	410.50'	0.923 af	**ADS_StormTech SC-740 +Cap** x 875 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 25 Rows of 35 Chambers
		1.531 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	411.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 411.00' / 410.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.70 cfs @ 10.20 hrs HW=410.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.70 cfs)

Primary OutFlow Max=3.00 cfs @ 12.67 hrs HW=412.51' (Free Discharge)
└**2=Culvert** (Inlet Controls 3.00 cfs @ 3.81 fps)

Summary for Pond 19P: Infil H

Inflow Area = 5.840 ac, 44.52% Impervious, Inflow Depth > 4.77" for 100 YR event
Inflow = 31.23 cfs @ 12.09 hrs, Volume= 2.323 af
Outflow = 2.77 cfs @ 13.04 hrs, Volume= 1.989 af, Atten= 91%, Lag= 56.8 min
Discarded = 1.36 cfs @ 10.60 hrs, Volume= 1.695 af
Primary = 1.40 cfs @ 13.04 hrs, Volume= 0.294 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 424.73' @ 13.04 hrs Surf.Area= 0.560 ac Storage= 1.047 af

Plug-Flow detention time= 228.4 min calculated for 1.985 af (85% of inflow)
Center-of-Mass det. time= 167.0 min (964.2 - 797.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	422.00'	0.489 af	**96.50'W x 252.82'L x 3.50'H Field A** 1.960 af Overall - 0.738 af Embedded = 1.222 af x 40.0% Voids
#2A	422.50'	0.738 af	**ADS_StormTech SC-740 +Cap** x 700 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 35 Chambers
		1.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	422.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	424.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 424.00' / 423.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.36 cfs @ 10.60 hrs HW=422.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 1.36 cfs)

Primary OutFlow Max=1.40 cfs @ 13.04 hrs HW=424.73' (Free Discharge)
↑**2=Culvert** (Inlet Controls 1.40 cfs @ 2.29 fps)

Summary for Pond 21P: Infil C

Inflow Area = 3.690 ac, 65.04% Impervious, Inflow Depth > 4.13" for 100 YR event
Inflow = 17.41 cfs @ 12.09 hrs, Volume= 1.269 af
Outflow = 2.48 cfs @ 12.64 hrs, Volume= 1.268 af, Atten= 86%, Lag= 32.7 min
Discarded = 0.98 cfs @ 11.25 hrs, Volume= 1.013 af
Primary = 1.50 cfs @ 12.64 hrs, Volume= 0.254 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 381.76' @ 12.64 hrs Surf.Area= 0.405 ac Storage= 0.494 af

Plug-Flow detention time= 127.2 min calculated for 1.268 af (100% of inflow)
Center-of-Mass det. time= 126.7 min (939.5 - 812.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	380.00'	0.355 af	**49.00'W x 359.62'L x 3.50'H Field A** 1.416 af Overall - 0.527 af Embedded = 0.889 af x 40.0% Voids
#2A	380.50'	0.527 af	**ADS_StormTech SC-740 +Cap** x 500 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Rows of 50 Chambers
		0.883 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	380.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	381.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 381.00' / 380.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.98 cfs @ 11.25 hrs HW=380.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.98 cfs)

Primary OutFlow Max=1.49 cfs @ 12.64 hrs HW=381.76' (Free Discharge)
└**2=Culvert** (Inlet Controls 1.49 cfs @ 2.34 fps)

Summary for Pond 23P: Resi Infil

Inflow Area = 14.730 ac, 34.76% Impervious, Inflow Depth > 1.99" for 100 YR event
Inflow = 31.63 cfs @ 12.10 hrs, Volume= 2.437 af
Outflow = 4.89 cfs @ 12.80 hrs, Volume= 2.434 af, Atten= 85%, Lag= 42.0 min
Discarded = 1.74 cfs @ 11.70 hrs, Volume= 1.387 af
Primary = 3.14 cfs @ 12.80 hrs, Volume= 1.046 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 411.61' @ 12.80 hrs Surf.Area= 0.718 ac Storage= 0.800 af

Plug-Flow detention time= 73.0 min calculated for 2.428 af (100% of inflow)
Center-of-Mass det. time= 72.2 min (937.1 - 865.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	410.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	410.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers
		1.575 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	410.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	410.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 410.00' / 409.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

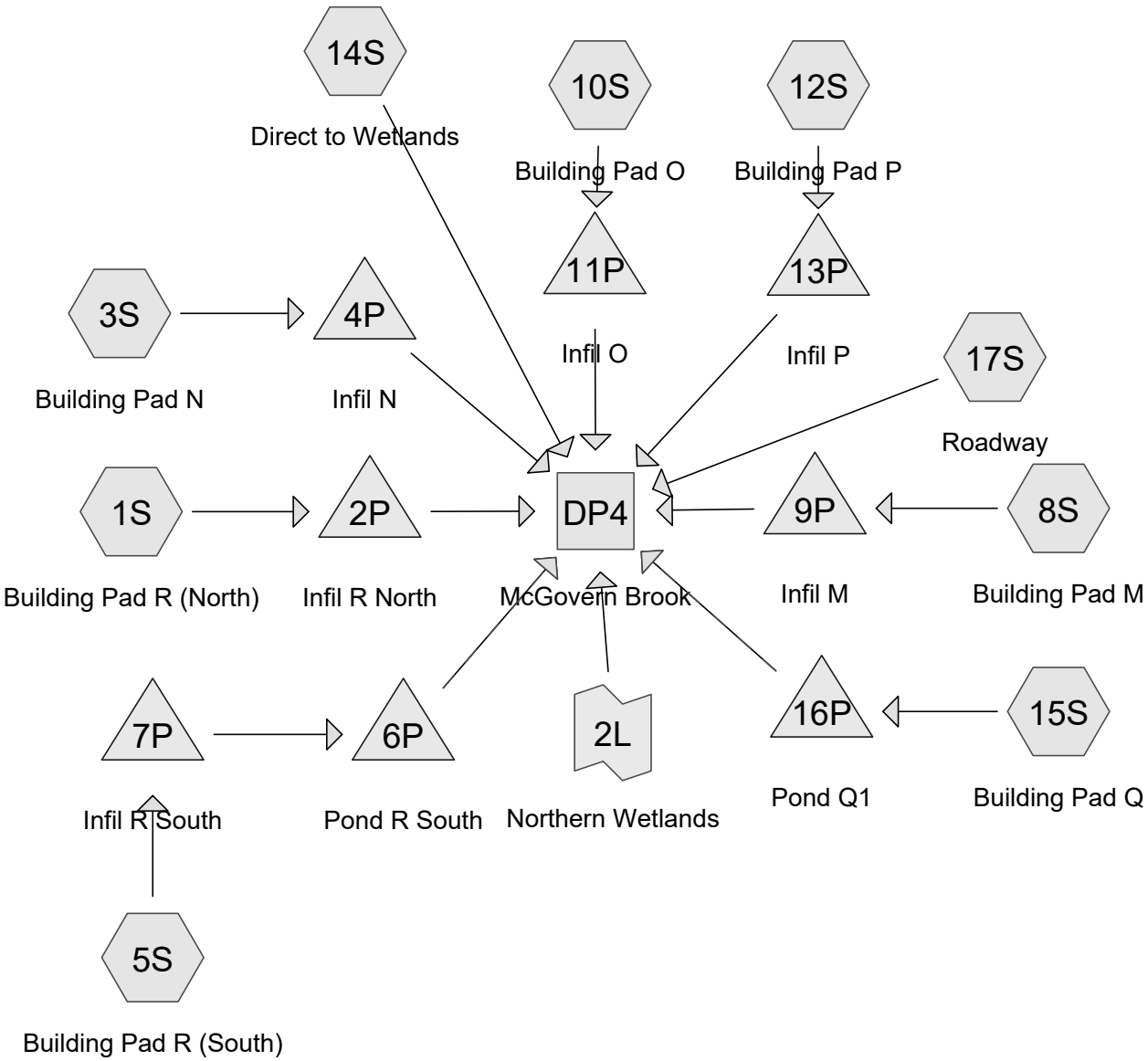
Discarded OutFlow Max=1.74 cfs @ 11.70 hrs HW=410.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=3.14 cfs @ 12.80 hrs HW=411.61' (Free Discharge)
↑**2=Culvert** (Inlet Controls 3.14 cfs @ 4.00 fps)

Summary for Link 24L: Connection to DP3

Inflow Area = 146.168 ac, 18.79% Impervious, Inflow Depth > 1.39" for 100 YR event
Inflow = 98.97 cfs @ 12.64 hrs, Volume= 16.890 af
Primary = 98.97 cfs @ 12.64 hrs, Volume= 16.890 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs



Subcat Reach Pond Link

Routing Diagram for Prop. Cond. DP3
Prepared by Bohler Engineering, Printed 11/6/2019
HydroCAD® 10.00-21 s/n 08311 © 2018 HydroCAD Software Solutions LLC

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
14.694	7.485	1.475	1.512	0.000	25.166	>75% Grass cover, Good	1S, 3S, 5S, 8S, 10S, 12S, 15S, 17S
0.145	0.000	0.000	0.000	0.000	0.145	Basin	5S
0.649	0.000	0.000	0.000	0.000	0.649	Basin, 0% imp	15S
9.816	6.937	2.387	1.967	0.000	21.107	Paved parking	1S, 3S, 5S, 8S, 10S, 12S, 15S, 17S
3.269	0.886	1.135	0.366	0.000	5.656	Roofs	1S, 3S, 5S, 8S, 10S, 12S, 15S
0.469	0.687	0.000	0.000	0.000	1.156	Unconnected roofs	3S
8.251	6.276	0.548	5.712	0.000	20.787	Woods, Good	14S
37.293	**22.271**	**5.545**	**9.557**	**0.000**	**74.666**	**TOTAL AREA**	

Summary for Subcatchment 1S: Building Pad R (North)

Runoff = 13.27 cfs @ 12.09 hrs, Volume= 0.961 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
1.167	98	Roofs, HSG A
4.004	98	Paved parking, HSG A
1.475	39	>75% Grass cover, Good, HSG A
0.002	98	Roofs, HSG D
0.333	98	Paved parking, HSG D
0.286	80	>75% Grass cover, Good, HSG D
7.267	85	Weighted Average
1.761		24.23% Pervious Area
5.506		75.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Building Pad N

Runoff = 16.58 cfs @ 12.09 hrs, Volume= 1.204 af, Depth> 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.469	98	Unconnected roofs, HSG A
1.144	98	Paved parking, HSG A
0.542	39	>75% Grass cover, Good, HSG A
0.687	98	Unconnected roofs, HSG B
1.489	98	Paved parking, HSG B
0.726	61	>75% Grass cover, Good, HSG B
0.364	98	Roofs, HSG D
1.356	98	Paved parking, HSG D
1.177	80	>75% Grass cover, Good, HSG D
7.954	88	Weighted Average
2.445		30.74% Pervious Area
5.509		69.26% Impervious Area
1.156		20.98% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Building Pad R (South)

Runoff = 7.05 cfs @ 12.10 hrs, Volume= 0.528 af, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
	0.119	98	Roofs, HSG A
	1.678	98	Paved parking, HSG A
*	0.145	98	Basin, HSG A
	1.499	39	>75% Grass cover, Good, HSG A
	0.389	98	Roofs, HSG B
	1.197	98	Paved parking, HSG B
	0.896	61	>75% Grass cover, Good, HSG B
	5.923	77	Weighted Average
	2.395		40.44% Pervious Area
	3.528		59.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 8S: Building Pad M

Runoff = 11.94 cfs @ 12.09 hrs, Volume= 0.878 af, Depth> 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.011	98	Roofs, HSG B
0.374	98	Paved parking, HSG B
0.180	61	>75% Grass cover, Good, HSG B
1.135	98	Roofs, HSG C
2.250	98	Paved parking, HSG C
1.142	74	>75% Grass cover, Good, HSG C
5.092	91	Weighted Average
1.322		25.96% Pervious Area
3.770		74.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 10S: Building Pad O

Runoff = 5.03 cfs @ 12.09 hrs, Volume= 0.364 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.369	98	Roofs, HSG B
1.309	98	Paved parking, HSG B
0.899	61	>75% Grass cover, Good, HSG B
0.024	98	Paved parking, HSG C
0.044	74	>75% Grass cover, Good, HSG C
0.062	98	Paved parking, HSG D
0.049	80	>75% Grass cover, Good, HSG D
2.756	85	Weighted Average
0.992		35.99% Pervious Area
1.764		64.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 12S: Building Pad P

Runoff = 1.97 cfs @ 12.30 hrs, Volume= 0.358 af, Depth> 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.604	98	Paved parking, HSG A
7.642	39	>75% Grass cover, Good, HSG A
0.117	98	Roofs, HSG B
2.286	98	Paved parking, HSG B
4.784	61	>75% Grass cover, Good, HSG B
0.009	98	Paved parking, HSG C
0.289	74	>75% Grass cover, Good, HSG C
15.731	58	Weighted Average
12.715		80.83% Pervious Area
3.016		19.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 14S: Direct to Wetlands

Runoff = 0.56 cfs @ 12.46 hrs, Volume= 0.221 af, Depth> 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
8.251	30	Woods, Good, HSG A
6.276	55	Woods, Good, HSG B
0.548	70	Woods, Good, HSG C
5.712	77	Woods, Good, HSG D
20.787	52	Weighted Average
20.787		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 15S: Building Pad Q

Runoff = 7.28 cfs @ 12.10 hrs, Volume= 0.570 af, Depth> 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

	Area (ac)	CN	Description
	1.983	98	Roofs, HSG A
*	0.649	98	Basin, 0% imp, HSG A
	1.908	98	Paved parking, HSG A
	3.442	39	>75% Grass cover, Good, HSG A
	7.982	73	Weighted Average
	4.091		51.25% Pervious Area
	3.891		48.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 17S: Roadway

Runoff = 3.46 cfs @ 12.00 hrs, Volume= 0.221 af, Depth> 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.00"

Area (ac)	CN	Description
0.094	39	>75% Grass cover, Good, HSG A
0.478	98	Paved parking, HSG A
0.282	98	Paved parking, HSG B
0.104	98	Paved parking, HSG C
0.216	98	Paved parking, HSG D
1.174	93	Weighted Average
0.094		8.01% Pervious Area
1.080		91.99% Impervious Area

Summary for Reach DP4: McGovern Brook

Inflow Area = 220.834 ac, 25.15% Impervious, Inflow Depth > 0.12" for 2 YR event
Inflow = 5.86 cfs @ 12.88 hrs, Volume= 2.165 af
Outflow = 5.86 cfs @ 12.88 hrs, Volume= 2.165 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Infil R North

Inflow Area = 7.267 ac, 75.77% Impervious, Inflow Depth > 1.59" for 2 YR event
Inflow = 13.27 cfs @ 12.09 hrs, Volume= 0.961 af
Outflow = 1.74 cfs @ 11.75 hrs, Volume= 0.960 af, Atten= 87%, Lag= 0.0 min
Discarded = 1.74 cfs @ 11.75 hrs, Volume= 0.960 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.79' @ 12.75 hrs Surf.Area= 0.718 ac Storage= 0.319 af

Plug-Flow detention time= 60.9 min calculated for 0.960 af (100% of inflow)
Center-of-Mass det. time= 60.3 min (888.8 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	350.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers
		1.575 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.74 cfs @ 11.75 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=350.00' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Summary for Pond 4P: Infil N

Inflow Area = 7.954 ac, 69.26% Impervious, Inflow Depth > 1.82" for 2 YR event
Inflow = 16.58 cfs @ 12.09 hrs, Volume= 1.204 af
Outflow = 0.82 cfs @ 11.25 hrs, Volume= 0.947 af, Atten= 95%, Lag= 0.0 min
Discarded = 0.82 cfs @ 11.25 hrs, Volume= 0.947 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 346.17' @ 14.91 hrs Surf.Area= 0.797 ac Storage= 0.609 af

Plug-Flow detention time= 281.9 min calculated for 0.947 af (79% of inflow)
Center-of-Mass det. time= 202.4 min (1,019.6 - 817.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	345.00'	0.693 af	**96.50'W x 359.62'L x 3.50'H Field A** 2.788 af Overall - 1.055 af Embedded = 1.734 af x 40.0% Voids
#2A	345.50'	1.055 af	**ADS_StormTech SC-740 +Cap** x 1000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 50 Chambers
		1.748 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	345.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	346.50'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.50' / 346.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.82 cfs @ 11.25 hrs HW=345.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.82 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=345.00' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Summary for Pond 6P: Pond R South

Inflow Area = 5.923 ac, 59.56% Impervious, Inflow Depth = 0.00" for 2 YR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 352.00' @ 0.00 hrs Surf.Area= 3,753 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	352.00'	14,970 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.00	3,753	0	0
353.00	4,546	4,150	4,150
354.00	5,396	4,971	9,121
355.00	6,302	5,849	14,970

Device	Routing	Invert	Outlet Devices
#1	Discarded	352.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.00' / 349.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	353.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	354.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**1=Exfiltration** (Passes 0.00 cfs of 0.21 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Infil R South

Inflow Area = 5.923 ac, 59.56% Impervious, Inflow Depth > 1.07" for 2 YR event
Inflow = 7.05 cfs @ 12.10 hrs, Volume= 0.528 af
Outflow = 1.17 cfs @ 11.85 hrs, Volume= 0.527 af, Atten= 83%, Lag= 0.0 min
Discarded = 1.17 cfs @ 11.85 hrs, Volume= 0.527 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 357.64' @ 12.66 hrs Surf.Area= 0.481 ac Storage= 0.152 af

Plug-Flow detention time= 41.8 min calculated for 0.527 af (100% of inflow)
Center-of-Mass det. time= 41.1 min (896.6 - 855.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	357.00'	0.421 af	**96.50'W x 217.22'L x 3.50'H Field A** 1.684 af Overall - 0.633 af Embedded = 1.051 af x 40.0% Voids
#2A	357.50'	0.633 af	**ADS_StormTech SC-740 +Cap** x 600 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 30 Chambers
		1.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	357.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	358.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 358.00' / 357.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.17 cfs @ 11.85 hrs HW=357.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=357.00' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Summary for Pond 9P: Infil M

Inflow Area = 5.092 ac, 74.04% Impervious, Inflow Depth > 2.07" for 2 YR event
Inflow = 11.94 cfs @ 12.09 hrs, Volume= 0.878 af
Outflow = 0.74 cfs @ 11.35 hrs, Volume= 0.864 af, Atten= 94%, Lag= 0.0 min
Discarded = 0.74 cfs @ 11.35 hrs, Volume= 0.864 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 350.92' @ 13.93 hrs Surf.Area= 0.718 ac Storage= 0.400 af

Plug-Flow detention time= 218.8 min calculated for 0.864 af (98% of inflow)
Center-of-Mass det. time= 208.9 min (1,013.3 - 804.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	350.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers

1.575 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.74 cfs @ 11.35 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.74 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=350.00' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Summary for Pond 11P: Infil O

Inflow Area = 2.756 ac, 64.01% Impervious, Inflow Depth > 1.59" for 2 YR event
Inflow = 5.03 cfs @ 12.09 hrs, Volume= 0.364 af
Outflow = 0.37 cfs @ 13.77 hrs, Volume= 0.293 af, Atten= 93%, Lag= 100.6 min
Discarded = 0.23 cfs @ 11.30 hrs, Volume= 0.256 af
Primary = 0.14 cfs @ 13.77 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 341.21' @ 13.77 hrs Surf.Area= 0.220 ac Storage= 0.173 af

Plug-Flow detention time= 257.8 min calculated for 0.292 af (80% of inflow)
Center-of-Mass det. time= 181.4 min (1,009.8 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	340.00'	0.194 af	**72.75'W x 131.78'L x 3.50'H Field A** 0.770 af Overall - 0.285 af Embedded = 0.486 af x 40.0% Voids
#2A	340.50'	0.285 af	**ADS_StormTech SC-740 +Cap** x 270 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 15 Rows of 18 Chambers
		0.479 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	340.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	341.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 341.00' / 340.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.23 cfs @ 11.30 hrs HW=340.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.14 cfs @ 13.77 hrs HW=341.21' (Free Discharge)
2=Culvert (Inlet Controls 0.14 cfs @ 1.22 fps)

Summary for Pond 13P: Infil P

Inflow Area = 15.731 ac, 19.17% Impervious, Inflow Depth > 0.27" for 2 YR event
Inflow = 1.97 cfs @ 12.30 hrs, Volume= 0.358 af
Outflow = 1.17 cfs @ 12.20 hrs, Volume= 0.357 af, Atten= 40%, Lag= 0.0 min
Discarded = 1.17 cfs @ 12.20 hrs, Volume= 0.357 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 345.13' @ 12.55 hrs Surf.Area= 0.481 ac Storage= 0.025 af

Plug-Flow detention time= 6.0 min calculated for 0.357 af (100% of inflow)
Center-of-Mass det. time= 5.0 min (947.9 - 943.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	345.00'	0.421 af	**96.50'W x 217.22'L x 3.50'H Field A** 1.684 af Overall - 0.633 af Embedded = 1.051 af x 40.0% Voids
#2A	345.50'	0.633 af	**ADS_StormTech SC-740 +Cap** x 600 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 30 Chambers
		1.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	345.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	346.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.00' / 345.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.17 cfs @ 12.20 hrs HW=345.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=345.00' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Summary for Pond 16P: Pond Q1

Inflow Area = 7.982 ac, 48.75% Impervious, Inflow Depth > 0.86" for 2 YR event
Inflow = 7.28 cfs @ 12.10 hrs, Volume= 0.570 af
Outflow = 1.02 cfs @ 12.95 hrs, Volume= 0.568 af, Atten= 86%, Lag= 50.7 min
Discarded = 1.02 cfs @ 12.95 hrs, Volume= 0.568 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 337.44' @ 12.95 hrs Surf.Area= 18,260 sf Storage= 7,800 cf

Plug-Flow detention time= 67.0 min calculated for 0.568 af (100% of inflow)
Center-of-Mass det. time= 65.4 min (934.4 - 869.0)

Volume	Invert	Avail.Storage	Storage Description
#1	337.00'	60,630 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.00	17,479	0	0
338.00	19,268	18,374	18,374
339.00	21,114	20,191	38,565
340.00	23,017	22,066	60,630

Device	Routing	Invert	Outlet Devices
#1	Discarded	337.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	335.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 335.00' / 334.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	338.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	339.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.02 cfs @ 12.95 hrs HW=337.44' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: Northern Wetlands

Inflow Area = 146.168 ac, 18.79% Impervious, Inflow Depth > 0.14" for 2 YR event
Inflow = 5.06 cfs @ 12.89 hrs, Volume= 1.686 af
Primary = 5.06 cfs @ 12.89 hrs, Volume= 1.686 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

2 YR Primary Outflow Imported from Prop Cond. 2~Link 24L.hce

Summary for Subcatchment 1S: Building Pad R (North)

Runoff = 24.12 cfs @ 12.09 hrs, Volume= 1.760 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
1.167	98	Roofs, HSG A
4.004	98	Paved parking, HSG A
1.475	39	>75% Grass cover, Good, HSG A
0.002	98	Roofs, HSG D
0.333	98	Paved parking, HSG D
0.286	80	>75% Grass cover, Good, HSG D
7.267	85	Weighted Average
1.761		24.23% Pervious Area
5.506		75.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Building Pad N

Runoff = 28.65 cfs @ 12.09 hrs, Volume= 2.117 af, Depth> 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.469	98	Unconnected roofs, HSG A
1.144	98	Paved parking, HSG A
0.542	39	>75% Grass cover, Good, HSG A
0.687	98	Unconnected roofs, HSG B
1.489	98	Paved parking, HSG B
0.726	61	>75% Grass cover, Good, HSG B
0.364	98	Roofs, HSG D
1.356	98	Paved parking, HSG D
1.177	80	>75% Grass cover, Good, HSG D
7.954	88	Weighted Average
2.445		30.74% Pervious Area
5.509		69.26% Impervious Area
1.156		20.98% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Building Pad R (South)

Runoff = 15.02 cfs @ 12.09 hrs, Volume= 1.090 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
	0.119	98	Roofs, HSG A
	1.678	98	Paved parking, HSG A
*	0.145	98	Basin, HSG A
	1.499	39	>75% Grass cover, Good, HSG A
	0.389	98	Roofs, HSG B
	1.197	98	Paved parking, HSG B
	0.896	61	>75% Grass cover, Good, HSG B
	5.923	77	Weighted Average
	2.395		40.44% Pervious Area
	3.528		59.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 8S: Building Pad M

Runoff = 19.68 cfs @ 12.09 hrs, Volume= 1.483 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.011	98	Roofs, HSG B
0.374	98	Paved parking, HSG B
0.180	61	>75% Grass cover, Good, HSG B
1.135	98	Roofs, HSG C
2.250	98	Paved parking, HSG C
1.142	74	>75% Grass cover, Good, HSG C
5.092	91	Weighted Average
1.322		25.96% Pervious Area
3.770		74.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 10S: Building Pad O

Runoff = 9.15 cfs @ 12.09 hrs, Volume= 0.668 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.369	98	Roofs, HSG B
1.309	98	Paved parking, HSG B
0.899	61	>75% Grass cover, Good, HSG B
0.024	98	Paved parking, HSG C
0.044	74	>75% Grass cover, Good, HSG C
0.062	98	Paved parking, HSG D
0.049	80	>75% Grass cover, Good, HSG D
2.756	85	Weighted Average
0.992		35.99% Pervious Area
1.764		64.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 12S: Building Pad P

Runoff = 13.36 cfs @ 12.11 hrs, Volume= 1.184 af, Depth> 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.604	98	Paved parking, HSG A
7.642	39	>75% Grass cover, Good, HSG A
0.117	98	Roofs, HSG B
2.286	98	Paved parking, HSG B
4.784	61	>75% Grass cover, Good, HSG B
0.009	98	Paved parking, HSG C
0.289	74	>75% Grass cover, Good, HSG C
15.731	58	Weighted Average
12.715		80.83% Pervious Area
3.016		19.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 14S: Direct to Wetlands

Runoff = 8.28 cfs @ 12.14 hrs, Volume= 1.025 af, Depth> 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
8.251	30	Woods, Good, HSG A
6.276	55	Woods, Good, HSG B
0.548	70	Woods, Good, HSG C
5.712	77	Woods, Good, HSG D
20.787	52	Weighted Average
20.787		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 15S: Building Pad Q

Runoff = 17.18 cfs @ 12.10 hrs, Volume= 1.260 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

	Area (ac)	CN	Description
	1.983	98	Roofs, HSG A
*	0.649	98	Basin, 0% imp, HSG A
	1.908	98	Paved parking, HSG A
	3.442	39	>75% Grass cover, Good, HSG A
	7.982	73	Weighted Average
	4.091		51.25% Pervious Area
	3.891		48.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 17S: Roadway

Runoff = 5.53 cfs @ 12.00 hrs, Volume= 0.363 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.50"

Area (ac)	CN	Description
0.094	39	>75% Grass cover, Good, HSG A
0.478	98	Paved parking, HSG A
0.282	98	Paved parking, HSG B
0.104	98	Paved parking, HSG C
0.216	98	Paved parking, HSG D
1.174	93	Weighted Average
0.094		8.01% Pervious Area
1.080		91.99% Impervious Area

Summary for Reach DP4: McGovern Brook

Inflow Area = 220.834 ac, 25.15% Impervious, Inflow Depth > 0.47" for 10 YR event
Inflow = 40.06 cfs @ 12.69 hrs, Volume= 8.689 af
Outflow = 40.06 cfs @ 12.69 hrs, Volume= 8.689 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Infil R North

Inflow Area = 7.267 ac, 75.77% Impervious, Inflow Depth > 2.91" for 10 YR event
Inflow = 24.12 cfs @ 12.09 hrs, Volume= 1.760 af
Outflow = 2.35 cfs @ 12.99 hrs, Volume= 1.759 af, Atten= 90%, Lag= 53.9 min
Discarded = 1.74 cfs @ 11.45 hrs, Volume= 1.645 af
Primary = 0.60 cfs @ 12.99 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.44' @ 12.99 hrs Surf.Area= 0.718 ac Storage= 0.707 af

Plug-Flow detention time= 135.0 min calculated for 1.759 af (100% of inflow)
Center-of-Mass det. time= 134.5 min (945.7 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	350.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers
		1.575 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.74 cfs @ 11.45 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=0.60 cfs @ 12.99 hrs HW=351.44' (Free Discharge)
2=Culvert (Inlet Controls 0.60 cfs @ 1.79 fps)

Summary for Pond 4P: Infil N

Inflow Area = 7.954 ac, 69.26% Impervious, Inflow Depth > 3.19" for 10 YR event
Inflow = 28.65 cfs @ 12.09 hrs, Volume= 2.117 af
Outflow = 1.62 cfs @ 14.12 hrs, Volume= 1.354 af, Atten= 94%, Lag= 121.5 min
Discarded = 0.82 cfs @ 10.10 hrs, Volume= 1.046 af
Primary = 0.80 cfs @ 14.12 hrs, Volume= 0.308 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 347.02' @ 14.12 hrs Surf.Area= 0.797 ac Storage= 1.134 af

Plug-Flow detention time= 261.9 min calculated for 1.351 af (64% of inflow)
Center-of-Mass det. time= 163.2 min (964.4 - 801.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	345.00'	0.693 af	**96.50'W x 359.62'L x 3.50'H Field A** 2.788 af Overall - 1.055 af Embedded = 1.734 af x 40.0% Voids
#2A	345.50'	1.055 af	**ADS_StormTech SC-740 +Cap** x 1000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 50 Chambers
		1.748 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	345.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	346.50'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.50' / 346.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.82 cfs @ 10.10 hrs HW=345.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.82 cfs)

Primary OutFlow Max=0.80 cfs @ 14.12 hrs HW=347.02' (Free Discharge)
2=Culvert (Inlet Controls 0.80 cfs @ 1.94 fps)

Summary for Pond 6P: Pond R South

Inflow Area = 5.923 ac, 59.56% Impervious, Inflow Depth = 0.13" for 10 YR event
Inflow = 0.36 cfs @ 13.05 hrs, Volume= 0.063 af
Outflow = 0.22 cfs @ 14.31 hrs, Volume= 0.063 af, Atten= 39%, Lag= 76.0 min
Discarded = 0.22 cfs @ 14.31 hrs, Volume= 0.063 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 352.18' @ 14.31 hrs Surf.Area= 3,894 sf Storage= 680 cf

Plug-Flow detention time= 34.0 min calculated for 0.063 af (100% of inflow)
Center-of-Mass det. time= 33.9 min (856.6 - 822.7)

Volume	Invert	Avail.Storage	Storage Description
#1	352.00'	14,970 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.00	3,753	0	0
353.00	4,546	4,150	4,150
354.00	5,396	4,971	9,121
355.00	6,302	5,849	14,970

Device	Routing	Invert	Outlet Devices
#1	Discarded	352.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.00' / 349.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	353.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	354.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.22 cfs @ 14.31 hrs HW=352.18' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Infil R South

Inflow Area = 5.923 ac, 59.56% Impervious, Inflow Depth > 2.21" for 10 YR event
Inflow = 15.02 cfs @ 12.09 hrs, Volume= 1.090 af
Outflow = 1.52 cfs @ 13.05 hrs, Volume= 1.089 af, Atten= 90%, Lag= 57.1 min
Discarded = 1.17 cfs @ 11.65 hrs, Volume= 1.026 af
Primary = 0.36 cfs @ 13.05 hrs, Volume= 0.063 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 358.33' @ 13.05 hrs Surf.Area= 0.481 ac Storage= 0.431 af

Plug-Flow detention time= 132.8 min calculated for 1.087 af (100% of inflow)
Center-of-Mass det. time= 131.9 min (966.0 - 834.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	357.00'	0.421 af	**96.50'W x 217.22'L x 3.50'H Field A** 1.684 af Overall - 0.633 af Embedded = 1.051 af x 40.0% Voids
#2A	357.50'	0.633 af	**ADS_StormTech SC-740 +Cap** x 600 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 30 Chambers
		1.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	357.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	358.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 358.00' / 357.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.17 cfs @ 11.65 hrs HW=357.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.17 cfs)

Primary OutFlow Max=0.36 cfs @ 13.05 hrs HW=358.33' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 0.36 cfs @ 1.55 fps)

Summary for Pond 9P: Infil M

Inflow Area = 5.092 ac, 74.04% Impervious, Inflow Depth > 3.50" for 10 YR event
Inflow = 19.68 cfs @ 12.09 hrs, Volume= 1.483 af
Outflow = 1.38 cfs @ 13.51 hrs, Volume= 1.164 af, Atten= 93%, Lag= 85.3 min
Discarded = 0.74 cfs @ 10.30 hrs, Volume= 0.951 af
Primary = 0.64 cfs @ 13.51 hrs, Volume= 0.213 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.46' @ 13.51 hrs Surf.Area= 0.718 ac Storage= 0.716 af

Plug-Flow detention time= 242.8 min calculated for 1.161 af (78% of inflow)
Center-of-Mass det. time= 165.3 min (955.2 - 789.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	350.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers

1.575 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.74 cfs @ 10.30 hrs HW=350.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.74 cfs)

Primary OutFlow Max=0.64 cfs @ 13.51 hrs HW=351.46' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.64 cfs @ 1.82 fps)

Summary for Pond 11P: Infil O

Inflow Area = 2.756 ac, 64.01% Impervious, Inflow Depth > 2.91" for 10 YR event
Inflow = 9.15 cfs @ 12.09 hrs, Volume= 0.668 af
Outflow = 1.88 cfs @ 12.53 hrs, Volume= 0.556 af, Atten= 79%, Lag= 26.2 min
Discarded = 0.23 cfs @ 10.15 hrs, Volume= 0.283 af
Primary = 1.66 cfs @ 12.53 hrs, Volume= 0.273 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 341.81' @ 12.53 hrs Surf.Area= 0.220 ac Storage= 0.277 af

Plug-Flow detention time= 168.4 min calculated for 0.555 af (83% of inflow)
Center-of-Mass det. time= 100.5 min (911.7 - 811.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	340.00'	0.194 af	**72.75'W x 131.78'L x 3.50'H Field A** 0.770 af Overall - 0.285 af Embedded = 0.486 af x 40.0% Voids
#2A	340.50'	0.285 af	**ADS_StormTech SC-740 +Cap** x 270 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 15 Rows of 18 Chambers
		0.479 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	340.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	341.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 341.00' / 340.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.23 cfs @ 10.15 hrs HW=340.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=1.65 cfs @ 12.53 hrs HW=341.81' (Free Discharge)
2=Culvert (Inlet Controls 1.65 cfs @ 2.42 fps)

Summary for Pond 13P: Infil P

Inflow Area = 15.731 ac, 19.17% Impervious, Inflow Depth > 0.90" for 10 YR event
Inflow = 13.36 cfs @ 12.11 hrs, Volume= 1.184 af
Outflow = 1.49 cfs @ 14.01 hrs, Volume= 1.183 af, Atten= 89%, Lag= 113.8 min
Discarded = 1.17 cfs @ 11.95 hrs, Volume= 1.102 af
Primary = 0.32 cfs @ 14.01 hrs, Volume= 0.080 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 346.32' @ 14.01 hrs Surf.Area= 0.481 ac Storage= 0.424 af

Plug-Flow detention time= 151.9 min calculated for 1.180 af (100% of inflow)
Center-of-Mass det. time= 150.7 min (1,041.0 - 890.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	345.00'	0.421 af	**96.50'W x 217.22'L x 3.50'H Field A** 1.684 af Overall - 0.633 af Embedded = 1.051 af x 40.0% Voids
#2A	345.50'	0.633 af	**ADS_StormTech SC-740 +Cap** x 600 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 30 Chambers
		1.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	345.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	346.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.00' / 345.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.17 cfs @ 11.95 hrs HW=345.06' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.17 cfs)

Primary OutFlow Max=0.32 cfs @ 14.01 hrs HW=346.32' (Free Discharge)
2=Culvert (Inlet Controls 0.32 cfs @ 1.51 fps)

Summary for Pond 16P: Pond Q1

Inflow Area = 7.982 ac, 48.75% Impervious, Inflow Depth > 1.89" for 10 YR event
Inflow = 17.18 cfs @ 12.10 hrs, Volume= 1.260 af
Outflow = 1.11 cfs @ 14.51 hrs, Volume= 1.145 af, Atten= 94%, Lag= 144.8 min
Discarded = 1.11 cfs @ 14.51 hrs, Volume= 1.145 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 338.37' @ 14.51 hrs Surf.Area= 19,945 sf Storage= 25,562 cf

Plug-Flow detention time= 248.5 min calculated for 1.143 af (91% of inflow)
Center-of-Mass det. time= 203.7 min (1,048.4 - 844.8)

Volume	Invert	Avail.Storage	Storage Description
#1	337.00'	60,630 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.00	17,479	0	0
338.00	19,268	18,374	18,374
339.00	21,114	20,191	38,565
340.00	23,017	22,066	60,630

Device	Routing	Invert	Outlet Devices
#1	Discarded	337.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	335.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 335.00' / 334.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	338.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	339.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.11 cfs @ 14.51 hrs HW=338.37' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**2=Culvert** (Passes 0.00 cfs of 16.00 cfs potential flow)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: Northern Wetlands

Inflow Area = 146.168 ac, 18.79% Impervious, Inflow Depth > 0.52" for 10 YR event
Inflow = 33.87 cfs @ 12.70 hrs, Volume= 6.314 af
Primary = 33.87 cfs @ 12.70 hrs, Volume= 6.314 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

10 YR Primary Outflow Imported from Prop Cond. 2~Link 24L.hce

Summary for Subcatchment 1S: Building Pad R (North)

Runoff = 30.01 cfs @ 12.09 hrs, Volume= 2.206 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
1.167	98	Roofs, HSG A
4.004	98	Paved parking, HSG A
1.475	39	>75% Grass cover, Good, HSG A
0.002	98	Roofs, HSG D
0.333	98	Paved parking, HSG D
0.286	80	>75% Grass cover, Good, HSG D
7.267	85	Weighted Average
1.761		24.23% Pervious Area
5.506		75.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Building Pad N

Runoff = 35.10 cfs @ 12.09 hrs, Volume= 2.619 af, Depth> 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.469	98	Unconnected roofs, HSG A
1.144	98	Paved parking, HSG A
0.542	39	>75% Grass cover, Good, HSG A
0.687	98	Unconnected roofs, HSG B
1.489	98	Paved parking, HSG B
0.726	61	>75% Grass cover, Good, HSG B
0.364	98	Roofs, HSG D
1.356	98	Paved parking, HSG D
1.177	80	>75% Grass cover, Good, HSG D
7.954	88	Weighted Average
2.445		30.74% Pervious Area
5.509		69.26% Impervious Area
1.156		20.98% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Building Pad R (South)

Runoff = 19.58 cfs @ 12.09 hrs, Volume= 1.418 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
	0.119	98	Roofs, HSG A
	1.678	98	Paved parking, HSG A
*	0.145	98	Basin, HSG A
	1.499	39	>75% Grass cover, Good, HSG A
	0.389	98	Roofs, HSG B
	1.197	98	Paved parking, HSG B
	0.896	61	>75% Grass cover, Good, HSG B
	5.923	77	Weighted Average
	2.395		40.44% Pervious Area
	3.528		59.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 8S: Building Pad M

Runoff = 23.78 cfs @ 12.09 hrs, Volume= 1.812 af, Depth> 4.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.011	98	Roofs, HSG B
0.374	98	Paved parking, HSG B
0.180	61	>75% Grass cover, Good, HSG B
1.135	98	Roofs, HSG C
2.250	98	Paved parking, HSG C
1.142	74	>75% Grass cover, Good, HSG C
5.092	91	Weighted Average
1.322		25.96% Pervious Area
3.770		74.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 10S: Building Pad O

Runoff = 11.38 cfs @ 12.09 hrs, Volume= 0.837 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.369	98	Roofs, HSG B
1.309	98	Paved parking, HSG B
0.899	61	>75% Grass cover, Good, HSG B
0.024	98	Paved parking, HSG C
0.044	74	>75% Grass cover, Good, HSG C
0.062	98	Paved parking, HSG D
0.049	80	>75% Grass cover, Good, HSG D
2.756	85	Weighted Average
0.992		35.99% Pervious Area
1.764		64.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 12S: Building Pad P

Runoff = 21.60 cfs @ 12.10 hrs, Volume= 1.751 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.604	98	Paved parking, HSG A
7.642	39	>75% Grass cover, Good, HSG A
0.117	98	Roofs, HSG B
2.286	98	Paved parking, HSG B
4.784	61	>75% Grass cover, Good, HSG B
0.009	98	Paved parking, HSG C
0.289	74	>75% Grass cover, Good, HSG C
15.731	58	Weighted Average
12.715		80.83% Pervious Area
3.016		19.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 14S: Direct to Wetlands

Runoff = 17.14 cfs @ 12.11 hrs, Volume= 1.627 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
8.251	30	Woods, Good, HSG A
6.276	55	Woods, Good, HSG B
0.548	70	Woods, Good, HSG C
5.712	77	Woods, Good, HSG D
20.787	52	Weighted Average
20.787		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 15S: Building Pad Q

Runoff = 23.02 cfs @ 12.09 hrs, Volume= 1.673 af, Depth> 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

	Area (ac)	CN	Description
	1.983	98	Roofs, HSG A
*	0.649	98	Basin, 0% imp, HSG A
	1.908	98	Paved parking, HSG A
	3.442	39	>75% Grass cover, Good, HSG A
	7.982	73	Weighted Average
	4.091		51.25% Pervious Area
	3.891		48.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 17S: Roadway

Runoff = 6.63 cfs @ 12.00 hrs, Volume= 0.440 af, Depth> 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.30"

Area (ac)	CN	Description
0.094	39	>75% Grass cover, Good, HSG A
0.478	98	Paved parking, HSG A
0.282	98	Paved parking, HSG B
0.104	98	Paved parking, HSG C
0.216	98	Paved parking, HSG D
1.174	93	Weighted Average
0.094		8.01% Pervious Area
1.080		91.99% Impervious Area

Summary for Reach DP4: McGovern Brook

Inflow Area = 220.834 ac, 25.15% Impervious, Inflow Depth > 0.79" for 25 YR event
Inflow = 71.51 cfs @ 12.66 hrs, Volume= 14.465 af
Outflow = 71.51 cfs @ 12.66 hrs, Volume= 14.465 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Infil R North

Inflow Area = 7.267 ac, 75.77% Impervious, Inflow Depth > 3.64" for 25 YR event
Inflow = 30.01 cfs @ 12.09 hrs, Volume= 2.206 af
Outflow = 3.30 cfs @ 12.85 hrs, Volume= 2.205 af, Atten= 89%, Lag= 45.3 min
Discarded = 1.74 cfs @ 11.20 hrs, Volume= 1.867 af
Primary = 1.56 cfs @ 12.85 hrs, Volume= 0.338 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.78' @ 12.85 hrs Surf.Area= 0.718 ac Storage= 0.894 af

Plug-Flow detention time= 143.7 min calculated for 2.200 af (100% of inflow)
Center-of-Mass det. time= 142.9 min (947.6 - 804.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	350.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers
		1.575 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.74 cfs @ 11.20 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=1.56 cfs @ 12.85 hrs HW=351.78' (Free Discharge)
2=Culvert (Inlet Controls 1.56 cfs @ 2.37 fps)

Summary for Pond 4P: Infil N

Inflow Area = 7.954 ac, 69.26% Impervious, Inflow Depth > 3.95" for 25 YR event
Inflow = 35.10 cfs @ 12.09 hrs, Volume= 2.619 af
Outflow = 2.71 cfs @ 13.28 hrs, Volume= 1.793 af, Atten= 92%, Lag= 71.3 min
Discarded = 0.82 cfs @ 9.45 hrs, Volume= 1.089 af
Primary = 1.89 cfs @ 13.28 hrs, Volume= 0.705 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 347.40' @ 13.28 hrs Surf.Area= 0.797 ac Storage= 1.339 af

Plug-Flow detention time= 237.1 min calculated for 1.790 af (68% of inflow)
Center-of-Mass det. time= 144.0 min (939.3 - 795.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	345.00'	0.693 af	**96.50'W x 359.62'L x 3.50'H Field A** 2.788 af Overall - 1.055 af Embedded = 1.734 af x 40.0% Voids
#2A	345.50'	1.055 af	**ADS_StormTech SC-740 +Cap** x 1000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 50 Chambers
		1.748 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	345.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	346.50'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.50' / 346.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.82 cfs @ 9.45 hrs HW=345.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.82 cfs)

Primary OutFlow Max=1.89 cfs @ 13.28 hrs HW=347.40' (Free Discharge)
2=Culvert (Inlet Controls 1.89 cfs @ 2.55 fps)

Summary for Pond 6P: Pond R South

Inflow Area = 5.923 ac, 59.56% Impervious, Inflow Depth = 0.49" for 25 YR event
Inflow = 1.25 cfs @ 12.81 hrs, Volume= 0.243 af
Outflow = 0.35 cfs @ 15.39 hrs, Volume= 0.243 af, Atten= 72%, Lag= 154.6 min
Discarded = 0.28 cfs @ 15.39 hrs, Volume= 0.239 af
Primary = 0.07 cfs @ 15.39 hrs, Volume= 0.003 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 353.52' @ 15.39 hrs Surf.Area= 4,985 sf Storage= 6,610 cf

Plug-Flow detention time= 244.0 min calculated for 0.242 af (100% of inflow)
Center-of-Mass det. time= 244.0 min (1,071.7 - 827.7)

Volume	Invert	Avail.Storage	Storage Description
#1	352.00'	14,970 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.00	3,753	0	0
353.00	4,546	4,150	4,150
354.00	5,396	4,971	9,121
355.00	6,302	5,849	14,970

Device	Routing	Invert	Outlet Devices
#1	Discarded	352.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.00' / 349.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	353.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	354.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.28 cfs @ 15.39 hrs HW=353.52' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.05 cfs @ 15.39 hrs HW=353.52' (Free Discharge)
└**2=Culvert** (Passes 0.05 cfs of 28.09 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 0.05 cfs @ 0.42 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Infil R South

Inflow Area = 5.923 ac, 59.56% Impervious, Inflow Depth > 2.87" for 25 YR event
Inflow = 19.58 cfs @ 12.09 hrs, Volume= 1.418 af
Outflow = 2.42 cfs @ 12.81 hrs, Volume= 1.417 af, Atten= 88%, Lag= 43.0 min
Discarded = 1.17 cfs @ 11.40 hrs, Volume= 1.174 af
Primary = 1.25 cfs @ 12.81 hrs, Volume= 0.243 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 358.68' @ 12.81 hrs Surf.Area= 0.481 ac Storage= 0.560 af

Plug-Flow detention time= 137.8 min calculated for 1.417 af (100% of inflow)
Center-of-Mass det. time= 137.2 min (963.7 - 826.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	357.00'	0.421 af	**96.50'W x 217.22'L x 3.50'H Field A** 1.684 af Overall - 0.633 af Embedded = 1.051 af x 40.0% Voids
#2A	357.50'	0.633 af	**ADS_StormTech SC-740 +Cap** x 600 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 30 Chambers
		1.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	357.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	358.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 358.00' / 357.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.17 cfs @ 11.40 hrs HW=357.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.17 cfs)

Primary OutFlow Max=1.25 cfs @ 12.81 hrs HW=358.68' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 1.25 cfs @ 2.21 fps)

Summary for Pond 9P: Infil M

Inflow Area = 5.092 ac, 74.04% Impervious, Inflow Depth > 4.27" for 25 YR event
Inflow = 23.78 cfs @ 12.09 hrs, Volume= 1.812 af
Outflow = 2.12 cfs @ 13.00 hrs, Volume= 1.433 af, Atten= 91%, Lag= 54.9 min
Discarded = 0.74 cfs @ 9.70 hrs, Volume= 0.989 af
Primary = 1.38 cfs @ 13.00 hrs, Volume= 0.444 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 351.72' @ 13.00 hrs Surf.Area= 0.718 ac Storage= 0.862 af

Plug-Flow detention time= 222.8 min calculated for 1.430 af (79% of inflow)
Center-of-Mass det. time= 146.7 min (931.2 - 784.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	350.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers

1.575 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.74 cfs @ 9.70 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.74 cfs)

Primary OutFlow Max=1.38 cfs @ 13.00 hrs HW=351.72' (Free Discharge)
2=Culvert (Inlet Controls 1.38 cfs @ 2.28 fps)

Summary for Pond 11P: Infil O

Inflow Area = 2.756 ac, 64.01% Impervious, Inflow Depth > 3.64" for 25 YR event
Inflow = 11.38 cfs @ 12.09 hrs, Volume= 0.837 af
Outflow = 2.73 cfs @ 12.49 hrs, Volume= 0.712 af, Atten= 76%, Lag= 23.9 min
Discarded = 0.23 cfs @ 9.55 hrs, Volume= 0.295 af
Primary = 2.51 cfs @ 12.49 hrs, Volume= 0.417 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 342.20' @ 12.49 hrs Surf.Area= 0.220 ac Storage= 0.338 af

Plug-Flow detention time= 146.3 min calculated for 0.712 af (85% of inflow)
Center-of-Mass det. time= 82.6 min (887.4 - 804.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	340.00'	0.194 af	**72.75'W x 131.78'L x 3.50'H Field A** 0.770 af Overall - 0.285 af Embedded = 0.486 af x 40.0% Voids
#2A	340.50'	0.285 af	**ADS_StormTech SC-740 +Cap** x 270 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 15 Rows of 18 Chambers
		0.479 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	340.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	341.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 341.00' / 340.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.23 cfs @ 9.55 hrs HW=340.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=2.50 cfs @ 12.49 hrs HW=342.20' (Free Discharge)
2=Culvert (Inlet Controls 2.50 cfs @ 3.19 fps)

Summary for Pond 13P: Infil P

Inflow Area = 15.731 ac, 19.17% Impervious, Inflow Depth > 1.34" for 25 YR event
Inflow = 21.60 cfs @ 12.10 hrs, Volume= 1.751 af
Outflow = 2.91 cfs @ 13.05 hrs, Volume= 1.672 af, Atten= 87%, Lag= 56.8 min
Discarded = 1.17 cfs @ 11.80 hrs, Volume= 1.196 af
Primary = 1.74 cfs @ 13.05 hrs, Volume= 0.476 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 346.84' @ 13.05 hrs Surf.Area= 0.481 ac Storage= 0.621 af

Plug-Flow detention time= 159.2 min calculated for 1.672 af (95% of inflow)
Center-of-Mass det. time= 135.4 min (1,011.9 - 876.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	345.00'	0.421 af	**96.50'W x 217.22'L x 3.50'H Field A** 1.684 af Overall - 0.633 af Embedded = 1.051 af x 40.0% Voids
#2A	345.50'	0.633 af	**ADS_StormTech SC-740 +Cap** x 600 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 30 Chambers
		1.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	345.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	346.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.00' / 345.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.17 cfs @ 11.80 hrs HW=345.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.17 cfs)

Primary OutFlow Max=1.74 cfs @ 13.05 hrs HW=346.84' (Free Discharge)
2=Culvert (Inlet Controls 1.74 cfs @ 2.47 fps)

Summary for Pond 16P: Pond Q1

Inflow Area = 7.982 ac, 48.75% Impervious, Inflow Depth > 2.52" for 25 YR event
Inflow = 23.02 cfs @ 12.09 hrs, Volume= 1.673 af
Outflow = 2.74 cfs @ 12.90 hrs, Volume= 1.421 af, Atten= 88%, Lag= 48.4 min
Discarded = 1.14 cfs @ 12.90 hrs, Volume= 1.210 af
Primary = 1.60 cfs @ 12.90 hrs, Volume= 0.212 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 338.66' @ 12.90 hrs Surf.Area= 20,477 sf Storage= 31,391 cf

Plug-Flow detention time= 232.3 min calculated for 1.419 af (85% of inflow)
Center-of-Mass det. time= 167.3 min (1,003.8 - 836.5)

Volume	Invert	Avail.Storage	Storage Description
#1	337.00'	60,630 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.00	17,479	0	0
338.00	19,268	18,374	18,374
339.00	21,114	20,191	38,565
340.00	23,017	22,066	60,630

Device	Routing	Invert	Outlet Devices
#1	Discarded	337.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	335.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 335.00' / 334.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	338.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	339.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.14 cfs @ 12.90 hrs HW=338.66' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.14 cfs)

Primary OutFlow Max=1.60 cfs @ 12.90 hrs HW=338.66' (Free Discharge)
└**2=Culvert** (Passes 1.60 cfs of 28.94 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 1.60 cfs @ 1.29 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: Northern Wetlands

Inflow Area = 146.168 ac, 18.79% Impervious, Inflow Depth > 0.80" for 25 YR event
Inflow = 57.03 cfs @ 12.66 hrs, Volume= 9.805 af
Primary = 57.03 cfs @ 12.66 hrs, Volume= 9.805 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

25 YR Primary Outflow Imported from Prop Cond. 2~Link 24L.hce

Summary for Subcatchment 1S: Building Pad R (North)

Runoff = 38.86 cfs @ 12.09 hrs, Volume= 2.890 af, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
1.167	98	Roofs, HSG A
4.004	98	Paved parking, HSG A
1.475	39	>75% Grass cover, Good, HSG A
0.002	98	Roofs, HSG D
0.333	98	Paved parking, HSG D
0.286	80	>75% Grass cover, Good, HSG D
7.267	85	Weighted Average
1.761		24.23% Pervious Area
5.506		75.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Building Pad N

Runoff = 44.75 cfs @ 12.09 hrs, Volume= 3.384 af, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.469	98	Unconnected roofs, HSG A
1.144	98	Paved parking, HSG A
0.542	39	>75% Grass cover, Good, HSG A
0.687	98	Unconnected roofs, HSG B
1.489	98	Paved parking, HSG B
0.726	61	>75% Grass cover, Good, HSG B
0.364	98	Roofs, HSG D
1.356	98	Paved parking, HSG D
1.177	80	>75% Grass cover, Good, HSG D
7.954	88	Weighted Average
2.445		30.74% Pervious Area
5.509		69.26% Impervious Area
1.156		20.98% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 5S: Building Pad R (South)

Runoff = 26.62 cfs @ 12.09 hrs, Volume= 1.933 af, Depth> 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
	0.119	98	Roofs, HSG A
	1.678	98	Paved parking, HSG A
*	0.145	98	Basin, HSG A
	1.499	39	>75% Grass cover, Good, HSG A
	0.389	98	Roofs, HSG B
	1.197	98	Paved parking, HSG B
	0.896	61	>75% Grass cover, Good, HSG B
	5.923	77	Weighted Average
	2.395		40.44% Pervious Area
	3.528		59.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 8S: Building Pad M

Runoff = 29.89 cfs @ 12.09 hrs, Volume= 2.310 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.011	98	Roofs, HSG B
0.374	98	Paved parking, HSG B
0.180	61	>75% Grass cover, Good, HSG B
1.135	98	Roofs, HSG C
2.250	98	Paved parking, HSG C
1.142	74	>75% Grass cover, Good, HSG C
5.092	91	Weighted Average
1.322		25.96% Pervious Area
3.770		74.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 10S: Building Pad O

Runoff = 14.74 cfs @ 12.09 hrs, Volume= 1.096 af, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.369	98	Roofs, HSG B
1.309	98	Paved parking, HSG B
0.899	61	>75% Grass cover, Good, HSG B
0.024	98	Paved parking, HSG C
0.044	74	>75% Grass cover, Good, HSG C
0.062	98	Paved parking, HSG D
0.049	80	>75% Grass cover, Good, HSG D
2.756	85	Weighted Average
0.992		35.99% Pervious Area
1.764		64.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 12S: Building Pad P

Runoff = 35.61 cfs @ 12.10 hrs, Volume= 2.718 af, Depth> 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.604	98	Paved parking, HSG A
7.642	39	>75% Grass cover, Good, HSG A
0.117	98	Roofs, HSG B
2.286	98	Paved parking, HSG B
4.784	61	>75% Grass cover, Good, HSG B
0.009	98	Paved parking, HSG C
0.289	74	>75% Grass cover, Good, HSG C
15.731	58	Weighted Average
12.715		80.83% Pervious Area
3.016		19.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 14S: Direct to Wetlands

Runoff = 32.73 cfs @ 12.11 hrs, Volume= 2.698 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
8.251	30	Woods, Good, HSG A
6.276	55	Woods, Good, HSG B
0.548	70	Woods, Good, HSG C
5.712	77	Woods, Good, HSG D
20.787	52	Weighted Average
20.787		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 15S: Building Pad Q

Runoff = 32.19 cfs @ 12.09 hrs, Volume= 2.331 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

	Area (ac)	CN	Description
	1.983	98	Roofs, HSG A
*	0.649	98	Basin, 0% imp, HSG A
	1.908	98	Paved parking, HSG A
	3.442	39	>75% Grass cover, Good, HSG A
	7.982	73	Weighted Average
	4.091		51.25% Pervious Area
	3.891		48.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 17S: Roadway

Runoff = 8.26 cfs @ 12.00 hrs, Volume= 0.555 af, Depth> 5.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=6.50"

Area (ac)	CN	Description
0.094	39	>75% Grass cover, Good, HSG A
0.478	98	Paved parking, HSG A
0.282	98	Paved parking, HSG B
0.104	98	Paved parking, HSG C
0.216	98	Paved parking, HSG D
1.174	93	Weighted Average
0.094		8.01% Pervious Area
1.080		91.99% Impervious Area

Summary for Reach DP4: McGovern Brook

Inflow Area = 220.834 ac, 25.15% Impervious, Inflow Depth > 1.41" for 100 YR event
Inflow = 129.24 cfs @ 12.59 hrs, Volume= 26.000 af
Outflow = 129.24 cfs @ 12.59 hrs, Volume= 26.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Infil R North

Inflow Area = 7.267 ac, 75.77% Impervious, Inflow Depth > 4.77" for 100 YR event
Inflow = 38.86 cfs @ 12.09 hrs, Volume= 2.890 af
Outflow = 4.54 cfs @ 12.76 hrs, Volume= 2.888 af, Atten= 88%, Lag= 40.2 min
Discarded = 1.74 cfs @ 10.65 hrs, Volume= 2.135 af
Primary = 2.79 cfs @ 12.76 hrs, Volume= 0.753 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 352.37' @ 12.76 hrs Surf.Area= 0.718 ac Storage= 1.195 af

Plug-Flow detention time= 149.9 min calculated for 2.882 af (100% of inflow)
Center-of-Mass det. time= 149.0 min (946.3 - 797.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	350.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers
		1.575 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.74 cfs @ 10.65 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.74 cfs)

Primary OutFlow Max=2.79 cfs @ 12.76 hrs HW=352.37' (Free Discharge)
2=Culvert (Inlet Controls 2.79 cfs @ 3.55 fps)

Summary for Pond 4P: Infil N

Inflow Area = 7.954 ac, 69.26% Impervious, Inflow Depth > 5.10" for 100 YR event
Inflow = 44.75 cfs @ 12.09 hrs, Volume= 3.384 af
Outflow = 4.32 cfs @ 12.93 hrs, Volume= 2.493 af, Atten= 90%, Lag= 50.8 min
Discarded = 0.82 cfs @ 8.75 hrs, Volume= 1.143 af
Primary = 3.50 cfs @ 12.93 hrs, Volume= 1.349 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 348.37' @ 12.93 hrs Surf.Area= 0.797 ac Storage= 1.708 af

Plug-Flow detention time= 221.0 min calculated for 2.493 af (74% of inflow)
Center-of-Mass det. time= 134.6 min (922.9 - 788.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	345.00'	0.693 af	**96.50'W x 359.62'L x 3.50'H Field A** 2.788 af Overall - 1.055 af Embedded = 1.734 af x 40.0% Voids
#2A	345.50'	1.055 af	**ADS_StormTech SC-740 +Cap** x 1000 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 50 Chambers
		1.748 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	345.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	346.50'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.50' / 346.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.82 cfs @ 8.75 hrs HW=345.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.82 cfs)

Primary OutFlow Max=3.50 cfs @ 12.93 hrs HW=348.37' (Free Discharge)
2=Culvert (Inlet Controls 3.50 cfs @ 4.46 fps)

Summary for Pond 6P: Pond R South

Inflow Area = 5.923 ac, 59.56% Impervious, Inflow Depth = 1.19" for 100 YR event
Inflow = 2.62 cfs @ 12.65 hrs, Volume= 0.587 af
Outflow = 2.32 cfs @ 13.37 hrs, Volume= 0.568 af, Atten= 12%, Lag= 43.4 min
Discarded = 0.29 cfs @ 13.37 hrs, Volume= 0.256 af
Primary = 2.03 cfs @ 13.37 hrs, Volume= 0.312 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 353.68' @ 13.37 hrs Surf.Area= 5,126 sf Storage= 7,447 cf

Plug-Flow detention time= 125.5 min calculated for 0.567 af (97% of inflow)
Center-of-Mass det. time= 119.4 min (953.9 - 834.5)

Volume	Invert	Avail.Storage	Storage Description
#1	352.00'	14,970 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
352.00	3,753	0	0
353.00	4,546	4,150	4,150
354.00	5,396	4,971	9,121
355.00	6,302	5,849	14,970

Device	Routing	Invert	Outlet Devices
#1	Discarded	352.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	350.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 350.00' / 349.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	353.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	354.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.29 cfs @ 13.37 hrs HW=353.68' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.29 cfs)

Primary OutFlow Max=2.03 cfs @ 13.37 hrs HW=353.68' (Free Discharge)
└**2=Culvert** (Passes 2.03 cfs of 29.10 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 2.03 cfs @ 1.39 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=352.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Infil R South

Inflow Area = 5.923 ac, 59.56% Impervious, Inflow Depth > 3.92" for 100 YR event
Inflow = 26.62 cfs @ 12.09 hrs, Volume= 1.933 af
Outflow = 3.79 cfs @ 12.65 hrs, Volume= 1.931 af, Atten= 86%, Lag= 33.2 min
Discarded = 1.17 cfs @ 11.05 hrs, Volume= 1.344 af
Primary = 2.62 cfs @ 12.65 hrs, Volume= 0.587 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 359.27' @ 12.65 hrs Surf.Area= 0.481 ac Storage= 0.767 af

Plug-Flow detention time= 135.9 min calculated for 1.931 af (100% of inflow)
Center-of-Mass det. time= 135.3 min (953.0 - 817.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	357.00'	0.421 af	**96.50'W x 217.22'L x 3.50'H Field A** 1.684 af Overall - 0.633 af Embedded = 1.051 af x 40.0% Voids
#2A	357.50'	0.633 af	**ADS_StormTech SC-740 +Cap** x 600 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 30 Chambers
		1.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	357.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	358.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 358.00' / 357.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.17 cfs @ 11.05 hrs HW=357.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.17 cfs)

Primary OutFlow Max=2.62 cfs @ 12.65 hrs HW=359.27' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 2.62 cfs @ 3.34 fps)

Summary for Pond 9P: Infil M

Inflow Area = 5.092 ac, 74.04% Impervious, Inflow Depth > 5.44" for 100 YR event
Inflow = 29.89 cfs @ 12.09 hrs, Volume= 2.310 af
Outflow = 3.18 cfs @ 12.82 hrs, Volume= 1.869 af, Atten= 89%, Lag= 43.7 min
Discarded = 0.74 cfs @ 9.00 hrs, Volume= 1.038 af
Primary = 2.45 cfs @ 12.82 hrs, Volume= 0.831 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 352.17' @ 12.82 hrs Surf.Area= 0.718 ac Storage= 1.098 af

Plug-Flow detention time= 205.1 min calculated for 1.865 af (81% of inflow)
Center-of-Mass det. time= 132.7 min (910.9 - 778.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	350.00'	0.626 af	**144.00'W x 217.22'L x 3.50'H Field A** 2.513 af Overall - 0.949 af Embedded = 1.564 af x 40.0% Voids
#2A	350.50'	0.949 af	**ADS_StormTech SC-740 +Cap** x 900 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 30 Rows of 30 Chambers

1.575 af Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	350.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	351.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 351.00' / 350.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.74 cfs @ 9.00 hrs HW=350.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.74 cfs)

Primary OutFlow Max=2.44 cfs @ 12.82 hrs HW=352.17' (Free Discharge)
2=Culvert (Inlet Controls 2.44 cfs @ 3.11 fps)

Summary for Pond 11P: Infil O

Inflow Area = 2.756 ac, 64.01% Impervious, Inflow Depth > 4.77" for 100 YR event
Inflow = 14.74 cfs @ 12.09 hrs, Volume= 1.096 af
Outflow = 3.94 cfs @ 12.46 hrs, Volume= 0.957 af, Atten= 73%, Lag= 22.0 min
Discarded = 0.23 cfs @ 8.80 hrs, Volume= 0.310 af
Primary = 3.71 cfs @ 12.46 hrs, Volume= 0.647 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 343.04' @ 12.46 hrs Surf.Area= 0.220 ac Storage= 0.439 af

Plug-Flow detention time= 128.1 min calculated for 0.957 af (87% of inflow)
Center-of-Mass det. time= 71.0 min (868.2 - 797.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	340.00'	0.194 af	**72.75'W x 131.78'L x 3.50'H Field A** 0.770 af Overall - 0.285 af Embedded = 0.486 af x 40.0% Voids
#2A	340.50'	0.285 af	**ADS_StormTech SC-740 +Cap** x 270 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 15 Rows of 18 Chambers
		0.479 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	340.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	341.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 341.00' / 340.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=0.23 cfs @ 8.80 hrs HW=340.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=3.71 cfs @ 12.46 hrs HW=343.04' (Free Discharge)
2=Culvert (Inlet Controls 3.71 cfs @ 4.72 fps)

Summary for Pond 13P: Infil P

Inflow Area = 15.731 ac, 19.17% Impervious, Inflow Depth > 2.07" for 100 YR event
Inflow = 35.61 cfs @ 12.10 hrs, Volume= 2.718 af
Outflow = 5.09 cfs @ 12.87 hrs, Volume= 2.492 af, Atten= 86%, Lag= 46.2 min
Discarded = 1.17 cfs @ 11.55 hrs, Volume= 1.235 af
Primary = 3.92 cfs @ 12.87 hrs, Volume= 1.258 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 348.22' @ 12.87 hrs Surf.Area= 0.481 ac Storage= 1.000 af

Plug-Flow detention time= 147.3 min calculated for 2.487 af (91% of inflow)
Center-of-Mass det. time= 106.0 min (968.3 - 862.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	345.00'	0.421 af	**96.50'W x 217.22'L x 3.50'H Field A** 1.684 af Overall - 0.633 af Embedded = 1.051 af x 40.0% Voids
#2A	345.50'	0.633 af	**ADS_StormTech SC-740 +Cap** x 600 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 20 Rows of 30 Chambers
		1.053 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	345.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	346.00'	**12.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.00' / 345.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Discarded OutFlow Max=1.17 cfs @ 11.55 hrs HW=345.04' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.17 cfs)

Primary OutFlow Max=3.92 cfs @ 12.87 hrs HW=348.22' (Free Discharge)
2=Culvert (Inlet Controls 3.92 cfs @ 4.99 fps)

Summary for Pond 16P: Pond Q1

Inflow Area = 7.982 ac, 48.75% Impervious, Inflow Depth > 3.50" for 100 YR event
Inflow = 32.19 cfs @ 12.09 hrs, Volume= 2.331 af
Outflow = 9.29 cfs @ 12.46 hrs, Volume= 1.984 af, Atten= 71%, Lag= 22.0 min
Discarded = 1.17 cfs @ 12.46 hrs, Volume= 1.279 af
Primary = 8.12 cfs @ 12.46 hrs, Volume= 0.705 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 338.96' @ 12.46 hrs Surf.Area= 21,037 sf Storage= 37,685 cf

Plug-Flow detention time= 176.1 min calculated for 1.980 af (85% of inflow)
Center-of-Mass det. time= 112.2 min (939.2 - 826.9)

Volume	Invert	Avail.Storage	Storage Description
#1	337.00'	60,630 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
337.00	17,479	0	0
338.00	19,268	18,374	18,374
339.00	21,114	20,191	38,565
340.00	23,017	22,066	60,630

Device	Routing	Invert	Outlet Devices
#1	Discarded	337.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	335.00'	**30.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 335.00' / 334.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#3	Device 2	338.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	339.00'	**20.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=1.17 cfs @ 12.46 hrs HW=338.96' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.17 cfs)

Primary OutFlow Max=8.08 cfs @ 12.46 hrs HW=338.96' (Free Discharge)
└**2=Culvert** (Passes 8.08 cfs of 30.70 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 8.08 cfs @ 2.21 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=337.00' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: Northern Wetlands

Inflow Area = 146.168 ac, 18.79% Impervious, Inflow Depth > 1.39" for 100 YR event
Inflow = 98.97 cfs @ 12.64 hrs, Volume= 16.890 af
Primary = 98.97 cfs @ 12.64 hrs, Volume= 16.890 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

100 YR Primary Outflow Imported from Prop Cond. 2~Link 24L.hce

APPENDIX F: OPERATION AND MAINTENANCE

- *STORMWATER OPERATION AND MAINTENACE PLAN*
- *INSPECTION REPORT*
- *INSPECTION AND MAINTENANCE LOG FORM*
- *LONG-TERM POLLUTION PREVENTION PLAN*
- *ILLICIT DISCHARGE STATEMENT*
- *SPILL PREVENTION*

STORMWATER OPERATION AND MAINTENANCE PLAN

Capital Group Properties
259 Turnpike Rd, Suite 100
Southborough, MA 01772

RESPONSIBLE PARTY DURING CONSTRUCTION:

Capital Group Properties
259 Turnpike Rd, Suite 100
Southborough, MA 01772

RESPONSIBLE PARTY POST CONSTRUCTION:

Capital Group Properties
259 Turnpike Rd, Suite 100
Southborough, MA 01772

Construction Phase

During the construction phase, all erosion control devices and measures shall be maintained in accordance with the final record plans, local/state approvals and conditions, the EPA Construction General Permit and the Stormwater Pollution Prevention Plan (SWPPP) if applicable. Additionally, the maintenance of all erosion / siltation control measures during construction shall be the responsibility of the general contractor. Contact information of the OWNER and CONTRACTOR shall be listed in the SWPPP for this site. The SWPPP also includes information regarding construction period allowable and illicit discharges, housekeeping and emergency response procedures. Upon proper notice to the property owner, the Town/City or its authorized designee shall be allowed to enter the property at a reasonable time and in a reasonable manner for the purposes of inspection.

Post Development Controls

Once construction is completed, the post development stormwater controls are to be operated and maintained in compliance with the following permanent procedures (note that the continued implementation of these procedures shall be the responsibility of the Owner or its assignee):

1. Parking lots and on-site driveways: Sweep at least twice (2) times per year and on a more frequent basis depending on sanding operations]. All resulting sweepings shall be collected and properly disposed of off site in accordance with MADEP and other applicable requirements.

2. Catch basins, yard drains, trench drains, manholes and piping: Inspect two (2) times per year and at the end of foliage and snow-removal. These features shall be cleaned two (2) times per year]. or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the catch basin or underground system. Accumulated sediment and hydrocarbons present must be removed and properly disposed of off site in accordance with MADEP and other applicable requirements.

3. Infiltration Basin: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months. Mow the buffer area, side slopes and basin bottom if grassed floor, rake if stone or sand bottom, remove trash and debris, remove grass clippings and accumulated organic matter. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements.

4. Underground Infiltration Basins: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months. The outlet of the basin, if any, shall be inspected for erosion and sedimentation, and rip-rap shall be promptly repaired in the case of erosion. Sediment collecting in the bottom of the basin shall be inspected twice annually, and removal shall commence any time the sediment reaches a depth of six inches anywhere in the basin. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements.

5. Forebays: The sediment forebay areas shall be inspected once per month to ensure they are operating as intended and that all components are stable and in working order. Inspections shall be by qualified personnel. During the growing season, the forebay shall be mowed at least twice, with additional cuttings performed as needed. All vegetation (i.e. tree saplings) will be removed from embankments and the forebay bottom. The inlet to the forebay shall be inspected for erosion and sedimentation, and rip-rap shall be promptly repaired as needed. Sediment forebays shall be cleaned quarterly and when sediment depth reaches half the height of the stone weir, or three to six feet, whichever is less. After sediment is removed, replace any vegetation damaged during the clean out by either reseeding or re-sodding. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements.

6. Oil/Grit Separators: Cleaning includes removal of accumulated oil and grease and sediment using a vacuum truck or other ordinary catch basin cleaning device. In areas of high sediment loading, inspect and clean inlets after every major storm. At a minimum, inspect oil grit separators monthly, and clean them out at least twice per year. Polluted water or sediments removed from an oil grit separator should be disposed of in accordance with all applicable local, state, and federal laws and regulations.

STORMWATER MANAGEMENT SYSTEM

POST-CONSTRUCTION INSPECTION REPORT

LOCATION:

Capital Commerce Center
McGovern Boulevard
Lancaster, Massachusetts

RESPONSIBLE PARTY:

Capital Group Properties
259 Turnpike Rd, Suite 100
Southborough, MA 01772

NAME OF INSPECTOR:	INSPECTION DATE:
Note Condition of the Following (sediment depth, debris, standing water, damage, etc.):	
Catch Basins:	
Discharge Points/ Flared End Sections / Rip Rap:	
Infiltration Basin:	
Water Quality Units:	
Other:	

Note Recommended Actions to be taken on the Following (sediment and/or debris removal, repairs, etc.):
Catch Basins:
Discharge Points / Flared End Sections / Rip Rap:
Infiltration Basin:
Water Quality Units:
Other:
Other:
Comments:

STORMWATER INSPECTION AND MAINTENANCE LOG FORM

Capital Croup Properties
McGovern Boulevard – Lancaster, MA

Stormwater Management Practice	Responsible Party	Date	Maintenance Activity Performed

LONG-TERM POLLUTION PREVENTION PLAN

Capital Group Properties
259 Turnpike Rd, Suite 100
Southborough, MA 01772

RESPONSIBLE PARTY DURING CONSTRUCTION:

Capital Group Properties
259 Turnpike Rd, Suite 100
Southborough, MA 01772

RESPONSIBLE PARTY POST CONSTRUCTION:

Capital Group Properties
259 Turnpike Rd, Suite 100
Southborough, MA 01772

For this site, the Long-Term Pollution Prevention Plan will consist of the following:

- No outdoor maintenance or washing of vehicles allowed.
- The property owner shall be responsible for "good housekeeping" including proper periodic maintenance of building and pavement areas, curbing, landscaping, etc.
- Proper storage and removal of solid waste (dumpsters).
- Sweeping of driveways a minimum of twice per year with a commercial cleaning unit. Any sediment removed shall be disposed of in accordance with applicable local and state requirements.
- Regular inspections and maintenance of Stormwater Management System as noted in the "O&M Plan".
- Snow removal shall be the responsibility of the property owner. Snow shall not be plowed, dumped and/or placed in forebays, infiltration basins or similar stormwater controls. Salting and/or sanding of pavement / walkway areas during winter conditions shall only be done in accordance with all state/local requirements and approvals.

OPERATON AND MAINTENANCE TRAINING PROGRAM

The Owner will coordinate an annual in-house training session to discuss the Operations and Maintenance Plan, the Long-Term Pollution Prevention Plan, and the Spill Prevention Plan and response procedures. Annual training will include the following:

Discuss the Operations and Maintenance Plan

- Explain the general operations of the stormwater management system and its BMPs
- Identify potential sources of stormwater pollution and measures / methods of reducing or eliminating that pollution
- Emphasize good housekeeping measures

Discuss the Spill Prevention and Response Procedures

- Explain the process in the event of a spill
- Identify potential sources of spills and procedures for cleanup and /or reporting and notification
- Complete a yearly inventory or Materials Safety Data sheets of all tenants and confirm that no potentially harmful chemicals are in use.
- Trash and other debris shall be removed from all areas of the site at least twice yearly.
- Reseed any bare areas as soon as they occur. Erosion control measures shall be installed in these areas to prevent deposits of sediment from entering the drainage system.
- Grass shall be maintained at a minimum blade height of two to three inches and only 1/3 of the plant height shall be removed at a time.
- Plants shall be pruned as necessary.
- The use of fertilizers will be kept at a level consistent with typical residential use. Fertilizer will be applied a maximum of once to twice per year during the initial planting and stabilization of landscaped areas. Once plants are established and growing well fertilizer will be applied judiciously.
- The use of pesticides will be kept at a level consistent with typical residential use. Where possible mechanical methods (i.e. pest traps) or biological methods (i.e. beneficial insects) of pest control shall be implemented. If pesticides (insecticide, herbicide, and fungicide) are required to be used, a pesticide which poses the lowest risk to public health and the environment shall be used.

- Pet waste shall be disposed of in accordance with local regulations. Pet waste shall not be disposed of in a storm drain or catch basin.

- Homeowners will be encouraged to implement the following methods when washing vehicles: Use soap sparingly, use a hose nozzle with a trigger to save water, and pour the bucket of soapy water down the sink when done and not in the street or when possible use a commercial car wash.

- Snow piles shall be located adjacent to or on pervious surfaces in upland areas. This will allow snow melt water to filter in to the soil, leaving behind sand and debris which can be removed in the springtime.

- In no case shall snow be disposed of or stored in resource areas (wetlands, floodplain, streams or other water bodies).

- In no case shall snow be disposed of or stored in the detention basins, infiltration basins or bioretention areas.

- If necessary, stockpiled snow will be removed from the Site and disposed of at an off-site location in accordance with all local, state and federal regulations.

- The amount of sand and deicing chemicals shall be kept at the minimum amount required to provide safe pedestrian and vehicle travel.

- Sand and deicing chemicals should be stockpiled under covered storage facilities that prevent precipitation and adjacent runoff from coming in contact with the deicing materials. Stockpile areas shall be located outside resource areas.

- The primary agents used for deicing at parking lots, sidewalks and the access roads shall consist of salt alternatives such as calcium carbonate ($CaCO3$) or potassium chloride (KCl) or sodium chloride.

ILLICIT DISCHARGE STATEMENT

Certain types of non-stormwater discharges are allowed under the U.S. Environmental Protection Agency Construction General Permit. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this LTPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. Any existing illicit discharges, if discovered during the course of the work, will be reported to MassDEP and the local DPW, as applicable, to be addressed in accordance with their respective policies. No illicit discharges will be allowed in conjunction with the proposed improvements.

SPILL PREVENTION AND RESPONSE PROCEDURES (POST CONSTRUCTION)

In order to prevent or minimize the potential for a spill of Hazardous Substances or Oil or come into contact with stormwater, the following steps will be implemented:

1. All Hazardous Substances or Oil (such as pesticides, petroleum products, fertilizers, detergents, acids, paints, paint solvents, cleaning solvents, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.

2. The minimum practical quantity of all such materials will be kept on site.

3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided on site.

4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

5. It is the OWNER's responsibility to ensure that all Hazardous Waste on site is disposed of properly by a licensed hazardous material disposal company. The OWNER is responsible for not exceeding Hazardous Waste storage requirements mandated by the EPA or state and local authorities.

In the event of a spill of Hazardous Substances or Oil, the following procedures should be followed:

1. All measures should be taken to contain and abate the spill and to prevent the discharge of the Hazardous Substance or Oil to stormwater or off-site. (The spill area should be kept well ventilated and personnel should wear appropriate protective clothing to prevent injury from contact with the Hazardous Substances.)

2. For spills of less than five (5) gallons of material, proceed with source control and containment, clean-up with absorbent materials or other applicable means unless an imminent hazard or other circumstances dictate that the spill should be treated by a professional emergency response contractor.

3. For spills greater than five (5) gallons of material immediately contact the MADEP at the toll-free 24-hour statewide emergency number: **1-888-304-1133**, the local fire department (**9-1-1**) and an approved emergency response contractor. Provide information on the type of material spilled, the location of the spill, the quantity spilled, and the time of the spill to the emergency response contractor or coordinator, and proceed with prevention, containment and/or clean-up if so desired. (Use the form provided, or similar).

4. If there is a Reportable Quantity (RQ) release, then the National Response Center should be notified immediately at (800) 424-8802; within 14 days a report should be submitted to the EPA regional office describing the release, the date and circumstances of the release and the steps taken to prevent another release. This Pollution Prevention Plan should be updated to reflect any such steps or actions taken and measures to prevent the same from reoccurring.

SPILL PREVENTION CONTROL AND COUNTERMEASURE FORM

Capital Group Properties
259 Turnpike Rd, Suite 100
Southborough, MA 01772

Where a release containing a hazardous substance occurs, the following steps shall be taken by the facility manager and/or supervisor:

1. Immediately notify The Lancaster Fire Department (at **9-1-1**)

2. All measures must be taken to contain and abate the spill and to prevent the discharge of the pollutant(s) to off-site locations, receiving waters, wetlands and/or resource areas.

3. Notify the Lancaster Health Department at (978) 365-3326 and the Lancaster Conservation Commission at (978) 365-3326.

4. Provide documentation from licensed contractor showing disposal and cleanup procedures were completed as well as details on chemicals that were spilled to the City of Lancaster Health Department and Conservation Commission.

Date of spill:_____ Time:_____ Reported By:_____

Weather Conditions:_____

Material Spilled	**Location of Spill**	**Approximate Quantity of Spill (in gallons)**	**Agency(s) Notified**	**Date of Notification**

Cause of Spill:_____

_____

Measures Taken to Clean up Spill:_____

_____

Type of equipment: _____ Make: _____ Size:_____

License or S/N: _____

Location and Method of Disposal_____

_____

Procedures, method, and precautions instituted to prevent a similar occurrence from recurring:_____

_____

Additional Contact Numbers:

- DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) EMERGENCY PHONE: 1-888-304-1133
- NATIONAL RESPONSE CENTER PHONE: (800) 424-8802
- U.S. ENVIRONMENTAL PROTECTION AGENCYPHONE: (888) 372-7341

APPENDIX I: DRAFT CONSTRUCTION MANAGENT PLAN

- Draft Construction Management Plan (Prepared by Bohler Engineering, dated November 15, 2019)

Construction Management Plan
Capital Commerce Center

McGovern Blvd. & Lunenburg Road
Lancaster, MA
Worcester County



Prepared for:
Capital Group Properties

Prepared by:
BOHLER ENGINEERING
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

November 15, 2019 W181228

Introduction

The project site (the "Site") is located off McGovern Boulevard and Lunenburg Road, in the Town of Lancaster, consisting of approximately 471± acres of land. As shown on the Town Assessor's Maps, the Site is identified as:

Map No. 8, Lots	38, 38D, 38F, 38G, 38H, 39, 39A, 39B, 39C, 42 & 45;
Map No. 9, Lots	2, 5, 8A;
Map No. 13, Lots	2, 3, 4, 7, 8; and
Map No. 14, Lots	1, 2, 3, 3A, 3B, 4, 4A, 4B, 4C, 4D, 4F, 4GA, 4GB, 4H, 4I, 4J, 4K, 4L, 4M, 8, 8A, 8B, 9D, 11A, 12, 13, Parcels B-2, B-4, & 9.

The Site is bordered by woods, wetlands, and residences to the north, Route 190 to the west, woods, wetlands and the North Nashua River to the south, and Lunenburg Road and Kimball Farm to the east. A portion of the Site to the east was recently developed as part of the Lancaster Crossing development project with a Dunkin', Mobil Gas Station, and soccer fields (F.C. Stars Soccer Complex) with associated driveways, parking areas, utilities, and stormwater management systems. McGovern Boulevard was constructed as the main access point to the Site and to access the Lancaster Crossing development from Lunenburg Road. The existing JB Hunt Trucking facility remains in the eastern portion of the Site with access from Lunenburg Road. A portion of the Site to the west, located off Johnny Appleseed Lane, consists of an existing residence, horse barn, horse track, and associated parking areas and utilities, as well as undeveloped areas consisting of woods and fields. A small piece of land on the westernmost edge of the Site is located within the Town line in Leominster. The remaining portion of the overall Site consists of a gravel pit and gravel access roads, as well as undeveloped fields, woodland, and wetlands. A small parcel of land, located in the central portion of the Site, is land-locked and is not included as part of the Project.

The development will consist of the construction the primary access road (extension of McGovern Boulevard) with associated utility and stormwater infrastructure concurrent with the construction of the water line extension and wastewater treatment plant. Individual lots will be created off the proposed roadways for the development of various uses. The development of each lot will also include the construction of onsite driveways, utilities, stormwater infrastructure, landscaping and site appurtenances to serve the various uses. This Construction Management Plan (CMP) will highlight several key items associated with the construction of the project.

The project will be subject to and adhere to the requirements of the EPA Construction General Permit (CGP) and Multi-Sector General Permit (MSGP). A full Stormwater Pollution Prevention Plan (SWPPP) in compliance with the CGP will be prepared prior to construction.

The project will also be subject to Orders of Conditions issued by the Lancaster Conservation Commission. Portions of the water main construction in Lunenburg will also require an NOI with the Lunenburg Conservation Commission. If the Order of Conditions has more stringent requirements than what is listed herein, the more stringent requirements will take precedent.

Start Work Notice

Prior to the start of any construction related activity, the Contractor shall provide the Town of Lancaster Building Department, Engineering Department, and Conservation Commission with the contact name and phone number of the full time Project Manager and on-site Superintendent assigned to this project. The Superintendent must be a full-time individual who will be on site for the entire duration of construction.

Should there be a change in the construction management team assigned, the contractor shall notify in writing to the Town of Lancaster Building Department, Engineering Department, and Conservation Commission.

Pre-Construction Meeting

Prior to the start of any construction related activity, the Contractor is required to schedule and hold a pre-construction meeting on site. The pre-construction meeting shall include, but not be limited to, representatives from the Town of Lancaster Building Department, Engineering Department and Conservation Commission as well as the Architect, Engineer and the Project Proponent. The purpose of the pre-construction meeting is to review and understand the site permit conditions imposed on the project, construction schedule, and address comments received from the Town representatives.

Site Mobilization

Prior to construction survey crews will establish controls so the various units, roadways and other infrastructure within the area of development. Once control is established the crews will lay out the limits of clearing and perimeter erosion controls (straw bales and silt fence). Once these items are established perimeter erosion controls within the 100-foot buffer will be inspected by the Lancaster Conservation Commission or their assigned representative and some site clearing will commence. Any existing buildings on-site that are proposed to remain for any period of time will be properly secured.

At the start of construction, a temporary construction office trailer will be set up. The trailer will serve as the operations center for the day to day construction activities.

Construction Phasing

The project is anticipated to occur in several phases. These phases are generally described below and further outlined on the enclosed Construction Phasing Plan.

The project is projected to be built out in several phases:

- Phase 1: Construction of the retail and recreational components already constructed, including Dunkin', Mobil Gas Station and F.C. Stars Soccer Complex;

- Phase 2: Construction of the primary access road (extension of McGovern Boulevard) concurrent with construction of the water line extension and wastewater treatment plant. This phase would likely include abandonment of the existing water and sewer infrastructure that currently serves Dunkin' and Mobil Gas, as well as connections to the new water infrastructure;

- Phase 3: Construction of the Automotive Sales and Service Facility (Use "F"), as well as industrial uses "B" & D";

- Future phases: as previously mentioned, subsequent phases will be determined based on market demand.

The overall phasing outlined herein is intended to provide a general indication of the expected order of construction. Final phasing may vary depending upon final tenant needs.

It is anticipated that each sub-phase of construction shall occur in the following order:

- Satisfy all pre-construction conditions of applicable federal, state, and local permits.
- Notify the Lancaster Conservation Commission prior to commencing work within 100 feet of any bordering vegetated wetland, isolated vegetated wetland, or water body or as otherwise indicated within the Order of Conditions.
- Install temporary construction office/trailer.
- An up-to-date copy of the Stormwater Pollution Prevention Plan (SWPPP) shall be maintained in the construction office and a sign or other notice shall be posted conspicuously outdoors near the construction office in accordance with the CGP.
- Complete installation of perimeter erosion control devices.
- Cut and remove trees intended for removal within phase area. The number of trees cut and removed at one time shall be kept to the minimum amount required for construction.
- Remove stumps.
- Commence earthwork operations including any blasting that may be required. Initial earthwork priorities shall include construction of stormwater basins, any areas to be used as temporary settling basins or other temporary stormwater collection/settling areas, and temporary diversion swales.
- Commence building construction as soon as allowed by Town.
- Throughout the duration of construction, provide stormwater control and treatment, and provide temporary stabilization measures for disturbed areas in accordance with the requirements of the CGP and this Construction Management Plan.
- Establish intended subgrade and simultaneously commence installation of underground utilities and stormwater infrastructure in areas where subgrade has been achieved.
- Spread and compact road base and place binder course of pavement as roadway utilities are completed.
- Upon placement of binder course, provide temporary curb/berm (or permanent curb/berm to the extent feasible or required) to direct street runoff to the catch basins.
- Establish permanent ground cover/stabilization in areas where final grade has been achieved and all other construction activities have been completed.
- Upon permanent stabilization of the respective tributary areas, finalize stormwater management areas. Remove any accumulated sediment, establish final grades, provide final surface treatment and stabilization, and install the permanent outlet structures.
- Plantings in established areas shall be completed per landscaping plans.
- Install final pavement.
- Remove perimeter erosion controls only after all paving is complete and exposed surfaces are stabilized.

The project is anticipated to have a five (5) year build out depending upon final tenant needs.

Earthwork

Earth disturbing activities shall be kept to the minimum amount required for each phase of construction, including those required for the transport and stockpile of materials between phases. The Operator shall only engage in earth disturbing activities that can be adequately controlled and protected as further outlined within this CMP.

The majority of the existing land area is an active gravel pit and based upon existing soils information the amount of ledge to be encountered on site is anticipated to be minimal. Should ledge be encountered, removal will be managed in accordance with all Local, State and Federal regulations.

Construction Operations

Below is a list of general construction operations and procedures to be followed throughout the course of construction.

Construction Hours: Hours of construction will be consistent with those required by the Town of Lancaster.

Erosion Controls: The selection, installation, and maintenance of soil erosion and sediment control BMPs must use good engineering practices and follow manufacturer's specifications. The Contractor shall install all storm water controls in accordance with good engineering practices, including applicable design specifications. All temporary sediment and erosion control measures will be repaired or replaced in compliance with the NPDES SWPPP.

At a minimum, all erosion and sediment control practices should be installed and maintained to the standards set forth in the SWPPP and in the site engineering plans. Areas that will not be paved or covered with non-erosive material should be stabilized using procedures in substantial conformance with the SWPPP and site engineering plans. The installation of any additional erosion and sediment control measures will be completed as necessary to minimize erosion and sedimentation.

The appropriate soil erosion and sediment controls should be implemented on site and modified to reflect the current phase of construction. Erosion controls should be the primary BMPs implemented and maintained onsite, with sediment control implemented as the secondary BMP. The following erosion and sediment controls are anticipated to be used during construction:

- Minimization of Disturbed Areas and Preservation of Existing Vegetative Buffers
- Erosion Control Blankets
- Minimize Soil Compaction
- Preservation of Topsoil
- Sediment Basins
- Storm Drain Inlet Protection
- Straw bales and silt fence
- Stabilized Channels / Diversion Swales
- Stone Check Dams
- Earth Dikes
- Dust suppression

Detailed Erosion and Sediment Control Plans will be included as part of the final construction documents.

Stabilization Controls: A fundamental principal for preventing erosion and controlling sedimentation is to minimize the extent of land disturbance. For areas where disturbances cannot be avoided, rapid stabilization of the surface is the most

effective method of controlling erosion. Areas that are disturbed during construction activity must be stabilized as soon as practicable. A land surface that is stabilized resists the erosive action of storm water runoff.

The Contractor will initiate soil stabilization measures whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site. Earth-disturbing activities have permanently ceased when clearing and excavation within any area of the construction site that will not include permanent structures has been completed. Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation within any area of the site that will not include permanent structures will not resume (i.e., the land will be idle) for a period of seven (7) or more calendar days, but such activities will resume in the future.

The seven (7) calendar day timeframe begins as soon as the Contractor knows that construction work on a portion of the site will temporarily cease. For the purposes of this project, the Contractor shall consider any of the following types of activities to constitute the initiation of stabilization, this list is not exhaustive:

- Prepping the soil for vegetative or non-vegetative stabilization;
- Applying mulch or other non-vegetative product to the exposed area;
- Seeding or planting the exposed area;
- Starting any of the activities in #1 – 3 on a portion of the area to be stabilized, but not on the entire area; and
- Finalizing arrangements to have stabilization product fully installed in compliance with the applicable deadline for completing stabilization in Parts 2.2.1.2 and 2.2.1.3 of the CGP.

Temporary vegetative cover may be established using hydro seeding for areas of exposed soil where construction will cease for more than seven (7) days. Hydroseeding may consist of wood fibers, seed, polymers and /or stabilizing emulsion. A record of the dates when major grading activities occur, when construction activities cease on a portion of the site, and when stabilization measures are initiated are to be included in the SWPPP.

Stockpiled Material: Topsoil and borrow stripped from the site or other onsite processed material shall be stockpiled in areas that will not interfere with construction phases and will be maintained at least fifteen (15) feet away from areas of concentrated flows or pavement. A silt fence (or equivalent) shall be installed around the perimeter of each stockpile. Soil stockpiles should be stabilized in accordance with soil stabilization controls outlined herein.

Anti-Tracking: The Site shall be managed to minimize the amount of dirt, mud, or dust that is generated and can thus be tracked or blown off the site. The Contractor shall provide stabilized construction entrance(s) to reduce off-site tracking, and if necessary a stabilized entrance will be installed at individual lots. The stabilized exits shall be constructed in accordance with the details on the approved plans and the SWPPP.

Maintenance may include top dressing the stabilized entrance with additional stone and removing top layers of stone and sediment, as needed. Vehicles hauling erodible material to and from the construction site should be covered with a tarp. If necessary, rumble strips and wheel wash shall be used in problem areas with fine grained soils or where off-site tracking cannot be controlled by a stabilized construction entrance and sweeping alone.

All dirt and/or debris tracked or transported to off-site paved surfaces shall be removed as needed by hand sweeping or mechanized sweeper. Washing of sediment from the right-of-way to downstream conveyances shall be prohibited.

Solid Waste Management: The project will comply with all applicable Federal, State and local requirements regarding the handling, recycling, and disposal of solid waste generated by the project. To the extent feasible, demolition materials will be segregated on site for reuse or disposal. This recycling will help to reduce greenhouse gases produced by the project.

Construction materials that can be recycled (brick, concrete, gypsum wallboard, wood, metal and asphalt roofing) will be separated and taken to a recycling facility or mixed materials will be delivered directly to a C&D processor based on cost effectiveness of the recycling method. Any materials that cannot be recycled will be processed as noted below.

Solid waste materials including trash, construction debris, excess construction materials, machinery, tools and other items will be collected and disposed of offsite. The trade/contractor is responsible to acquire the permit required for such disposal. Burning on site will not be permitted. No solid materials, including building materials, shall be discharged to Waters of the State, except as authorized by a Section 404 permit. All waste materials should be collected and stored in approved receptacles. No wastes should be placed in any location other than in the approved containers appropriate for the materials being discarded. There should be no liquid wastes deposited into dumpsters or other containers which may leak. Receptacles with deficiencies should be replaced as soon as possible and the appropriate clean-up procedure should take place, if necessary. Construction waste material is not to be buried on site.

Hazardous materials and all other material on site should be stored in accordance with manufacturer or Material Safety Data Sheet (MSDS) specifications. When disposing of hazardous materials, follow manufacturer, local, or State recommended methods.

Collection and disposal of solid waste during construction will be provided by a licensed contractor. The private contractor will obtain any necessary permits for removal and transport of rubbish from the Town of Shrewsbury.

It is expected that cleanup on on-site debris will be conducted on at least a weekly basis. At the very least, the clean-up should occur by 12:00 pm Friday every week.

Sanitary Waste:

To the extent practicable, portable sanitary stations should be located in an area that does not drain to any protected natural areas, Waters of the State, or storm water structures and should be anchored to the ground to prevent against tipping over, if necessary. Portable sanitary stations located on impervious surfaces should be placed on top of a secondary containment device, or be surrounded by a control device (e.g., gravel-bag berm). Contractors should not create or allow unsanitary conditions. Sanitary waste should be disposed of in accordance with applicable State and/or local regulations.

Portable toilets service will be provided by a licensed contractor.

Dewatering:

The Contractor is prohibited from discharging ground water or accumulated storm water that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, unless such waters are first effectively managed by appropriate controls. Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control. During de-watering/pumping operations, only uncontaminated water should be allowed to discharge to protected natural areas, Waters of the State, or to a storm sewer system (in accordance with local permits). Inlet hoses should be placed in a stabilized sump pit or floated at the surface of the water in order to limit the amount of sediment intake. Pumping operations may be discharged to a stabilized area with a sediment filter bag. The Contractor shall also meet the following requirements for dewatering activities:

- Do not discharge visible floating solids or foam;
- Use an oil-water separator or suitable filtration device (such as a cartridge filter) that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials;
- To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area;
- At all points where dewatering water is discharged, comply with the velocity dissipation requirements;
- With backwash water, either haul it away for disposal or return it to the beginning of the treatment process; and
- Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

Maintenance of BMPs:

The inspection and maintenance of the erosion and sediment control measures (BMPs) is critical to their effectiveness. Maintenance will be an ongoing process for the duration of construction and will continue until the site has been deemed stabilized. As required by the NPDES CGP, the erosion and sediment control measures will be inspected at regular intervals and repairs will be made as required. The contractor will be required to maintain a log book documenting the contractor's observations during inspection and documenting any corrective actions made to the erosion control BMPs.

Throughout the duration of construction, the contractor will be required to have an on-site supply of additional straw bales to replace those that become damaged or deteriorated. Any erosion and sediment control measures that, upon inspection, are found to be damaged, deteriorated or not functioning properly will be repaired, replaced or corrected immediately after inspection.

Air Quality Control:

Air Pollution Control is regulated by MassDEP through 310 CMR 7.09 – Dust, Odor, Construction and Demolition. All construction and demolition for this project shall comply with these regulations.

Fugitive dust is particulate matter that is generated from the natural or mechanical disturbance of soil and rock. Fugitive dust emissions will be generated during building demolition, site preparation, excavation operations, and the related onsite vehicle traffic. Generation of fugitive dust will depend upon the specific types of operations, the silt and moisture content of the soil, local meteorological conditions (i.e. wind speed and precipitation amounts), and emission controls.

Site preparation activities will consist of demolition of buildings, removal of top and sub soils, placement and compaction of fill material to bring the site to elevations, and associated site construction. Dust mitigation measures shall be implemented on site as necessary. Repetitive treatment shall be applied as needed to accomplish control when temporary dust control measures are used. At least one mobile unit should be available to distribute water to control dust on the project area. Each mobile unit will be equipped with a positive shutoff valve to prevent over watering. If field observations indicate that additional protection from wind erosion (in addition to, or in place of watering) is necessary, alternative dust suppressant controls should be implemented. The following list of control measures may be implemented on site to limit the generation of dust as needed:

- Provide wet suppression to minimize the generation of dust from demolition activities, excavation operations and on site vehicle traffic.
- Cover loads on construction vehicles hauling materials to and from the site.
- Cover tops of stockpiles and /or temporarily stabilize in accordance with the SWPPP
- Monitor construction means and methods to ensure disturbed areas are minimized and disturbed areas are stabilized as soon as earthwork activities are completed.
- Install crushed stone tracking pads at site construction entrances
- Sweep streets to remove sediment should construction related sediment be tracked onto public ways.
- Utilization of mulch, stone or spray-on soil treatments for temporary stabilization as needed

In addition, the Proponent acknowledges the importance of emission controls and will encourage contractors to comply with MassDEP' s "Diesel Engine

Retrofits in the Construction Industry: A How to Guide" and the use of ultra-low sulfur diesel in off-rad engines. Construction vehicles will be required to comply with all applicable laws and regulations regarding engine idling, and shall minimize any such idling. The construction contractor is encouraged to use equipment fitted with diesel oxidation catalysts (DOC) or diesel particulate filters (DPF) to reduce emissions.

Noise Control:

Noise is regulated by MassDEP through 310 CMR 7.10 – Noise (also known as the "Noise Regulation") with further guidance is provided in MassDEP "Noise Guideline Document" dated 4/2003 and MassDEP Division of Air Quality Control Policy Number 90-001. All construction and demolition for this project shall comply with these regulations and guidelines.

The construction of the project will result in a temporary increase in sound levels near the site. The construction process will require the use of equipment and construction methods that may be audible from off-site locations. Construction activities will consist of building demolition, clearing and grubbing, rough and fine grading activities, foundation work, building construction and finish work. Work associated with these activities will overlap.

Efforts will be made to minimize the impact of noise resulting from construction activities. The following noise mitigation measures will be implemented at the site and will remain in effect for the duration of construction.

- All exhaust mufflers on construction equipment will be in good working order
- Contracts will include language requiring contractors to properly maintain their equipment.
- Back up alarms on vehicles and equipment will be adjusted as low as possible to reduce noise, without compromising safety.
- When feasible, equipment that is not being used will be turned off
- Noise creating equipment on site will be located as far as possible from sensitive receptors
- Engine housing panels on all equipment will be kept closed
- Electricity will be obtained from the electric grid as soon as feasible to reduce the use of portable generators.
- No construction vehicle and/or equipment shall commence warming up prior to the permitted hours of construction.

APPENDIX J: ENF CERTIFICATE AND COMMENTS

- Certificate on the ENF, dated July 9, 2019
- Department of Conservation and Recreation Comment Letter on the ENF, dated July 1, 2019
- Department of Energy Resources Comment Letter on the ENF, dated July 8, 2019
- MassDEP Comment Letter on the ENF, dated July 9, 2019
- MassDOT Comment Letter on the ENF, dated July 1, 2019
- Coded Comments
- Comment Responses

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July 11, 2019

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Capital Commerce Center
PROJECT MUNICIPALITY	: Lancaster and Leominster
PROJECT WATERSHED	: Nashua
EEA NUMBER	: 16043
PROJECT PROPONENT	: Capital Group Properties
DATE NOTICED IN MONITOR	: June 10, 2019

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62I) and Section 11.06 of the MEPA Regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of a Draft Environmental Impact Report (DEIR).

Project Description

As described in the Environmental Notification Form (ENF), the project consists of a mixed-use development on a 471-acre site located in Lancaster and Leominster. The master plan project represents maximum build out of the site and will include construction of approximately 2,690,000 square feet (sf) of industrial, retail, recreational, hotel and residential uses. esidential development consisting of 117 single family, duplex and triplex units is proposed in the western portion of the site. The project includes construction of access road, 3,462 surface parking spaces, stormwater management systems, and utility infrastructure. The area of the site within Leominster is very small and no buildings are proposed within this area. The eastern portion of the site contains a trucking facility and the Lancaster Crossing development project. The trucking facility will be demolished.

Primary access to the site is proposed via McGovern Boulevard (a private way) from Lunenburg Road to the east. Access to the residential component to the west is proposed from Leominster via Johnny Appleseed Lane and White Pond Road. McGovern Boulevard will be extended approximately 4,200 linear feet (lf) to the west to provide access to multiple industrial buildings proposed in the central portion of the site.

The project includes construction of a wastewater treatment plant (WWTP) and construction of a 2.5-mile water line from Lunenburg to the project site. The Proponent has entered into an agreement with the Lunenburg Water District (LWD) to serve the project site. A 200,000-gallon concrete fire suppression tank on the site will be maintained, if required.

The Development Summary Table identifies land uses for each building, gross square footage (gsf) per use, and parking and loading requirements.

Table 1: Development Summary Table

LAND USE	BUILDING/ STRUCTURE	DESCRIPTION	UNITS	FLOORPLATE (SQ. FT)	STORIES	G.S.F.	SURFACE PARKING	TRAILER PARKING	LOADING DOCKS
INDUSTRIAL	A			1,020,000	1	1,020,000	587	316	214
	B			150,000	1	150,000	146		32
	C			42,000	1	42,000	24		5
	D			145,000	1	145,000	83		13
	E			37,500	1	37,500	84		15
	F			42,000	1	42,000	92		5
	G			37,500	1	37,500	95		15
	H			42,000	1	42,000	42		5
	I			37,500	1	37,500	84		15
	J	AUTO SALES & SERVICE FACILITY		14,000	1	14,000	80		
RESIDENTIAL	K	SINGLE FAMILY, DUPLEX & TRIPLEX UNITS	117	128,700	2	257,400			
	L	MULTI-FAMILY APARTMENTS	140	44,650	4	178,600	260		
	M	MULTI-FAMILY APARTMENTS	160	50,000	4	200,000	270		
	N	MULTI-FAMILY APARTMENTS	200	64,500	4	258,000	210		
HOTEL	O		120	16,000	4	64,000	120		
RECREATIONAL	P	EXISTING SOCCER FIELDS		5000	1	5000	276		
	Q	INDOOR SPORTS FACILITY		86,500	1	86,500	216		
RETAIL	R	PROPOSED RETAIL		65,700	1	65,700	418		
		EXISTING RETAIL		7300,	1	7300	59		
TOTAL			737	2,035,850		2,690,000	3146	316	319

The project will be phased and constructed over multiple years depending on market conditions. The project is at a conceptual level of design. Several components of the Master Plan have already been constructed (Lancaster Crossing includes a Dunkin' and Mobil Gas Station; F.C. Stars Soccer Complex; and associated access, utility and drainage infrastructure). These components were previously permitted and are described in the Master Plan and MEPA filings and included in cumulative impacts. The Proponent has executed a purchase and sale agreement for the Automotive Sales and Service Facility and is in discussions regarding purchase of buildings B and D. It is likely that these components of the Master Plan will be constructed prior to other uses.

The ENF identifies potential phasing of the project:

- Phase 1 – Lancaster Crossing development project consisting of Dunkin, Mobil Gas Station and addition of commercial, retail and residential uses.
- Phase 2 – construction of McGovern Boulevard extension, water line extension and WWTP. This phase may include abandonment of water and sewer infrastructure that serves Dunkin' and Mobil Gas and connection to new water lines;
- Phase 3 – construction of Building J (Automotive Sales and Service Facility), Buildings B and D.
- Future phases.

Project Site

The 471-acre project site, which is comprised of numerous parcels, is located west of Lunenburg Road. The majority of the site is in Lancaster; a small area along the westernmost edge of the site extends into Leominster. McGovern Boulevard and Lunenburg Road (Route 70) in Lancaster provide access from the east. Johnny Appleseed Lane in Leominster provides access from the west. The project site abuts Interstate 190 (I-190) to the west, and is located south of Route 2, which are both under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). The project site is generally bounded by woods, wetlands, and residences to the north; I-190 to the west; woods, wetlands and the North Nashua River to the south; and Lunenburg Road and Kimball Farm to the east. The project site directly abuts two parcels within the Lancaster State Forest that are under the care, custody and control of the Massachusetts Department of Conservation and Recreation (DCR). A portion of the eastern part of the site was recently developed as part of the Lancaster Crossing development project with a Dunkin', Mobil Gas Station, and soccer fields (F.C. Stars Soccer Complex) with associated driveways, parking areas, utilities, and stormwater management systems.

The JB Hunt Trucking facility is located in the eastern portion of the site with access from Lunenburg Road. A portion of the site to the west, located off Johnny Appleseed Lane, includes a house, horse barn, horse track, associated parking areas and utilities, and undeveloped areas consisting of woods and fields. The remaining portion of the site consists of a gravel mining operation, gravel access roads, and undeveloped fields, woodlands, and wetlands. A small land-locked parcel of land in the central portion of the site is not part of the project. Topography varies greatly with elevations ranging from 516 feet in the north to 268 feet in the south.

The site, previously under single ownership, is subdivided and owned by five additional ownership entities. Lancaster Crossing, located in the eastern portion of the site, contains approximately 50 acres of land and will be developed by a separate entity. Additional commercial, retail and residential uses will be incorporated into Lancaster Crossing. The site is located within the Enterprise District (Retail Sub-district) and Residential Zoning District. It is overlain by the Integrated Planning Overlay District (IPOD), which allows broad range of uses, the Floodplain Overlay District and the Water Resources Overlay District.

The project site contains numerous wetland resource areas associated with White Pond, McGovern Brook and numerous tributary streams, and several isolated wetlands. Wetland resource areas

include Bordering Vegetated Wetlands (BVW), Isolated Vegetated Wetlands (IVW), Bank, Bordering Land Subject to Flooding (BLSF), Land Under Water (LUW) and Riverfront Area (RFA). The site contains one Certified Vernal Pool (CVP). Portions of the project site to the north and east are located in a Zone A and a small portion of the site along the southern edge is located within the Zone AE, with no base flood elevations (BFE), according to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) (No. 25027C0289E, effective July 4, 2011). The southern portion of the site is located within the Central Nashua River Valley Area of Critical Environmental Concern (ACEC). Two public water supply wells and associated interim wellhead protection area (IWPA) are located in the eastern portion of the site and service the Dunkin' and Mobil Gas Station properties.

Prior MEPA Review

An ENF (EEA# 15604) for development associated with the site was submitted in October 2016 by North Lancaster Water LLC (NLW) to modify an existing Public Water Supply Permit (PWS) permit to provide water service to the Dunkin' facility. The ENF was withdrawn by North Lancaster Water LLC on December 9, 2016 to address information necessary to adequately evaluate the project, including a "look back" analysis of development that was completed and identification of proposed and planned development in the project area. Based on changes to the project and the analysis provided, it was determined that the project did not require MEPA review. An Advisory Opinion (AO) issued on July 26, 2019 indicated that the Dunkin' and the gas station would require Public Water Supply (PWS) permits from MassDEP and confirmed that the project did not exceed any environmental review thresholds. The AO indicated that development of any portion of the remainder of land now or formerly owned by NLW within five years of the AO could be subject to MEPA review based on cumulative impacts.

Environmental Impacts and Mitigation

Potential environmental impacts associated with the project include: alteration of 55 acres of land; creation of 152.7 acres of new impervious area for a total of 166 acres; alteration of 115,000 sf of BLSF and 420,000 sf of RFA; generation of 11,264 new unadjusted average daily trips (adt) for a total of 17,620 adt; construction of 3,109 new parking spaces for a total of 3,462 spaces; use and generation of 155,385 gallons per day (gpd) of water and wastewater, respectively, for a total of 157,385 gpd; and construction of 4.1 miles of water main and 1.8 miles of sewer main. The Dunkin' facility and Mobil Gas Station resulted in impacts to 15,295 sf of BLSF and 19,644 sf of RFA. Emissions of Greenhouse Gases (GHG) and other air pollutants are associated with on-site energy use and automobile travel by residents, employees and visitors to the site.

The ENF identifies preliminary measures to avoid, minimize and mitigate potential environmental impacts associated with transportation, air quality and GHG emissions, wetlands, stormwater, and construction period impacts. These include traffic improvements (traffic signal and roadway widening); pedestrian and bicycle accommodations; stormwater management system; restoration and/or replication for impacts to wetland resource areas; and implementation of construction-period best management practices (BMPs). Mitigation will be developed through review of the DEIR and Final EIR (FEIR).

Permitting and Jurisdiction

The project is undergoing MEPA review and subject to preparation of a mandatory Environmental Impact Report (EIR) pursuant to 301 CMR Sections 11.03(1)(a)(1), (1)(a)(2), (6)(a)(6) and (6)(a)(7) because it requires Agency Actions and will alter 50 or more acres of land, create 10 or more acres of impervious area, generate 3,000 or more new adt providing access to a single location, and construct 1,000 or more new parking spaces at a single location. The project may exceed the threshold at 301 CMR 11.03(3)(a)(1)(b) for alteration of 10 or more acres of other wetlands and appears to exceed the threshold at 301 CMR 11.03(3)(b)(1)(f) for alteration of one-half or more acres of other wetlands.[1] The project will exceed an ENF threshold pursuant to 301 CMR 11.03(5)(b)(1) for construction of a new wastewater treatment and/or disposal facility with a capacity of 100,000 or more gpd. It will require a Vehicular Access Permit from MassDOT.[2] It will require a Water Distribution System Modification Permit, an Individual Permit for Sewerage Treatment Plant and a Hydrogeologic Evaluation Report Approval from MassDEP. The project is subject to the May 5, 2010 MEPA GHG Emissions Policy and Protocol (the Policy).

The project requires an Order of Conditions (OOC) from the Lancaster and Lunenburg Conservation Commissions (and potentially an OOC from the Leominster Conservation Commission) (and, on appeal only, a Superseding Order of Conditions from MassDEP), a National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) from the U.S. Environmental Protection Agency (EPA), and an Obstruction Evaluation/Airport Airspace Analysis from the Federal Aviation Administration (FAA).

The project is not receiving Financial Assistance from the Commonwealth. Therefore, MEPA jurisdiction is limited to those aspects of the project that are within the subject matter of any required or potentially required Agency Actions and that may cause Damage to the Environment, as defined in the MEPA regulations.

SCOPE

General

The DEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope. The DEIR should clearly demonstrate that the Proponent has sought to avoid, minimize and mitigate Damage to the Environment to the maximum extent feasible.

Project Description and Permitting

The ENF generally describes existing site conditions, provides a conceptual project description and plans, and includes a limited alternatives analysis. It briefly reviews the project's impacts on land, transportation, water and sewer use, wetlands, and stormwater management.

[1] The ENF does not identify these thresholds.
[2] The ENF does not identify this Permit. MassDOT comments indicate it is required.

The DEIR should provide a detailed description of the project and associated impacts and identify any changes to the project since the filing of the ENF. It should include updated site plans for existing and post-development conditions at a legible scale. Conceptual plans should clearly identify: all major project components (proposed buildings, access roads, roadway improvements, etc.); areas of land alteration (new and previously disturbed); impervious areas; wetland resource areas; ownership of parcels including easement areas; pedestrian and bicycle accommodations; and stormwater and utility infrastructure. Conceptual plans should be provided for on-site work as well as any proposed off-site work for transportation or utility improvements. The DEIR should identify all easements and public utilities on the site including parties to the easements and location and condition of public infrastructure. It should describe any constraints on project design or use of the site posed by these conditions.

The DEIR should identify and describe State, federal and local permitting and review requirements associated with the project. It should include a description and analysis of applicable statutory and regulatory standards and requirements, and a discussion of the project's consistency with those standards. The DEIR should provide an update on local permitting processes.

The DEIR should identify project phasing. It should identify areas to be developed for each phase and identify associated activities. The DEIR should identify the number of residential units that will be designated as affordable.

Alternatives Analysis

The DEIR should include a comprehensive alternatives analysis that demonstrates that Damage to the Environment can be avoided, minimized or mitigated to the maximum extent practicable. Priority should be placed on avoidance and minimization of land alteration, including creation of impervious area, and integration of uses throughout the site to minimize traffic generation and maximize the ability for shared parking. The alternatives identified below should be analyzed in the DEIR. The DEIR should describe and quantify each alternative's impacts on land alteration, creation of impervious area, development within the ACEC, impacts to wetland resource areas, traffic generation, parking, water use, and wastewater. This comparison should be provided in a tabular format with supporting narrative and conceptual site plans. The DEIR should also describe how project phasing could be developed to avoid and minimize environmental impacts.

- A No-Build Alternative
- By-Right Alternative
- Alternative Master Plans A and C (as described in the ENF)
- Reduced Impact Alternatives
  - Limit development to previously altered areas
  - Integrate uses throughout the site and within buildings (e.g., residential over retail)
- A Preferred Alternative

The Preferred Alternative represents maximum build-out of the site. Significant opportunities exist to reduce impacts. I strongly encourage the Proponent to implement cross-cutting measures. Passivehouse design and preservation/creation of open space. High performance buildings built to Passivehouse standards will lower energy use, energy costs and will be quieter and better insulated from

noise, which is particularly important in a development in close proximity to a highway. These structures are inherently more resilient because they can retain comfortable temperatures for a longer period of time during a power outage. Open space can function as part of a stormwater management system, provide amenities to tenants and resident and preserve/create flood storage capacity to support resiliency.

The alternatives analysis should evaluate a greater height, density, and grouping of buildings to reduce impervious surfaces and increase open space. It should analyze reduced parking ratios, structured parking and land banking of parking to reduce impervious area and traffic generation. The DEIR should evaluate a development alternative that provides a substantial buffer to the Lancaster State Forest and avoids and minimizes development within the floodplain. The DEIR should discuss steps the Proponent will take to further reduce the impacts of the project since the filing of the ENF, or, if certain measures are infeasible, the DEIR should discuss why these measures will not be adopted.

ACEC and Lancaster State Forest

The DEIR should demonstrate that the project will avoid and minimize adverse effects on natural resource values of the area. It should address how project planning and development can promote preservation, restoration, or enhancement of resource areas within the ACEC.

Significant project infrastructure is proposed along the property line with the Lancaster State Forest. This includes parking areas, stormwater basins, a WWTP and sewage disposal area in the southern portion of the site. DCR comments express concern that the project will create permanent adverse impacts on public conservation land. Analysis of a reduced impact alternative should include a 100-foot buffer from Lancaster State Forest. DCR accesses the Lancaster State Forest via a roadway north of Assessor's Lot 14-11. The DCR comment letter indicates that the development may impact this access. Prior to filing the DEIR, the Proponent should stake/mark all mutual property lines and corners abutting Lancaster State Forest and consult with DCR regarding its concerns.

Land Alteration and Open Space

The project will result in significant new creation of impervious area of 153 acres for a site total of 166 acres, a substantial portion of the project site, and alteration of 55 acres of land including clearing of wooded areas. The DEIR should quantify the total amount of alteration associated with the project including areas to be altered for buildings, roadways, parking, automotive storage, wastewater, water and stormwater infrastructure, landscaping, and other project components. The DEIR should provide a revised estimate of impacts associated with new land alteration and impervious area and include a breakdown for each project element. The DEIR should clarify the location, type and amount of alteration in previously undisturbed areas. The DEIR should include site plans that clearly locate and delineate areas proposed for development and those to be left undisturbed. It should include a grading plan and identify the depth and location of fill/excavation.

The ENF indicates that the Proponent will work with the Town of Lancaster to designate open space areas on-site where feasible. The DEIR should identify open space that will remain undisturbed and/or restored upon completion of construction and identify whether and how open space will be protected. Given the size of the project site, the Proponent should consider placing a conservation

restriction (CR) on portions of the site designated as open space, including areas containing wetlands, to ensure their permanent protection.

The DEIR should provide identify, in the narrative and on project plans, the extent and type of clearing associated with the project and how impacts to mature trees, unique geologic formations, and wildlife corridors will be avoided to the extent practicable. The DEIR should provide a comprehensive evaluation of all measures to reduce the amount of land alteration and impervious area, including reductions in roadway widths and impervious surfaces, pervious pavement for low intensity parking areas and sidewalks, and reducing parking.

Wetlands and Stormwater

The Lancaster, Lunenburg and Leominster Conservation Commissions will review the project and/or project elements to determine consistency with the Wetlands Protection Act (WPA), the Wetlands Regulations (310 CMR 10.00), and associated performance standards, including stormwater management standards (SMS). According to the ENF, the project will not alter BVW. The project will alter significant amounts of BLSF and RFA; however, the ENF does not clearly describe project-related impacts.

The Lancaster Conservation Commission issued an Order of Resource Area Delineation (ORAD) in 2018 to confirm jurisdictional wetlands and associated buffer zones within the central portion of the project site. The Proponent provided a commitment to the Lancaster Conservation Commission that it would include mitigation of fill associated with a farm pond/wash pond in this area (1,815 sf) in future project permitting.

Portions of the project have already been constructed including the outdoor athletic fields, the Dunkin' and the Mobil Gas Station in the eastern portion of the site. Work associated with the previously completed outdoor athletic fields and retail shops occurred within BLSF and RFA. The ENF provides a brief permitting history for impacts and mitigation on the eastern portion of the site between fall of 2013 and spring of 2017. The ENF indicates that the remainder of the project could alter an additional 115,000 sf of BLSF and 420,000 sf of RA.

The DEIR should demonstrate that the project can be designed and constructed consistent with applicable WPA performance standards. The DEIR should include a description of all permanent and temporary wetland impacts including grading, clearing and construction-related disturbances and provide alternatives analyses consistent with regulatory requirements to demonstrate how wetland impacts will be avoided, minimized and mitigated. The DEIR should describe how much of the project will occur in developed and undeveloped RFA. It should include detailed plans at a reasonable scale that clearly delineate all applicable resource area and buffer zone boundaries including floodplain elevations (based on FEMA FIRMs if identified). Project plans should depict all project elements (including utilities) in relation to wetland resource areas and any associated buffer zones within the site. The DEIR should describe the nature of all impacts that cannot be avoided and whether they are temporary or permanent in nature. The DEIR should describe measures to mitigate unavoidable wetland impacts and include replication and restoration plans designed to meet the performance standards pursuant to 310 CMR 10.00, and demonstrate that compensatory storage on an incremental basis will be provided.

The DEIR should evaluate alternatives that minimize alteration of wetland resource areas, including BLSF and RFA, and activities within the Buffer Zone. Portions of the project, including the auto storage facility with a large gravel storage area and stormwater basins, are near wetlands located within the ACEC, which are sensitive wetland resource areas. The DEIR should evaluate alternatives that locate these components further away from the sensitive resource areas. The DEIR should consider structured parking alternatives. The DEIR should include information regarding use and maintenance of gravel storage areas and how impacts to sensitive resource areas and receptors will be avoided.

Portions of the project site are located within the 100-year floodplain (Zones A and AE which does not include a BFE). As the coordinating agency for the NFIP, DCR's Flood Hazard Mitigation Program (FHMP) submitted comments regarding the project's consistency with applicable federal, state and local standards and requirements related to floodplain development including, but not limited to, the State Building Code and Wetlands Regulations. DCR comments indicate concern regarding construction within floodplain. I expect the DEIR will be responsive to the comments provided by DCR regarding compliance with regulatory standards and requirements and will include hydrologic and hydraulic analyses necessary to identify and mitigate potential impacts. As noted by DCR, the Proponent will be required to develop a BFE and demonstrate it can meet requirements of the Wetlands Regulations and the local floodplain regulations of Lancaster.

The DEIR should include a description of the stormwater management system and provide documentation, including plans, stormwater checklist and calculations, in support of the proposed design and its consistency with the SMS. In particular, the DEIR should describe consistency with Standard #6 for Critical Areas based on the presence of vernal pools on-site. The DEIR should confirm that stormwater structures are not located within 100 feet of vernal pools. The DEIR should evaluate alternatives where the stormwater structures are set back from receiving wetland resource areas to the maximum extent possible. It should include a review of Low Impact Development (LID) techniques (e.g., pervious pavement, raingardens/bioretention areas, bioswales, tree box filters, and green roofs, and reuse of roof runoff for irrigation) and incorporate these measures into the project design to the extent feasible. The Proponent should analyze additional measures to reduce impervious area, including narrower roadways, locating parking underneath buildings, structured parking, shared parking and banking of parking until warranted by demand. The DEIR should identify stormwater BMPs for each of the proposed uses on-site.

Traffic and Transportation

The project will require a Vehicular Access Permit from MassDOT because of anticipated impacts to Route 2 and the site's location abutting I-190. The Transportation Impact Assessment generally conforms to the EEA/MassDOT *Transportation Impact Assessment (TIA) Guidelines*. The Proponent should consult with MassDOT prior to filing the DEIR to ensure MassDOT's comments are addressed.

The TIA provides an assessment of the transportation impacts of the project and on area roadways, and describes pedestrian and bicycle facilities, and other transportation modes. It outlines the traffic analysis, including the study area, data collection, and analyses that were conducted to assess transportation impacts. It describes existing conditions and identifies and describes the transportation study area. It provides capacity analyses and projections for No Build, Build, and Build with Mitigation

scenarios. A seven-year planning horizon was used for the analysis. Future conditions included general background growth and growth associated with planned and/or approved development projects in the project area.

The TIA includes nine study area intersections. The study area should be revised to include the Route 2 Off- and On-Ramps associated with Exit 34, along Old Union Turnpike and Harvard Street, if they meet the intersection thresholds identified in MassDOT comments. In addition, the DEIR should provide capacity analyses and propose mitigation where the intersections or approaches under state jurisdiction are anticipated to operate at a Level of Service (LOS) E or F during a peak period under 2026 No-Build or Build conditions.

Trip Generation

Based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual's* Land Use Codes (LUC) 130 (Industrial Park), 210 (Single-Family Housing (Detached), 221 (Multifamily Housing (Mid-Rise), 310 (Hotel), 488 (Soccer Complex), and 820 (Shopping Center), the overall project will generate approximately 17,620 unadjusted adt on an average weekday and 18,386 unadjusted vehicle trips on a Saturday, including 1,472, 1,584 and 2,085 vehicle trips during the weekday morning and evening, and Saturday midday peak hours, respectively. The development project, excluding existing uses, will generate 11,332 unadjusted vehicle trips on an average weekday and 11,352 unadjusted vehicle trips on a Saturday, including 844, 1,062 and 1,455 vehicle trips expected during the weekday morning and evening, and Saturday midday peak-hours, respectively. After adjustment for internal trips and pass-by trips, the project is expected to generate 9,790 net new adt on an average weekday and 9,602 net new trips on a Saturday, including 752, 838 and 1,299 vehicle trips expected during the weekday morning and evening, and Saturday midday peak-hours, respectively.

The DEIR should demonstrate that pass-by rates were appropriately applied to weekend traffic figures along Lunenburg Road (pass-by volume cannot exceed 15 percent of traffic along adjacent roadway). The DEIR should clarify whether the Soccer Facility consists of three or four fields, adjust trip generation figures and capacity analyses as appropriate, and provide justification for using the average rate rather than the fitted curve equation for LUC 820.

Traffic Operations

Traffic operations and vehicle queue analyses were performed at the study area intersections for the 2019 Existing, 2026 No-Build, 2026 Build and 2026 Mitigated Build conditions. The TIA indicates that all intersections and approaches under state jurisdiction are anticipated to operate at an acceptable LOS during the weekday morning and evening peak periods, except the northbound Route 2 Westbound Off-Ramp left-turn approach at the Fort Pond Road/Route Westbound Ramps intersection (LOS for the left-turn approach deteriorates from D to E during the weekday evening peak hour). The DEIR should evaluate and commit to improvements that would restore this movement to a LOS D or better in the Build condition. The DEIR should identify improvements to address the short queue storage on the Route 2 Westbound Off-Ramp.

Several alternatives are currently being evaluated for the Route 2 interchanges in Lancaster and Harvard as part of MassDOT project #605393; however, the TIA does not incorporate the project into tis

analysis because improvements would not be constructed by 2026. The DEIR should provide an update on this project.

Mitigation is proposed at several intersections under the jurisdiction of the Town of Lancaster. The Lunenburg Road/McGovern Boulevard intersection will be signalized, with demand-based vehicular and bicycle detection and emergency vehicle pre-emption capabilities. McGovern Boulevard will be widened to provide an exclusive eastbound left-turn lane and an exclusive eastbound right-turn lane. The northbound approach of Lunenburg Road will be widened to introduce an exclusive left-turn lane and the southbound approach will be widened to introduce an exclusive right-turn lane. Traffic signal modifications will be implemented at the Main Street/Seven Bridge Road and Main Street/Lunenburg Road intersections in accordance with the Traffic Monitoring Program. The DEIR should clarify the timing of these improvements or the thresholds which are anticipated that will trigger mitigation.

The DEIR should include capacity analyses for the Saturday midday peak hour. The DEIR should propose mitigation for any intersection approaches under state jurisdiction that will operate at a LOS E or F in the 2026 No-Build or Build conditions.

The DEIR should include sufficiently detailed conceptual plans (minimum 80-scale) for proposed roadway improvements in order to verify the feasibility of constructing improvements. The plans should show proposed lane widths and offsets, layout lines and jurisdictions, and land uses adjacent to areas where improvements are proposed. Any proposed mitigation within the state highway layout and all internal site circulation must be consistent with a Complete Streets design approach that provides adequate and safe accommodations for all roadway users, including bicyclists, pedestrians, and public transit riders. The *MassDOT Project Development and Design Guide* provides information to support this analysis. Where these criteria cannot be met, the Proponent should provide justification, and should work with MassDOT to obtain a design waiver.

Safety

The TIA includes a summary of crash rates based on MassDOT data (continuous three-year period 2013 through 2015). All but one of the study area intersections (Main Street/Lunenburg Road) experience crash rates below MassDOT statewide and District 3 averages. The intersections at Main Street/Lunenburg Road, Old Union Turnpike/Route 2 Eastbound Ramp, and Fort Pond Road/Route 2 Westbound Ramps are listed as 2013-2015 Highway Safety Improvement Program (HSIP)-eligible crash clusters. The Proponent conducted a Road Safety Audit (RSA) at the Main Street/Lunenburg Road intersection in 2017. The DEIR should commit to implementing low-cost, short-term improvements identified in the RSA as mitigation for this project. The Proponent is coordinating with MassDOT to determine the location of individual crash reports at the other two HSIP-eligible intersections to determine whether the HSIP-eligibility applies to the Route 2 mainline or the ramps intersections. MassDOT comments indicate that additional RSAs, with commensurate commitments to improvements identified through the RSAs, will need to be completed prior to submission of the DEIR if deemed appropriate by MassDOT. The DEIR should provide an update of the RSA process, determinations, and mitigation.

Parking

The project includes 3,462 surface parking spaces. The ENF documents how the parking supply was developed and compares it to the amount required based on the ITE's *Parking Generation* document (4th edition) and local zoning requirements. The parking supply is less than that required by zoning and higher than ITE recommendations. The DEIR should conduct a shared parking analysis based on the ITE Manual, reduce its parking supply and consider land banking of parking spaces until warranted by demand. As noted previously, reductions in impervious area and parking will improve resiliency, reduce traffic generation and improve air quality.

Multimodal

The TIA includes an inventory of bicycle, pedestrian and transit facilities and services throughout the study area. The project will provide pedestrian and bicycle accommodations along McGovern Boulevard within the project site to connect to Lunenburg Road and provide sidewalks along each side of Lunenburg Road. The DEIR should clarify whether sidewalks along Lunenburg Road will be provided solely along the site frontage. MassDOT comments note that the widening of Lunenburg Road may allow for the provision of a shared-use path (in place of one or both of the proposed sidewalk) to accommodate bicycles. The DEIR should evaluate provision of shared-use paths along Lunenburg Road. The DEIR should include graphics (and supporting narrative) depicting internal circulation patterns (vehicles, pedestrian, and bicycles) and connection points to adjacent land uses. The DEIR should identify measures for improving pedestrian and bicycle access in the study area.

The Montachusett Regional Transit Authority (MART) does not currently operate service in the vicinity of the project site. The Proponent should consult with MART to examine the feasibility of extending service to the project site. Given the size of the project, the Proponent should explore an operational subsidy to support this extended service to encourage alternative transportation options to the site. The DEIR should provide an update of consultations with MART.

Transportation Demand Management

The Proponent will implement a Transportation Demand Management (TDM) program to reduce single-occupancy vehicle (SOV). The Proponent should work toward identifying the details of the measures included in the ENF and developing additional programs. The Proponent should consult with MassDOT to help implement the TDM program.

Transportation Monitoring Program

The Proponent will conduct an annual traffic monitoring program (TMP) commencing six months after the issuance of the first Certificate of Occupancy for the project site and continuing for a period of five years following full occupancy of the project. It will include:

- Simultaneous automatic traffic recorder (ATR) counts at site driveways for a continuous 24-hour period on a typical weekday and Saturday;
- Weekday AM and PM and Saturday peak hour turning movement counts (TMC) and capacity analyses at site driveways and selected intersections (Main Street/Lunenburg Road,

Lunenburg Road/McGovern Boulevard, and Lunenburg Road/Old Union Turnpike), and any other mitigated intersections; and

- Parking demand counts during the weekday evening peak period.

The DEIR should commit to conducting an employee travel survey.

Climate Change

Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth (EO 569) was issued on September 16, 2016. EO 569 recognizes the serious threat presented by climate change and directs agencies within the administration to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The Order seeks to ensure that Massachusetts will meet GHG emissions reduction limits established under the Global Warming Solution Act of 2008 (GWSA) and will work to prepare state government and cities and towns for the impacts of climate change.

I note that The Town of Lancaster has received a planning grant from the Municipal Vulnerability Preparedness (MVP) Program and is seeking designation from the Executive Office of Energy and Environmental Affairs (EEA) as a MVP program. The funding will be used to assessment of the Town's vulnerability to natural and climate-related hazards and to develop and prioritize specific actions to reduce vulnerability to the effects of climate change and improve resilience. I encourage the Proponent to consult with the Town regarding its planning and applicability to the project area.

The GHG Policy and requirements to analyze the effects of climate change through EIR review is an important part of this statewide strategy. These analyses advance understanding of a project's contribution and vulnerability to climate change. I strongly encourage the Proponent to consider complementary approaches, such as Passivehouse design, incorporation of renewables and inclusion of LID in site design, which can improve the project's resiliency, reduce GHG emissions and conserve and sustainably employ the natural resources of the Commonwealth.

Adaptation and Resiliency

The DEIR should provide an analysis and discussion of vulnerabilities of the site to the potential effects associated with climate change including increased frequency and intensity of precipitation events, flooding and extreme heat events. To assist in this evaluation, the Proponent should review the 2018 Massachusetts State Hazard and Mitigation and Climate Adaptation Plan at www.resilientma.com and review data available through the Climate Change Clearinghouse for the Commonwealth.

The DEIR should identify measures to improve the project's resiliency and adaptation to potential effects of climate change. Avoidance and minimization of land alteration and new impervious area within the unaltered, wooded portions of the site and avoidance of development within the floodplain are the most effective ways to reduce the vulnerability of the site to the effects of climate change. The DEIR should incorporate ecosystem-based adaptation measures and infrastructure design to minimize and mitigate impacts. Building elevations and stormwater management infrastructure should be designed in a manner to promote climate change resiliency and adaptation. The Proponent should also consider impacts on the proposed structures, building entry and exit points, vehicular access, public

and private on-site utilities, and first floor uses. The analysis provided in the DEIR should demonstrate that the drainage system is designed to avoid exacerbating flooding of the site and adjacent properties.

The DEIR should provide information on project phasing and development of active and passive recreation areas and open space features that will be designed to flood. It should include figures that depict existing and proposed elevation contours and a supporting narrative that addresses how the open space will function to absorb and buffer flood waters. The DEIR should also identify site elements that have been incorporated into project design to reduce the impact of extreme heat waves and limit the potential impact of more frequent and intense storm precipitation. The Proponent should consider how on-site renewable energy, a central energy plant, or co- or tri-generation systems may provide added resiliency during periods of power loss during storms.

Greenhouse Gas (GHG) Emissions

This project is subject to review under the GHG Policy. The DEIR should include an analysis of GHG emissions and mitigation measures for the proposed project in accordance with the standard requirements of this Policy, which requires projects to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize or mitigate such emissions. The analysis should quantify the direct and indirect CO_2 emissions associated with the project's energy use (stationary sources) and transportation-related emissions (mobile sources). The DEIR should identify and commit to mitigation measures to reduce GHG emissions.

As noted in comments from the Massachusetts Department of Energy Resources (DOER), the project could potentially eliminate stationary-source GHG emissions by using Passivehouse design for residential and hotel components; generating on-site renewable energy through rooftop solar photovoltaic (PV); heat pump/variable refrigerant flow (VRF) systems, energy recovery and light emitting diode (LED) lighting; and insulated building envelopes (avoiding glass curtain walls and excessive windows) for the office component. In addition to mitigating GHG emissions, the measures recommended by DOER may reduce costs by eliminating the need for gas service to the site, reducing the size of HVAC systems, and lower utility costs. The project could be eligible for significant financial incentives from the MassSave program, the Massachusetts Clean Energy Center (MCEC) and through Alternative Energy Credits (AEC) for all-electric and Passivehouse options. The Commonwealth's SMART program provides the opportunity for the Proponent or developer of the project to benefit directly by selling energy generated from rooftop solar PV to the utility.

Stationary Sources

The DEIR should include a GHG emissions analysis that calculates and compares GHG emissions associated with: 1) a Base Case corresponding to the 9th Edition of the Massachusetts Building Code, and 2) a Preferred Alternative that achieves greater reductions in energy use and GHG emissions than required by the amended Building Code. The 9th edition of the Building Code references the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) 90.1-2013 and the International Energy Conservation Code (IECC) 2015. The Town of Lancaster adopted the Stretch Energy Code (SC) in 2011 subsequent to its designation as a Green Community under the provisions of the *Green Communities Act of 2008*. Therefore, the project will be required to meet the applicable version of the SC in effect at the time of construction. The SC requires a 10 percent reduction

in energy use compared to the base Building Code requirements. The GHG analysis should model energy use, GHG emissions, and mitigation measures associated with the project in accordance with the GHG Policy and DOER's comment letter.

The GHG analysis should clearly demonstrate consistency with the objectives of MEPA review, one of which is to document the means by which Damage to the Environment can be avoided, minimized, and mitigated to the maximum extent feasible. The DEIR should identify the model used to analyze GHG emissions, clearly state modeling assumptions for each project element, explicitly note which GHG reduction measures have been modeled, and identify whether certain building design or operational GHG reduction measures will be mandated by the Proponent to future occupants or merely encouraged for adoption and implementation. The DEIR should include the modeling printout for each alternative and emission tables that compare base case emissions in tons per year (tpy) with the Preferred Alternative showing the anticipated reduction in tpy and percentage by emissions source (direct, indirect and transportation). Other tables and graphs may also be included to convey the GHG emissions and potential reductions associated with various mitigation measures as necessary. The DEIR should provide data and analysis in the format requested in DOER's letter.

The DEIR should present an evaluation of mitigation measures identified in the GHG Policy Appendix and in DOER's comment letter. The Proponent should consult with its utility provider regarding available incentives, including performance based energy efficiency incentives. GHG emissions reduction potential, relative benefits and available incentives should be evaluated. The DEIR should explain, in reasonable detail, why certain measures, that could provide significant GHG reductions, were not selected – either because it is not applicable to the project or is considered technically or financially infeasible. I strongly encourage the Proponent to prioritize measures that can offset emissions reductions and reduce energy costs over the lifespan of the project.

The DEIR should include an analysis of Passivehouse design (Passive House Institute United States (PHIUS) and Passive House Institute) for townhomes, multifamily, senior housing, and hotel. Passivehouse would cost less to operate compared to Code construction and higher construction costs (i.e., two to four percent) could be offset with financial incentives. The analyses should include: estimates of funding through MCEC grants; estimates of AECs, including bonus multipliers for Passivehouse-level performance; estimates of MassSave incentives based on consultation with utility provider; and cost savings associated with eliminating need for gas infrastructure.

The GHG analysis should investigate the feasibility of using electric cold-climate ASHPs and VRF for space heating and ASHPs for water heating, both of which are eligible for significant incentives and would reduce emissions.

The DEIR should thoroughly analyze the feasibility of incorporating on-site energy generation including solar PV systems on rooftops and canopies over parking lots. The analysis should document the expected energy savings and reduction in GHG emissions. The number and size of warehouses and other industrial structures provides an opportunity for significant generation of solar energy. The Massachusetts' SMART plan provides a pathway for building owner(s) to benefit directly from solar. Using a Qualified Facility pathway, a building owner can develop and sell PV directly to the utility for a set price irrespective of off-taking load needs. The DEIR should include an analysis of utility company incentives, AEC and other incentives for implementing on-site renewable energy generation and

evaluate the applicability of the incentive programs to the project. At a minimum, rooftops should be constructed "solar ready" to facilitate future installation of PV systems.

The DEIR should describe the potential output of PV systems, an economic analysis associated with a first-party or third-party installation, and an analysis of how mechanical systems can be planned to maximize and preserve capacity for rooftop solar. This analysis should include assumptions about available rooftop areas, potential system outputs, and installation costs ($/watt). The Proponent should refer to DOER's comment letter and the DOER website (http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/).

Mobile Sources

The GHG analysis should include an evaluation of the potential GHG emissions of the project's mobile emissions sources using the EPA MOVES emissions model. The DEIR should follow the guidance provided in the Policy for *Indirect Emissions from Transportation* and use data gathered as part of the mesoscale analysis to determine mobile emissions for Existing Conditions, and future No-Build, Build, and Build with Mitigation Conditions. The Proponent should thoroughly explore means to improve traffic operations and reduce SOV trips. Improvements in traffic operations that reduce idling time and a reduction in vehicle trips can reduce overall project-related mobile source GHG reductions. The DEIR should also review measures to promote the use of low-emissions vehicles, including installing EV charging stations and providing designated parking spaces for these vehicles. I strongly encourage the Proponent to provide charging stations at 5% of spaces and provide an additional 5% of spaces as EV ready. The Build with Mitigation model should incorporate anticipated roadway improvements and TDM measures to be implemented by the project and document the resulting reductions in GHG emissions.

Sustainable Design

The Proponent should also consider adoption of additional sustainable design measures for which GHG reductions cannot be easily quantified, such as water conservation measures, including the use of low flow water fixtures; rainwater harvesting; construction waste recycling; recycling areas; and recycled content/regional materials. Additional GHG reductions can be achieved through effective materials management during the design, construction, and operations phases of the project. These measures will be considered when evaluating whether the project can mitigate its GHG emissions to the greatest extent practicable. The DEIR should note whether the project will seek certification by the Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system, and if so, to what level. If applicable, the DEIR should identify specific measures that will be incorporated into the project design to achieve the LEED certification.

Land Alteration

The ENF notes that the project will exceed the ENF review threshold for alteration of more than 50 acres of land. In accordance with the GHG Policy, projects that alter over 50 acres of land are required to analyze the carbon associated with removal of trees and soil disturbance during the construction period and loss of carbon sequestration. The purpose of this analysis is to develop an *estimate,* not an exact accounting of GHG emissions associated with land clearing. The DEIR should

describe the methodology and data used to develop the analysis, identify associated impacts on GHG emissions, and identify measures to avoid, minimize and mitigate impacts.

I encourage the Proponent to consult with EEA and MEPA on the development of this analysis. The Proponent may develop its own analysis or may consider a draft protocol developed by EEA land policy staff and the MEPA Office. The draft protocol includes: assumptions regarding current and proposed land uses, forest types, and soil types; assumptions regarding carbon sequestration of soils and trees; and the ability to consider a one-time loss of sequestration (e.g. tree clearing) as well as loss of potential sequestration over a certain time period. The draft protocol was used most recently to estimate GHG emissions associated with land alteration for the Norton Business Park (EEA # 15750) and Campanelli Business Park (EEA# 15830) projects.

Mitigation

The DEIR should include a commitment to provide a self-certification to the MEPA Office at the completion of the project. It should be signed by an appropriate professional (e.g. engineer, architect, transportation planner, general contractor) indicating that all of the GHG mitigation measures, or equivalent measures that are designed to collectively achieve identified reductions in stationary source GHG emission and transportation-related measures, have been incorporated into the project.

Air Quality

The DEIR should include a mesoscale analysis prepared in accordance with MassDEP's *Guidelines for Performing Mesoscale Analysis of Indirect Sources.* The purpose of the mesoscale analysis is to determine whether and to what extent the proposed project will increase emissions of volatile organic compounds (VOCs) and nitrogen oxides (NO_x,) and to determine consistency with the State Implementation Plan (SIP). The analysis should use data consistent with the traffic analysis.

The DEIR should identify the design of proposed parking structures (i.e., open air, enclosed, etc.) and, as appropriate, provide information on the location of emission vents and other combustion sources. Exhaust areas should be sited to avoid conflicts with pedestrian routes or public gathering spaces. EPA's AERMOD model is the appropriate tool for estimating potential ground-level impacts of parking garages and combustion source emissions (i.e., boilers, generators, etc.). Industrial, commercial, and institutional uses may use heating equipment and emergency generators that require certifications, inspections, and/or Permits from MassDEP. The DEIR should identify certification and/or permits that likely will be required for proposed project elements.

Water Supply

Water demand is estimated at 157,285 gpd and will be supplied by the LWD. LWD is authorized by MassDEP's Water Management Act (WMA) Program to withdraw an annual average volume of 0.54 million gallons per day (mgd). Actual withdrawals from 2016 through 2018 ranged from 0.51 to 0.54 mgd; therefore, LWD will need to increase its authorization to meet project demand. LWD submitted a WMA Permit application on December 8, 2018 to increase its withdrawal volume and add a new wellfield. MassDEP issued approval of the wellfield site and the proposed pumping test on September 21, 2017. The pumping test is scheduled for late summer 2019 and will be reviewed concurrently with

the WMA Permit application. The DEIR should indicate whether the Proponent will provide funding to support upgrades to the water system identified by LWD.

LWD's WMA permit will require a mitigation plan to be submitted and approved by MassDEP to offset withdrawals in excess of the baseline volume. Examples of mitigation projects suitable for the WMA program are those that remove or disconnect impervious surface; protect and preserve open space; provide infiltration and inflow removal from a sewer system; or otherwise improve surface water wildlife habitat. Stormwater improvements that exceed standard requirements and culvert replacements that meet Massachusetts stream crossing standards may also be considered as mitigation for WMA. The DEIR should indicate whether the Proponent will support mitigation projects to offset the increased demand on LWD's system. The DEIR should provide an update on consultations with MassDEP and LWD regarding water supply.

Approximately 4.1 miles of water main will be extended from Lunenburg into Lancaster to supply drinking water. The project will require a Water Distribution System Modification Permit from MassDEP for the new water main. MassDEP will work with the Town of Lancaster and LWD to determine ownership and responsibility of the water main associated with the public water system. The Dunkin' and Mobil Gas Station are operating two separate PWS with individual wells. The DEIR should address whether the PWS will be connected to the new water.

The DEIR should identify water conservation measures that will be incorporated into the project design, such as reusing grey water and rainwater for toilet flushing and irrigation, low-flow plumbing fixtures, limits on outdoor water use, and drought-resistant plants for landscaping and estimate associated reductions in water demand.

Wastewater

The project will construct a WWTP pursuant to 314 CMR 5.00 (Groundwater Discharge Permit (GWDP) Regulations) to discharge treated effluent on-site up to a total proposed design flow of 155,385 gpd. The Proponent proposes to connect all septic systems at the site (the Dunkin' and the Mobil Gas Station) to the WWTP. The project will construct 1.8 miles of new sewer mains through the site.

The Proponent submitted a Hydrogeologic Evaluation Report Approval application to MassDEP on June 13, 2019 for its review. The Proponent may apply for an Individual GWDP following a determination by MassDEP that the site has capacity for the discharge. The DEIR should describe existing and proposed wastewater infrastructure and flow and include a site plan.

MassDEP will require that all wastewater generated on-site is connected to the WWTP. The DEIR should describe how the project will meet the requirements for a privately owned WWTP pursuant to 310 CMR 5.15. The GWDP regulations require that a single entity be the permittee responsible for operation, monitoring, maintenance, and repair of the WWTP. However, if the privately owned WWTP treats waste from activities owned or controlled by other entities, all stakeholders must share the financial and operational responsibilities for the WWTP. Because the project includes residential uses, the GWDP will require a Financial Assurance Mechanism to fund the immediate repair and replacement of the WWTP. The DEIR should describe the legal and financial arrangements that will achieve compliance with these permitting requirements.

Construction Period

The DEIR should describe the schedule for construction of project elements and identify construction staging areas. It should evaluate construction-period impacts (including but not limited to erosion and sedimentation, air quality, solid waste disposal, and transportation/traffic) and outline feasible measures that can be implemented to eliminate or minimize these impacts. A construction period Stormwater Pollution Prevention Plan (SWPPP) should be developed consistent with the NPDES CGP for the project to reduce erosion and sedimentation impacts. The DEIR should describe if blasting will be required and identify compliance with applicable regulations.

I encourage the Proponent to mitigate the construction period impacts of diesel emissions, including requiring use of construction equipment with engines manufactured to Tier 4 federal emission standards or best available control technology (BACT). The DEIR should confirm that the project will require construction contractors to use Ultra Low Sulfur Diesel (ULSD) fuel in off-road equipment. The DEIR should address how the project will support compliance with the Massachusetts Idling regulation at 310 CMR 7.11 such as driver training, periodic inspections by site supervisors, and posting signage temporarily during construction and permanently post-construction.

The DEIR should provide information regarding the project's generation, handling, recycling, and disposal of C&D debris. It should describe the management and disposal of any asbestos containing materials (ACM). The DEIR should quantify and characterize the material to be generated and define waste management and diversion goals to be implemented by the contractors constructing the project. The DEIR should identify the specific and aggressive construction recycling and source reduction goals the Proponent will make as a way to increase the sustainability of the project. The DEIR should address compliance with the waste bans regulations (310 CMR 19.017).

Excavating, removing, and/or disposing of contaminated soil, pumping of contaminated groundwater, or working in contaminated media must be done under the provisions of M.G.L. c. 21E and all other applicable federal, state, and local laws and regulations. The DEIR should describe how it compliance with the MCP and M.G.L. c. 21E during construction and identify construction-period mitigation measures.

Mitigation/Draft Section 61 Findings

The DEIR should include a separate chapter summarizing proposed mitigation measures. This chapter should include draft Section 61 Findings for each Permit to be issued by a State Agency. The DEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and include a schedule for implementation. The DEIR should clearly indicate which mitigation measures will be constructed or implemented based upon project phasing, either tying mitigation commitments to overall project square footage/phase or environmental impact thresholds, to ensure that measures are in place to mitigate the anticipated impact associated with each development phase.

Responses to Comments

The DEIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the DEIR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the Scope of the DEIR beyond what has been expressly identified in this certificate.

Circulation

The Proponent should circulate the DEIR to those parties who commented on the ENF, to any State Agencies from which the Proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. Per 301 CMR 11.16(5), the Proponent may circulate copies of the DEIR to commenters in CD-ROM format or by directing commenters to a project website address. However, the Proponent must make a reasonable number of hard copies available to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. The Proponent should send correspondence accompanying the CD-ROM or website address indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. The DEIR submitted to the MEPA office should include a digital copy of the complete document. A copy of the DEIR should be made available for review at the Lancaster and Leominster Public Libraries.

July 11, 2019
Date

K. Theoharides
Kathleen A. Theoharides

Comments received:

06/26/2019 Paula Cioffi
06/26/2019 Christine Mirabito (two comments)
06/27/2019 Kaitlyn Drew
06/27/2019 Joe Ramirez, President of White Pond Road Association
07/01/2019 Greg Jackson
07/01/2019 Robert Keene (two comments)
07/01/2019 Victoria Petracca (two comments)
07/01/2019 Ann Fuller
07/01/2019 Deb D'Eramo
07/01/2019 Timothy Castner
07/01/2019 Massachusetts Department of Transportation (MassDOT)
07/05/2019 Massachusetts Department of Conservation and Recreation (DCR)
07/08/2019 Massachusetts Department of Energy Resources (DOER)
07/09/2019 Massachusetts Department of Environmental Protection (MassDEP) – Central Regional Office (CERO)

KAT/PPP/ppp

Energy & Environmental Affairs

Public Comments Portal

View Comment

Comment Details

EEA #/MEPA ID*	First Name	Address Line 1
16043	Ann	185 Langen Road
Comments Submit Date	**Last Name**	**Address Line 2**
7-1-2019	Fuller	--
Review Due By	**Phone**	**State**
7-2-2019	--	MASSACHUSETTS
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	annpfuller@comcast.net	01523

Comments

Topic: Capital Commerce Center - Feedback

I am not in favor of this project. I do not believe we need more retail in this area. There is a big shopping mall in Berlin (Highland Cor Park (Leominster) and a big mall in Leominster. Not to be forgotten is the fact that more and more people are shopping online and, Marshalls, HomeGoods, HomeSense and Sierra Trading Post), stores are closing. It would be a shame to cut down trees and destroy There is nothing worse than big empty cement buildings. The traffic situation would be horrendous if this project goes through. The where would the town get water ? I hear over and over that water and water pressure is a problem in town. This would add to noise p meeting about the proposed race track. Many people from White Pond, Spec Pond and Fort Pond stood up and spoke about all the fields. People move to Lancaster and live and stay in Lancaster because they like a rural setting. This would destroy the peaceful tov

Attachments

Update Status

Status

Opened ▼ SUBMIT

Share Comment

EEA No. 16043

Christine Mirabito
944 George Hill Rd.
Lancaster, Massachusetts 01523
June 26,2019

Dear Ms.Patel,

I m writing to you today in response to the proposed commercial development in Lancaster,Massachusetts. The effect this will have on the animal life and vegetation in Lancaster will have dire impact on the wildlife and vegetation that now resides in this area, as well as surrounding areas. This open natural environment is the home range for red tail hawks, herons, and bald eagles as well as many other common Massachusetts birds. This land is also the home of wildlife such as coyotes, fox, squirrels, deer, turkeys and other common wildlife. The yellow spotted salamanders are common in Lancaster and may be found on this site as well. This area needs to be protected from commercial and industrial development. It will be a great injustice to the integrity of the history,culture of Lancaster to not protect the wildlife that exists today.

Sincerely,
Christine Mirabito ,Lancaster Massachusetts
Christine Mirabito

P.S.
Would you kindly call me to state you recieved this 339 927 4202. Thank you
or
978 706 1098

Energy & Environmental Affairs
Public Comments Portal

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Comment Details

EEA #/MEPA ID*	First Name	Address Line 1
16043	christine	944 George HILL RD
Comments Submit Date	**Last Name**	**Address Line 2**
6-26-2019	mirabito	--
Review Due By	**Phone**	**State**
7-2-2019	--	MASSACHUSETTS
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	rsmirabito@verizon.net	01523

Comments

Topic: Lancaster Commerce Center Proposed Development

Dear MEPA Administration, I am writing to you today in response to the proposed commercail development in Lancaster Masssachu the beautiful avian,and land animals that inhabit this region. lancaster has been a sanctuary for theses animals in contrast to the ur area is home to a variety of Massachusetts wildlife and should be protected from commerce. redtail hawks, herons,bald eagles,owls land. Coyotees ,fox, deer, turkeys and even moose have been spotted in this area. Lancaster is a homespun community that does n wildlife. We entrust you to protect our community and our wildlife! Christine Mirabito

Attachments

Update Status

Status

Opened ▼ SUBMIT

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SHARE WITH A REGISTERED USER

dcr
Massachusetts

July 1, 2019

Secretary Kathleen A. Theoharides
Executive Office of Energy and Environmental Affairs
Attn: Purvi Patel, MEPA Office
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: EOEEA #16043 Capital Commerce Center ENF

Dear Secretary Theoharides:

The Department of Conservation and Recreation ("DCR" or "Department") is pleased to submit the following comments in response to the Environmental Notification Form ("ENF") submitted by Capital Group Properties (the "Proponent") for the Capital Commerce Center project (the "Project") in Lancaster.

As described in the ENF, the proposed Project will construct 2,690,000 sf of new development on a 471-acre site, consisting of several parcels. The development plan includes 616 residential units in four buildings; ten industrial buildings that total 1.5 million square feet; a hotel containing 120 rooms; one retail building (65,700 sf); and an indoor soccer facility. The Project site currently contains an existing gas station and soccer fields. An additional 152 acres of the site is proposed to become impervious surface. Wastewater treatment will be provided by an on-site treatment plant. The Project requires a mandatory EIR, due to the exceedance of several EIR thresholds, including direct alteration of 50 acres or more of land; creation of 10 acres or more impervious surface; generation of 3,000 or more new additional daily trips per day providing access to a single location; and construction of 1,000 or new parking spaces at a single location.

The Project directly abuts two parcels under DCR's care, custody and control, both part of Lancaster State Forest. As proposed, the Project involves activities within a 100-year floodplain as delineated on the current effective Flood Insurance Rate Map ("FIRM") for Worcester County, dated July 16, 2014. A portion of the Project Site is within the Central Nashua River Valley Area of Critical Environmental Concern ("ACEC").

Central Nashua River Valley ACEC

In 1996, the Executive Office of Energy and Environmental Affairs designated the 12,900-acre Central Nashua River Valley ACEC. The ACEC requires the highest standard of environmental review and protection over a 20-mile riparian corridor of the North Nashua and Nashua Rivers situated south of Route 2 in Leominster, Lancaster, Bolton and Harvard. Associated with this corridor are extensive surface waters, wetlands, floodplains and aquifers, as well as associated riparian zones, wildlife and rare species habitats, forests, farmlands, and publicly and privately owned open space.

Due to the ACEC designation for portions of this site, DCR notes that EOEEA agency actions are required to ensure that projects in ACECs incorporate adequate measures to preserve, restore, or enhance the resource areas in accordance with 301 CMR 12.11 (1) and (2). Development designs must ensure that impacts will minimize any adverse effects on groundwater quality, habitat values, biodiversity, storm damage prevention, flood control, historic and archeological resources, scenic and recreational resources,

Department of Conservation and Recreation
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Boston MA 02114-2119
617-626-1250 617-626-1351 Fax
www.mass.gov/orgs/department-of-conservation-recreation

Charles D. Baker, Governor
Karyn E. Polito, Lt. Governor
Kathleen A. Theoharides, Secretary, Executive Office of Energy & Environmental Affairs
Leo Roy, Commissioner, Department of Conservation & Recreation

and other natural resource values of the area. DCR requests that the Proponent demonstrate in its DEIR how the project design within the Central Nashua River Valley ACEC will avoid adverse effects on the above resources, including, but not limited to, groundwater quality, habitat values, biodiversity, storm damage prevention, and flood control, historic and archaeological resources, and scenic and recreational resources. DCR also requests that the Proponent clarify how areas of the Project within the ACEC will meet the ACEC regulations (301 CMR 12.01 to 12.15).

Lancaster State Forest

DCR notes that the southern portion of the site plan shows several locations where project infrastructure, including parking areas, storm water basins, and a subsurface wastewater treatment plant, are placed up to the edge of the shared property line. This Project infrastructure, if placed in such close proximity to DCR property, is likely to adversely affect public conservation land permanently. To demonstrate that the Proponent has designed its development to first avoid environmental impacts, DCR requests that the Proponent prepare a reduced development plan that would use a 100-foot no development buffer measured from DCR property lines, similar to the buffer that is being provided in the northwest portion of the Site. This development analysis should avoid adverse impacts to DCR property and access rights and protect the function and values of public conservation land.

To ensure the Proponent accurately depicts boundary lines shared with DCR, DCR requests that the Proponent stake and monument all mutual property lines and corners abutting Lancaster State Forest prior to the filing of the DEIR, and provide the Department an opportunity to review these boundaries prior to permanent installation, in particular Assessor's Map Lot 13-5.

DCR has historically accessed Lancaster State Forest by way of a roadway north of Assessor's Lot 14-11 and through Lancaster Town Forest. It appears that the proposed development may impact that access. DCR requests that the Proponent work with the Department to ensure that permanent access is confirmed on the record to address DCR's longstanding use of the accessway.

Flood Hazard Management Program

As proposed, the Project involves activities within a 100-year floodplain as delineated on the current effective Flood Insurance Rate Map ("FIRM") for Worcester County, dated July 16, 2014. DCR's Flood Hazard Management Program ("FHMP"), under agreement with the Federal Emergency Management Agency ("FEMA"), is the state coordinating agency for the NFIP. As such, the FHMP provides technical assistance to communities that participate in the NFIP related directly to the program and also related to floodplain management in general. Communities that participate in the NFIP are required by FEMA, as a condition of their participation, to regulate development within the 100-year floodplain in a manner that meets or exceeds the minimum standards established by FEMA, located at 44 CFR 60.3. Participating communities such as Lancaster are required to adopt the NFIP requirements through locally enforceable measures. In Massachusetts, many of the requirements contained in 44 CFR 60.3 are enforced through existing state regulations such as the State Building Code (780 CMR) and Wetlands Protection Act regulations (310 CMR 10.00). Communities typically adopt the remainder of the requirements as part of a zoning ordinance or other locally enforceable measure. Lancaster has a zoning bylaw that includes a Floodplain District section which has been accepted by FEMA as meeting their requirements under the NFIP.

In our role as NFIP coordinator, the FHMP offers comments on the proposed Project's relationship to many of the above regulations and requirements. The FHMP does not directly administer any of these requirements and therefore does not provide official determinations as to compliance with them; rather,

our comments are provided as an overview of the requirements and the documentation necessary to demonstrate compliance with these requirements.

The Project includes construction of approximately 2,690,000 GSF of mixed uses on-site, along with associated access roadways, parking and circulation areas, stormwater management systems, and utility infrastructure. Based on information submitted with the ENF, some of the work is located within the 100-year floodplain on the current effective FIRM, specifically zones A and AE. Because of its location in the 100-year floodplain, compliance with the requirements of several federal, state and local measures related to floodplain development is required. The Massachusetts State Building Code (780 CMR) Ninth Edition, includes specific standards for structures newly constructed or substantially improved in the floodplain.

Because unnumbered A zones do not include base flood elevations, the Proponent will be required to develop base flood elevation information for use in this project meeting the requirements of the Wetlands Protection Act regulations and the local floodplain regulations of Lancaster. Lancaster's Zoning Bylaw, Article VII Floodplain Regulations, Section 220-26, E states:

"Base flood elevation data is required for subdivision proposals or other developments greater than 50 lots or five acres, whichever is the lesser, within unnumbered A zones."

This is consistent with standards in the NFIP regulations. (*See* 44 CFR 60.3, (b), (3).)

Additionally, projects within the 100-year floodplain involving any federal action (e.g., permitting, funding) must also comply with federal Executive Order 11988, Floodplain Management. This executive order requires an eight-step decision-making process which includes analysis of alternatives, avoiding impacts when possible, and minimizing impacts when avoidance is not possible. Because this Project requires filing a National Pollutant Discharge and Elimination System ("NPDES") General Permit for Stormwater Discharges from Construction Activities, and also an Obstruction Analysis/Airport Airspace Analysis ("OE/AAA") from the Federal Aviation Administration, compliance with this process is necessary.

Summary

In light of the concerns raised above, DCR requests that the Proponent evaluate a development alternative that is in compliance with the ACEC regulations, would provide a substantial buffer between DCR lands and any proposed development or infrastructure improvements, provide monumentation at property bounds, ensure access to Lancaster State Forest is not discontinued, and avoid or minimize floodplain development in compliance with the National Flood Insurance Program or other relevant regulations.

Thank you for the opportunity to comment on the ENF. General questions regarding DCR's comments can be directed to Nat Tipton, MEPA Review Coordinator, at (617) 626-1341 or nathaniel.tipton@mass.gov. Questions regarding the Central Nashua River Valley ACEC can be directed to Nancy Putnam, DCR Director of Ecology and ACEC Programs at (617) 626-1394 or nancy.putnam@mass.gov. Questions regarding DCR's Flood Hazard Management program and its responsibilities under the National Flood Insurance Program, please contact Eric Carlson at (617) 626-1362 or eric.carlson @mass.gov. Questions regarding land protection can be directed to Christine Berry at (978) 887-5931 ext. 7 or christine.berry@mass.gov.

Sincerely,

Leo P. Roy
Commissioner

cc: Christine Berry, Eric Carlson, Priscilla Geigis, Jennifer Howard, Nancy Putnam (DCR)

Energy & Environmental Affairs
Public Comments Portal

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Comment Details

EEA #/MEPA ID*	First Name	Address Line 1
16043	Deb	127 Harvard Rd
Comments Submit Date	**Last Name**	**Address Line 2**
7-1-2019	D'Eramo	--
Review Due By	**Phone**	**State**
7-2-2019	--	MASSACHUSETTS
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	deb705a@gmail.com	01523

Comments

Topic: Too large

As a Lancaster resident I view this project as too much too soon. The space is available but the town is nowhere ready to handle this catch up on our affordable housing requirements of over 10%. We worked hard this year to get an approved Housing Production Plan housing. This development will not only NOT provide affordable housing but will also require the town to provide even more afforda needs time to get our affordable housing units underway and ensure future developments like this one - CONTRIBUTE affordable h bylaws in place to ensure developers provide affordable units but we aren't there yet. Please consider requiring the developer to pro state as the governor has clearly stated. We also have major concerns on the environment. There should be studies done on this lan habitat. The development needs to take into account these critical areas on environment for our wildlife. Once the impact is made t recover it. Please ensure the developer works with our town conservation commission to properly evaluate the impact to our enviror

Attachments

Update Status

Status

Opened ▼ SUBMIT

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
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Charles D. Baker
Governor

Karyn E. Polito
Lt. Governor

Kathleen A. Theoharides
Secretary

Judith F. Judson
Commissioner

8 July 2019

Kathleen Theoharides, Secretary
Executive Office of Energy & Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114
Attn: MEPA Unit

RE: Capital Commerce Center, Lancaster, Massachusetts, EEA #16034

Cc: Maggie McCarey, Director of Efficiency Programs, Department of Energy Resources
Judith Judson, Commissioner, Department of Energy Resources

Dear Secretary Theoharides:

We've reviewed the Environmental Notification Form (ENF) for the above project. The proposed project includes 2.7M -sf of built-space consisting of approximately 900,000-sf of residential buildings (single family, duplex, triplex and multifamily), 1.6M-sf of industrial space, and 200,000 -sf of commercial space (hotel, retail, recreation). For this project, we expect key mitigation measures to include:

- Electrification of space and water heating with heat pump/VRF systems (All Buildings);
- Passivehouse (PHI or PHIUS method) (Residential & Hotel);
- Maintained envelope integrity with framed, insulated walls with continuous insulation (All Buildings);
- Avoid glass curtain wall assemblies and excessive windows (All Buildings);
- Energy recovery (All Buildings);
- LED lighting (All Buildings);
- Rooftop solar PV (All Buildings);

Emissions associated with regulated end uses can be largely eliminated (typically: 50 to 80% less emissions than code-built construction) with the above strategies. Significant incentives are available, as well.

Passivehouse also provides superior indoor air quality, comfort, resilience, and noise reduction. Passivehouse typically costs 0 to 6% more to build initially but can cost less on a cash-flow basis from day one as described herein.

Electrification of Space and Water Heating

Electrification of space and water heating is a key mitigation strategy with significant short- and long-term implications on GHG emissions. Massachusetts currently has relatively low grid emissions (700 lbs/MWhr) which are expected to decline each year with implementation of clean energy policies that increase renewable electricity sources.. The implication is that efficient electric space and water heating with cold climate air source heat pump and VRF equipment is expected to have much less emissions than even condensing gas boilers. Currently, efficient electric heating has approximately **55% lower emissions** than natural gas heating and, by 2050, efficient electric heating is expected to have approximately **85% lower emissions**.

Efficient electrification of space and water heating entails use of:

- Cold-climate air source heat pumps, and/or VRF for space heating;
- Air source heat pumps for water heating.

Heat pumps and/or VRFs if used for space heating can qualify for significant incentives, including Alternative Energy Credits (AECs). Additionally, electrifying space and water heating could eliminate the need for gas service from some or all the project, potentially eliminating costs associated with gas utility distribution.

Passivehouse

We recommend that Passivehouse be thoroughly investigated for the residential buildings and hotel. Two Passivehouse standards exist: Passive House Institute United States (PHIUS) and Passive House Institute (PHI), both are recognized by Massachusetts building code.

In addition to providing significant GHG reduction benefits, Passivehouse would be more affordable as they cost much less to operate than Code.

In terms of capital costs, Passivehouse usually costs more to construct. An extensive cost study shows that Passivehouse multifamily costs about 2 to 4% more[1] to construct, on average. However, this cost of construction premium can be reduced by financial benefits available to the developer, as follows:

[1] "Accelerating Market Transformation for High-Performance Building Enclosures", Pembina Institute, dated September 2016.

- Alternative Energy Credits[2]
- MassSave© performance-based utility incentives[3]

Passivehouse would also greatly improve resiliency as Passivehouse units can stay warm (or cool, in summer) for extended periods, even with loss of active space conditioning equipment.

Integrity of Building Envelope

High-performing envelope is essential to successful GHG mitigation. Key strategies for maintaining integrity of envelope are:

- Limiting or eliminating use of glass "curtain wall" and spandrel assemblies;
- Maximizing framed, insulated walls sections;
- Maintaining window/wall rations to code levels.

The thermal performance of windows, curtain walls, and spandrels is about **70 to 80% less** than the thermal performance of the framed, insulated wall assemblies. Accordingly, buildings which use extensive curtain wall, spandrel, and windows have compromised envelope performance, compared to code building which increases energy consumption and increases emissions.

Rooftop Solar PV

Rooftop PV can provide significant GHG benefits as well as significant financial benefits. We recommend PV evaluations be performed for all buildings and at least 80% of roof space be set aside for PV on all roofs.

It's important to plan the project to ensure that roof space is set aside for PV and doesn't become unnecessarily encroached with HVAC appurtenances, diminishing the value of this asset.

Recommendations for subsequent Submissions

Recommendations are as follows:

1. Emissions and utility cost reduction should be estimated for heat pumps/VRF for all buildings for both space heating and water heating.

2. Emissions and utility cost reduction should be estimated using Passivehouse for the single family, duplex, triplex, multifamily, and the hotel. Passivehouse analysis should include:

[2] https://www.mass.gov/service-details/alternative-portfolio-standard-rulemaking;

[3] https://www.masssave.com/-/media/Files/PDFs/Save/Residential/Pay-for-Savings.pdf?la=en&hash=67420BCA38A8BC3BBDB8B9DE41949DE58D22C964

a. Estimate of Alternative Energy Credits, including bonus multipliers for Passivehouse-level performance;

b. Estimates of MassSave® incentives, based on meeting with utility. Note that new Passivehouse incentive offerings are included in the 2019-2021 statewide energy efficiency plan.

3. Evaluate solar PV for all buildings. Investigate models of ownership and operation under SMART, including Qualified Facility pathway. Meet utility to discuss interconnection. Include building roof plans showing location of planned solar and location of roof HVAC equipment and other appurtenances. Indicate on the plans the code-required extent of solar readiness. Map out maximum area available for solar. Estimate GHG reduction as a result of solar PV.

4. Above-code envelope should be used throughout. In summary:

   a. Above Code-threshold envelope is recommended (vertical walls, windows, roofs and exposed floors). Priority should be given to increasing continuous insulation. Distinguish between R value of batt and R value of continuous insulation. Indicate planned wall assembly U value and wall construction type (mass, wood, metal stud, etc). Confirm that the relationship between R-value and assembly U-factor conform to Appendix A of the Code.

   b. Window to wall ratios should be maintained at or below the values shown in Table G3.1.1-1 of ASHRAE 90.1-2013.

   c. Glass curtain wall/spandrel systems should be avoided.

5. Report the following for each building:

Vertical Envelope	Reference Building		Proposed Building	
	Percent of Vertical Area	**U value**	**Percent of Vertical Area**	**U value**
Framed, insulated Wall	%	value	%	value
Opaque glass, curtain wall, shadowbox, spandrel	%	value	%	value
Vision glass	%	value	%	value
	100%	***Aggregate U***	***100%***	***Aggregate U***
		Aggregate R		***Aggregate R***

Aggregate U is calculated as: $(U_1\%_1 + U_2\%_2 + U_3\%_3)$ where U is the respective thermal transmittance values and $\%_1$ is the percent area of framed insulated wall; $\%_2$ is the percent area of opaque glass, curtain, or shadowbox; and $\%_3$ is the

percent area of vision glass. Only areas adjacent to conditioned space are counted, areas adjacent to unconditioned spaces (e.g. parking garages, mechanical penthouses) are not counted. Aggregate R is the inverse of aggregate U.

6. For all buildings, the proposed aggregate R calculated above should be larger than the reference building; otherwise envelope performance is being traded-off for other improvements, reversing mitigation gains. Tradeoffs should be avoided.

7. Investigate external shading.

8. Submit project modeling files to the DOER on a flash drive.

9. Compare model results total and individual end uses with representative, prototype buildings developed by Pacific Northwest National Labs/Department of Energy found at the link below. Provide a summary explaining potential differences.

   - https://www.energycodes.gov/sites/default/files/documents/BECP_901_2013_Progress_Indicator_0_0.pdf
   - http://www.energycodes.gov/sites/default/files/documents/2013EndUseTables.zip
   - https://www.energycodes.gov/commercial-energy-cost-savings-analysis

10. Include a table similar to the example below. For "code value" ensure that the value incorporates any improved efficiency per requirements of Section C406.1 of the Massachusetts' amendments.

Measure/Area	Base Code	Proposed	% Change	Comment
AC Efficiency (EER)				
Bldg 1	*code value*	*design value*	%	
Bldg 2	*code value*	*design value*	%	
ERV Effectiveness (%)				
Bldg 1	*code value*	*design value*	%	
Bldg 2	*code value*	*design value*	%	
Boiler (% efficiency)				
Bldg 1	*code value*	*design value*	%	
Bldg 2	*code value*	*design value*	%	
LPD (Watts/sq ft)				
Bldg 1	*code value*	*design value*	%	
Bldg 2	*code value*	*design value*	%	
(continue to include service water, equipment, etc)				

Capital Commerce Center, EEA #16043
Lancaster, Massachusetts

Sincerely,



Paul F. Ormond, P.E.
Energy Efficiency Engineer
Massachusetts Department of Energy Resources



Brendan Place
Clean Energy Engineer
Massachusetts Department of Energy Resources

Patel, Purvi (EEA)

From: gwjwi@aol.com
Sent: Monday, July 01, 2019 11:05 PM
To: Patel, Purvi (EEA)
Subject: MEPA Review for Capital Commerce Center in Lancaster, MA -- EEA No. 16043

Dear MEPA Analyst Patel:

I have significant concerns about the environmental impact of the Capital Commerce Center proposed in the northern area of Lancaster. The project plans to add multiple business and residential structures in a 471 acre area that is largely, previously undeveloped.

The sprawling development appears to border the North Nashua River and transects multiple tributary streams. It will irreparably destroy over 55 acres of existing woodlands and wetlands that provide important wildlife habitat as well as watershed for the nearby river.

The proposed development appears to be sandwiched between two NHESP priority habitat areas, with one to the west and another to the east. In addition, it appears to border Cook's Conservation area to the south. Given its proximity to these important conservation and habitat areas, I would like to see a full range of environmental studies conducted including a complete and comprehensive review of rare species, plants, and habitat.

One certified vernal pool is known to exist on the southwest portion of the site. Given the large, diverse range of terrain and wetlands on the parcel, it seems likely that others are there as well. Lancaster and neighboring towns are known to have a variety of salamanders and turtles, so there could very well be essential habitat for those species and others on this site as well.

A 2017 evaluation of possible water sources for economic development in north Lancaster, considered establishing new wells on town land just north of the Nashua River as one of the attractive options. It's hard to believe the town would consider siting this extensive development and it's massive sewage treatment facility that close to one of the town's only alternative water sources.

The town of Lancaster has exceeded its WMA permit level for 8 of the past 10 years and is desperately in need of establishing a secondary source for its municipal water system. Its existing wells are both in the same aquifer in south Lancaster and are highly susceptible to contamination due to their location and the surrounding soil types.

The single-access entry to the proposed development off of route 70 will add over 11,000 vehicle trips per day which will certainly increase traffic backups at the intersection with route 117 to the south at peak travel times. All the extra vehicles and all the additional backups are bound to significantly degrade the local air quality.

While Lancaster would benefit from expanding its business tax base, there is little current need for an additional 617 housing units. The local zoning board recently approved a development in the south end of Lancaster consisting of 96 apartments and 56 single-family homes. It's hard to see the need for another, concurrent, large housing development. The town is not even staffed to deal with all this construction at the same time.

What Lancaster needs more of is affordable housing. The Capital Commerce project would significantly increase the market-rate housing in Lancaster which would actually reduce progress toward meeting the state's mandate for 10% affordable housing.

The residential portions of the development appear to receive generous zoning relief without providing the benefits typically associated with cluster development. There is no affordable housing, no conservation land set aside, and little or no recreation or open space planned.

Lancaster would likely benefit from additional retail, restaurant, and food store options. It would benefit from a reasonably sized hotel and more recreational facilities. What it does not need is more car dealerships. Most of all, Lancaster really needs more affordable housing.

This area appears to contain significant wildlife and habitat resources in an environmentally sensitive location. The North Nashua River is within the Commonwealth's Central Nashua River Valley Area of Critical Environmental Concern. The Nashua River recently received national designation as a "Wild and Scenic River" and the North Nashua River is part of that greater watershed.

The impact of any development in this area must be carefully and thoughtfully evaluated.

Sincerely,

Greg Jackson
Lancaster, MA

Patel, Purvi (EEA)

From: Joe Ramirez <ramizer366@comcast.net>
Sent: Thursday, June 27, 2019 1:31 PM
To: Patel, Purvi (EEA)
Subject: Capital Commerce Center, at McGovern Boulevard in Lancaster

Hello Purvi,

Thank you for coordinating the MEPA meeting at the McGovern Boulevard site in Lancaster. It was very informative, and as an abutter, I have a multitude of concerns based on the enormous scale of the project.

My primary concern needs to be the proposed access to White Pond Road. This is a private road, and as president of the association, I need to make it clear that there is absolutely no access to the road. We went through a law suit back in the late 90's, and were deeded a strip of land around the outside edge of the street. This capped it from any future extension. It is mentioned twice in the proposal, and once by a member of the development group at the meeting, that White Pond Road would be an access point for the 117 homes proposed at section K of their map. Moments later, he backed away from that statement when I contested it. So to be clear, there will not be any access allowed from White Pond Road, including emergency access, and it needs to be removed from any plans going forward.

My second concern is traffic. Having lived in the area for 23 years, I find it impossible to believe the traffic impact study when they claim it won't have a significant affect on traffic. Soccer tournaments already cause a ridiculous amount of congestion, and the number of cars associated with the development far exceeds the number currently connected with the soccer fields. The entire site is only accessible from 2 spots, McGovern Boulevard and Johnny Appleseed Lane. Both of these intersections have had multiple traffic fatalities in recent years. Adding 117 homes to Johnny Appleseed would much more than double the number of homes on that dead end street. It is a narrow, winding road with the only egress being on a very steep hill that has always been a problem intersection. Claiming it won't change anything would be naive. What also must be considered is the interscetion of 70 and 117. Not only has there also been a fatality there recently, but the school buses are often delayed by 15 or 20 minutes in the morning due to traffic backing up as much as a 1/2 mile, making kids late for school.

Adding 117 single family, duplex and triple family homes and 500 apartments will increase the population of the town by 25 - 30%. Again, this mass of new people can only access their homes by 2 points of entry. Also being added to the equation are the cars attributed to the 120 unit hotel and other businesses of the plan. The local infastructure is not built for this level of increase. Nor can the schools, police or fire departments handle such a population explosion in their present state.

This site has been a target for development in Lancaster for decades. But the problems with it have not changed over that time, and I don't see anything different with this plan. It has limited water available to it, and extremely limited access. The water problem may be solved by obtaining water from Lunenburg, but as of now, they don't have the water neccesary to accomodate this project. Even if they do obtain additional water, it needs to be studied carefully as to where it is coming from. If it is through additional wells, they need to be fed from a completely different aquifer than are the homes in North Lancaster. The town can't pretend that there is plenty of water for all, especially when they have issued water bans to the car dealerships that already exsist. Residents in this area do not have a plan B for water. We are completely restricted to personal wells. Another issue is that the area is teaming with wildlife. The wetlands need to be

protected, and impact to the animals limited as much as possible. We have a nesting pair of bald eagles on White Pond for the first time in a century. Most residents in the area purchased their homes to be in a wooded area with an abundance of wildlife. But coyotes and other preditors being forced out of the woods and into people's back yards is not what anyone is looking for.

As abutters, we can accept that this land will be developed in some manner. What we ask is that it isn't hugely detrimental to the current residents who have been paying taxes for years. Businesses with a small number of employees and no direct retail customers would be preferrable as it would have only a small impact on the traffic. Lancaster is a tiny, rural town of 8000. This project would not only change that, but it would more than likely cause an increase in property taxes, which are already among the highest in the area. We all know that adding homes actually cost the town money rather than generating income. Increasing the population by nearly a third would certainly cause this to happen.

Thank you for your time,
Joe Ramirez
President of White Pond Road Association

Energy & Environmental Affairs
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Comment Details

EEA #/MEPA ID*	First Name	Address Line 1
16043	Kaitlyn	250 White Pond Rd
Comments Submit Date	**Last Name**	**Address Line 2**
6-27-2019	Drew	--
Review Due By	**Phone**	**State**
7-2-2019	--	MASSACHUSETTS
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	kaitlynldrew@gmail.com	01523

Comments

Topic: Effect on White Pond

Hi, As a resident of White Pond Rd, we all have private wells on our road as well as Holiday Lane. Whites Pond also serves as a prim MA. Not noted in this proposal as it is a separate development, but there is currently a 34-acre solar field going in just to the northe Golf Course is). I am wondering what the environmental impacts are with having so much clearing both east and south of Whites Pc prone to flooding? Also, I would like to know what the impacts on the aquafor are with such clearing and massive development, anc have no option for public water hookups? I am also concerned with secondary used vehicles being stored on the site and what preca materials get spilled into both the Nashua River, vernal pools and aquafor as well. Finally, I am concerned about the noise and air pc those residents in the area of North Lancaster. Thank you for your time.

Attachments

Update Status

Status

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Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Central Regional Office • 8 New Bond Street, Worcester MA 01606 • 508-792-7650

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

July 9, 2019

Secretary Kathleen A. Theoharides
Executive Office of Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114

Attention: MEPA Unit – Purvi Patel

Re: Environmental Notification Form (ENF)
Capital Commerce Center
Lancaster
EEA #16043

Dear Secretary Theoharides,

The Massachusetts Department of Environmental Protection's ("MassDEP") Central Regional Office (CERO) has reviewed the ENF for the proposed Capital Commerce Center in Lancaster (the "Project"). Capital Group Properties (the "Proponent") is proposing to construct approximately 2,690,000 gross square footage (gsf) of mixed uses on-site, along with associated access roadways, parking and circulation areas, stormwater management systems, and utility infrastructure. The Project will generally include the construction of numerous industrial buildings including an automotive sales and service facility; single family, duplex and triplex units residential; multi-family apartments; a hotel; a new indoor sports facility; and retail space.

MEPA History

On October 31, 2016, North Lancaster Water LLC filed an ENF with MEPA for a Dunkin' facility proposed to be constructed at 1474 Lunenburg Road. Development of the Dunkin' facility would require a modification to the public water supply permit issued by MassDEP for an existing facility. On December 1, 2016, MEPA requested a "look back" analysis of the 50-acre commercial/retail development known as Lancaster Crossing, which included the proposed Dunkin' facility. North Lancaster Water withdrew the ENF without prejudice on December 9, 2016.

On March 29, 2017, two applications were filed with MassDEP for public water supply wells on parcels within the Lancaster Crossing development to serve the Dunkin' and a proposed Mobil gas

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

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station. The Proponent provided MEPA with the preliminary results of the "look back" analysis. As a result, MEPA indicated the filing of a Request for an Advisory Opinion would be appropriate.

On June 19, 2017, the Proponent submitted a Request for an Advisory Opinion letter to MEPA requesting confirmation that the proposed Dunkin' and Mobil gas station project would not be subject to review under MEPA. Based on the information provided, MEPA determined that the proposed project was not subject to MEPA review and the submission of an ENF was not required. However, if development of any portion of the remainder of land then or formerly owned by North Lancaster Water is proposed in the next five years, the Proponent was directed to consult with MEPA to determine whether it may be subject to MEPA review.

The existing 471-acre Site has been subdivided and sold to five ownership entities. The Lancaster Crossing development project (EEA# 15604) contains approximately 50± acres located in the eastern portion of the Site along Lunenburg Road, and is proposed to be developed by a separate entity with commercial/retail/residential uses. The Dunkin', Mobil Gas Station, and soccer complex have already been constructed as part of the Project. The ENF includes all parcels that make up the Site, regardless of current ownership.

This Project is under MEPA review because it meets or exceeds the following review thresholds:

- 11.03(1)(a)(1) – Direct alteration of 50 or more acres of land
- 11.03(1)(a)(2) – Creation of 10 or more acres of impervious area
- 11.03(6)(a)(6) – Generation of 3,000 or more New adt on roadways providing access to a single location
- 11.03(6)(a)(7) – Construction of 1,000 or more parking spaces at a single location
- 11.03(3)(a)(1)(b) – Alteration of 10 or more acres of other wetlands (Riverfront Area and Bordering Land Subject to Flooding)
- 11.03(5)(b)(1) – Construction of a new wastewater treatment facility with a capacity of 100,000 or more gallons per day (gpd)

The Project requires the following State Agency Permits:

- MassDEP – Water Distribution System Modification Permit (BRP WS 32)
- Individual Permit for Sewerage Treatment Plan (BRP WP79)
- Hydrogeologic Evaluation Report Approval (WP83)
- Superseding Order of Conditions (if local Order of Conditions is appealed)

MassDEP offers the following comments:

Alternatives Analysis

The alternatives analysis does not describe the respective environmental impacts of the five alternatives considered, except for traffic. MassDEP notes that the preferred alternative results in the creation of the most impervious surface (166 acres) of the five considered. MassDEP requests that the alternative analysis in the DEIR be expanded to include not only a comparison of the environmental impacts of each option, but the available mitigation measures as well. For example, the ENF states that wetlands impacts will not be quantified until the Master Plan is complete, so it is difficult to determine the appropriate nature and extent of mitigation that would be required for each of the alternatives, including the preferred alternative.

Water Supply

The Project will require 157,285 gallons per day (gpd) of drinking water, which will be purchased from the Lunenburg Water District (Water District). The Water District is regulated through MassDEP's Water Management Act (WMA) Program to withdraw an annual average volume of 0.54 million gallons per day (MGD). Actual withdrawals from 2016 through 2018 ranged from 0.51 to 0.54 MGD; therefore the Water District will need an increase in its total authorized withdrawal volume in order to supply the Project's demand. On December 8, 2018, the Water District submitted a WMA Permit application to increase its total authorized withdrawal volume. The application includes the addition of a new wellfield to the WMA Permit. MassDEP issued approval of the wellfield site and the proposed pumping test on September 21, 2017; however, the pumping test has not yet been completed and is scheduled for late summer 2019. MassDEP must review the pumping test application concurrently with the WMA Permit application, so the WMA Permit application is on hold until MassDEP receives a WS19 application with the pumping test results. The development of the wellfield was determined by the Water District to be the most cost effective means to supply increased demand on the water system and to insure continued withdrawals below the secondary maximum contaminant levels of iron and manganese. The Proponent should consider funding any water system upgrades that the Water District identifies as necessary to supply the Project.

The Water District's WMA permit will require a mitigation plan to be submitted and approved by MassDEP to offset withdrawals in excess of the baseline volume. Examples of mitigation projects suitable for the WMA program are those that remove or disconnect impervious surface; protect and preserve open space; provide infiltration and inflow removal from a sewer system; or otherwise improve surface water wildlife habitat. Stormwater improvements that exceed standard requirements and culvert replacements that meet stream crossing standards can also be considered as mitigation for WMA. The Proponent is encouraged to participate in any mitigation projects that will offset the increased demand on the Water District's system from the Project. The Proponent should work with LWD to record details of any potential mitigation work performed at the site for future submittal to MassDEP for consideration as mitigation.

Approximately 4.1 miles of water main will extend from Lunenburg into Lancaster to supply drinking water. A WS32 Water System Modification Permit from MassDEP will be required for the new water main. MassDEP will work with the town of Lancaster and the Water District to determine ownership and responsibility of the water main associated with the public water system. The existing Dunkin' and Mobil gas station and convenience store are currently operating two separate public water systems that have individual wells within the development area. With the new water line from the Water District serving the Project, these two public water systems should be required to connect to the new water line and become customers of the Water District. The Proponent should indicate the plans for abandoning these two public water systems in the DEIR.

Wastewater

The Project will consist of development of approximately 2,690,000 gross square footage of mixed uses. To accommodate these uses, the Proponent proposes to construct a wastewater treatment facility permitted under 314 CMR 5.00 (Groundwater Discharge Permit Regulations) to discharge treated effluent to the ground up to a total proposed design flow of 155,385 gpd. The Proponent proposes to connect all existing septic systems at the Site (the Dunkin' and the Mobil gas station) to the wastewater treatment facility.

As part of the discharge permit application process, on June 13, 2019, the Proponent submitted a BRP WP 83 application for hydrogeologic approval to the MassDEP Central Regional Office for review. Once the site has been determined to be adequate to accept the discharge of 155,385 gallons per day of wastewater, the Proponent can apply for an Individual Groundwater Discharge permit. In the DEIR, the Proponent should identify location of the sewer collection system associated with the proposed development.

MassDEP will require that all wastewater generated on the site shall be connected to the treatment facility. The Proponent should describe in the DEIR how the Project will meet the requirements for a privately owned wastewater treatment facility in 310 CMR 5.15. MassDEP's regulation requires that a single entity be the permittee responsible for operation, monitoring, maintenance, and repair of the treatment facility. However, if the privately owned treatment facility treats waste from activities owned or controlled by other entities, all stakeholders must share the financial and operational responsibilities for the wastewater treatment facility. Because the Project includes residential uses, the discharge permit will require a Financial Assurance Mechanism to fund the immediate repair and replacement of the Facility. The DEIR should describe the legal and financial arrangements that will achieve compliance with these permitting requirements.

Wetlands

There are numerous wetland resource areas on the Site including Bank associated with intermittent and perennial streams, Land Under Water (LUW), Bordering Vegetated Wetlands (BVW), Isolated Vegetated Wetlands (IVW), Bordering Land Subject to Flooding (BLSF), and Riverfront Area (RA). The southern half of the Site is within the Central Nashua River Valley Area of Critical Environmental Concern (ACEC).

Portions of the Project have already been constructed including the outdoor athletic fields and retail shops in the eastern portion of the property. Work associated with the previously completed outdoor athletic fields and retail shops occurred within Bordering Land Subject to Flooding (BLSF) and Riverfront Area. The ENF indicates that the remainder of the Project will potentially alter an additional 115,000 sf of BLSF and 420,000 sf of RA, but that quantification of the extent of alterations has not yet been fully determined.

A final Order of Conditions is required for the remainder of the Project in accordance with the Massachusetts Wetlands Protection Act (G.L. c. 131, § 40; WPA). The Project must be designed to meet all performance standards identified in the WPA Regulations at 310 CMR 10.00 for work proposed in each wetland resource area affected. Identified impacts to BLSF and RA should be reduced and/or eliminated as much as possible and a detailed alternatives analysis should be provided. Portions of the Project, including the auto storage facility with a large gravel storage area and stormwater basins, are near ACEC wetlands, which are sensitive wetland resource areas. In the alternative analysis in the DEIR, the Proponent should evaluate alternatives that situate these components further away from the sensitive resource areas. The DEIT should also consider structured parking alternatives. The Proponent should include information on how the large gravel storage areas would be utilized and maintained in a manner to prevent impacts to sensitive resource areas and receptors.

The Proponent should identify the location of all utilities associated with the development and identify impacts to wetlands resource areas. The residential component of the development that is accessed from Leominster does not have any details on where the water and sewer lines will be located.

The Project must comply with the Massachusetts Stormwater Standards (Stormwater Standards). The ENF provides general statements that the Project will be designed in compliance with the Stormwater Standards; however, the DEIR should include greater detail to confirm this general statement. Future filings should contain the required stormwater checklist and supporting calculations. Stormwater basins shown on the plan are mostly associated with the central industrial uses. The plan does not depict any stormwater best management practices associated with the residential, hotel, or retail uses. Vernal pools are critical areas under the Stormwater Standards and stormwater structures are not permitted within 100 feet, but the ENF plan depicts a stormwater basin within 100 feet of a vernal pool. In the DEIR, the Proponent should evaluate alternatives where the stormwater structures are set back from receiving wetland resource areas as must as possible due to the sensitive nature of the wetland resource areas.

Air Quality

Construction and Demolition Air/Noise Pollution

Construction and demolition activity must conform to current Massachusetts Air Pollution Control regulations governing nuisance conditions at 310 CMR 7.01, 7.09 and 7.10 and not cause or contribute to a condition of air pollution due to dust, odor or noise. As such, the Proponent should propose measures to prevent and minimize dust, noise, and odor nuisance conditions during construction and/or demolition.

MassDEP requests that all non-road diesel equipment rated 50 horsepower or greater meet EPA's Tier 4 emission limits, which are the most stringent emission standards currently available for off-road engines. If a piece of equipment is not available in the Tier 4 configuration, then the Proponent should use construction equipment that has been retrofitted with appropriate emissions reduction equipment. Emission reduction equipment include EPA-verified, CARB-verified, or MassDEP-approved diesel oxidation catalysts (DOCs) or Diesel Particulate Filters (DPFs). The Proponent should maintain a list of the engines, their emission tiers, and, if applicable, the best available control technology installed on each piece of equipment on file for Departmental review.

Massachusetts Idling Regulation

MassDEP reminds the Proponent that unnecessary idling (i.e., in excess of five minutes), with limited exception, is not permitted during the construction and operations phase of the project (310 CMR 7.11). With regard to construction period activity, typical methods of reducing idling include driver training, periodic inspections by site supervisors, and posting signage. In addition, to ensure compliance with this regulation once the Project is occupied, MassDEP requests that the Proponent install permanent signs limiting idling to five minutes or less on-site.

MassDEP appreciates the opportunity to comment on the Project. If you have any questions regarding these comments, please do not hesitate to contact Stella Tamul, Central Regional Office MEPA Coordinator, at (508) 767-2763.

Very truly yours,

Mary Jude Pigsley
Regional Director

cc: Commissioner's Office, MassDEP

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

July 1, 2019

Kathleen Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Lancaster: Capital Commerce Center – ENF
(EEA #16043)

ATTN: MEPA Unit
Purvi Patel

Dear Secretary Theoharides:

On behalf of the Massachusetts Department of Transportation, I am submitting comments regarding the proposed Capital Commerce Center project, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please contact J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (857) 368-8862.

Sincerely,

Robert E. Fogg /FOR

David J. Mohler
Executive Director
Office of Transportation Planning

DJM/jll

Ten Park Plaza, Suite 4150, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

cc: Jonathan Gulliver, Administrator, Highway Division
Patricia Leavenworth, P.E., Chief Engineer, Highway Division
Neil Boudreau, Assistant Administrator of Traffic and Safety Engineering
Barry Lorion, P.E., District 3 Highway Director
Community Development and Planning Office, Town of Lancaster
Office of Planning & Development, City of Leominster
Montachusett Regional Transit Authority
Montachusett Regional Planning Commission
PPDU Files

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

TO: David J. Mohler, Executive Director
Office of Transportation Planning

FROM: J. Lionel Lucien, P.E, Manager
Public/Private Development Unit

DATE: July 1, 2019

RE: Lancaster – Capital Commerce Center: ENF
(EEA #16043)

The Public/Private Development Unit (PPDU) has reviewed the Environmental Notification Form (ENF) for the Capital Commerce Center project in Lancaster and Leominster. The 471-acre site currently consists of five separate development parcels made up of several different uses, including a 2,300 square foot coffee/donut shop, a 5,000 square foot gas station with convenience store, an outdoor soccer facility, an 11,800 square foot trucking facility, a residence and equestrian uses, gravel pits and access roads, and undeveloped fields, woodland, and wetlands. The project proposes to construct 2.69 million square feet of mixed-use development, including an approximately 1.57 million square foot industrial park with an automotive sales and service facility, 117 single-family residential units, 500 multi-family residential units, a 120-room hotel, an approximately 86,500 square foot indoor soccer facility, and approximately 65,700 square feet of additional retail space. All existing development will be retained with the exception of the trucking facility.

Based on the information presented in the ENF, the Full-Build project is expected to generate 17,620 unadjusted vehicle trips on an average weekday and 18,368 unadjusted vehicle trips on an average Saturday, with 1,472 unadjusted vehicle trips during the weekday morning peak hour, 1,584 unadjusted vehicle trips during the weekday evening peak hour, and 2,085 unadjusted vehicle trips during the Saturday midday peak hour. The project will include 3,462 parking spaces. The project exceeds the Massachusetts Environmental Policy Act (MEPA) thresholds for trip generation (3,000 new trips) and parking (1,000 spaces) and thus is categorically included for the preparation of an Environmental Impact Report (EIR).

The project site is made up of three parts. The eastern portion of the project site, which includes the existing Lancaster Crossing development and the trucking facility, would involve the construction of the multi-family apartment buildings, hotel, indoor sports facility, and retail space. Access to this portion of the site is proposed via the existing McGovern Boulevard as well as via additional access points off of Lunenburg Road. The central portion of the project site would consist of the industrial buildings with access proposed via an extension of McGovern Boulevard. The western portion of the project site would consist of 117 single-family, duplex, and triplex housing units accessed by Johnny Appleseed Road to the west (through Leominster) and White Pond Road to the east. The western portion of the project site would be accessed

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separately from the eastern and central portions. A Vehicular Access Permit from MassDOT will be required due to anticipated impacts on Route 2, a state-owned roadway. The project site also abuts I-190, a state-owned roadway.

The EENF includes a Transportation Impact Assessment (TIA) prepared in conformance with the current MassDOT/EOEEA *Transportation Impact Assessment Guidelines*. The Draft Environmental Impact Report (DEIR) should address the comments raised in this letter.

Study Area

The TIA study area includes the following intersections:

- Main Street (Route 70/Route 117) at Seven Bridge Road (Route 117) and Shirley Road;
- Main Street (Route 70/117) at Lunenburg Road (Route 70);
- Lunenburg Road (Route 70) at McGovern Boulevard;
- Lunenburg Road (Route 70) at Old Union Turnpike Road;
- Lunenburg Road (Route 70) at Woods Lane/Fort Pond Road;
- Old Union Turnpike at Route 2 Eastbound Ramps;
- Fort Pond Road at Route 2 Westbound Ramps;
- Mechanic Street at Johnny Appleseed Lane; and
- Mechanic Street at White Pond Road.

The DEIR study area should include the Route 2 Off- and On-Ramps associated with Exit 34, along Old Union Turnpike and Harvard Street, unless they do not meet the study area intersection thresholds of site-generated traffic representing 100 vehicles during the peak hour or five percent of all intersection traffic during the peak hour. If these intersections meet study area thresholds, the Proponent should provide capacity analyses as part of the DEIR submission and propose mitigation in instances where the intersections or intersection approaches under state jurisdiction are anticipated to operate at an LOS E or F during a peak period under 2026 No-Build or Build condition.

Otherwise, the study area is considered to be acceptable and adequate in capturing the impact of the project on area roadways.

Trip Generation

The TIA includes trip generation rates that were calculated using the Institute of Transportation Engineers (ITE)'s *Trip Generation Manual* (10th Edition). As presented in the ENF, trip generation was calculated based on Land Use Code (LUC) 130 – Industrial Park, LUC 210 – Single-Family Housing (Detached), LUC 221 – Multifamily Housing (Mid-Rise), LUC 310 – Hotel, LUC 488 – Soccer Complex, and LUC 820 – Shopping Center. The development project, separate from existing traffic-generating land uses, site is expected to generate 11,332 unadjusted vehicle trips on an average weekday and 11,352 unadjusted vehicle trips on an average Saturday, with 844 trips during the weekday morning peak hour, 1,062 trips during the

weekday evening peak hour, and 1,445 trips during the Saturday midday peak hour. Internal capture and pass-by rates were applied using rates obtained from the ITE *Trip Generation Handbook* (3rd Edition). Accordingly, the site is expected to generate 9,790 net new vehicle trips on an average weekday and 9,602 net new vehicle trips on an average Saturday, with 752 trips during the weekday morning peak hour, 838 trips during the weekday evening peak hour, and 1,299 trips during the Saturday midday peak hour. No mode share splits were applied to the project.

The DEIR must demonstrate that pass-by rates were appropriately applied to weekend traffic figures along Lunenburg Road; the pass-by volume cannot exceed 15 percent of traffic along the adjacent roadway. The DEIR should also clarify whether the existing FC Stars soccer facility features three or four fields, adjust trip generation figures and capacity analyses as appropriate, as well as provide justification for using the average rate rather than the fitted curve equation for LUC 820 – Shopping Center.

Safety

The TIA includes a summary of crash rates derived from MassDOT for the continuous three-year period of 2013 through 2015, with the Proponent coordinating with MassDOT to acquire individual crash reports for the Old Union Turnpike/Route 2 Eastbound Ramps and Fort Pond Road/Route 2 Westbound Ramps intersections in order to determine the crash rate for these intersections. All but one of the study area intersections (the Main Street/Lunenburg Road intersection) experience crash rates below the MassDOT statewide and District 3 averages for signalized or unsignalized intersections.

The Main Street/Lunenburg Road intersection, Old Union Turnpike/Route 2 Eastbound Ramps, and Fort Pond Road/Route 2 Westbound Ramps intersections are all listed as 2013-2015 Highway Safety Improvement Program (HSIP)-eligible crash clusters. A Road Safety Audit was completed by the Proponent at the Main Street/Lunenburg Road intersection in 2017; the DEIR should commit to implementing low-cost, short-term improvements identified in the RSA as mitigation for this project. As discussed above, the Proponent is coordinating with MassDOT to determine the location of individual crash reports at the Old Union Turnpike/Route 2 Eastbound Ramps and Fort Pond Road/Route 2 Westbound Ramps intersections to determine whether the HSIP-eligibility applies to the Route 2 mainline or the ramps intersections. Additional RSAs, with commensurate commitments to low-cost, short-term improvements identified through the RSAs, will need to be completed prior to the submission of the DEIR if deemed appropriate by MassDOT.

Traffic Operations

Capacity analyses were conducted for the weekday morning and weekday evening peak periods for the existing, 2026 No-Build, 2026 Build, and 2026 Mitigated Build conditions. According to the preliminary TIA attached to the ENF, all intersections and intersection approaches under state jurisdiction are anticipated to operate at an acceptable Level of Service (LOS) during the weekday morning and weekday evening peak periods, except for the

northbound Route 2 Westbound Off-Ramp left-turn approach at the Fort Pond Road/Route 2 Westbound Ramps intersection. The Level of Service for this left-turn approach deteriorates from D to E during the weekday evening peak hour; the DEIR should evaluate and commit to improvements that would restore this movement to a LOS D or better in the Build condition. We note that queue storage on the Route 2 Westbound Off-Ramp is limited to approximately 200 feet; improvements to address the short queue storage should be identified in the DEIR given the queue will likely exceed the available storage with the addition of project-related traffic, specifically during the weekday evening peak hour.

Several alternatives are currently being evaluated for the Route 2 interchanges in Lancaster and Harvard as part of MassDOT project #605393. The TIA notes that five alternatives for Exit 35 are being evaluated at present. These alternatives were not incorporated in the TIA as it is not expected that the improvements will be in place by the 2026 Build year; the DEIR should provide any update on this process as available.

Mitigation is proposed at several intersections under the jurisdiction of the Town of Lancaster. The Lunenburg Road/McGovern Boulevard intersection will be signalized, with demand-based vehicular and bicycle detection as well as emergency vehicle pre-emption capabilities. McGovern Boulevard will be widened to provide an exclusive eastbound left-turn and an exclusive eastbound right-turn lane. The northbound approach of Lunenburg Road will be widened to introduce an exclusive left-turn lane under protected-permitted signal phasing with the southbound approach widened to introduce an exclusive right-turn lane under permissive-overlap signal phasing.

Additionally, traffic signal timing modifications will be implemented at the Main Street/Seven Bridge Road and Lunenburg Road/Main Street intersections in accordance to the Traffic Monitoring Program committed to by the Proponent. The DEIR should clarify the timing of these improvements or the thresholds which are anticipated to be needed to trigger mitigation.

The DEIR should include capacity analyses for the Saturday midday peak hour. Mitigation should be proposed as part of the DEIR if any instances where intersection approaches under state jurisdiction are anticipated to operate at an LOS E or F in the 2026 No-Build or Build conditions.

Conceptual Plans

Any proposed mitigation within the state highway layout and all internal site circulation must be consistent with a healthy transportation design approach that provides adequate and safe accommodations for all roadway users, including pedestrians, bicyclists, and public transit riders. Guidance on healthy transportation design is included in the MassDOT *Project Development and Design Guide*. Where these criteria cannot be met, the proponent should provide justification, and should work with the MassDOT Highway Division to obtain a design waiver.

Multimodal Access and Facilities

The TIA includes an inventory of pedestrian, bicycle, and transit facilities and services in the vicinity of the project site. Pedestrian and bicycle accommodations are absent along Lunenburg Road; the Proponent has committed to providing these accommodations along McGovern Boulevard within the project site which would connect with Lunenburg. The Proponent will provide sidewalks along each side of Lunenburg Road; the DEIR should clarify whether this would be solely provided along the site frontage. The Proponent proposes no bicycle accommodations along Lunenburg Road; we note that the proposed widening of Lunenburg Road may allow for the provision of a shared use path (in place of one or both of the sidewalks) to allow for bicycle accommodations. The DEIR should evaluate this alternative.

The Montachusett Regional Transit Authority (MART) does not currently operate service in the vicinity of the project site; the Proponent should reach out to MART to examine the feasibility of extending service to the project site. An operational subsidy to support this service should be explored, in cognizance of the need to encourage alternative transportation options for a project of this size. The DEIR should provide documentation of this outreach.

Parking

The project will include provision for 3,462 spaces at Full-Build, including existing spaces on-site. A comparison of this figure with Town of Lancaster Zoning By-Laws and estimates from the *Parking Generation* (4th edition) are detailed in the TIA, demonstrating that the parking supply falls below Town of Lancaster requirements but above ITE recommendations. Although the Proponent notes that feasible opportunities to further reduce the parking supply is limited, we encourage the Proponent to investigate land banking of parking spaces until and unless needed, based on monitoring conducted at a future date.

Transportation Demand Management Program

To reduce site trip generation, the TIA includes a comprehensive Transportation Demand Management (TDM) program. The Proponent details the following TDM measures in the EENF with the goal of reducing vehicle trips by employees, residents, and visitors of the project:

- Assignment of an Employee Transportation Coordinator to oversee, implement, monitor, and evaluate TDM measures. The Transportation Coordinator will be responsible for managing rideshare and carpool programs and distributing information to encourage alternative means of transportation;
- Provision of preferential parking for rideshare, carpool and hybrid vehicles;
- Provision of electric vehicle charging stations;
- Provision of secure, weather-protected, long-term bicycle parking, as well as bicycle racks for short-term users;
- Provision of shower facilities for walking and bicycling commuters;
- Encouragement and promotion of vanpool and carpool participation, including implementation of a ride-matching program;
- Provision of a guaranteed ride home program; and

- Promotional events to encourage ridesharing and travel by alternative means of transportation.

The Proponent should work toward identifying the details of these measures as well as developing additional programs. We encourage the Proponent to consult with MassDOT to help implement the TDM program.

Transportation Monitoring Program

The Proponent has committed to conduct an annual traffic monitoring program to be conducted six months after the issuance of the first Certificate of Occupancy for the project site and continuing for a period of five years following full occupancy of the project. It will include:

- Simultaneous automatic traffic recorder (ATR) counts at site driveways for a continuous 24-hour period on a typical weekday and Saturday;
- Weekday AM, weekday PM, and Saturday midday turning movement counts (TMCs) and capacity analyses at site driveways and selected intersections (Main Street/Lunenburg Road, Lunenburg Road/McGovern Boulevard, and Lunenburg Road/Old Union Turnpike), as well as any other "mitigated" intersections; and
- Parking demand counts during the weekday evening peak period.

The Proponent should also commit to conducting a travel survey of employees at the site.

The goals of the monitoring program will be to evaluate the assumptions made in the EIRs and the adequacy of the mitigation measures, as well as to determine the effectiveness of the TDM program. The results of each iteration of the monitoring program should be summarized in a technical memorandum provided to MassDOT. This monitoring plan (timing, duration, etc.) should be revisited with MassDOT's PPDU and the District 3 Office prior to its implementation.

The DEIR should provide an update of the local permitting processes for the proposed project, particularly with respect to any transportation issues being discussed. We strongly encourage the Proponent to consult with MassDOT before any transportation issues are discussed in local meetings or hearings.

The Proponent should continue consultation with appropriate MassDOT units, including PPDU and the District 3 Office, to discuss preparation of the DEIR. If you have any questions regarding these comments, please contact me at (857) 368-8862 or Michael Clark at (857) 368-8867.

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Comment Details

EEA #/MEPA ID*	First Name	Address Line 1
16043	Paula	--
Comments Submit Date	**Last Name**	**Address Line 2**
6-26-2019	Cioffi	--
Review Due By	**Phone**	**State**
7-2-2019	+19782893210	--
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	paulacioffi@comcast.net	--

Comments

Topic: Capital Commerce Center Project EEA#16403

June 26, 2019 Secretary of Energy and Environmental Affairs Executive Office of Energy and Environmental Affairs (EEA) ATTN: ME St. Suite 900 Boston, MA 02114 Dear Ms Patel, I feel that the scale of proposed Commerce Center Project is completely out of prop enhance the growth of the town of Lancaster. Lancaster has a population of approximately 7400. The addition of a residential proje family/triplex/duplex residences has the potential to increase the population by more than 25%. The number of bedrooms projecte has to consider the current infrastructure of Lancaster, which includes a Fire department with 2 full time firefighters and the remain consists of a handful of full time officers and the remainder part time. I believe there are 4 or less police vehicles. The major effect o watershed, ponds and conservation land. It appears there will be more than 150acres of impervious surface, where there is currently Nashua river is in close proximity and already suffers from intermittent flooding issues in the Town of Lancaster and the Town of Cli watershed has the potential to increase flooding from the Nashua River, effect the water flow in surrounding aquifers, affecting wat to multiple surrounding ponds-including White's Pond, Spectacle Pond, Fort Pond, etc. Spectacle Pond is one of the cleanest ponds residences rely solely on well water. Changes in the surrounding watershed has the potential to cause decreases in the water flow th auto depot has the potential to contaminate our vital water source. Additional issues center around the volume of traffic this projec going to be one entrance/exit to the proposed apartment buildings, by way of McGovern Rd. This is a 2 lane road, emptying into a 2 signal will not be sufficient to mitigate the effects of a large volume of cars. If one was to be extremely conservative, one could pred However, this area has no public transportation, no sidewalks, and no substantial shopping areas within walking distance. It is more apartment, especially in the current environment of both partners/spouses/co-habitors being employed. The traffic on Lunenburg field use, with bottlenecks at Route 117 and Route 2. These are not problems that are likely to ever be mitigated, with very little abili there is a road improvement project planned for Route 117, it will not substantially increase the size of 117, but help to increase the flo project is designed to alleviate the current traffic woes and was not projected to include a substantial increase in traffic. In the morn from the connecting ramp from 190 north to at least Exit 37-Devens, with overflow traffic traveling on the smaller parallel road-Old also proposes a threat to our water supply, first due to the large amount of impervious surface and second from the potential spill /

Additional comments EEA # 16403

I implore you to reconsider how the scope of this project will transform the integrity of the surrounding wetlands, watershed, conservation land, aquifer and ponds, forever.

Commercial and residential growth in Lancaster is welcome. However, it must be accomplished at a reasonable pace and size that can be reasonably accommodated without dire financial impact, due to the need for considerable infrastructure, school, and safety additions , While the investors may profit from this massive project, the Town of Lancaster, a quaint central Massachusetts town, where "everybody knows your name", may cease to exist.

Paula Cioffi

33 Fire Rd 7

Lancaster MA 01523

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Comment Details

EEA #/MEPA ID*	First Name	Address Line 1
16043	Robert	--
Comments Submit Date	**Last Name**	**Address Line 2**
7-1-2019	Keene	--
Review Due By	**Phone**	**State**
7-2-2019	+19786604823	--
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	bob.keene@comcast.net	--

Comments

Topic: NO to Capital Commerce Center

I live about 1 mile from this proposed project and I believe the extra traffic burden will be incredibly high. Route 2 spends a significar and then increasing the traffic on route 70, especially around the soccers fields is quite dangerous. That spot is over trafficked alreac Kimball Farms and the soccer fields ... and i've witnessed head on collisions on that road before as well. The roads are not sufficientl that much retail space. Especially with the amount of traffic for kids & families at the soccer complex. Just say NO to the this projec

Attachments

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EEA #/MEPA ID*	First Name	Address Line 1
16043	Robert	493 White Pond Road
Comments Submit Date	**Last Name**	**Address Line 2**
7-1-2019	Keene	--
Review Due By	**Phone**	**State**
7-2-2019	--	MASSACHUSETTS
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	bob.keene@comcast.net	01523

Comments

Topic: What for?

I moved to Lancaster recently because of the quiet space and lack of commercial shopping centers. Lancaster is centrally located be Commons) and Leominster (Orchard Hill Park, Target, Kohl's, 3 grocery stores, Searstown) are all minutes away. I already see stores i as closing stores in Searstown and Orchard Hill. Those shops are close enough for every Lancaster resident ... there is no need for a b

Attachments

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EEA #/MEPA ID*	First Name	Address Line 1
16043	Timothy	55 Fire Road 10
Comments Submit Date	**Last Name**	**Address Line 2**
7-1-2019	Castner	--
Review Due By	**Phone**	**State**
7-2-2019	--	MASSACHUSETTS
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	thcastner@comcast.net	01523

Comments

Topic: Capital Commerce Center in Lancaster

To whom it may concern, As you conduct your review of this project I would ask that you explore the possibility of requiring a forest development will be adjacent to one of the premier wild areas in lancaster. There is a significant population of deer in the area and I it is very close to an extensive trail network. The visitor experience on these trails could be substantially impacted by the developme is very close to the North Branch of the Nashua River obviously steps must be taken to preserve the integrity of the river which is a l Scenic River. The North Branch is under discussion to be added to that designation as well. All steps that you can take to preserve tl Timothy Castner

Attachments

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Comment Details

EEA #/MEPA ID*	First Name	Address Line 1
16043	Victoria	67 Woodland Meadow Drive
Comments Submit Date	**Last Name**	**Address Line 2**
7-1-2019	Petracca	--
Review Due By	**Phone**	**State**
7-2-2019	--	MASSACHUSETTS
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	victoria.marquis@calistagroup.com	01523

Comments

Topic: Environmental Impact of Offering No Affordable Housing Component

Dear MEPA Review Team, The current proposal for the Capital Commerce Center includes approximately 616 market-rate housing u triplexes, and single-family homes. As cited, the project is located in a high-density overlay district which allows apartment style de and other affordable housing amenities. Our great concern is that the units are exclusively market rate, generating an additional bur requirement. MGL requires every town in the Commonwealth to maintain over 10% of its year-round housing inventory as deed-rest development will undeniably create a legal need to provide an additional 62 affordable housing units elsewhere and cause the asso contribution or mitigation from the developer. To be clear, the total environmental impacts of the housing proposed here INCLUDES required under MGL, wherever they are constructed. Construction of the required 62 affordable housing units creates a significant lo near affordable housing amenities such as regional transportation. This should be included by MEPA under the environmental impa not currently have an Inclusionary Zoning bylaw that requires developers to provide affordable housing for every new subdivision, b kindly ask that you seriously consider the environmental impact of NOT providing any affordable housing in this project - because t development elsewhere. Given the profitability of 616 market-rate housing units versus the environmental impacts of a total 678 hc for this private large-scale, high-density development Respectfully, Victoria M. Petracca

Attachments

Update Status

Status

Energy & Environmental Affairs
Public Comments Portal

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Comment Details

EEA #/MEPA ID*	**First Name**	**Address Line 1**
16043	Victoria	67 Woodland Meadow Drive
Comments Submit Date	**Last Name**	**Address Line 2**
7-1-2019	Petracca	--
Review Due By	**Phone**	**State**
7-2-2019	--	MASSACHUSETTS
Reviewer	**Email**	**Zip Code**
Purvi Patel (617) 626-1029	victoria.marquis@calistagroup.com	01523

Comments

Topic: Vernal Pools as Part of Intermittent Streams on 471-Acre Site

Dear MEPA Review Team, Please add an investigation of vernal pools in the intermittent streams on the 471-acre site in Spring 202(another intermittent stream in Lancaster. Respectfully, Victoria Petracca

Attachments

Update Status

Status

Opened ▼ SUBMIT

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dcr
Massachusetts

July 1, 2019

Secretary Kathleen A. Theoharides
Executive Office of Energy and Environmental Affairs
Attn: Purvi Patel, MEPA Office
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: EOEEA #16043 Capital Commerce Center ENF

Dear Secretary Theoharides:

The Department of Conservation and Recreation ("DCR" or "Department") is pleased to submit the following comments in response to the Environmental Notification Form ("ENF") submitted by Capital Group Properties (the "Proponent") for the Capital Commerce Center project (the "Project") in Lancaster.

As described in the ENF, the proposed Project will construct 2,690,000 sf of new development on a 471-acre site, consisting of several parcels. The development plan includes 616 residential units in four buildings; ten industrial buildings that total 1.5 million square feet; a hotel containing 120 rooms; one retail building (65,700 sf); and an indoor soccer facility. The Project site currently contains an existing gas station and soccer fields. An additional 152 acres of the site is proposed to become impervious surface. Wastewater treatment will be provided by an on-site treatment plant. The Project requires a mandatory EIR, due to the exceedance of several EIR thresholds, including direct alteration of 50 acres or more of land; creation of 10 acres or more impervious surface; generation of 3,000 or more new additional daily trips per day providing access to a single location; and construction of 1,000 or new parking spaces at a single location.

The Project directly abuts two parcels under DCR's care, custody and control, both part of Lancaster State Forest. As proposed, the Project involves activities within a 100-year floodplain as delineated on the current effective Flood Insurance Rate Map ("FIRM") for Worcester County, dated July 16, 2014. A portion of the Project Site is within the Central Nashua River Valley Area of Critical Environmental Concern ("ACEC").

Central Nashua River Valley ACEC

In 1996, the Executive Office of Energy and Environmental Affairs designated the 12,900-acre Central Nashua River Valley ACEC. The ACEC requires the highest standard of environmental review and protection over a 20-mile riparian corridor of the North Nashua and Nashua Rivers situated south of Route 2 in Leominster, Lancaster, Bolton and Harvard. Associated with this corridor are extensive surface waters, wetlands, floodplains and aquifers, as well as associated riparian zones, wildlife and rare species habitats, forests, farmlands, and publicly and privately owned open space.

Due to the ACEC designation for portions of this site, DCR notes that EOEEA agency actions are required to ensure that projects in ACECs incorporate adequate measures to preserve, restore, or enhance the resource areas in accordance with 301 CMR 12.11 (1) and (2). Development designs must ensure that impacts will minimize any adverse effects on groundwater quality, habitat values, biodiversity, storm damage prevention, flood control, historic and archeological resources, scenic and recreational resources,

Department of Conservation and Recreation
251 Causeway Street, Suite 600
Boston MA 02114-2119
617-626-1250 617-626-1351 Fax
www.mass.gov/orgs/department-of-conservation-recreation

Charles D. Baker, Governor
Karyn E. Polito, Lt. Governor
Kathleen A. Theoharides, Secretary, Executive Office of Energy & Environmental Affairs
Leo Roy, Commissioner, Department of Conservation & Recreation

and other natural resource values of the area. DCR requests that the Proponent demonstrate in its DEIR how the project design within the Central Nashua River Valley ACEC will avoid adverse effects on the above resources, including, but not limited to, groundwater quality, habitat values, biodiversity, storm damage prevention, and flood control, historic and archaeological resources, and scenic and recreational resources. DCR also requests that the Proponent clarify how areas of the Project within the ACEC will meet the ACEC regulations (301 CMR 12.01 to 12.15). 2-1 2-2

Lancaster State Forest

DCR notes that the southern portion of the site plan shows several locations where project infrastructure, including parking areas, storm water basins, and a subsurface wastewater treatment plant, are placed up to the edge of the shared property line. This Project infrastructure, if placed in such close proximity to DCR property, is likely to adversely affect public conservation land permanently. To demonstrate that the Proponent has designed its development to first avoid environmental impacts, DCR requests that the Proponent prepare a reduced development plan that would use a 100-foot no development buffer measured from DCR property lines, similar to the buffer that is being provided in the northwest portion of the Site. This development analysis should avoid adverse impacts to DCR property and access rights and protect the function and values of public conservation land. 2-3

To ensure the Proponent accurately depicts boundary lines shared with DCR, DCR requests that the Proponent stake and monument all mutual property lines and corners abutting Lancaster State Forest prior to the filing of the DEIR, and provide the Department an opportunity to review these boundaries prior to permanent installation, in particular Assessor's Map Lot 13-5. 2-4

DCR has historically accessed Lancaster State Forest by way of a roadway north of Assessor's Lot 14-11 and through Lancaster Town Forest. It appears that the proposed development may impact that access. DCR requests that the Proponent work with the Department to ensure that permanent access is confirmed on the record to address DCR's longstanding use of the accessway. 2-5

Flood Hazard Management Program

As proposed, the Project involves activities within a 100-year floodplain as delineated on the current effective Flood Insurance Rate Map ("FIRM") for Worcester County, dated July 16, 2014. DCR's Flood Hazard Management Program ("FHMP"), under agreement with the Federal Emergency Management Agency ("FEMA"), is the state coordinating agency for the NFIP. As such, the FHMP provides technical assistance to communities that participate in the NFIP related directly to the program and also related to floodplain management in general. Communities that participate in the NFIP are required by FEMA, as a condition of their participation, to regulate development within the 100-year floodplain in a manner that meets or exceeds the minimum standards established by FEMA, located at 44 CFR 60.3. Participating communities such as Lancaster are required to adopt the NFIP requirements through locally enforceable measures. In Massachusetts, many of the requirements contained in 44 CFR 60.3 are enforced through existing state regulations such as the State Building Code (780 CMR) and Wetlands Protection Act regulations (310 CMR 10.00). Communities typically adopt the remainder of the requirements as part of a zoning ordinance or other locally enforceable measure. Lancaster has a zoning bylaw that includes a Floodplain District section which has been accepted by FEMA as meeting their requirements under the NFIP.

In our role as NFIP coordinator, the FHMP offers comments on the proposed Project's relationship to many of the above regulations and requirements. The FHMP does not directly administer any of these requirements and therefore does not provide official determinations as to compliance with them; rather,

our comments are provided as an overview of the requirements and the documentation necessary to demonstrate compliance with these requirements.

The Project includes construction of approximately 2,690,000 GSF of mixed uses on-site, along with associated access roadways, parking and circulation areas, stormwater management systems, and utility infrastructure. Based on information submitted with the ENF, some of the work is located within the 100-year floodplain on the current effective FIRM, specifically zones A and AE. Because of its location in the 100-year floodplain, compliance with the requirements of several federal, state and local measures related to floodplain development is required. The Massachusetts State Building Code (780 CMR) Ninth Edition, includes specific standards for structures newly constructed or substantially improved in the floodplain.

Because unnumbered A zones do not include base flood elevations, the Proponent will be required to develop base flood elevation information for use in this project meeting the requirements of the Wetlands Protection Act regulations and the local floodplain regulations of Lancaster. Lancaster's Zoning Bylaw, Article VII Floodplain Regulations, Section 220-26, E states: 2-6

"Base flood elevation data is required for subdivision proposals or other developments greater than 50 lots or five acres, whichever is the lesser, within unnumbered A zones."

This is consistent with standards in the NFIP regulations. (*See* 44 CFR 60.3, (b), (3).)

Additionally, projects within the 100-year floodplain involving any federal action (e.g., permitting, funding) must also comply with federal Executive Order 11988, Floodplain Management. This executive order requires an eight-step decision-making process which includes analysis of alternatives, avoiding impacts when possible, and minimizing impacts when avoidance is not possible. Because this Project requires filing a National Pollutant Discharge and Elimination System ("NPDES") General Permit for Stormwater Discharges from Construction Activities, and also an Obstruction Analysis/Airport Airspace Analysis ("OE/AAA") from the Federal Aviation Administration, compliance with this process is necessary.

Summary

In light of the concerns raised above, DCR requests that the Proponent evaluate a development alternative that is in compliance with the ACEC regulations, would provide a substantial buffer between DCR lands and any proposed development or infrastructure improvements, provide monumentation at property bounds, ensure access to Lancaster State Forest is not discontinued, and avoid or minimize floodplain development in compliance with the National Flood Insurance Program or other relevant regulations. 2-7

Thank you for the opportunity to comment on the ENF. General questions regarding DCR's comments can be directed to Nat Tipton, MEPA Review Coordinator, at (617) 626-1341 or nathaniel.tipton@mass.gov. Questions regarding the Central Nashua River Valley ACEC can be directed to Nancy Putnam, DCR Director of Ecology and ACEC Programs at (617) 626-1394 or nancy.putnam@mass.gov. Questions regarding DCR's Flood Hazard Management program and its responsibilities under the National Flood Insurance Program, please contact Eric Carlson at (617) 626-1362 or eric.carlson @mass.gov. Questions regarding land protection can be directed to Christine Berry at (978) 887-5931 ext. 7 or christine.berry@mass.gov.

Sincerely,

Leo P. Roy
Commissioner

cc: Christine Berry, Eric Carlson, Priscilla Geigis, Jennifer Howard, Nancy Putnam (DCR)

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
BOSTON, MA 02114
Telephone: 617-626-7300
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Charles D. Baker
Governor

Karyn E. Polito
Lt. Governor

Kathleen A. Theoharides
Secretary

Judith F. Judson
Commissioner

8 July 2019

Kathleen Theoharides, Secretary
Executive Office of Energy & Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114
Attn: MEPA Unit

RE: Capital Commerce Center, Lancaster, Massachusetts, EEA #16034

Cc: Maggie McCarey, Director of Efficiency Programs, Department of Energy Resources
Judith Judson, Commissioner, Department of Energy Resources

Dear Secretary Theoharides:

We've reviewed the Environmental Notification Form (ENF) for the above project. The proposed project includes 2.7M -sf of built-space consisting of approximately 900,000-sf of residential buildings (single family, duplex, triplex and multifamily), 1.6M-sf of industrial space, and 200,000 -sf of commercial space (hotel, retail, recreation). For this project, we expect key mitigation measures to include:

- Electrification of space and water heating with heat pump/VRF systems (All Buildings);
- Passivehouse (PHI or PHIUS method) (Residential & Hotel);
- Maintained envelope integrity with framed, insulated walls with continuous insulation (All Buildings);
- Avoid glass curtain wall assemblies and excessive windows (All Buildings);
- Energy recovery (All Buildings);
- LED lighting (All Buildings);
- Rooftop solar PV (All Buildings);

Emissions associated with regulated end uses can be largely eliminated (typically: 50 to 80% less emissions than code-built construction) with the above strategies. Significant incentives are available, as well.

Passivehouse also provides superior indoor air quality, comfort, resilience, and noise reduction. Passivehouse typically costs 0 to 6% more to build initially but can cost less on a cash-flow basis from day one as described herein.

Electrification of Space and Water Heating

Electrification of space and water heating is a key mitigation strategy with significant short- and long-term implications on GHG emissions. Massachusetts currently has relatively low grid emissions (700 lbs/MWhr) which are expected to decline each year with implementation of clean energy policies that increase renewable electricity sources.. The implication is that efficient electric space and water heating with cold climate air source heat pump and VRF equipment is expected to have much less emissions than even condensing gas boilers. Currently, efficient electric heating has approximately **55% lower emissions** than natural gas heating and, by 2050, efficient electric heating is expected to have approximately **85% lower emissions**.

Efficient electrification of space and water heating entails use of:

- Cold-climate air source heat pumps, and/or VRF for space heating;
- Air source heat pumps for water heating.

Heat pumps and/or VRFs if used for space heating can qualify for significant incentives, including Alternative Energy Credits (AECs). Additionally, electrifying space and water heating could eliminate the need for gas service from some or all the project, potentially eliminating costs associated with gas utility distribution.

Passivehouse

We recommend that Passivehouse be thoroughly investigated for the residential buildings and hotel. Two Passivehouse standards exist: Passive House Institute United States (PHIUS) and Passive House Institute (PHI), both are recognized by Massachusetts building code.

In addition to providing significant GHG reduction benefits, Passivehouse would be more affordable as they cost much less to operate than Code.

In terms of capital costs, Passivehouse usually costs more to construct. An extensive cost study shows that Passivehouse multifamily costs about 2 to 4% more[1] to construct, on average. However, this cost of construction premium can be reduced by financial benefits available to the developer, as follows:

[1] "Accelerating Market Transformation for High-Performance Building Enclosures", Pembina Institute, dated September 2016.

- Alternative Energy Credits[2]
- MassSave© performance-based utility incentives[3]

Passivehouse would also greatly improve resiliency as Passivehouse units can stay warm (or cool, in summer) for extended periods, even with loss of active space conditioning equipment.

Integrity of Building Envelope

High-performing envelope is essential to successful GHG mitigation. Key strategies for maintaining integrity of envelope are:

- Limiting or eliminating use of glass "curtain wall" and spandrel assemblies;
- Maximizing framed, insulated walls sections;
- Maintaining window/wall rations to code levels.

The thermal performance of windows, curtain walls, and spandrels is about **70 to 80% less** than the thermal performance of the framed, insulated wall assemblies. Accordingly, buildings which use extensive curtain wall, spandrel, and windows have compromised envelope performance, compared to code building which increases energy consumption and increases emissions.

Rooftop Solar PV

Rooftop PV can provide significant GHG benefits as well as significant financial benefits. We recommend PV evaluations be performed for all buildings and at least 80% of roof space be set aside for PV on all roofs.

It's important to plan the project to ensure that roof space is set aside for PV and doesn't become unnecessarily encroached with HVAC appurtenances, diminishing the value of this asset.

Recommendations for subsequent Submissions

Recommendations are as follows:

1. Emissions and utility cost reduction should be estimated for heat pumps/VRF for all buildings for both space heating and water heating. 3-1
2. Emissions and utility cost reduction should be estimated using Passivehouse for the single family, duplex, triplex, multifamily, and the hotel. Passivehouse analysis should include: 3-2 3-3

[2] https://www.mass.gov/service-details/alternative-portfolio-standard-rulemaking;

[3] https://www.masssave.com/-/media/Files/PDFs/Save/Residential/Pay-for-Savings.pdf?la=en&hash=67420BCA38A8BC3BBDB8B9DE41949DE58D22C964

a. Estimate of Alternative Energy Credits, including bonus multipliers for Passivehouse-level performance;

b. Estimates of MassSave® incentives, based on meeting with utility. Note that new Passivehouse incentive offerings are included in the 2019-2021 statewide energy efficiency plan.] END 3-3

3. [Evaluate solar PV for all buildings. Investigate models of ownership and operation under SMART, including Qualified Facility pathway. Meet utility to discuss interconnection. Include building roof plans showing location of planned solar and location of roof HVAC equipment and other appurtenances. Indicate on the plans the code-required extent of solar readiness. Map out maximum area available for solar. Estimate GHG reduction as a result of solar PV.] 3-4

4. Above-code envelope should be used throughout. In summary:

a. Above Code-threshold envelope is recommended (vertical walls, windows, roofs and exposed floors). [Priority should be given to increasing continuous insulation. 3-5 Distinguish between R value of batt and R value of continuous insulation. Indicate planned wall assembly U value and wall construction type (mass, wood, metal stud, etc). Confirm that the relationship between R-value and assembly U-factor conform to Appendix A of the Code.]

b. [Window to wall ratios should be maintained at or below the values shown in Table G3.1.1-1 of ASHRAE 90.1-2013.] 3-6

c. [Glass curtain wall/spandrel systems should be avoided.] 3-7

5. [Report the following for each building:] 3-8

Vertical Envelope	Reference Building		Proposed Building	
	Percent of Vertical Area	U value	Percent of Vertical Area	U value
Framed, insulated Wall	%	value	%	value
Opaque glass, curtain wall, shadowbox, spandrel	%	value	%	value
Vision glass	%	value	%	value
	100%	*Aggregate U*	*100%*	*Aggregate U*
		Aggregate R		*Aggregate R*

Aggregate U is calculated as: ($U_1\%_1 + U_2\%_2 + U_3\%_3$) where U is the respective thermal transmittance values and $\%_1$ is the percent area of framed insulated wall; $\%_2$ is the percent area of opaque glass, curtain, or shadowbox; and $\%_3$ is the

percent area of vision glass. Only areas adjacent to conditioned space are counted, areas adjacent to unconditioned spaces (e.g. parking garages, mechanical penthouses) are not counted. Aggregate R is the inverse of aggregate U.

6. For all buildings, the proposed aggregate R calculated above should be larger than the reference building; otherwise envelope performance is being traded-off for other improvements, reversing mitigation gains. Tradeoffs should be avoided. 3-9

7. Investigate external shading. 3-10

8. Submit project modeling files to the DOER on a flash drive. 3-11

9. Compare model results total and individual end uses with representative, prototype buildings developed by Pacific Northwest National Labs/Department of Energy found at the link below. Provide a summary explaining potential differences. 3-12

   - https://www.energycodes.gov/sites/default/files/documents/BECP_901_2013_Progress_Indicator_0_0.pdf
   - http://www.energycodes.gov/sites/default/files/documents/2013EndUseTables.zip
   - https://www.energycodes.gov/commercial-energy-cost-savings-analysis

10. Include a table similar to the example below. For "code value" ensure that the value incorporates any improved efficiency per requirements of Section C406.1 of the Massachusetts' amendments. 3-13

Measure/Area	Base Code	Proposed	% Change	Comment
AC Efficiency (EER)				
Bldg 1	*code value*	*design value*	%	
Bldg 2	*code value*	*design value*	%	
ERV Effectiveness (%)				
Bldg 1	*code value*	*design value*	%	
Bldg 2	*code value*	*design value*	%	
Boiler (% efficiency)				
Bldg 1	*code value*	*design value*	%	
Bldg 2	*code value*	*design value*	%	
LPD (Watts/sq ft)				
Bldg 1	*code value*	*design value*	%	
Bldg 2	*code value*	*design value*	%	
(continue to include service water, equipment, etc)				

Capital Commerce Center, EEA #16043
Lancaster, Massachusetts

Sincerely,



Paul F. Ormond, P.E.
Energy Efficiency Engineer
Massachusetts Department of Energy Resources



Brendan Place
Clean Energy Engineer
Massachusetts Department of Energy Resources

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

July 9, 2019

Secretary Kathleen A. Theoharides
Executive Office of Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114

Attention: MEPA Unit – Purvi Patel

Re: Environmental Notification Form (ENF)
Capital Commerce Center
Lancaster
EEA #16043

Dear Secretary Theoharides,

The Massachusetts Department of Environmental Protection's ("MassDEP") Central Regional Office (CERO) has reviewed the ENF for the proposed Capital Commerce Center in Lancaster (the "Project"). Capital Group Properties (the "Proponent") is proposing to construct approximately 2,690,000 gross square footage (gsf) of mixed uses on-site, along with associated access roadways, parking and circulation areas, stormwater management systems, and utility infrastructure. The Project will generally include the construction of numerous industrial buildings including an automotive sales and service facility; single family, duplex and triplex units residential; multi-family apartments; a hotel; a new indoor sports facility; and retail space.

MEPA History

On October 31, 2016, North Lancaster Water LLC filed an ENF with MEPA for a Dunkin' facility proposed to be constructed at 1474 Lunenburg Road. Development of the Dunkin' facility would require a modification to the public water supply permit issued by MassDEP for an existing facility. On December 1, 2016, MEPA requested a "look back" analysis of the 50-acre commercial/retail development known as Lancaster Crossing, which included the proposed Dunkin' facility. North Lancaster Water withdrew the ENF without prejudice on December 9, 2016.

On March 29, 2017, two applications were filed with MassDEP for public water supply wells on parcels within the Lancaster Crossing development to serve the Dunkin' and a proposed Mobil gas

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

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station. The Proponent provided MEPA with the preliminary results of the "look back" analysis. As a result, MEPA indicated the filing of a Request for an Advisory Opinion would be appropriate.

On June 19, 2017, the Proponent submitted a Request for an Advisory Opinion letter to MEPA requesting confirmation that the proposed Dunkin' and Mobil gas station project would not be subject to review under MEPA. Based on the information provided, MEPA determined that the proposed project was not subject to MEPA review and the submission of an ENF was not required. However, if development of any portion of the remainder of land then or formerly owned by North Lancaster Water is proposed in the next five years, the Proponent was directed to consult with MEPA to determine whether it may be subject to MEPA review.

The existing 471-acre Site has been subdivided and sold to five ownership entities. The Lancaster Crossing development project (EEA# 15604) contains approximately 50± acres located in the eastern portion of the Site along Lunenburg Road, and is proposed to be developed by a separate entity with commercial/retail/residential uses. The Dunkin', Mobil Gas Station, and soccer complex have already been constructed as part of the Project. The ENF includes all parcels that make up the Site, regardless of current ownership.

This Project is under MEPA review because it meets or exceeds the following review thresholds:

- 11.03(1)(a)(1) – Direct alteration of 50 or more acres of land
- 11.03(1)(a)(2) – Creation of 10 or more acres of impervious area
- 11.03(6)(a)(6) – Generation of 3,000 or more New adt on roadways providing access to a single location
- 11.03(6)(a)(7) – Construction of 1,000 or more parking spaces at a single location
- 11.03(3)(a)(1)(b) – Alteration of 10 or more acres of other wetlands (Riverfront Area and Bordering Land Subject to Flooding)
- 11.03(5)(b)(1) – Construction of a new wastewater treatment facility with a capacity of 100,000 or more gallons per day (gpd)

The Project requires the following State Agency Permits:

- MassDEP – Water Distribution System Modification Permit (BRP WS 32)
- Individual Permit for Sewerage Treatment Plan (BRP WP79)
- Hydrogeologic Evaluation Report Approval (WP83)
- Superseding Order of Conditions (if local Order of Conditions is appealed)

MassDEP offers the following comments:

Alternatives Analysis

[The alternatives analysis does not describe the respective environmental impacts of the five alternatives considered, except for traffic. MassDEP notes that the preferred alternative results in the creation of the most impervious surface (166 acres) of the five considered. MassDEP requests that the alternative analysis in the DEIR be expanded to include not only a comparison of the environmental impacts of each option, but the available mitigation measures as well.] For example, the ENF states that wetlands impacts will not be quantified until the Master Plan is complete, so it is difficult to determine the appropriate nature and extent of mitigation that would be required for each of the alternatives, including the preferred alternative. 4-1

Water Supply

The Project will require 157,285 gallons per day (gpd) of drinking water, which will be purchased from the Lunenburg Water District (Water District). The Water District is regulated through MassDEP's Water Management Act (WMA) Program to withdraw an annual average volume of 0.54 million gallons per day (MGD). Actual withdrawals from 2016 through 2018 ranged from 0.51 to 0.54 MGD; therefore the Water District will need an increase in its total authorized withdrawal volume in order to supply the Project's demand. On December 8, 2018, the Water District submitted a WMA Permit application to increase its total authorized withdrawal volume. The application includes the addition of a new wellfield to the WMA Permit. MassDEP issued approval of the wellfield site and the proposed pumping test on September 21, 2017; however, the pumping test has not yet been completed and is scheduled for late summer 2019. MassDEP must review the pumping test application concurrently with the WMA Permit application, so the WMA Permit application is on hold until MassDEP receives a WS19 application with the pumping test results. The development of the wellfield was determined by the Water District to be the most cost effective means to supply increased demand on the water system and to insure continued withdrawals below the secondary maximum contaminant levels of iron and manganese. [The Proponent should consider funding any water system upgrades that the Water District identifies as necessary to supply the Project.] 4-2

The Water District's WMA permit will require a mitigation plan to be submitted and approved by MassDEP to offset withdrawals in excess of the baseline volume. Examples of mitigation projects suitable for the WMA program are those that remove or disconnect impervious surface; protect and preserve open space; provide infiltration and inflow removal from a sewer system; or otherwise improve surface water wildlife habitat. Stormwater improvements that exceed standard requirements and culvert replacements that meet stream crossing standards can also be considered as mitigation for WMA. [The Proponent is encouraged to participate in any mitigation projects that will offset the increased demand on the Water District's system from the Project.] 4-3 [The Proponent should work with LWD to record details of any potential mitigation work performed at the site for future submittal to MassDEP for consideration as mitigation.] 4-4

Approximately 4.1 miles of water main will extend from Lunenburg into Lancaster to supply drinking water. A WS32 Water System Modification Permit from MassDEP will be required for the new water main. MassDEP will work with the town of Lancaster and the Water District to determine ownership and responsibility of the water main associated with the public water system. The existing Dunkin' and Mobil gas station and convenience store are currently operating two separate public water systems that have individual wells within the development area. [With the new water line from the Water District serving the Project, these two public water systems should be required to connect to the new water line and become customers of the Water District.] 4-5 [The Proponent should indicate the plans for abandoning these two public water systems in the DEIR.] 4-6

Wastewater

The Project will consist of development of approximately 2,690,000 gross square footage of mixed uses. To accommodate these uses, the Proponent proposes to construct a wastewater treatment facility permitted under 314 CMR 5.00 (Groundwater Discharge Permit Regulations) to discharge treated effluent to the ground up to a total proposed design flow of 155,385 gpd. The Proponent proposes to connect all existing septic systems at the Site (the Dunkin' and the Mobil gas station) to the wastewater treatment facility.

As part of the discharge permit application process, on June 13, 2019, the Proponent submitted a BRP WP 83 application for hydrogeologic approval to the MassDEP Central Regional Office for review. Once the site has been determined to be adequate to accept the discharge of 155,385 gallons per day of wastewater, the Proponent can apply for an Individual Groundwater Discharge permit. In the DEIR, the Proponent should identify location of the sewer collection system associated with the proposed development. 4-7

MassDEP will require that all wastewater generated on the site shall be connected to the treatment facility. The Proponent should describe in the DEIR how the Project will meet the requirements for a privately owned wastewater treatment facility in 310 CMR 5.15. MassDEP's regulation requires that a single entity be the permittee responsible for operation, monitoring, maintenance, and repair of the treatment facility. However, if the privately owned treatment facility treats waste from activities owned or controlled by other entities, all stakeholders must share the financial and operational responsibilities for the wastewater treatment facility. Because the Project includes residential uses, the discharge permit will require a Financial Assurance Mechanism to fund the immediate repair and replacement of the Facility. The DEIR should describe the legal and financial arrangements that will achieve compliance with these permitting requirements. 4-8 4-9 4-10

Wetlands

There are numerous wetland resource areas on the Site including Bank associated with intermittent and perennial streams, Land Under Water (LUW), Bordering Vegetated Wetlands (BVW), Isolated Vegetated Wetlands (IVW), Bordering Land Subject to Flooding (BLSF), and Riverfront Area (RA). The southern half of the Site is within the Central Nashua River Valley Area of Critical Environmental Concern (ACEC).

Portions of the Project have already been constructed including the outdoor athletic fields and retail shops in the eastern portion of the property. Work associated with the previously completed outdoor athletic fields and retail shops occurred within Bordering Land Subject to Flooding (BLSF) and Riverfront Area. The ENF indicates that the remainder of the Project will potentially alter an additional 115,000 sf of BLSF and 420,000 sf of RA, but that quantification of the extent of alterations has not yet been fully determined.

A final Order of Conditions is required for the remainder of the Project in accordance with the Massachusetts Wetlands Protection Act (G.L. c. 131, § 40; WPA). The Project must be designed to meet all performance standards identified in the WPA Regulations at 310 CMR 10.00 for work proposed in each wetland resource area affected. Identified impacts to BLSF and RA should be reduced and/or eliminated as much as possible and a detailed alternatives analysis should be provided. Portions of the Project, including the auto storage facility with a large gravel storage area and stormwater basins, are near ACEC wetlands, which are sensitive wetland resource areas. In the alternative analysis in the DEIR, the Proponent should evaluate alternatives that situate these components further away from the sensitive resource areas. The DEIR should also consider structured parking alternatives. The Proponent should include information on how the large gravel storage areas would be utilized and maintained in a manner to prevent impacts to sensitive resource areas and receptors. 4-11 4-12 4-13 4-14 4-15

The Proponent should identify the location of all utilities associated with the development and identify impacts to wetlands resource areas. The residential component of the development that is accessed from Leominster does not have any details on where the water and sewer lines will be located. 4-16

The Project must comply with the Massachusetts Stormwater Standards (Stormwater Standards). The ENF provides general statements that the Project will be designed in compliance with the Stormwater Standards; however, the DEIR should include greater detail to confirm this general statement. Future filings should contain the required stormwater checklist and supporting calculations. Stormwater basins shown on the plan are mostly associated with the central industrial uses. The plan does not depict any stormwater best management practices associated with the residential, hotel, or retail uses. Vernal pools are critical areas under the Stormwater Standards and stormwater structures are not permitted within 100 feet, but the ENF plan depicts a stormwater basin within 100 feet of a vernal pool. In the DEIR, the Proponent should evaluate alternatives where the stormwater structures are set back from receiving wetland resource areas as must as possible due to the sensitive nature of the wetland resource areas. 4-17 4-18 4-19

Air Quality

Construction and Demolition Air/Noise Pollution

Construction and demolition activity must conform to current Massachusetts Air Pollution Control regulations governing nuisance conditions at 310 CMR 7.01, 7.09 and 7.10 and not cause or contribute to a condition of air pollution due to dust, odor or noise. As such, the Proponent should propose measures to prevent and minimize dust, noise, and odor nuisance conditions during construction and/or demolition. 4-20

MassDEP requests that all non-road diesel equipment rated 50 horsepower or greater meet EPA's Tier 4 emission limits, which are the most stringent emission standards currently available for off-road engines. If a piece of equipment is not available in the Tier 4 configuration, then the Proponent should use construction equipment that has been retrofitted with appropriate emissions reduction equipment. Emission reduction equipment include EPA-verified, CARB-verified, or MassDEP-approved diesel oxidation catalysts (DOCs) or Diesel Particulate Filters (DPFs). The Proponent should maintain a list of the engines, their emission tiers, and, if applicable, the best available control technology installed on each piece of equipment on file for Departmental review. 4-21 4-22

Massachusetts Idling Regulation

MassDEP reminds the Proponent that unnecessary idling (i.e., in excess of five minutes), with limited exception, is not permitted during the construction and operations phase of the project (310 CMR 7.11). With regard to construction period activity, typical methods of reducing idling include driver training, periodic inspections by site supervisors, and posting signage. In addition, to ensure compliance with this regulation once the Project is occupied, MassDEP requests that the Proponent install permanent signs limiting idling to five minutes or less on-site. 4-23

MassDEP appreciates the opportunity to comment on the Project. If you have any questions regarding these comments, please do not hesitate to contact Stella Tamul, Central Regional Office MEPA Coordinator, at (508) 767-2763.

Very truly yours,



Mary Jude Pigsley
Regional Director

cc: Commissioner's Office, MassDEP

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

MassDOT
Massachusetts Department of Transportation

July 1, 2019

Kathleen Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Lancaster: Capital Commerce Center – ENF
(EEA #16043)

ATTN: MEPA Unit
Purvi Patel

Dear Secretary Theoharides:

On behalf of the Massachusetts Department of Transportation, I am submitting comments regarding the proposed Capital Commerce Center project, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please contact J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (857) 368-8862.

Sincerely,

David J. Mohler
Executive Director
Office of Transportation Planning

DJM/jll

Ten Park Plaza, Suite 4150, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

cc: Jonathan Gulliver, Administrator, Highway Division
Patricia Leavenworth, P.E., Chief Engineer, Highway Division
Neil Boudreau, Assistant Administrator of Traffic and Safety Engineering
Barry Lorion, P.E., District 3 Highway Director
Community Development and Planning Office, Town of Lancaster
Office of Planning & Development, City of Leominster
Montachusett Regional Transit Authority
Montachusett Regional Planning Commission
PPDU Files

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

TO: David J. Mohler, Executive Director
Office of Transportation Planning

FROM: J. Lionel Lucien, P.E, Manager
Public/Private Development Unit

DATE: July 1, 2019

RE: Lancaster – Capital Commerce Center: ENF
(EEA #16043)

The Public/Private Development Unit (PPDU) has reviewed the Environmental Notification Form (ENF) for the Capital Commerce Center project in Lancaster and Leominster. The 471-acre site currently consists of five separate development parcels made up of several different uses, including a 2,300 square foot coffee/donut shop, a 5,000 square foot gas station with convenience store, an outdoor soccer facility, an 11,800 square foot trucking facility, a residence and equestrian uses, gravel pits and access roads, and undeveloped fields, woodland, and wetlands. The project proposes to construct 2.69 million square feet of mixed-use development, including an approximately 1.57 million square foot industrial park with an automotive sales and service facility, 117 single-family residential units, 500 multi-family residential units, a 120-room hotel, an approximately 86,500 square foot indoor soccer facility, and approximately 65,700 square feet of additional retail space. All existing development will be retained with the exception of the trucking facility.

Based on the information presented in the ENF, the Full-Build project is expected to generate 17,620 unadjusted vehicle trips on an average weekday and 18,368 unadjusted vehicle trips on an average Saturday, with 1,472 unadjusted vehicle trips during the weekday morning peak hour, 1,584 unadjusted vehicle trips during the weekday evening peak hour, and 2,085 unadjusted vehicle trips during the Saturday midday peak hour. The project will include 3,462 parking spaces. The project exceeds the Massachusetts Environmental Policy Act (MEPA) thresholds for trip generation (3,000 new trips) and parking (1,000 spaces) and thus is categorically included for the preparation of an Environmental Impact Report (EIR).

The project site is made up of three parts. The eastern portion of the project site, which includes the existing Lancaster Crossing development and the trucking facility, would involve the construction of the multi-family apartment buildings, hotel, indoor sports facility, and retail space. Access to this portion of the site is proposed via the existing McGovern Boulevard as well as via additional access points off of Lunenburg Road. The central portion of the project site would consist of the industrial buildings with access proposed via an extension of McGovern Boulevard. The western portion of the project site would consist of 117 single-family, duplex, and triplex housing units accessed by Johnny Appleseed Road to the west (through Leominster) and White Pond Road to the east. The western portion of the project site would be accessed

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separately from the eastern and central portions. A Vehicular Access Permit from MassDOT will be required due to anticipated impacts on Route 2, a state-owned roadway. The project site also abuts I-190, a state-owned roadway.

The EENF includes a Transportation Impact Assessment (TIA) prepared in conformance with the current MassDOT/EOEEA *Transportation Impact Assessment Guidelines*. The Draft Environmental Impact Report (DEIR) should address the comments raised in this letter.

Study Area

[The TIA study area includes the following intersections: 5-1

- Main Street (Route 70/Route 117) at Seven Bridge Road (Route 117) and Shirley Road;
- Main Street (Route 70/117) at Lunenburg Road (Route 70);
- Lunenburg Road (Route 70) at McGovern Boulevard;
- Lunenburg Road (Route 70) at Old Union Turnpike Road;
- Lunenburg Road (Route 70) at Woods Lane/Fort Pond Road;
- Old Union Turnpike at Route 2 Eastbound Ramps;
- Fort Pond Road at Route 2 Westbound Ramps;
- Mechanic Street at Johnny Appleseed Lane; and
- Mechanic Street at White Pond Road.]

[The DEIR study area should include the Route 2 Off- and On-Ramps associated with Exit 34, along Old Union Turnpike and Harvard Street, unless they do not meet the study area intersection thresholds of site-generated traffic representing 100 vehicles during the peak hour or five percent of all intersection traffic during the peak hour.][If these intersections meet study area thresholds, the Proponent should provide capacity analyses as part of the DEIR submission and propose mitigation in instances where the intersections or intersection approaches under state jurisdiction are anticipated to operate at an LOS E or F during a peak period under 2026 No-Build or Build condition.] 5-2 5-3

Otherwise, the study area is considered to be acceptable and adequate in capturing the impact of the project on area roadways.

Trip Generation

The TIA includes trip generation rates that were calculated using the Institute of Transportation Engineers (ITE)'s *Trip Generation Manual* (10th Edition). As presented in the ENF, trip generation was calculated based on Land Use Code (LUC) 130 – Industrial Park, LUC 210 – Single-Family Housing (Detached), LUC 221 – Multifamily Housing (Mid-Rise), LUC 310 – Hotel, LUC 488 – Soccer Complex, and LUC 820 – Shopping Center. The development project, separate from existing traffic-generating land uses, site is expected to generate 11,332 unadjusted vehicle trips on an average weekday and 11,352 unadjusted vehicle trips on an average Saturday, with 844 trips during the weekday morning peak hour, 1,062 trips during the

weekday evening peak hour, and 1,445 trips during the Saturday midday peak hour. Internal capture and pass-by rates were applied using rates obtained from the ITE *Trip Generation Handbook* (3rd Edition). Accordingly, the site is expected to generate 9,790 net new vehicle trips on an average weekday and 9,602 net new vehicle trips on an average Saturday, with 752 trips during the weekday morning peak hour, 838 trips during the weekday evening peak hour, and 1,299 trips during the Saturday midday peak hour. No mode share splits were applied to the project.

[The DEIR must demonstrate that pass-by rates were appropriately applied to weekend traffic figures along Lunenburg Road; the pass-by volume cannot exceed 15 percent of traffic along the adjacent roadway.] [The DEIR should also clarify whether the existing FC Stars soccer facility features three or four fields, adjust trip generation figures and capacity analyses as appropriate, as well as provide justification for using the average rate rather than the fitted curve equation for LUC 820 – Shopping Center.] 5-4 5-5

Safety

The TIA includes a summary of crash rates derived from MassDOT for the continuous three-year period of 2013 through 2015, with the Proponent coordinating with MassDOT to acquire individual crash reports for the Old Union Turnpike/Route 2 Eastbound Ramps and Fort Pond Road/Route 2 Westbound Ramps intersections in order to determine the crash rate for these intersections. All but one of the study area intersections (the Main Street/Lunenburg Road intersection) experience crash rates below the MassDOT statewide and District 3 averages for signalized or unsignalized intersections.

The Main Street/Lunenburg Road intersection, Old Union Turnpike/Route 2 Eastbound Ramps, and Fort Pond Road/Route 2 Westbound Ramps intersections are all listed as 2013-2015 Highway Safety Improvement Program (HSIP)-eligible crash clusters. [A Road Safety Audit was completed by the Proponent at the Main Street/Lunenburg Road intersection in 2017; the DEIR should commit to implementing low-cost, short-term improvements identified in the RSA as mitigation for this project.] As discussed above, the Proponent is coordinating with MassDOT to determine the location of individual crash reports at the Old Union Turnpike/Route 2 Eastbound Ramps and Fort Pond Road/Route 2 Westbound Ramps intersections to determine whether the HSIP-eligibility applies to the Route 2 mainline or the ramps intersections. [Additional RSAs, with commensurate commitments to low-cost, short-term improvements identified through the RSAs, will need to be completed prior to the submission of the DEIR if deemed appropriate by MassDOT.] 5-6 5-6

Traffic Operations

Capacity analyses were conducted for the weekday morning and weekday evening peak periods for the existing, 2026 No-Build, 2026 Build, and 2026 Mitigated Build conditions. [According to the preliminary TIA attached to the ENF, all intersections and intersection approaches under state jurisdiction are anticipated to operate at an acceptable Level of Service (LOS) during the weekday morning and weekday evening peak periods, except for the 5-7

northbound Route 2 Westbound Off-Ramp left-turn approach at the Fort Pond Road/Route 2 Westbound Ramps intersection. The Level of Service for this left-turn approach deteriorates from D to E during the weekday evening peak hour; the DEIR should evaluate and commit to improvements that would restore this movement to a LOS D or better in the Build condition. We note that queue storage on the Route 2 Westbound Off-Ramp is limited to approximately 200 feet; improvements to address the short queue storage should be identified in the DEIR given the queue will likely exceed the available storage with the addition of project-related traffic, specifically during the weekday evening peak hour. 5-8

Several alternatives are currently being evaluated for the Route 2 interchanges in Lancaster and Harvard as part of MassDOT project #605393. The TIA notes that five alternatives for Exit 35 are being evaluated at present. These alternatives were not incorporated in the TIA as it is not expected that the improvements will be in place by the 2026 Build year; the DEIR should provide any update on this process as available. 5-9

Mitigation is proposed at several intersections under the jurisdiction of the Town of Lancaster. The Lunenburg Road/McGovern Boulevard intersection will be signalized, with demand-based vehicular and bicycle detection as well as emergency vehicle pre-emption capabilities. McGovern Boulevard will be widened to provide an exclusive eastbound left-turn and an exclusive eastbound right-turn lane. The northbound approach of Lunenburg Road will be widened to introduce an exclusive left-turn lane under protected-permitted signal phasing with the southbound approach widened to introduce an exclusive right-turn lane under permissive-overlap signal phasing.

Additionally, traffic signal timing modifications will be implemented at the Main Street/Seven Bridge Road and Lunenburg Road/Main Street intersections in accordance to the Traffic Monitoring Program committed to by the Proponent. The DEIR should clarify the timing of these improvements or the thresholds which are anticipated to be needed to trigger mitigation. 5-10

The DEIR should include capacity analyses for the Saturday midday peak hour. Mitigation should be proposed as part of the DEIR if any instances where intersection approaches under state jurisdiction are anticipated to operate at an LOS E or F in the 2026 No-Build or Build conditions. 5-11

Conceptual Plans

Any proposed mitigation within the state highway layout and all internal site circulation must be consistent with a healthy transportation design approach that provides adequate and safe accommodations for all roadway users, including pedestrians, bicyclists, and public transit riders. Guidance on healthy transportation design is included in the MassDOT *Project Development and Design Guide*. Where these criteria cannot be met, the proponent should provide justification, and should work with the MassDOT Highway Division to obtain a design waiver. 5-12

Multimodal Access and Facilities

The TIA includes an inventory of pedestrian, bicycle, and transit facilities and services in the vicinity of the project site. Pedestrian and bicycle accommodations are absent along Lunenburg Road; the Proponent has committed to providing these accommodations along McGovern Boulevard within the project site which would connect with Lunenburg. The Proponent will provide sidewalks along each side of Lunenburg Road; the DEIR should clarify whether this would be solely provided along the site frontage. The Proponent proposes no bicycle accommodations along Lunenburg Road; we note that the proposed widening of Lunenburg Road may allow for the provision of a shared use path (in place of one or both of the sidewalks) to allow for bicycle accommodations. The DEIR should evaluate this alternative. 5-13 5-14

The Montachusett Regional Transit Authority (MART) does not currently operate service in the vicinity of the project site; the Proponent should reach out to MART to examine the feasibility of extending service to the project site. An operational subsidy to support this service should be explored, in cognizance of the need to encourage alternative transportation options for a project of this size. The DEIR should provide documentation of this outreach. 5-15

Parking

The project will include provision for 3,462 spaces at Full-Build, including existing spaces on-site. A comparison of this figure with Town of Lancaster Zoning By-Laws and estimates from the *Parking Generation* (4th edition) are detailed in the TIA, demonstrating that the parking supply falls below Town of Lancaster requirements but above ITE recommendations. Although the Proponent notes that feasible opportunities to further reduce the parking supply is limited, we encourage the Proponent to investigate land banking of parking spaces until and unless needed, based on monitoring conducted at a future date. 5-16

Transportation Demand Management Program

To reduce site trip generation, the TIA includes a comprehensive Transportation Demand Management (TDM) program. The Proponent details the following TDM measures in the EENF with the goal of reducing vehicle trips by employees, residents, and visitors of the project:

- Assignment of an Employee Transportation Coordinator to oversee, implement, monitor, and evaluate TDM measures. The Transportation Coordinator will be responsible for managing rideshare and carpool programs and distributing information to encourage alternative means of transportation;
- Provision of preferential parking for rideshare, carpool and hybrid vehicles;
- Provision of electric vehicle charging stations;
- Provision of secure, weather-protected, long-term bicycle parking, as well as bicycle racks for short-term users;
- Provision of shower facilities for walking and bicycling commuters;
- Encouragement and promotion of vanpool and carpool participation, including implementation of a ride-matching program;
- Provision of a guaranteed ride home program; and

- Promotional events to encourage ridesharing and travel by alternative means of transportation.

[The Proponent should work toward identifying the details of these measures as well as developing additional programs. We encourage the Proponent to consult with MassDOT to help implement the TDM program.] 5-17

Transportation Monitoring Program

The Proponent has committed to conduct an annual traffic monitoring program to be conducted six months after the issuance of the first Certificate of Occupancy for the project site and continuing for a period of five years following full occupancy of the project. It will include:

- Simultaneous automatic traffic recorder (ATR) counts at site driveways for a continuous 24-hour period on a typical weekday and Saturday;
- Weekday AM, weekday PM, and Saturday midday turning movement counts (TMCs) and capacity analyses at site driveways and selected intersections (Main Street/Lunenburg Road, Lunenburg Road/McGovern Boulevard, and Lunenburg Road/Old Union Turnpike), as well as any other "mitigated" intersections; and
- Parking demand counts during the weekday evening peak period.

[The Proponent should also commit to conducting a travel survey of employees at the site.] 5-18

[The goals of the monitoring program will be to evaluate the assumptions made in the EIRs and the adequacy of the mitigation measures, as well as to determine the effectiveness of the TDM program. The results of each iteration of the monitoring program should be summarized in a technical memorandum provided to MassDOT. This monitoring plan (timing, duration, etc.) should be revisited with MassDOT's PPDU and the District 3 Office prior to its implementation.] 5-19

[The DEIR should provide an update of the local permitting processes for the proposed project, particularly with respect to any transportation issues being discussed. We strongly encourage the Proponent to consult with MassDOT before any transportation issues are discussed in local meetings or hearings.] 5-20

[The Proponent should continue consultation with appropriate MassDOT units, including PPDU and the District 3 Office, to discuss preparation of the DEIR.] 5-21 If you have any questions regarding these comments, please contact me at (857) 368-8862 or Michael Clark at (857) 368-8867.

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Comment Details

EEA #/MEPA ID*
16043

Comments Submit Date
7-1-2019

Review Due By
7-2-2019

Reviewer
Purvi Patel (617) 626-1029

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Status
Opened

Comments

Topic: Capital Commerce Center in Lancaster

To whom it may concern, As you conduct your review of this project I would ask that you explore the possibility of requiring a forested buffer around the edge of the property. This development will be adjacent to one of the premier wild areas in lancaster. There is a significant population of deer in the area and I have heard reports of moose and bear. In addition it is very close to an extensive trail network. The visitor experience on these trails could be substantially impacted by the development depending on how it proceeds. Finally, since it is very close to the North Branch of the Nashua River obviously steps must be taken to preserve the integrity of the river which is a key tributary to a recently designated Wild and Scenic River. The North Branch is under discussion to be added to that designation as well. All steps that you can take to preserve the area will be greatly appreciated. Sincerely, Timothy Castner

6-1
6-2

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Comments Submit Date
6-26-2019

Review Due By
7-2-2019

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Comments

Topic: Capital Commerce Center Project EEA#16403

June 26, 2019 Secretary of Energy and Environmental Affairs Executive Office of Energy and Environmental Affairs (EEA) ATTN: MEPA Office Purvi Patel EEA# 16043 100 Cambridge St. Suite 900 Boston, MA 02114 Dear Ms Patel I feel that the scale of proposed Commerce Center Project is completely out of proportion to the type of development that will enhance the growth of the town of Lancaster. Lancaster has a population of approximately 7400. The addition of a residential project, with 500 apartments and 117 single family/triplex/duplex residences has the potential to increase the population by more than 25%. The number of bedrooms projected for this project has not been determined. One has to consider the current infrastructure of Lancaster, which includes a Fire department with 2 full time firefighters and the remainder on-call fire fighters. The police department consists of a handful of full time officers and the remainder part time. I believe there are 4 or less police vehicles. The major effect of this project will be it's effect on the wetlands, watershed, ponds and conservation land. It appears there will be more than 150acres of impervious surface, where there is currently soil, sand and gravel, brush, grasses etc. The Nashua river is in close proximity and already suffers from intermittent flooding issues in the Town of Lancaster and the Town of Clinton further south. The disruption of the current watershed has the potential to increase flooding from the Nashua River, effect the water flow in surrounding aquifers, affecting water flow to surrounding wells, affect the water flow to multiple surrounding ponds-including White's Pond, Spectacle Pond, Fort Pond, etc. Spectacle Pond is one of the cleanest ponds in the area and is spring fed. The surrounding residences rely solely on well water. Changes in the surrounding watershed has the potential to cause decreases in the water flow the underlying water basins. The projected large auto depot has the potential to contaminate our vital water source. Additional issues center around the volume of traffic this project will provide. It appears that there is essentially going to be one entrance/exit to the proposed apartment buildings, by way of McGovern Rd. This is a 2 lane road, emptying into a 2 lane road. The addition of turn lanes and a traffic signal will not be sufficient to mitigate the effects of a large volume of cars. If one was to be extremely conservative, one could predict one car per apartment, making 500 cars. However, this area has no public transportation, no sidewalks, and no substantial shopping areas within walking distance. It is more likely that the number of cars will be 2 per apartment, especially in the current environment of both partners/spouses/co-habitors being employed. The traffic on Lunenburg road is already heavy, especially at times of soccer field use, with bottlenecks at Route 117 and Route 2. These are not problems that are likely to ever be mitigated, with very little ability to enlarge either Route 2 or Route 117. While there is a road improvement project planned for Route 117, it will not substantially increase the size of 117, but help to increase the flow, with turn lanes and signals. However, this project is designed to alleviate the current traffic woes and was not projected to include a substantial increase in traffic. In the mornings, Route 2 East is already bumper to bumper from the connecting ramp from 190 north to at least Exit 37-Devens, with overflow traffic traveling on the smaller parallel road-Old Union Turnpike. The proposed auto storage depot also proposes a threat to our water supply,, first due to the large amount of impervious surface and second from the potential soil/water contamination from car fluids. This is an environmentally sensitive area. The addition of 500+ cars for the apartments, 117+ for the other residences, will impact the soil and water purity.

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Attachments

Commerce Center Project.docx (null)

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Additional comments EEA # 16403

I implore you to reconsider how the scope of this project will transform the integrity of the surrounding wetlands, watershed, conservation land, aquifer and ponds, forever.

Commercial and residential growth in Lancaster is welcome. However, it must be accomplished at a reasonable pace and size that can be reasonably accommodated without dire financial impact, due to the need for considerable infrastructure, school, and safety additions , While the investors may profit from this massive project, the Town of Lancaster, a quaint central Massachusetts town, where "everybody knows your name", may cease to exist.

Paula Cioffi

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Lancaster MA 01523

Energy & Environmental Affairs
Public Comments Portal

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Comment Details

EEA #/MEPA ID* 16043	**First Name** Deb	**Address Line 1** 127 Harvard Rd	**Organization** --
Comments Submit Date 7-1-2019	**Last Name** D'Eramo	**Address Line 2** --	**Affiliation Description** Individual
Review Due By 7-2-2019	**Phone** --	**State** MASSACHUSETTS	**Status** Opened
Reviewer Purvi Patel (617) 626-1029	**Email** deb705a@gmail.com	**Zip Code** 01523	

Comments

Topic: Too large

As a Lancaster resident I view this project as too much too soon. The space is available but the town is nowhere ready to handle this many additional residences. We are trying to catch up on our affordable housing requirements of over 10%. We worked hard this year to get an approved Housing Production Plan and have begun to tackle providing affordable housing. This development will not only NOT provide affordable housing but will also require the town to provide even more affordable housing due to the number of units. The town needs time to get our affordable housing units underway and ensure future developments like this one - CONTRIBUTE affordable housing to the community! We're working to get bylaws in place to ensure developers provide affordable units but we aren't there yet. Please consider requiring the developer to provide affordable units - it's a HUGE need across the state as the governor has clearly stated. We also have major concerns on the environment. There should be studies done on this land for vernal pools and other important wildlife habitat. The development needs to take into account these critical areas on environment for our wildlife. Once the impact is made to our treasured environment, there is no way to recover it. Please ensure the developer works with our town conservation commission to properly evaluate the Impact to our environment. Thank you for your consideration.

6-12

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EEA #/MEPA ID* 16043	**First Name** Kaitlyn	**Address Line 1** 250 White Pond Rd	**Organization** --
Comments Submit Date 6-27-2019	**Last Name** Drew	**Address Line 2** --	**Affiliation Description** --
Review Due By 7-2-2019	**Phone** --	**State** MASSACHUSETTS	**Status** Opened
Reviewer Purvi Patel (617) 626-1029	**Email** kaitlynldrew@gmail.com	**Zip Code** 01523	

Comments

Topic: Effect on White Pond

Hi, As a resident of White Pond Rd, we all have private wells on our road as well as Holiday Lane. Whites Pond also serves as a primary irrigation source for Gove Farm in Leominster, MA. Not noted in this proposal as it is a separate development, but there is currently a 34-acre solar field going in just to the northeast of this project (where the former Lancaster Golf Course is). I am wondering what the environmental impacts are with having so much clearing both east and south of Whites Pond and change in the landscape in an area already prone to flooding? Also, I would like to know what the impacts on the aquafor are with such clearing and massive development, and wastewater runoff will have on those of us who have no option for public water hookups? I am also concerned with secondary used vehicles being stored on the site and what precautions will be taken to ensure no hazardous materials get spilled into both the Nashua River, vernal pools and aquafor as well. Finally, I am concerned about the noise and air pollution that such increased traffic will cause for those residents in the area of North Lancaster. Thank you for your time.

6-15
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16043

Comments Submit Date
7-1-2019

Review Due By
7-2-2019

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Comments

Topic: Capital Commerce Center - Feedback

I am not in favor of this project. I do not believe we need more retail in this area. There is a big shopping mall in Berlin (Highland Commons), there are a lot of stores at Orchard Hill Park (Leominster) and a big mall in Leominster. Not to be forgotten is the fact that more and more people are shopping online and, with the exception of the TJX chains (TJ Maxx, Marshalls, HomeGoods, HomeSense and Sierra Trading Post), stores are closing. It would be a shame to cut down trees and destroy open space to build stores that are not needed. There is nothing worse than big empty cement buildings. The traffic situation would be horrendous if this project goes through. There are already too many cars on Route 70. From where would the town get water ? I hear over and over that water and water pressure is a problem in town. This would add to noise pollution as well. Last summer I attended a meeting about the proposed race track. Many people from White Pond, Spec Pond and Fort Pond stood up and spoke about all the noise they already contend with due to the soccer fields. People move to Lancaster and live and stay in Lancaster because they like a rural setting. This would destroy the peaceful town we all love.

6-19
6-20
6-21
6-22

Attachments

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Patel, Purvi (EEA)

From: gwjwi@aol.com
Sent: Monday, July 01, 2019 11:05 PM
To: Patel, Purvi (EEA)
Subject: MEPA Review for Capital Commerce Center in Lancaster, MA -- EEA No. 16043

Dear MEPA Analyst Patel:

I have significant concerns about the environmental impact of the Capital Commerce Center proposed in the northern area of Lancaster. The project plans to add multiple business and residential structures in a 471 acre area that is largely, previously undeveloped. 6-23

The sprawling development appears to border the North Nashua River and transects multiple tributary streams. It will irreparably destroy over 55 acres of existing woodlands and wetlands that provide important wildlife habitat as well as watershed for the nearby river. 6-24

The proposed development appears to be sandwiched between two NHESP priority habitat areas, with one to the west and another to the east. In addition, it appears to border Cook's Conservation area to the south. Given its proximity to these important conservation and habitat areas, I would like to see a full range of environmental studies conducted including a complete and comprehensive review of rare species, plants, and habitat. 6-25

One certified vernal pool is known to exist on the southwest portion of the site. Given the large, diverse range of terrain and wetlands on the parcel, it seems likely that others are there as well. Lancaster and neighboring towns are known to have a variety of salamanders and turtles, so there could very well be essential habitat for those species and others on this site as well. 6-26

A 2017 evaluation of possible water sources for economic development in north Lancaster, considered establishing new wells on town land just north of the Nashua River as one of the attractive options. It's hard to believe the town would consider siting this extensive development and it's massive sewage treatment facility that close to one of the town's only alternative water sources. 6-27

The town of Lancaster has exceeded its WMA permit level for 8 of the past 10 years and is desperately in need of establishing a secondary source for its municipal water system. Its existing wells are both in the same aquifer in south Lancaster and are highly susceptible to contamination due to their location and the surrounding soil types. 6-28

The single-access entry to the proposed development off of route 70 will add over 11,000 vehicle trips per day which will certainly increase traffic backups at the intersection with route 117 to the south at peak travel times. All the extra vehicles and all the additional backups are bound to significantly degrade the local air quality. 6-29

While Lancaster would benefit from expanding its business tax base, there is little current need for an additional 617 housing units. The local zoning board recently approved a development in the south end of Lancaster consisting of 96 apartments and 56 single-family homes. It's hard to see the need for another, concurrent, large housing development. The town is not even staffed to deal with all this construction at the same time. 6-30

What Lancaster needs more of is affordable housing. The Capital Commerce project would significantly increase the market-rate housing in Lancaster which would actually reduce progress toward meeting the state's mandate for 10% affordable housing. 6-31

The residential portions of the development appear to receive generous zoning relief without providing the benefits typically associated with cluster development. There is no affordable housing, no conservation land set aside, and little or no recreation or open space planned. 6-32

Lancaster would likely benefit from additional retail, restaurant, and food store options. It would benefit from a reasonably sized hotel and more recreational facilities. What it does not need is more car dealerships. Most of all, Lancaster really needs more affordable housing. 6-33

This area appears to contain significant wildlife and habitat resources in an environmentally sensitive location. The North Nashua River is within the Commonwealth's Central Nashua River Valley Area of Critical Environmental Concern. The Nashua River recently received national designation as a "Wild and Scenic River" and the North Nashua River is part of that greater watershed. 6-34

The impact of any development in this area must be carefully and thoughtfully evaluated.

Sincerely,

Greg Jackson
Lancaster, MA

Energy & Environmental Affairs
Public Comments Portal

purvi.patel@mass.gov

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Comment Details

EEA #/MEPA ID* 16043	**First Name** Robert	**Address Line 1** --	**Organization** --
Comments Submit Date 7-1-2019	**Last Name** Keene	**Address Line 2** --	**Affiliation Description** --
Review Due By 7-2-2019	**Phone** +19786604823	**State** --	**Status** Opened
Reviewer Purvi Patel (617) 626-1029	**Email** bob.keene@comcast.net	**Zip Code** --	

Comments

Topic: NO to Capital Commerce Center

[I live about 1 mile from this proposed project and I believe the extra traffic burden will be incredibly high. Route 2 spends a significant portion of the day in stand still traffic aready, and then increasing the traffic on route 70, especially around the soccers fields is quite dangerous. That spot is over trafficked already.] there was a serious accident just recently near Kimball Farms and the soccer fields ... and i've witnessed head on collisions on that road before as well [The roads are not sufficiently safe for that the type of traffic need to support that much retail space. Especially with the amount of traffic for kids & families at the soccer complex. Just say NO to the this project.]

6-35

6-36

Attachments

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purvi.patel@mass.gov

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Comment Details

EEA #/MEPA ID*
16043

Comments Submit Date
7-1-2019

Review Due By
7-2-2019

Reviewer
Purvi Patel (617) 626-1029

First Name
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Last Name
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Address Line 2
--

State
MASSACHUSETTS

Zip Code
01523

Organization
--

Affiliation Description
Individual

Status
Opened

Comments

Topic: What for?

I moved to Lancaster recently because of the quiet space and lack of commercial shopping centers. Lancaster is centrally located between Hudson/Berlin (home of Highland Commons) and Leominster (Orchard Hill Park, Target, Kohl's, 3 grocery stores, Searstown) are all minutes away. I already see stores in Highland commons failing/closing and as well as closing stores in Searstown and Orchard Hill. Those shops are close enough for every Lancaster resident ... there is no need for a blight in Lancaster. Please just no.

Attachments

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purvi.patel@mass.gov

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Comment Details

EEA #/MEPA ID*
16043

Comments Submit Date
6-26-2019

Review Due By
7-2-2019

Reviewer
Purvi Patel (617) 626-1029

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Last Name
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rsmirabito@verizon.net

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Address Line 2
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State
MASSACHUSETTS

Zip Code
01523

Organization
Lancaster Resident

Affiliation Description
Individual

Status
Opened

Comments

Topic: Lancaster Commerce Center Proposed Development

Dear MEPA Administration, I am writing to you today in response to the proposed commercail development in Lancaster Masssachusetts. This development will have dire effects on the beautiful avian,and land animals that inhabit this region. lancaster has been a sanctuary for theses animals in contrast to the urban stttings of Leominister and Fitchburg. this area is home to a variety of Massachusetts wildlife and should be protected from commerce. redtail hawks, herons,bald eagles,owls yellow spotted salamanders are living on this land. Coyotees ,fox, deer, turkeys and even moose have been spotted in this area. Lancaster is a homespun community that does not need commerce but does need to preserve its wildlife. We entrust you to protect our community and our wildlife! Christine Mirabito

6-37

Attachments

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EEA No. 16043

Christine Mirabito
944 George Hill Rd.
Lancaster, Massachusetts 01523
June 26,2019

Dear Ms.Patel,

I m writing to you today in response to the proposed commercial development in Lancaster,Massachusetts. The effect this will have on the animal life and vegetation in Lancaster will have dire impact on the wildlife and vegetation that now resides in this area, as well as surrounding areas. This open natural environment is the home range for red tail hawks, herons, and bald eagles as well as many other common Massachusetts birds. This land is also the home of wildlife such as coyotes, fox, squirrels, deer, turkeys and other common wildlife. The yellow spotted salamanders are common in Lancaster and may be found on this site as well. This area needs to be protected from commercial and industrial development. It will be a great injustice to the integrity of the history,culture of Lancaster to not protect the wildlife that exists today.

Sincerely,
Christine Mirabito ,Lancaster Massachusetts
Christine Mirabito

P.S.
Would you kindly call me to state you recieved this 339 927 4202. Thank You
or
978 706 1098

Energy & Environmental Affairs

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purvi patel@mass.gov

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Comment Details

EEA #/MEPA ID*
16043

Comments Submit Date
7-1-2019

Review Due By
7-2-2019

Reviewer
Purvi Patel (617) 626-1029

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Last Name
Petracca

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victoria.marquis@calistagroup.com

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67 Woodland Meadow Drive

Address Line 2
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State
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Zip Code
01523

Organization
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Affiliation Description
Individual

Status
Opened

Comments

Topic: Environmental Impact of Offering No Affordable Housing Component

Dear MEPA Review Team, The current proposal for the Capital Commerce Center includes approximately 616 market-rate housing units of various typologies: apartments, duplexes, triplexes, and single-family homes. As cited, the project is located in a high-density overlay district which allows apartment style development. The site is near regional transportation and other affordable housing amenities. Our great concern is that the units are exclusively market rate, generating an additional burden for Lancaster to meet its affordable housing requirement. MGL requires every town in the Commonwealth to maintain over 10% of its year-round housing inventory as deed-restricted affordable housing. Therefore, this development will undeniably create a legal need to provide an additional 62 affordable housing units elsewhere and cause the associated environmental impact - without any contribution or mitigation from the developer. To be clear, the total environmental impacts of the housing proposed here INCLUDES the impact of an additional 62 affordable units required under MGL, wherever they are constructed. Construction of the required 62 affordable housing units creates a significant loss of natural resources elsewhere, not necessarily near affordable housing amenities such as regional transportation. This should be included by MEPA under the environmental impacts of this project. For information, Lancaster does not currently have an Inclusionary Zoning bylaw that requires developers to provide affordable housing for every new subdivision, but this is being proposed. In the meantime, we kindly ask that you seriously consider the environmental impact of NOT providing any affordable housing in this project - because this requires significant new affordable development elsewhere. Given the profitability of 616 market-rate housing units versus the environmental impacts of a total 678 housing units, this seems like a reasonable condition for this private large-scale, high-density development Respectfully, Victoria M. Petracca

6-38

6-39

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purvi.patel@mass.gov

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Comment Details

EEA #/MEPA ID*
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Comments Submit Date
7-1-2019

Review Due By
7-2-2019

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Organization
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Affiliation Description
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Status
Opened

Comments

Topic: Vernal Pools as Part of Intermittent Streams on 471-Acre Site

Dear MEPA Review Team, Please add an investigation of vernal pools in the intermittent streams on the 471-acre site in Spring 2020. A 524-foot vernal pool was recently located in another intermittent stream in Lancaster. Respectfully, Victoria Petracca

Attachments

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Patel, Purvi (EEA)

From: Joe Ramirez <ramizer366@comcast.net>
Sent: Thursday, June 27, 2019 1:31 PM
To: Patel, Purvi (EEA)
Subject: Capital Commerce Center, at McGovern Boulevard in Lancaster

Hello Purvi,

Thank you for coordinating the MEPA meeting at the McGovern Boulevard site in Lancaster. It was very informative, and as an abutter, I have a multitude of concerns based on the enormous scale of the project.

My primary concern needs to be the proposed access to White Pond Road. This is a private road, and as president of the association, I need to make it clear that there is absolutely no access to the road. We went through a law suit back in the late 90's, and were deeded a strip of land around the outside edge of the street. This capped it from any future extension. It is mentioned twice in the proposal, and once by a member of the development group at the meeting, that White Pond Road would be an access point for the 117 homes proposed at section K of their map. Moments later, he backed away from that statement when I contested it. So to be clear, there will not be any access allowed from White Pond Road, including emergency access, and it needs to be removed from any plans going forward. 6-40

My second concern is traffic. Having lived in the area for 23 years, I find it impossible to believe the traffic impact study when they claim it won't have a significant affect on traffic. Soccer tournaments already cause a ridiculous amount of congestion, and the number of cars associated with the development far exceeds the number currently connected with the soccer fields. The entire site is only accessible from 2 spots, McGovern Boulevard and Johnny Appleseed Lane. Both of these intersections have had multiple traffic fatalities in recent years. Adding 117 homes to Johnny Appleseed would much more than double the number of homes on that dead end street. It is a narrow, winding road with the only egress being on a very steep hill that has always been a problem intersection. Claiming it won't change anything would be naive. What also must be considered is the interscetion of 70 and 117. Not only has there also been a fatality there recently, but the school buses are often delayed by 15 or 20 minutes in the morning due to traffic backing up as much as a 1/2 mile, making kids late for school. 6-41 6-42 6-43

Adding 117 single family, duplex and triple family homes and 500 apartments will increase the population of the town by 25 - 30%. Again, this mass of new people can only access their homes by 2 points of entry. Also being added to the equation are the cars attributed to the 120 unit hotel and other businesses of the plan. The local infastructure is not built for this level of increase. Nor can the schools, police or fire departments handle such a population explosion in their present state. 6-44 6-45

This site has been a target for development in Lancaster for decades. But the problems with it have not changed over that time, and I don't see anything different with this plan. It has limited water available to it, and extremely limited access. The water problem may be solved by obtaining water from Lunenburg, but as of now, they don't have the water neccesary to accomodate this project. Even if they do obtain additional water, it needs to be studied carefully as to where it is coming from. If it is through additional wells, they need to be fed from a completely different aquifer than are the homes in North Lancaster. The town can't pretend that there is plenty of water for all, especially when they have issued water bans to the car dealerships that already exsist. Residents in this area do not have a plan B for water. We are completely restricted to personal wells. Another issue is that the area is teaming with wildlife. The wetlands need to be 6-45 6-46

protected, and impact to the animals limited as much as possible. We have a nesting pair of bald eagles on White Pond for the first time in a century. Most residents in the area purchased their homes to be in a wooded area with an abundance of wildlife. But coyotes and other preditors being forced out of the woods and into people's back yards is not what anyone is looking for.

As abutters, we can accept that this land will be developed in some manner. What we ask is that it isn't hugely detrimental to the current residents who have been paying taxes for years. Businesses with a small number of employees and no direct retail customers would be preferrable as it would have only a small impact on the traffic. Lancaster is a tiny, rural town of 8000. This project would not only change that, but it would more than likely cause an increase in property taxes, which are already among the highest in the area. We all know that adding homes actually cost the town money rather than generating income. Increasing the population by nearly a third would certainly cause this to happen. 6-47

Thank you for your time,
Joe Ramirez
President of White Pond Road Association

June 14, 2019

Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Purvi Patel EEA No. 16043
100 Cambridge Street, Suite 900
Boston MA 02114

Dear Ms. Patel,

The scale of the Preferred Master Plan (PMP) is not in sync with the environmental and conservation value of the location.

This particular area of Lancaster is one of the Town's conservation gems, with much local thought and planning going into its sustainability and public use. All of us locals expect development to happen here. Not on the scale of this PMP, however. Lancaster's population is 7,400 not counting the prison census. The residential portion of this PMP alone would increase the Town's population by at least 25%.

The PMP abuts 100% conservation land. Efforts should be made by the developer to provide noticeable buffers of undisturbed land between his property and this conservation land (which is the DCR-owned Lancaster State Forest, Lancaster Conservation Commission land, etc.). There are several locations on the PMP, particularly with building Q, and the parking lot near building J, that are "right up" to the abutting edge of this conservation land in very sensitive areas, environmentally. This conservation land is heavily used and contributes to us locals' quality of life in choosing to live here. 6-48

The massive parking lot in the western part of the PMP is outdated with today's design guidelines for lower impact development. This is particularly disturbing in this area because of the NHESP-mapped certified vernal pool located here. Whether it's an extension of the parking lot or a proposed storm water treatment basin in one of the alternative scenarios, it is completely counter to wildlife biology standards to create islands between wetland systems and vernal pools. 6-49 6-50

Importantly, this whole area is within "State-mapped Habitat of Potential Regional and Statewide Importance". I have attached that map. MassDEP in conjunction with NHESP require a detailed wildlife evaluation study to be completed by a certified wildlife biologist. (Please see the MassDEP guidance document, "Wildlife Habitat Protection Guidance for Inland Wetlands".) 6-51

Much of this PMP is in the ACEC. The Nashua River in Lancaster was designated as a Wild & Scenic River just in the last few months and this development abuts that. This location is an incredibly special place. 6-52

Much of this PMP site is in Lancaster's Water Resource District (WRD). There are limitations on wastewater, auto salvage storage, hazardous waste and petroleum product storage (which will affect the car service center) and on the percentage of impervious surface allowed. Efforts were made by a Fort Pond Road developer several years ago to decrease the size of the WRD in that area to facilitate denser development and the zoning bylaw amendment did not pass at Town Meeting. 6-53 6-54

I do not know how solid the plan is for Lunenburg water to supply this site. Within the last 4 years, that has been a controversial local issue with Lunenburg residents. Many of them are not aware of this current effort towards a Lunenburg-Lancaster agreement on water that will supply Lunenburg Road. Assuming it goes through, I am hoping that MEPA and this developer will work together to create a development plan that does not exploit the location to its maximum profit…A plan which everyone can live with without degrading the hundreds of acres of conservation land that it abuts. Many of us have been working many years to create this legacy of conservation land. 6-55 6-56

Sincerely,

Cara Sanford, Lancaster

Code	Comment	Response
ENF Comments		
1-1	The DEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope.	The DEIR has been filed in conformance with Section 11.07 of the MEPA regulations and has been modified by the scope outlined in the ENF Certificate.
1-2	The DEIR should clearly demonstrate that the Proponent has sought to avoid, minimize and mitigate Damage to the Environment to the maximum extent feasible.	The DEIR contains a detailed Alternatives Analysis including a quantitative comparison of the proposed impacts for each alternative. The proponent has sought to avoid, minimize and mitigate damage to the environment through this analysis while providing a development program that is suitable for the area and in alignment with the Town of Lancaster master planning efforts. The Proponent will design the Project to meet or exceed all applicable Local, State, and Federal Standards and Regulations.
1-3	The DEIR should provide a detailed description of the project and associated impacts and identify any changes to the project since the filing of the ENF.	A detailed Alternatives Analysis including a quantitative comparison of the proposed impacts for each alternative is provided in **Section 2** of the DEIR. An updated description as well as a section describing any changes to the Project since the ENF filing are provided in **Section 1** of the DEIR.
1-4	It should include updated site plans for existing and post-development conditions at a legible scale.	Updated site plans for existing and proposed conditions are provided in **Appendix B**.
1-5	Conceptual plans should clearly identify: all major project components (proposed buildings, access roads, roadway improvements, etc.); areas of land alteration (new and previously disturbed); impervious areas; wetland resource areas; ownership of parcels including easement areas; pedestrian and bicycle accommodations; and stormwater and utility infrastructure. Conceptual plans should be provided for on-site work as well as any proposed off-site work for transportation or utility improvements.	The Existing Conditions plan identifies all major existing project components and is provided in **Appendix B.** The majority of the proposed project components, including proposed buildings, access roads, impervious areas, pedestrian accommodations, stormwater management areas, and wetland resource areas are identified on the Preferred Master Plan, also provided in **Appendix B**. The Conceptual Utility Plans included in Appendix B outline the proposed utility services for the main access road. Utility services will be extended from the proposed road to each lot depending upon the final end-user. Locations of potential easements are unknown at this time and will be identified on future design plans associated with the Project build-out. Bicycle accommodations are identified and described in in **Section 7**, transpiration and in the TIAS in **Appendix F**. Conceptual plans for off-site improvements are included in the Traffic Impact and Access Study in **Appendix F**.
1-6	The DEIR should identify all easements and public utilities on the site including parties to the easements and location and condition of public infrastructure. It should describe any constraints on project design or use of the site posed by these conditions.	The majority of the Site is an active gravel pit and there is limited existing utility infrastructure on Site. The areas that contain other existing uses are serviced by on-site wells and septic systems. Existing utility infrastructure and impacts are outlined within **Section 6** of the DEIR. There are no known existing easements that would pose any constraints on project design. Locations of potential easements are unknown at this time and will be identified on future design plans associated with the Project build-out.

1-7	The DEIR should identify and describe State, federal and local permitting and review requirements associated with the project. It should include a description and analysis of applicable statutory and regulatory standards and requirements, and a discussion of the project's consistency with those standards. The DEIR should provide an update on local permitting processes.	The Project is subject to the Town of Lancaster Zoning Bylaws. The project will comply with the Zoning Bylaws and no waivers or variances are anticipated at this time. The Project is subject to the Wetlands Protection Act (WPA) and the Town of Lancaster Wetlands Protection Bylaw for work adjacent to and any direct alteration to wetland resource areas. The project will fully comply with all performance standards outlined in the WPA and the local regulations. Notice of Intent Applications will be filed with the Conservation Commission and DEP for any work in these areas. The roadways and individual lots will include stormwater management systems in full compliance with the Massachusetts Stormwater Standards. Refer to **Section 1** of the DEIR for updates on all local, state and federal permitting processes.
1-8	The DEIR should identify project phasing. It should identify areas to be developed for each phase and identify associated activities.	Refer to **Section 9** of the DEIR for information on project phasing.
1-9	The DEIR should identify the number of residential units that will be designated as affordable.	It is anticipated that 12% of the residential units would be affordable units. This would equate to 60 of the units in the development which would be affordable units.
1-10	The DEIR should include a comprehensive alternatives analysis that demonstrates that Damage to the Environment can be avoided, minimized or mitigated to the maximum extent practicable. Priority should be placed on avoidance and minimization of land alteration, including creation of impervious area, and integration of uses throughout the site to minimize traffic generation and maximize the ability for shared parking. The alternatives identified below should be analyzed in the DEIR. • A No-Build Alternative • By-Right Alternative • Alternative Master Plans A and C (as described in the ENF) • Reduced Impact Alternatives o Limit development to previously altered areas o Integrate uses throughout the site and within buildings (e.g., residential over retail) • A Preferred Alternative The DEIR should describe and quantify each alternative's impacts on land alteration, creation of impervious area, development within the ACEC, impacts to wetland resource areas, traffic generation, parking, water use, and wastewater. This comparison should be provided in a tabular format with supporting narrative and conceptual site plans.	Refer to **Section 2** of the DEIR for a description of the Project alternatives and their associated impacts. A comparison of each alternatives impacts are provided in **Table 2.2.**
1-11	The DEIR should also describe how project phasing could be developed to avoid and minimize environmental impacts.	It is anticipated that the project phasing will occur such that the initial roadway and utility infrastructure needed to service the proposed uses will be early on. The next anticipated phase is construction of the auto sales facility and work in this area will be minimized to only what is needed for the proposed use in an effort to avoid and minimize environmental impacts. The remaining areas will be developed on an as-needed basis to suit tenant needs. Construction in these area will again be limited to only what is needed for the proposed use in an effort to avoid and minimize environmental impacts. A description of the phases and their associated impacts and mitigation efforts is provided in **Sections 9 and 10** of the DEIR. A Draft Construction Management Plan has been provided in **Appendix I**.

1-12	The Preferred Alternative represents maximum build-out of the site. Significant opportunities exist to reduce impacts. I strongly encourage the Proponent to implement cross-cutting measures.	The above-Code building envelopes are a cross-cutting measure to reduce impacts as they allow smaller mechanical equipment to be specified for each building and they reduce energy use along with GHG emissions.
1-13	The alternatives analysis should evaluate a greater height, density, and grouping of buildings to reduce impervious surfaces and increase open space. It should analyze reduced parking ratios, structured parking and land banking of parking to reduce impervious area and traffic generation.	The Traffic Impact and Access Study provided in **Appendix F** reviews the proposed parking supply for the project based on zoning and ITE methodology with time of day factors calculations provided for the projected uses. The parking supply will be refined as the project Tenants are selected. The majority of the Project is for an industrial style development which is consistent with what the Town is looking to achieve under the IPOD overlay. The parking density and location provided is consistent with the needs of the end users and general practice. Multi-story buildings and parking structures do not lend itself to this type of development. Reserve or land bank parking is not specified as being allowed in the underlying zoning for the project. The IPOD overlay district does allow for a "Minimum number of spaces, or as may be modified by special permit under that section". The proponent will work with the Town during the permitting process to identify areas if and where land banked parking may be feasible and allowed.
1-14	The DEIR should evaluate a development alternative that provides a substantial buffer to the Lancaster State Forest and avoids and minimizes development within the floodplain.	The proponent will be helping to provide additional buffers to the state forest by donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7 acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation lands and contain wetlands, streams and are within the ACEC. For Phase 1 work, the Dunkin' Donuts facility, the Mobil Gas Station, and FC Stars, there was 15,295 SF of impact to bordering land subject to flooding (BLSF) which was previously mitigated. An additional 15,000 SF of BLSF impact is anticipated based upon improvements to McGovern Boulevard and will be fully mitigated as part part of the project. Given the existing topography on the Site, all proposed buildings and associated site work are anticipated to be several feet above floodplain elevation. As such, the development of the lots are not anticpated impact to the floodplain. This is significantly reduced from the 115,000 SF noted in the ENF Filing.
1-15	The DEIR should discuss steps the Proponent will take to further reduce the impacts of the project since the filing of the ENF, or, if certain measures are infeasible, the DEIR should discuss why these measures will not be adopted.	An updated description as well as a section describing any changes to the Project since the ENF filing are provided in **Section 1** of the DEIR.
1-16	The DEIR should demonstrate that the project will avoid and minimize adverse effects on natural resource values of the area.	The DEIR contains a detailed Alternatives Analysis including a quantitative comparison of the proposed impacts for each alternative refer to **Section 2** of the DEIR. The proponent has sought to avoid, minimize and mitigate damage to the environment through this analysis while providing a development program that is suitable for the area and in alignment with the Town of Lancaster master planning efforts. The Proponent will design the Project to meet or exceed all applicable Local, State, and Federal Standards and Regulations.
1-17	It should address how project planning and development can promote preservation, restoration, or enhancement of resource areas within the ACEC.	The project will include approximately 36.9 acres of open space in the southwestern portion of the Site adjacent to the proposed auto sales area. This area contains a significant amount of wetland resource areas and is within the ACEC. In addition, the proponent will be donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7 acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation areas and contain wetlands, streams and are within the ACEC

1-18	Analysis of a reduced impact alternative should include a 100-foot buffer from Lancaster State Forest.	The proponent will be helping to provide additional buffers to the state forest by donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7 acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation lands and contain wetlands, streams and are within the ACEC.
1-19	DCR accesses the Lancaster State Forest via a roadway north of Assessor's Lot 14-11. The OCR comment letter indicates that the development may impact this access. Prior to filing the DEIR, the Proponent should stake/mark all mutual property lines and comers abutting Lancaster State Forest and consult with DCR regarding its concerns.	The Proponent has staked out the property line between the State Forest where it abuts the proposed WWTP. There is a section of the trail that runs through Lot 14-11 in the area of the proposed WWTP. That section of the trail may need to be rerouted further south to avoid this conflict. The Proponent is fully committed to working with DCR to maintain this connection. The Proponent has been in discussion with the Town of Lancaster as well to maintain and expand this trail network.
1-20	The DEIR should quantify the total amount of alteration associated with the project including areas to be altered for buildings, roadways, parking, automotive storage, wastewater, water and stormwater infrastructure, landscaping, and other project components.	Refer to **Section 3** of the DEIR for information on alteration associated with the proposed project.
1-21	The DEIR should provide a revised estimate of impacts associated with new land alteration and impervious area and include a breakdown for each project element.	Refer to **Section 3** of the DEIR for information on alteration associated with the proposed project.
1-22	The DEIR should clarify the location, type and amount of alteration in previously undisturbed areas.	Refer to **Section 3** of the DEIR for information on alteration associated with the proposed project.
1-23	The DEIR should include site plans that clearly locate and delineate areas proposed for development and those to be left undisturbed. It should include a grading plan and identify the depth and location of fill/excavation.	Refer to **Appendix B** for plans that delineate the proposed areas for development and remaining on-site open space. The Project proposes to balance cut/fill onsite during design in order to limit the need for soil export/import to the maximum extent practicable. Refer to **Section 3** of the DEIR for a description of earthwork onsite. Refer also to the Draft Construction Management Plan in **Appendix I** and the Conceptual Heat Map Exhibits identifying cut/fill areas in **Appendix B.**
1-24	The DEIR should identify open space that will remain undisturbed and/or restored upon completion of construction and identify whether and how open space will be protected.	Areas outside the proposed limits of development shown on the Preferred Master Plan are anticipated to remain as open space. This includes: (1) approximately 36.9 acres of open space in the southwestern portion of the Site adjacent to the proposed auto sales area, and (2) approximately 61.4 acres of open space will remain in northern portion of the site near buildings "C" and "D". These areas contain a significant amount of wetland resource areas that are not anticipated to be impacted by the proposed project. In addition, the proponent will be donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7 acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation areas and contain wetlands, streams and are within the ACEC. Refer to **Section 4** of the DEIR for additional information.
1-25	Given the size of the project site, the Proponent should consider placing a conservation restriction (CR) on portions of the site designated as open space, including areas containing wetlands, to ensure their permanent protection.	The proponent is committed to working with the Town to provide open space in a mechanism of their choosing. This would be completed towards the end of the project when the final configuration of the development has been finalized. The proponent is also committed to donating two parcels of land to the Town as part of the project. These parcels are abutting the State Forest and are identified as Map 14, Lot 15 and Map 19, Lot 11, totaling 86.7 acres.

1-26	The DEIR should provide identify, in the narrative and on project plans, the extent and type of clearing associated with the project and how impacts to mature trees, unique geologic formations, and wildlife corridors will be avoided to the extent practicable.	The existing project site consists largely of an active earth removal and processing facility and agricultural fields. Tree clearing will be limited to areas outside the 100 foot Buffer Zones to wetlands, where possible. In areas where tree clearing cannot be avoided, it will be limited to areas outside the 25 foot Buffer Zone to wetlands. To our knowledge, there are no unique geologic formations on the project site. Existing, undisturbed wildlife corridors are limited to the northerly and southerly portions of the site and significant portions of them will be preserved, as depicted on the project plans.
1-27	The DEIR should provide a comprehensive evaluation of all measures to reduce the amount of land alteration and impervious area, including reductions in roadway widths and impervious surfaces, pervious pavement for low intensity parking areas and sidewalks, and reducing parking.	The Traffic Impact and Access Study provided in Appendix F reviews the proposed parking supply for the project based on zoning and ITE methodology with time of day factors calculations provided for the projected office and industrial park uses. The parking supply will be refined as the project Tenants are selected and parking will be provided to comply with zoning and tenant operational needs. Roadway infrastructure will be minimized to that required to service the proposed development in accordance with the TIAS recommendations as well as local and state regulations. Reserve or land bank parking is not specified as being allowed in the underlying zoning for the project. The IPOD overlay district does allow for a "Minimum number of spaces, or as may be modified by Special Permit under that section". The proponent will work with the Town during the permitting process to identify areas where land banked parking may be feasible and allowed. LID techniques to be considered for use on the individual lots consist of raingardens, bioretention areas, tree box filters, porous pavement, water quality swales, and green roofs. These techniques will be considered on a case by case basis as appropriate and feasible due to on site constraints (i.e. soils conditions, groundwater, location, etc.) in order to reduce impervious area and land disturbance. The stormwater management controls will be dispersed across the development of the individual lots so as to not centralize the stormwater system. These techniques will be considered and discussed in the future NOI filings developed for the proposed build-out of the property.
1-28	The DEIR should demonstrate that the project can be designed and constructed consistent with applicable WPA performance standards.	The project complies with the Wetlands Protection Act performance standards for all wetland resource areas. No new stream crossings are proposed. The existing stream crossing to be upgraded complies with the stream crossing standards for replacement crossings. Work is proposed within Riverfront Area. This work complies with the Inner Riparian Zone disturbance restrictions as well as the 10% threshold for Outer Riparian Zone disturbance. An alternatives analysis to justify work within the Outer Riparian Zone is/will be provided. Work proposed within Bordering Land Subject to Flooding meets requirements for compensatory storage and habitat restoration, where applicable. The 1,815 square foot former farm pond/wash pond that was filled will be replicated in-kind and on-site. No other impacts to wetland resource areas are proposed.
1-29	The DEIR should include a description of all permanent and temporary wetland impacts including grading, clearing and construction-related disturbances and provide alternatives analyses consistent with regulatory requirements to demonstrate how wetland impacts will be avoided, minimized and mitigated.	The existing McGovern Brook and intermittent stream crossings to be upgraded will result Bank, Bordering Vegetated Wetland, Bordering Land Subject to Flooding and Riverfront Area disturbance. These impacts will be mitiaged with a combination of stream restoration within the expanded culverts, wetland replication and compensatory flood storage. Performance standards for Riverfront Area will be met including the alternatives analysis and No Significant Adverse Impact requirements. Sections 4 and 10 of the DEIR describe the proposed impacts and mitigation.
1-30	The DEIR should describe how much of the project will occur in developed and undeveloped RFA.	Refer to **Section 4** of the DEIR for description of resource area impacts.

1-31	It should include detailed plans at a reasonable scale that clearly delineate all applicable resource area and buffer zone boundaries including floodplain elevations (based on FEMA FIRMs if identified).	The project plans depict vegetated wetland, bank and mean annual high water line boundaries that were field delineated and approved under an Order of Resource Area Delineation (DEP File CE 193-0554). Bordering Land Subject to Flooding boundaries associated with the FEMA mapped Zone A are depicted on the project plans. No elevations are available for the Zone A areas.
1-32	Project plans should depict all project elements (including utilities) in relation to wetland resource areas and any associated buffer zones within the site.	Project elements, resource areas and associated buffer zones are depicted on the Preferred Master Plan, alternative plans and the Conceptual Utility plan provided within **Appendix B and C** of the DEIR.
1-33	The DEIR should describe the nature of all impacts that cannot be avoided and whether they are temporary or permanent in nature.	Project elements, resource areas and associated buffer zones are depicted on the Preferred Master Plan, alternative plans and the Conceptual Utility plan provided within **Appendix B and C** of the DEIR.
1-34	The DEIR should describe measures to mitigate unavoidable wetland impacts and include replication and restoration plans designed to meet the performance standards pursuant to 310 CMR 10.00, and demonstrate that compensatory storage on an incremental basis will be provided.	The plans depict proposed mitigation for the stream crossing upgrade. A wetland replication area including open water and bordering vegetation is depicted in order to mitigate for the 1,815 square foot former farm/wash pond that was filled. A compensatory storage area is depicted and a table of incremental flood storage compensation is provided on the project plans.
1-35	The DEIR should evaluate alternatives that minimize alteration of wetland resource areas, including BLSF and RFA, and activities within the Buffer Zone.	Refer to **Section 4** of the DEIR for information on alteration associated with the proposed project.
1-36	Portions of the project, including the auto storage facility with a large gravel storage area and stormwater basins, are near wetlands located within the ACEC, which are sensitive wetland resource areas. The DEIR should evaluate alternatives that locate these components further away from the sensitive resource areas.	Stormwater runoff from these surface areas will be directed into a stormwater system designed in accordance with DEP stormwater standards. We will fully comply with local buffer requirements and the project has been modified since the ENF to remove the parking previously proposed within the RFA.
1-37	The DEIR should consider structured parking alternatives.	The Traffic Impact and Access Study provided in **Appendix F** reviews the proposed parking supply for the project based on zoning and ITE methodology with time of day factors calculations provided for the projected office and industrial park uses. The parking supply will be refined as the project Tenants are selected. However, industrial uses are typically not conducive to structured parking.
1-38	The DEIR should include information regarding use and maintenance of gravel storage areas and how impacts to sensitive resource areas and receptors will be avoided.	The surface for the auto sales and service facility is essentially an impervious surface constructed of a reclaimed asphalt with an emulsiphier. Stormwater runoff from these surface areas will be directed into a stormwater system designed in full accordance with DEP stormwater standards. Maintenance will be performed similar to other paved surfaces and stormwater systems. A full Operation and Maintenance Plan will be prepared as part of the local permitting process and will comply with DEP stormwater standards.
1-39	The DEIR should include a description of the storm water management system and provide documentation, including plans, storm water checklist and calculations, in support of the proposed design and its consistency with the SMS. In particular, the DEIR should describe consistency with Standard #6 for Critical Areas based on the presence of vernal pools on-site. The DEIR should confirm that stormwater structures are not located within 100 feet of vernal pools.	The Project has been designed in accordance with the Wetlands Protection Act and the MassDEP Stormwater Standards and a Drainage Report for the proposed Project is provided in **Appendix H**. A Stormwater Operation and Maintenance Plan and Long-Term Pollution Prevention Plan are included in the Appendices section of the report. The vernal pool is located within the bordering vegetated wetlands southwest of the auto sales facility. All stormwater structures are in excess of 100 feet from the vernal pool.
1-40	The DEIR should evaluate alternatives where the storm water structures are set back from receiving wetland resource areas to the maximum extent possible.	Stormwater structures as shown on the enclosed plans are approximate and may change depending upon final tenant fit-out. These structures will be setback from resource areas to the maximum extent practicable as the individual site development plans are developed. Infiltration basins will be set back a minimum of 50 feet from resource areas.

1-41	It should include a review of Low Impact Development (LID) techniques (e.g., pervious pavement, raingardens/bioretention areas, bioswales, tree box filters, and green roofs, and reuse of roof runoff for irrigation) and incorporate these measures into the project design to the extent feasible.	LID techniques to be considered for use on the individual lots consist of raingardens, bioretention areas, tree box filters, porous pavement, water quality swales, and green roofs. These techniques will be considered on a case by case basis as appropriate and feasible due to on site constraints (i.e. soils conditions, groundwater, location, etc.) in order to reduce impervious area and land disturbance. The stormwater management controls will be dispersed across the development of the individual lots so as to not centralize the stormwater system. These techniques will be considered and discussed in the future NOI filings developed for the proposed build-out of the property.
1-42	The Proponent should analyze additional measures to reduce impervious area, including narrower roadways, locating parking underneath buildings, structured parking, shared parking and banking of parking until warranted by demand.	The Traffic Impact and Access Study provided in **Appendix F** reviews the proposed parking supply for the project based on zoning and ITE methodology with time of day factors calculations provided for the projected office and industrial park uses. The parking supply will be refined as the project Tenants are selected. Roadway infrastructure will be minimized to that required to service the proposed development in accordance with the TIAS recommendations as well as local and state regulations. Reserve or land bank parking is not specified as being allowed in the underlying zoning for the project. The IPOD overlay district does allow for a "Minimum number of spaces, or as may be modified by special permit under that section". The proponent will work with the Town during the permitting process to identify areas where land banked parking may be feasible and allowed.
1-43	The DEIR should identify stormwater BMPs for each of the proposed uses on-site.	The Project will be designed in full accordance with the Wetlands Protection Act and the MassDEP Stormwater Standards and a Drainage Report for the proposed Project is provided in **Appendix H**. A Stormwater Operation and Maintenance Plan and Long-Term Pollution Prevention Plan are included in the Appendices section of the Drainage Report.
1-44	The Proponent should consult with MassDOT prior to filing the DEIR to ensure MassDOT's comments are addressed.	The Project Team facilitated a conference call with MassDOT PPDU and MassDOT District 3 on Monday, August 5, 2019 to discuss the scope of MassDOT comments on the ENF and the scope of the DEIR.
1-45	The TIA includes nine study area intersections. The study area should be revised to include the Route 2 Off- and On-Ramps associated with Exit 34, along Old Union Turnpike and Harvard Street, if they meet the intersection thresholds identified in MassDOT comments.	The study area as part of the revised TIAPS, included in the DEIR, has incorporated the Route 2 Off- and On-Ramps associated with Exit 34, along Old Union Turnpike and Harvard Street as noted.
1-46	In addition, the DEIR should provide capacity analyses and propose mitigation where the intersections or approaches under state jurisdiction are anticipated to operate at a Level of Service (LOS) E or F during a peak period under 2026 No-Build or Build conditions.	The Proponent has provided a transportation mitigation program, as described in Chapter VII of the DEIR.
1-47	The DEIR should demonstrate that pass-by rates were appropriately applied to weekend traffic figures along Lunenburg Road (pass-by volume cannot exceed 15 percent of traffic along adjacent roadway).	The pass-by trip generation included in the DEIR and as projected in the original ENF does not exceed 15 percent of the adjacent street traffic for the peak hours studied.
1-48	The DEIR should clarify whether the Soccer Facility consists of three or four fields, adjust trip generation figures and capacity analyses as appropriate, and provide justification for using the average rate rather than the fitted curve equation for LUC 820.	The existing site consists of three soccer fields and the proposed site will add one additional field (indoor). Chapter VII of the DEIR provides additional clarity on the number of soccer fields and additional clarity on the use of the average rate for LUC 820.

1-49	The TIA indicates that all intersections and approaches under state jurisdiction are anticipated to operate at an acceptable LOS during the weekday morning and evening peak periods, except the northbound Route 2 Westbound Off-Ramp left-tum approach at the Fort Pond Road/Route Westbound Ramps intersection (LOS for the left-tum approach deteriorates from D to E during the weekday evening peak hour). The DEIR should evaluate and commit to improvements that would restore this movement to a LOS D or better in the Build condition.	As part of discussions with MassDOT, there are no practical mitigation alternatives for the approach that would result in a reduction of LOS at the intersection. Note that a LOS E on the stop-sign approach of any side-street (in this case the freeway ramp) is not uncharacteristic. The Applicant is committed to provide mitigation along the Route 2 westbound off-ramp approach to increase queue storage; however, this will not decrease LOS.
1-50	The DEIR should identify improvements to address the short queue storage on the Route 2 Westbound Off-Ramp.	Chapter VII of the DEIR identifies the mitigation commitments of the Applicant; including extending the queue storage on the Route 2 Westbound Off-Ramp.
1-51	Several alternatives are currently being evaluated for the Route 2 interchanges in Lancaster and Harvard as part of MassDOT project #605393; however, the TIA does not incorporate the project into tis analysis because improvements would not be constructed by 2026. The DEIR should provide an update on this project.	Chapter VII of the DEIR provides a summary of the current status of MassDOT project #605393.
1-52	Mitigation is proposed at several intersections under the jurisdiction of the Town of Lancaster. The Lunenburg Road/McGovern Boulevard intersection will be signalized, with demand-based vehicular and bicycle detection and emergency vehicle pre-emption capabilities. McGovern Boulevard will be widened to provide an exclusive eastbound left-tum lane and an exclusive eastbound right-tum lane. The northbound approach of Lunenburg Road will be widened to introduce an exclusive left-tum lane and the southbound approach will be widened to introduce an exclusive right-tum lane. Traffic signal modifications will be implemented at the Main Street/Seven Bridge Road and Main Street/Lunenburg Road intersections in accordance with the Traffic Monitoring Program. The DEIR should clarify the timing of these improvements or the thresholds which are anticipated that will trigger mitigation.	Table 7.14 of the DEIR provides the timing of transportation related improvements. A detailed description of the timing is also provided in the Chapter VII narrative.
1-53	The DEIR should include capacity analyses for the Saturday midday peak hour.	Chapter VII of the DEIR provides a revised capacity and queue analysis which includes the Saturday midday peak hour.
1-54	The DEIR should propose mitigation for any intersection approaches under state jurisdiction that will operate at a LOSE or Fin the 2026 No-Build or Build conditions.	See response to Comment 1-46.
1-55	The DEIR should include sufficiently detailed conceptual plans (minimum 80-scale) for proposed roadway improvements in order to verify the feasibility of constructing improvements. The plans should show proposed lane widths and offsets, layout lines and jurisdictions, and land uses adjacent to areas where improvements are proposed. Any proposed mitigation within the state highway layout and all internal site circulation must be consistent with a Complete Streets design approach that provides adequate and safe accommodations for all roadway users, including bicyclists, pedestrians, and public transit riders. The *MassDOT Project Development and Design Guide* provides information to support this analysis. Where these criteria cannot be met, the Proponent should provide justification, and should work with MassDOT to obtain a design waiver.	Chapter VII of the DEIR provides conceptual improvement plans for proposed roadway improvements at the intersection of Lunenburg Road and the Route 2 WB Off-Ramp. Improvements, both on-site and off-site as identified are consistent with Complete Streets principles and provide accommodations, where possible for all roadway users. Design exceptions for improvements within State Highway Layout shall be discussed with MassDOT during any 25% Design process. In addition, the Applicant is currently working with the Town of Lancaster on the final layout of the site based on programming within the IPOD-1 district. Final layout of on-site pedestrian and bicycle accommodations, internal site circulation, and other on-site transportation networks will be designed following this Town process. The FEIR will further describe and depict these transportation enhancements for the review of MEPA and MassDOT.

1-56	The DEIR should commit to implementing low-cost, short-term improvements identified in the RSA as mitigation for this project	An overwhelming majority of low-cost, short-term improvements have been incorporated in to the design for MassDOT Project No. 608779. Minor improvements related to the RSA, to be implemented by the Proponent have been identified in Chapter VII of the DEIR.
1-57	MassDOT comments indicate that additional RSAs, with comtilensurate commitments to improvements identified through the RSAs, will need to be completed prior to submission of the DEIR if deemed appropriate by MassDOT. The DEIR should provide an update of the RSA process, determinations, and mitigation.	TEC completed an analysis of all crashes occurring at the Route 2 Exit 35 Interchange. In consultation with the MassDOT Traffic and Safety Section, TEC submitted a letter on September 13, 2019 which noted that an RSA was not required.
1-58	The parking supply is less than that required by zoning and higher than ITE recommendations. The DEIR should conduct a shared parking analysis based on the ITE Manual, reduce its parking supply and consider land banking of parking spaces until warranted by demand.	The nature, layout, and size of the site do not promote an ability to utilize shared parking. Chapter VII of the DEIR provides a refined description of the parking facilities and potential parking related TDM measures.
1-59	The DEIR should clarify whether sidewalks along Lunenburg Road will be provided solely along the site frontage.	Sidewalks along the west side of Lunenburg Road are to be constructed along the limits of work and between the Kimball Farm driveways along the east side of roadway. These accommodations are depicted in Figure 7.7.
1-60	MassDOT comments note that the widening of Lunenburg Road may allow for the provision of a shared-use path (in place of one or both of the proposed sidewalk) to accommodate bicycles. The DEIR should evaluate provision of shared-use paths along Lunenburg Road.	Chapter VII provides an overview of the pedestrian accommodations to be provided off-site and description of other pedestrian improvements that the Town of Lancaster is currently evaluating separate from this project.
1-61	The DEIR should include graphics (and supporting narrative) depicting internal circulation patterns (vehicles, pedestrian, and bicycles) and connection points to adjacent land uses.	The Applicant is currently working with the Town of Lancaster on the final layout of the site based on programming within the IPOD-1 district. Final layout of on-site pedestrian and bicycle accommodations, internal site circulation, and other on-site transportation networks will be designed following this Town process. The FEIR will further describe and depict these transportation enhancements for the review of MEPA and MassDOT.
1-62	The DEIR should identify measures for improving pedestrian and bicycle access in the study area.	See response to Comment 1-60.
1-63	The Proponent should consult with MART to examine the feasibility of extending service to the project site. Given the size of the project, the Proponent should explore an operational subsidy to support this extended service to encourage alternative transportation options to the site. The DEIR should provide an update of consultations with MART.	The Proponent has consulted with MART to examine the feasibility of extending service to the Project site.
1-64	The Proponent will implement a Transportation Demand Management (TDM) program to reduce single-occupancy vehicle (SOV). The Proponent should work toward identifying the details of the measures included in the ENF and developing additional programs. The Proponent should consult with MassDOT to help implement the TDM program.	Chapter VII of the DEIR identifies the Project's Transportation Demand Management Measures and the details of each measure.
1-65	The DEIR should commit to conducting an employee travel survey.	Chapter VII of the DEIR identifies the Project's Transportation Demand Management Measures; including a new commitment to conduct an employee travel survey.
1-66	I note that The Town of Lancaster has received a planning grant from the Municipal Vulnerability Preparedness (MVP) Program and is seeking designation from the Executive Office of Energy and Environmental Affairs (EEA) as a MVP program. I encourage the Proponent to consult with the Town regarding its planning and applicability to the project area.	Based upon discussions with the Town Administrator, the Town of Lancaster is still in process of developing its Municipal Vulnerability Preparedness Program.

1-67	I strongly encourage the Proponent to consider complementary approaches, such as Passivehouse design, incorporation of renewables and inclusion of LID in site design, which can improve the project's resiliency, reduce GHG emissions and conserve and sustainably employ the natural resources of the Commonwealth.	LID techniques to be considered for use on the individual lots consist of raingardens, bioretention areas, tree box filters, porous pavement, water quality swales, and green roofs. These techniques will be considered on a case by case basis as appropriate and feasible due to on site constraints (i.e. soils conditions, groundwater, location, etc.) in order to reduce impervious area and land disturbance. The stormwater management controls will be dispersed across the development of the individual lots so as to not centralize the stormwater system. These techniques will be considered and discussed in the future NOI filings developed for the proposed build-out of the property.
1-68	The DEIR should provide an analysis and discussion of vulnerabilities of the site to the potential effects associated with climate change including increased frequency and intensity of precipitation events, flooding and extreme heat events. To assist in this evaluation, the Proponent should review the 2018 Massachusetts State Hazard and Mitigation and Climate Adaptation Plan at www.resilientma.com and review data available through the Climate Change Clearinghouse for the Commonwealth.	Based upon existing site topography and conceptual grading analysis the proposed buildings and associated sites are anticipated to be several feet above floodplain elevation. The entire Project will designed in compliance with the MassDEP Stormwater Standards, the Wetlands Protection Act, and all other local, state, and federal regulations. A Stormwater Report has been prepared for the Revised Preferred Master Plan and is included in **Appendix H**. Precipitation data as specified in TR-55 has been utilized in the preparation of the hydrologic analysis of the pre- and post-construction stormwater conditions. The lots have not been fully designed at this time, but will align with the general design intent and best management practices as outlined in the Stormwater Report, and subsequent NOI filings will be made as the Project is built-out.
1-69	The DEIR should identify measures to improve the project's resiliency and adaptation to potential effects of climate change.	With the potential for extreme heat events in the future, the proposed building envelopes are insulated better than Code to help buffer the impact of high temperature events and reduce power consumption.
1-70	The DEIR should incorporate ecosystem-based adaptation measures and infrastructure design to minimize and mitigate impacts.	With the potential for extreme heat events in the future, the proposed building envelopes will be insulated better than Code to help buffer the impact of high temperature events and reduce power consumption.
1-71	Building elevations and stormwater management infrastructure should be designed in a manner to promote climate change resiliency and adaptation.	Based upon existing site topography and conceptual grading analysis the proposed buildings and associated sites are anticipated to be several feet above floodplain elevation. The entire Project will designed in compliance with the MassDEP Stormwater Standards, the Wetlands Protection Act, and all other local, state, and federal regulations. A Stormwater Report has been prepared for the Revised Preferred Master Plan and is included in **Appendix H**. Precipitation data as specified in TR-55 has been utilized in the preparation of the hydrologic analysis of the pre- and post-construction stormwater conditions. The lots have not been fully designed at this time, but will align with the general design intent and best management practices as outlined in the Stormwater Report, and subsequent NOI filings will be made as the Project is built-out.
1-72	The Proponent should also consider impacts on the proposed structures, building entry and exit points, vehicular access, public and private on-site utilities, and first floor uses.	Based upon existing site topography and conceptual grading analysis the proposed buildings and associated sites are anticipated to be several feet above floodplain elevation The entire Project will be designed in compliance with the MassDEP Stormwater Standards, the Wetlands Protection Act, and all other local, state, and federal regulations. A Stormwater Report has been prepared for the Revised Preferred Master Plan and is included in Appendix I. Precipitation data as specified in TR-55 has been utilized in the preparation of the hydrologic analysis of the pre- and post-construction stormwater conditions. The lots have not been fully designed at this time, but will align with the general design intent and best management practices as outlined in the Stormwater Report, and subsequent NOI filings will be made as the Project is built-out.

1-73	The analysis provided in the DEIR should demonstrate that the drainage system is designed to avoid exacerbating flooding of the site and adjacent properties.	A Stormwater Report has been prepared for the Revised Preferred Master Plan and is included in **Appendix H.** This includes an analysis of pre- and post-development peak rates of runoff to the points of analysis. As noted in the report the post-development rates are at or below pre-development rates in order to mitigate offsite flooding impacts from the project. This analysis will continue to be refined as the individual pads are designed and permitted on the local level.
1-74	The DEIR should provide information on project phasing and development of active and passive recreation areas and open space features that will be designed to flood. It should include figures that depict existing and proposed elevation contours and a supporting narrative that addresses how the open space will function to absorb and buffer flood waters.	There are no proposed areas within the project that have been designed to flood. As noted, the Dunkin' Donuts facility and the Mobil Gas Station resulted in impacts of 15,295 SF of impact to bordering land subject to flooding (BLSF). An additional 15,000 SF of BLSF is anticipated to be impacted based upon improvements to McGovern Boulevard. Given the existing topography on the Site, the proposed buildings and associated sites are anticipated to be several feet above floodplain elevation. The development of the lots are not anticipated impact to the floodplain. Any BLSF that is impacted will be replicated at a minimum 1:1 ratio.
1-75	The DEIR should also identify site elements that have been incorporated into project design to reduce the impact of extreme heat waves and limit the potential impact of more frequent and intense storm precipitation.	With the potential for extreme heat events in the future, the proposed building envelopes are insulated better than Code to help buffer the impact of high temperature events and reduce power consumption. The entire Project will designed in compliance with the MassDEP Stormwater Standards, the Wetlands Protection Act, and all other local, state, and federal regulations. A Stormwater Report has been prepared for the Revised Preferred Master Plan and is included in Appendix I. Precipitation data as specified in TR-55 has been utilized in the preparation of the hydrologic analysis of the pre- and post-construction stormwater conditions. The lots have not been fully designed at this time, but will align with the general design intent and best management practices as outlined in the Stormwater Report, and subsequent NOI filings will be made as the Project is built-out.
1-76	The Proponent should consider how on-site renewable energy, a central energy plant, or co- or tri-generation systems may provide added resiliency during periods of power loss during storms.	Section 4.5 of the GHG report provides an analysis of PV solar, which demonstrates it could provide up to 78% of on-site electrical demand.
1-77	The DEIR should include an analysis of GHG emissions and mitigation measures for the proposed project in accordance with the standard requirements of this Policy, which requires projects to quantify carbon dioxide (C02) emissions and identify measures to avoid, minimize or mitigate such emissions. The analysis should quantify the direct and indirect C02 emissions associated with the project's energy use (stationary sources) and transportation-related emissions (mobile sources). The DEIR should identify and commit to mitigation measures to reduce GHG emissions.	A comprehensive GHG analysis, consistent with the EEA GHG Policy, is provided in the DEIR.
1-78	The DEIR should include a GHG emissions analysis that calculates and compares GHG emissions associated with: 1) a Base Case corresponding to the 9th Edition of the Massachusetts Building Code, and 2) a Preferred Alternative that achieves greater reductions in energy use and GHG emissions than required by the amended Building Code.	The GHG analysis modeled energy use, GHG emissions and mitigation measures in accordance with the EEA GHG Policy .
1-79	The Town of Lancaster adopted the Stretch Energy Code (SC) in 2011 subsequent to its designation as a Green Community under the provisions of the Green Communities Act of 2008. Therefore, the project will be required to meet the applicable version of the SC in effect at the time of construction. The SC requires a 10 percent reduction in energy use compared to the base Building Code requirements.	The GHG analysis includes aa demonstration that the project complies with the Stretch Code, following modeling guidance from DOER.

1-80	The GHG analysis should model energy use, GHG emissions, and mitigation measures associated with the project in accordance with the GHG Policy and DOER's comment letter.	The GHG analysis modeled energy use, GHG emissions and mitigation measures in accordance with the EEA GHG Policy, and includes the analyses requested in the DOER comment letter.
1-81	The GHG analysis should clearly demonstrate consistency with the objectives of MEPA review, one of which is to document the means by which Damage to the Environment can be avoided, minimized, and mitigated to the maximum extent feasible.	A comprehensive GHG analysis, consistent with the EEA GHG Policy, is provided in the DEIR. All mitigation measures recommended by DOER to minimize and mitigate Damage to the Environment are evaluated in the GHG report.
1-82	The DEIR should identify the model used to analyze GHG emissions, clearly state modeling assumptions for each project element, explicitly note which GHG reduction measures have been modeled, and identify whether certain building design or operational GHG reduction measures will be mandated by the Proponent to future occupants or merely encouraged for adoption and implementation.	All modeling details are provided in the GHG report. A draft tenant manual in the GHG report identifies mandated energy efficiency measures.
1-83	The DEIR should include the modeling printout for each alternative and emission tables that compare base case emissions in tons per year (tpy) with the Preferred Alternative showing the anticipated reduction in tpy and percentage by emissions source (direct, indirect and transportation). Other tables and graphs may also be included to convey the GHG emissions and potential reductions associated with various mitigation measures as necessary.	The GHG report provides all requested modeling printouts and details.
1-84	The Proponent should consult with its utility provider regarding available incentives, including performance based energy efficiency incentives. GHG emissions reduction potential, relative benefits and available incentives should be evaluated. The DEIR should explain, in reasonable detail, why certain measures, that could provide significant GHG reductions, were not selected- either because it is not applicable to the project or is considered technically or financially infeasible. I strongly encourage the Proponent to prioritize measures that can offset emissions reductions and reduce energy costs over the lifespan of the project.	The GHG report identifies and analyzes energy efficiency incentives from National Grid, including MassSAVE Incentives for Residential Development (pages 29-30), Whole Building Incentives for Commercial Development (page 30), SMART Program Incentives for PV systems (pages 43-44), and Thermal AECs for both Residential and Commercial Developments (pages 44-45).
1-85	The DEIR should include an analysis of Passivehouse design (Passive House Institute United States (PHIUS) and Passive House Institute) for townhomes, multifamily, senior housing, and hotel. The analyses should include: estimates of funding through MCEC grants; estimates of AECs, including bonus multipliers for Passivehouse-level performance; estimates of MassSave incentives based on consultation with utility provider; and cost savings associated with eliminating need for gas infrastructure.	Section 4.4 of the GHG report provides a comprehensive Passivehouse analysis for all residential structures and the hotel, including AEC credits and MassSave incentives.
1-86	The GHG analysis should investigate the feasibility of using electric cold-climate ASHPs and VRF for space heating and ASHPs for water heating, both of which are eligible for significant incentives and would reduce emissions.	Section 4.5 of the GHG report provides a complete analysis of heat pumps for space heating and cooling as well as water heating.
1-87	The DEIR should thoroughly analyze the feasibility of incorporating on-site energy generation including solar PV systems on rooftops and canopies over parking lots. The analysis should document the expected energy savings and reduction in GHG emissions.	Section 4.5 of the GHG report provides a complete PV emissions and feasibility analysis for the project using National Grid's latest incentive structure for large PV projects under the SMART program.

1-88	The DEIR should include an analysis of utility company incentives, AEC and other incentives for implementing on-site renewable energy generation and evaluate the applicability of the incentive programs to the project. At a minimum, rooftops should be constructed "solar ready" to facilitate future installation of PV systems.	Section 4.5 of the GHG report provides a complete PV emissions and feasibility analysis for the project using National Grid's latest incentive structure for large PV projects under the SMART program. The proponent affirms its commitment to have solar0ready space available of the project buildings.
1-89	The DEIR should describe the potential output of PV systems, an economic analysis associated with a first-party or third-party installation, and an analysis of how mechanical systems can be planned to maximize and preserve capacity for rooftop solar. This analysis should include assumptions about available rooftop areas, potential system outputs, and installation costs ($/watt).	The PV analysis in Section 4.5 of the GHG report provides these details.
1-90	The GHG analysis should include an evaluation of the potential GHG emissions of the project's mobile emissions sources using the EPA MOVES emissions model. The DEIR should follow the guidance provided in the Policy for Indirect Emissions from Transportation and use data gathered as part of the mesoscale analysis to determine mobile emissions for Existing Conditions, and future NoBuild, Build, and Build with Mitigation Conditions.	Section 3.0 of the GHG report provides the mobile CO_2 emissions analysis.
1-91	The Proponent should thoroughly explore means to improve traffic operations and reduce SOV trips.	**Section 7** of the DEIR provides a detailed summary of the Project's Transportation Demand Management measures.
1-92	The DEIR should also review measures to promote the use of low-emissions vehicles, including installing EV charging stations and providing designated parking spaces for these vehicles. I strongly encourage the Proponent to provide charging stations at 5% of spaces and provide an additional 5% of spaces as EV ready.	See response to Comment 1-91.
1-93	The Build with Mitigation model should incorporate anticipated roadway improvements and TDM measures to be implemented by the project and document the resulting reductions in GHG emissions.	The emission reductions from proposed TDMs are quantified in the mobile CO_2 emissions analysis in Section 3.0 of the GHG report.
1-94	The Proponent should also consider adoption of additional sustainable design measures for which GHG reductions cannot be easily quantified, such as water conservation measures, including the use of low flow water fixtures; rainwater harvesting; construction waste recycling; recycling areas; and recycled content/regional materials.	The Project will reduce water use by implementing various water saving strategies such as: installation of low-flow plumbing fixtures, installation of low flow/high efficiency toilets, and develop maintenance and employee education programs. In addition, drought tolerant plantings will be considered to reduce the need for irrigation onsite. Construction and demolition activities will comply with all DEP regulations. Refer to the draft CMP in **Appendix I** for information addressing the Project's generation, handling, recycling, and disposal of construction and demolition debris.
1-95	The DEIR should note whether the project will seek certification by the Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system, and if so, to what level. If applicable, the DEIR should identify specific measures that will be incorporated into the project design to achieve the LEED certification.	Tenants for a majority of the project site have not yet been identified. LEED certification will be considered on a tenant-by-tenant basis.

1-96	The ENF notes that the project will exceed the ENF review threshold for alteration of more than 50 acres of land. In accordance with the GHG Policy, projects that alter over 50 acres of land are required to analyze the carbon associated with removal of trees and soil disturbance during the construction period and loss of carbon sequestration. The purpose of this analysis is to develop an estimate, not an exact accounting of GHG emissions associated with land clearing. The DEIR should describe the methodology and data used to develop the analysis, identify associated impacts on GHG emissions, and identify measures to avoid, minimize and mitigate impacts. I encourage the Proponent to consult with EEA and MEPA on the development of this analysis. The Proponent may develop its own analysis or may consider a draft protocol developed by EEA land policy staff and the MEPA Office.	The carbon sequestration analysis is provided in Section 5.0 of the GHG report.
1-97	The DEIR should include a commitment to provide a self-certification to the MEPA Office at the completion of the project. It should be signed by an appropriate professional (e.g. engineer, architect, transportation planner, general contractor) indicating that all of the GHG mitigation measures, or equivalent measures that are designed to collectively achieve identified reductions in stationary source GHG emission and transportation-related measures, have been incorporated into the project.	At the completion of construction, the proponent will provide a certification to the MEPA Office, signed by an appropriate professional. The certification will identify either of the following: 1) all of the energy efficiency mitigation measures adopted by the Project as part of the Mitigation Alternative have been implemented; or 2) an equivalent set of energy efficiency mitigation measures, which together are designed to achieve the same percentage reduction in CO_2 emissions as the Mitigation Alternative, when compared to the Base Case, based on the same modeling assumptions in this report, have been adopted.
1-98	The DEIR should include a mesoscale analysis prepared in accordance with MassDEP's *Guidelines for Performing Mesoscale Analysis of Indirect Sources* . The purpose of the mesoscale analysis is to determine whether and to what extent the proposed project will increase emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx,) and to determine consistency with the State Implementation Plan (SIP). The analysis should use data consistent with the traffic analysis.	Section 2.0 of the GHG report provides the mesoscale emissions analysis.
1-99	The DEIR should identify the design of proposed parking structures (i.e., open air, enclosed, etc.) and, as appropriate, provide information on the location of emission vents and other combustion sources. Exhaust areas should be sited to avoid conflicts with pedestrian routes or public gathering spaces. EPA's AERMOD model is the appropriate tool for estimating potential ground-level impacts of parking garages and combustion source emissions (i.e., boilers, generators, etc.). Industrial, commercial, and institutional uses may use heating equipment and emergency generators that require certifications, inspections, and/or Permits from MassDEP. The DEIR should identify certification and/or permits that likely will be required for proposed project elements.	The proposed development does not include any parking structures. The tenants for the majority of the project site have not been identified. Permits required will be identified on a tenant-by-tenant basis and obtained as necessary.
1-100	The DEIR should indicate whether the Proponent will provide funding to support upgrades to the water system identified by LWD.	The proponent will provide funds to design and construct the water main infrastructure needed to extend water from Lunenburg to Lancaster. This will support the development and provide the opportunity for future connection to all parcels of land along the 2.5 mile route.
1-101	The DEIR should indicate whether the Proponent will support mitigation projects to offset the increased demand on LWD's system.	See response to Comment 1-100.

1-102	The DEIR should provide an update on consultations with MassDEP and LWD regarding water supply.	As noted the ENF Certificate, the LWD submitted a WMA Permit application on December 8, 2018 to increase its withdrawal volume and add a new wellfield. MassDEP issued approval of the wellfield site and the proposed pumping test on September 21, 2017. The pumping test was scheduled for late summer 2019 and has been completed at this time. The Town of Lunenburg will be compiling the testing information for submittal to DEP which will be reviewed concurrently with the WMA Permit application.
1-103	The Dunkin' and Mobil Gas Station are operating two separate PWS with individual wells. The DEIR should address whether the PWS will be connected to the new water.	The current plan is to have Dunkin Donuts and the gas station connect into the water system once it is up and running. The on-site infrastructure is already in place for them to tie into.
1-104	The DEIR should identify water conservation measures that will be incorporated into the project design, such as reusing grey water and rainwater for toilet flushing and irrigation, low-flow plumbing fixtures, limits on outdoor water use, and drought-resistant plants for landscaping and estimate associated reductions in water demand.	The tenants for the majority of the project site have not been identified. At a minimum, the landscaping will be drought resistant and low flow fixtures will be encouraged. Other water conservation measures will be considered on a tenant-by-tenant basis.
1-105	The DEIR should describe existing and proposed wastewater infrastructure and flow and include a site plan.	There is currently no existing wastewater infrastructure on the greater part of the site. The commercial properites on the road have their own individual on-site systems. The proposed infrastructure will have a sewer collection system throughout the project with all wastewater brought to the new STP.
1-106	The DEIR should describe how the project will meet the requirements for a privately owned WWTP pursuant to 310 CMR 5.15.	As a private wastewater facility, ownership documents will be prepared per 310 CMR 5.15 whereby all users will be a member of the Association which owns, uses, and operates the wastewater treatment facility. Legal documents to this effect are required by DEP as part of the Groundwater Discharge Permit process. Ownership will be by a legal entity, typically an Association which consists of the same users and owners. 314 CMR 5.15 describes in detail the requirements for ownership. Essentially the entity must own the land and have control of the property, with the ability to exert financial control and responsibility of the users/owners. A multi use facility such as this would typically have an “umbrella trust” which may consist of representatives of the various users. It would be typical for there to be a Trustee from the condo association, the hotel, the business, etc. Association documents would consider the various flows of the users and an equitable rate structure for all of the users. They would jointly be responsible for the day to day operations of the facility as well as long term maintenance, including future replacement.
1-107	The GWDP regulations require that a single entity be the permittee responsible for operation, monitoring, maintenance, and repair of the WWTP. However, if the privately owned WWTP treats waste from activities owned or controlled by other entities, all stakeholders must share the financial and operational responsibilities for the WWTP. Because the project includes residential uses, the GWDP will require a Financial Assurance Mechanism to fund the immediate repair and replacement of the WWTP. The DEIR should describe the legal and financial arrangements that will achieve compliance with these permitting requirements.	See response 1-106 above regarding ownership. Financial Assurance Mechanism’s (FAM’S) are also part of the Groundwater Discharge Permitting process. The requirements include financial accounts where are set up and maintained to provide for short term repair or replacement of wastewater equipment as well as long term future replacement of the facility at some point in the future. Annual financial reports are submitted to DEP to insure that these accounts are properly funded. An Immediate Repair and Replacement Fund of 15% of STP cost is established to fund any major repairs at the facility on an immediate basis. In addition, a Capital Reserve fund is also established to provide a finanacial growth mechanism to provide 25% of the replacement cost of the STP after a 20 year period.
1-108	The DEIR should describe the schedule for construction of project elements and identify construction staging areas. It should evaluate construction-period impacts (including but not limited to erosion and sedimentation, air quality, solid waste disposal, and transportation/traffic) and outline feasible measures that can be implemented to eliminate or minimize these impacts.	A draft Construction Management Plan has been developed for the Project and is included in **Appendix I.**

1-109	A construction period Stormwater Pollution Prevention Plan (SWPPP) should be developed consistent with the NPDES CGP for the project to reduce erosion and sedimentation impacts.	A NPDES CGP is required for the proposed project and the SWPPP will be submitted prior to any land disturbance activities.
1-110	The DEIR should describe if blasting will be required and identify compliance with applicable regulations.	The site is an active gravel pit and based upon existing soils significant ledge is not anticipated to be encountered on the Site. Any ledge encountered will be removed in accordance with all local, state and federal regulations.
1-111	I encourage the Proponent to mitigate the construction period impacts of diesel emissions, including requiring use of construction equipment with engines manufactured to Tier 4 federal emission standards or best available control technology (BACT).	Construction contracts will consider requirements for Tier 3 and 4 equipment engines, which represent BACT.
1-112	The DEIR should confirm that the project will require construction contractors to use Ultra Low Sulfur Diesel (ULSD) fuel in off-road equipment.	Construction contracts will require use of ULSD fuel. Measures to minimize fugitive dust emissions will be required, in accordance with 310 CMR 7.00.
1-113	The DEIR should address how the project will support compliance with the Massachusetts Idling regulation at 310 CMR 7.11 such as driver training, periodic inspections by site supervisors, and posting signage temporarily during construction and permanently post-construction.	Signs will be posted at project entrances and construction firms will be instructed regarding the Idling Regulation.
1-114	The DEIR should provide information regarding the project's generation, handling, recycling, and disposal of C&D debris. It should describe the management and disposal of any asbestos containing materials (ACM). The DEIR should quantify and characterize the material to be generated and define waste management and diversion goals to be implemented by the contractors constructing the project. The DEIR should identify the specific anq aggressive construction recycling and source reduction goals the Proponent will make as a way to increase the sustainability of the project. The DEIR should address compliance with the waste bans regulations (310 CMR 19.017).	The Site is an active gravel pit and asbestos containing materials are not anticipated to be encountered. Construction and demolition activities will comply with all DEP regulations. Refer to the draft CMP in **Appendix I** for information addressing the Project's generation, handling, recycling, and disposal of construction and demolition debris. The project will comply with all applicable Federal, State and local requirements regarding the handling, recycling, and disposal of solid waste generated by the project, including 310 CMR 19.017.
1-115	Excavating, removing, and/or disposing of contaminated soil, pumping of contaminated groundwater, or working in contaminated media must be done under the provisions of M.G.L.c.21E and all other applicable federal, state, and local laws and regulations. The DEIR should describe how it compliance with the MCP and M.G.L.c.21E during construction and identify construction-period mitigation measures.	The Site is not listed on MassGIS as a DEP Tier Classified 21 E Site. The Site is an active gravel pit and contaminated material is not anticipated to be encountered.
1-116	The DEIR should include a separate chapter summarizing proposed mitigation measures. This chapter should include draft Section 61 Findings for each Permit to be issued by a State Agency. The DEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and include a schedule for implementation. The DEIR should clearly indicate which mitigation measures will be constructed or implemented based upon project phasing, either tying mitigation commitments to overall project square footage/phase or environmental impact thresholds, to ensure that measures are in place to mitigate the anticipated impact associated with each development phase.	The DEIR provides a separate chapter summarizing the project's mitigation measures; including Section 61 Findings for all applicable state permits. Table 7.14 within Chapter VII of the DEIR provides a summary matrix which defines each mitigation measure, the potential right-of-way and environmental impacts, the parties responsible for implementation, and a schedule with phasing for implementation.
1-117	The DEIR should contain a copy of this Certificate and a copy of each comment letter received.	A copy of the ENF Certificate as well as copies of all state agency comment letters are included in **Appendix J** of the DEIR.

1-118	In order to ensure that the issues raised by commenters are addressed, the DEIR should include direct responses to comments to the extent that they are within MEPA jurisdiction.	Responses to all comments by state agencies and associated with the ENF filing are included in **Appendix J** and further discussed in the DEIR as noted.
1-119	The Proponent should circulate the DEIR to those parties who commented on the ENF, to any State Agencies from which the Proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations.	The DEIR will be submitted to state and municipal agencies from which the Proponent will seek permits or approvals, and to all parties as specified in Section 11.16 of the MEPA Regulations. Refer to **Appendix K** of the DEIR for a Circulation List of DEIR recipients.
1-120	The Proponent must make a reasonable number of hard copies available to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis.	Hard copies of the DEIR filing will be provided for distribution upon request.
1-121	The Proponent should send correspondence accompanying the CD-ROM or website address indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments.	Instructions will be inlcuded to direct readers to the appropriate location of the electronic document and/or hard copies, as well as relavant comment deadlines.
1-122	The DEIR submitted to the MEPA office should include a digital copy of the complete document.	A digital copy of the compiled DEIR filing will be provided to MEPA upon submission.
1-123	A copy of the DEIR should be made available for review at the Lancaster and Leominster Public Libraries.	A copy of the DEIR will be made available for review at the Lancaster and Leominster Public Library.
DCR Comments		
2-1	DCR requests that the Proponent demonstrate in its DEIR how the project design within the Central Nashua River Valley ACEC will avoid adverse effects on the above resources, including, but not limited to, groundwater quality, habitat values, biodiversity, storm damage prevention, and flood control, historic and archaeological resources, and scenic and recreational resources.	The portions of the project within the ACEC will be improved from their existing state as an active sand and gravel mine. The project areas will be stabilized with a combination of impervious and vegetated surfaces. Stormwater will be detained and treated in accordance with DEP critical area standards. Project improvements will improve conditions within the ACEC relative to water quality, storm damage prevention and flood control. Habitat value and biodiversity will be unchanged. Historic and archaeological resources are not present within the project site. Scenic and recreational resources will be improved as a result of site development including recreational facilities.
2-2	DCR also requests that the Proponent clarify how areas of the Project within the ACEC will meet the ACEC regulations (301 CMR 12.01 to 12.15).	In accordance with 301 CMR 12.00, ACEC resource protection will be enhanced by the portions of the project within the ACEC as described in response 2-1 above.
2-3	DCR requests that the Proponent prepare a reduced development plan that would use a 100-foot no development buffer measured from DCR property lines, similar to the buffer that is being provided in the northwest portion of the Site. This development analysis should avoid adverse impacts to DCR property and access rights and protect the function and values of public conservation land.	Providing a 100-foot buffer to the DCR property will provide too great of an impact to building A. Alternatively, the proponent will be helping to provide additional buffers to the state forest by donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7 acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation lands and contain wetlands, streams and are within the ACEC. There is a section of the trail that runs through Lot 14-11 in the area of the proposed WWTP. That section of the trail may need to be rerouted further south to avoid this conflict. The Proponent is committed to working with DCR to maintain this connection. The Proponent has been in discussion with the Town of Lancaster as well to maintain and expand this trial network.
2-4	DCR requests that the Proponent stake and monument all mutual property lines and corners abutting Lancaster State Forest prior to the filing of the DEIR.	The proponent has staked out the property line between the State forest where it abuts the proposed WWTP.
2-5	DCR has historically accessed Lancaster State Forest by way of a roadway north of Assessor's Lot 14- 11 and through Lancaster Town Forest. It appears that the proposed development may impact that access.DCR requests that the Proponent work with the Department to ensure that permanent access is confirmed on the record to address DCR's longstanding use of the accessway.	There is a section of the trail that runs through Lot 14-11 in the area of the proposed wastewater treatment plant. That section of the trail may need to be rerouted further to the south to avoid this conflict. The proponent is committed to working with DCR to maintain this connection. The applicant has been in discussion with the Town as well to maintain and expand this trail network.

2-6	Because unnumbered A zones do not include base flood elevations, the Proponent will be required to develop base flood elevation information for use in this project meeting the requirements of the Wetlands Protection Act regulations and the local floodplain regulations of Lancaster.	Given the existing steep topography on the Site and well defined wetland and low lying areas, the proposed buildings and associated sites are anticipated to be several feet above floodplain elevation. The development of the lots are not anticipated to impact the floodplain. Base flood elevations will be determined as part of the future Notice of Intents (NOI) to be filed with the Town of Lancaster Conservation Commission and MassDEP.
2-7	DCR requests that the Proponent evaluate a development alternative that is in compliance with the ACEC regulations, would provide a substantial buffer between DCR lands and any proposed development or infrastructure improvements, provide monumentation at property bounds, ensure access to Lancaster State Forest is not discontinued, and avoid or minimize floodplain development in compliance with the National Flood Insurance Program or other relevant regulations.	The proponent will be helping to provide additional buffers to the state forest by donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation lands and contain wetlands, streams and are within the ACEC. There is a section of the trail that runs through Lot 14-11 in the area of the proposed WWTP. That section of the trail may need to be rerouted further south to avoid this conflict. The Proponent is committed to working with DCR to maintain this connection. The Proponent has been in discussion with the Town of Lancaster as well to maintain and expand this trial network. As noted, the existing phase 1 work that has been constructed resulted in impacts of 15,295 SF of impact to bordering land subject to flooding (BLSF) and have already been mitigated. An additional 15,000 SF of BLSF is anticipated to be impacted based upon improvements to McGovern Boulevard. Given the existing topography on the Site, the development of the lots are not anticipated impact to the floodplain. Any BLSF that is impacted will be replicated at a minimum 1:1 ratio.
DOER Comments		
3-1	Emissions and utility cost reduction should be estimated for heat pumps/VRF for all buildings for both space heating and water heating.	Section 4.5 of the GHG report provides a complete analysis of heat pumps for space heating and cooling as well as water heating.
3-2	Emissions and utility cost reduction should be estimated using Passivehouse for the single family, duplex, triplex, multifamily, and the hotel.	Section 4.4 of the GHG report provides a comprehensive Passivehouse analysis for all residential structures and the hotel.
3-3	Passivehouse analysis should include: a. Estimate of Alternative Energy Credits, including bonus multipliers for Passivehouse-level performance; b. Estimates of MassSave incentives, based on meeting with utility. Note that new Passivehouse incentive offerings are included in the 2019-2021 statewide energy efficiency plan.	Section 4.4 of the GHG report provides a comprehensive Passivehouse analysis for all residential structures and the hotel, including AEC credits and MassSave incentives.
3-4	Evaluate solar PV for all buildings. Investigate models of ownership and operation under SMART, including Qualified Facility pathway. Meet utility to discuss interconnection. Include building roof plans showing location of planned solar and location of roof HVAC equipment and other appurtenances. Indicate on the plans the code-required extent of solar readiness. Map out maximum area available for solar. Estimate GHG reduction as a result ofsolar PV.	Section 4.5 of the GHG report provides a complete PV emissions and feasibility analysis for the project using National Grid's latest incentive structure for large PV projects under the SMART program. Detailed roof plans are not available at this time since the Project is only at the concept stage of design.
3-5	Priority should be given to increasing continuous insulation. Distinguish between R value of batt and R value of continuous insulation. Indicate planned wall assembly U value and wall construction type (mass, wood, metal stud, etc). Confirm that the relationship between R-value and assembly U-factor conform to Appendix A of the Code.	All building envelopes are above Code. Tables 6A through 6E in the GHG report clearly state both the batt and continuous-insulation R values. Table 6F provides the planned wall assembly U and R values. We confirm that the relationship between R-values and U-values conform to the tables in Appendix A of ASHRAE 90.1-2013.
3-6	Window to wall ratios should be maintained at or below the values shown in Table G3.1.1-1 of ASHRAE 90.1-2013.	In the analysis, overall window areas are assumed to be equal to, or less than, the values in ASHRAE Table G3.1.1-1.
3-7	Glass curtain wall/spandrel systems should be avoided.	Glass curtain wall/spandrel systems will not be used in the design.
3-8	Report the following for each building:	See Table 6F of the GHG report.

3-9	For all buildings, the proposed aggregate R calculated above should be larger than the reference building; otherwise envelope performance is being traded-off for other improvements, reversing mitigation gains. Tradeoffs should be avoided.	The proposed aggregate R values for all buildings are larger than the reference buildings. No trade-offs are made.
3-10	Investigate external shading.	External shades will be encouraged in the actual building design.
3-11	Submit project modeling files to the DOER on a flash drive.	Modeling files have been sent to DOER.
3-12	Compare model results total and individual end uses with representative, prototype buildings developed by Pacific Northwest National Labs/Department of Energy found at the link below. Provide a summary explaining potential differences.	Table 8 in the GHG report compares modeled EUI values to PNNL values.
3-13	Include a table similar to the example below. For "code value" ensure that the value incorporates any improved efficiency per requirements of Section C406.1 of the Massachusetts' amendments.	The requested Code and design values are in Tables 6A through 6E of the GHG report. ERV will be encouraged in the actual MEP design.
DEP Comments		
4-1	The alternatives analysis does not describe the respective environmental impacts of the five alternatives considered, except for traffic. MassDEP notes that the preferred alternative results in the creation of the most impervious surface (166 acres) of the five considered. MassDEP requests that the alternative analysis in the DEIR be expanded to include not only a comparison of the environmental impacts of each option, but the available mitigation measures as well.	Refer to **Sections 2 and 3** of the DEIR for information on alternatives and alterations associated with the proposed project.
4-2	The Proponent should consider funding any water system upgrades that the Water District identifies as necessary to supply the Project.	The proponent will provide funds to design and construct the water main infrastructure needed to extend water from Lunenburg to Lancaster. This will support the development and provide the opportunity for future connection to all parcels of land along the 2.5-mile route.
4-3	The Proponent is encouraged to participate in any mitigation projects that will offset the increased demand on the Water District's system from the Project.	See response to Comment 4-2.
4-4	The Proponent should work with LWD to record details of any potential mitigation work performed at the site for future submittal to MassDEP for consideration as mitigation.	The Proponent will work with LWD to provide record details of potential mitigation work performed at the site.
4-5	With the new water line from the Water District serving the Project, these two public water systems should be required to connect to the new water line and become customers of the Water District.	Water service to the existing Dunkin' and Mobil Gas Station uses is currently provided via two (2) existing PWS wells located on the Site on the west side of McGovern Brook. Following the construction of the water line extension, these wells will be abandoned and the properties will be serviced from the new water main.
4-6	The Proponent should indicate the plans for abandoning these two public water systems in the DEIR.	Water service to the existing Dunkin' and Mobil Gas Station uses is currently provided via two (2) existing PWS wells located on the Site on the west side of McGovern Brook. Following the construction of the water line extension, these wells will be abandoned and the properties will be serviced from the new water main. Refer to **Section 6** of the DEIR for more information on utilities.
4-7	On the DEIR, the Proponent should identify location of the sewer collection system associated with the proposed development.	A plan showing the sewer collection system layout is shown on the Conceptual Utility Plan included in **Appendix B**.

4-8	MassDEP will require that all wastewater generated on the site shall be connected to the treatment facility.	All wastewater will be connected to the proposed treatment facility. Physically this will be accomplished via the sewer collection system for the development. As a private wastewater facility, ownership documents will be prepared per 310 CMR 5.15 whereby all users will be a member of the Association which owns, uses, and operates the wastewater treatment facility. Legal documents to this effect are required by DEP as part of the Groundwater Discharge Permit process. Ownership will be by a legal entity, typically an Association which consists of the same users and owners. 314 CMR 5.15 describes in detail the requirements for ownership. Essentially the entity must own the land and have control of the property, with the ability to exert financial control and responsibility of the users/owners. A multi use facility such as this would typically have an "umbrella trust" which may consist of representatives of the various users. It would be typical for there to be a Trustee from the condo association, the hotel, the business, etc. Association documents would consider the various flows of the users and an equitable rate structure for all of the users. They would jointly be responsible for the day to day operations of the facility as well as long term maintenance, including future replacement.
4-9	The Proponent should describe in the DEIR how the Project will meet the requirements for a privately owned wastewater treatment facility in 310 CMR 5.15.	See response to Comment 4-8.
4-10	Because the Project includes residential uses, the discharge permit will require a Financial Assurance Mechanism to fund the immediate repair and replacement of the Facility. The DEIR should describe the legal and financial arrangements that will achieve compliance with these permitting requirements.	Financial Assurance Mechanism's (FAM'S) are also part of the Groundwater Discharge Permitting process. The requirements include financial accounts where are set up and maintained to provide for short term repair or replacement of wastewater equipment as well as long term future replacement of the facility at some point in the future. Annual financial reports are submitted to DEP to insure that these accounts are properly funded. Typically the STP would have no impacts on any abutting properties. In this case, the STP is located in the center of the site, very remote from abutters and neighbors. There will be no visual, noise, odor, or other impacts from the facility.
4-11	The Project must be designed to meet all performance standards identified in the WPA Regulations at 310 CMR 10.00 for work proposed in each wetland resource area affected.	The project complies with the Wetlands Protection Act performance standards for all wetland resource areas. No new stream crossings are proposed. The existing stream crossing to be upgraded complies with the stream crossing standards for replacement crossings. Work is proposed within Riverfront Area. This work complies with the Inner Riparian Zone disturbance restrictions as well as the 10% threshold for Outer Riparian Zone disturbance. An alternatives analysis to justify work within the Outer Riparian Zone is/will be provided. Work proposed within Bordering Land Subject to Flooding meets requirements for compensatory storage and habitat restoration, where applicable. The 1,815 square foot former farm pond/wash pond that was filled will be replicated in-kind and on-site. No other impacts to wetland resource areas are proposed.
4-12	Identified impacts to BLSF and RA should be reduced and/or eliminated as much as possible and a detailed alternatives analysis should be provided.	Refer to **Sections 2 and 3** of the DEIR for a detailed alternatives analysis and information on alteration associated with the proposed project.

4-13	In the alternative analysis in the DEIR, the Proponent should evaluate alternatives that situate these components further away from the sensitive resource areas.	The surface for the auto sales and service facility is essentially an impervious surface constructed of a reclaimed asphalt with an emulsiphier. Stormwater runoff from these surface areas will be directed into a stormwater system designed in accordance with DEP stormwater standards. Stormwater structures as shown on the enclosed plans are approximate and may change depending upon final tenant fit-out. These structures will be setback from resource areas to the maximum extent practicable as the individual site development plans are developed. Infiltration basins will be set back a minimum of 50 feet from resource areas.
4-14	The DEIR should also consider structured parking alternatives.	The Traffic Impact and Access Study provided in **Appendix F** reviews the proposed parking supply for the project based on zoning and ITE methodology with time of day factors calculations provided for the projected office and industrial park uses. The parking supply will be refined as the project Tenants are selected.
4-15	The Proponent should include information on how the large gravel storage areas would be utilized and maintained in a manner to prevent impacts to sensitive resource areas and receptors.	The surface for the auto sales and service facility is essentially an impervious surface constructed of a reclaimed asphalt with an emulsiphier. Stormwater runoff from these surface areas will be directed into a stormwater system designed in accordance with DEP stormwater standards.
4-16	The Proponent should identify the location of all utilities associated with the development and identify impacts to wetlands resource areas. The residential component of the development that is accessed from Leominster does not have any details on where the water and sewer lines will be located.	Refer to the Conceptual Utility Plan provided in **Appendix B** of the DEIR for approximate location of utilities to serve the Site. Refer to **Section 6** of the DEIR for a description on existing and proposed utilities. Refer to **Section 4** of the DEIR for a description of proposed impacts to resource areas. Currently the developer does not control the land accessed from Leominster nor do they intend to in the future. However, this area was included in the plans per request from MEPA as part of the original scope. If the site was to be developed in the future and utilities were needed, it is likely that they would be extended from Leominster and/or consist of on-site systems.
4-17	The Project must comply with the Massachusetts Stormwater Standards (Stormwater Standards). The ENF provides general statements that the Project will be designed in compliance with the Stormwater Standards; however, the DEIR should include greater detail to confirm this general statement.	The entire Project will designed in compliance with the MassDEP Stormwater Standards, the Wetlands Protection Act, and all other local, state, and federal regulations. A Stormwater Report has been prepared for the Revised Preferred Master Plan and is included in Appendix I. Precipitation data as specified in TR-55 has been utilized in the preparation of the hydrologic analysis of the pre- and post-construction stormwater conditions. The lots have not been fully designed at this time, but will align with the general design intent and best management practices as outlined in the Stormwater Report, and subsequent NOI filings will be made as the Project is built-out. Any and all future Notice of Intent filings will include the requisite stormwater checklist and supporting calculations.
4-18	Future filings should contain the required stormwater checklist and supporting calculations.	Any and all future Notice of Intent filings will include the requisite stormwater checklist and supporting calculations.
4-19	In the DEIR, the Proponent should evaluate alternatives where the stormwater structures are set back from receiving wetland resource areas as must as possible due to the sensitive nature of the wetland resource areas.	Final location of all stormwater BMPs will be determined as the individual site plans for each end user are developed. Stormwater BMP locations will be set back from receiving wetland resources to the maximum extent practicable and in compliance with Mass DEP stormwater standards. It is noted that infiltration basins will be set back a minimum of 50 feet from wetland resource areas.
4-20	Construction and demolition activity must conform to current Massachusetts Air Pollution Control regulations governing nuisance conditions at 310 CMR 7.01, 7.09 and 7.10 and not cause or contribute to a condition of air pollution due to dust, odor or noise. As such, the Proponent should propose measures to prevent and minimize dust, noise, and odor nuisance conditions during construction and/or demolition.	The project will comply with all current Massachusetts Air Pollution Control regulations and not cause or contribute to a condition of air pollution due to dust, odor or noise. Refer to the draft CMP in **Appendix I** . In addition, the Stormwater Pollution Prevention Plan (SWPPP) produced for the project will outline measures to eliminate dust pollution during construction in accordance with the Construction General Permit.

4-21	MassDEP requests that all non-road diesel equipment rated 50 horsepower or greater meet EPA 's Tier 4 emission limits, which are the most stringent emission standards currently available for off-road engines. If a piece of equipment is not available in the Tier 4 configuration, then the Proponent should use construction equipment that has been retrofitted with appropriate emissions reduction equipment.	Construction contracts will consider requirements for Tier 3 and 4 equipment engines, which represent BACT.
4-22	The Proponent should maintain a list of the engines, their emission tiers, and, if applicable, the best available control technology installed on each piece of equipment on file for Departmental review.	The proponent will maintain this list of information for Departmental review.
4-23	To ensure compliance with this regulation once the Project is occupied, MassDEP requests that the Proponent install permanent signs limiting idling to five minutes or less on-site	Signs will be posted at project entrances and construction firms will be instructed regarding the Idling Regulation.
MassDOT Comments		
5-1	The TIA study area includes the following intersections: • Main Street (Route 70/Route 117) at Seven Bridge Road (Route 117) and Shirley Road; • Main Street (Route 70/117) at Lunenburg Road (Route 70); • Lunenburg Road (Route 70) at McGovern Boulevard; • Lunenburg Road (Route 70) at Old Union Turnpike Road; • Lunenburg Road (Route 70) at Woods Lane/Fort Pond Road; • Old Union Tumpike at Route 2 Eastbound Ramps; • Fort Pond Road at Route 2 Westbound Ramps; • Mechanic Street at Johnny Appleseed Lane; and • Mechanic Street at White Pond Road.	No Response Required
5-2	The DEIR study area should include the Route 2 Off- and On-Ramps associated with Exit 34, along Old Union Turnpike and Harvard Street, unless they do not meet the study area intersection thresholds of site-generated traffic represent in 100 vehicles during the peak hour or five percent of all intersection traffic during the peak hour.	See response to Comment 1-45.
5-3	If these intersections meet study area thresholds, the Proponent should provide capacity analyses as part of the DEIR submission and propose mitigation in instances where the intersections or intersection approaches under state jurisdiction are anticipated to operate at an LOS E or F during a peak period under 2026 No-Build or Build condition.	See response to Comment 1-46.
5-4	The DEIR must demonstrate that pass-by rates were appropriately applied to weekend traffic figures along Lunenburg Road; the pass-by volume cannot exceed 15 percent of traffic along the adjacent roadway.	See response to Comment 1-47.
5-5	The DEIR should also clarify whether the existing FC Stars soccer facility features three or four fields, adjust trip generation figures and capacity analyses as appropriate, as well as provide justification for using the average rate rather than the fitted curve equation for LUC 820-Shopping Center.	See response to Comment 1-48.

5-6	A Road Safety Audit was completed by the Proponent at the Main Street/Lunenburg Road intersection in 2017; the DEIR should commit to implementing low-cost, short-term improvements identified in the RSA as mitigation for this project. Additional RSAs, with commensurate commitments to low-cost, short-term improvements identified through the RSAs, will need to be completed prior to the submission of the DEIR if deemed appropriate by MassDOT.	See responses to Comments 1-56 and 1-57.
5-7	According to the preliminary TIA attached to the ENF, all intersections and intersection approaches under state jurisdiction are anticipated to operate at an acceptable Level of Service (LOS) during the weekday morning and weekday evening peak periods, except for the northbound Route 2 Westbound Off-Ramp left-tum approach at the Fort Pond Road/Route 2 Westbound Ramps intersection. The Level of Service for this left-tum approach deteriorates from D to E during the weekday evening peak hour; the DEIR should evaluate and commit to improvements that would restore this movement to a LOS D or better in the Build condition.	See response to Comment 1-49.
5-8	We note that queue storage on the Route 2 Westbound Off-Ramp is limited to approximately 200 feet; improvements to address the short queue storage should be identified in the DEIR given the queue will likely exceed the available storage with the addition of project-related traffic, specifically during the weekday evening peak hour.	See response to Comment 1-50.
5-9	Several alternatives are currently being evaluated for the Route 2 interchanges in Lancaster and Harvard as part of MassDOT project #605393. The TIA notes that five alternatives for Exit 35 are being evaluated at present. These alternatives were not incorporated in the TIA as it is not expected that the improvements will be in place by the 2026 Build year; the DEIR should provide any update on this process as available.	See response to Comment 1-51.
5-10	Additionally, traffic signal timing modifications will be implemented at the Main Street/Seven Bridge Road and Lunenburg Road/Main Street intersections in accordance to the Traffic Monitoring Program committed to by the Proponent. The DEIR should clarify the timing of these improvements or the thresholds which are anticipated to be needed to trigger mitigation.	Chapter VII of the DEIR provides an overall of mitigation in relation to project phasing and trip thresholds.
5-11	The DEIR should include capacity analyses for the Saturday midday peak hour. Mitigation should be proposed as part of the DEIR if any instances where intersection approaches under state jurisdiction are anticipated to operate at an LOS E or F in the 2026 No Build or Build conditions.	See responses to Comments 1-46 and 1-53.
5-12	Any proposed mitigation within the state highway layout and all internal site circulation must be consistent with a healthy transportation design approach that provides adequate and safe accommodations for all roadway users, including pedestrians, bicyclists, and public transit riders. Guidance on healthy transportation design is included in the MassDOT Project Development and Design Guide. Where these criteria cannot be met, the proponent should provide justification, and should work with the MassDOT Highway Division to obtain a design waiver.	See response to Comment 1-55.

5-13	The TIA includes an inventory of pedestrian, bicycle, and transit facilities and services in the vicinity of the project site. Pedestrian and bicycle accommodations are absent along Lunenburg Road; the Proponent has committed to providing these accommodations along McGovern Boulevard within the project site which would connect with Lunenburg. The Proponent will provide sidewalks along each side of Lunenburg Road; the DEIR should clarify whether this would be solely provided along the site frontage.	Chapter 7 of the DEIR provides an updated summary of all pedestrian and bicycle infrastructure modifications to be constructed as mitigation for the project.
5-14	The Proponent proposes no bicycle accommodations along Lunenburg Road; we note that the proposed widening of Lunenburg Road may allow for the provision of a shared use path (in place of one or both of the sidewalks) to allow for bicycle accommodations. The DEIR should evaluate this alternative.	See response to Comment 1-60.
5-15	The Montachusett Regional Transit-Authority (MART) does not currently operate service in the vicinity of the project site; the Proponent should reach out to MART to examine the feasibility of extending service to the project site. An operational subsidy to support this service should be explored, in cognizance of the need to encourage alternative transportation options for a project of this size. The DEIR should provide documentation of this outreach.	See response to Comment 1-63.
5-16	Although the Proponent notes that feasible opportunities to further reduce the parking supply is limited, we encourage the Proponent to investigate land banking of parking spaces until and unless needed, based on monitoring conducted at a future date.	See response to Comment 1-65.
5-17	The Proponent should work toward identifying the details of these measures as well as developing additional programs. We encourage the Proponent to consult with MassDOT to help implement the TDM program.	See response to Comment 1-64.
5-18	The Proponent should also commit to conducting a travel survey of employees at the site.	See response to Comment 1-58.
5-19	The goals of the monitoring program will be to evaluate the assumptions made in the EIRs and the adequacy of the mitigation measures, as well as to determine the effectiveness of the TDM program. The results of each iteration of the monitoring program should be summarized in a technical memorandum provided to MassDOT. This monitoring plan (timing, duration, etc.) should be revisited with MassDOT's PPDU and the District 3 Office prior to its implementation.	Chapter 7 of the DEIR provides a detailed summary of the scope for the project's traffic monitoring program.
5-20	The DEIR should provide an update of the local permitting processes for the proposed project, particularly with respect to any transportation issues being discussed. We strongly encourage the Proponent to consult with MassDOT before any transportation issues are discussed in local meetings or hearings.	The Project Team has discussed potential off-site mitigation at the intersection of Lunenburg Road and McGovern Blvd with the Town on several occasions. Formal permitting of the site through the Town is ongoing. The Project Team facilitated a conference call with MassDOT PPDU and MassDOT District 3 on Monday, August 5, 2019 to discuss the scope of MassDOT comments on the ENF and the scope of the DEIR.
5-21	The Proponent should continue consultation with appropriate MassDOT units, including PPDU and the District 3 Office, to discuss preparation of the DEIR.	See response to Comment 1-44.

Code	Comment	Response
Public Comments		
6-1	As you conduct your review of this project I would ask that you explore the possibiliy of requiring a forested buffer around the edge of the property. This development will be adjacent to one of the premier wild areas In lancaster. There is a significant populatlon of deer in the area and I have heard reports of moose and bear. In addition it is very close to an extensive trail network. The visitor experience on these trails could be substantially impacted by the development depending on how it proceeds.	The project will include approximately 36.9 acres of open space in the southwestern portion of the Site adjacent to the proposed auto sales area. Additionally, approximatley 61.4 acres of open space will remain in the northern portion of the site near buildings "C" and "D". These areas contain a significat amount of wetland resource areas that are not anticipated to be impacted by the proposed project. In addtion, the proponent will be donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7 acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation areas and contain wetlands, streams and are within the ACEC. Refer to **Section 10** of the DEIR for addittional information.
6-2	Finally, since it is very close to the North Branch of the Nashua River obviously steps must be taken to preserve the integrity of the river which is a key tributary to a recently designated Wild and Scenic River. The North Branch is under discussion to be added to that designation as well. All steps that you can take to preserve the area will be greatly appreciated.	The project site consists largely of an active sand and gravel mine. The project areas will be stabilized with a combination of impervious and vegetated surfaces. Stormwater will be detained and treated in accordance with DEP critical area standards. Project improvements will improve conditions within the watershed relative to water quality, storm damage prevention and flood control.
6-3	I feel that the scale of proposed Commerce Center Project is completely out of proportion to the type of development that will enhance the growth of the town of Lancaster. Lancaster has a population of approxlmately 7400. The addition of a residential project, with 500 apartments and 117 single family/triplex/ duplex residences has the potential to increase the population by more than 25%	The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same.
6-4	The major effect of this project will be it's effect on the wetlands, watershed, ponds and conservation land. It appears there will be more than 150acres of impervious surface, where there is currently soil, sand and gravel, brush, grasses, etc.	The DEIR contains a detailed Alternatives Analysis including a quantitative comparison of the proposed impacts for each alternative. The proponent has sought to avoid, minimize and mitigate impacts to the environment through this analysis while providing a development program that is suitable for the area and in alignment with the Town of Lancaster master planning efforts. The Proponent will design the Project to meet or exceed all applicable Local, State, and Federal Standards and Regulations. Further, there is a significant donation of open space as part of this project.
6-5	The Nashua river is in close proximity and already suffers from intermittent flooding issues in the Town of Lancaster and the Town of Clinton further south. The distruption of the current watershed has the potential to increase flooding from the Nashua River, effect the water flow in surrounding aquifers, affect the water flow to surrounding wells, affect the waler flow to multiple surrounding ponds-Including White's Pond, Spectacle Pond. Font Pond, etc.	The project site consists largely of an active sand and gravel mine. The project areas will be stabilized with a combination of impervious and vegetated surfaces. Stormwater will be detained and treated in accordance with DEP critical area standards. Project improvements will improve conditions within the watershed relative to water quality, storm damage prevention and flood control.
6-6	The surrounding residences rely solely on well water. Changes in the surrounding watershed has the potential to cause decreases in the water flow the underlying water basin.	More than 157,000 gallons per day of treated wastewater will be dischrged on site, helping to maintain groundwater levels.

6-7	The projected large auto depot has the potential to contaminate our vital water source.	The auto sales and service area is for outdoor storage of used, operable and inoperable automobiles, trucks and other vehicles, for wholesale online auction. All vehicles are liquidated intact, meaning no dismantling, draining of fluids, crushing or sale of parts occurs at the facility. The vehicles are sold in the same "AS-IS" condition as when they arrive. Vehicles brought to this site are expected to have all, of the primary fluid reservoirs of damaged vehicles emptied before they are delivered. In the unlikely event that spillage or leakage were to occur, trained operators have defined protocols to remediate the spillage. Stormwater runoff from the auto sales and service facility will be directed into a stormwater system designed in ful accordance with DEP stormwater standards. Maintenance will be performed similar to other paved surfaces and stormwater systems. A full Operation and Maintenance Plan will be prepared as part of the local permitting process and will fully comply with DEP stormwater standards.
6-8	Additional issues center around the volume of traffic this project will provide. It appears that there is essentially going to be one entrance/exit to the proposed apartment buildings, by way of McGovern Rd. This is a 2 lane road, emptying Into a 2 lane road. The addition of turn lanes and a traffic signal will not be sufficient to mitigate the effects of a large volume of cars. If one was to be extremely conservative, one could predict one car per apartment, making 500 cars.	Site generated traffic volumes for the proposed project is based upon the industry standard ITE publication Trip generation, 10th Edition (2017) which utilizes thousands of traffic counts over more than 100 land uses to assist in projecting traffic by private and public development sites. In this instance, the ENF and DEIR provide traffic volume projections for the given land uses on-site. Note that the size of the land use is taken into account for projecting traffic. In the case of apartment units as commented, the number of units does not equal the number of trips in any given hour. Whereas most residents work, these trips are typically spread over multiple hours, as residents work off-peak hours, residents telecommute, etc. Although the number of trips entering/exiting the site is elevated, the construction of turn-lanes, and a traffic signal is expected to result in acceptable levels-of-service at the intersection of Lunenburg Road / McGovern Boulevard.
6-9	However, this area has no public transportation, no sidewalks, and no substantial shopping areas within walking distance. It is more likely that the number of cars will be 2 per apartment, especially in the current environment of both partners/spouscs/co-habitors being employed.	The Proponent has reached out to MART to examine opportunities to extend Bus Route 8 to/from the site. In regards to number of cars per apartment, not all apartments will be multi-bedroom or consist of multiple occupants. In addition, not all families possess two vehicles. Note that parking related demand figures, as reported in the ENF and DEIR, are projected based on the ITE publication Parking Generation, 5th Edition (2019) which utilizes thousands of parking counts over more than 100 land uses to assist in projecting parking field size by private and public development sites. A standard multi-level apartment typically correlates to approximately 1.47 parked vehicles per unit (85th percentile peak demand).
6-10	The traffic on Lunenburg road is already heavy, especially at times of soccer field use, with bottlenecks at Route 117 and Route 2. These are not problems that are likely to ever be mitigated, with very little ability to enlarge either Route 2 or Roule 117. While there is a road improvement project planned for Route 117, it will not substantially increase the size of 117, but help to increase the flow, with turn lanes and signals. However, this project is designed to alleviate the current traffic woes and was not projected to include a substantial increase in traffic. In the mornings, Route 2 East is already bumper to bumper from the connecting ramp from 190 north to at least Exit 37-Devens, with overflow traffic traveling on the smaller parallel road-Old Union Turnpike.	TEC has projected all traffic volumes at the study area intersections based upon actual traffic counts during a standard weekday while school was in session and on a typical Saturday during the summer (peak tourist and recreational activities). All counts were adjusted for seasonal variation based on other count stations in the area. New traffic signals to be installed along Route 117 are expected to significantly improve traffic operations along Route 117. Additional traffic signal timing optimization will be completed by the project during the occupancy period.

6-11	The proposed auto storage depot also proposes a threat to our water supply, first due to the large amount of impervious surface and second from the potential soil/water contamrnation from car fluids. This is an environmentally sensitive area. The addition of 500+ cars for the apartments, 117+ for the other residences, will impact the soil and water purity.	The auto sales and service area is for outdoor storage of used, operable and inoperable automobiles, trucks and other vehicles, for wholesale online auction. All vehicles are liquidated intact, meaning no dismantling, draining of fluids, crushing or sale of parts occurs at the facility. The vehicles are sold in the same "AS-IS" condition as when they arrive. Vehicles brought to this site are expected to have all, of the primary fluid reservoirs of damaged vehicles emptied before they are delivered. In the unlikely event that spillage or leakage were to occur, trained operators have defined protocols to remediate the spillage. Stormwater runoff from the auto sales and service facility will be directed into a stormwater system designed in full accordance with DEP stormwater standards. Maintenance will be performed similar to other paved surfaces and stormwater systems. A full Operation and Maintenance Plan will be prepared as part of the local permitting process and will fully comply with DEP stormwater standards. The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same during the local permitting process.
6-12	As a Lancaster resident I view this project as too much too soon. The space Is available but the town is nowhere ready to handle this many additional residences.	The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same during the local permitting process.
6-13	We are trying to catch up on our affordable housing requirements of over 10%. We worked hard this year to get an approved Housing Production Plan and have begun to tackle providing affordable housing. This development will not only NOT provide affordable housing but will also require the town to provide even more affordable housing due to the number of units. The town needs time to get our affordable housing units underway and ensure future developments like this one - CONTRIBUTE affordable housing to the community.	It is anticipated that 12% of the residential units would be affordable units. This would equate to 60 of the units in the development which would be affordable units. The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same during the local permitting process.
6-14	We're working to get bylaws in place to ensure developers provide affordable units but we aren't there yet. Please consider requiring the developer to provide affordable units - it's a HUGE need across the state as the governor has clearly stated. We also have major concerns on the environment.	It is anticipated that 12% of the residential units would be affordable units. This would equate to 60 of the units in the development which would be affordable units. The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same during the local permitting process.

6-15	There should be studies done on this land for vernal pools and other important wildlife habitat. The development needs to take into account these critical areas on environment for our wildlife. Once the impact is made to our treasured environment, there is no way to recover it. Please ensure the developer works with our town conservation commission to properly evaluate the impact to our environment.	The project site consists largely of an active sand and gravel mine with negligible habitat value. The portions of the site outside the active mine have been studied and delineated. Vernal pools have been identified and the project has been designed so that no work will take place near any vernal pools. We have been working closely with the Lancaster Conservation Commission. They have confirmed wetland resource areas and are awaiting a Notice of Intent application which is forthcoming.
6-16	As a resident of White Pond Rd, we all have private wells on our road as well as Holiday Lane. White Pond also serves as a primary irrigation source for Grove Farm in Leominster, MA. Not noted in this proposal as it is a separate development, but there is currently a 34-acre solar field going in just to the northeast of this project (where the former Lancaster Golf Course is). I'm wondering what the environmental impacts are with having so much clearing both east and south of Whites Pond and change in the landscape in an area already prone to flooding.	The DEIR contains a detailed Alternatives Analysis including a quantitative comparison o fthe proposed impacts for ecah alternative. The proponent has sought to avoid, minimize and mitigate impacts to the environment through this analysis while providing a development program that is suitable for the area and in alighment with the Town of Lancaster master planning efforts. The Proponent will design the Project to fully meet or exceed all applicable Local, State, and Federal Standards and Regulations.
6-17	Also, I would like to know what the impacts on the aquafor are with such clearing and massive development, and wastewater runoff will have on those of us who have no option for public water hookup.	Wastewater being discharged to the aquifer will be tretaed to state water quality standards. Quality will be maintained through the state's required monthly monitoring of the wastewater and groundwater. Water quality reports must be submitted to the state as part of the Groundwater Discharge Program.
6-18	I am also concerned with secondary used vehicles being stored on the site and what precautions will be taken to ensure no hazardous materials getspilled into both the Nashua River, vernal pools and aquafor as well.	The auto sales and service area is for outdoor storage of used, operable and inoperable automobiles, trucks and other vehicles, for wholesale online auction. All vehicles are liquidated intact, meaning no dismantling, draining of fluids, crushing or sale of parts occurs at the facility. The vehicles are sold in the same “AS-IS” condition as when they arrive. Vehicles brought to this site are expected to have all of the primary fluid reservoirs of damaged vehicles emptied before they are delivered. In the unlikely event that spillage or leakage were to occur, trained operators have defined protocols to remediate the spillage.
6-19	Finally, I am concerned about the noise and air pollution that such increased traffic will cause for those residents in the area of North Lancaster.	Traffic mitigation measures proposed by the project will reduce intersection delays and vehicle idling, and help preserve local air quality. Motor vehicles traveling on driveways and in parking lots internal to the project will be traveling at very low speeds and will not generate significant noise.
6-20	I am not in favor of this project. I do not believe we need more retail in this area. There ls a big shopping mall in Berlin (Highland Commons), there are a lot or stores at Orchard Hill Park (Leominster) and a big mall in Leominster.	Our market analysis shows a market for the proposed development, otherwise we would not be making the investment in the project that we are.
6-21	The traffic situation would be horrendous if this project goes through. There are already too many cars on Route 70.	The revised traffic study included in the DEIR provides a detailed capacity and queue analysis at the major conflict points along the Route 70 corridor.
6-22	From where would the town get water? I hear over and over that water and water pressure is a problem in town.	The Town of Lancaster has executed a Memorandum of Understanding (MOU) with the Lunenburg Water District to service the Project. An Intermunicipal Agreement is currently being developed under which the Town of Lancaster will purchase water from the Lunenburg water district. Luneburg will read the meters and bill Lancaster, who will in-turn bill individual users. A 2.5± mile water line extension is proposed to extend from the connection point at the intersection of Leominster Shirley Road and Reservoir Road in Lunenburg to the north, to the Site at McGovern Boulevard off Lunenburg Road in Lancaster. The proponent will provide funds to design and construct the water main infrastructure needed to extend from Lunenburg to Lancaster. This will support the development and provide opportunity for future connection to all parcels of land along the 2.5-mile route.

6-23	This would add to noise pollution as well. last summer I attended a meeting about the proposed race track. Many people from White Pond, Spec Pond and Fort Pond stood up and spoke about all the noise they already contend with due to the soccer fields. People move to Lancaster and live and stay in Lancaster because they like a rural setting. This would destroy the peaceful town we all love.	The project does not include a race track or any other significant noise-generating source. Motor vehicles traveling on driveways and in parking lots internal to the project will be traveling at very low speeds and will not generate significant noise.
6-24	I have significant concerns about the environmental impact of the Capital Commerce Center proposed in the northern area ot Lancaster.	See response 6-25.
6-25	The sprawling development appears to border the North Nashua River and transects multiple tributary streams. It will irreparably destroy over 55 acres of existing woodlands and wetlands that provide important wildlife habitat as well as watershed for the nearby river.	The project site consists largely of an active sand and gravel mine with negligible habitat value. The portions of the site outside the active mine have been studied and delineated. Vernal pools have been identified and the project has been designed so that no work will take place near any vernal pools. We have been working closely with the Lancaster Conservation Commission. They have confirmed wetland resource areas and are awaiting a Notice of Intent application which is forthcoming. The site will minimize impact to existing wooded areas to the maximum extent practicable.
6-26	The proposed development appears to be sandwiched between two NH ESP priority habitat areas, with one to the west and another to the east. In addition, it appears to border Cook's Conservation area to the south. Given its proximity to these important conservation and habitat areas, I would like to see a full range of environmental studies conducted including a complete and comprehensive review of rare species, plants, and habitat.	See response 6-25.
6-27	One certified vernal pool is known to exist on the southwest portion of the site. Given the large, diverse range of terrain and wetlands on the parcel, it seems likely that others are there as well.	Vernal pools have been identified and the project has been designed so that no work will take place near any vernal pools. We have been working closely with the Lancaster Conservation Commission. They have confirmed wetland resource areas and are awaiting a Notice of Intent application which is forthcoming.
6-28	A 2017 evaluation of possible water sources for economic development in north Lancaster, considered establishing new wells on town land just north of the Nashua River as one of the attractive options. It's hard to believe the town would consider siting this extensive development and it's massive sewage treatment facility that close to one of the town's only alternative water sources.	Wastewater being discharged to the aquifer will be treated to state water quality standards. Quality will be maintained through the state's required monthly monitoring of the wastewater and groundwater. Water quality reports must be submitted to the state as part of the Groundwater Discharge Program.
6-29	The town of Lancaster has exceeded its WMA permit level for 8 of the past 10 years and is desperately in need of establishing a secondary source for its municipal water system. Its existing wells are both in the same aquifer in south Lancaster and are highly susceptible to contamination due to their location and the surrounding soil types.	See response 6-28.
6-30	The single-access entry to the proposed development off of route 70 will add over 11,000 vehicle trips per day which will certainly increase traffic backups at the intersection with route 117 to the south at peak travel times. All the extra vehicles and all the additional backups are bound to significantly degrade the local air quality.	Note that the development is projected to add an additional 9,790 new vehicle trips per day (24-hours). These trips will be distributed across the roadway network. The site has been designed to provide complementary land uses where both industrial and residential uses are provided. New traffic signals to be installed along Route 117 are expected to significantly improve traffic operations along Route 117. Additional traffic signal timing optimization will be completed by the project during the occupancy period to minimize vehicle idling.

6-31	While Lancaster would benefit from expanding its business tax base, there is little current need for an additional 617 housing units. The local zoning board recently approved a development in the south end of Lancaster consisting of 96 apartments and 56 single-family homes. It's hard to see the need for another, concurrent, large housing development. The town is not even staffed to deal with all this construction at the same time.	The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same.
6-32	What Lancaster needs more of is affordable housing. The Capital Commerce project would significantly increase the market-rate housing in Lancaster which would actually reduce progress toward meeting the state's mandate for 10% affordable housing.	It is anticipated that 12% of the residential units would be affordable units. This would equate to 60 of the units in the development which would be affordable units. The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same during the local permitting process.
6-33	The residential portions of the development appear to receive generous zoning relief without providing the benefits typically associated with cluster development. There is no affordable housing, no conservation land set aside, and little or no recreation or open space planned.	It is anticipated that 12% of the residential units would be affordable units. This would equate to 60 of the units in the development which would be affordable units. The project will include approximately 36.9 acres of open space in the southwestern portion of the Site adjacent to the proposed auto sales area. Additionally, approximatley 61.4 acres of open space will remain in the northern portion of the site near buildings "C" and "D". These aeras contain a significat amount of wetland resource areas that are not anticipated to be impacted by the proposed project. In addtion, the proponent will be donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7 acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation areas and contain wetlands, streams and are within the ACEC. Refer to **Section 10** of the DEIR for addittional information.
6-34	Lancaster would likely benefit from additional retail, restaurant, and food store options. It would benefit from a reasonably sized hotel and more recreational facilities. What it does not need is more car dealerships. Most of all, Lancaster really needs more affordable housing.	The auto sales and service area is for outdoor storage of used, operable and inoperable automobiles, trucks and other vehicles, for wholesale online auction. It also includes an accessory office, shipping and receiving area and customer parking. It is anticipated that 12% of the residential units would be affordable units. This would equate to 60 of the units in the development which would be affordable units. The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same during the local permitting process.
6-35	This area appears to contain significant wildlife and habitat resources in an environmentally sensitive location. The North Nashua River is within the Commonwealth's Central Nashua River Valley Area of Critical Environmental Concern. The Nashua River recently received national designation as a "Wild and Scenic River" and the North Nashua River is part of that greater watershed.	The portions of the project within the ACEC will be improved from their existing state as an active sand and gravel mine. The project areas will be stabilized with a combination of impervious and vegetated surfaces. Stormwater will be detained and treated in accordance with DEP critical area standards. Project improvements will improve conditions within the ACEC relative to water quality, storm damage prevention and flood control. Habitat value and biodiversity will be unchanged.

6-36	I live about 1 mile from this proposed project and I believe the exra traffic burden will be incredibly high. Route 2 spends a significant portion of the day in stand still traffic a ready, and then increasing the traffic on route 70, especially around the soccers fields is quite dangerous. That spot is over trafficked already.	The revised traffic study included in the DEIR provides a detailed capacity and queue analysis at the major conflict points along the Route 70 corridor.
6-37	The roads are not sufficiently safe for that the type of traffic need to support that much retail space. Especially with the amount of traffic for kids & families at the soccer complex. Just say NO to the this project.	The master plan currently proposes 67,500 SF of retail space, which would generally be considered support retail for the residential and industrial land uses. Each individual tenant space as shown on the master plan is itself small and is expected to be occupied by a specialty use. The revised traffic study included in the DEIR provides a detailed capacity and queue analysis at the major conflict points along the Route 70 corridor.
6-38	This development will have dire effects on the beautiful avian, and land animals that inhabit this region. lancaster has been a sanctuary for theses animals in contrast to the urban stttings of Leominister and Fitchburg. this area is home to a variety of Massachusetts wildlife and should be protected from commerce, redtail hawks, herons, bald eagles, owls. yellow spotted salamanders are living on this land. Coyotees ,fox, deer, turkeys and even moose have been spotted in this area. Lancaster is a homespun community that does not need commerce but does need to preserve its wildlife. We entrust you to protect our community and our wildlife!	The project site consists largely of an active sand and gravel mine with negligible habitat value. The portions of the site outside the active mine have been studied and delineated. Vernal pools have been identified and the project has been designed so that no work will take place near any vernal pools. We have been working closely with the Lancaster Conservation Commission. They have confirmed wetland resource areas and are awaiting a Notice of Intent application which is forthcoming.The site will minimize impact to existing wooded areas to the maximum extent practicable.
6-39	Our great concern is that the units are exclusively market rate, generating an additional burden for Lancaster to meet its affordable housing requirement. MGL requires every town in the Commonwealth to maintain over 10% of its year-round housing inventory as deed-restricted affordable housing. Therefore, this development will undeniably create a legal need to provide an additional 62 affordable housing units elsewhere and cause the associated environmental impact - without any contribution or mitigation from the developer.	It is anticipated that 12% of the residential units would be affordable units. This would equate to 60 of the units in the development which would be affordable units. The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same during the local permitting process.
6-40	Construction of the required 62 affordable housing units creates a significant loss or natural resources elsewhere, not necessarily near affordable housing amenities such as regional transportation. This should be included by MEPA under the environmental impacts- of this project.	The DEIR contains a detailed Alternatives Analysis including a quantitative comparison of the proposed impacts for each alternative. The proponent has sought to avoid, minimize and mitigate impacts to the environment through this analysis while providing a development program that is suitable for the area and in alignment with the Town of Lancaster master planning efforts. The Proponent will design the Project to meet or exceed all applicable Local, State, and Federal Standards and Regulations.
6-41	My primary concern needs to be the proposed access to White Pond Road. This is a private road, and as president of the association, I need to make it clear that there is absolutely no access to the road.	For the purposes of the traffic study, all traffic has been removed from projections along White Pond Road.
6-42	My second concern is traffic. Having lived in the area for 23 years, I find it impossible to believe the traffic impact study when they claim it won't have a significant affect on traffic. Soccer tournaments already cause a ridiculous amount of congestion, and the number of cars associated with the development far exceeds the number currently connected with the soccer fields.	The traffic study as documented provides a capacity and queue analysis that utilizes traffic counts conducted on each study area intersection and projects site generated traffic volumes based on the industry standard ITE publication Trip Generation, 10th Edition which utilizes thousands of traffic counts to estimate new traffic based on the land uses on-site. In addition to improvements currently in the works or currently under study by MassDOT, the Proponent has committed to mitigation traffic impacts at many locations within the study area.

6-43	The entire site is only accessible from 2 spots, McGovern Boulevard and Johnny Appleseed Lane. Both of these intersections have had multiple traffic fatalities in recent years.	Only a restricted portion of the residential component on-site can access/egress via Johnny Appleseed Lane. The Proponent has committed to substantial improvements at the intersection of Lunenburg Road / McGovern Boulevard; including a new traffic signal, turn lane, pedestrian crossings, and bike accommodations to assist in mitigating safety for all users.
6-44	What also must be considered is the intersection of 70 and 117. Not only has there also been a fatality there recently, but the school buses are often delayed by 15 or 20 minutes in the morning due to traffic backing up as much as a 1/2 mile, making kids late for school.	Significant corridor improvements to Route 117 between Lunenburg Road and Seven Bridges Road as part of a MassDOT Project are expected to go under construction in Spring 2020. The new traffic signals at each of the key northbound and southbound approaches, where an overwhelming majority of this delay is occurring, will significantly reduce delay on these approaches. The Proponent has committed to optimize traffic signal timings during the occupancy period of the development to ensure that the improved traffic operations at these two intersections are continued post-project.
6-45	Adding 117 single family, duplex and triple family homes and 500 apartments will increase the population of the town by 25 - 30%.	The proposed development is intended to be permitted under the Integrated Planning Overlay District (IPOD). The preferred and alternative plans contain residential components as required under the IPOD zoning requirements. The proponent feels the area and development may not be well suited for the housing components. Therefore, they are amendable to removing them and replacing with additional industrial uses should the Town provide a mechanism for same during the local permitting process.
6-46	The local infastructure is not built for this level of increase. Nor can the schools, police or fire departments handle such a population explosion in their present state.	The project proposes mitigation measures to address infrastructure concerns as well as significant tax revenue generations to address same.
6-47	The water problem may be solved by obtaining water from Lunenburg, but as of now, they don't have the water neccesary to accomodate this project.	Lunnenburg is in the process of expanding their generation capacity to accommodate the additional water demand.
6-48	Another issue is that the area is teaming with wildlife. The wetlands need to be protected, and impact to the animals limited as much as possible.	The project site consists largely of an active sand and gravel mine with negligible habitat value. The portions of the site outside the active mine have been studied and delineated. Vernal pools have been identified and the project has been designed so that no work will take place near any vernal pools. We have been working closely with the Lancaster Conservation Commission. They have confirmed wetland resource areas and are awaiting a Notice of Intent application which is forthcoming. The site will minimize impact to existing wooded areas to the maximum extent practicable.
6-49	This project would not only change that, but it would more than likely cause an increase in property taxes, which are already among the highest in the area.	This project would be a substantial generator of additonal taxes for the Town which could potentially help lower taxes for the existing tax payers.
6-50	Efforts should be made by the developer to provide noticeable buffers of undisturbed land between this property and this conservation land (which is the DCR-owned Lancaster State Forest, Lancaster Conservation Commission land, etc.)	The project will include approximately 36.9 acres of open space in the southwestern portion of the Site adjacent to the proposed auto sales area. Additionally, approximatley 61.4 acres of open space will remain in the northern portion of the site near buildings "C" and "D". These areas contain a significant amount of wetland resource areas that are not anticipated to be impacted by the proposed project. In addtion, the proponent will be donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation areas and contain wetlands, streams and are within the ACEC. Refer to **Section 10** of the DEIR for addittional information.

6-51	The massive parking lot in the western part of the PMP is outdated with today's design guidelines for lower impact development.	The stormwater runoff from these surface areas will be directed into a stormwater system designed in accordance with DEP stormwater standards. LID techniques to be considered for use on the individual lots consist of raingardens, bioretention areas, treebox filters, porous pavement, water quality swales, and green roofs. These techniques will be considered on a case by case basis as appropriate and feasible due to on site constraints (i.e. soils conditions, groundwater, location, etc.) in order to reduce impervious area and land disturbance. The stormwater management controls will be dispersed across the development of the individual lots so as to not centralize the stormwater system. These techniques will be considered and discussed in the future NOI filings developed for the proposed build-out of the property.
6-52	Whether it's an extension of the parking lot or a proposed storm water treatment basin in one of the alternative scenarios, it is completely counter to wildlife biology standards to create islands between wetland systems and vernal pools.	The existing wetland systems and vernal pools will not be isolated by the project. Connections between the systems will remain undeveloped in the southerly part of the site.
6-53	Importantly, this whole area is within "State-mapped Habitat of Potential Regional and Statewide Importance". I have attached that map. MassDEP in conjunction with NHESP require a detailed wildlife evaluation study to be completed by a certified wildlife biologist.	The presence of a Habitat of *Potential* Regional and Statewide Importance is acknowledged. The project site consists largely of an active sand and gravel mine with negligible habitat value. The portions of the site outside the active mine have been studied and delineated. Vernal pools have been identified and the project has been designed so that no work will take place near any vernal pools. The requirement for a Detailed Wildlife Habitat Evaluation will be triggered by the proposed work within Bordering Land Subject to Flooding adjacent to McGovern Brook. This evaluation will be provided to the Lancaster Conservation Commission and to MA DEP as part of project permitting requirements.
6-54	Much of this PMP is in the ACEC. The Nashua River in Lancaster was designated as a Wild & Scenic River just in the last few months and this development abuts that. This location is an incredibly special place.	The portions of the project within the ACEC will be improved from their existing state as an active sand and gravel mine. The project areas will be stabilized with a combination of impervious and vegetated surfaces. Stormwater will be detained and treated in accordance with DEP critical area standards. Project improvements will improve conditions within the ACEC relative to water quality, storm damage prevention and flood control. Habitat value and biodiversity will be unchanged.
6-55	Much of this PMP site is in Lancaster's Water Resource District (WRD). There are limitations on wastewater, auto salvage storage, hazardous waste and petroleum product storage (which will affect the car service center) and on the percentage of impervious surface allowed.	The project will be in full accordance with all applicable regulations and zoning ordinances.
6-56	Efforts were made by a Fort Pond Road developer several years ago to decrease the size of the WRD in that area to facilitate denser development and the zoning bylaw amendment did not pass at Town Meeting.	The project will be in full accordance with all applicable regulations and oning ordinances.
6-57	I do not know how solid the plan is for Lunenburg water to supply this site. Within the last 4 years, that has been a controversial local issue with Lunenburg residents. Many of them are not aware of this current effort towards a Lunenburg-Lancaster agreement on water that will supply Lunenburg Road.	Lunenburg submitted a WMA Permit application on December 8, 2018 to increase its withdrawal volume and add a new wellfield. MassDEP issued approval of the wellfield site and the proposed pumping test on September 21, 2017. The pumping test was scheduled for late summer 2019 and will be reviewed concurrently with the WMA Permit application.

6-58	Assuming it goes through, I am hoping that MEP A and this developer will work together to create a development plan that does not exploit the location to its maximum profit ... A plan wbfoh everyone can live with without degrading the hundreds of acres of conservation land that it abuts.	The DEIR contains a detailed Alternatives Analysis including a quantitative comparison o fthe proposed impacts for ecah alternative. The proponent has sought to avoid, minimize and mitigate damage to the environment through this analysis while providing a development program that is suitable for the area and in alighment with the Town of Lancaster master planning efforts. The Proponent will design the Project to meet or exceed all applicable Local, State, and Federal Standards and Regulations. The project will include approximately 36.9 acres of open space in the southwestern portion of the Site adjacent to the proposed auto sales area. Additionally, approximatley 61.4 acres of open space will remain in the northern portion of the site near buildings "C" and "D". These aeras contain a significat amount of wetland resource areas that are not anticipated to be impacted by the proposed project. In addtion, the proponent will be donating two parcels of land (Map 14, Lot 15 and Map 19, Lot 11) totaling 86.7acres of land as open space. These parcels are adjacent to the Lancaster State Forest as well as other conservation areas and contain wetlands, streams and are within the ACEC. Refer to **Section 10** of the DEIR for addittional information.

APPENDIX K: DEIR CIRCULATION LIST

CIRCULATION LIST

SECRETARY KATHLEEN THEOHARIDES
EXECUTIVE OFFICE OF ENERGY &
ENVIRONMENTAL AFFAIRS
ATTENTION: MEPA OFFICE
100 CAMBRIDGE STREET, SUITE 900 (9TH FLOOR)
BOSTON, MA 02114

DEPARTMENT OF ENVIRONMENTAL
PROTECTION
COMMISSIONER'S OFFICE
ATTENTION: MEPA COORDINATOR
ONE WINTER STREET
BOSTON, MA 02108

DEPARTMENT OF ENVIRONMENTAL
PROTECTION
CENTRAL REGIONAL OFFICE
ATTENTION: MEPA COORDINATOR
8 NEW BOND STREET
WORCESTER, MA 01608

MASSACHUSETTS DEPARTMENT OF PUBLIC
HEALTH
ATTENTION: MEPA COORDINATOR
250 WASHINGTON STREET
BOSTON, MA 02108

MASSACHUSETTS DEPARTMENT OF
TRANSPORTATION
PUBLIC/PRIVATE DEVELOPMENT UNIT
TEN PARK PLAZA #4150
BOSTON, MA 02116

MASSDOT HIGHWAY DEPARTMENT –
DISTRICT 3
ATTENTION: MEPA COORDINATOR
403 BELMONT STREET
WORCESTER, MA 01604

MASSACHUSETTS HISTORICAL COMMISSION
THE MA ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MA 02125

ENERGY FACILITIES SITING BOARD
ATTENTION: MEPA COORDINATOR
ONE SOUTH STATION
BOSTON, MA 02110

MASSACHUSETTS DIVISION OF ENERGY
RESOURCES
ATTENTION: MEPA COORDINATOR
100 CAMBRIDGE STREET, SUITE 1020 (10TH
FLOOR)
BOSTON, MA 02114

MASSACHUSETTS DEPARTMENT OF
CONSERVATION AND RECREATION
251 CAUSEWAY STREET – 9TH FLOOR
BOSTON, MA 02114

MONTACHUSETT REGIONAL PLANNING
COMMISSION
464 ABBOTT AVENUE
LEOMINSTER, MA 01453

LANCASTER COMMUNITY DEVELOPMENT &
PLANNING
PRESCOTT BUILDING
701 MAIN STREET, SUITE 4, LOWER LEVEL
LANCASTER, MA 01523

LANCASTER ADMINISTRATION & BOARD OF
SELECTMAN
PRESCOTT BUILDING
701 MAIN STREET, SECOND FLOOR
LANCASTER, MA 01523

LANCASTER PLANNING BOARD
TOWN HALL, SUITE 4
695 MAIN STREET
LANCASTER, MA 01523

LANCASTER CONSERVATION COMMISSION
PRESCOTT BUILDING
701 MAIN STREET, SUITE 4, LOWER LEVEL
LANCASTER, MA 01523

LANCASTER BOARD OF HEALTH
PRESCOTT BUILDING
701 MAIN STREET, SUITE 6, LOWER LEVEL
LANCASTER, MA 01523

LANCASTER PUBLIC LIBRARY
717 MAIN STREET
LANCASTER, MA 01523

LEOMINSTER PUBLIC LIBRARY
30 WEST STREET
LEOMINSTER, MA 01453

NASHUA RIVER WATERSHED ASSOCIATION
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