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LETTER OF TRANSMITTAL

DATE: 1/2/2020

SENDING VIA: **Federal Express/Next Day**

TO: SHREWSBURY BOARD OF SELECTMAN
ATTN: KRISTEN LAS
100 MAPLE AVENUE
SHREWSBURY, MA 01545

RE: Centech Park North
Shrewsbury, MA

JOB #: W181144

Item #	# of Copies	Date	Description
1	1	01/02/20	Final Environmental Impact Report

These are transmitted: ☐ For approval ☒ For your use ☐ As requested ☐ For review and comment

Comments:

Attached please find the above-mentioned items for your use. Should you have any questions or require any additional information, please do not hesitate in contacting me 508-480-9900.

COPY TO:

FROM: **Nathaniel Mahonen (nmahonen@bohlereng.com)**

If enclosures are not as noted, kindly notify us at once.

Final Environmental Impact Report

CENTECH PARK NORTH

384-386 South Street, Shrewsbury, Massachusetts
Worcester County

Submitted to:
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
Attn: MEPA Office

Proponent:
Town of Shrewsbury
100 Maple Ave., Shrewsbury, MA 01545

EcoTec, Inc.
102 Grove Street, Worcester, MA 01605

Prepared by:
BOHLER ENGINEERING
352 Turnpike Road, Southborough, MA 01772

Whitestone Associates, Inc.
352 Turnpike Road, Suite 320
Southborough, MA 01772

MDM Transportation Consultants, Inc.
28 Lord Road, Suite 280, Marlborough, MA 01752

Tech Environmental
303 Wyman Street, Suite 295, Waltham, MA 02451

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January 2, 2020

#W181144

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Mass DOER - Greenhouse Gas Draft Section 61 Findings

APPENDIX E: DEIR CERTIFICATE AND COMMENTS
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MassDOT Comment Letter on the DEIR, dated September 20, 2019

MassDOER Comment Letter on DEIR, dated September 24, 2019

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APPENDIX F: FEIR CIRCULATION LIST

I. PROJECT DESCRIPTION

Site Context and Zoning

The project site (hereinafter referred to as the "Site") is located at 384-386 South Street, identified as Tax Assessor's Map 42, Parcel 011, consisting of approximately 66.5± acres of land. The Site is bordered by South Street and commercial property (Charles River Lab) to the north, a ground-mounted solar field and residential properties to the west, commercial businesses and Route 20 to the south, and residential dwellings and commercial properties to the east. A portion of the Site along South Street is currently developed with three (3) vacant buildings and a paved/gravel parking area associated with the prior agricultural use of the property. The remaining portion of the Site consists of undeveloped woodlands with mature tree growth, areas covered by scrub vegetation and secondary tree growth within the former farm fields, and wetland resource areas. The Site has undeveloped frontage along South Street and Route 20 and is separated into two distinct developable areas by a large wetland resource area that generally extends from the southwest edge to the northeast of the Site.

The Site is located within the Town's Flexible Development Overlay District, which contains Sub-Districts A and B located in the north and south portions, respectively. The underlying zoning is Office-Research (O-R). Adjacent parcels to the north and northeast are zoned O-R, while parcels to the east, south, and southwest are Limited-Industrial. Parcels located to the west of the site are zoned Rural "B".

Site and Project History

The Site, formerly known as the "Allen Property", was previously used for agricultural purposes and was previously zoned Limited Industrial and Rural "B". After numerous unsuccessful attempts by the previous owner to market the land for light industrial development, the owners entered into a purchase and sale agreement with a national rental housing developer in 2002. Because much of the property had been assessed as Chapter 61A land, the Town of Shrewsbury was afforded a right of first refusal to match the housing developer's purchase offer.

In 2002, the Town of Shrewsbury obtained a state grant to implement several of the Town's 2001 Master Plan commercial and industrial zoning recommendations, which identified the Site as suitable for industrial, office, and research and development uses. In September of 2002, the Town acquired approximately 49-acres by exercising its right of first refusal and acquired the remaining portion through negotiations with the previous owner. The acquisition was made under the auspices of the Shrewsbury Development Corporation (SDC), which was established in February of 2003.

In 2007, after four (4) years of conceptual site planning, the Town was awarded a Chapter 43D Expedited Permitting planning grant to conduct an independent assessment of the land's potential, explore the impacts of development possibilities, and prepare a plan for the Board of Selectman's consideration in accordance with the requirements of Chapter 493. A Conceptual Site Development Plan was prepared by Beta Group, Inc. as part of the 2008 "Allen Property Master Plan Report", which proposed amendments to the Zoning Bylaw to allow more flexible uses to be developed on the Site and ultimately supplement the existing Office-Research district. In 2009,

Shrewsbury Town Meeting voted to rezone the property and establish a Flexible Development Overlay District and associated by-law. The goal of the overlay zoning district was to encourage flexible, planned development to provide employment and fiscal benefits to the town, and to establish review and permitting procedures for a Priority Development Site under the provisions of MGL Chapter 43D.

Additionally, in early 2018, the Town received a Site Readiness Grant from MassDevelopment and a Local Technical Assistance Grant from the Central Massachusetts Regional Planning Commission (CMRPC) and commissioned a second study to evaluate the former Allen Property as a potential site for the proposed Beal Early Childhood Center. The study evaluated and compared the merits of the Site and an alternative site known as the Glavin Center on Lake Street. It was determined that the alternate site was more suitable for the development of the school.

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. A Project Notification Form (PNF) was filed with the Massachusetts Historical Commission (MHC) on November 20, 2018. MHC to confirmed that the Site does not meet the criteria of eligibility for listing in the State Register of Historical Places and no further MHC review is required for the Project.

A Phase I Environmental Site Assessment was conducted in February 5, 2018 and did not identify any Recognizable Environmental Concerns. Due to the past use of a portion of the Site as an orchard, a Potential Environmental Concern is noted due to possible use of lead arsenate pesticides.

The Project triggers review thresholds requiring compliance with the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00. The Proponent filed an Environmental Notification Form (ENF) with the MEPA Office on November 30, 2018. An ENF Certificate was issued by MEPA on January 4, 2019, requiring the filing of a mandatory Environmental Impact Report (EIR). On August 15, 2019, the Proponent filed a Draft EIR (DEIR), and received the corresponding Certificate issued by MEPA on September 27, 2019. In the Certificate, MEPA concluded that the Proponent may prepare and submit for review a Final EIR (FEIR). The FEIR is comprised of the information found within this report and in the corresponding Appendices, complies with 310 CMR 11.07, and addresses the comments identified in the DEIR Certificate and those provided by State Agencies.

Summary of Project Changes

The Preferred Master Plan remains the same as submitted in the DEIR filing. In response to DEIR comments received from MEPA and corresponding State Agencies, several modifications are proposed to the Project in an effort to further reduce environmental impacts to the Site where possible. The modifications proposed in this FEIR include recommendations for reserve parking areas, reduced wetland buffer impacts, reduced impervious coverage, and reduced direct wetland impacts, as further described herein.

As described in the Shrewsbury Zoning Bylaw, the Planning Board may allow a decrease in parking of up to 25% for “reserve parking” during the local permitting process. The Proponent will consider designation of 25% of the parking required onsite as reserve spaces. The Preferred Master Plan proposes a total of 812± parking spaces onsite, therefore approximately 200± parking

spaces may be designated as such and shall be maintained as pervious/landscaped surfaces until parking demand or the Town warrants them as needed. By incorporating this change, the Project would result in a total of approximately 612± parking spaces. Potential reserve parking locations were identified as areas located in wetland buffer zones in an effort to reduce total buffer zone impacts to the maximum extent practicable. The Reserve and Compact Parking Exhibit provided in **Appendix B** identifies potential reserve parking locations.

The Project proposes to reduce impervious coverage onsite by both designating reserve parking and by specifying compact parking spaces in lieu of standard spaces. As noted in the Shrewsbury Zoning Bylaw, sites located within the underlying Office/Research District allow up to 25% of required parking to be designated for compact spaces. The Proponent will consider designation of 25% of the remaining parking required (after the removal of reserve spaces from the total) as compact parking, which equates to approximately 150± spaces. As a result of the reduced number and size of spaces across the site, the Project will result in approximately 13.1± acres of new impervious surface, which represents a reduction in impervious surface of approximately 6±% when compared to the DEIR. Refer to the Reserve and Compact Parking Exhibit provided in **Appendix B** for potential compact parking areas.

The Project also proposes an 870± SF or 22% reduction in total wetland impacts as compared to the DEIR filing. This reduction is the result of removing impacts near Building F. These areas are represented on the Revised Wetland Resources & Associated Impacts Plan provided in **Appendix B**.

Refer to **Table 1** below for a quantitative summary of project changes as proposed to the Preferred Master Plan since the DEIR filing.

Table 1: Project Impact Comparison

Project Impacts	Alternative	
	DEIR Preferred Master Plan	**FEIR Reduced Impact**
Total Increase in Impervious Coverage* (Ac)	14±	13.1±
Impacts to Wetland Resource Areas (SF)	3,930± (impact) 4,340± (replication) 1,800± (restoration)	3,060± (impact) 2,580± (replication) 1,800± (restoration)
Parking Spaces	812±	622± **

* Includes buildings

** As approved by the Town of Shrewsbury Planning Board for the use of reserve and compact parking spaces onsite

II. LAND ALTERATION

Open Space

The Proponent is committed to providing open space and landscaping as required by the Town of Shrewsbury Zoning Bylaw. Within the Flexible Development Overlay District, a minimum of 25% open space is required. Additional landscaped buffers, interior landscaping, and tree planting are required by local regulations. Subsequent plans to be submitted for local permits will meet or exceed the above requirements. The Proponent has also identified approximately 29± acres of open space. The Town has not committed to a restriction on the open space, however, there are restrictions on development of open space within the Zoning Bylaws and the Town will continue to look for ways to use the 29 acres as passive and/or active open space for the proposed development. Refer to the Potential Protected Open Space Exhibit provided in Appendix B of the DEIR for reference.

III. WETLAND RESOURCE AREAS

Mitigation and Performance Standards

The cumulative impacts proposed to the BVW for all areas will be 3,060± SF, which is a reduction of 22% from the DEIR Filing. Wetland impacts proposed at the crossing for the future development of Building E have been relocated to an area that is not designated by the Massachusetts NHESP as a potential vernal pool (PVP). Refer to the Revised Wetland Resources & Associated Impacts Exhibit provided in **Appendix B**.

In areas of wetland replication, a ratio of 2:1 is proposed as mitigation. All work associated with wetland impact/replication will be in compliance with the performance standards outlined in the Massachusetts Wetlands Protection Act, Section 310 CMR 10.55(4). Work proposed on the future development lots and water loop connection are anticipated to require separate Orders of Conditions from the Town of Shrewsbury Conservation Commission.

During the local permitting process, the proposed work associated with wetland impact and replication, including but not limited to surface area calculations, grading, planting descriptions, construction details, erosion control, and phasing will be developed in accordance with the Massachusetts Inland Wetland Replication Guidelines and constructed in accordance with standard best practices. Plans will be submitted to the Town for approval, and a copy of the NOI filing will be provided to MassDEP. These filings will demonstrate compliance with WPA performance standards. The Project will also be subject to a NPDES CGP and Multi-Sector General Permit (MSGP) and will have a SWPPP that will be utilized to minimize construction related impacts.

IV. STORMWATER MANAGEMENT AND LID TECHNIQUES

The drainage system will be designed to meet or exceed MassDEP Stormwater Standards (the "Standards") and the Town of Shrewsbury Stormwater Management Rules & Regulations. 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. Existing drainage infrastructure within South Street that discharges to the Project Site will remain to the extent practicable and may be modified to maintain existing drainage flow patterns. There are no anticipated piped connections to off-site stormwater infrastructure. The Proponent will work with the Town of Shrewsbury to evaluate and mitigate any potential impacts to the existing stormwater infrastructure and to resource areas on and surrounding the Project site.

Low impact development (LID) techniques to be considered for use on the individual lots consist of proprietary water quality units, bioretention areas, grassed swales, and rainwater collection cisterns. Proprietary water quality units will provide pretreatment and will be sized to treat the 1-inch water quality volume onsite. Bioretention areas will be considered in locations of stormwater basins identified on the Preferred Master Plan, included in Appendix B of the DEIR, to further improve the water quality of stormwater discharges from the site. Additional treatment onsite will be considered with the use of water quality/grassed swales. Cisterns will be considered to collect rainwater from proposed building rooftops for reuse for irrigation. Each LID technique 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. For potential site locations of the LID techniques described above, refer to the Potential Low Impact Design (LID) Location Exhibit provided in **Appendix B**.

Additional LID techniques such as photo-voltaic (PV) and electric car charging stations are also considered for the Project. The Proponent commits to providing "solar-ready" space available for possible PV installation on 60% of the roof areas on the project buildings, an amount exceeding Code requirements. Electric conduit shall be provided to a minimum of 10% of the parking spaces on each lot for the installation of electric vehicle charging stations, as required by the Town of Shrewsbury. Approximate locations of future electric vehicle parking and charging stations is shown on the Potential Low Impact Design (LID) Location Exhibit provided in **Appendix B**.

The Town of Shrewsbury has submitted a Municipal Vulnerability Preparedness (MVP) Action Grant in November 2019 in an effort to plan for climate change resiliency and to encourage the use of LID techniques on future projects.

V. UTILITY INFRASTRUCTURE

Water Supply & Mitigation Strategies

The Proponent will coordinate with end-users to ensure that efficient water use strategies are implemented to reduce overall potable water use on-site, and to ensure that the necessary water supply is available.

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
- Capturing / Reusing rainwater for irrigation
- Installation of low-flow plumbing fixtures
- Development/Implementation of maintenance and employee education programs

Wastewater Supply & Mitigation Strategies

The Project is expected to generate an increase in wastewater flows of approximately 29,500± GPD from the existing condition. Current wastewater generated from the existing Site is directed to a treatment plant located in the Town of Westborough. The Project is expected to continue to direct wastewater flows to the same. However, if it is determined that an alternate source is to be considered to handle flows from the Project, the Proponent will ensure that the required infrastructure is designed in conformance with all local and state regulations, and necessary permits are sought for the connection.

Per discussions with the Water/Sewer Department, the Town requires Infiltration/Inflow (I/I) mitigation at a ratio of 4:1 upon connection of a new service to the municipal system.

VI. TRANSPORTATION

Refer to Section VII of the DEIR for a thorough description of transportation impacts and mitigation strategies associated with the Project. The impacts and mitigation recommendations are consistent with the Project as described in the DEIR and this FEIR.

The Transportation Component provided in **Appendix C** presents supplemental transportation analyses that respond to MassDOT comments issued as part of the Certificate on the DEIR for the proposed commercial development of the Centech Park North property. This supplemental report also includes an updated Letter of Commitment which will provide the basis for a subsequent Section 61 Finding to be issued by MassDOT for the project, provided in **Appendix D**. Specific areas of supplemental analyses include the following:

- *Updated Study Area*: The Study area presented in the DEIR have been updated to include a review of the Grafton Street interchange along Route 9 as well as the signalized intersections of Route 9 with Lake Street and Oak Street to determine whether they meet *Transportation Impact Assessment Guidelines* for inclusion in the study area.

- *Updated Traffic Operations Analysis*: Updated capacity analyses for the expanded study intersection of Route 9 eastbound at Grafton Street are developed for Baseline and future-year No-Build and Build conditions.

- *Updated Monitoring Program:* The monitoring program presented in the DEIR has been updated to include a monitoring of the Route 20 at Centech Boulevard intersection prior to build-out of Sub-District B.

- *Mitigation Summary:* Mitigation measures are outlined that minimize the traffic impacts for the development and have been further refined since the DEIR to address comments issued by MassDOT on the DEIR. This section outlines specific mitigation measures to offset project-related traffic impacts that include (a) traffic monitoring; (b) access/egress improvements; (c) pedestrian and bicycle accommodations; (d) a transportation demand management (TDM) program to enhance traffic operations and travel safety; (e) off-site

improvements; and (f) road safety audit. Refinement of these mitigative actions is anticipated under a subsequent MEPA filing that will consider the master plan buildout of the property and that will be memorialized as part of a MassDOT Section 61 Finding following completion of the MEPA review process.

VII. ENERGY, GREENHOUSE GAS EMISSIONS, & AIR QUALITY

Refer to Section VIII of the DEIR for a thorough description of energy, greenhouse gas emissions, and air quality impacts and mitigation measures, as well as associated analyses for the Project. The information provided is consistent with the Project as described in the DEIR and this FEIR. Refer to **Appendix D** for Draft MassDOER Section 61 findings.

VIII. MITIGATION SUMMARY

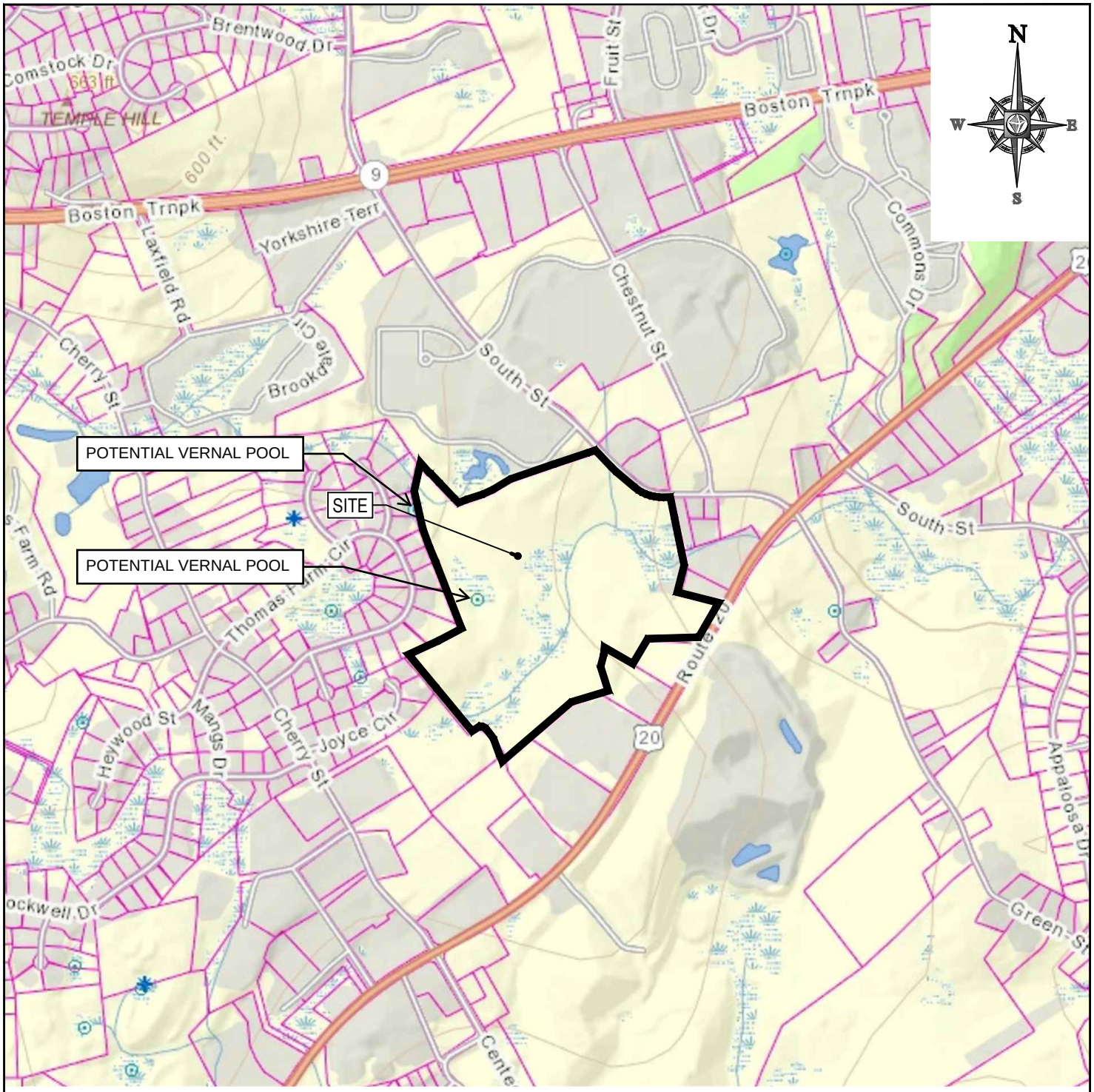
A summary of revised mitigation efforts proposed as part of the Project since the DEIR filing are included below.

- Consider reducing total parking onsite by 25% by designating reserve parking areas*;
- Consider reducing impervious coverage onsite by designating 25% of parking spaces as compact spaces*;
- Reduce total impervious coverage by 6%**;
- Reduce wetland impacts by approximately 22%;
- Reduce wetland buffer zone impacts;
- Propose rainwater cisterns at buildings to capture and promote reuse of rainwater for irrigation;
- Provide electric conduit to 10% of the proposed parking spaces on each lot for future electric vehicle charging stations;
- Provide additional methods to reduce idling onsite such as provide driver training, perform periodic inspections by site supervisors, and install signage to limit idling to five minutes or less on site; and
- Consider the locations of noise producing equipment and site features in relation to abutters (e.g. HVAC units, generators, loading areas, driveways, etc.).

* As approved by the Town of Shrewsbury Planning Board during the local permitting process for reserve parking and compact spaces.
** Impervious coverage reduction achieved by providing reserve parking and compact spaces.

APPENDIX A: PROJECT MAPS

Areas of Critical Environmental Concern (ACEC) Map



LEGEND

AREA OF CRITICAL ENVIRONMENTAL CONCERN (NON SHOWN ON MAP EXTENTS)

POTENTIAL VERNAL POOL (PVP)

SCALE: 1"=1000'
SOURCE: MASSGIS (DEPARTMENT OF CONSERVATION & RECREATION)

PROJECT:

AREAS OF CRITICAL ENVIRONMENTAL CONCERN MAP

FOR

CENTECH PARK NORTH

MAP #42, LOT #11
384-386 SOUTH STREET
TOWN OF SHREWSBURY, WORCESTER COUNTY, MASSACHUSETTS

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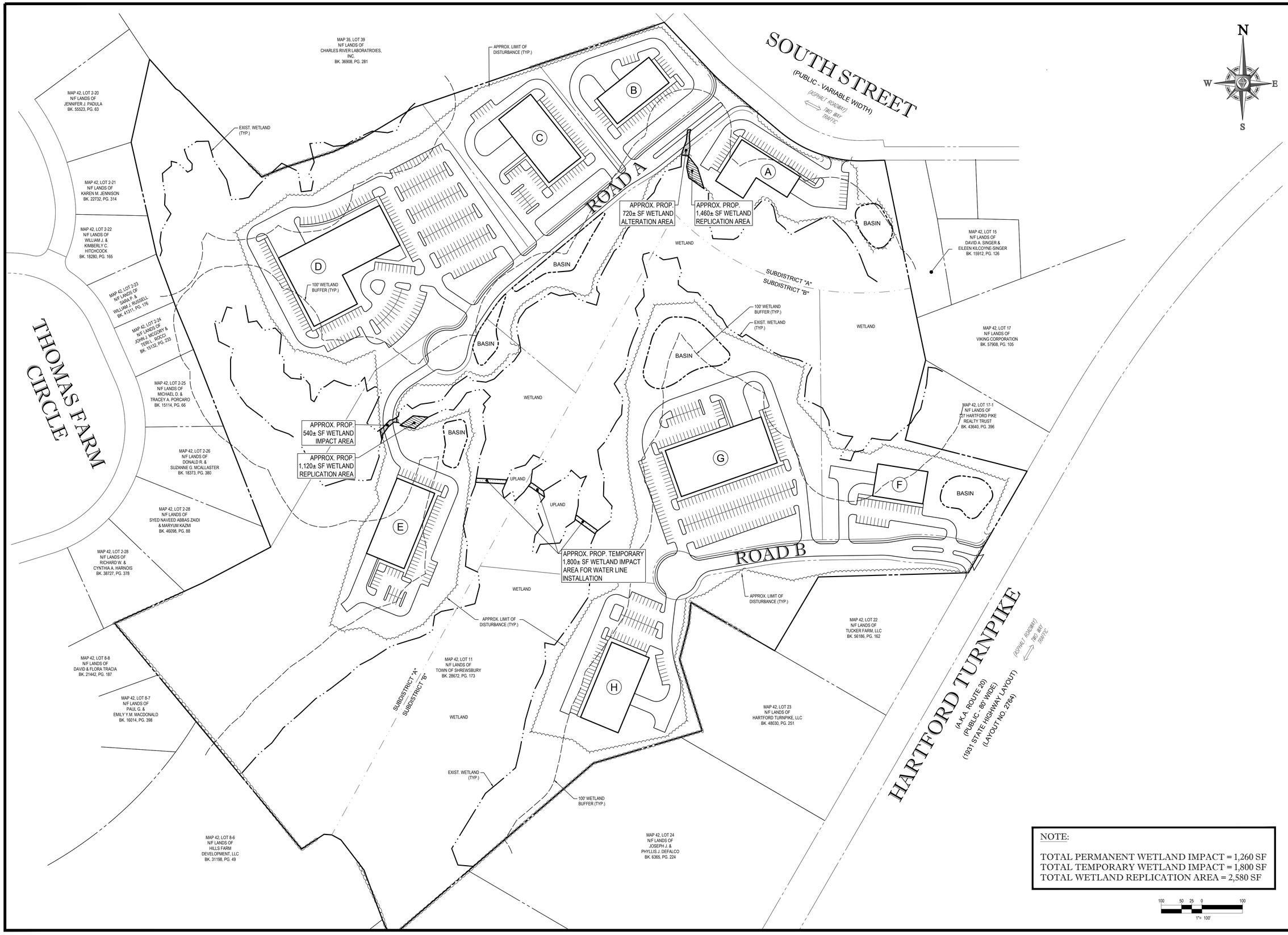
APPENDIX B: EXISTING AND PROPOSED CONDITIONS PLANS

Revised Wetland Resources and Associated Impacts Plan

Reserve and Compact Parking Space Exhibit

Potential Low Impact Design (LID) Exhibit

Approximate Pedestrian and Bicycle Circulation Exhibit



NOTE:

TOTAL PERMANENT WETLAND IMPACT = 1,260 SF
TOTAL TEMPORARY WETLAND IMPACT = 1,800 SF
TOTAL WETLAND REPLICATION AREA = 2,580 SF

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PRELIMINARY

PROJECT No.:	W181144
DRAWN BY:	CFD
CHECKED BY:	NEM
DATE:	11/15/2019
SCALE:	AS NOTED
CAD I.D.:	W181144CB1-MEPA CONCEPTS

PROJECT:
SITE DEVELOPMENT PLANS
FOR
CENTECH PARK NORTH

LOCATION OF SITE
MAP 42, LOT 11
384-386 SOUTH STREET
TOWN OF SHREWSBURY
WORCESTER COUNTY, MASSACHUSETTS

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SHEET TITLE:
REVISED WETLAND RESOURCES & ASSOCIATED IMPACTS PLAN

SHEET NUMBER:
1
OF 1

CB1 - 11/15/2019

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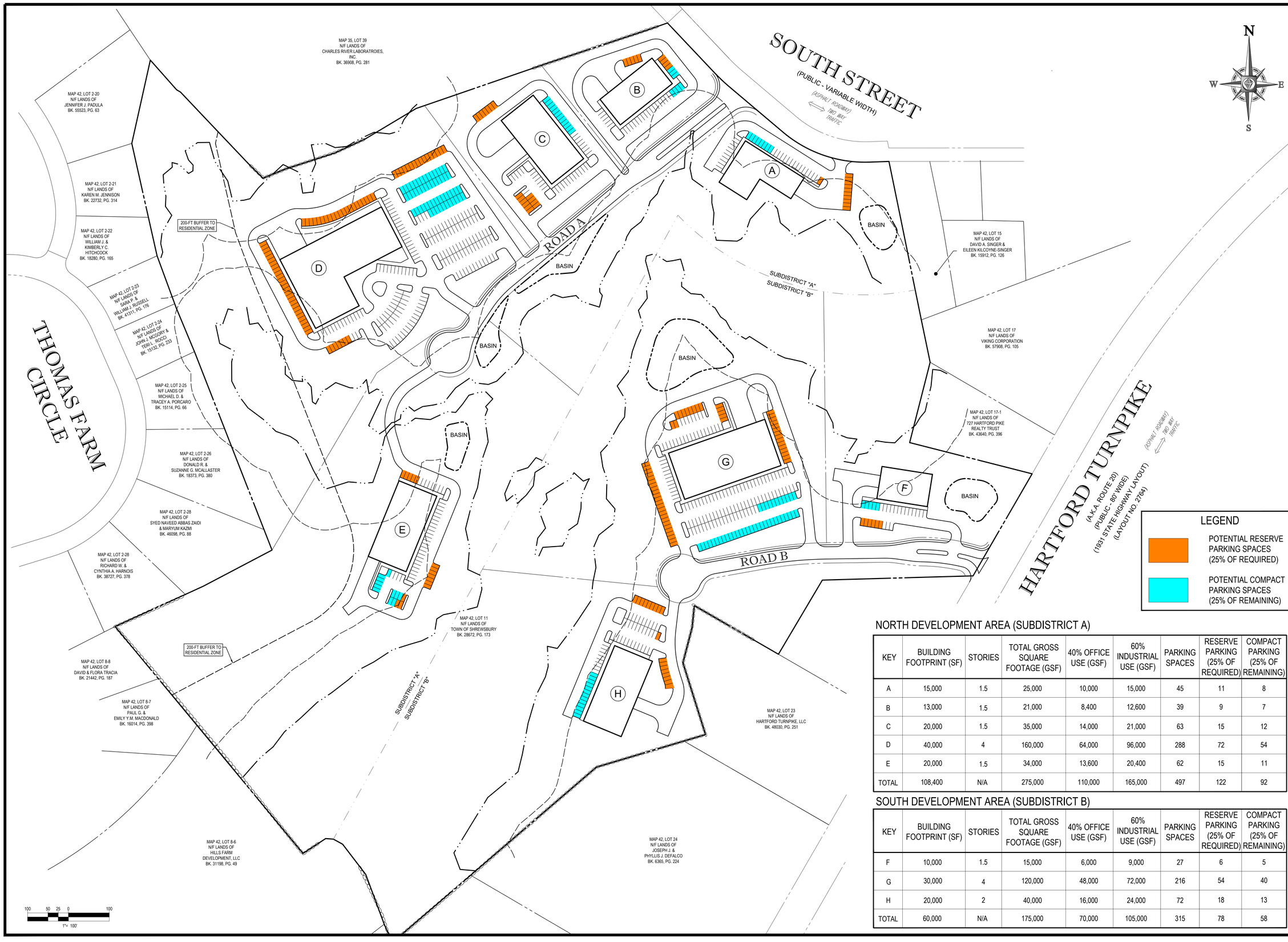

LEGEND

- POTENTIAL RESERVE PARKING SPACES (25% OF REQUIRED)
- POTENTIAL COMPACT PARKING SPACES (25% OF REMAINING)

NORTH DEVELOPMENT AREA (SUBDISTRICT A)

KEY	BUILDING FOOTPRINT (SF)	STORIES	TOTAL GROSS SQUARE FOOTAGE (GSF)	40% OFFICE USE (GSF)	60% INDUSTRIAL USE (GSF)	PARKING SPACES	RESERVE PARKING (25% OF REQUIRED)	COMPACT PARKING (25% OF REMAINING)
A	15,000	1.5	25,000	10,000	15,000	45	11	8
B	13,000	1.5	21,000	8,400	12,600	39	9	7
C	20,000	1.5	35,000	14,000	21,000	63	15	12
D	40,000	4	160,000	64,000	96,000	288	72	54
E	20,000	1.5	34,000	13,600	20,400	62	15	11
TOTAL	108,400	N/A	275,000	110,000	165,000	497	122	92

SOUTH DEVELOPMENT AREA (SUBDISTRICT B)

KEY	BUILDING FOOTPRINT (SF)	STORIES	TOTAL GROSS SQUARE FOOTAGE (GSF)	40% OFFICE USE (GSF)	60% INDUSTRIAL USE (GSF)	PARKING SPACES	RESERVE PARKING (25% OF REQUIRED)	COMPACT PARKING (25% OF REMAINING)
F	10,000	1.5	15,000	6,000	9,000	27	6	5
G	30,000	4	120,000	48,000	72,000	216	54	40
H	20,000	2	40,000	16,000	24,000	72	18	13
TOTAL	60,000	N/A	175,000	70,000	105,000	315	78	58

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DATE: 11/15/2019
SCALE: AS NOTED
CAD I.D.: W181144CB1

PROJECT:
SITE DEVELOPMENT PLANS
FOR
CENTECH PARK NORTH

LOCATION OF SITE
MAP #42, LOT #11
384-386 SOUTH STREET
TOWN OF SHREWSBURY
WORCESTER COUNTY,
MASSACHUSETTS

BOHLER ENGINEERING
352 TURNPIKE ROAD
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SITE DEVELOPMENT PLANS

FOR

CENTECH PARK NORTH

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SITE DEVELOPMENT PLANS

FOR

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APPENDIX C: TRANSPORTATION COMPONENT & APPENDICES

FEIR Transportation Component – Proposed Centech Park North (Prepared by MDM Transportation Consultants, Inc., dated December 30, 2019)

FEIR ***Transportation Component***

PROPOSED CENTECH PARK NORTH

South Street
Shrewsbury, Massachusetts

Prepared for:

Bohler Engineering, P.C.

December 30, 2019

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

FEIR ***Transportation Component***

PROPOSED CENTECH PARK NORTH

South Street
Shrewsbury, Massachusetts

Prepared for:
Bohler Engineering, P.C.

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December 30, 2019

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2	*2019 Baseline Weekday Peak Hour Traffic Volumes*
3	*2026 No-Build Weekday Peak Hour Traffic Volumes*
4	*2026 Build Weekday Peak Hour Traffic Volumes*
5	*Conceptual Plan – Route 20 at South Street/Green Street*
6	*Conceptual Plan – Route 20 at South Street/Green Street (w/ Future Route 20)*

TABLES

Number	Title
1	*Intersection Traffic-Volume Increases*
2	*Intersection Capacity Analysis Results – Route 9 at Grafton Street*
3	*Traffic Mitigation Summary*

1.0 INTRODUCTION

This section of the Final EIR presents supplemental transportation analyses that respond to MassDOT comments issued as part of the Certificate on the Draft Environmental Impact Report (DEIR) for the proposed commercial development of the Centech Park North property along Route 20 and South Street in Shrewsbury, Massachusetts. This report also includes an updated Letter of Commitment which will provide the basis for a subsequent Section 61 Finding to be issued by MassDOT for the project. Specific areas of supplemental analyses are as follows:

- **Updated Study Area.** The Study area presented in the DEIR have been updated to include a review of the Grafton Street interchange along Route 9 as well as the signalized intersections of Route 9 with Lake Street and Oak Street to determine whether they meet *Transportation Impact Assessment Guidelines* for inclusion in the study area.

- **Updated Traffic Operations Analysis.** Updated capacity analyses for the expanded study intersection of Route 9 eastbound at Grafton Street are developed for Baseline and future-year No-Build and Build conditions.

- **Updated Monitoring Program.** The monitoring program presented in the DEIR has been updated to include a monitoring of the Route 20 at Centech Boulevard intersection prior to build-out of Sub-District B.

- **Mitigation Summary**. Mitigation measures are outlined that minimize the traffic impacts for the development and have been further refined since the DEIR to address comments issued by MassDOT on the DEIR. This section outlines specific mitigation measures to offset project-related traffic impacts that include (a) traffic monitoring; (b) access/egress improvements; (c) pedestrian and bicycle accommodations; (d) a transportation demand management (TDM) program to enhance traffic operations and travel safety; (e) off-site improvements; and (f) road safety audit. Refinement of these mitigative actions is anticipated under a subsequent MEPA filing that will consider the master plan buildout of the property and that will be memorialized as part of a MassDOT Section 61 Finding following completion of the MEPA review process.

2.0 UPDATED STUDY AREA

Evaluation of the proposed development impacts requires the establishment of a future baseline analysis condition. This section estimates future roadway and traffic conditions at the supplemental study area intersections with and without the proposed development. Previous assumptions used in the DEIR in including background developments and background growth were used.

To determine the impact of site-generated traffic volumes on the roadway network under future conditions, baseline traffic volumes in the study area were projected to a future year condition. Traffic volumes on the roadway network at that time, in the absence of the development (the No-Build condition), would include existing traffic, new traffic due to general background traffic growth, and traffic related to specific development by others that is currently under review at the local and/or state level. Consideration of these factors resulted in the development of No-Build traffic volumes. Anticipated site-generated traffic volumes were then superimposed upon these No-Build traffic-flow networks to develop future Build conditions.

The following sections provide an overview of the Baseline, future No-Build traffic volumes, and projected Build traffic volumes for the Route 9 at Grafton Street interchange.

2.1 STUDY AREA ROADWAY NETWORK

The supplemental study area roadways and intersections are described briefly in this section. A general description of the physical roadway and intersection features is provided. The study area includes roadways under State (MassDOT) and local (Town) jurisdiction. **Figure 1** shows the site location relative to updated study area.

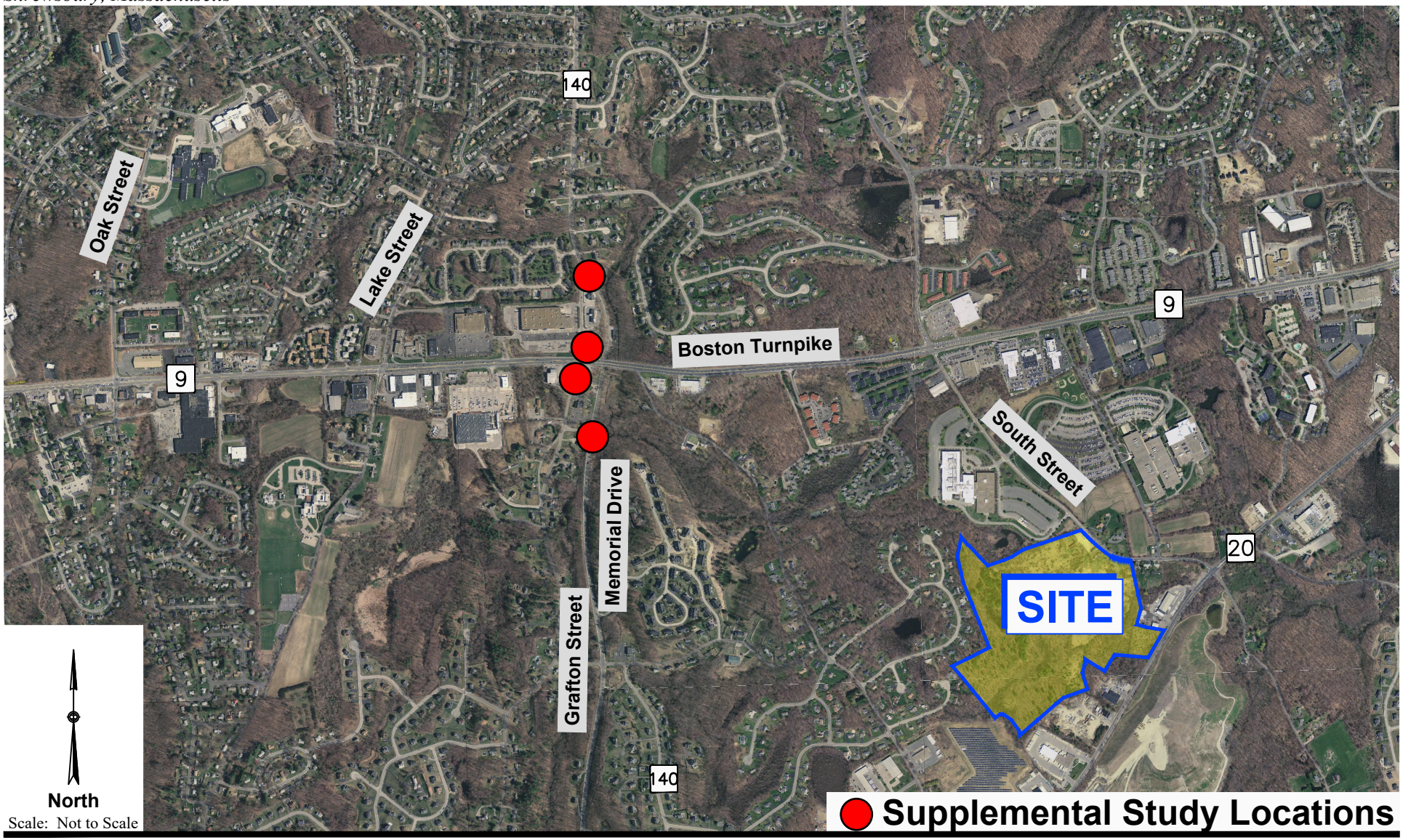

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Figure 1

Site Location

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2.1.1 ROADWAYS

Boston Worcester Turnpike (Route 9)

Route 9 is classified by the MassDOT as an Urban Other Principal Arterial roadway under MassDOT (State) jurisdiction. This roadway generally runs in an east-west direction and provides a connection among various towns and major highways along the central portion of Massachusetts. On a local basis, Route 9 is also known as Boston Worcester Turnpike and provides a connection between the Route 20 interchange located at the Northborough town line to the east and the Worcester city line at Lake Quinsigamond to the west. Within the study area, Route 9 is generally straight with rolling terrain. The roadway provides two lanes of travel in each direction, separated by a Jersey barrier median, with additional turn lanes at its major intersections. The posted speed limit along Boston Worcester Turnpike (Route 9) ranges from 45 to 50 mph in the study area. Land use along Route 9 in the expanded study area is primarily commercial in nature and includes a Home Depot, a retail plaza, restaurants and an office building.

Grafton Street

Grafton Street is classified by the MassDOT as a local roadway under Town jurisdiction. Grafton Street is generally a north-south roadway that connects Route 9 to the north with Route 20 to the south. Grafton Street generally provides one lane of travel in each direction separated by a double yellow centerline. Posted advisory speed limits of 30 mph are located along the roadway in the study area. Land use along Grafton Street near Route 9 consists of residential uses and commercial uses including a Daycare, Café Noir, a retail plaza, and an office building.

Memorial Drive/Grafton Street (Route 140)

Route 140 is classified by the MassDOT as an Urban Principle Arterial roadway under Town jurisdiction. Route 140 is generally a north-south roadway that connects Route 9 to the north with Route 20 to the south. Route 140 generally provides one lane of travel in each direction separated by a double yellow centerline with additional turn lanes provided at its major intersections. Posted advisory speed limits of 40 mph are located along the roadway near its intersection with Route 9. Land use along South Street consists of residential and commercial uses including UPS, United Rentals and Toyota Industrial Equipment.

2.1.2 INTERSECTIONS

Boston Worcester Turnpike (Route 9) at Grafton Street Interchange

Route 9 meets Grafton Street to form a three-legged, unsignalized intersection. The Route 9 eastbound approach provides a two through lanes and an approximately 200-foot right-turn lane. The Grafton Street northbound approach provides an exclusive right-turn lane under "STOP" control. Land use at the intersection consists of a law office, a lighting and furniture store and Swaagat Collections store.

2.2 BASELINE TRAFFIC VOLUMES

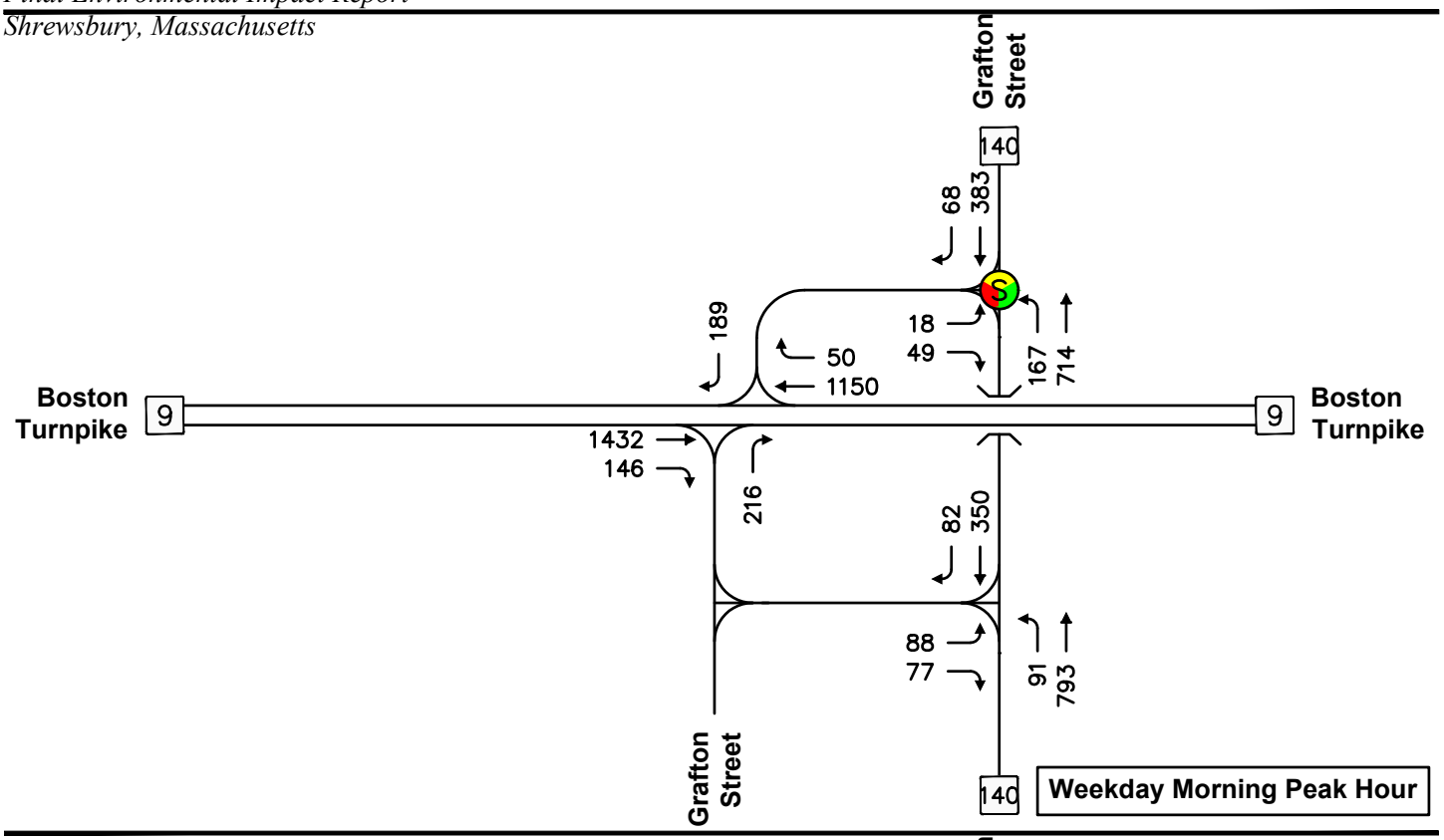
Traffic-volume data used in this study were obtained by mechanical and manual methods in October 2019. Manual turning movement counts (TMCs) were conducted at the supplemental study intersections during the weekday morning (7:00 to 9:00 AM) and weekday evening (4:00 to 6:00 PM) peak periods. These hours represent the combination of busiest activity periods of the proposed site uses and commuter traffic periods. Traffic count data are included in the **Appendix**.

Review of MassDOT permanent count station data in the area indicates that October is an above-average traffic month. No adjustment (reduction) was applied to the October traffic volumes to represent average 2019 Baseline conditions. Permanent count station data is provided in the **Appendix**. The resulting Baseline weekday morning and weekday evening peak-hour traffic volumes for updated study intersections are depicted in **Figures 2**.

2.2.1 FUTURE TRAFFIC VOLUMES

Future 2026 No-Build Traffic Volumes for the supplemental study area intersections were developed by expanding upon the assumptions outlined in the DEIR. Specifically, a 0.5 percent annual growth rate (3.6 percent increase over a 7-year horizon) was applied to Baseline traffic volumes over a seven-year period to account for future traffic growth in the study area as well as trips associated with site-specific trips associated with the Pointe at Hills Farm residential development, the infill of Charles River Laboratories and UMass Offices, Edgemere Crossing at Flint Pond. Trip tracings for the site-specific development are included in the **Appendix**. Future 2026 No-Build traffic volumes are displayed in **Figure 3**.

Future Build condition traffic volumes were arrived at by adding development-specific traffic increases for the development to the 2026 No-Build conditions. The Trip distribution calculated in the DEIR was expanded to include the expanded study intersections based on Journey to Work data. Detailed trip distribution calculations and trip tracings are provided in the **Appendix**. 2026 Build condition traffic-volume networks for the weekday morning and weekday evening peak hours are presented in **Figure 4**.



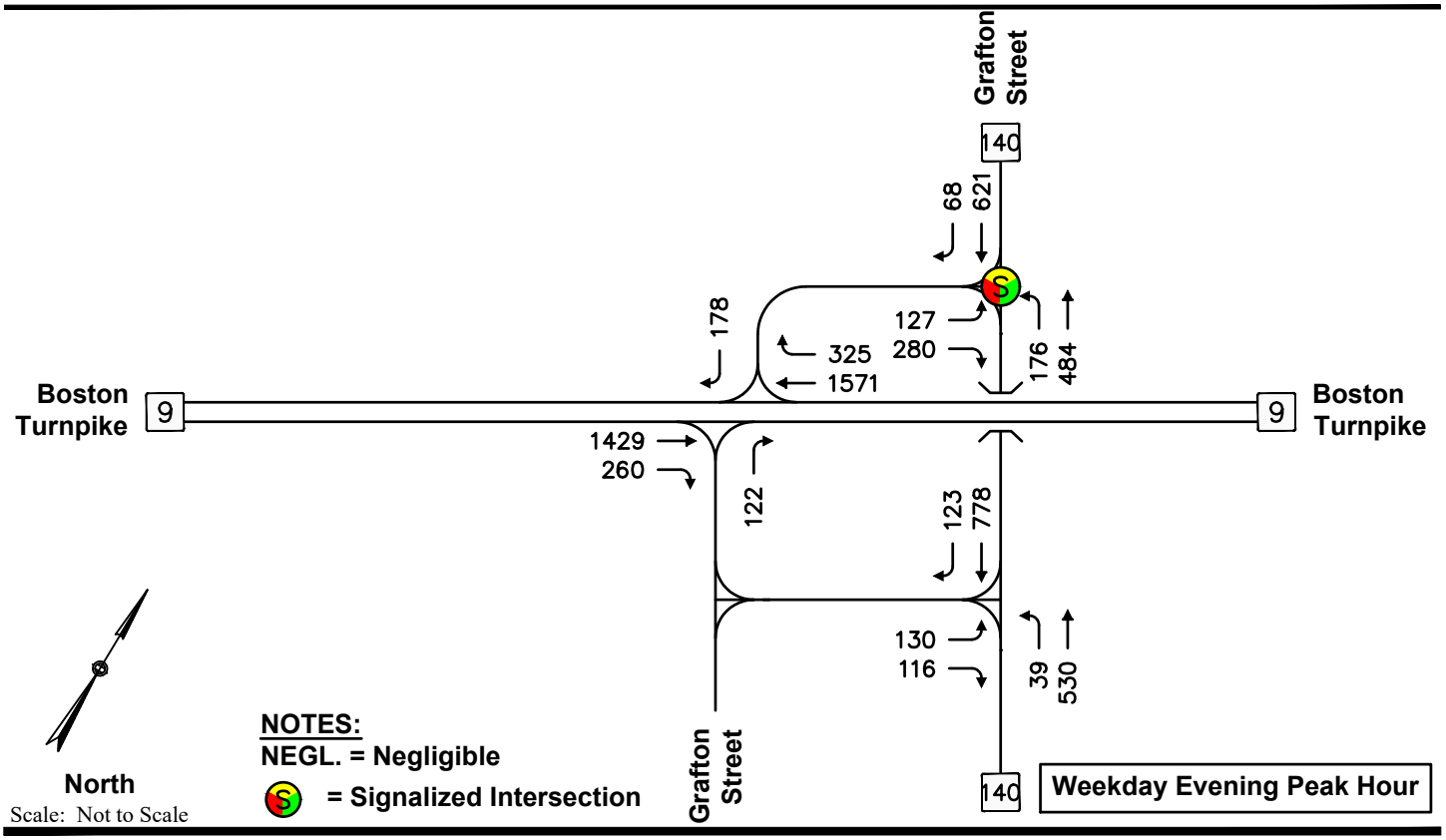


Figure 2

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2019 Baseline Conditions
Weekday Peak Hour Volumes

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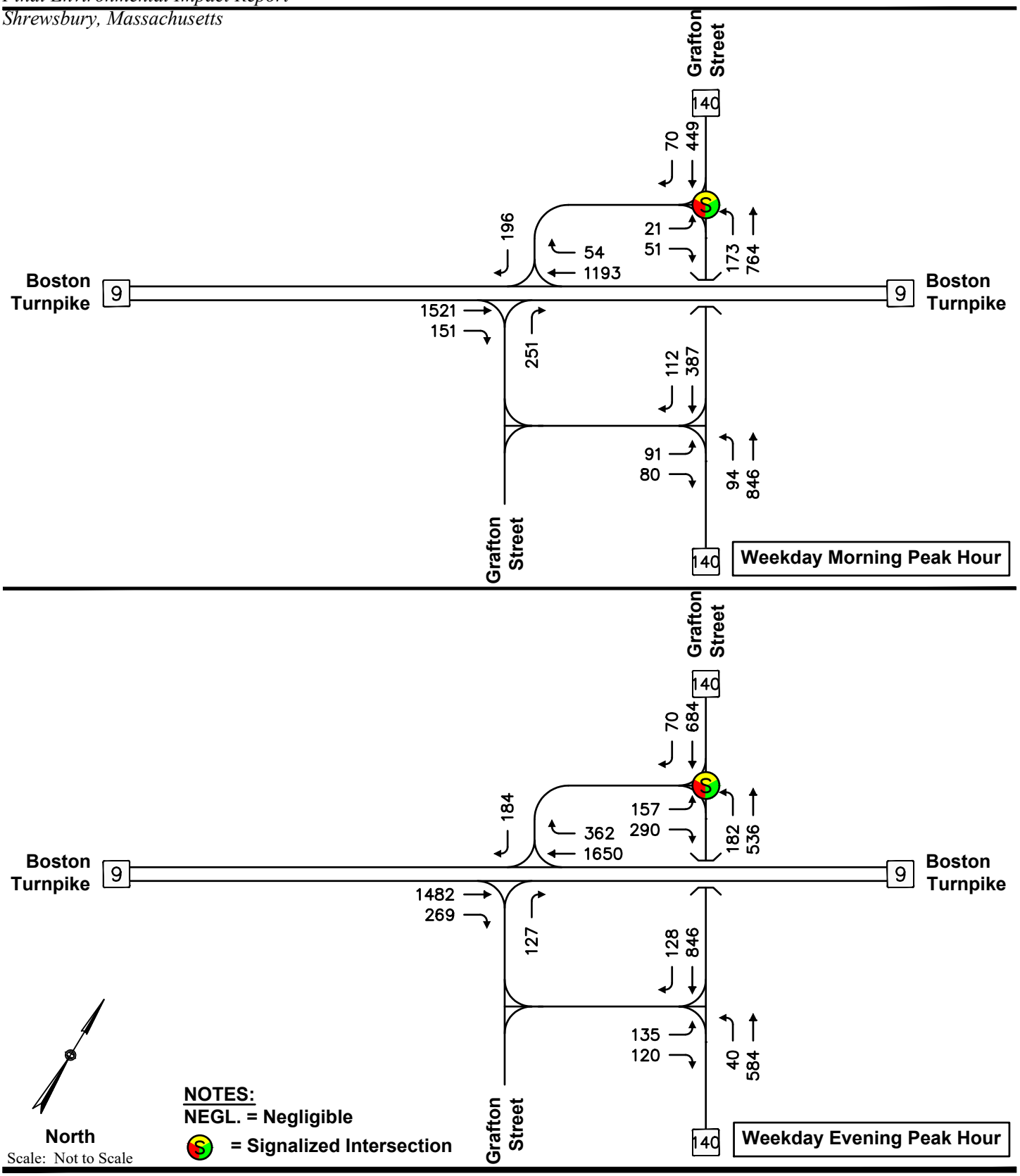

Figure 3

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2026 No-Build Conditions
Weekday Peak Hour Volumes

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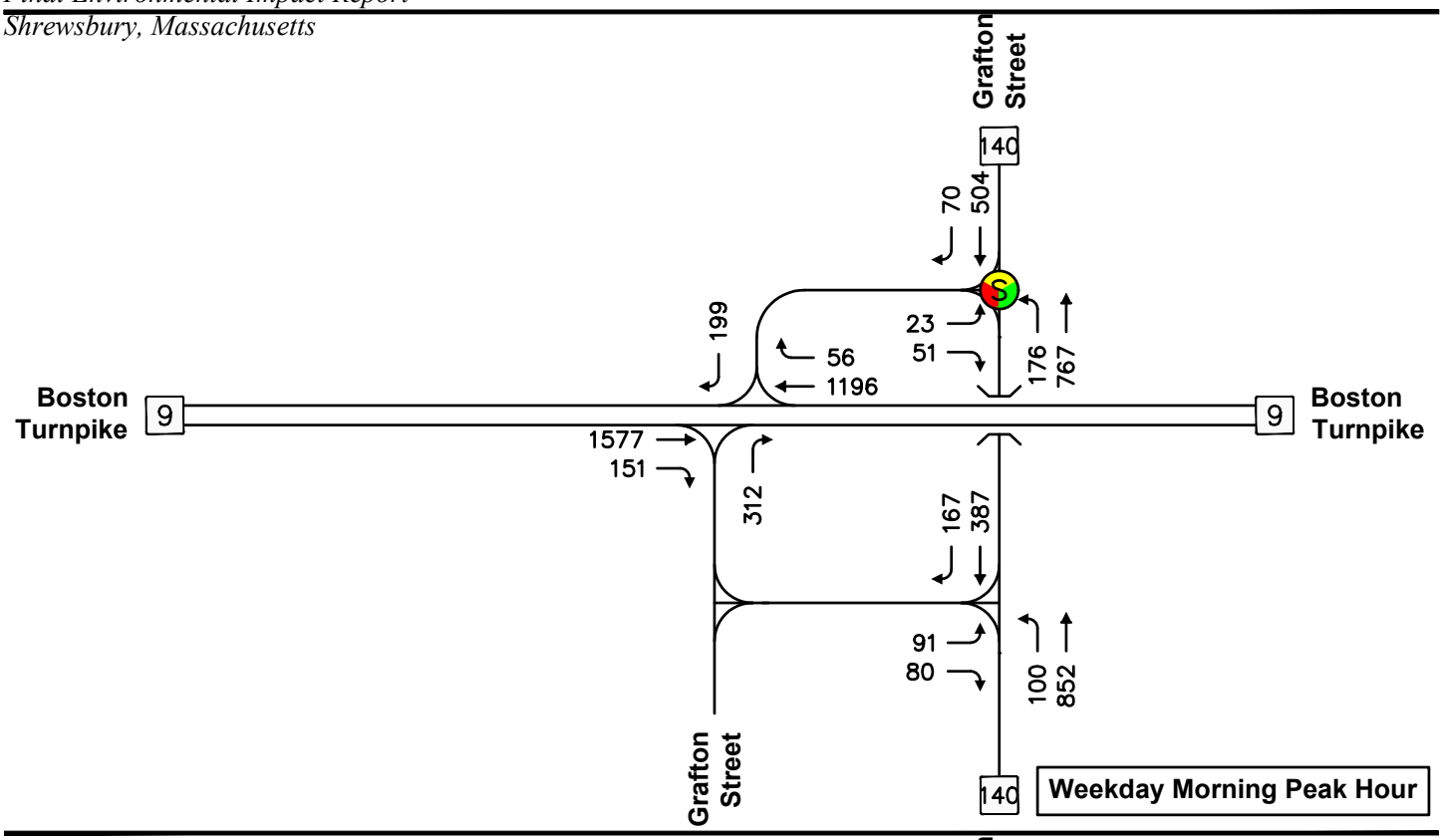

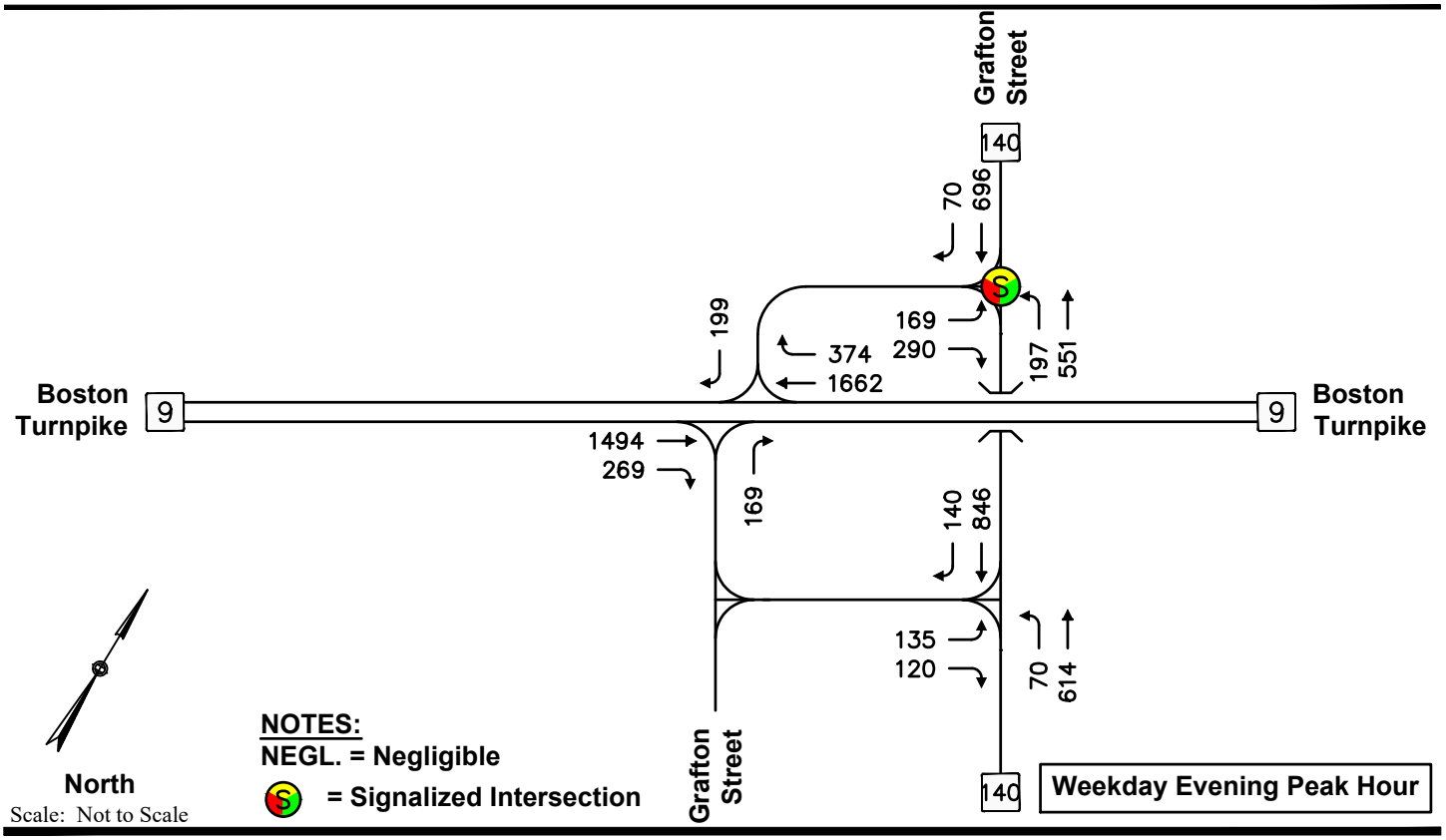

Figure 4

MDM TRANSPORTATION CONSULTANTS, INC.
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2026 Build Conditions
Weekday Peak Hour Volumes

Date: January 20120
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2.2.2 TRAFFIC VOLUME INCREASES

Project-related traffic volume increases at the supplemental study intersections are summarized in **Table 1**, which provides a qualitative understanding of potential peak hour traffic impacts associated with the proposed development.

TABLE 1
INTERSECTION TRAFFIC VOLUME INCREASES

Intersection	No-Build	Build	Δ Volume	Δ %
Weekday Morning Peak Hour				
Route 9 at Grafton Street	1,443	1,451	8	0.6%
Grafton Street at Grafton Circle (Route 140)	1,528	1,591	63	4.1%
Grafton Circle at Memorial Drive (Route 140)	1,610	1,677	67	4.2%
Grafton Street at Route 9	1,923	2,040	117	6.1%
Weekday Evening Peak Hour				
Route 9 at Grafton Street	2,196	2,235	39	1.8%
Grafton Street at Grafton Circle (Route 140)	1,919	1,973	54	2.8%
Grafton Circle at Memorial Drive (Route 140)	1,853	1,925	72	3.9%
Grafton Street at Route 9	1,878	1,932	54	2.9%

As summarized in **Table 1,** traffic volume increases at the updated study area intersections are projected to be below the threshold for inclusion in the study area based on the *Transportation Impact Assessment Guidelines* for increases in traffic volume greater that 100 vehicles or 5% increase with the exception of the Grafton street intersection with Route 9 during the weekday morning peak hour. Therefore, a safety analysis review and capacity analysis are provided in the subsequent sections of this report for the Grafton street intersection with Route 9 eastbound. A review of the traffic volume increases projected for the project along Route 9 to the west of Route 140 also indicate that the signalized intersection along Route 9 at Lake Street and Oak Street also fall below the guidelines, therefore, no additional analysis is required along Route 9 beyond Grafton Street.

2.3 SAFETY

In order to identify crash trends and safety characteristics for expanded study area intersection of Route 9 eastbound at Grafton Street, crash data were obtained from MassDOT for the Town of Shrewsbury for the five-year period covering 2014 through 2018 (the most recent full year of data currently available from MassDOT). A summary of the crash data with crash rates for the supplemental study intersection is provided below with detailed data provided in the **Appendix.**

Crash rates were calculated for the study intersection. This rate quantifies the number of crashes per million entering vehicles. MassDOT has determined the official District 3 (which includes the Town Shrewsbury) crash rate to be 0.61 for unsignalized intersections. This rate represents MassDOT's "average" crash experience for District 3 communities and serves as a basis for comparing reported crash rates for the study intersections. Where calculated crash rates notably exceed the district average, some form of safety countermeasures may be warranted. A review of Highway Safety Improvement Project (HSIP) locations was also conducted. The crash review indicated the following:

- *Route 9 eastbound at Grafton Street.* Nine (9) crashes were reported for the Route 9 and Grafton Street unsignalized intersection resulting in a crash rate of 0.21 which is below the District-wide average of 0.61. The crashes involved eight (8) rear-end type collisions (89%), and one (1) single vehicle type collision. The majority (88%) resulted in property damage collisions and under dry roadway conditions (88%). The majority (56%) of the crashes occurred during the weekday morning or weekday evening commuting periods. No fatalities or pedestrian-related incidents were reported. The intersection is not listed as an HSIP location.

3.0 UPDATED TRAFFIC OPERATIONS ANALYSIS

This section presents intersection capacity analyses for the supplemental study intersection of Route 9 eastbound at Grafton Street for the Baseline, No-Build, and Build traffic-volume conditions. Capacity analyses, conducted in accordance with EEA/MassDOT guidelines, provide an index of how well the roadway facilities serve the traffic demands placed upon them. The operational results provide the basis for recommended access and roadway improvements in the following section.

3.1 CAPACITY ANALYSIS PROCEDURES

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the 2010 Highway Capacity Manual (HCM). The resulting analysis presents a level-of-service (LOS) designation for individual intersection movements. The LOS is a letter designation that provides a qualitative measure of operating conditions based on several factors including roadway geometry, speeds, ambient traffic volumes, traffic controls, and driver characteristics. Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of LOS, depending on the time of day, day of week, or period of year. A range of six levels of service are defined on the basis of average delay, ranging from LOS A (the least delay) to LOS F (delays greater than 50 seconds for unsignalized movements). The specific control delays and associated LOS designations are presented in the **Appendix.**

3.2 INTERSECTION CAPACITY ANALYSIS RESULTS

Capacity analysis results for the weekday morning and weekday evening peak hour capacity analysis results for the supplemental study intersection is described below, with detailed analysis results presented in the **Appendix**.

3.2.1 Level of Service Analysis

The capacity analysis results for the intersection in the supplemental study intersection is summarized in **Table 2** for the weekday morning and weekday evening peak hours, respectively. Detailed analysis results are presented in the **Appendix**.

TABLE 2
INTERSECTION CAPACITY ANALYSIS RESULTS
ROUTE 9 AT GRAFTON STREET

		Baseline			2026 No-Build			2026 Build		
Time Period	Approach	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
Weekday Morning	Eastbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
Peak Hour	NB Exit[4]	0.38	15	B	0.46	16	C	0.58	20	C
Weekday Evening	Eastbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
Peak Hour	NB Exit[4]	0.33	20	C	0.36	21	C	0.49	25	C

[1] Volume-to-capacity ratio
[2] Average control delay per vehicle (in seconds)
[3] Level of service
[4] The Grafton Street NB approach to Rt.9 was calibrated based on observed conditions

As summarized in **Table 2,** Under Build conditions, the unsignalized intersection of Route 9 at Grafton Street will continue to operate at an overall LOS C or better during the weekday morning and weekday evening peak hours. Mainline (through) travel along Route 9 will continue to operate unimpeded with minimal delay.

4.0 UPDATED MONITORING PROGRAM

As summarized in the DEIR, the Proponent will monitor traffic volumes and operations at the site driveways and at the Route 20/South Street intersection six months following initial occupancy and after the occupancy of each additional building thereafter to determine whether applicable signal and geometric improvements are necessary to offset project impacts. The counts will include weekday morning (7:00 AM to 9:00 AM) and weekday evening (4:00 PM to 6:00 PM) turning movement counts and 48-hour driveway ATR counts. Subsequent to the DEIR filing the Proponent had a meeting with MassDOT and has agreed to also monitor the Route 20 at Centech Boulevard/Cherry Street intersection prior to build-out of Sub-District B and to provide 5-years of travel surveys of employees following occupancy.

4.1 ROUTE 20 AT SOUTH STREET

As summarized in the DEIR, a Monitoring Protocol as defined herein is identified with specific operational thresholds which if exceeded for any development phase of the project would trigger the need for structural improvements at Route 20/South Street/Green Street prior to additional building occupancy. The implementation timeline for improvements is based on certain operational thresholds for the Route 20/South Street/Green Street intersection which will serve as a primary means of access/egress for the Sub-District A.

Potential build-out scenarios/phases that would trigger mitigation requirements at the Route 20/South Street/Green Street intersection were evaluated and compared to specific operational thresholds as follows:

a) Level-of-service (LOS): Operations of LOS E (55 seconds or greater average delay) for any intersection movement or approach during peak weekday traffic periods; and

b) Vehicle Queuing: Vehicle queues along South Street that extend to or beyond Chestnut Street.

The analysis presented in the DEIR indicated that the full build-out of Sub-District A (up to 275,000 sf comprised of 110,000 sf general office space and 165,000 sf of industrial space) may be supported through implementation of optimized signal timing at the Route 20/South Street/Green Street intersection. Implementation of additional measures including lane widening of South Street at Route 20 and associated signal timing modifications may be necessary subject to actual background growth/area development as development approaches this buildout limit. Based on discussion with MassDOT, the intersection improvements can be implemented under a Category 1 Access Permit, accordingly, the improvements are exempt from MassDOT's Healthy Transportation Initiative (HTI) requirements.

4.2 ROUTE 20 AT CENTECH BOULEVARD

MassDOT comments in the DEIR Certificate that "*the FEIR should evaluate and, to the extent feasible, commit to…mitigation improvements at the Route 20/Centech Boulevard/Cherry Street intersection*". MDM has evaluated potential improvements, noting however that limited impacts of the Subdistrict A component (i.e., the Phase I development) do not warrant study or mitigative actions at this location as summarized below.

Phase I Development Impact (Sub District A)

The DEIR presents trip generation for each phase of development, comprising Subdistrict A (Phase I, 110,000 sf Office and 165,000 sf Industrial Park) and Subdistrict B (Phase II, 70,000 sf Office and 105,000 sf Industrial Park). While the Route 20 at Centech Boulevard and Cherry Street intersection does warrant inclusion the EIR on the basis of *full build* traffic increases, the Phase I component trip increases represent approximately 3 percent or less of intersection volume and range from only 65 to 81 vehicle-trips during peak hours. Accordingly, this limited trip activity presents an immaterial impact, falls below MassDOT criteria requiring detailed study, and would not independently warrant mitigative actions at this location. As cited in the DEIR capacity analysis (full-build scenario), no change to Route 20 operations is anticipated (LOS C or better operations are projected); consequently, the reduced/limited Phase I impacts do not justify mitigative actions at this location.

Full Build Development Impact (Sub District B)

As documented in the DEIR (technical appendices trip tracings), trip increases associated with full build-out of the Project to include Sub-District B development is projected to represent approximately 4 percent (AM peak) to 7 percent (PM peak) of intersection volume and range from 89 to 182 vehicle-trips during peak hours. Capacity analysis indicates that side-street operations will experience longer delays (LOS F) during PM peak hours independent of the Project but will be slightly exacerbated with anticipated trip increases on Route 20. Accordingly, the Proponent has agreed to monitor the signalized intersection of Route 20 at Centech Boulevard/ Cherry Street prior to buildout of Sub-District B.

Monitoring Protocol

The Proponent will monitor traffic volumes and operations at the Route 20 at Centech Boulevard/Cherry Street intersection prior to initial occupancy of Sub-District B within 90 days of occupancy of each additional building thereafter to determine whether applicable signal timing and/or phasing changes are necessary to offset project impacts. The counts will include weekday morning (7:00 AM to 9:00 AM) and weekday evening (4:00 PM to 6:00 PM) turning movement counts.

5.0 MITIGATION SUMMARY

This section identifies roadway improvements that support projected traffic increases associated with the proposed development, and that serve to minimize/offset project-related traffic impacts.

5.1 RECOMMENDATIONS

Mitigation measures are outlined that minimize the traffic impacts for the development and have been further refined to address comments issued by MassDOT on the DEIR. This section outlines specific mitigation measures to offset project-related traffic impacts that include (a) traffic monitoring; (b) access/egress improvements; (c) pedestrian and bicycle accommodations; (d) a transportation demand management (TDM) program to enhance traffic operations and travel safety; (e) off-site improvements; and (f) road safety audit. Refinement of these mitigative actions is anticipated under a subsequent MEPA filing that will consider the master plan buildout of the property and that will be memorialized as part of a MassDOT Section 61 Finding following completion of the MEPA review process. An updated draft Letter of Commitment is included in the **Appendix** that serves as an initial basis for the Section 61 Finding.

A summary of proposed mitigation actions, schedule and cost is provided below in accordance with **Table 3**, and as described in the sections below.

TABLE 3
TRAFFIC MITIGATION SUMMARY

Commitment	Cost	Status
A1: Commitment to regular, scheduled traffic count analysis to monitor traffic conditions and mitigation requirements at site driveways and Route 20/South Street. The annual monitoring will include an annual travel survey of employees for five years following occupancy of the project.		Following initial occupancy and upon occupancy of each building Phase
A2: Commitment to traffic count analysis to monitor traffic conditions and mitigation requirements at Route 20/Centech Boulevard/Cherry Street.		Prior to initial occupancy of Sub-District B and upon occupancy of each building Phase
B: Access/Egress Improvements		Prior to Occupancy each Sub-District
C: Installation bicycle and pedestrian accommodations on-site and sharrows and signs along South Street.		Prior to initial occupancy
D: Implementation of an on-site Transportation Coordinator to facilitate Transportation Demand measures to avoid peak hour traffic congestion at the site and surrounding intersections		Prior to initial occupancy
E1: Signal timing modifications at the Route 20 at South Street /Green Street intersection		Within 6 months of initial occupancy
E2: Geometric widening of the South Street approach to Route 20		Anticipated Prior to occupancy of Sub-District B
F1: Road Safety Audit Route 9 at South Street		Completed by the Proponent as of 8/1/2019
F2: Road Safety Audit Short Term/Low Cost Improvements		Within 6 months of initial occupancy

A1: Traffic Monitoring (Site Driveways & Route 20 at South Street)

The Proponent will monitor traffic volumes and operations at the site driveways and at the Route 20/South Street intersection six months following initial occupancy and after the occupancy of each additional building thereafter to determine whether applicable signal and geometric improvements are necessary to offset project impacts. The monitoring program will include turning movement counts during a weekday morning (7:00 AM to 9:00 AM) and weekday evening (4:00 PM to 6:00 PM) and 48-hour driveway ATR counts. The Proponent will also provide an annual travel survey of employees for five years following occupancy of the Site. The mitigation will be installed when the monitoring thresholds are met.

A2: Traffic Monitoring (Route 20 at Centech Boulevard/ Cherry Street)

The Proponent will monitor traffic volumes and operations at the Route 20/Centech Boulevard/Cherry Street intersection following initial occupancy of Sub-District B and after the occupancy of each additional building thereafter to determine whether applicable signal timing or phasing changes are necessary to offset project impacts. The counts will include weekday morning (7:00 AM to 9:00 AM) and weekday evening (4:00 PM to 6:00 PM) turning movement counts.

B: Access/Egress Improvements

The Proponent will implement the following access/Egress improvements:

- *Site Driveway at Route 20.* The site driveway intersection with Route 20 has been designed as a right-in/right-out driveway and has been conceptually designed to accommodate a tractor trailer (WB-50) design vehicle. The design will also accommodate the planned improvements as cited by MassDOT for the Route 20 Corridor improvement project. Signs and pavement markings that comply with the Manual on Uniform Traffic Control Devices (MUTCD) will also be provided including STOP signs (R1-1), No Left-Turn signs (R3-2) and STOP line pavement markings.

- *Driveway Design at South Street*. The final driveway width and curb radii between the site driveway and South Street will be designed to accommodate the Town's largest fire apparatus (ladder truck) and service vehicles. Signs and pavement markings that comply with the Manual on Uniform Traffic Control Devices (MUTCD) will also be provided including STOP signs (R1-1) and STOP line pavement markings.

- *Sight Line Triangles.* Plantings (shrubs, bushes) and structures (walls, fences, etc.) should be maintained at a height of 2 feet or less within the sight lines in vicinity of the Site driveway intersections with South Street and Route 20 to ensure unobstructed sight lines are available.

C: Bicycle and Pedestrian Accommodations

The Proponent is committed to providing pedestrian and bicycle accommodations to better provide access the Site. The proponent will provide the following pedestrian and bicycle accommodations:

- *On-Site Pedestrian Amenities*. The Site Plan will incorporate sidewalks that connect the proposed building entrances with parking areas and sidewalks along the driveway that connect to the existing sidewalk system along South Street. The Proponent is reviewing the feasibility of providing a pedestrian connection between Sub-District A and Sub-District B which would require a wetland crossing.

- *Crosswalks & ADA Compliant Ramps.* Marked crosswalks and ADA compliant ramps will be provided at the proposed driveway intersection with South Street and at any internal site driveway crossings. Crosswalks and ADA compliant ramps will be provided at the proposed driveway intersection with Route 20 at a location consistent with plans for the Route 20 corridor project.

- *Bicycle Amenities*. The Proponent will incorporate bicycle racks within the property near building entrances and the site driveway will be designed for bicycle accommodation to encourage and facilitate this mode of transportation to/from the Site. Additional means of bicycle accommodation on area roadway including appropriate roadway markings and signs will also be considered within the larger context of the future roadway improvements along the Route 20 corridor that are being evaluated by MassDOT as part of the Route 20 corridor study.

- *Bicycle markings and Signage*. The Proponent will install bicycle "sharrow" pavement markings and signage along South Street between Route 9 and Route 20 to provide a connection to the Site and to complement the future Route 20 corridor.

D: Travel Demand Management

The Proponent is committed to reduce Site trip generation by tenant employees by implementing a TDM program, elements of which will be memorialized in a Tenant Manual and/or will be made a provision of a master deed. These elements are consistent with the Massachusetts Department of Environmental Protection (MADEP) directive to use all reasonable and feasible mitigation actions to reduce auto emissions. The TDM program includes the following elements, which are subject to selected tenant corporate policies:

- *Employee Transportation Coordinator*. The Proponent will designate a contact that will serve as transportation coordinator responsible for disseminating relevant TDM information to tenants including documentation of TDM information as part of a Tenant Manual at time of lease and/or as subject to a Master Deed for the property.

- *Public Transportation Information & Promotion*. Service and schedule information for the Worcester Regional Transit Authority (WRTA) and MBTA will be posted and public transportation subsidy program considered to promote the use of public transportation by employees and visitors. Alternative means of connecting the Site to the nearby MBTA station at Centech Boulevard (Grafton MBTA station) will also be evaluated by the Proponent such as modification of WRTA bus routes, rideshare services such as Uber and Lyft, bike share services, tenant employee carpool options, and rideshare matching services with other nearby employers along South Street that include UMass and Charles River Laboratories.

- *Workforce Transportation Program.* The proponent will apply for available funding through the Workforce Transportation Program to help employees meet workforce transportation needs, including first mile/last mile connections.

- *Bicycle Facilities and Amenities*. Bicycle parking, including visible accessible racks for visitors and employees will be provided proximate to building entrances. The Proponent will also consider a bike share service for the property that will provide tenant employees access to bicycles for access to nearby transit options, recreational purposes during break periods and alternative means of travel to area destinations.

- *Alternative Work Arrangements*. The Proponent will encourage its tenants to provide alternative work arrangements such as flextime, compressed workweek and telecommuting in order to allow employees to balance work and personal commitments, and to reduce traffic and parking demands.

- *Preferential Parking for Carpools, Vanpools and Car Sharing.* Preferential parking locations for building tenant employees who use carpools and vanpools are to be provided; specific locations and number are to be determined through refinement of the Site Plans for the project.

- *Preferential Parking for Low-Emission Vehicles.* Preferential parking locations for employees and patrons who use low-emission vehicles will be considered; charging stations for electric vehicles will also be considered during the Site Plan development process.

- *Transit Pass Subsidy.* The Proponent will encourage its tenants to offer fare subsidies for commuter rail passes for eligible employees and/or offer pre-tax payroll deductions for employee transit passes.

- *Transit System Connections.* Alternative means of connecting the Site to the nearby MBTA station at Centech Boulevard (Grafton MBTA station) will also be evaluated by the Proponent such as modification of WRTA bus routes, rideshare services such as Uber and Lyft, bike share services, tenant employee carpool options, and rideshare matching services with other nearby employers along South Street that include UMass and Charles River Laboratories.

- *MassRides*. MassRides is the Executive Office of Transportation's statewide travel options program providing free assistance to commuters, employers, students, and other traveler markets. MassRides programs may encourage workers to use alternative forms of transportation such as carpooling, vanpooling, and to utilize a large database for rideshare matching. The Proponent will promote commuter assistance programs available through MassRides by encouraging building tenants to incorporate information on MassRides as part of the employee orientation programs.

- *Guaranteed Ride Home*. The Proponent will encourage commercial tenants to offer a guaranteed ride home program that subsidizes taxi service for employees using non-auto commute options in cases of unexpected circumstances.

- *Pedestrian Infrastructure*. Sidewalk connections within the property along primary pedestrian desire lines that connect building entrances with the public sidewalk network; posting of area maps that highlight area walking/bicycle routes to promote walking and bicycle travel to/from the Site and area businesses. The Proponent also recognizes the need for extending existing sidewalks along South Street from their current terminal points to Route 9 and Route 20; however, the feasibility of constructing these sidewalk extensions is subject to further evaluation by the Proponent to determine potential land acquisition/easement requirements. The Proponent has discussed the design details for pedestrian improvements at the Route 9/South Street intersection with District 3 and PPDU staff. Discussion with MassDOT indicate that MassDOT will not be pursuing pedestrian improvements including traffic signal upgrades and crosswalk across State highway and relocation of the median barrier anytime soon. Therefore, MassDOT and the Town of Shrewsbury are in agreement to not extend the sidewalk along South Street from the CVS property and Price Chopper property to the State Highway layout at Route 9 at this time.

- *On-Site Support Services/Amenities*. Buildings will include services and amenities that encourage employees to remain on-site for essential services and internalize trip making to the campus including on-site mailboxes and an on-site Fed-Ex and/or UPS drop box locations. Other amenities to be considered in building programming may include an employee fitness center, showers, and cafeteria for employees – measures aimed at reducing the need to conduct off-site trips during a typical workday. Specific measures are to be evaluated in more detail during the Site Plan review process.

E: Route 20 at South Street

The Proponent will work with MassDOT to provide mitigation commitments and mitigation protocol for the Route 20 at South Street intersection which in summary entails (a) signal retiming only to accommodate the Phase I (Sub District A) development, and (b) widening of South Street north leg to accommodate a dedicated right-turn lane and traffic signal timing optimization to offset project traffic impacts for Phase II (Sub District B), subject to meeting implementation thresholds per monitoring protocol. Conceptual access improvements at the Route 20/South Street/Green Street signalized intersection are presented in **Figure 5**.

As shown graphically in **Figure 5,** the improvements include widening of the South Street approach to include a dedicated right-turn lane principally within Town layout with no change to MassDOT traffic signal strain pole locations or equipment and would require only signal retiming/optimization. The project is compatible with the Route 20 Long-Range Improvements (see **Figure 6**) which will provide a 4-lane cross section along Route 20 and associated MassDOT's Healthy Transportation Initiative (HTI) elements for which land takings are required.

While the proposed improvements are consistent with long-range Route 20 improvements, the relatively minor work within jurisdiction of MassDOT suggests the need only for a Category I Access Permit which would be exempt the improvements from HTI requirements.

F: Road Safety Audit – Route 9/ South Street – Completed by Proponent

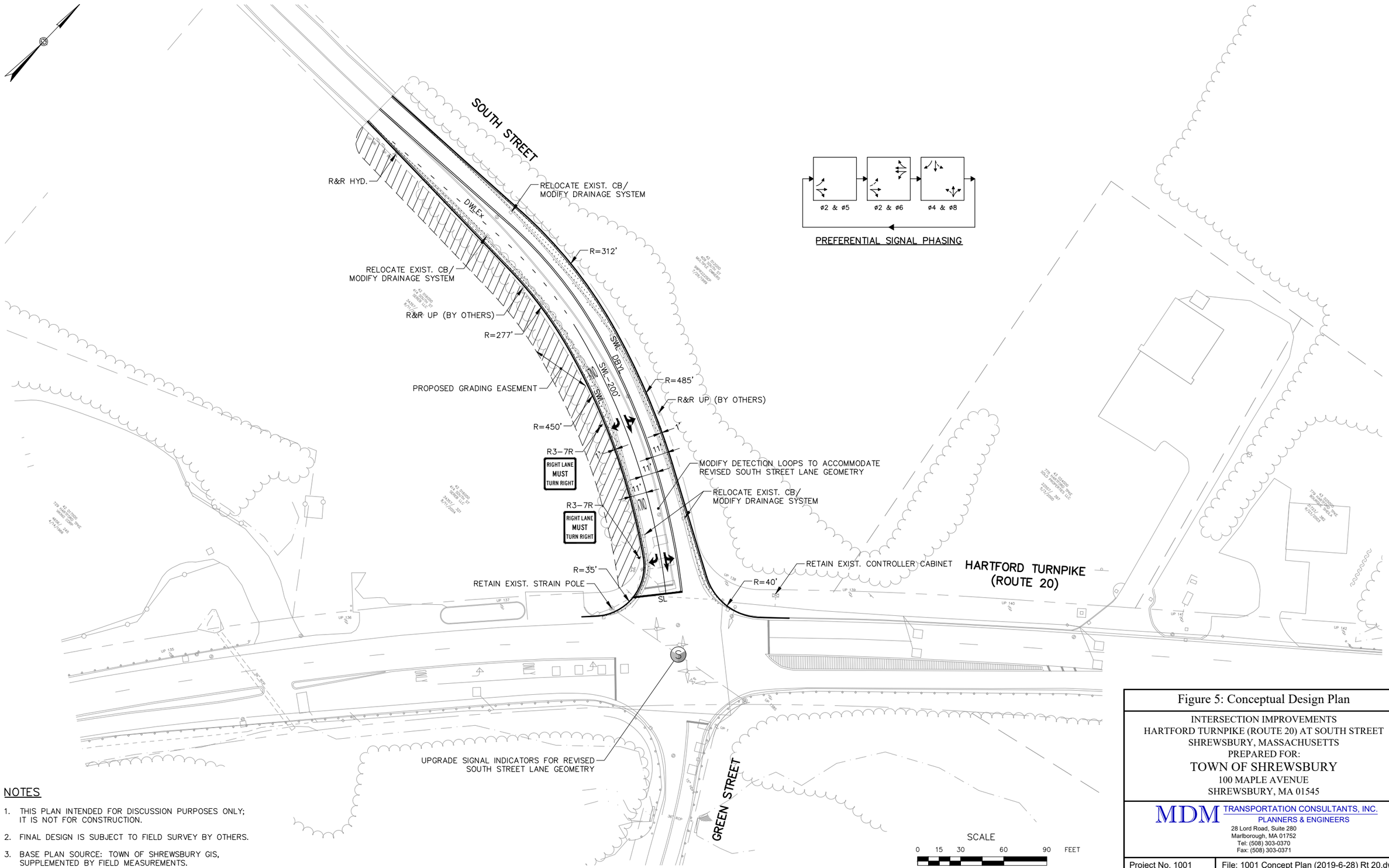
This intersection of Route 9 at South Street is listed as a 2014 – 2016 Highway Safety Improvement Program (HSIP) cluster by MassDOT and was the subject of a Road Safety Audit (RSA) which was prepared by the Proponent on June 26, 2019. The purpose of an RSA is to identify potential short-term, medium term and long-term safety/operational improvements. The Proponent will implement several of the short-term/low cost improvements as outlined in the RSA subject to approval by MassDOT as described below:

- Replace the near side "No Turn on Red" (R10-11b) sign on the South Street southbound approach with a "Right Turn on Red Must Yield to U-Turn" (R10-30) sign.

- Relocate the static "Advanced Traffic Signal" (W3-3) sign on the Route 9 westbound approach to the crest of the hill just west of the Fruit Street intersection. The location will be reviewed with MassDOT to provide visibility for approaching vehicles. Install a 45-mph speed advisory plaque (W13-1p) on the same post.

- Install a "No-Turn on Red" (R10-11b) sign for the Route 9 eastbound right turn movements.

- Verify if the signal clearance times (yellow and all red) are appropriate and adjust if required.



NOTES

1. THIS PLAN INTENDED FOR DISCUSSION PURPOSES ONLY; IT IS NOT FOR CONSTRUCTION.
2. FINAL DESIGN IS SUBJECT TO FIELD SURVEY BY OTHERS.
3. BASE PLAN SOURCE: TOWN OF SHREWSBURY GIS, SUPPLEMENTED BY FIELD MEASUREMENTS.

Figure 5: Conceptual Design Plan

INTERSECTION IMPROVEMENTS
HARTFORD TURNPIKE (ROUTE 20) AT SOUTH STREET
SHREWSBURY, MASSACHUSETTS
PREPARED FOR:
TOWN OF SHREWSBURY
100 MAPLE AVENUE
SHREWSBURY, MA 01545

MDM TRANSPORTATION CONSULTANTS, INC.
PLANNERS & ENGINEERS
28 Lord Road, Suite 280
Marlborough, MA 01752
Tel: (508) 303-0370
Fax: (508) 303-0371

Project No. 1001	File: 1001 Concept Plan (2019-6-28) Rt 20.dwg	
Date: June 28, 2019	Scale: As Noted	Sheet 1 of 1

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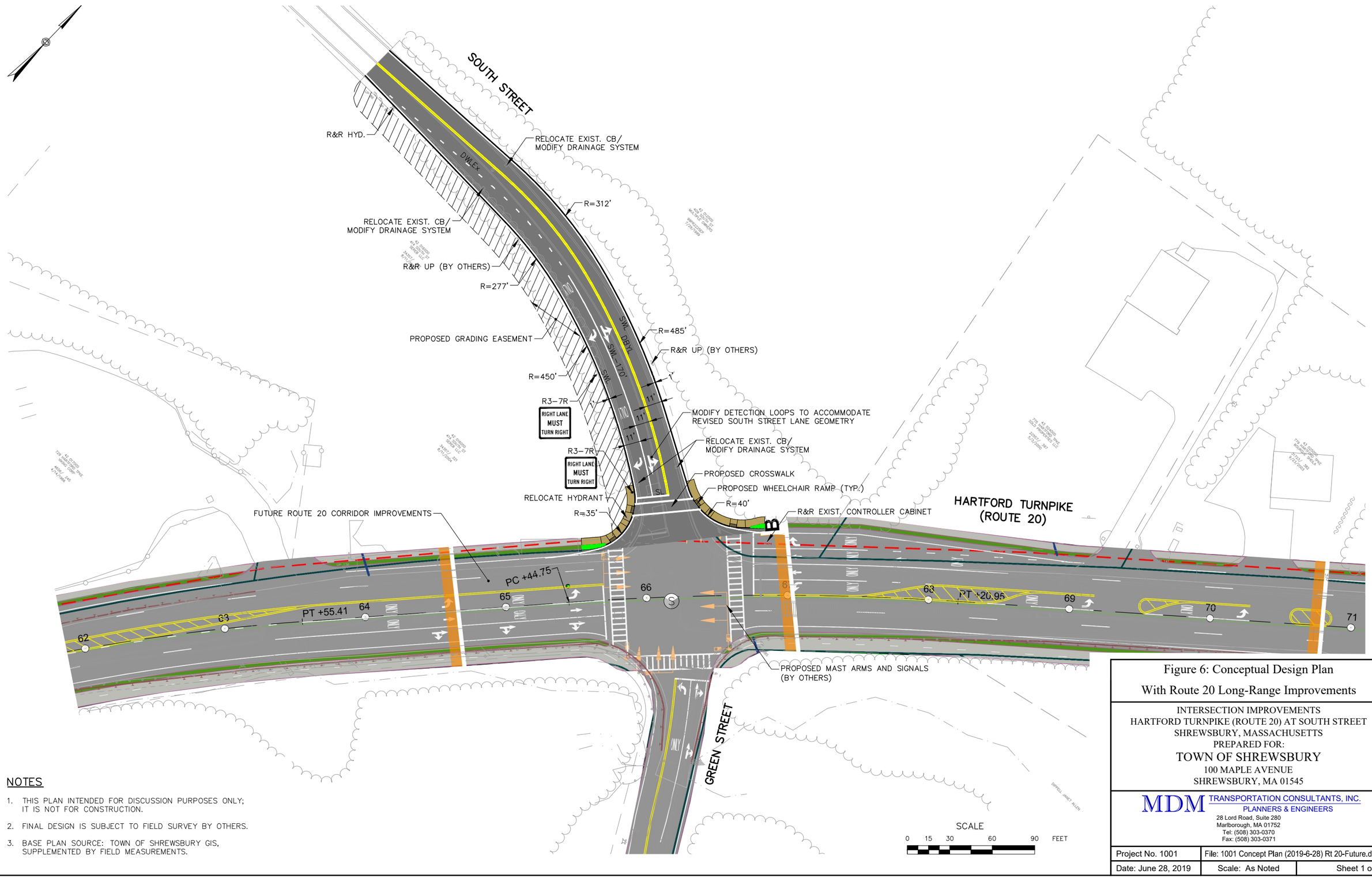

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Figure 6: Conceptual Design Plan

With Route 20 Long-Range Improvements

INTERSECTION IMPROVEMENTS
HARTFORD TURNPIKE (ROUTE 20) AT SOUTH STREET
SHREWSBURY, MASSACHUSETTS
PREPARED FOR:
TOWN OF SHREWSBURY
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SHREWSBURY, MA 01545

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- Coordinate with the school bus operator to relocate the bus stop further south along South Street as feasible or to allow the buses to pull into Yorkshire Terrace and/or Laxfield Road.

5.2 CONCLUSIONS

In summary, MDM finds that incremental traffic associated with the proposed Centech North development is expected to be modest at study intersections and will be accommodated within available capacities following implementation of access/egress improvements and off-site improvements at Route 20/South Street. Additional improvements including pedestrian and bicycle accommodations and a Transportation Demand Management (TDM) program as outlined in this study will establish a framework of accommodating Site traffic impacts and encouraging non-motorized travel modes and pedestrian/bicycle accommodation. Refinement of these mitigative actions is anticipated under MEPA and local review and that will be memorialized as part of a MassDOT Section 61 Finding following completion of the MEPA review process.

APPENDIX

- Traffic Volume Data
- Bicycle and Pedestrian Volumes
- Seasonal/Yearly Growth Data
- Background Projects
- Expanded Project Trip Tracings
- Trip Distribution
- Crash Data
- Capacity Analysis
- Draft Letter of Commitment

□ Traffic Volume Data

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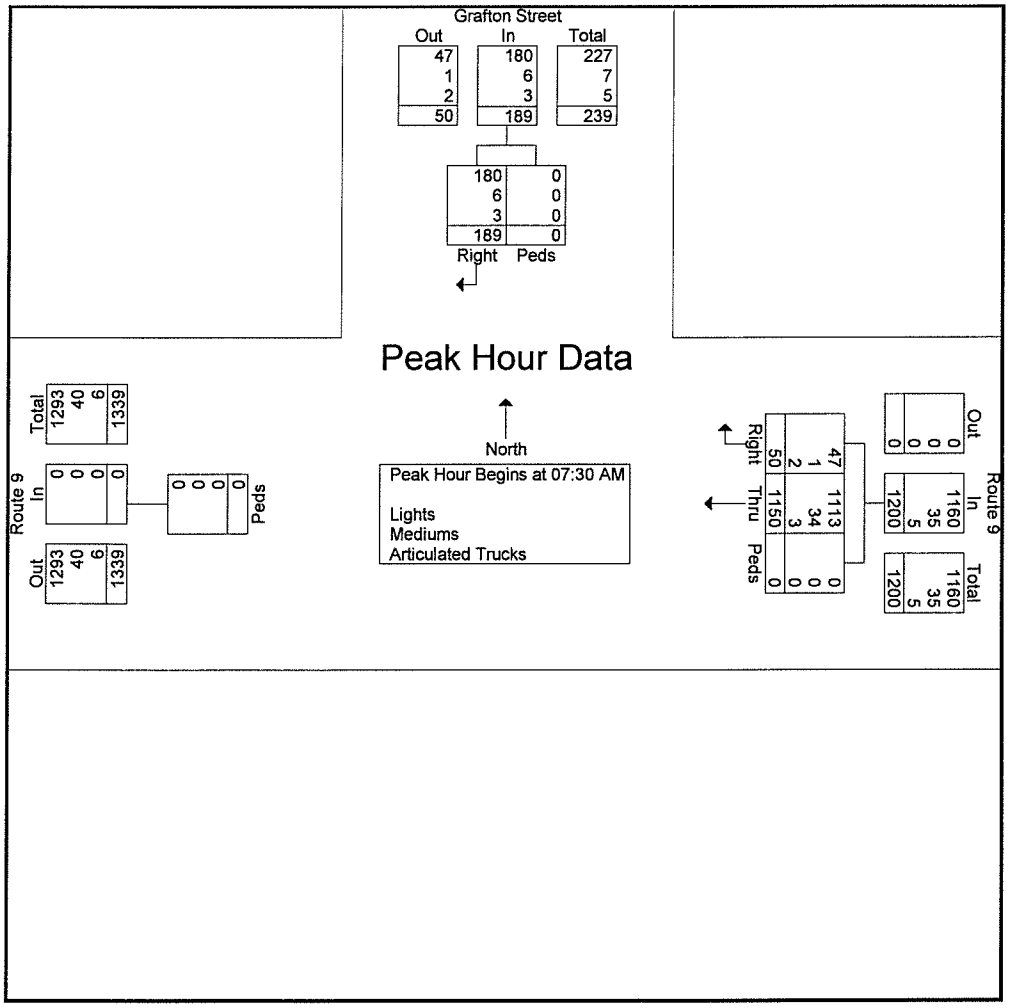
N/S: Grafton Street
E/W: Route 9
Shrewsbury, MA

File Name : 1001 Rt 9 West at Grafton
Site Code : 1001
Start Date : 10/8/2019
Page No : 2

	Grafton Street From North			Route 9 From East				Route 9 From West		
Start Time	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	47	0	47	8	283	0	291	0	0	338
07:45 AM	47	0	47	**16**	307	0	323	0	0	**370**
08:00 AM	45	0	45	16	**309**	0	**325**	0	0	370
08:15 AM	**50**	0	**50**	10	251	0	261	0	0	311
Total Volume	189	0	189	50	1150	0	1200	0	0	1389
% App. Total	100	0		4.2	95.8	0		0		
PHF	.945	.000	.945	.781	.930	.000	.923	.000	.000	.939
Lights	180	0	180	47	1113	0	1160	0	0	1340
% Lights	95.2	0	95.2	94.0	96.8	0	96.7	0	0	96.5
Mediums	6	0	6	1	34	0	35	0	0	41
% Mediums	3.2	0	3.2	2.0	3.0	0	2.9	0	0	3.0
Articulated Trucks	3	0	3	2	3	0	5	0	0	8
% Articulated Trucks	1.6	0	1.6	4.0	0.3	0	0.4	0	0	0.6



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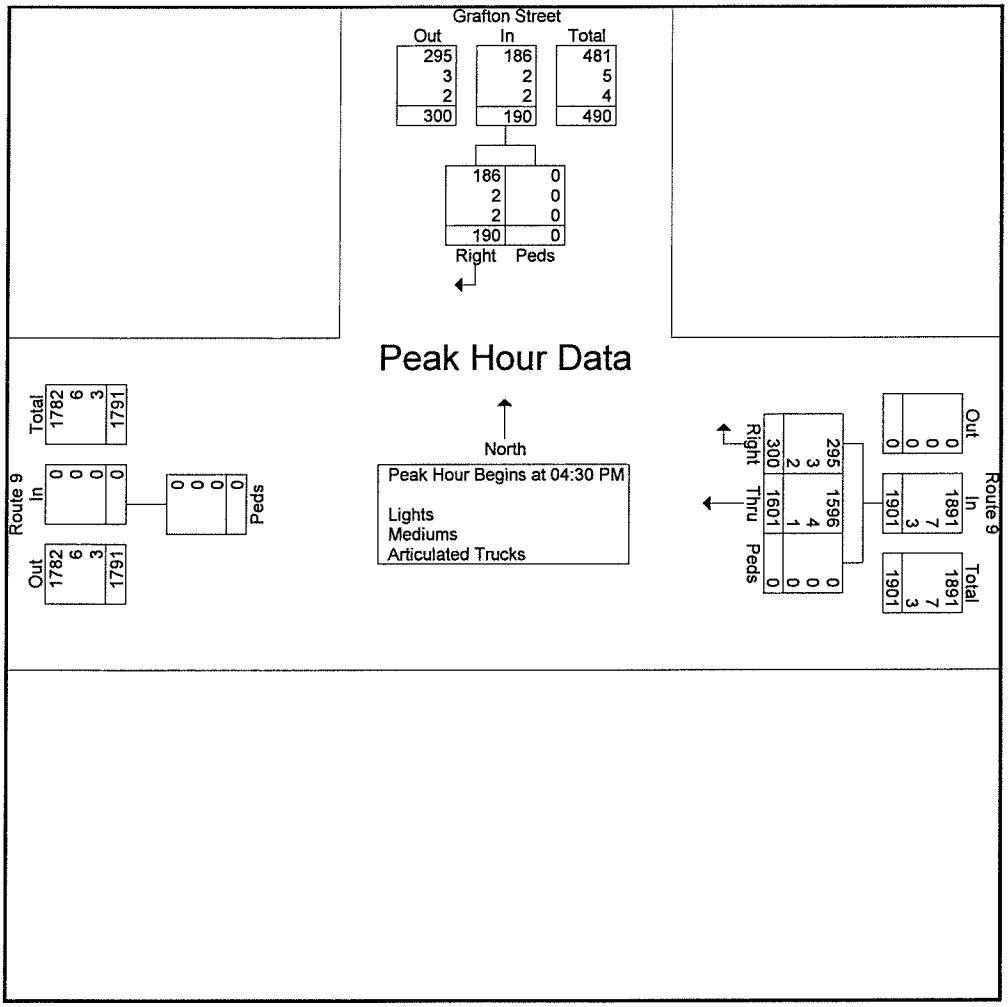
Start Time	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	50	0	50	58	401	0	459	0	0	509
04:45 PM	44	0	44	67	392	0	459	0	0	503
05:00 PM	43	0	43	**95**	**409**	0	**504**	0	0	**547**
05:15 PM	**53**	0	**53**	80	399	0	479	0	0	532
Total Volume	190	0	190	300	1601	0	1901	0	0	2091
% App. Total	100	0		15.8	84.2	0		0		
PHF	.896	.000	.896	.789	.979	.000	.943	.000	.000	.956
Lights	186	0	186	295	1596	0	1891	0	0	2077
% Lights	97.9	0	97.9	98.3	99.7	0	99.5	0	0	99.3
Mediums	2	0	2	3	4	0	7	0	0	9
% Mediums	1.1	0	1.1	1.0	0.2	0	0.4	0	0	0.4
Articulated Trucks	2	0	2	2	1	0	3	0	0	5
% Articulated Trucks	1.1	0	1.1	0.7	0.1	0	0.2	0	0	0.2



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Groups Printed- Lights - Mediums - Articulated Trucks

	Grafton Street From North			Route 9 From East				Route 9 From West		
Start Time	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Int. Total
07:00 AM	28	0	28	10	209	0	219	0	0	247
07:15 AM	28	0	28	15	221	0	236	0	0	264
07:30 AM	47	0	47	8	283	0	291	0	0	338
07:45 AM	47	0	47	16	307	0	323	0	0	370
Total	150	0	150	49	1020	0	1069	0	0	1219
08:00 AM	45	0	45	16	309	0	325	0	0	370
08:15 AM	50	0	50	10	251	0	261	0	0	311
08:30 AM	48	0	48	26	247	0	273	0	0	321
08:45 AM	45	0	45	22	255	0	277	0	0	322
Total	188	0	188	74	1062	0	1136	0	0	1324
04:00 PM	41	0	41	58	410	0	468	0	0	509
04:15 PM	36	0	36	68	333	0	401	0	0	437
04:30 PM	50	0	50	58	401	0	459	0	0	509
04:45 PM	44	0	44	67	392	0	459	0	0	503
Total	171	0	171	251	1536	0	1787	0	0	1958
05:00 PM	43	0	43	95	409	0	504	0	0	547
05:15 PM	53	0	53	80	399	0	479	0	0	532
05:30 PM	38	0	38	83	371	0	454	0	0	492
05:45 PM	34	0	34	64	361	0	425	0	0	459
Total	168	0	168	322	1540	0	1862	0	0	2030
Grand Total	677	0	677	696	5158	0	5854	0	0	6531
Apprch %	100	0		11.9	88.1	0		0		
Total %	10.4	0	10.4	10.7	79	0	89.6	0	0	
Lights	652	0	652	672	5069	0	5741	0	0	6393
% Lights	96.3	0	96.3	96.6	98.3	0	98.1	0	0	97.9
Mediums	16	0	16	17	73	0	90	0	0	106
% Mediums	2.4	0	2.4	2.4	1.4	0	1.5	0	0	1.6
Articulated Trucks	9	0	9	7	16	0	23	0	0	32
% Articulated Trucks	1.3	0	1.3	1	0.3	0	0.4	0	0	0.5

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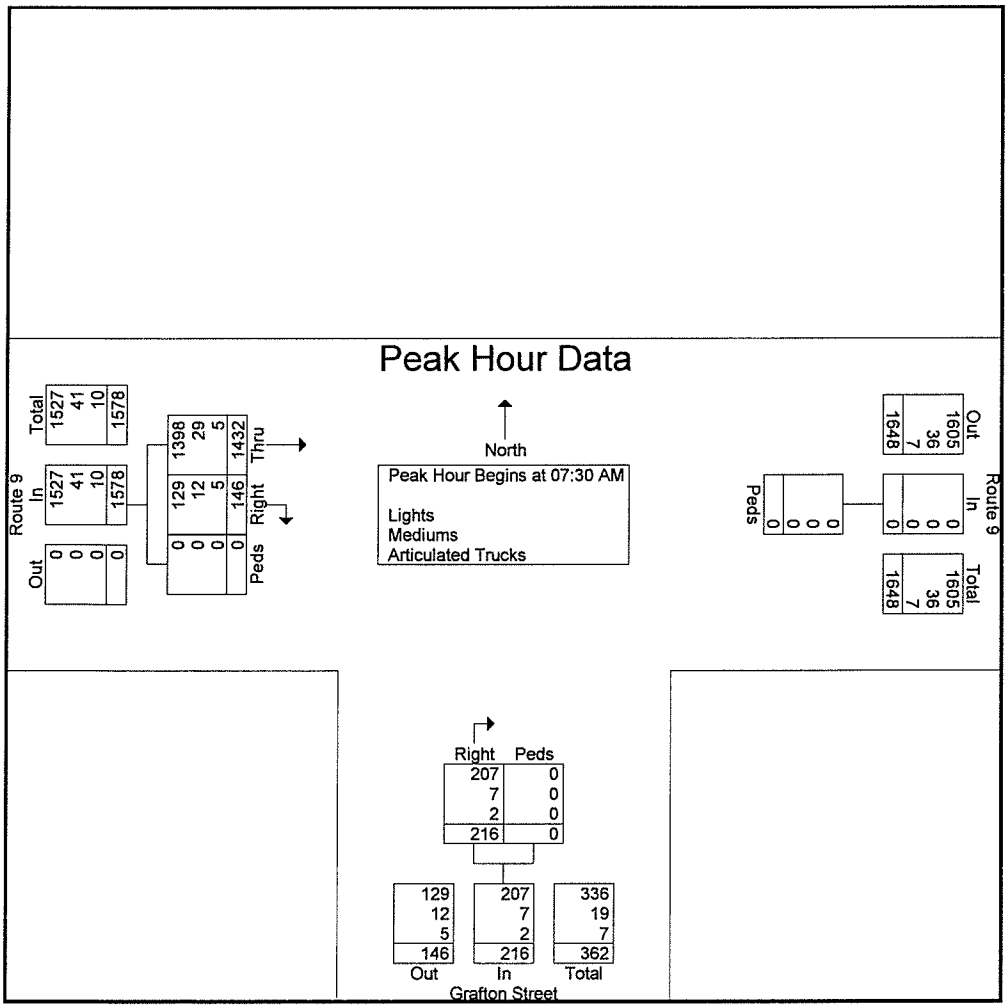
	Route 9 From East		Grafton Street From South			Route 9 From West				
Start Time	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	0	0	54	0	54	27	340	0	367	421
07:45 AM	0	0	49	0	49	33	**382**	0	**415**	464
08:00 AM	0	0	**63**	0	**63**	39	373	0	412	**475**
08:15 AM	0	0	50	0	50	**47**	337	0	384	434
Total Volume	0	0	216	0	216	146	1432	0	1578	1794
% App. Total	0		100	0		9.3	90.7	0		
PHF	.000	.000	.857	.000	.857	.777	.937	.000	.951	.944
Lights	0	0	207	0	207	129	1398	0	1527	1734
% Lights	0	0	95.8	0	95.8	88.4	97.6	0	96.8	96.7
Mediums	0	0	7	0	7	12	29	0	41	48
% Mediums	0	0	3.2	0	3.2	8.2	2.0	0	2.6	2.7
Articulated Trucks	0	0	2	0	2	5	5	0	10	12
% Articulated Trucks	0	0	0.9	0	0.9	3.4	0.3	0	0.6	0.7



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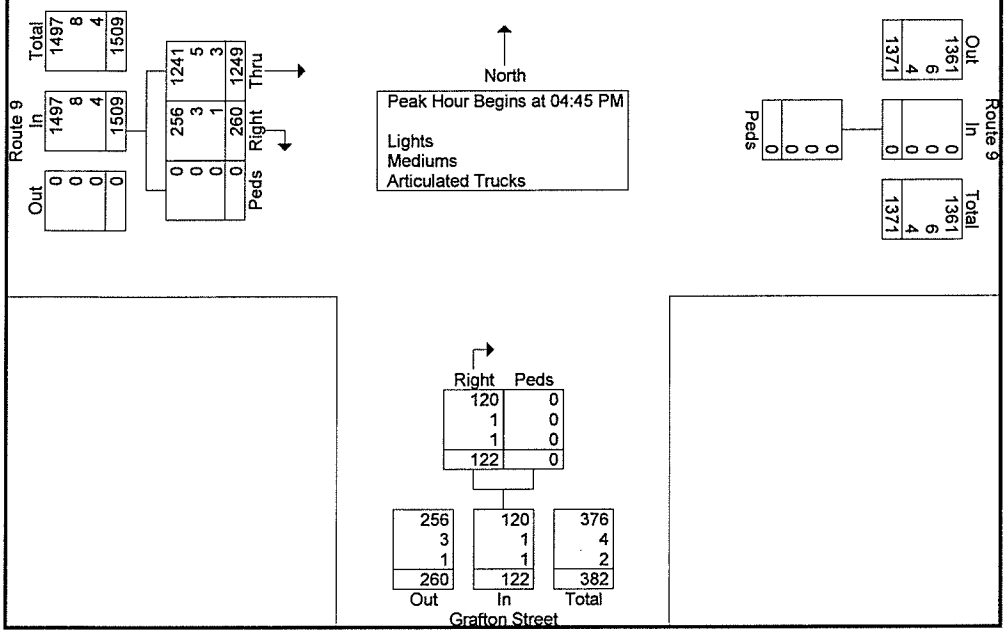
	Route 9 From East		Grafton Street From South			Route 9 From West				
Start Time	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	0	34	0	34	64	313	0	377	411
05:00 PM	0	0	21	0	21	61	315	0	376	397
05:15 PM	0	0	**37**	0	**37**	**70**	305	0	375	**412**
05:30 PM	0	0	30	0	30	65	**316**	0	**381**	411
Total Volume	0	0	122	0	122	260	1249	0	1509	1631
% App. Total	0		100	0		17.2	82.8	0		
PHF	.000	.000	.824	.000	.824	.929	.988	.000	.990	.990
Lights	0	0	120	0	120	256	1241	0	1497	1617
% Lights	0	0	98.4	0	98.4	98.5	99.4	0	99.2	99.1
Mediums	0	0	1	0	1	3	5	0	8	9
% Mediums	0	0	0.8	0	0.8	1.2	0.4	0	0.5	0.6
Articulated Trucks	0	0	1	0	1	1	3	0	4	5
% Articulated Trucks	0	0	0.8	0	0.8	0.4	0.2	0	0.3	0.3

Peak Hour Data



MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

N/S: Grafton Street
E/W: Route 9
Shrewsbury, MA

File Name : 1001 Rt 9 East at Grafton
Site Code : 1001
Start Date : 10/8/2019
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	Route 9 From East		Grafton Street From South			Route 9 From West				
Start Time	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
07:00 AM	0	0	27	0	27	24	284	0	308	335
07:15 AM	0	0	55	0	55	17	346	0	363	418
07:30 AM	0	0	54	0	54	27	340	0	367	421
07:45 AM	0	0	49	0	49	33	382	0	415	464
Total	0	0	185	0	185	101	1352	0	1453	1638
08:00 AM	0	0	63	0	63	39	373	0	412	475
08:15 AM	0	0	50	0	50	47	337	0	384	434
08:30 AM	0	0	50	0	50	39	311	0	350	400
08:45 AM	0	0	36	0	36	45	287	0	332	368
Total	0	0	199	0	199	170	1308	0	1478	1677
04:00 PM	0	0	26	0	26	58	295	0	353	379
04:15 PM	0	0	37	0	37	61	302	0	363	400
04:30 PM	0	0	28	0	28	64	310	0	374	402
04:45 PM	0	0	34	0	34	64	313	0	377	411
Total	0	0	125	0	125	247	1220	0	1467	1592
05:00 PM	0	0	21	0	21	61	315	0	376	397
05:15 PM	0	0	37	0	37	70	305	0	375	412
05:30 PM	0	0	30	0	30	65	316	0	381	411
05:45 PM	0	0	27	0	27	61	302	0	363	390
Total	0	0	115	0	115	257	1238	0	1495	1610
Grand Total	0	0	624	0	624	775	5118	0	5893	6517
Apprch %	0		100	0		13.2	86.8	0		
Total %	0	0	9.6	0	9.6	11.9	78.5	0	90.4	
Lights	0	0	603	0	603	747	5037	0	5784	6387
% Lights	0	0	96.6	0	96.6	96.4	98.4	0	98.2	98
Mediums	0	0	18	0	18	19	64	0	83	101
% Mediums	0	0	2.9	0	2.9	2.5	1.3	0	1.4	1.5
Articulated Trucks	0	0	3	0	3	9	17	0	26	29
% Articulated Trucks	0	0	0.5	0	0.5	1.2	0.3	0	0.4	0.4

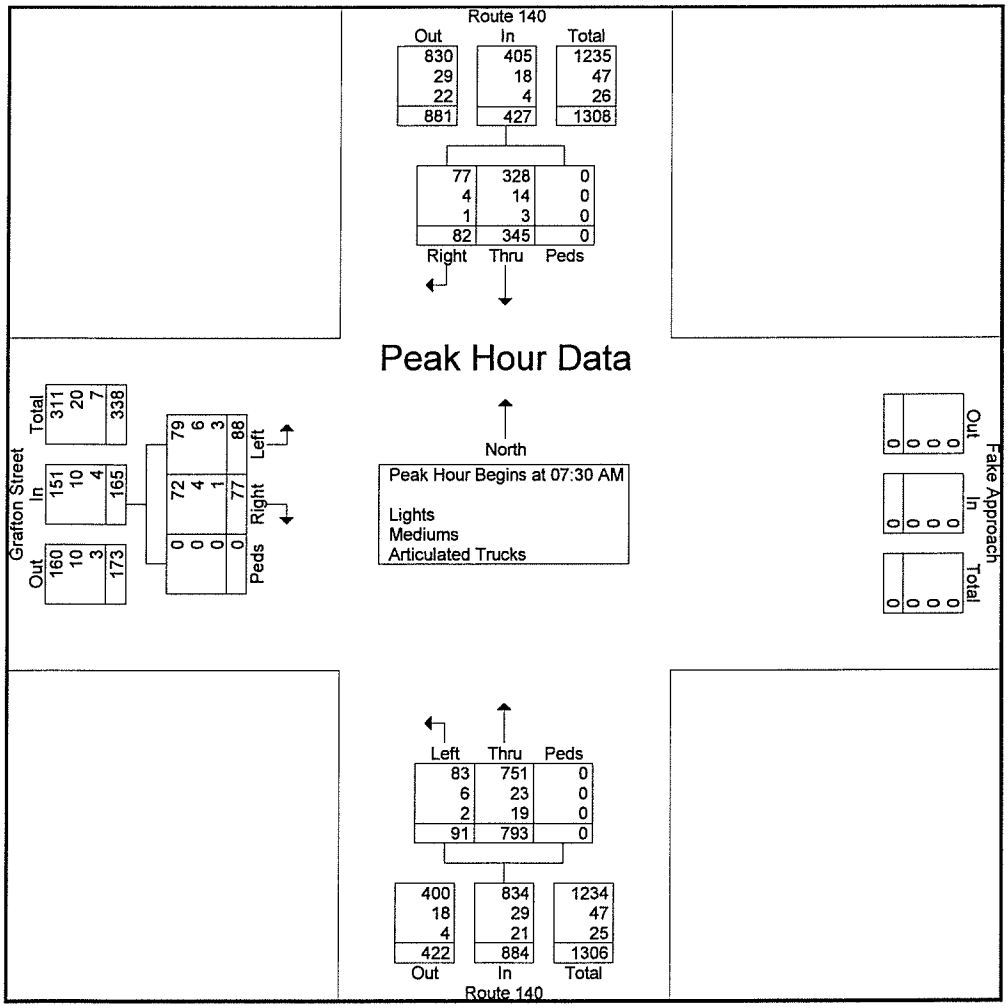
MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 124
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 EB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 2

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	21	65	0	86	**223**	21	0	**244**	16	18	0	34	364
07:45 AM	14	**116**	0	**130**	215	22	0	237	18	22	0	40	**407**
08:00 AM	**28**	80	0	108	181	**26**	0	207	21	19	0	40	355
08:15 AM	19	84	0	103	174	22	0	196	**22**	**29**	0	**51**	350
Total Volume	82	345	0	427	793	91	0	884	77	88	0	165	1476
% App. Total	19.2	80.8	0		89.7	10.3	0		46.7	53.3	0		
PHF	.732	.744	.000	.821	.889	.875	.000	.906	.875	.759	.000	.809	.907
Lights	77	328	0	405	751	83	0	834	72	79	0	151	1390
% Lights	93.9	95.1	0	94.8	94.7	91.2	0	94.3	93.5	89.8	0	91.5	94.2
Mediums	4	14	0	18	23	6	0	29	4	6	0	10	57
% Mediums	4.9	4.1	0	4.2	2.9	6.6	0	3.3	5.2	6.8	0	6.1	3.9
Articulated Trucks	1	3	0	4	19	2	0	21	1	3	0	4	29
% Articulated Trucks	1.2	0.9	0	0.9	2.4	2.2	0	2.4	1.3	3.4	0	2.4	2.0



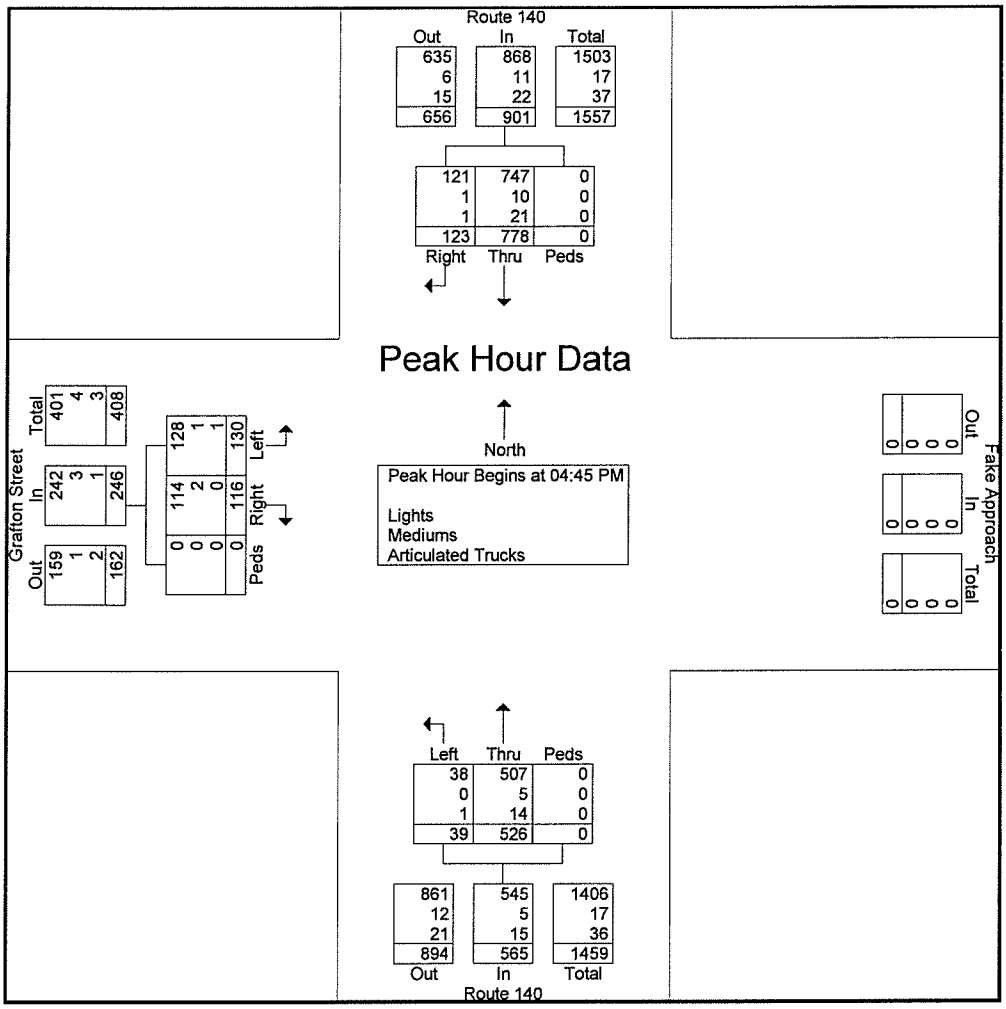
MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 124
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 EB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 3

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	30	186	0	216	134	8	0	142	27	24	0	51	409
05:00 PM	26	**215**	0	**241**	**141**	8	0	**149**	25	**39**	0	64	**454**
05:15 PM	33	188	0	221	134	11	0	145	**32**	35	0	**67**	433
05:30 PM	**34**	189	0	223	117	**12**	0	129	32	32	0	64	416
Total Volume	123	778	0	901	526	39	0	565	116	130	0	246	1712
% App. Total	13.7	86.3	0		93.1	6.9	0		47.2	52.8	0		
PHF	.904	.905	.000	.935	.933	.813	.000	.948	.906	.833	.000	.918	.943
Lights	121	747	0	868	507	38	0	545	114	128	0	242	1655
% Lights	98.4	96.0	0	96.3	96.4	97.4	0	96.5	98.3	98.5	0	98.4	96.7
Mediums	1	10	0	11	5	0	0	5	2	1	0	3	19
% Mediums	0.8	1.3	0	1.2	1.0	0	0	0.9	1.7	0.8	0	1.2	1.1
Articulated Trucks	1	21	0	22	14	1	0	15	0	1	0	1	38
% Articulated Trucks	0.8	2.7	0	2.4	2.7	2.6	0	2.7	0	0.8	0	0.4	2.2



MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 124
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 EB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
07:00 AM	16	67	0	83	164	8	0	172	12	13	0	25	280
07:15 AM	18	81	0	99	150	20	0	170	12	11	0	23	292
07:30 AM	21	65	0	86	223	21	0	244	16	18	0	34	364
07:45 AM	14	116	0	130	215	22	0	237	18	22	0	40	407
Total	69	329	0	398	752	71	0	823	58	64	0	122	1343
08:00 AM	28	80	0	108	181	26	0	207	21	19	0	40	355
08:15 AM	19	84	0	103	174	22	0	196	22	29	0	51	350
08:30 AM	19	84	0	103	137	16	0	153	15	23	0	38	294
08:45 AM	23	111	0	134	120	10	0	130	22	25	0	47	311
Total	89	359	0	448	612	74	0	686	80	96	0	176	1310
04:00 PM	19	163	0	182	176	11	0	187	30	22	0	52	421
04:15 PM	27	189	0	216	113	13	0	126	25	31	0	56	398
04:30 PM	31	174	0	205	118	9	0	127	35	31	0	66	398
04:45 PM	30	186	0	216	134	8	0	142	27	24	0	51	409
Total	107	712	0	819	541	41	0	582	117	108	0	225	1626
05:00 PM	26	215	0	241	141	8	0	149	25	39	0	64	454
05:15 PM	33	188	0	221	134	11	0	145	32	35	0	67	433
05:30 PM	34	189	0	223	117	12	0	129	32	32	0	64	416
05:45 PM	35	154	0	189	131	7	0	138	30	33	0	63	390
Total	128	746	0	874	523	38	0	561	119	139	0	258	1693
Grand Total	393	2146	0	2539	2428	224	0	2652	374	407	0	781	5972
Apprch %	15.5	84.5	0		91.6	8.4	0		47.9	52.1	0		
Total %	6.6	35.9	0	42.5	40.7	3.8	0	44.4	6.3	6.8	0	13.1	
Lights	377	1992	0	2369	2312	211	0	2523	360	393	0	753	5645
% Lights	95.9	92.8	0	93.3	95.2	94.2	0	95.1	96.3	96.6	0	96.4	94.5
Mediums	13	101	0	114	59	10	0	69	9	10	0	19	202
% Mediums	3.3	4.7	0	4.5	2.4	4.5	0	2.6	2.4	2.5	0	2.4	3.4
Articulated Trucks	3	53	0	56	57	3	0	60	5	4	0	9	125
% Articulated Trucks	0.8	2.5	0	2.2	2.3	1.3	0	2.3	1.3	1	0	1.2	2.1

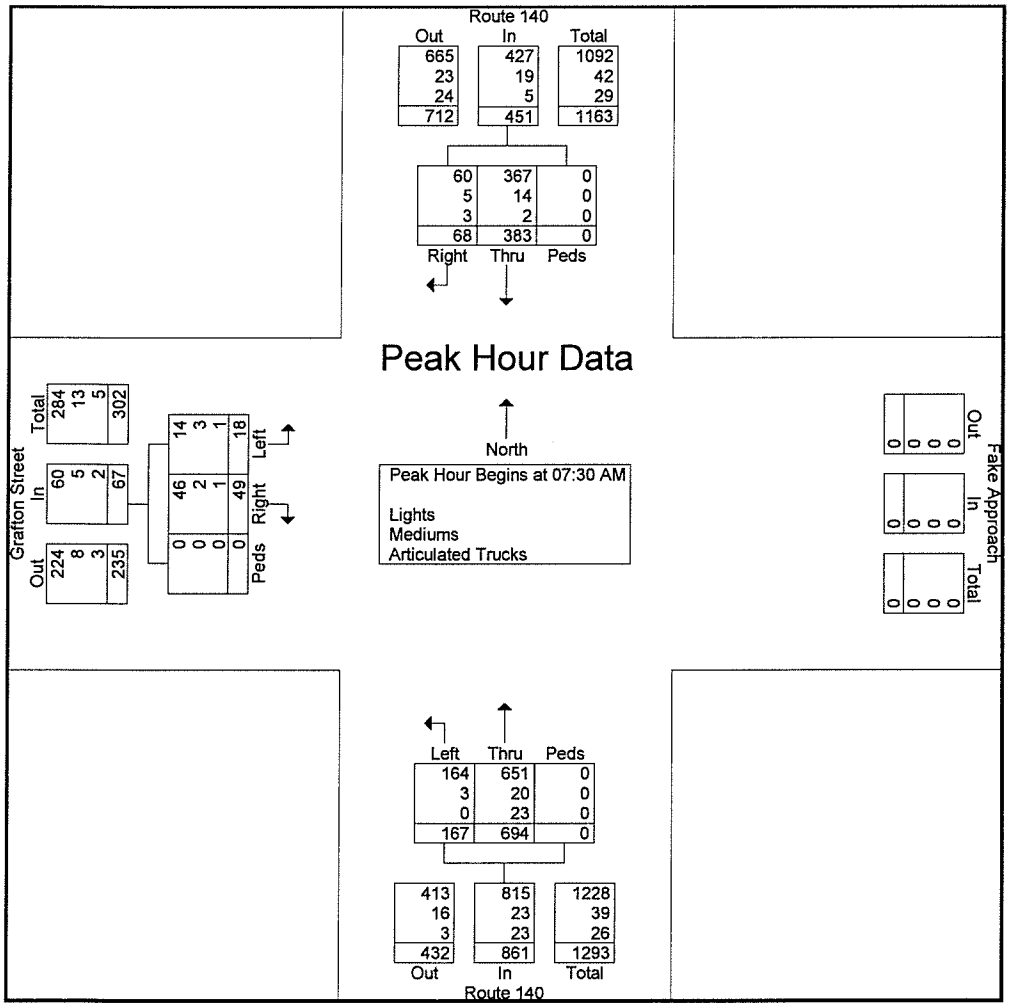
MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 140
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 WB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 2

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	**21**	83	0	104	**201**	45	0	**246**	10	3	0	13	363
07:45 AM	18	**112**	0	**130**	193	36	0	229	11	6	0	17	**376**
08:00 AM	9	96	0	105	155	40	0	195	**19**	**7**	0	**26**	326
08:15 AM	20	92	0	112	145	**46**	0	191	9	2	0	11	314
Total Volume	68	383	0	451	694	167	0	861	49	18	0	67	1379
% App. Total	15.1	84.9	0		80.6	19.4	0		73.1	26.9	0		
PHF	.810	.855	.000	.867	.863	.908	.000	.875	.645	.643	.000	.644	.917
Lights	60	367	0	427	651	164	0	815	46	14	0	60	1302
% Lights	88.2	95.8	0	94.7	93.8	98.2	0	94.7	93.9	77.8	0	89.6	94.4
Mediums	5	14	0	19	20	3	0	23	2	3	0	5	47
% Mediums	7.4	3.7	0	4.2	2.9	1.8	0	2.7	4.1	16.7	0	7.5	3.4
Articulated Trucks	3	2	0	5	23	0	0	23	1	1	0	2	30
% Articulated Trucks	4.4	0.5	0	1.1	3.3	0	0	2.7	2.0	5.6	0	3.0	2.2



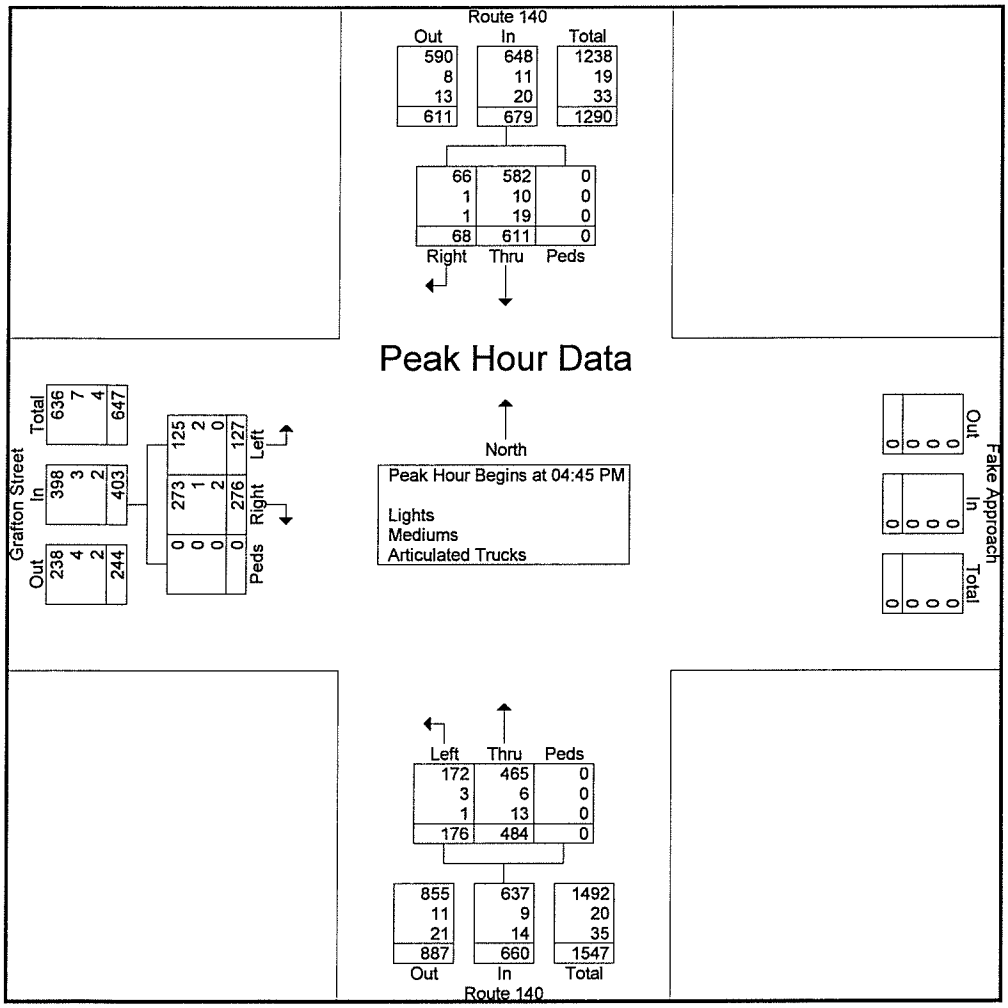
MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 140
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 WB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 3

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	17	142	0	159	122	41	0	163	63	26	0	89	411
05:00 PM	17	**162**	0	**179**	**129**	**51**	0	**180**	**80**	30	0	**110**	**469**
05:15 PM	**18**	155	0	173	120	50	0	170	64	**36**	0	100	443
05:30 PM	16	152	0	168	113	34	0	147	69	35	0	104	419
Total Volume	68	611	0	679	484	176	0	660	276	127	0	403	1742
% App. Total	10	90	0		73.3	26.7	0		68.5	31.5	0		
PHF	.944	.943	.000	.948	.938	.863	.000	.917	.863	.882	.000	.916	.929
Lights	66	582	0	648	465	172	0	637	273	125	0	398	1683
% Lights	97.1	95.3	0	95.4	96.1	97.7	0	96.5	98.9	98.4	0	98.8	96.6
Mediums	1	10	0	11	6	3	0	9	1	2	0	3	23
% Mediums	1.5	1.6	0	1.6	1.2	1.7	0	1.4	0.4	1.6	0	0.7	1.3
Articulated Trucks	1	19	0	20	13	1	0	14	2	0	0	2	36
% Articulated Trucks	1.5	3.1	0	2.9	2.7	0.6	0	2.1	0.7	0	0	0.5	2.1



MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 140
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 WB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
07:00 AM	6	67	0	73	147	32	0	179	8	1	0	9	261
07:15 AM	5	87	0	92	125	26	0	151	13	6	0	19	262
07:30 AM	21	83	0	104	201	45	0	246	10	3	0	13	363
07:45 AM	18	112	0	130	193	36	0	229	11	6	0	17	376
Total	50	349	0	399	666	139	0	805	42	16	0	58	1262
08:00 AM	9	96	0	105	155	40	0	195	19	7	0	26	326
08:15 AM	20	92	0	112	145	46	0	191	9	2	0	11	314
08:30 AM	12	76	0	88	108	39	0	147	22	10	0	32	267
08:45 AM	19	115	0	134	112	38	0	150	19	6	0	25	309
Total	60	379	0	439	520	163	0	683	69	25	0	94	1216
04:00 PM	15	138	0	153	148	39	0	187	47	26	0	73	413
04:15 PM	14	145	0	159	102	44	0	146	67	33	0	100	405
04:30 PM	18	163	0	181	84	44	0	128	52	28	0	80	389
04:45 PM	17	142	0	159	122	41	0	163	63	26	0	89	411
Total	64	588	0	652	456	168	0	624	229	113	0	342	1618
05:00 PM	17	162	0	179	129	51	0	180	80	30	0	110	469
05:15 PM	18	155	0	173	120	50	0	170	64	36	0	100	443
05:30 PM	16	152	0	168	113	34	0	147	69	35	0	104	419
05:45 PM	14	140	0	154	126	36	0	162	56	27	0	83	399
Total	65	609	0	674	488	171	0	659	269	128	0	397	1730
Grand Total	239	1925	0	2164	2130	641	0	2771	609	282	0	891	5826
Apprch %	11	89	0		76.9	23.1	0		68.4	31.6	0		
Total %	4.1	33	0	37.1	36.6	11	0	47.6	10.5	4.8	0	15.3	
Lights	218	1782	0	2000	2010	629	0	2639	586	272	0	858	5497
% Lights	91.2	92.6	0	92.4	94.4	98.1	0	95.2	96.2	96.5	0	96.3	94.4
Mediums	13	91	0	104	57	11	0	68	18	9	0	27	199
% Mediums	5.4	4.7	0	4.8	2.7	1.7	0	2.5	3	3.2	0	3	3.4
Articulated Trucks	8	52	0	60	63	1	0	64	5	1	0	6	130
% Articulated Trucks	3.3	2.7	0	2.8	3	0.2	0	2.3	0.8	0.4	0	0.7	2.2

□ Bicycle and Pedestrian Volumes

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

28 Lord Road, Suite 280
Marlborough, MA

N/S: Grafton Street
E/W: Route 9
Shrewsbury, MA

File Name : 1001 Rt 9 East at Grafton
Site Code : 1001
Start Date : 10/8/2019
Page No : 1

Groups Printed- Bicycles on Road - Pedestrians

	Route 9 From East		Grafton Street From South			Route 9 From West				
Start Time	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA

N/S: Grafton Street
E/W: Route 9
Shrewsbury, MA

File Name : 1001 Rt 9 East at Grafton
Site Code : 1001
Start Date : 10/8/2019
Page No : 2

Groups Printed- Bicycles on Road - Pedestrians

	Route 9 From East		Grafton Street From South			Route 9 From West				
Start Time	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0		0	0		0	0	0		
Total %										
Bicycles on Road										0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0
Pedestrians										0
% Pedestrians	0	0	0	0	0	0	0	0	0	0

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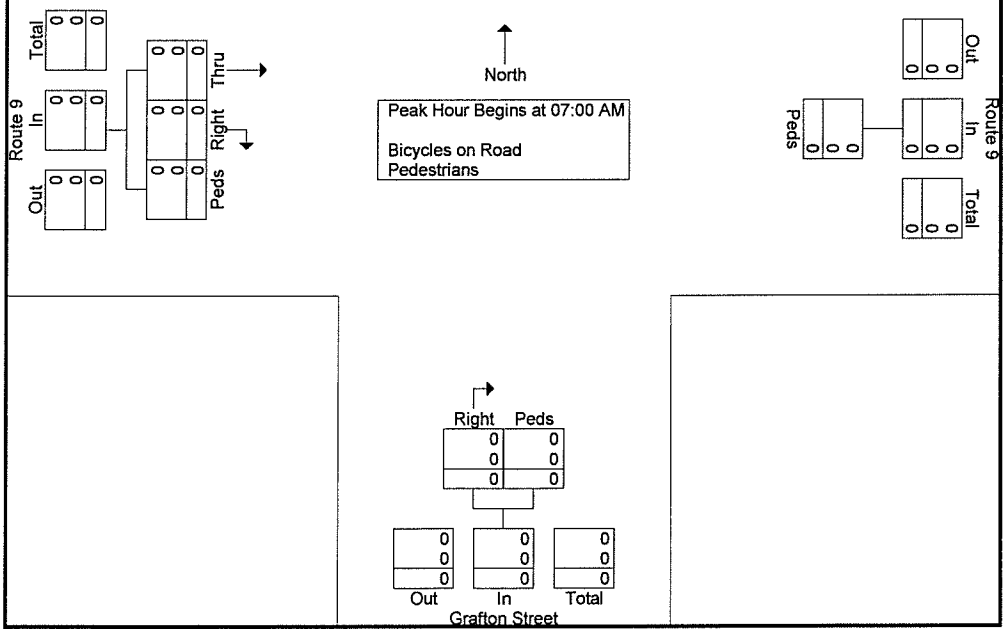
28 Lord Road, Suite 280
Marlborough, MA

N/S: Grafton Street
E/W: Route 9
Shrewsbury, MA

File Name : 1001 Rt 9 East at Grafton
Site Code : 1001
Start Date : 10/8/2019
Page No : 3

	Route 9 From East		Grafton Street From South			Route 9 From West				
Start Time	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0		0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Bicycles on Road	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0

Peak Hour Data



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Marlborough, MA

N/S: Grafton Street
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File Name : 1001 Rt 9 East at Grafton
Site Code : 1001
Start Date : 10/8/2019
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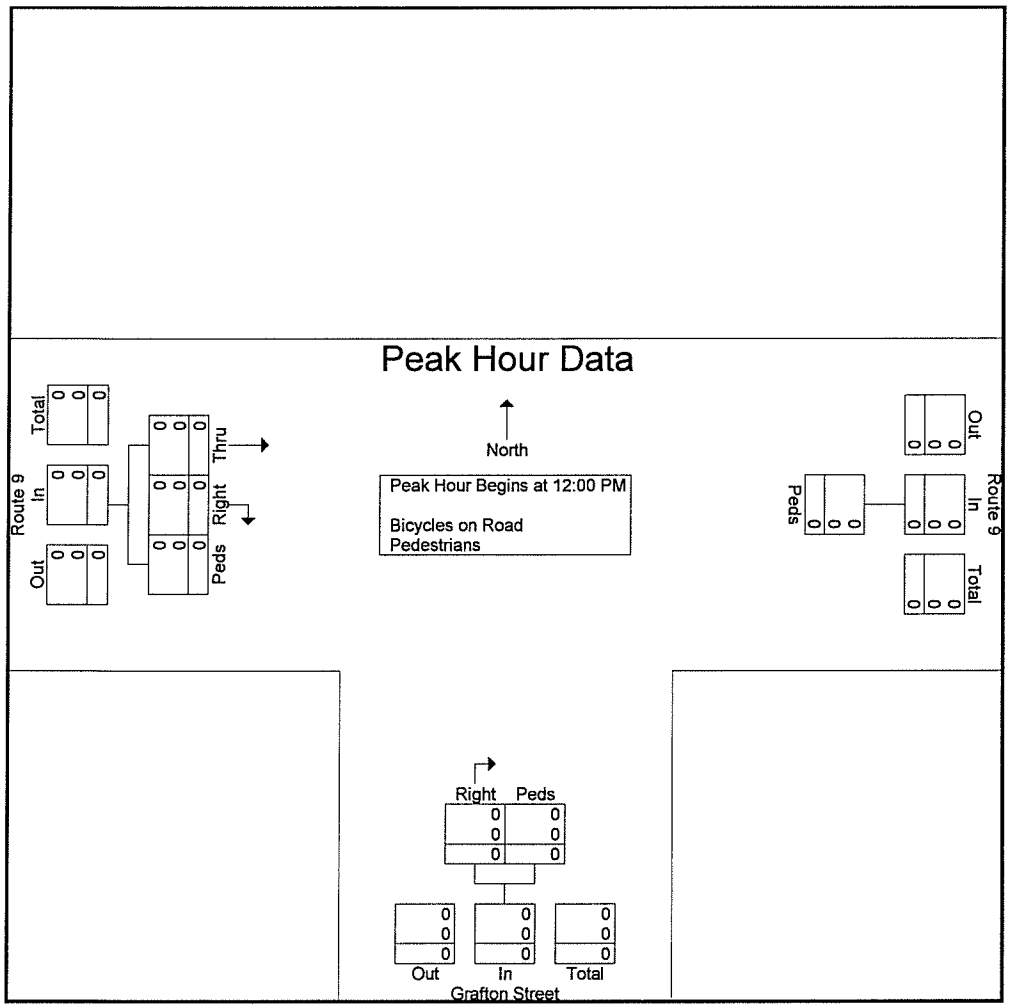
	Route 9 From East		Grafton Street From South			Route 9 From West				
Start Time	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00 PM										
12:00 PM	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0		0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Bicycles on Road	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0



MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA

N/S: Grafton Street
E/W: Route 9
Shrewsbury, MA

File Name : 1001 Rt 9 West at Grafton
Site Code : 1001
Start Date : 10/8/2019
Page No : 1

Groups Printed- Bicycles on Road - Pedestrians

	Grafton Street From North			Route 9 From East				Route 9 From West		
Start Time	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0

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Marlborough, MA

N/S: Grafton Street
E/W: Route 9
Shrewsbury, MA

File Name : 1001 Rt 9 West at Grafton
Site Code : 1001
Start Date : 10/8/2019
Page No : 2

Groups Printed- Bicycles on Road - Pedestrians

	Grafton Street From North			Route 9 From East				Route 9 From West		
Start Time	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0	0		0		
Total %										
Bicycles on Road										0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0
Pedestrians										0
% Pedestrians	0	0	0	0	0	0	0	0	0	0

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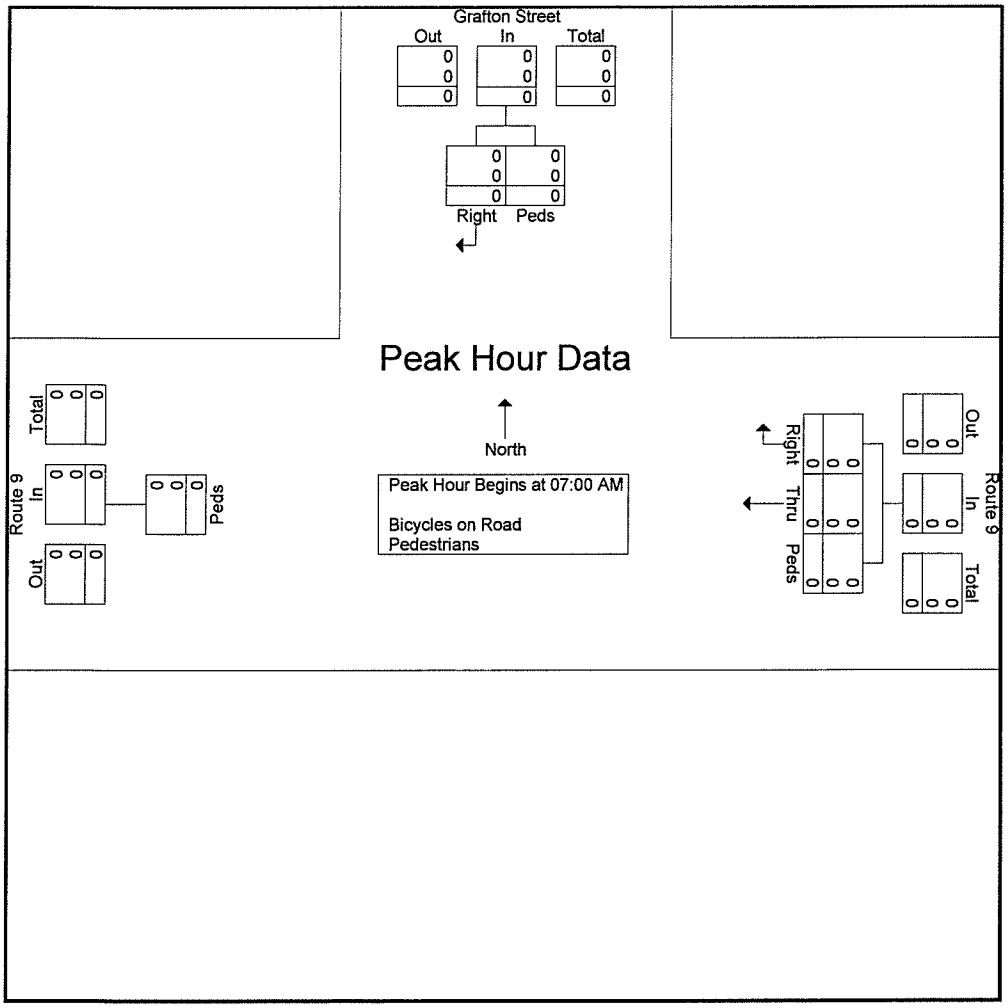
Shrewsbury, MA

File Name : 1001 Rt 9 West at Grafton
Site Code : 1001
Start Date : 10/8/2019
Page No : 3

	Grafton Street From North			Route 9 From East				Route 9 From West		
Start Time	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0	0		0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Bicycles on Road	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0



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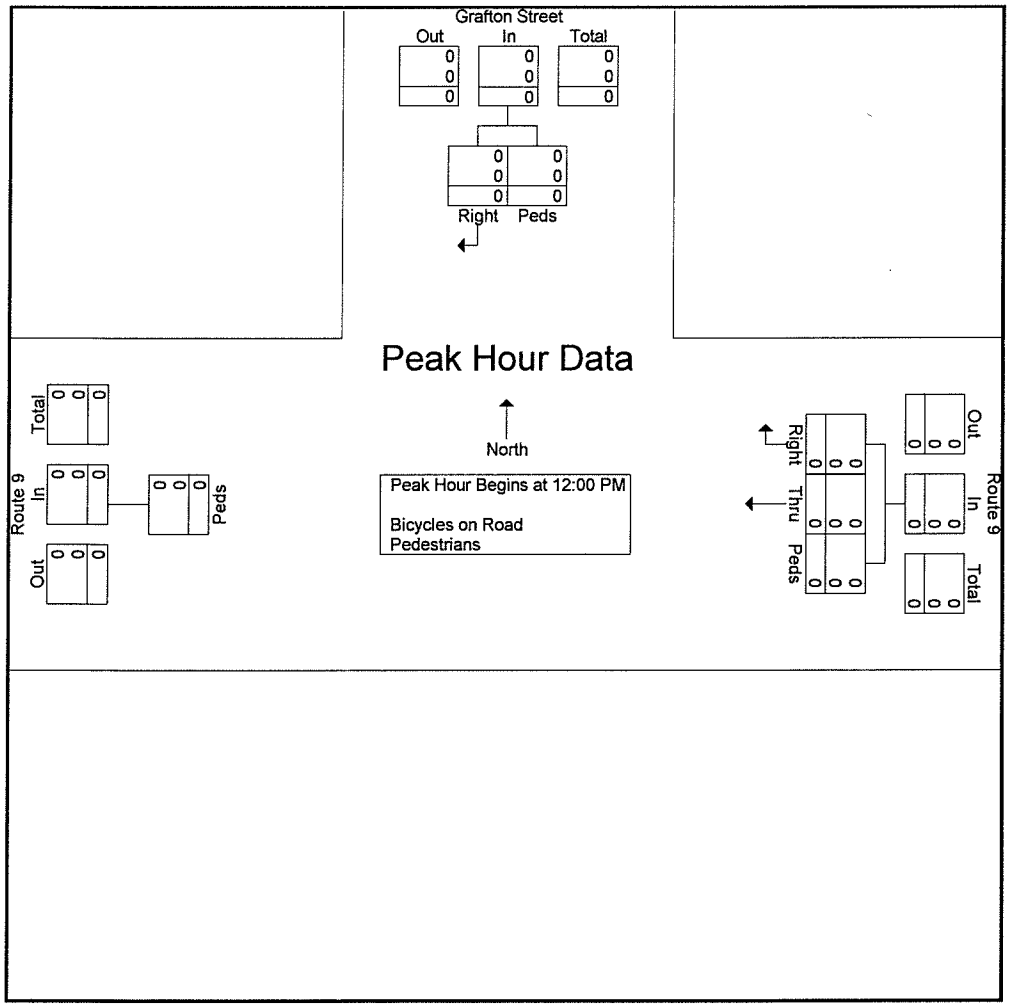
28 Lord Road, Suite 280
Marlborough, MA

N/S: Grafton Street
E/W: Route 9
Shrewsbury, MA

File Name : 1001 Rt 9 West at Grafton
Site Code : 1001
Start Date : 10/8/2019
Page No : 4

	Grafton Street From North			Route 9 From East				Route 9 From West		
Start Time	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00 PM										
12:00 PM	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0	0		0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Bicycles on Road	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0



MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 124
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 EB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 1

Groups Printed- Bicycles on Road - Pedestrians

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 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
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 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
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 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
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 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
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
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 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
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 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
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 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

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 124
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 EB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 2

Groups Printed- Bicycles on Road - Pedestrians

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 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	1	0	1	1
Apprch %	0	0	0		0	0	0		0	100	0		
Total %	0	0	0	0	0	0	0	0	0	100	0	100	
Bicycles on Road	0	0	0	0	0	0	0	0	0	1	0	1	1
% Bicycles on Road	0	0	0	0	0	0	0	0	0	100	0	100	100
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0

MDM TRANSPORTATION CONSULTANTS, INC.
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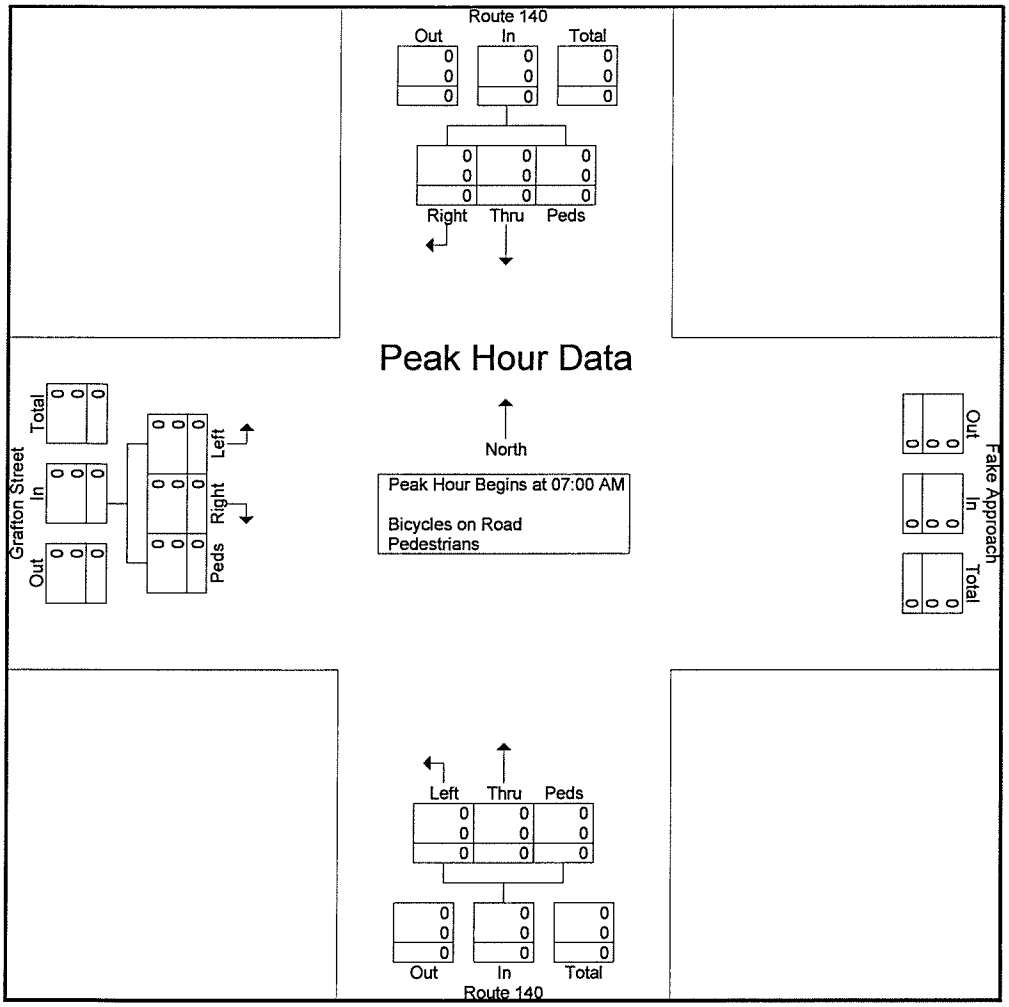
28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 124
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 EB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 3

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 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
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0

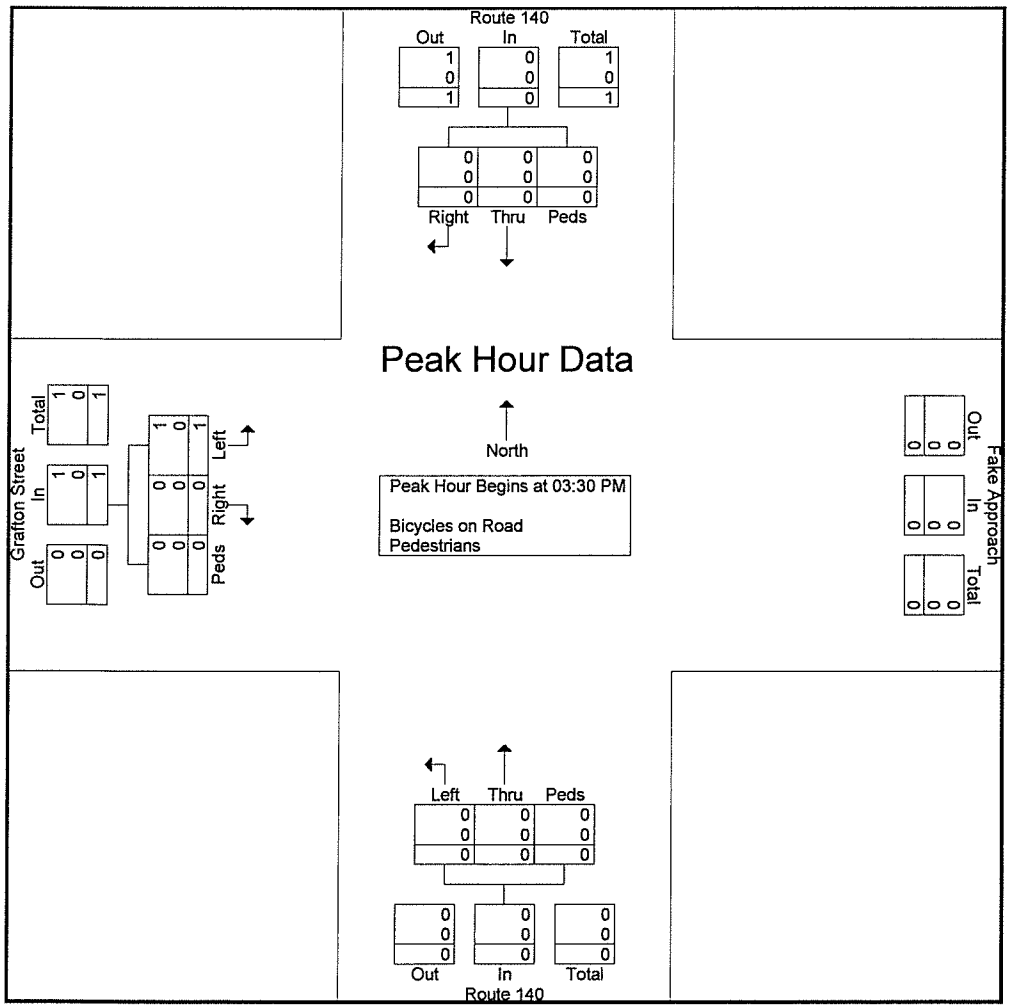


MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 124
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 EB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 4

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:30 PM													
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250
Bicycles on Road	0	0	0	0	0	0	0	0	0	1	0	1	1
% Bicycles on Road	0	0	0	0	0	0	0	0	0	100	0	100	100
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0



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28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 140
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 WB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 1

Groups Printed- Bicycles on Road - Pedestrians

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 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
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 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
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 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
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 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
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
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 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
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 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
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 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

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Marlborough, MA

N/S: Route 140
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 WB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 2

Groups Printed- Bicycles on Road - Pedestrians

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 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
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	1
Total	0	0	0	0	0	0	1	1	0	0	0	0	1
Grand Total	0	0	0	0	0	0	1	1	0	0	0	0	1
Apprch %	0	0	0		0	0	100		0	0	0		
Total %	0	0	0	0	0	0	100	100	0	0	0	0	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	1	1	0	0	0	0	1
% Pedestrians	0	0	0	0	0	0	100	100	0	0	0	0	100

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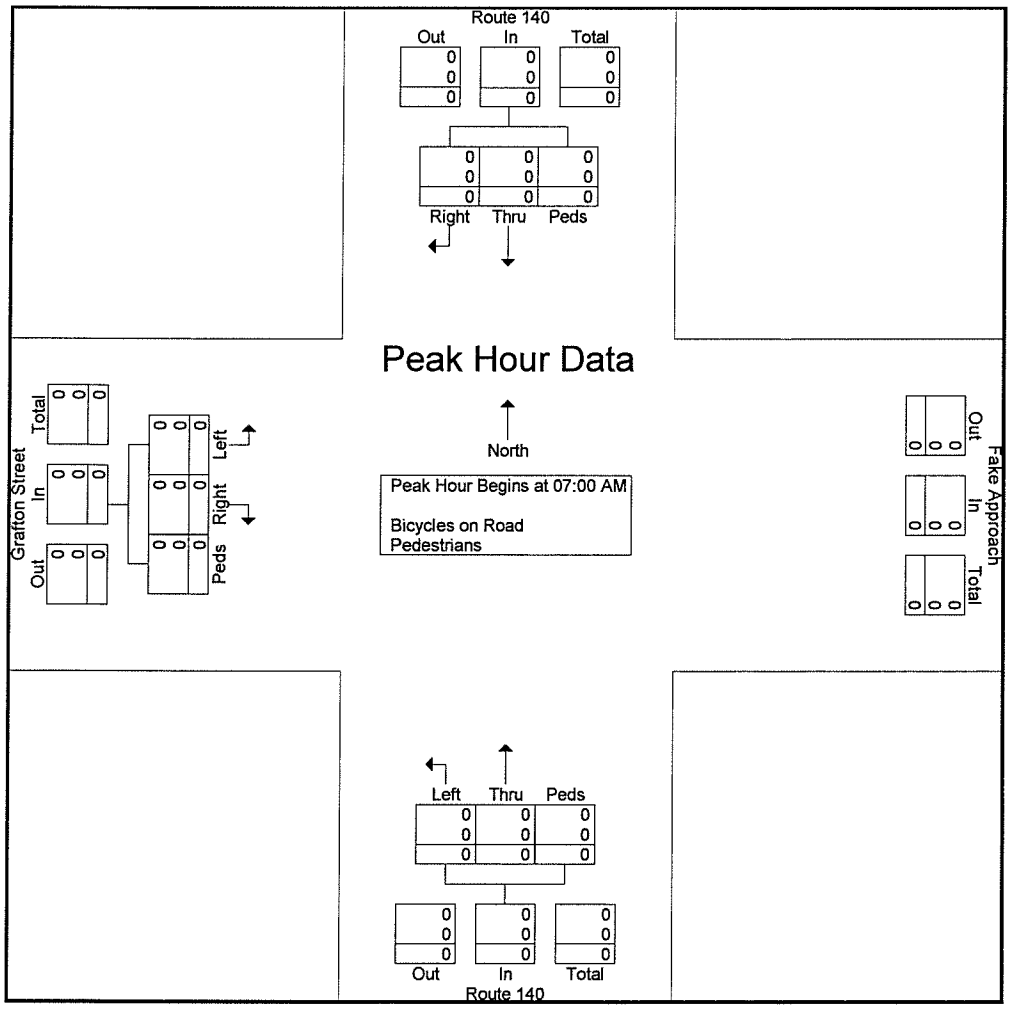
28 Lord Road, Suite 280
Marlborough, MA

N/S: Route 140
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 WB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 3

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 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
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0



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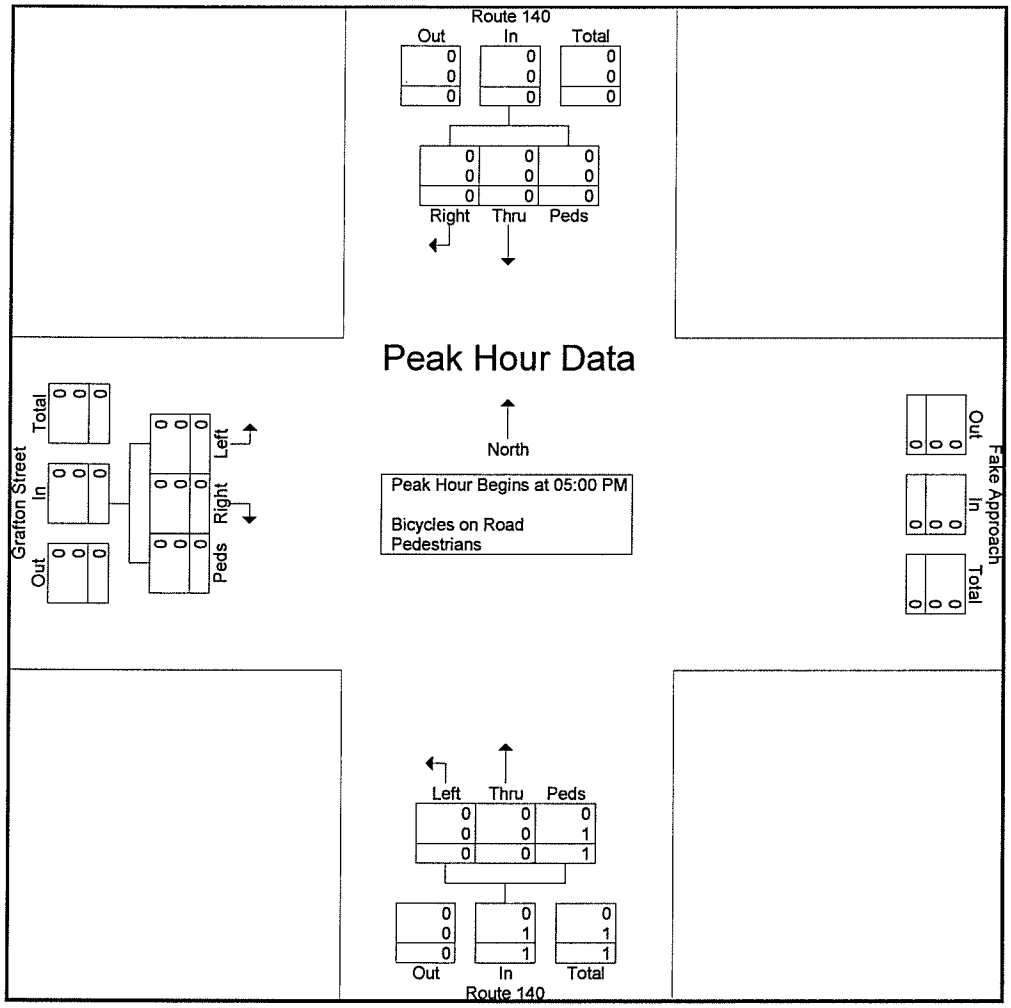
Marlborough, MA

N/S: Route 140
E/W: Grafton Street
Shrewsbury, MA

File Name : 1001 Rt 140 at Rt 9 WB Connector
Site Code : 1001
Start Date : 10/8/2019
Page No : 4

	Route 140 From North				Route 140 From South				Grafton Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	**1**	**1**	0	0	0	0	**1**
Total Volume	0	0	0	0	0	0	1	1	0	0	0	0	1
% App. Total	0	0	0		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.250
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	1	1	0	0	0	0	1
% Pedestrians	0	0	0	0	0	0	100	100	0	0	0	0	100



□ Seasonal/Yearly Growth Data

SECTION I - CONTINUOUS COUNTING STATION MONTHLY AVERAGE DAILY TRAFFIC

STATION 307 - WESTBOROUGH - RTE.9 - EAST OF NORTHBOROUGH T.L.

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
07	47,505	47,283	49,268	49,136	*50,000*	*52,000*	*53,000*	52,322	49,031	50,571	49,662	47,007	49,732
	-4%	-2%	-3%	1%	1%	-4%	-8%	-7%	-1%	-3%	-4%	-1%	-3%
08	45,614	46,112	47,829	49,816	*50,518*	*49,936*	*48,629*	48,759	48,531	49,009	47,490	46,696	48,245
	-3%	1%	-3%	-2%	-2%	0%	-2%	-3%	-2%	-1%	0%	2%	-1%
09	44,103	46,434	46,455	49,049	*49,474*	*49,934*	*47,638*	47,056	47,762	48,663	47,379	47,564	47,626
	-1%	0%	2%	0%	0%	1%	-1%	1%	1%	1%	2%	2%	1%
11	43,244	46,150	48,016	48,943	*49,781*	*50,525*	*46,812*	48,234	48,825	49,198	49,151	49,888	48,231
	7%	2%	1%	-1%	1%	-1%	3%	4%	0%	2%	2%	-5%	1%
12	46,381	46,883	48,608	48,662	*50,126*	*49,961*	*48,380*	49,941	48,882	50,056	50,015	47,600	48,791
	0%	-1%	-2%	1%	1%	-9%	3%	-1%	2%	0%	-1%	2%	0%
13	46,393	46,220	47,421	49,359	*50,657*	*45,623*	*49,797*	49,223	49,935	50,021	49,651	48,441	48,562
Seasonal Adjustment Factor (to average month)	1.07	1.04	1.01	0.99	0.97	0.98	0.99	0.99	0.99	0.98	0.99	1.01	

Growth -0.65%

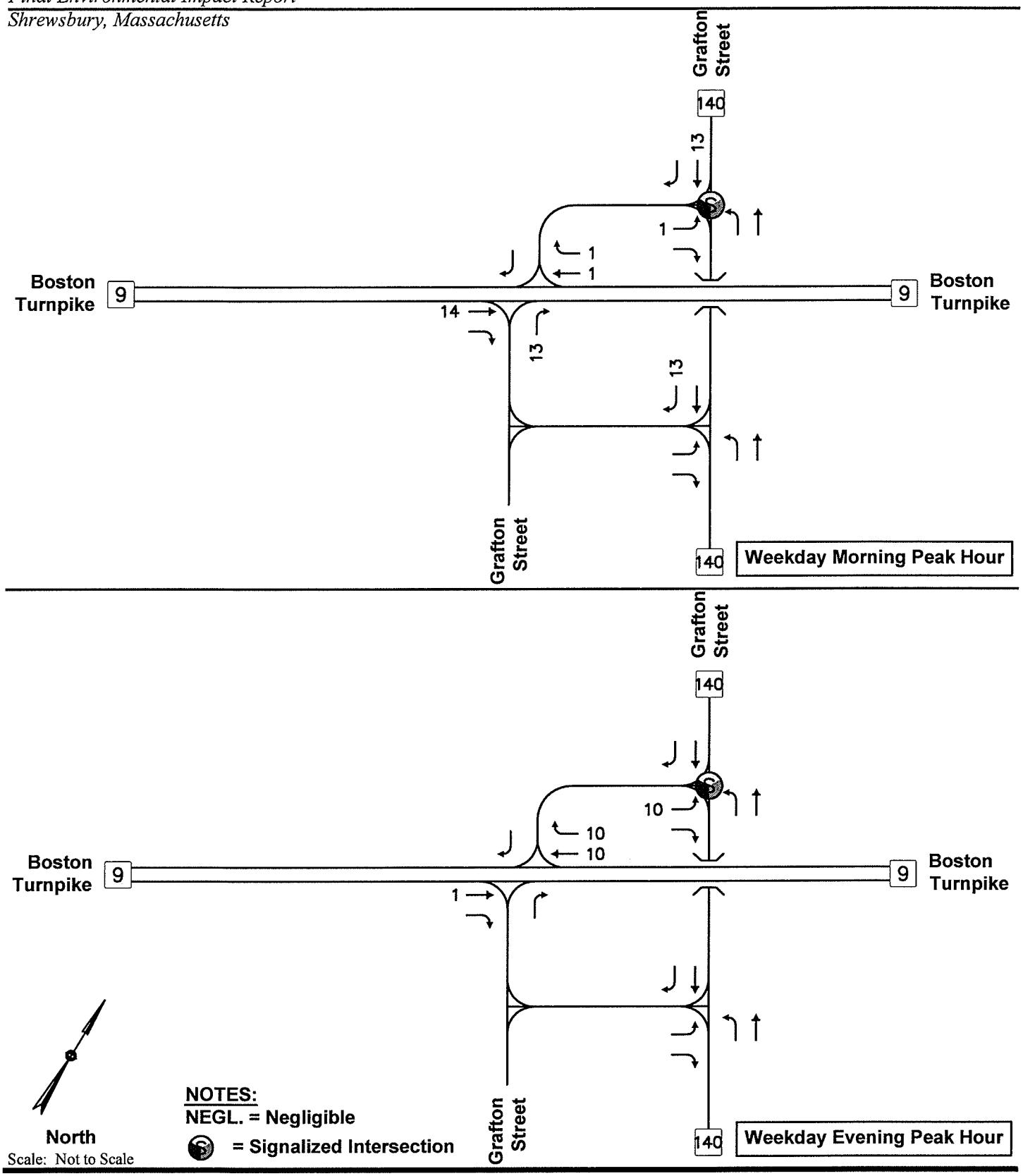
Average Yearly Growth Calculated -0.7%

Yearly Growth Factor Used 0.5%

ITALICS = ESTIMATED DATA

MADT

□ Background Projects



Attachment

MDM TRANSPORTATION CONSULTANTS, INC.
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Background Projects
100% Charles River Infill
Weekday Peak Hour Volumes

Date: January 2020
Dwg No. 1001 FEIR.dwg
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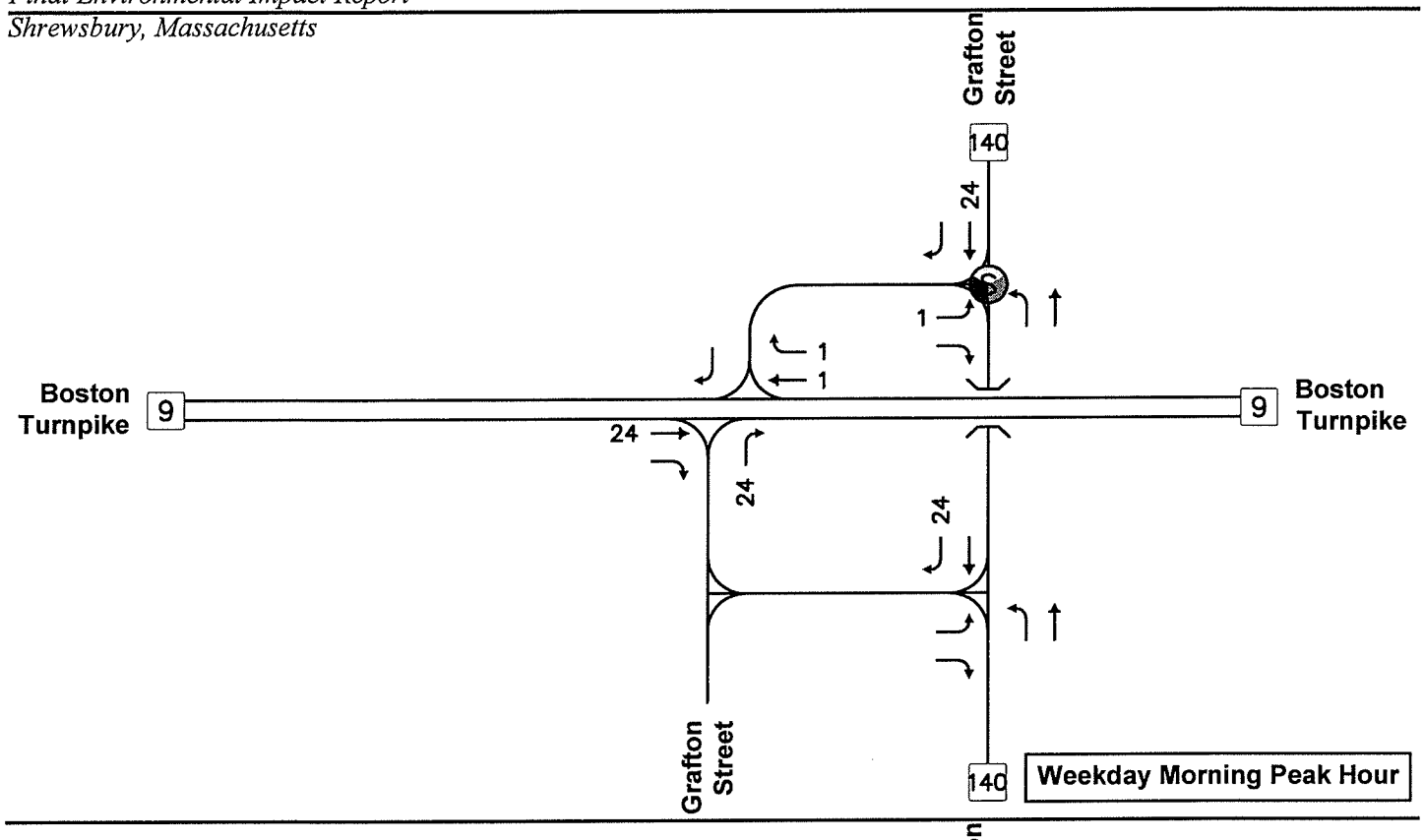

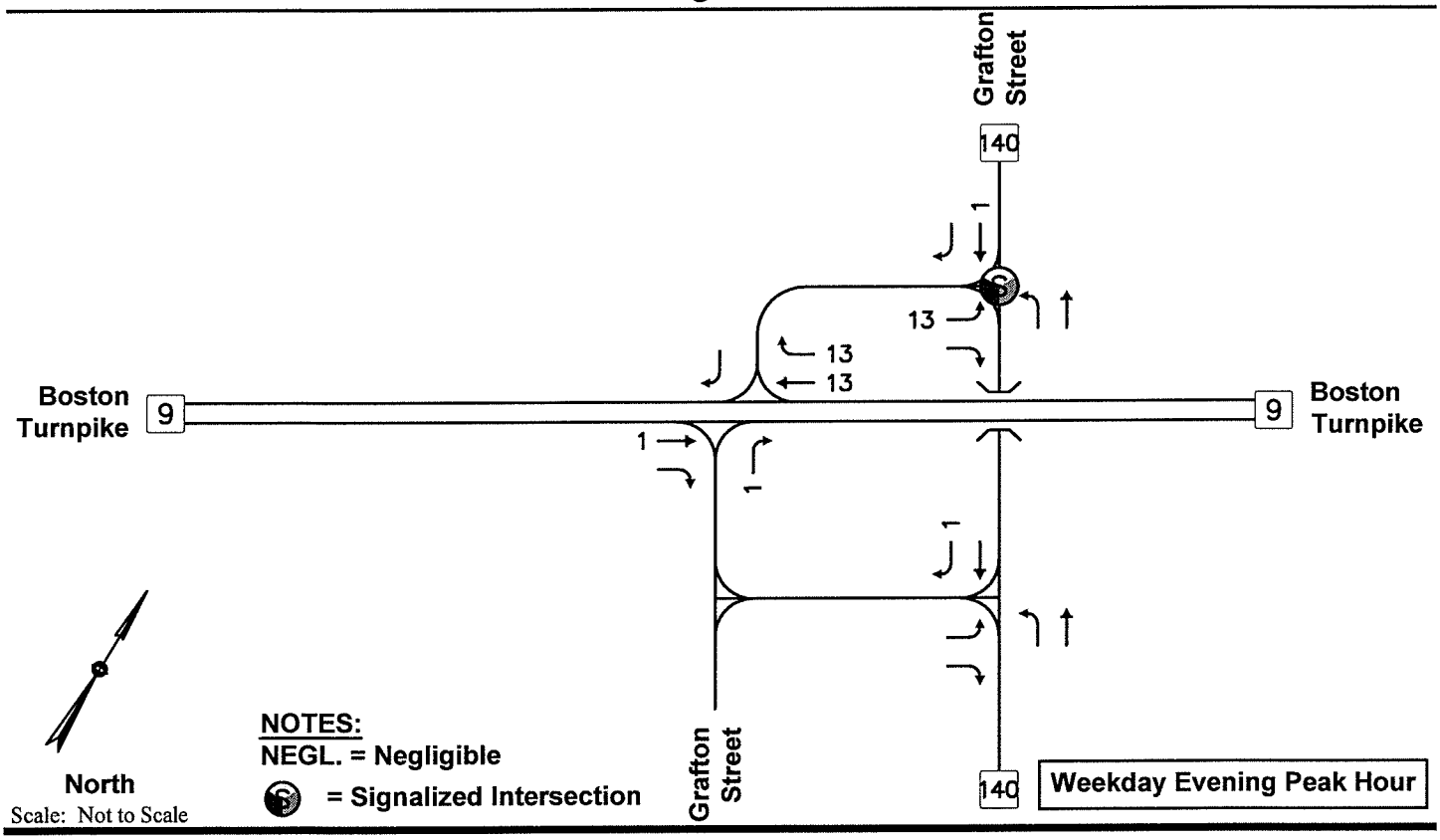

Attachment

MDM TRANSPORTATION CONSULTANTS, INC.
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Background Projects
25% UMass Infill
Weekday Peak Hour Volumes

Date: January 2020
Dwg No. 1001 FEIR.dwg
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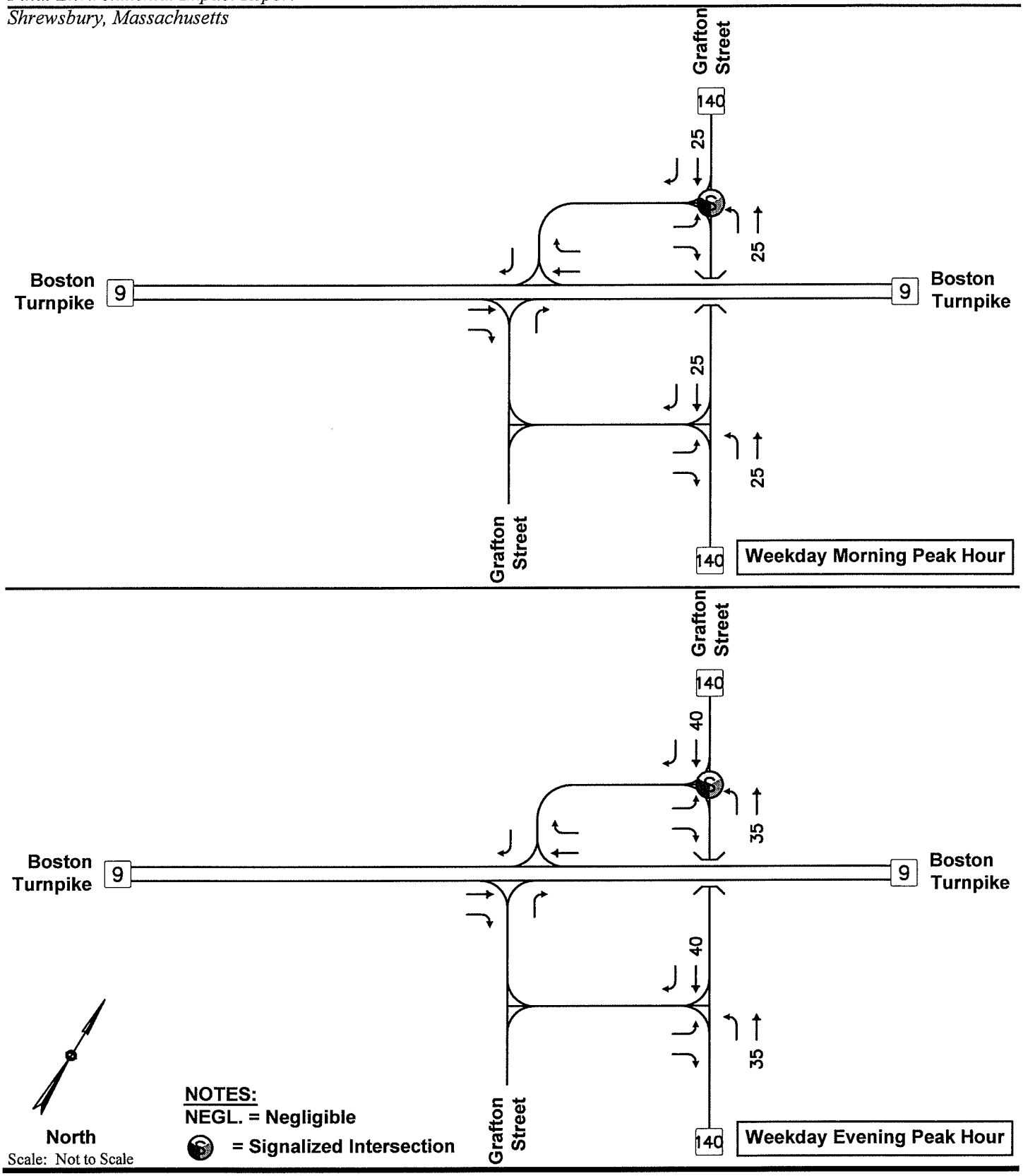

Attachment

MDM TRANSPORTATION CONSULTANTS, INC.
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Background Projects
Edgemere Crossing at Flint Pond
Weekday Peak Hour Volumes

Date: January 2020
Dwg No. 1001 FEIR.dwg
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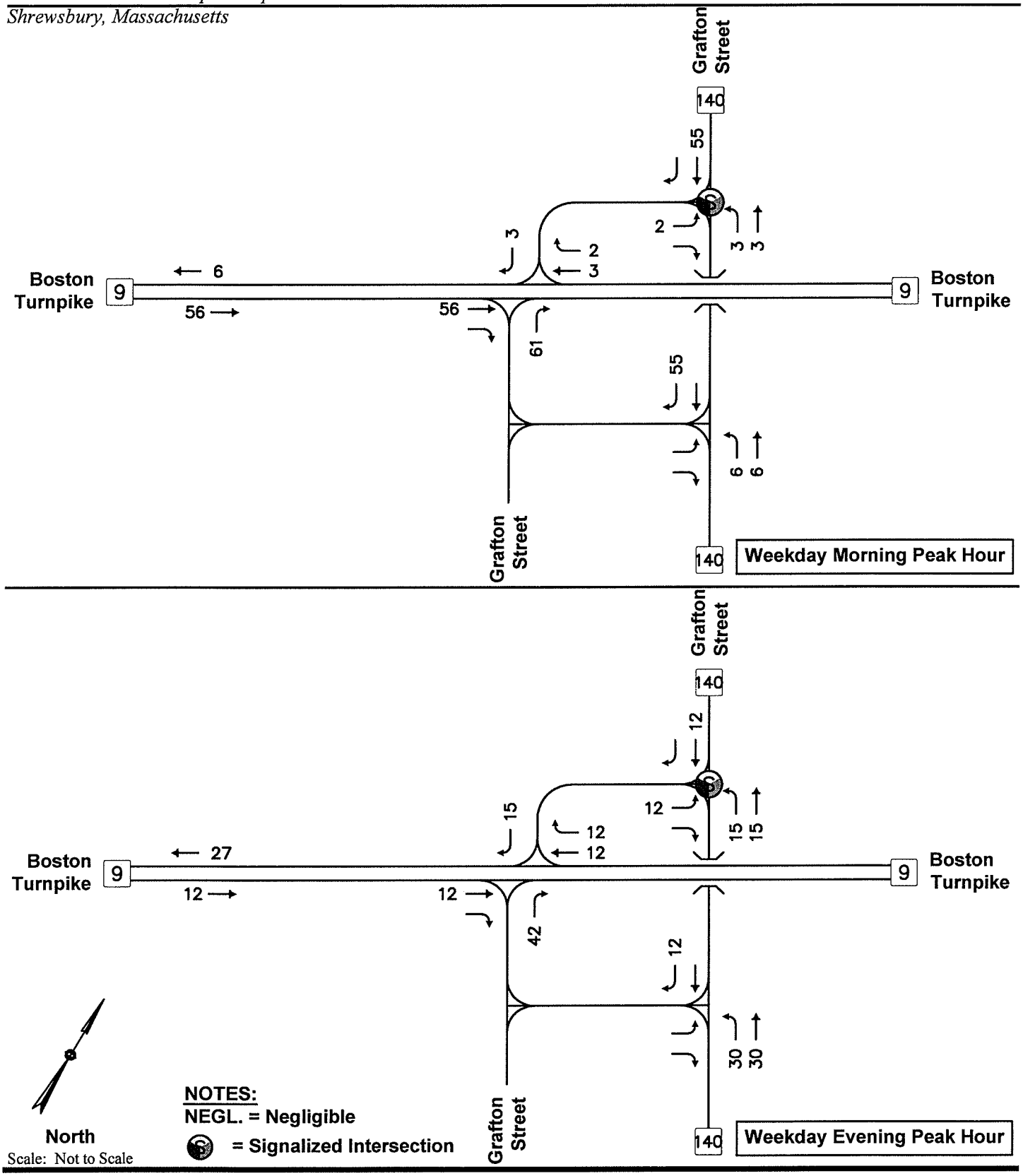
□ Expanded Project Trip Tracings



Attachment

MDM TRANSPORTATION CONSULTANTS, INC.
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Site Generated Trips
Weekday Peak Hour Volumes

Date: January 2020
Dwg No. 1001 FEIR.dwg
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□ Trip Distribution

Residence-to-Work Distribution

US Census Journey-to-Work Data

Workplace Town	Residence Town	Residence State	All Workers	% of Total Rounded	To/From Routes																	
					Route 9 From West		Route 9 From East		140 From North		Route 20 From West		Route 20 From East		Centech Blvd From South		Green Street From South		Cherry Street From North		South Street From North		Total
Shrewsbury	Worcester city	Massachusetts	3,405	26.0%	25%	6.5%		0.0%	20%	5.2%	25%	6.5%		0.0%		0.0%		0.0%	5%	1.3%	25%	6.5%	26.0%
Shrewsbury	Shrewsbury town	Massachusetts	3,150	24.1%	30%	7.2%	10%	2.4%	30%	7.2%	10%	2.4%	5%	1.2%		0.0%		0.0%	5%	1.2%	10%	2.4%	24.1%
Shrewsbury	Auburn town	Massachusetts	356	2.7%		0.0%		0.0%		0.0%	50%	1.4%		0.0%		0.0%		0.0%		0.0%	50%	1.4%	2.7%
Shrewsbury	Holden town	Massachusetts	326	2.5%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	100%	2.5%	2.5%
Shrewsbury	Webster town	Massachusetts	280	2.1%		0.0%		0.0%		0.0%	50%	1.1%		0.0%		0.0%		0.0%		0.0%	50%	1.1%	2.1%
Shrewsbury	Leicester town	Massachusetts	244	1.9%		0.0%		0.0%		0.0%	50%	0.9%		0.0%		0.0%		0.0%		0.0%	50%	0.9%	1.9%
Shrewsbury	Oxford town	Massachusetts	239	1.8%		0.0%		0.0%		0.0%	50%	0.9%		0.0%		0.0%		0.0%		0.0%	50%	0.9%	1.8%
Shrewsbury	Grafton town	Massachusetts	226	1.7%		0.0%		0.0%		0.0%		0.0%		0.0%	100%	1.7%		0.0%		0.0%		0.0%	1.7%
Shrewsbury	Northborough town	Massachusetts	211	1.6%		0.0%		0.0%		0.0%		0.0%	100%	1.6%		0.0%		0.0%		0.0%		0.0%	1.6%
Shrewsbury	West Boylston town	Massachusetts	207	1.6%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	100%	1.6%	1.6%
Shrewsbury	Millbury town	Massachusetts	191	1.5%		0.0%		0.0%		0.0%	100%	1.5%		0.0%		0.0%		0.0%		0.0%		0.0%	1.5%
Shrewsbury	Sutton town	Massachusetts	190	1.5%	25%	0.4%		0.0%		0.0%	50%	0.7%		0.0%		0.0%		0.0%		0.0%	25%	0.4%	1.5%
Shrewsbury	Rutland town	Massachusetts	164	1.3%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	100%	1.3%	1.3%
Shrewsbury	Sturbridge town	Massachusetts	161	1.2%		0.0%		0.0%		0.0%	100%	1.2%		0.0%		0.0%		0.0%		0.0%		0.0%	1.2%
Shrewsbury	Douglas town	Massachusetts	154	1.2%		0.0%		0.0%		0.0%	50%	0.6%		0.0%		0.0%		0.0%		0.0%	50%	0.6%	1.2%
Shrewsbury	Southbridge Town city	Massachusetts	138	1.1%		0.0%		0.0%		0.0%	75%	0.8%		0.0%		0.0%		0.0%		0.0%	25%	0.3%	1.1%
Shrewsbury	Charlton town	Massachusetts	130	1.0%		0.0%		0.0%		0.0%	100%	1.0%		0.0%		0.0%		0.0%		0.0%		0.0%	1.0%
Shrewsbury	Leominster city	Massachusetts	118	0.9%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	100%	0.9%	0.9%
Shrewsbury	Framingham town	Massachusetts	112	0.9%		0.0%	100%	0.9%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	0.9%
Shrewsbury	Fitchburg city	Massachusetts	103	0.8%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	100%	0.8%	0.8%
Shrewsbury	Hudson town	Massachusetts	97	0.7%		0.0%	60%	0.4%		0.0%		0.0%	20%	0.1%		0.0%		0.0%		0.0%	20%	0.1%	0.7%
Shrewsbury	Northbridge town	Massachusetts	95	0.7%		0.0%		0.0%		0.0%	100%	0.7%		0.0%		0.0%		0.0%		0.0%		0.0%	0.7%
Shrewsbury	Marlborough city	Massachusetts	90	0.7%		0.0%	100%	0.7%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	0.7%
Shrewsbury	Boylston town	Massachusetts	88	0.7%		0.0%		0.0%		0.0%		0.0%	30%	0.2%		0.0%		0.0%		0.0%	70%	0.5%	0.7%
Shrewsbury	Milford town	Massachusetts	87	0.7%		0.0%	100%	0.7%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	0.7%
Shrewsbury	Clinton town	Massachusetts	86	0.7%		0.0%		0.0%		0.0%		0.0%	40%	0.3%		0.0%		0.0%		0.0%	60%	0.4%	0.7%
Shrewsbury	Boston city	Massachusetts	85	0.6%		0.0%	100%	0.6%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	0.6%
Shrewsbury	Franklin Town city	Massachusetts	82	0.6%		0.0%	100%	0.6%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	0.6%
Shrewsbury	Blackstone town	Massachusetts	78	0.6%		0.0%	50%	0.3%		0.0%	50%	0.3%		0.0%		0.0%		0.0%		0.0%		0.0%	0.6%
Shrewsbury	Westborough town	Massachusetts	73	0.6%		0.0%	100%	0.6%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	0.6%
Shrewsbury	Gardner city	Massachusetts	69	0.5%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	100%	0.5%	0.5%
Shrewsbury	Uxbridge town	Massachusetts	67	0.5%		0.0%		0.0%		0.0%	100%	0.5%		0.0%		0.0%		0.0%		0.0%		0.0%	0.5%
Shrewsbury	Upton town	Massachusetts	66	0.5%		0.0%	50%	0.3%		0.0%	50%	0.3%		0.0%		0.0%		0.0%		0.0%		0.0%	0.5%
Shrewsbury	Dudley town	Massachusetts	65	0.5%		0.0%		0.0%		0.0%	100%	0.5%		0.0%		0.0%		0.0%		0.0%		0.0%	0.5%
Shrewsbury	Springfield city	Massachusetts	64	0.5%		0.0%		0.0%		0.0%	100%	0.5%		0.0%		0.0%		0.0%		0.0%		0.0%	0.5%
Shrewsbury	Princeton town	Massachusetts	63	0.5%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%	100%	0.5%	0.5%
Shrewsbury	Spencer town	Massachusetts	60	0.5%		0.0%		0.0%		0.0%	50%	0.2%		0.0%		0.0%		0.0%		0.0%	50%	0.2%	0.5%
		Sub-Total	11,422	87.3%		14.1%		7.4%		12.4%		22.0%		3.4%		1.7%		0.0%		2.5%		23.7%	74.8%
		Other	1,668	12.7%		2.4%		1.3%		2.1%		3.7%		0.6%		0.3%		0.0%		0.4%		4.0%	12.7%
		Total	13,090	100%		16.5%		8.7%		14.5%		25.7%		4.0%		2.0%		0.0%		2.9%		27.7%	87.6%
					SAY	15%		10%		15%		25%		5%		5%		0%		0%		25%	100%

□ Crash Data

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Shrewsbury, MA COUNT DATE : Oct-19

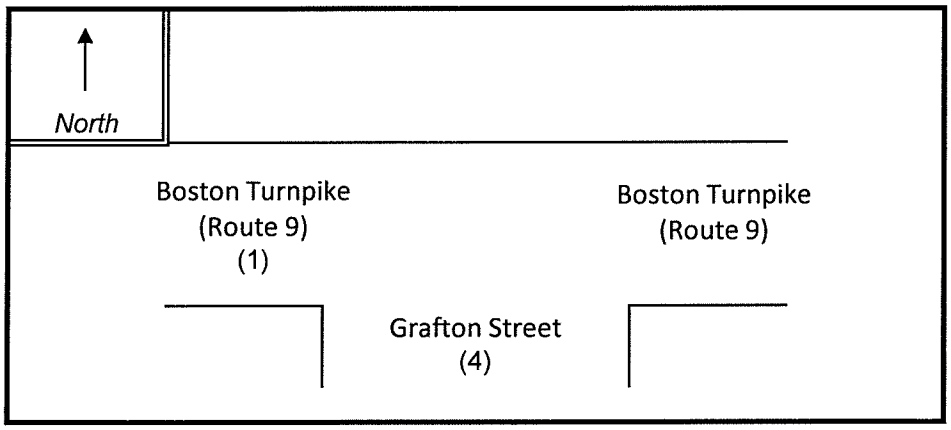
DISTRICT : 3 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Boston Turnpike (Route 9)

MINOR STREET(S) : Grafton Street

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 (PM) :	1,578			216		1,794

" K " FACTOR : **0.076** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **23,605**

TOTAL # OF CRASHES : 9 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.80**

CRASH RATE CALCULATION : 0.21 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT District 3 Avg: Signalized = 0.89; Unsignalized = 0.61

Project Title & Date: 1001 - Shrewsbury

massDOT

Route 9 Easrbound at Grafton Street

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2014																					
3974923	SHREWSBURY	09/10/2014	9:02 AM	Non-fatal Injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: E / V2: E		V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	Dry	Daylight	Clear	GRAFTON STREET / BOSTON TURNPIKE					
3985244	SHREWSBURY	08/15/2014	4:24 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Traveling straight ahead / V2: Slowing or stopped in traffic	V1: E / V2: E	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility))	Dry	Daylight	Clear	BOSTON TURNPIKE	GRAFTON STREET				
2015																					
4122780	SHREWSBURY	08/18/2015	7:36 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: E / V2: E	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) / V2:(Passenger car)	Dry	Daylight	Clear	BOSTON TURNPIKE / GRAFTON STREET					
4131744	SHREWSBURY	06/04/2015	5:24 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Turning right / V2: Turning right	V1: W / V2: W	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	Dry	Daylight	Clear	BOSTON TURNPIKE / GRAFTON STREET / BOSTON TURNPIKE					
4170025	SHREWSBURY	08/07/2015	4:47 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: W / V2: W	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) / V2:(Passenger car)	Dry	Daylight	Cloudy	BOSTON TURNPIKE	GRAFTON STREET				
2016																					
4381444	SHREWSBURY	12/02/2016	4:40 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1: Not Reported / V2: Not Reported	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) / V2:(Passenger car)	Dry	Dark - unknown roadway lighting	Clear	GRAFTON STREET					
2017																					
4409268	SHREWSBURY	04/06/2017	11:14 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1: S		V1:(Light truck(van, mini-van, pickup, sport utility))	Wet	Daylight	Rain	GRAFTON STREET					
2018																					
4627588	SHREWSBURY	11/09/2018	6:23 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1: E / V2: E	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) / V2:(Passenger car)	Dry	Dawn	Clear	GRAFTON STREET / BOSTON TURNPIKE Rte 9 E					
4632151	SHREWSBURY	11/12/2018	2:13 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1: S / V2: S	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	Dry	Daylight	Cloudy	BOSTON TURNPIKE Rte 9 W / GRAFTON STREET					

□ Capacity Analysis

Intersection						
Int Delay, s/veh	1.9					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱				↱
Traffic Vol, veh/h	1432	146	0	0	0	216
Future Vol, veh/h	1432	146	0	0	0	216
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Stop
Storage Length	-	250	-	-	-	0
Veh in Median Storage, #	0	-	-	-	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	12	2	0	0	0	4
Mvmt Flow	1523	155	0	0	0	230

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	762
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	4.3
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	0	0	605
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-			
Mov Cap-1 Maneuver	-	-	-	605
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	14.5
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	605	-
HCM Lane V/C Ratio	0.38	-
HCM Control Delay (s)	14.5	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	1.8	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱				↱
Traffic Vol, veh/h	1521	151	0	0	0	251
Future Vol, veh/h	1521	151	0	0	0	251
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Stop
Storage Length	-	250	-	-	-	0
Veh in Median Storage, #	0	-	-	-	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	12	2	0	0	0	4
Mvmt Flow	1618	161	0	0	0	267

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	809
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	4.3
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	0	0	583
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-			
Mov Cap-1 Maneuver	-	-	-	583
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	16.3
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	583	-
HCM Lane V/C Ratio	0.458	-
HCM Control Delay (s)	16.3	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	2.4	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱				↱
Traffic Vol, veh/h	1577	151	0	0	0	312
Future Vol, veh/h	1577	151	0	0	0	312
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Stop
Storage Length	-	250	-	-	-	0
Veh in Median Storage, #	0	-	-	-	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	12	2	0	0	0	4
Mvmt Flow	1678	161	0	0	0	332

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	839
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	4.3
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	0	0	569
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-			
Mov Cap-1 Maneuver	-	-	-	569
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	19.8
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	569	-
HCM Lane V/C Ratio	0.583	-
HCM Control Delay (s)	19.8	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	3.7	-

Intersection						
Int Delay, s/veh	1.6					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱				↱
Traffic Vol, veh/h	1482	269	0	0	0	127
Future Vol, veh/h	1482	269	0	0	0	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Stop
Storage Length	-	250	-	-	-	0
Veh in Median Storage, #	0	-	-	-	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	1	2	0	0	0	2
Mvmt Flow	1497	272	0	0	0	128

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	749
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	0	0	354
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-			
Mov Cap-1 Maneuver	-	-	-	354
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	20.8
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	354	-
HCM Lane V/C Ratio	0.362	-
HCM Control Delay (s)	20.8	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	1.6	-

Intersection						
Int Delay, s/veh	1.5					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱				↱
Traffic Vol, veh/h	1429	260	0	0	0	122
Future Vol, veh/h	1429	260	0	0	0	122
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Stop
Storage Length	-	250	-	-	-	0
Veh in Median Storage, #	0	-	-	-	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	1	2	0	0	0	2
Mvmt Flow	1443	263	0	0	0	123

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	722
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	0	0	369
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-			
Mov Cap-1 Maneuver	-	-	-	369
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	19.6
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	369	-
HCM Lane V/C Ratio	0.334	-
HCM Control Delay (s)	19.6	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	1.4	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱				↱
Traffic Vol, veh/h	1494	269	0	0	0	169
Future Vol, veh/h	1494	269	0	0	0	169
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Stop
Storage Length	-	250	-	-	-	0
Veh in Median Storage, #	0	-	-	-	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	1	2	0	0	0	2
Mvmt Flow	1509	272	0	0	0	171

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	-	-	755
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	0	0	351
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-			
Mov Cap-1 Maneuver	-	-	-	351
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	24.6
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	EBT
Capacity (veh/h)	351	-
HCM Lane V/C Ratio	0.486	-
HCM Control Delay (s)	24.6	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	2.6	-

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA

Graftion Street
Approach to Route 9 EB
Shrewsbury, MA

File Name : Grafton Street SSD AM
Site Code : 1001
Start Date : 12/19/2019
Page No : 1

Summary Information:

3:47:00 PM - 4:48:00 PM	Grafton Street
Total Vehicle Count:	215
Delayed Vehicle Count:	215
Through Vehicle Count:	0
Average Stopped Time:	14.43
Maximum Stopped Time:	52
Min. Secs. for Delay:	0
Average Queue:	0.86
Queue Density:	1.73
Maximum Queue:	5
Delay in Vehicle Hour:	0.86
Total Delay:	3103

□ Draft Letter of Commitment

On Town of Shrewsbury Letterhead

December 30, 2019

Mr. J. Lionel Lucien, P.E.
Massachusetts Department of Transportation
Public/Private Development Unit
10 Park Plaza, Room 4150
Boston, MA 02116

Re: Letter of Commitment
Proposed Centech Park North
EEA No. 15950
Shrewsbury, Massachusetts

Dear Mr. Lucien:

The Town of Shrewsbury (Proponent) has prepared this draft Letter of Commitment to the Massachusetts Department of Transportation ("MassDOT") defining proposed mitigation measures and implementation schedule within state jurisdiction roadways for the proposed Centech Park North project (EEA No. 15950) in Shrewsbury, MA ("Project"). This Letter of Commitment is provided in response to comments noted in the August 24, 2019 Certificate on the Draft Environmental Impact Report (DEIR) and serves as the Proponent's formal commitment to mitigation on state jurisdiction roadways, which will inform subsequent issuance of a Section 61 Finding by your office.

Project Description

The Site comprises approximately 66.5± acres bounded by Route 20 to the south and South Street to the east in Shrewsbury, Massachusetts. The property is currently occupied by three vacant buildings and a paved parking area. Site access/egress includes two full access/egress driveways along South Street.

Under the proposed development program, the Site will be redeveloped to include 450,000± sf of office and industrial park space with 275,000± sf off South Street (Sub-District A) and 175,000± sf off Route 20 (Sub-District B). The master plan for the project assumes 40% office space and 60% industrial space for each Sub-District with on-site parking to include 812± surface parking spaces. Site access/egress is proposed via two (2) non-connecting driveways: a full access/egress driveway along South Street that will support Sub-District A and a right-in/right-out driveway along Route 20 that will support Sub-District B.

Status of MEPA Review

An ENF for the Proposed Development was submitted for review under MEPA on December 5, 2018 and was scoped for a DEIR on January 4, 2019. A DEIR was submitted for review on August 15, 2019 and was scoped for FEIR on September 27, 2019.

The FEIR responds to individual and agency comments on the DEIR and that addresses MassDOT comments including refinement of this DRAFT Letter of Commitment. The Proponent will continue to coordinate with MassDOT under the MEPA process to formalize mitigation commitments and timelines so that a subsequent Section 61 Finding may be issued.

Proposed Mitigation – State Jurisdiction Roadways

Capacity analyses were conducted for the weekday morning and weekday evening peak hours for Baseline, future No-Build, and future Build conditions. The analyses indicate that certain signal timing and/or physical improvements may be required at the Route 20 intersection with South Street and at Centech Boulevard to support the development; access to Route 20 will also be required to support Centech Park North Sub District B. Operations at the remaining study locations are sufficient to support the development. Roadway improvements that support projected traffic increases associated with the proposed development are identified that minimize or offset Project-related traffic impacts and address access needs for the Project Site. The list of improvements on state jurisdiction roadways includes the following:

Site Driveway at Route 20

The site driveway intersection with Route 20 has been designed as a right-in/right-out driveway and has been conceptually designed to accommodate a tractor trailer (WB-50) design vehicle. Conceptual driveway access plans for the proposed driveway intersection with Route 20 are presented in the FEIR Transportation Component for (a) implementation assuming existing layout of Route 20, and (b) implementation assuming a planned/future 4-lane cross section of Route 20 is advanced by others. Signs and pavement markings that comply with the Manual on Uniform Traffic Control Devices (MUTCD) will also be provided including STOP signs (R1-1), No Left Turn signs (R3-2) and STOP line pavement markings.

Improvements to the Route 20 at Site Driveway which will be subject to a Highway Access Permit as described above will be undertaken by the Proponent prior to initial occupancy of Sub-District B.

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Route 20 at South Street

The Proponent will work with MassDOT to provide (a) signal retiming only to accommodate the Phase I (Sub District A) development, and (b) widening of South Street north leg to accommodate a dedicated right-turn lane and traffic signal timing optimization to offset project traffic impacts for additional (phased) occupancy of Sub District A or Phase II (Sub District B), subject to meeting implementation thresholds per a defined monitoring protocol. The improvements include widening of the South Street approach to include a dedicated right-turn lane principally within Town layout with no change to MassDOT traffic signal equipment with associated signal retiming/optimization. The project is compatible with the Route 20 Long-Range Improvements by others which will provide a 4-lane cross section along Route 20 and associated MassDOT Healthy Transportation Initiative (HTI) elements for which land takings are required.

Based on consultation with MassDOT District 3 Office and the Public Private Development Unit, the relatively minor geometric modifications and signal timing adjustments that are within MassDOT jurisdiction to support the Project requires only a Category I Access Permit and as such which would be exempt from HTI requirements.

Analysis results indicate that the recommended geometric and signal modifications significantly improve traffic operations relative to No-Build conditions and offset impacts by the Project. Likewise, queuing along the South Street southbound lanes are expected to improve significantly.

Improvements to the Route 20 at South Street signal timing improvements as described above will be undertaken by the Proponent within 6 months of initial occupancy at Centech Park North (Sub District A). Additional geometric and traffic signal timing modifications at this location may be required to support additional development beyond initial occupancy of the Sub District A component subject to meeting applicable monitoring thresholds as established under the Transportation Monitoring Program. Subject to meeting applicable monitoring thresholds, the Proponent will design, permit and implement applicable intersection improvements that are consistent with conceptual improvements entitled "Conceptual Design Plan, Route 20 at South Street, Shrewsbury Massachusetts" prepared by MDM Transportation Consultants, Inc. dated June 28, 2019 as documented in the FEIR.

Route 20 at Centech Boulevard/Cherry Street

The Proponent will work with MassDOT to provide (a) signal retiming optimization and/or phasing changes to accommodate the Phase II (Sub District B) development, subject to meeting implementation thresholds as defined in the Transportation Monitoring Program.

Improvements to the Route 20 at Centech Boulevard/Cherry Street will be undertaken by the Proponent prior to initial occupancy of Sub District B if warranted based on monitoring.

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Road Safety Audit – Route 9/ South Street – Completed by Proponent

This intersection of Route 9 at South Street is listed as a 2014 – 2016 Highway Safety Improvement Program (HSIP) cluster by MassDOT and was the subject of a Road Safety Audit (RSA) which was completed by the Proponent and accepted by MassDOT as of June 26, 2019. The purpose of an RSA is to identify potential short-term, medium term and long-term safety/operational improvements. The Proponent will implement several of the short-term/low cost improvements as outlined in the RSA subject to approval by MassDOT as described below:

- Replace the near side "No Turn on Red" (R10-11b) sign on the South Street southbound approach with a "Right Turn on Red Must Yield to U-Turn" (R10-30) sign.

- Relocate the static "Advanced Traffic Signal" (W3-3) sign on the Route 9 westbound approach to the crest of the hill just west of the Fruit Street intersection. The location will be reviewed with MassDOT to provide visibility for approaching vehicles. Install a 45-mph speed advisory plaque (W13-1p) on the same post.

- Install a "No-Turn on Red" (R10-11b) sign for the Route 9 eastbound right turn movements.

- Verify if the signal clearance times (yellow and all red) are appropriate and adjust if required.

- The Proponent (Town) will work with the school bus company to relocate the bus stop further south along South Street or to allow the buses to pull into Yorkshire Terrace and/or Laxfield Road.

The Proponent will implement the short term/low cost improvements as listed above within 6 months of initial occupancy of Centech Park North (Sub District A).

<u>Transportation Demand Management Program</u>

The Proponent is committed to reduce Site trip generation by tenant employees by implementing a TDM program, elements of which will be memorialized in a Tenant Manual and/or will be made a provision of a master deed. These elements are consistent with the Massachusetts Department of Environmental Protection (MADEP) directive to use all reasonable and feasible mitigation actions to reduce auto emissions. The TDM program includes the following elements, which are subject to selected tenant corporate policies:

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- *Employee Transportation Coordinator*. The Proponent will designate a contact that will serve as transportation coordinator responsible for disseminating relevant TDM information to tenants including documentation of TDM information as part of a Tenant Manual at time of lease and/or as subject to a Master Deed for the property.

- *Public Transportation Information & Promotion*. Service and schedule information for the Worcester Regional Transit Authority (WRTA) and MBTA will be posted and public transportation subsidy program considered to promote the use of public transportation by employees and visitors. Alternative means of connecting the Site to the nearby MBTA station at Centech Boulevard (Grafton MBTA station) will also be evaluated by the Proponent such as modification of WRTA bus routes, rideshare services such as Uber and Lyft, bike share services, tenant employee carpool options, and rideshare matching services with other nearby employers along South Street that include UMass and Charles River Laboratories.

- *Workforce Transportation Program.* The proponent will work with MassDOT to secure funding through the Workforce Transportation Program to help employees meet workforce transportation needs, including first mile/last mile connections.

- *Bicycle Facilities and Amenities*. Bicycle parking, including visible accessible racks for visitors and employees will be provided proximate to building entrances. The Proponent will also consider a bike share service for the property that will provide tenant employees access to bicycles for access to nearby transit options, recreational purposes during break periods and alternative means of travel to area destinations.

- *Alternative Work Arrangements*. The Proponent will encourage its tenants to provide alternative work arrangements such as flextime, compressed workweek and telecommuting in order to allow employees to balance work and personal commitments, and to reduce traffic and parking demands.

- *Preferential Parking for Carpools, Vanpools and Car Sharing.* Preferential parking locations for building tenant employees who use carpools and vanpools are to be provided; specific locations and number are to be determined through refinement of the Site Plans for the project.

- *Preferential Parking for Low-Emission Vehicles.* Preferential parking locations for employees and patrons who use low-emission vehicles will be considered; charging stations for electric vehicles will also be considered during the Site Plan development process.

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- *Transit Pass Subsidy.* The Proponent will encourage its tenants to offer fare subsidies for commuter rail passes for eligible employees and/or offer pre-tax payroll deductions for employee transit passes.

- *Transit System Connections.* Alternative means of connecting the Site to the nearby MBTA station at Centech Boulevard (Grafton MBTA station) will also be evaluated by the Proponent such as modification of WRTA bus routes, rideshare services such as Uber and Lyft, bike share services, tenant employee carpool options, and rideshare matching services with other nearby employers along South Street that include UMass and Charles River Laboratories.

- *MassRides*. MassRides is the Executive Office of Transportation's statewide travel options program providing free assistance to commuters, employers, students, and other traveler markets. MassRides programs may encourage workers to use alternative forms of transportation such as carpooling, vanpooling, and to utilize a large database for rideshare matching. The Proponent will promote commuter assistance programs available through MassRides by encouraging building tenants to incorporate information on MassRides as part of the employee orientation programs.

- *Guaranteed Ride Home*. The Proponent will encourage commercial tenants to offer a guaranteed ride home program that subsidizes taxi service for employees using non-auto commute options in cases of unexpected circumstances.

- *Pedestrian Infrastructure*. Sidewalk connections within the property along primary pedestrian desire lines that connect building entrances with the public sidewalk network; posting of area maps that highlight area walking/bicycle routes to promote walking and bicycle travel to/from the Site and area businesses. The Proponent also recognizes the need for extending existing sidewalks along South Street from their current terminal points to Route 9 and Route 20; however, the feasibility of constructing these sidewalk extensions is subject to further evaluation by the Proponent to determine potential land acquisition/easement requirements. The Proponent has discussed the design details for pedestrian improvements at the Route 9/South Street intersection with District 3 and PPDU staff. Discussion with MassDOT indicate that MassDOT will not be pursuing pedestrian improvements including traffic signal upgrades and crosswalk across State highway and relocation of the median barrier anytime soon. Therefore, MassDOT and the Town of Shrewsbury are in agreement to not extend the sidewalk along South Street from the CVS property and Price Chopper property to the State Highway layout at Route 9 at this time.

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- *On-Site Support Services/Amenities*. Buildings will include services and amenities that encourage employees to remain on-site for essential services and internalize trip making to the campus including on-site mailboxes and an on-site Fed-Ex and/or UPS drop box locations. Other amenities to be considered in building programming may include an employee fitness center, showers, and cafeteria for employees – measures aimed at reducing the need to conduct off-site trips during a typical workday. Specific measures are to be evaluated in more detail during the Site Plan review process.

Transportation Monitoring Program

The Proponent will provide an annual travel survey of employees at the Site for a period of 5 years beginning six months following occupancy of the Site. Traffic volumes as presented in the DEIR Traffic Impact and Access Study dated August 15, 2019 shall serve as baseline traffic conditions for comparative purposes. Implementation of signal timing modifications at the Route 20/South Street/Green Street intersection, structural improvements at the Route 20/South Street/Green Street intersection to include widening of the South Street approach, and signal timing improvements at the Route 20/Centech Boulevard/Cherry Street intersection are contingent on the following monitoring protocol:

Route 20/South Street/Green Street

- Within 90 days following the occupancy of each building within Sub-District A, the Proponent shall conduct weekday peak hour traffic volume counts (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) at the South Street intersections at Routh 20 and the Site Driveway. The Proponent will also conduct a 24-hour weekday automatic traffic recorder (ATR) count at the site driveway for a typical weekday. Intersection operational analysis and observations including level-of-service, vehicle queuing and approach delay shall be documented for these traffic volumes for comparison to established mitigation thresholds.

- Following each monitoring report, the Proponent shall identify any operation constraints that would require implementation of mitigation actions (i.e., intersection improvements). These thresholds would be either (a) approach delay for the southbound South Street approach to Route 20 that exceeds 55 seconds on average (LOS E conditions); or (b) vehicle queues on South Street that extend to or beyond Chestnut Street during the weekday evening peak traffic period. If either of the mitigation thresholds is met, implementation of intersection improvements at Route 20/South Street/Green Street may be required prior to any additional building occupancy following the submitted monitoring report.

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Route 20/Centech Boulevard/Cherry Street

- Prior to occupancy of Sub-District B and within 90 days following the occupancy of each subsequent building, the Proponent shall conduct weekday peak hour traffic volume counts (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) at the Route 20 intersection with Centech Boulevard/Cherry Street. Intersection operational analysis and observations including level-of-service, vehicle queuing and approach delay shall be documented for these traffic volumes to determine whether signal timing and/or phasing changes are necessary to offset project impacts relative to No Build conditions as documented in the DEIR. Subject to a determination that such signal timing or phasing modifications are necessary to achieve operations equal to or better than those documented in the DEIR for the No Build condition, the Proponent will identify appropriate signal timing or phasing changes in accordance with MassDOT approved design guidelines and shall design, permit and implement such improvements prior to any additional building occupancy beyond Sub District A.

The Proponent shall provide the results of each of the Transportation Monitoring reports to MassDOT and the Town to determine necessary mitigation actions in accordance with the defined monitoring thresholds and to advance required designs, permits, approvals as may be required prior to additional building occupancy as defined in the Transportation Monitoring Program.

Mitigation Schedule, Costs, and Responsible Parties

Implementation of the TDM program for the development, transportation monitoring program and proposed improvements at state jurisdiction roadway locations as described above shall be at the sole cost and responsibility of the Town of Shrewsbury and shall occur as outlined above.

The Town of Shrewsbury looks forward to the issuance of a Section 61 Finding by your office on this Project. Please contact me if you have any questions.

Sincerely,

Town of Shrewsbury

By: _____
Name:
Title:

DRAFT

APPENDIX D: DRAFT SECTION 61 FINDINGS

MassDOT - Draft Letter of Commitment

Mass DOER - Greenhouse Gas Draft Section 61 Findings

On Town of Shrewsbury Letterhead

December 30, 2019

Mr. J. Lionel Lucien, P.E.
Massachusetts Department of Transportation
Public/Private Development Unit
10 Park Plaza, Room 4150
Boston, MA 02116

Re: Letter of Commitment
Proposed Centech Park North
EEA No. 15950
Shrewsbury, Massachusetts

Dear Mr. Lucien:

The Town of Shrewsbury (Proponent) has prepared this draft Letter of Commitment to the Massachusetts Department of Transportation ("MassDOT") defining proposed mitigation measures and implementation schedule within state jurisdiction roadways for the proposed Centech Park North project (EEA No. 15950) in Shrewsbury, MA ("Project"). This Letter of Commitment is provided in response to comments noted in the August 24, 2019 Certificate on the Draft Environmental Impact Report (DEIR) and serves as the Proponent's formal commitment to mitigation on state jurisdiction roadways, which will inform subsequent issuance of a Section 61 Finding by your office.

Project Description

The Site comprises approximately 66.5± acres bounded by Route 20 to the south and South Street to the east in Shrewsbury, Massachusetts. The property is currently occupied by three vacant buildings and a paved parking area. Site access/egress includes two full access/egress driveways along South Street.

Under the proposed development program, the Site will be redeveloped to include 450,000± sf of office and industrial park space with 275,000± sf off South Street (Sub-District A) and 175,000± sf off Route 20 (Sub-District B). The master plan for the project assumes 40% office space and 60% industrial space for each Sub-District with on-site parking to include 812± surface parking spaces. Site access/egress is proposed via two (2) non-connecting driveways: a full access/egress driveway along South Street that will support Sub-District A and a right-in/right-out driveway along Route 20 that will support Sub-District B.

Status of MEPA Review

An ENF for the Proposed Development was submitted for review under MEPA on December 5, 2018 and was scoped for a DEIR on January 4, 2019. A DEIR was submitted for review on August 15, 2019 and was scoped for FEIR on September 27, 2019.

The FEIR responds to individual and agency comments on the DEIR and that addresses MassDOT comments including refinement of this DRAFT Letter of Commitment. The Proponent will continue to coordinate with MassDOT under the MEPA process to formalize mitigation commitments and timelines so that a subsequent Section 61 Finding may be issued.

Proposed Mitigation – State Jurisdiction Roadways

Capacity analyses were conducted for the weekday morning and weekday evening peak hours for Baseline, future No-Build, and future Build conditions. The analyses indicate that certain signal timing and/or physical improvements may be required at the Route 20 intersection with South Street and at Centech Boulevard to support the development; access to Route 20 will also be required to support Centech Park North Sub District B. Operations at the remaining study locations are sufficient to support the development. Roadway improvements that support projected traffic increases associated with the proposed development are identified that minimize or offset Project-related traffic impacts and address access needs for the Project Site. The list of improvements on state jurisdiction roadways includes the following:

Site Driveway at Route 20

The site driveway intersection with Route 20 has been designed as a right-in/right-out driveway and has been conceptually designed to accommodate a tractor trailer (WB-50) design vehicle. Conceptual driveway access plans for the proposed driveway intersection with Route 20 are presented in the FEIR Transportation Component for (a) implementation assuming existing layout of Route 20, and (b) implementation assuming a planned/future 4-lane cross section of Route 20 is advanced by others. Signs and pavement markings that comply with the Manual on Uniform Traffic Control Devices (MUTCD) will also be provided including STOP signs (R1-1), No Left Turn signs (R3-2) and STOP line pavement markings.

Improvements to the Route 20 at Site Driveway which will be subject to a Highway Access Permit as described above will be undertaken by the Proponent prior to initial occupancy of Sub-District B.

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Route 20 at South Street

The Proponent will work with MassDOT to provide (a) signal retiming only to accommodate the Phase I (Sub District A) development, and (b) widening of South Street north leg to accommodate a dedicated right-turn lane and traffic signal timing optimization to offset project traffic impacts for additional (phased) occupancy of Sub District A or Phase II (Sub District B), subject to meeting implementation thresholds per a defined monitoring protocol. The improvements include widening of the South Street approach to include a dedicated right-turn lane principally within Town layout with no change to MassDOT traffic signal equipment with associated signal retiming/optimization. The project is compatible with the Route 20 Long-Range Improvements by others which will provide a 4-lane cross section along Route 20 and associated MassDOT Healthy Transportation Initiative (HTI) elements for which land takings are required.

Based on consultation with MassDOT District 3 Office and the Public Private Development Unit, the relatively minor geometric modifications and signal timing adjustments that are within MassDOT jurisdiction to support the Project requires only a Category I Access Permit and as such which would be exempt from HTI requirements.

Analysis results indicate that the recommended geometric and signal modifications significantly improve traffic operations relative to No-Build conditions and offset impacts by the Project. Likewise, queuing along the South Street southbound lanes are expected to improve significantly.

Improvements to the Route 20 at South Street signal timing improvements as described above will be undertaken by the Proponent within 6 months of initial occupancy at Centech Park North (Sub District A). Additional geometric and traffic signal timing modifications at this location may be required to support additional development beyond initial occupancy of the Sub District A component subject to meeting applicable monitoring thresholds as established under the Transportation Monitoring Program. Subject to meeting applicable monitoring thresholds, the Proponent will design, permit and implement applicable intersection improvements that are consistent with conceptual improvements entitled "Conceptual Design Plan, Route 20 at South Street, Shrewsbury Massachusetts" prepared by MDM Transportation Consultants, Inc. dated June 28, 2019 as documented in the FEIR.

Route 20 at Centech Boulevard/Cherry Street

The Proponent will work with MassDOT to provide (a) signal retiming optimization and/or phasing changes to accommodate the Phase II (Sub District B) development, subject to meeting implementation thresholds as defined in the Transportation Monitoring Program.

Improvements to the Route 20 at Centech Boulevard/Cherry Street will be undertaken by the Proponent prior to initial occupancy of Sub District B if warranted based on monitoring.

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Road Safety Audit – Route 9/ South Street – Completed by Proponent

This intersection of Route 9 at South Street is listed as a 2014 – 2016 Highway Safety Improvement Program (HSIP) cluster by MassDOT and was the subject of a Road Safety Audit (RSA) which was completed by the Proponent and accepted by MassDOT as of June 26, 2019. The purpose of an RSA is to identify potential short-term, medium term and long-term safety/operational improvements. The Proponent will implement several of the short-term/low cost improvements as outlined in the RSA subject to approval by MassDOT as described below:

- Replace the near side "No Turn on Red" (R10-11b) sign on the South Street southbound approach with a "Right Turn on Red Must Yield to U-Turn" (R10-30) sign.

- Relocate the static "Advanced Traffic Signal" (W3-3) sign on the Route 9 westbound approach to the crest of the hill just west of the Fruit Street intersection. The location will be reviewed with MassDOT to provide visibility for approaching vehicles. Install a 45-mph speed advisory plaque (W13-1p) on the same post.

- Install a "No-Turn on Red" (R10-11b) sign for the Route 9 eastbound right turn movements.

- Verify if the signal clearance times (yellow and all red) are appropriate and adjust if required.

- The Proponent (Town) will work with the school bus company to relocate the bus stop further south along South Street or to allow the buses to pull into Yorkshire Terrace and/or Laxfield Road.

The Proponent will implement the short term/low cost improvements as listed above within 6 months of initial occupancy of Centech Park North (Sub District A).

<u>Transportation Demand Management Program</u>

The Proponent is committed to reduce Site trip generation by tenant employees by implementing a TDM program, elements of which will be memorialized in a Tenant Manual and/or will be made a provision of a master deed. These elements are consistent with the Massachusetts Department of Environmental Protection (MADEP) directive to use all reasonable and feasible mitigation actions to reduce auto emissions. The TDM program includes the following elements, which are subject to selected tenant corporate policies:

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- *Employee Transportation Coordinator*. The Proponent will designate a contact that will serve as transportation coordinator responsible for disseminating relevant TDM information to tenants including documentation of TDM information as part of a Tenant Manual at time of lease and/or as subject to a Master Deed for the property.

- *Public Transportation Information & Promotion*. Service and schedule information for the Worcester Regional Transit Authority (WRTA) and MBTA will be posted and public transportation subsidy program considered to promote the use of public transportation by employees and visitors. Alternative means of connecting the Site to the nearby MBTA station at Centech Boulevard (Grafton MBTA station) will also be evaluated by the Proponent such as modification of WRTA bus routes, rideshare services such as Uber and Lyft, bike share services, tenant employee carpool options, and rideshare matching services with other nearby employers along South Street that include UMass and Charles River Laboratories.

- *Workforce Transportation Program.* The proponent will work with MassDOT to secure funding through the Workforce Transportation Program to help employees meet workforce transportation needs, including first mile/last mile connections.

- *Bicycle Facilities and Amenities*. Bicycle parking, including visible accessible racks for visitors and employees will be provided proximate to building entrances. The Proponent will also consider a bike share service for the property that will provide tenant employees access to bicycles for access to nearby transit options, recreational purposes during break periods and alternative means of travel to area destinations.

- *Alternative Work Arrangements*. The Proponent will encourage its tenants to provide alternative work arrangements such as flextime, compressed workweek and telecommuting in order to allow employees to balance work and personal commitments, and to reduce traffic and parking demands.

- *Preferential Parking for Carpools, Vanpools and Car Sharing.* Preferential parking locations for building tenant employees who use carpools and vanpools are to be provided; specific locations and number are to be determined through refinement of the Site Plans for the project.

- *Preferential Parking for Low-Emission Vehicles.* Preferential parking locations for employees and patrons who use low-emission vehicles will be considered; charging stations for electric vehicles will also be considered during the Site Plan development process.

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- *Transit Pass Subsidy.* The Proponent will encourage its tenants to offer fare subsidies for commuter rail passes for eligible employees and/or offer pre-tax payroll deductions for employee transit passes.

- *Transit System Connections.* Alternative means of connecting the Site to the nearby MBTA station at Centech Boulevard (Grafton MBTA station) will also be evaluated by the Proponent such as modification of WRTA bus routes, rideshare services such as Uber and Lyft, bike share services, tenant employee carpool options, and rideshare matching services with other nearby employers along South Street that include UMass and Charles River Laboratories.

- *MassRides*. MassRides is the Executive Office of Transportation's statewide travel options program providing free assistance to commuters, employers, students, and other traveler markets. MassRides programs may encourage workers to use alternative forms of transportation such as carpooling, vanpooling, and to utilize a large database for rideshare matching. The Proponent will promote commuter assistance programs available through MassRides by encouraging building tenants to incorporate information on MassRides as part of the employee orientation programs.

- *Guaranteed Ride Home*. The Proponent will encourage commercial tenants to offer a guaranteed ride home program that subsidizes taxi service for employees using non-auto commute options in cases of unexpected circumstances.

- *Pedestrian Infrastructure*. Sidewalk connections within the property along primary pedestrian desire lines that connect building entrances with the public sidewalk network; posting of area maps that highlight area walking/bicycle routes to promote walking and bicycle travel to/from the Site and area businesses. The Proponent also recognizes the need for extending existing sidewalks along South Street from their current terminal points to Route 9 and Route 20; however, the feasibility of constructing these sidewalk extensions is subject to further evaluation by the Proponent to determine potential land acquisition/easement requirements. The Proponent has discussed the design details for pedestrian improvements at the Route 9/South Street intersection with District 3 and PPDU staff. Discussion with MassDOT indicate that MassDOT will not be pursuing pedestrian improvements including traffic signal upgrades and crosswalk across State highway and relocation of the median barrier anytime soon. Therefore, MassDOT and the Town of Shrewsbury are in agreement to not extend the sidewalk along South Street from the CVS property and Price Chopper property to the State Highway layout at Route 9 at this time.

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- *On-Site Support Services/Amenities*. Buildings will include services and amenities that encourage employees to remain on-site for essential services and internalize trip making to the campus including on-site mailboxes and an on-site Fed-Ex and/or UPS drop box locations. Other amenities to be considered in building programming may include an employee fitness center, showers, and cafeteria for employees – measures aimed at reducing the need to conduct off-site trips during a typical workday. Specific measures are to be evaluated in more detail during the Site Plan review process.

Transportation Monitoring Program

The Proponent will provide an annual travel survey of employees at the Site for a period of 5 years beginning six months following occupancy of the Site. Traffic volumes as presented in the DEIR Traffic Impact and Access Study dated August 15, 2019 shall serve as baseline traffic conditions for comparative purposes. Implementation of signal timing modifications at the Route 20/South Street/Green Street intersection, structural improvements at the Route 20/South Street/Green Street intersection to include widening of the South Street approach, and signal timing improvements at the Route 20/Centech Boulevard/Cherry Street intersection are contingent on the following monitoring protocol:

Route 20/South Street/Green Street

- Within 90 days following the occupancy of each building within Sub-District A, the Proponent shall conduct weekday peak hour traffic volume counts (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) at the South Street intersections at Routh 20 and the Site Driveway. The Proponent will also conduct a 24-hour weekday automatic traffic recorder (ATR) count at the site driveway for a typical weekday. Intersection operational analysis and observations including level-of-service, vehicle queuing and approach delay shall be documented for these traffic volumes for comparison to established mitigation thresholds.

- Following each monitoring report, the Proponent shall identify any operation constraints that would require implementation of mitigation actions (i.e., intersection improvements). These thresholds would be either (a) approach delay for the southbound South Street approach to Route 20 that exceeds 55 seconds on average (LOS E conditions); or (b) vehicle queues on South Street that extend to or beyond Chestnut Street during the weekday evening peak traffic period. If either of the mitigation thresholds is met, implementation of intersection improvements at Route 20/South Street/Green Street may be required prior to any additional building occupancy following the submitted monitoring report.

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Route 20/Centech Boulevard/Cherry Street

- Prior to occupancy of Sub-District B and within 90 days following the occupancy of each subsequent building, the Proponent shall conduct weekday peak hour traffic volume counts (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) at the Route 20 intersection with Centech Boulevard/Cherry Street. Intersection operational analysis and observations including level-of-service, vehicle queuing and approach delay shall be documented for these traffic volumes to determine whether signal timing and/or phasing changes are necessary to offset project impacts relative to No Build conditions as documented in the DEIR. Subject to a determination that such signal timing or phasing modifications are necessary to achieve operations equal to or better than those documented in the DEIR for the No Build condition, the Proponent will identify appropriate signal timing or phasing changes in accordance with MassDOT approved design guidelines and shall design, permit and implement such improvements prior to any additional building occupancy beyond Sub District A.

The Proponent shall provide the results of each of the Transportation Monitoring reports to MassDOT and the Town to determine necessary mitigation actions in accordance with the defined monitoring thresholds and to advance required designs, permits, approvals as may be required prior to additional building occupancy as defined in the Transportation Monitoring Program.

Mitigation Schedule, Costs, and Responsible Parties

Implementation of the TDM program for the development, transportation monitoring program and proposed improvements at state jurisdiction roadway locations as described above shall be at the sole cost and responsibility of the Town of Shrewsbury and shall occur as outlined above.

The Town of Shrewsbury looks forward to the issuance of a Section 61 Finding by your office on this Project. Please contact me if you have any questions.

Sincerely,

Town of Shrewsbury

By: _____
Name:
Title:

DRAFT

Town of Shrewsbury

August 15, 2019

Mr. Paul F. Ormond, P.E.
Energy Efficiency Engineer
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Re: Draft Section 61 Findings
Greenhouse Gas
EEA No. 15590
Shrewsbury, Massachusetts

Dear Mr. Ormond:

The Town of Shrewsbury (Proponent) has prepared this draft letter of commitment to the Massachusetts Department of Energy Resources to define the following steps to be taken by the proponent:

At construction completion for each building, the end user 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.

APPENDIX E: DEIR CERTIFICATE AND COMMENTS

Certificate on the DEIR, dated 9/27/19

MassDEP Comment Letter on the DEIR, dated September 20, 2019

MassDOT Comment Letter on the DEIR, dated September 20, 2019

MassDOER Comment Letter on DEIR, dated September 24, 2019

Comment Response Matrix

The Commonwealth of Massachusetts –
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Kathleen A. Theoharides
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
http://www.mass.gov/eea

September 27, 2019

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Centech Park North
PROJECT MUNICIPALITY	: Shrewsbury
PROJECT WATERSHED	: SuAsCO
EEA NUMBER	: 15950
PROJECT PROPONENT	: Town of Shrewsbury
DATE NOTICED IN MONITOR	: August 21, 2019

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62I) and Section 11.08 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Draft Environmental Impact Report (DEIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations. The Proponent may prepare and submit for review a Final Environmental Impact Report (FEIR) in accordance with the Scope below.

Project Description

As described in the DEIR, the Revised Master Plan for the proposed project includes the construction of approximately 450,000 square feet (sf) of commercial development, associated access roadways, 812 parking spaces, a stormwater management system and utility infrastructure. The Town of Shrewsbury (Town) is working with the Central Massachusetts Regional Planning Commission (CMRPC) to determine the best uses for the property based on current and projected market conditions. The DEIR and assessment of environmental impacts is based on a revised conceptual Master Plan.

The Master Plan identifies two separate development areas, Subdistrict A and B. The subdistricts are separated by a wetland system and will have separate access roads. Subdistrict A is located on the northwestern portion of the site and includes five buildings (total of 275,000 sf) and 497 parking spaces. Access to Subdistrict A will be provided via Road A from South Street.

Subdistrict B is located on the southeastern portion of the site and consists of three buildings (total of 175,000 sf) and 315 parking spaces. Access to Subdistrict B will be provided via Road B from Route 20.

The project is proposed in phases: four phases in Sub-District A and three phases in Sub-District B. Phase 1A and 2A will include the construction of access roads, pedestrian access, utility and stormwater infrastructure, and landscaping. Construction of the cross-country water main connection between Road A and Road B is also planned for Phase 2A. Phases 1B, 1C, 1D 2B and 2C will include the construction of the individual lots along with associated driveways, pedestrian accommodations, utility and stormwater infrastructure, and landscaping. Construction on each lot will depend upon the final tenant fit out and needs.

Changes to the Project Since Filing the ENF

Since the ENF was filed, the Town has refined the site plan and project programming to include 180,000 sf (40%) of office uses and 270,000 sf (60%) of industrial uses. The revisions reduce parking, impervious area and BVW compared to the ENF.

Project Site

The 66.5-acre project site formerly known as the "Allen Property" was previously used for agricultural purposes. The owners of the property entered into a purchase and sale agreement with a residential developer in 2002; however, because much of the property had been assessed as Chapter 61A land, the Town was afforded the right of first refusal to match the residential developer's offer for approximately 49 acres of the parcel. The Town acquired the 49 acres and, through negotiations with the previous owner via the Shrewsbury Development Corporation (SDC), it acquired the remaining 17.5 acres. In 2009, a Flexible Development Overlay District and associated by-laws were established on the property.

The site is comprised of eight developable lots. It is bounded by South Street and Charles River Laboratories to the north, a ground mounted solar field and residential properties to the west, commercial uses and Route 20 to the south and residential uses and South Street to the east. A portion of the site along South Street contains three vacant buildings and a parking area (paved and gravel) associated with the prior agricultural use. The remaining area consists of undeveloped vegetated areas.

The project site is not located within a 100-year flood plain; it is located in an area of minimal flood hazard according to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) (Panel No. 25027C0639F). The site is not located within *Priority* and/or *Estimated Habitat* as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP) or within an Area of Critical Environmental Concern (ACEC). The site does contain soils identified as Prime Farmland Soils.

Jurisdiction and Permitting

The project is undergoing MEPA review and is subject to a Mandatory EIR pursuant to 301 CMR 11.03(1)(a)(2) because it requires a State Agency Action and involves the creation of ten or more acres of impervious area. The project also exceeds the ENF review thresholds at 11.03(1)(b)(1); 11.03(6)(b)(13); and 11.03(6)(b)(15) because it will result in the direct alteration of 25 or more acres of land; will generate 2,000 or more new adt and construct 300 or more new parking spaces at a single location.[1] The project requires a Vehicular Access Permit from the Massachusetts Department of Transportation (MassDOT). The project is subject to the MEPA Greenhouse Gas (GHG) Policy and Protocol.

The project will require an Order of Conditions for multiple components of the project from the Shrewsbury Conservation Commission (or in the case of an appeal, a Superseding Order of Conditions from the Massachusetts Department of Environmental Protection (MassDEP)), and a National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the United States Environmental Protection Agency (EPA).

The Proponent is seeking Financial Assistance from MassDevelopment and the Executive Office of Housing and Economic Development. Therefore, subject matter jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations. These include land alteration, transportation, wetlands, stormwater, air quality and GHG Emissions.

Environmental Impacts and Mitigation

Potential environmental impacts associated with the project include New alteration of 26.9 acres of land (reduced from 28.8 acres), the creation of 14 acres of new impervious area (reduce from 20 acres), alteration of 3,934 sf of BVW (reduced from 4,900 sf) , generation of 2,664 new adt (reduced from 4,384 adt), construction of 812 parking spaces (reduced from 1,127 spaces), an increase water demand and wastewater generation by 29,500 gallons per day (gpd) (reduced from 33,750).

Measures to avoid, minimize and mitigate potential impacts include, wetland replication, roadway and transportation improvements and the construction of a stormwater management system designed to meet or exceed MassDEP's standards.

Review of the DEIR

The DEIR reviewed existing conditions and provided a description of the project, including the size and proposed use of each building and proposed access roads. It provided a conceptual layout design, roadways and landscaping, which will continue to undergo design refinement. The DEIR identified the project's impacts on transportation and infrastructure. It provided an analysis of the project's GHG emissions and revised the site plan and uses to reduce parking and impervious area. The DEIR included a Response to Comments, identified

[1] The project as presented in the ENF exceeded EIR traffic thresholds at 11.03(6)(a)(6) and 11.03(6)(a)(7). Revisions to the project have reduced trip generation and parking to below EIR thresholds.

mitigation commitments and provided draft Section 61 Findings. It identified the statutory and regulatory standards and requirements applicable to the project.

Alternatives Analysis

The DEIR included a revised alternative analysis which considered a Reduced Impact Alternative which is represented by the Revised Preferred Master Plan (Preferred Alternative). The DEIR provided a qualitative and quantitative comparison of a No Build Alternative, a 2008 Master Plan Alternative (Alternative A), ENF Master Plan Alternative, and the Revised Preferred Master Plan Alternative (Preferred Alternative).

The 2008 Master Plan Alternative included a larger development with approximately 611,000 sf of office and industrial uses. This alternative would alter 30.7 acres of new land, create 24.7 acres of new impervious surface, impact 6,294 sf of BVW, generate 5,130 new adt; increase water demand by 45,825 gpd and generate 45,825 gpd of wastewater. The ENF Master Plan Alternative included 450,000 sf of office and industrial uses and would result in the new alteration of 28.8 acres of land, creation of 22 acres of impervious surface; impact 4,900 sf of BVW; generate 4,384 new adt; and increase water demand and wastewater generation by 33,750 gpd. The Preferred Alternative, as described herein, includes a 450,000 sf office/industrial development which would reduce new land alteration to 26.9 acres, impervious surface to 16 acres, BVW impacts to 3,930 sf, New adt to 2,664 and water demand and wastewater generation to 29,500 gpd. The DEIR indicates that the Preferred Alternative was selected because it will provide the maximum benefit to the Town while reducing environmental impacts compared to the other alternatives.

Land Alteration

As noted earlier, the Preferred Alternative presented in the DEIR will result in the overall development of 30.8 acres (46%) of the site and approximately 22 acres (33%) of the site as impervious area. Of this developed area, 14.8 acres will consist of landscaping, stormwater management components and grading. The elevation of the 66.5-acre project site ranges from a maximum elevation of 564 ft in the west to 496 ft adjacent to wetlands in the east with slopes ranging between 0.5% and 20%. Development of the site will include clearing, excavation and blasting. It is estimated that approximately 16,500 cy of ledge will be removed and processed for use as fill material on site. Based on preliminary grades associated with the project, it is estimated that approximately 30,000 cubic yards (cys) of fill will be imported to the site for grading. The Town will strip and stockpile Prime Farmland soils for re-use on-site and, if available, offer surplus soil to local farmers.

Approximately 35.7 acres of the project site or 54% will remain undeveloped. The DEIR identified an approximately 29-acre open space area within the center of the project site that will be considered for preservation in perpetuity under a conservation restriction (CR) or similar mechanism.

Wetlands and Stormwater

The project will result in 3,930 sf of impacts to BVW. Of those impacts, 1,800 sf will be temporary impacts associated with the installation of a water line that will loop between Road A and Road B and will cross through the wetland system located in the center of the project site (Phase 2A). Approximately 2,130 sf of permanent impacts to BVW include 720 sf associated with the Construction of Road A (Phase 1A). The Shrewsbury Conservation Commission reviewed Phase 1A for its consistency with the Wetlands Protection Act and implementing regulations (310 CMR 10.00) and issued an Order of Conditions (DEP File# 285-1827). Approximately 535 sf of impacts are associated with the development of Building E (Phase 1B, 1C or 1D) and 864 sf of BVW impacts are associated with the development of Building F (Phase 2B or 2C). Work proposed on the future development lots and water loop connections are anticipated to require separate Orders of Conditions from the Town of Shrewsbury Conservation Commission. In areas of wetland replication, a ratio of 2:1 is proposed as mitigation. Accordingly, approximately 4,340 sf of replication is proposed.

The DEIR included a stormwater report detailing existing and proposed hydrological conditions in the 2-, 10-, 25-, and 100-year storm events and drainage system sizing calculations. The DEIR indicates that an operation and maintenance plan and Stormwater Pollution Prevention Plan (SWPP) will be prepared and submitted. Proposed stormwater BMPs include deep sump catch basins, forebays, proprietary stormwater quality units and infiltration basins. The DEIR described consistency with stormwater management standards (SMS) and included calculations demonstrating compliance with groundwater recharge and total suspended solids (TSS) removal requirements. The DEIR states that Low Impact Development (LID) measures including raingardens, bioretention areas, tree box filters, porous pavement, water quality swales and green roofs will be considered for individual lots on a case-by-case basis.

Traffic and Transportation

The project requires a Vehicular Access Permit from MassDOT to access Route 20. Site access/egress is proposed via two non-connecting driveways: a full access/egress driveway from South Street (Sub-District A) and a right-in/right-out driveway from Route 20 (Sub-District B).

The DEIR included a Transportation Impact Assessment (TIA) which is in general conformance with the MassDOT/Executive Office of Energy and Environmental Affairs (EEA) Transportation Impact Assessment Guidelines. Trip generation estimates were calculated using the Institute of Transportation Engineers (ITE)'s Trip Generation Manual (10th edition) ITE's *Trip Generation* for Land Use Code (LUC) 710 (General Office) and LUC 130 (Industrial Park). Accordingly, the site is expected to generate 2,664 new daily weekday vehicle trips, with 317 vehicle trips occurring during the weekday morning peak hour and 316 vehicle trips occurring during the weekday evening peak hour. No credit was taken for walking, bicycling, or transit trips.

The study area for the DEIR was based on recommendations by MassDOT during the ENF review and includes the following roadways and intersections:

- Route 9 at South Street (Signalized);
- Route 9 Westbound Off-ramp at Route 20 Westbound (Unsignalized);
- Route 20 Eastbound at Route 9 Eastbound (Unsignalized);
- Route 20 at South Street/Green Street (Signalized);
- Route 20 at Centech Boulevard/Cherry Street (Signalized);
- Route 20 at Walnut Street – North (Unsignalized);
- Route 20 at Walnut Street – South (Unsignalized);
- South Street at Charles River Labs/Umass Campus Access Road (Unsignalized);
- Proposed Site Driveway at South Street (Unsignalized);
- Proposed Site Driveway at Route 20 (Unsignalized).

The TIA described traffic volumes and conditions, projected trip generation rates, crash rate data, and level-of-service (LOS) operations at study area intersections under 2019 Existing Conditions, 2026 No Build, and 2026 Build conditions. The Route 9/South Street intersection is anticipated to operate at a Level of Service (LOS) E during the weekday morning peak hour under 2026 Build conditions, with the Route 9/South Street and Route 20/Centech Boulevard/Cherry Street intersections anticipated to operate at a LOS E during the weekday evening peak hour under 2026 Build conditions. Additionally, the Route 20 Westbound On-Ramp is anticipated to operate at LOS F during the weekday evening peak hour, including several intersection approaches during both the weekday morning and weekday evening peak hours. The DEIR did not include mitigation to address degraded operations at these intersections. The Proponent notes the Route 20 Corridor Improvements project (MassDOT #607442) ("Corridor project") is under development and MassDOT is considering alternatives to provide two travel lanes in each direction along Route 20, improve pedestrian and bicycle accommodations, and implement geometric modifications to approaches at the Route 20/South Street/Green Street, Route 20/Centech Boulevard/Cherry Street, and Route 20/Walnut Street intersections. MassDOT comments indicate that this project has not been designed or funded. Therefore, the Proponent should identify mitigation improvements at the Route 20/Centech Boulevard/Cherry Street intersection that it could commit to in the event that the Corridor project and associated improvements in traffic operations does not proceed.

1-1

The Proponent has committed to providing an optimized traffic signal timing plan at the Route 20/South Street/Green Street intersection, to be implemented within six months of initial occupancy. If warranted by the Traffic Monitoring Program, the Town will permit and implement geometric and signal modifications at this intersection. Proposed geometric improvements include widening the southbound South Street approach to provide a shared through/left-turn lane and an exclusive right-turn lane.

The TIA includes a summary of crash rates derived from MassDOT and the Towns of Shrewsbury and Northborough for the continuous five-year period of 2014 through 2018. Crash rates at all but one of the study area intersections (Route 9 at South Street) are below the MassDOT statewide and District 3 averages. A Road Safety Audit (RSA) was conducted at the Route 9/South Street intersection because it is a Highway Safety Improvement Program (HSIP)-eligible intersection. The Proponent has committed to the following measures to improve safety at this intersection:

- Replacement of signage on the South Street southbound approach;
- Relocation and replacement of signage on the Route 9 westbound approach;
- Installation of a "No Turn on Red" sign on the Route 9 eastbound approach;
- Verification and adjustment of signal clearance timings as appropriate; and
- Coordination with the school bus operator to relocate the existing bus stop further south along South Street.

Multimodal

The DEIR identified public transit services within the project area. The Grafton Massachusetts Bay Transportation Authority (MBTA) Commuter Rail Station is located approximately 1.7 miles south of the Site Driveway/Route 20 intersection and 2.4 miles south of the Site Driveway/South Street intersection. The Worcester Regional Transit Authority (WRTA) does not operate service in the vicinity of the project site.

The DEIR provides conceptual plans illustrating the extension of the sidewalk system along South Street from the CVS property through the Route 9 intersection to the Price Chopper
1-2 property. South Street, in this area, is within the jurisdiction of the Town of Shrewsbury. The Proponent should work with the Town to provide adequate accommodation for pedestrians and bicyclists. Crosswalks and ADA-compliant ramps should be provided at the Site
1-3 Driveway/Route 20 intersection upon occupancy of the project site. If the Corridor project has not been completed, MassDOT District 3 should be consulted regarding design of the Route
1-4 9/South Street intersection improvements.

Parking

The TIA includes a comparison of the proposed parking supply with the Town of The Shrewsbury Zoning Bylaws and Regulations which estimates required parking at 720 parking spaces as well as ITE Parking Generation, 5th Edition guidelines, which estimates amounts to between 755 and 1,159 spaces.[3] The Proponent should continue to identify ways to reduce
1-5 parking.

Transportation Demand Measures

The Proponent has identified the following Transportation Demand Management (TDM) measures with the goal of reducing single-occupancy vehicle trips by employees and patrons of the project:

- Provision of an Employee Transportation Coordinator (ETC) to disseminate TDM information to tenants;
- Posting of service and schedule information for WRTA and MBTA services;
- Encouragement of tenants to provide a public transportation subsidy program for employees and visitors;
- Evaluation of alternative means for connecting the project site to the Grafton MBTA Commuter Rail Station such as through rideshare services, bike share services, tenant

[3] Comments from MassDOT erroneously state that the project includes 1,256 structured parking spaces.

employee carpool options, and rideshare matching services with other nearby employers along South Street;
- Provision of bicycle racks for employees and visitors;
- Encouragement of tenants to provide alternative work arrangements;
- Provision of preferential parking for carpools, vanpools, car sharing, and low-emission vehicles;
- Consideration of charging stations for electric vehicles; and
- Encouragement of commercial tenants for provision of a guaranteed ride home program.

Transportation Monitoring Program

The Proponent will conduct an annual traffic monitoring every six months after occupancy of each phase, and for five years after full occupancy of the project. It will include:

- Simultaneous automatic traffic recorder (ATR) counts at the site driveway for a continuous 24-hour period on a typical weekday;
- Travel survey of employees at the site; and
- Weekday AM and PM peak hour turning movement counts (TMCs) and operations analysis at site driveways and mitigated intersections.

The goal of the monitoring program is to evaluate the transportation-related assumptions made in the DEIR and FEIR, the effectiveness of roadway improvements and the TDM program and to identify additional mitigation if necessary to address any deficiencies.

Water Supply and Wastewater

As described in the DEIR, the Proponent will work with the Town and end-users to ensure that efficient water use strategies are implemented to reduce potable water use, wastewater generation and provide adequate water supply. The Proponent will incorporate water conservation measures, including use of drought tolerant plantings, reduced and more efficient irrigation, installation of low-flow plumbing fixtures and development and implementation of maintenance and employee education programs. Installation of new watertight sewer mains will limit inflow/infiltration (I/I) within the onsite sewer system.

Greenhouse Gas Emissions

This project is subject to review under the GHG Policy. The DEIR includes 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 emissions. The analysis quantifies the direct and indirect CO_2 emissions associated with the project's energy use (stationary sources) and transportation-related emissions (mobile sources) and identifies mitigation commitments.

The DEIR includes 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 Shrewsbury adopted the Stretch Energy Code (SC) 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. Buildings over 100,000 sf are required to demonstrate that the energy use will be at least 10% below that a baseline of ASHRAE 90.1-2013 Appendix G. The GHG analysis includes results of energy modeling, identifies GHG emissions, and evaluates effectiveness of mitigation measures.

The DEIR includes a summary of modeling inputs for each prototype (e.g. U-values, efficiencies, lighting power densities (LPD), etc.) for the Base Case and the Preferred Alternative. The DEIR identifies those energy efficiency measures that will be incorporated into the project and were modeled in the GHG analysis and measures that will be studied further during the advanced design stages.

The DEIR identifies the following building related energy efficiency measures:

- Energy efficient windows and building envelope (use of framed, insulated wall sections and improved window efficiency);
- High-efficiency HVAC systems;
- Allocate 60% percent of total available roof area as solar ready;
- Installation of energy efficient lighting, both exterior and interior, and incorporation of reduced LPD;
- Low-flow and water-efficient plumbing; and
- Green Tenant guidelines to inform tenants on how to conserve energy.

The GHG analysis calculated stationary source CO_2 emissions from the proposed building sources using eQuest v3.65 modeling software. Mobile source GHG emissions were calculated using the EPA MOVES emissions model, MassDEP guidelines and data from the mesoscale analysis. Emissions were calculated for the 2019 Existing, 2026 No Build and 2026 Build conditions. The analysis estimates emissions reductions associated with the TDM program and intersection improvements. The GHG analysis indicates that the Base Case will generate approximately 2,194.3 tons per year (tpy) of GHG emissions, consisting of 1,218 tpy of stationary source emissions and 976.3 tpy of mobile source emissions. The Preferred Alternative will reduce stationary source emissions by 217.8 tpy to 1,000.2 tpy (17.9 percent) and will decrease mobile source emissions by 19.6 tpy to 956.7 tpy (%). Overall emissions will be reduced by 237.4 tpy (10.8 percent).

The Proponent has committed to provide 60% of the flat roof area of each building as solar-ready. This would provide 1,010 kW of PV solar capacity which is projected to generate 1,203 MWh per year. The solar array would reduce project related GHG emissions by 410 tpy (41%). The DEIR included a cost feasibility analysis for the incorporation of solar PV. The DEIR notes that Shrewsbury Electric and Cable Operations (SELCO) limits the size of PV solar installation to 600 kW. Additionally, SELCO prohibits third party PV solar systems and

subsidies offered by the Department of Energy Resources (DOER) are not available because SELCO is not part of the SMART program. Despite these constraints, the Proponent recognizes the importance of future-proofing buildings' rooftops to accommodate future solar use even if it is not feasible today. The Proponent continues to commit to a 60% solar ready roof area which is approximately double the code requirement.

The DEIR provided a feasibility analysis of electrification which incorporates the use of cold-climate air source heat pumps (ASHPs) and variable refrigerant flow (VRF) for space heating as well as ASHPs for water heating. The analysis indicates that swapping condensing gas heating to ASHPs/VRF would reduce emissions by 71 tpy and would reduce utility costs by $6,200/year. In addition, Alternative Energy Certificate (AEC) for use of qualifying space heat pump equipment could generate an income of $13,500/year. Incorporation of ASHP water heating could potentially eliminate need for gas service and associated infrastructure. Full electrification of the site has the potential to increase project related stationary GHG emissions reductions from 18% to 22% in 2020 and increase GHG emissions reductions from 19% to 40% by 2050 as emissions from the electrical grid decline. The Proponent has not fully committed to project electrification but will continue to study the use of ASHP for space and water heating.

Land Alteration

The DEIR included an analysis of carbon sequestration that would be lost due to clearing of mature forest associated with the project development. The majority of the 66.5-acre project site consists of scrub shrub vegetation, protected wetland areas and previously developed areas. Based on removal of 5 acres of mature forest, 326 tons of sequestered carbon will be released at the time of construction and 1.02 tons of carbon sequestration per year will be lost.

Air Quality

The DEIR included the results of an air quality mesoscale analysis to determine whether and to what extent the proposed project will increase emissions of volatile organic compounds (VOCs) and nitrogen oxides (NO_x) within the project area. The mesoscale analysis was completed using data from the transportation modeling consistent with MassDEP guidance and is provided in the table below.

Pollutant	2019 Existing	2026 No Build	2026 Build	2026 Build with Mitigation
VOC	17.772 kg/day	13.175 kg/day	15.426 kg/day	15.381 kg/day
NO_x	13.734 kg/day	6.655 kg/day	7.768 kg/day	7.746 kg/day

Construction Period

The DEIR includes a phased construction schedule and identifies construction period BMPs. It evaluates construction-period impacts including erosion and sedimentation, air quality, noise, blasting, solid waste disposal, and truck traffic. A draft Construction Management Plan (CMP) outlines feasible measures that can be implemented to eliminate or minimize these impacts. A construction period Stormwater Pollution Prevention Plan (SWPPP) will be developed consistent with the NPDES CGP for the project to reduce erosion and sedimentation impacts. The DEIR indicates that blasting will be conducted and subject to regulatory requirements as applicable.

Conclusion

The DEIR included a detailed project description, identified baseline environmental conditions, and provided a transportation analysis, and a GHG analysis. The following Scope identifies additional analysis and information that must be provided in the FEIR including continued consideration of measures to reduce and minimize land alteration and creation of impervious area, and inclusion of a comprehensive stormwater management plan for the site, which incorporates LID measures for drainage. In addition, the FEIR should include additional transportation analysis and mitigation as described in MassDOT's comment letter.

Based on a review of the DEIR, consultation with State Agencies and a review of comment letters, I have determined that the DEIR is adequate notwithstanding that aspects of the project require additional description and analysis in the FEIR.

SCOPE

General

1-6 [The FEIR should follow Section 11.07 of the MEPA regulations for outline and content,
1-7 as modified by this Scope] [The FEIR should include a comprehensive description of the project, quantify its impacts and clearly identify mitigation measures] [It should include an analysis of the project that demonstrates that the Preferred Alternative includes all feasible means to avoid
1-8 Damage to the Environment, or to the extent that Damage to the Environment cannot be avoided, that it includes measures to minimize and mitigate Damage to the Environment to the maximum extent practicable.]

Project Description and Permitting

1-9 [The FEIR should describe any changes to the project since the filing of the DEIR. It should include updated site plans, if applicable, for existing and post-development conditions at a legible scale.] [Conceptual plans should clearly identify: all major project components (proposed buildings, access roads, etc.); areas of land alteration (new and previously disturbed); impervious
1-10 areas; wetland resource areas; ownership of parcels including easement areas; pedestrian and bicycle accommodations; and stormwater and utility infrastructure.] [Conceptual plans should be

1-11 provided for on-site work as well as any proposed off-site work for transportation or utility improvements.]

1-12 [The FEIR should include a list of required Permits, Financial Assistance, or other State approvals and provide an update on status.] [It should include a description and analysis of
1-13 applicable statutory and regulatory standards and requirements, and a discussion of the project's consistency with those standards.] [The FEIR should provide an update on the federal and local
1-14 review and permitting processes.]

Land Alteration

1-15 [The FEIR should demonstrate that the amount of land alteration has been limited to the maximum extent practicable and/or propose supplemental landscaping or tree planting to mitigate impacts associated with land alteration.] [The Proponent should continue to reduce
1-16 impervious area through the reduction of parking, incorporation of pervious surfaces and landscaped areas.] [The FEIR should quantify the total amount of alteration associated with the
1-17 proposed project including areas to be altered for buildings, roadways, wastewater, water and stormwater infrastructure, landscaping, and other project components in a tabular format.]

1-18 [The FEIR should provide additional details on the proposed 29-acre open space area that is being considered for preservation. The FEIR should identify the area and the mechanism by which it will be preserved.]

Wetlands and Stormwater

1-19 [The FEIR should identify any changes to wetland impacts including the impacts associated with the potential pedestrian connection between the two subdistricts.] [The FEIR
1-20 should demonstrate that the project can be designed and constructed consistent with the Wetland Protection Act (WPA) performance standards for all impacted wetland resource areas.] [It should
1-21 include updated plans at a reasonable scale that clearly delineate all applicable resource area, including Bank, and buffer zone boundaries.] [The FEIR should identify the permitting path for
1-22 each component of the project, including off-site work, and whether multiple NOIs will be filed.]
1-23 [The FEIR should clarify whether any stormwater will be discharged to MassDOT infrastructure within Route 20.] [The FEIR should continue to evaluate use of LID techniques for stormwater management, including but not limited to: use of pervious pavement, raingardens/bioretention
1-24 areas, bioswales, tree box filters, and green roofs, and reuse of roof runoff for irrigation.]

[Comments from MassDEP identify additional information that should be provided in the FEIR to demonstrate that feasible alternatives have been evaluated to avoid and minimize
1-25 impacts associated with access to Building E and Building F including reconfiguration of the building.]

Traffic and Transportation

1-26 [The FEIR should review and respond to comments submitted by MassDOT to address outstanding concerns regarding project-related traffic and transportation impacts.] I hereby

incorporate by reference the comment letter from MassDOT, dated September 20, 2019, into the Scope for the FEIR. The Proponent should continue consultation with MassDOT during
1-27 preparation of the FEIR.

1-28 The FEIR should determine whether intersections along Route 9 west of the South Street intersection should be included in the study area based on the *Transportation Impact Assessment Guidelines* for intersections exceeding 100 vehicles on all approaches during peak travel periods. At a minimum, the Route 9/Grafton Street, Route 9/Lake Street, and Route 9/Oak Street intersections should be evaluated.

1-29 Because the Route 20 Corridor Improvements project (MassDOT #607442) is not designed or funded, the FEIR should identify and evaluate interim mitigation that could be implemented at the Route 9/South Street to address the degraded operations in the 2026 Build condition. Based on the analysis, the Proponents should identify associated mitigation commitments.

1-30 The FEIR should include commitments to additional low-cost, short-term improvements identified in the Route 9/South Street RSA including reinstalling the bicycle pavement markings on detection zones, replacing the double left turn lane line extension markings on the South Street southbound approach, and replace sections of damaged end treatment/crash cushions.

1-31 The Proponent should contact WRTA to examine the possibility of providing service to the project site and its surrounding area given the presence of employers within the area particularly along South Street; this service may benefit from connections to Worcester's Union Station and/or the Grafton MBTA Commuter Rail Station. The FEIR should include documentation of outreach to the WRTA regarding potential service to the project area.

1-32 The Proponent should continue to study the feasibility of reducing parking and the potential to bank parking and not construct it until warranted by demand. The FEIR should
1-33 identify electric vehicle charging stations with a goal of 10% of all parking being allocated for electric vehicles (5% constructed with charging stations and 5% EV ready).

Greenhouse Gas Emissions

I acknowledge the Proponent's responsiveness to comments from DOER on the ENF. The DEIR analyzes electrification of space and water heating and rooftop PV. The FEIR should
1-34 include an updated GHG analysis which reflects any changes or refinements in building size and/or use since the filing of the DEIR. The FEIR should provide a detailed response to the
1-35 Department of Energy Resources' (DOER) comment letter regarding the opportunities for energy efficiency through electrification of the project. We encourage the Proponent to commit
1-36 to electrification based on the positive analysis presented in the DEIR and the ability to lower energy costs for businesses while significantly reducing GHG emissions over time.

1-37 The FEIR should include a revised mobile source GHG analysis to reflect any changes to traffic mitigation (roadway improvements, signal timing, public transportation, etc.) since the

DEIR. The FEIR should identify the quantity and location of electric charging stations proposed
1-38 for the site.

Water Supply and Wastewater

1-39 The FEIR should address comments in MassDEP's comment letter regarding the source of water for proposed irrigation. The FEIR should indicate whether wastewater from the project
1-40 will be directed to the treatment plant in Westborough or through Worcester to the Upper Blackstone Water Pollution Abatement District treatment plant. The FEIR should identify
1-41 whether I/I offsets will be required.

Mitigation and Section 61 Findings

1-42 The FEIR should include a separate chapter summarizing all proposed mitigation measures. The FEIR should include draft Section 61 Findings for each Agency Action. The
1-43 FEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and a schedule for implementation.

Responses to Comments

1-44 The FEIR 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 FEIR should
1-45 include direct responses to comments to the extent that they are within MEPA jurisdiction in a separate Response to Comments section of the FEIR. This directive is not intended to, and shall not be construed to enlarge the scope of the FEIR beyond what has been expressly identified in this Certificate.

Circulation

1-46 The Proponent should circulate the FEIR to those parties who commented on the ENF and/or the DEIR, 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. A copy of the
1-47 FEIR should be made available for review at the Shrewsbury public library. To save paper and other resources, the Proponent may circulate copies of the FEIR to commenters other than State Agencies in a digital format (e.g., CD-ROM, USB drive) or post to an online website. Appendices to a hard copy of the FEIR may also be provided on CD-ROM or USB drive.
1-48 However, the Proponent should make available a reasonable number of hard copies to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis. The Proponent should send a letter accompanying the digital copy
1-49 or identifying the web address of the online version of the FEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. The FEIR submitted to the MEPA office should include a digital copy
1-50 of the complete document.

September 27, 2019
Date

K. Theoharides
Kathleen A. Theoharides

Comments received:

09/20/2019	Massachusetts Department of Environmental Protection (MassDEP) Central Regional Office (CERO)
09/20/2019	Massachusetts Department of Transportation (MassDOT)
09/20/2019	Department of Energy Resources (DOER)

KAT/EFF/eff

Commonwealth of Massachusetts
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

September 20, 2019

Secretary Kathleen Theoharides
Executive Office of Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114

Attention: MEPA Unit – Erin Flaherty

Re: Draft Environmental Impact Report (DEIR)
Centech Park North
Shrewsbury
EEA #15950

Dear Secretary Theoharides,

The Massachusetts Department of Environmental Protection's ("MassDEP") Central Regional Office has reviewed the DEIR for the Centech Park North Project in Shrewsbury (the "Project"). The Town of Shrewsbury (the "Proponent") proposes approximately 450,000 square feet of mixed-use commercial space comprising 40% office space and 60% industrial space. Since issuance of the Secretary's Certificate on the Environmental Notification Form (ENF), the Project has been further revised and has reduced environmental impacts compared to the original ENF. Specifically, the number of parking spaces, amount of impervious surface, and wetlands impacts have been reduced. The Project will alter 26.9 acres of land, create approximately 14 acres of impervious area and will permanently alter approximately 2,130 square feet (sf) of Bordering Vegetated Wetlands (BVW), with temporary alteration of approximately 1,800 sf of BVW. The Project will be serviced by municipal water and sewer systems and is estimated to generate approximately 29,500 gallons per day (gpd) of wastewater and 29,500 gpd potable water demand. New power and gas services are also proposed to the Site.

This Project is under MEPA review because it meets or exceeds the following review thresholds:

- 11.03 (1)(a)(2) – Creation of 10 or more acres of impervious area
- 11.03 (1)(b)(1) – Direct alteration of 25 or more acres of land
- 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 new parking spaces at a single location

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

Printed on Recycled Paper

The Project requires the following State Agency Permits:

- Highway Access Permit – Massachusetts Department of Transportation

MassDEP offers the following comments:

Alternatives Analysis

The No-Build Alternative was determined not to be an economically viable option for the property, which the Proponent acquired specifically for redevelopment purposes. The "2008 Master Plan" Alternative (Alternative A) was further evaluated in the DEIR and those resource impacts were more fully described for comparison purposes. Additionally, the Revised Preferred Master Plan (the Project) proposes further reduced impacts compared to the ENF Master Plan specifically reducing impervious surface, wetland alterations, and utility infrastructure.

The Proponent intends to develop the Project so as to limit environmental impacts, promote economic growth, facilitate respectful development, and create high-quality jobs.

Water Supply

The Proponent proposes 29,500 gpd of drinking water use for the Project, which is a reduction from the estimated flows provided in the ENF. The Proponent states in the DEIR that water conservation
2-1 equipment will be installed on irrigation infrastructure, but does not discuss the source of water for irrigation. The Town of Shrewsbury's Water Department prohibits the connection of new irrigation systems to the municipal water supply.

Wastewater

The Proponent estimates that the Project will generate approximately 29,500 gpd of sanitary wastewater, which is a reduction from the estimated flows provided in the ENF. The DEIR states that wastewater will be discharged into Shrewsbury's municipal sewer system through a sewer connection administered at the local level. However, the DEIR does not indicate whether wastewater from the Project will be directed to the treatment plant in Westborough or through Worcester to the Upper
2-2 Blackstone Water Pollution Abatement District treatment plant. In the FEIR, the Proponent should confirm which treatment plant will receive the wastewater from the Project, and whether any I/I removal requirements will be triggered.

Wetlands

Wetlands

The Project as described in the DEIR will result in a 20% reduction in alterations to Bordering Vegetated Wetlands ("BVW") from the ENF proposal, with a total net alteration of 3,930 square feet of BVW associated with construction of Roadway A, access to Building E, and in an area to the north of Building F. Constuction of a waterline between roads A and B will temporarily alter 1,800 square feet of BVW.
2-3 The Proponent does not explain the necessity for the wetland alteration adjacent to Building F in the DEIR. Bank impacts, which are often associated with wetland crossings, such as the access crossing to
2-4 Building E, are not described nor quantified in the DEIR.

2-5 Two Potential Vernal Pools ("PVPs") with verified vernal pool features are present on the property, however, because the DEIR plan set does not show the locations of these PVPs, MassDEP is unable to

determine whether the Project will adversely impact these features. Site Plans show a proposed wetland replication area associated with the proposed crossing to Building E along the perimeter of a ponded area
2-6 that is designated by the Massachusetts Natural Heritage and Endangered Species Program as a PVP. The Proponent should consider alternative locations for this replication area that will not require disturbance of soils and mature vegetation adjacent to a PVP.

The Proponent filed a Notice of Intent ("NOI") for the construction of Roadway A with the Shrewsbury Conservation Commission ("the Commission") and with MassDEP on March 28, 2019. File Number 285-1827 was issued by MassDEP on May 14, 2019. MassDEP made comments related to BVW Performance Standards and infiltration basin setbacks in the File Number Notification Letter issued after the technical review of the NOI. The Commission issued an Order of Conditions (OOC) on June 18, 2019, approving the Project. The OOC was not appealed.

The Proponent will be required to submit a Notice of Intent (NOI) to the Shrewsbury Conservation Commission and MassDEP for the construction of Building A, the construction of and access to Building E, the construction of Road B and adjacent Buildings F, G, and H, and the waterline loop between Roads A and B. Upon receipt of the Notice of Intent filing, MassDEP may provide project-specific comments to the Shrewsbury Conservation Commission and the Proponent as part of the File Number Issuance
2-7 Notification Letter. The Proponent shall design the remaining portions of the Project to meet all performance standards identified in the Massachusetts Wetlands Protection Act Regulations 310 CMR 10.00 for work proposed in each affected wetland resource areas. The NOI should include justification
2-8 for the 864 square feet of BVW alteration proposed to the north of Building F in the NOI and the Proponent should consider alternative designs to reduce or eliminate this resource area alteration. If
2-9 present, Bank shall be shown on the Site Plans at all crossing locations, the crossing shall be designed to meet the Massachusetts Stream Crossing Standards, and a Wildlife Habitat Evaluation shall be included with the NOI if Bank impacts exceed the thresholds for wildlife habitat significance permitted under 310 CMR 10.54(4)(a)(5).

Stormwater

2-10 The Project is subject to the Massachusetts Stormwater Standards. The NOI for the remaining Phases of the Project should include documentation to demonstrate that source controls, pollution prevention measures, erosion and sediment controls, and the post-development drainage system will be designed in compliance with the stormwater elements of the Massachusetts Wetlands Protection Act regulations (310 CMR 10.00), applicable standards, and the *Stormwater Management Handbooks*. The Proponent should use precipitation data as specified in TR-55 or that required by the local municipality, whichever is more
2-11 conservative, for the purposes of preparing the stormwater analysis. MassDEP recommends that the potential impact of increased precipitation frequency and volume due to climate change be considered during the design of the stormwater management system.

2-12 The NOI filing should include a stormwater management report with, at a minimum, 1) calculations of water quality volume, infiltration volume, total suspended solids removal, and peak rates of runoff for predevelopment and post-development site, 2) a description of stormwater Best Management Practices (BMPs) and structural features, and 3) stormwater system design plans presented at a readable scale. Documentation to support statements that the stormwater system design provides adequate protection for wetland resources also should be included to show compliance with the stormwater standards and
2-13 *Stormwater Management Handbooks*. The DEIR states that Potential Vernal Pools with verified vernal pool features are present on the subject site. Vernal Pools qualify as Outstanding Resource Waters (ORWs) and the stormwater management plan for the Project should be designed to meet all Stormwater Standards and setbacks associated with ORWs and Vernal Pools.

The ENF Certificate directed the Proponent to evaluate the use of Low Impact Development (LID) techniques for stormwater management, identify LID measures that were incorporated into the Project design, and where not used, the Proponent was requested to provide an explanation as to why they were infeasible for implementation on-site. The NOI for Roadway A recently reviewed by the Shrewsbury Conservation and MassDEP did not contain a discussion of LID measures, and the site design did not appear to prioritize the incorporation of LID measures. The DEIR states that "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."
2-14 The Proponent should commit to incorporating LID measures into the design of the remaining phases of the Project.

Air Quality

The Draft Construction Management Plan in the DEIR lists noise mitigation measures during construction of the Project, including making sure that exhaust mufflers are in good working order, and when feasible,
2-15 turning off equipment that is not being used. MassDEP notes that unnecessary idling (i.e., in excess of five minutes), with limited exceptions, 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
2-16 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.

Given that 60% of the Project's 450,000 square feet will be for industrial uses, MassDEP notes the proximity of existing residences to the Project, and the possibility that industrial development of the site
2-17 may create a condition of air pollution related to noise on abutting parcels. The Proponent should be aware of and review MassDEP's noise regulations and policies concerning noise. Proper and considered placement of HVAC equipment and emergency generator(s), with the potential addition of noise abatement enclosure for HVAC roof top units or a noise abatement enclosure for generators, could prevent future noise complaints from abutters. Locations of loading docks and driveways could also contribute to noise generation.

MassDEP appreciates the opportunity to comment on the Project. If you have any questions regarding these comments, please do not hesitate to contact Andrea Briggs, Central Regional Office MEPA Coordinator, at (508) 767-2734.

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

September 20, 2019

Matthew Beaton, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Shrewsbury: Centech Park North – DEIR
(EEA #15950)

ATTN: MEPA Unit
Erin Flaherty

Dear Secretary Beaton:

On behalf of the Massachusetts Department of Transportation, I am submitting comments regarding the proposed Centech Park North project in Shrewsbury, 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
Planning Board, Town of Shrewsbury
Worcester Regional Transit Authority
Central Massachusetts Regional Planning Commission
PPDU Files

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

MEMORANDUM

TO: David Mohler, Executive Director
Office of Transportation Planning

FROM: J. Lionel Lucien, P.E, Manager
Public/Private Development Unit

DATE: September 20, 2019

RE: Shrewsbury: Centech Park North – DEIR
(EEA #15950)

The Public/Private Development Unit (PPDU) has reviewed the Draft Environmental Impact Report (DEIR) for the proposed Centech Park North project in Shrewsbury. The 66.5-acre site, located in the vicinity of 384-386 South Street and 704-764 Hartford Turnpike (Route 20), currently consists of three vacant structures associated with former agricultural use, a paved parking area, and undeveloped land. Approximately 450,000 square feet of development consisting of approximately 180,000 square feet of office space and 270,000 square feet of industrial space across two development subdistricts (Subdistrict A and Subdistrict B) and eight buildings are proposed. Four phases of project build-out associated with Subsistrict A and three phases of project build-out associated with Subdistrict B are proposed. Two site access driveways are proposed: access from South Street would serve approximately 275,000 square feet of space across five building lots in Subdistrict A, with access from Route 20 serving approximately 175,000 square feet of space across at three building lots in Subdistrict B. The 40%/60% split of office to industrial space is proposed for each Subdistrict.

Based on the information presented in the DEIR, the Full-Build project is expected to generate 2,664 new vehicle trips on an average weekday, with 317 new vehicle trips during the weekday morning peak hour and 316 new vehicle trips during the weekday evening peak hour. Provision for 812 parking spaces is proposed. The project was categorically included for preparation of an EIR given land alteration impacts; the trip generation and parking projections provided in the Environmental Notification Form (ENF) exceeded the Massachusetts Environmental Policy Act (MEPA) threshold for trip generation (3,000 new trips) and threshold for parking (1,000 new spaces), although these figures have been reduced in the DEIR.

Access to the site would be provided via one full-access driveway off of South Street and one right-in/right-out driveway off of Route 20. The project site is bounded by existing development on all non-roadway edges, including commercial development and solar energy facilities abutting Route 20 to the east and south, low-density residential development to the west, and commercial development abutting South Street to the north. A Vehicular Access Permit from MassDOT will be required because Route 20 is a state-owned roadway.

Ten Park Plaza, Suite 4150, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

The DEIR includes a Transportation Impact and Access Study (TIAS) prepared in general conformance with the current MassDOT/EOEEA *Transportation Impact Assessment Guidelines*. The FEIR should address the comments raised in this response letter.

Study Area

The TIAS study area includes the following intersections:

- Route 9 (Boston Turnpike) at South Street (signalized);
- Route 9 (Boston Turnpike) Westbound at Route 20 (Hartford Turnpike) Westbound Ramp (unsignalized);
- Route 20 (Hartford Turnpike) Eastbound at Route 9 (Boston Turnpike) Eastbound Ramp (unsignalized);
- Route 20 (Hartford Turnpike) at South Street/Green Street (signalized);
- Route 20 (Hartford Turnpike) at Centech Boulevard/Cherry Street (signalized);
- Route 20 (Hartford Turnpike) at Walnut Street (north) (unsignalized);
- Route 20 (Hartford Turnpike) at Walnut Street (south) (unsignalized);
- South Street at Charles River Labs/UMass Campus Access Road (unsignalized);
- Proposed Site Driveway at South Street (unsignalized); and
- Proposed Site Driveway at Route 20 (Hartford Turnpike).

We note that based on the results of the trip distribution, over 100 vehicles are anticipated
3-1 to access the site from Route 9 west of the South Street intersection. As such, the FEIR should determine whether intersections along Route 9 west of the South Street intersection are merited for inclusion in the study area based on the *Transportation Impact Assessment Guidelines* for intersections exceeding 100 vehicles on all approaches during peak travel periods. At a minimum, the Route 9/Grafton Street, Route 9/Lake Street, and Route 9/Oak Street intersections should be evaluated.

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 DEIR, trip generation was calculated based on ITE trip rates for Land Use Code (LUC) 130 – Industrial Park and LUC 710 – General Office Building; the trip generation accounted for the square footage of each Subdistrict separately. Accordingly, the site is expected to generate 2,664 new daily weekday vehicle trips, with 317 vehicle trips occurring during the weekday morning peak hour and 316 vehicle trips occurring during the weekday evening peak hour. No credit was taken for walking, bicycling, or transit trips.

We note that the trip generation methodology used the average rate for each LUC, rather than the fitted curve rate as required in the 2014 MassDOT/EEA *Transportation Impact Assessment Guidelines*. In MassDOT's EENF response letter, we requested that justification be provided for using the average rate; the DEIR notes that a fitted curve rate is not provided for LUC 130 and the two rates are comparable for LUC 710. Supplemental information provided by the Proponent argues that the correlation factor for LUC 130 is low which, along with the absence of a fitted curve equation for the weekday morning and weekday evening peak hour of adjacent street traffic justifies use of the average rate; using the average rate during the weekday morning and weekday evening peak hour of adjacent street traffic for LUC 710 results in a more conservative analysis. MassDOT accepts this justification for the trip generation methodology.

Safety

The TIAS includes a summary of crash rates derived from MassDOT and the Towns of Shrewsbury and Northborough for the continuous five-year period of 2014 through 2018. Crash rates at all but one of the study area intersections (Route 9 at South Street) fall below the MassDOT statewide and District 3 averages.

A Road Safety Audit (RSA) was conducted at the Route 9/South Street intersection as required by its listing as a Highway Safety Improvement Program (HSIP)-eligible intersection. The Proponent has committed to providing the following safety-related mitigation measures at this intersection:

- Replacement of signage on the South Street southbound approach;
- Relocation and replacement of signage on the Route 9 westbound approach;
- Installation of a "No Turn on Red" sign on the Route 9 eastbound approach;
- Verification and adjustment of signal clearance timings as appropriate; and
- Coordination with the school bus operator to relocate the existing bus stop further south along South Street.

3-2 The Proponent should additionally commit to reinstalling the bicycle pavement markings on the detection zones, replacing the double left turn lane line extension markings on the South Street southbound approach, and replace sections of damaged end treatment/crash cushions. Each of these have been identified as low-cost, short-term improvements from the Route 9/South Street RSA.

The Route 20/Walnut Street intersections were previously identified as HSIP-eligible at the time of the ENF submission; as these intersections are no longer HSIP-eligible, an RSA is no longer required.

Traffic Operations

Capacity analyses were conducted for the weekday morning and weekday evening peak periods for existing, 2026 No-Build, and 2026 Build conditions. The Route 9/South Street intersection is anticipated to operate at a Level of Service (LOS) E during the weekday morning

peak hour under 2026 Build conditions, with the Route 9/South Street and Route 20/Centech Boulevard/Cherry Street intersections anticipated to operate at a LOS E during the weekday evening peak hour under 2026 Build conditions. Additionally, the Route 20 Westbound On-Ramp is anticipated to operate at LOS F during the weekday evening peak hour, along with several intersection approaches under local jurisdiction during both the weekday morning and weekday evening peak hours.

The Proponent proposes no mitigation measures in response to these impacts. The
3-3 Proponent notes the Route 20 Corridor Improvements project (MassDOT #607442) is under development and is considering alternatives to provide two travel lanes in each direction along Route 20, improve pedestrian and bicycle accommodations, and implement geometric modifications to approaches at the Route 20/South Street/Green Street, Route 20/Centech Boulevard/Cherry Street, and Route 20/Walnut Street intersections. As these improvements are not currently designed or funded, the FEIR should evaluate and, to the extent feasible, commit to components of these mitigation improvements at the Route 20/Centech Boulevard/Cherry Street intersection. Mitigation at the Route 20 Westbound On-Ramp approach is not required as MassDOT is more conclusively implementing improvements at the Route 9/Route 20 interchange.

3-4 Similarly, the FEIR should evaluate and, to the extent feasible, commit to improvements at the Route 9/South Street intersection is order to address the deficient operations that are observed in the 2026 Build condition.

The Proponent has committed to providing an optimized traffic signal timing plan at the Route 20/South Street/Green Street intersection, to be implemented within six months of initial occupancy, and, if necessary, will permit and implement geometric and signal modifications at this intersection in accordance with the Traffic Monitoring Program. Proposed geometric improvements include widening the southbound South Street approach to provide a shared through/left-turn lane and an exclusive right-turn lane.

Multimodal Access and Facilities

The Grafton MBTA Commuter Rail Station is located approximately 1.7 miles south of the Site Driveway/Route 20 intersection and 2.4 miles south of the Site Driveway/South Street intersection. The Worcester Regional Transit Authority (WRTA) does not operate service in the
3-5 vicinity of the project site. Given the presence of other employers in the vicinity of the project site, particularly along South Street, the Proponent should contact WRTA to examine the possibility of providing service to the project site and its surrounding environs; this service may benefit from connections to Worcester's Union Station and/or the Grafton MBTA Commuter Rail Station. The FEIR should include documentation of outreach to the WRTA regarding this matter.

3-6 The DEIR provides conceptual plans illustrating the extension of the sidewalk system along South Street from the CVS property through the Route 9 intersection to the Price Chopper property. Given South Street in this area is under the Town of Shrewsbury jurisdiction, the

Proponent should work with the Town to provide adequate accommodation for pedestrians and bicyclists. Crosswalks and ADA-compliant ramps should be provided at the Site
3-7 Driveway/Route 20 intersection; the FEIR should commit to providing these improvements upon occupancy of the project site should the Route 20 Corridor Improvements Project not be completed at that time; MassDOT District 3 should be consulted with regarding design details for improvements at the Route 9/South Street intersection.

Parking

The DEIR proposes provision for 812 parking spaces, 1,256 of which would be provided in a structured facility. The TIA includes a comparison of the proposed parking supply with the Town of Shrewsbury Zoning Bylaws and Regulations as well as ITE *Parking Generation, 5th Edition* guidelines, which estimates amounts to between 755 and 1,159 spaces; therefore finding
3-8 the parking supply to be in general conformance with these standards. We encourage the Proponent to investigate reducing parking or land banking of parking spaces until and unless needed, based on monitoring conducted at a future date.

Transportation Demand Management Program

The Proponent has identified the following Transportation Demand Management (TDM) measures with the goal of reducing single-occupancy vehicle trips by employees and patrons of the project:

- Provision of an Employee Transportation Coordinator (ETC) to disseminate TDM information to tenants;
- Posting of service and schedule information for WRTA and MBTA services;
- Encouragement of tenants to provide a public transportation subsidy program for employees and visitors;
- Evaluation of alternative means for connecting the project site to the Grafton MBTA Commuter Rail Station such as through rideshare services, bike share services, tenant employee carpool options, and rideshare matching services with other nearby employers along South Street;
- Provision of bicycle racks for employees and visitors;
- Encouragement of tenants to provide alternative work arrangements;
- Provision of preferential parking for carpools, vanpools, car sharing, and low-emission vehicles;
- Consideration of charging stations for electric vehicles; and
- Encouragement of commercial tenants for provision of a guaranteed ride home program.

3-9 The Proponent should work toward identifying the details of these measures as well as developing additional programs. We note that the DEIR seeks to "consider" and "encourage" many of these measures; a commitment to providing individual measures should be made and documented in the FEIR.

3-10 The Proponent is invited to consult with MassDOT to help implement the TDM program.

3-11 Please note that MassDOT recently launched the Workforce Transportation Program to provide funding to help employers meet workforce transportation needs, including first mile/last mile connections. The Proponent is encouraged to utilize this program moving forward.

Transportation Monitoring Program

3-12 The Proponent is required to conduct an annual traffic monitoring program for a period of five years, beginning six months after occupancy of the project. At a minimum, the monitoring program should include:

- Simultaneous automatic traffic recorder (ATR) counts at the site driveway for a continuous 24-hour period on a typical weekday;
- Travel survey of employees at the site; and
- Weekday AM and PM peak hour turning movement counts (TMCs) and operations analysis at site driveways and mitigated intersections.

The goals of the monitoring program will be to evaluate the assumptions made in the Environmental Impact Report 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.

3-13 With regards to mitigation improvements at the Route 20/South Street/Green Street intersection, the Proponent will, within 90 days of occupancy of each building within Subdistrict A, conduct capacity analyses during the weekday evening peak hour and, should either an LOS E be observed at the South Street southbound approach or vehicle queues on South Street extend to or beyond Chestnut Street, commit to implementing intersection improvements described in the Traffic Operations section above. The FEIR should commit to implementation of these improvements upon discovery rather than prior to occupancy of any additional building space; MassDOT typically requires unacceptable operational impacts to be mitigated prior to their materialization.

Section 61 Finding

3-14 The FEIR should include an updated Draft Section 61 Finding, outlining the mitigation measures the Proponent has committed to implementing in conjunction with this project. The Draft Section 61 Finding will be the basis for MassDOT to issue a final Section 61 Finding for the project.

3-15 The FEIR 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.

3-16 [The Proponent should continue consultation with appropriate MassDOT units, including PPDU and the District 3 Office, to discuss preparation of the FEIR.] If you have any questions regarding these comments, please contact me at (857) 368-8862 or Michael Clark at (857) 368-8867.

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
BOSTON, MA 02114
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Charles D. Baker
Governor

Karyn E. Polito
Lt. Governor

Kathleen Theoharides
Secretary

Judith F. Judson
Commissioner

24 September 2019

Kathleen Theoharides, Secretary
Executive Office of Energy & Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114
Attn: MEPA Unit

RE: Centech Park North, Shrewsbury, Massachusetts, EEA #15950

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 Draft Environmental Notification Form (ENF) for the above project. The proposed project includes 450,000-sf of office, warehouse, and retail buildings.

Executive Summary

The DEIR was responsive to our ENF recommendations, providing evaluations and analyses of electrification, improved envelope, and solar PV.

Evaluations indicate that efficient electrification of space and water heating provides significant GHG emissions benefits, costs less to operate, and enables the project to take advantage of Alternative Energy Credits (AECs).

Accordingly, the DOER recommends that the project commit to efficient electrification which is currently not a project commitment.

The project is committing to above-code envelope performance and above-code solar readiness.

Our detailed review follows.

High-Performance Envelope

Underpinning all strategies for emissions reduction is a high-performance envelope. Key strategies for ensuring high-performance envelope include:

- Limiting or eliminating use of glass "curtain wall" and spandrel assemblies;
- Maximizing framed, insulated walls sections;
- Minimizing window areas;
- Using continuous insulation;
- Using thermal breaks;
- Reducing air-leakage.

The thermal performance of even the highest-performing windows, curtain walls, and spandrel assemblies available 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 which increases energy consumption and emissions.

4-1 [The project is committing to better-than-code envelope for all buildings. As detailed in the DEIR, both the office and manufacturing building types are committing to envelope performance that is about a 20% improvement over code by using framed insulated wall sections and improved window performance. Curtain wall and spandrel assemblies are avoided. We encourage the project to maintain and consider further improving this commitment as high-performance envelopes not only improve energy efficiency but also provide more flexibility in HVAC choices, including efficient electrification.]

Envelope and HVAC

High-performance, above-Code envelopes can result in smaller, leaner, and less expensive HVAC systems. For example, with a Code envelope, extensive perimeter heating (and cooling) of exterior walls is typically required to maintain comfort. In contrast, high-performance envelopes can deliver the same comfort without perimeter systems. This can result in lower HVAC costs and makes it easier to use cold-climate heat pumps.

Electrification

Efficient electrification of space and water heating entails the swapping of fossil fuels (natural gas, oil, and propane) and electric resistance with:

- Cold-climate air source heat pumps and variable refrigerant flow (VRF) for space heating;

- Air source heat pumps for water heating.

Efficient electrification of space and water heating is a key mitigation strategy with significant short- and long-term implications on GHG emissions. Massachusetts grid emissions rates continue to decline with the 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 have lower emissions than other fossil-fuel based heating options, including best-in-class condensing natural gas equipment. Currently, efficient electric heating has approximately **45% lower emissions** than condensing natural gas heating and, by 2050, efficient electric heating is expected to have approximately **85% lower emissions** than condensing natural gas heating.

Heat pumps and/or VRFs used for space heating can qualify for significant incentives, including Alternative Energy Credits (AECs) (more below).

The analyses presented confirm that swapping from the currently-proposed, best-in-class, condensing gas heating to efficient electric heat pumps/VRF yields significant emissions reduction. In addition, the analyses show that utility costs would also go down, saving the building users about $6,200 per year.

Alternative Energy Certificates (AECs)

Space heating with qualifying space heat pump equipment could also yield Alternative Energy Certificates (AECs). Note that Alternative Energy Credits are available to towns with their own municipal light plant (MLP).

Analysis show that building users would have a potential AEC income of about $13,500 per year.

Air Source Heat Pump Water Heating

Air source heat pumps for water heating can be readily incorporated into office, retail, and warehouse buildings. Accordingly, it's feasible to completely eliminate gas service and distribution from the project.

Rooftop Solar PV

Rooftops can be an asset for renewable generation with solar PV either for the host buildings themselves; for community solar programs; or some other future use to be determined. Economics and regulatory setting for PV system is continuing to change and evolve. Accordingly, it's important to future-proof buildings' roofs to accommodate PV systems in the future, even if they are not necessarily feasible today.

The project is committing to having 60% of all roof areas be solar ready. This commitment more than doubles the solar readiness required by Code, as detailed below.

			Code required Solar Readiness		Commitment to Solar Readiness	
Building	Number of Stories	Roof Area (sf)	Percent	Area (sf)	Percent	Area (sf)
Building A	1.5	15,000	50%	7,500	60%	9,000
Building B	1.5	13,000	50%	6,500	60%	7,800
Building C	1.5	20,000	50%	10,000	60%	12,000
Building D	4	40,000	0%	-	60%	24,000
Building E	1.5	20,000	50%	10,000	60%	12,000
Building F	1.5	10,000	50%	5,000	60%	6,000
Building G	4	30,000	0%	-	60%	18,000
Building H	2	20,000	50%	10,000	60%	12,000
			Total	49,000		100,800
				Mitigation above Code Requirements		51,800 sf

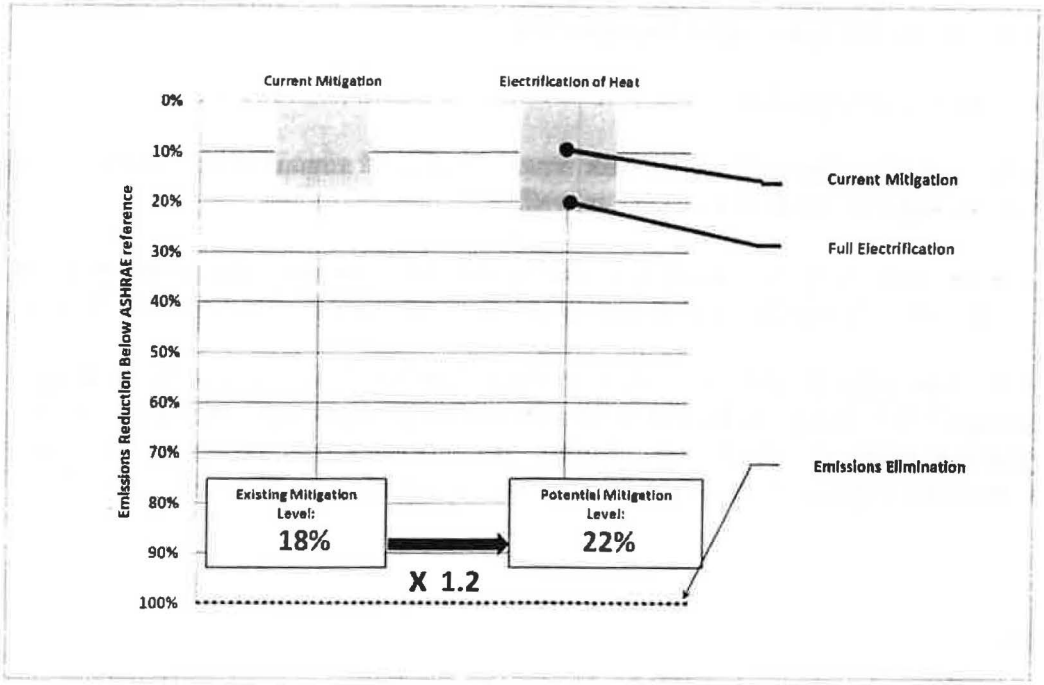
The project contained a thorough analysis of Shrewsbury's solar program and concluded that it would difficult for the project proponent to commit to PV installation today, though solar PV opportunities exist for potential future tenants. Accordingly, the solar readiness commitment, without the actual solar installation, is an appropriate commitment for this project.

Emissions Reduction 2020 and 2050

Project emissions reduction are illustrated on the next page. In 2020, with grid emission rate of about 700 lbs/MWhr, the project's current mitigation (improved envelope, improved lighting, improved HVAC) would yield an 18% reduction from Baseline. If the project uses efficient electrification for space and water heating (rather than currently-proposed fossil-fuel gas condensing space heating and electric resistance water heating), emissions reduction would increase to 22%, or, about a 1.2x improvement.

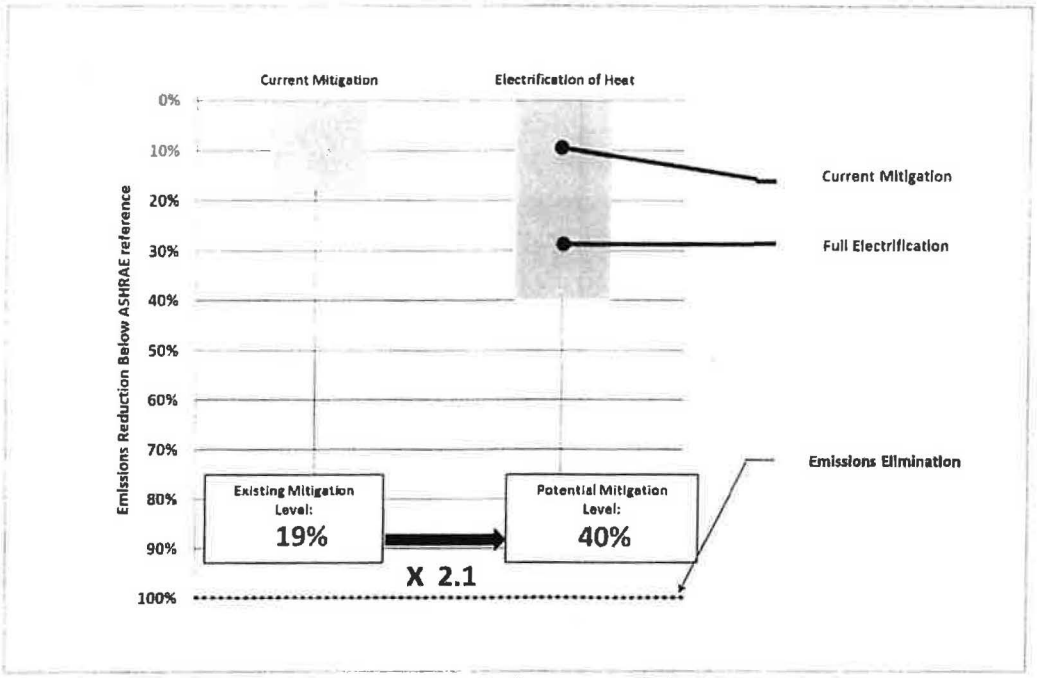
Note that two of the buildings are subject to Stretch Code provisions. Therefore, an 18% reduction from Baseline would correspond to a Mitigation Level[1] of about 8%. If emissions reduction is increased to 22% with efficient electrification, Mitigation Level would be about 12%, or, a 1.5x improvement.

[1] Mitigation Level is the percent GHG reduction beyond the reduction that would occur as a result of following state codes, including Stretch Code. A Mitigation Level of 0% means that no mitigation is proposed.



Emissions Reduction – 2020

By 2050, however, because grid emissions are continually improving with addition of renewables onto the electric grid, efficient electrification would be 40% lower than Code baseline. This would be more than double the currently-proposed emission reduction.



Emissions Reduction – 2050

Centech Park North, EEA #15950
Shrewsbury, Massachusetts

Recommendations for subsequent Submissions

Recommendations are as follows:

4-2 1. [The currently-proposed, above-code envelope should remain a commitment. Consider further improvements to envelope, as well.]

4-3 2. [The currently-proposed doubling of rooftop solar readiness should remain a commitment.
   a. Provide detailed, scaled roof plans showing set aside for proposed PV-ready areas.]

4-4 3. [The project should commit to efficient electrification of space and water heating with heat pumps/VRF. Analyses show that on an annual basis this would cost $6,200 less to operate, generate about $13,500 in AEC income, improve emissions reduction by a factor of 1.2 today, and improve emissions reduction by a factor of more than 2 by 2050.]

Sincerely,

Paul F. Ormond, P.E.
Energy Efficiency Engineer
Massachusetts Department of Energy Resources

Code	Comment	Response
	DEIR Comments	
1-1	The Proponent should identify mitigation improvements at the Route 20/Centech Boulevard/Cherry Street intersection that it could commit to in the event that the Corridor project and associated improvements in traffic operations does not proceed.	See Response to MassDOT PPDU Comment 3-3
1-2	The Proponent should work with the Town to provide adequate accommodation for pedestrians and bicyclists.	See Response to MassDOT PPDU Comment 3-6 and 3-7.
1-3	Crosswalks and ADA-compliant ramps should be provided at the Site Driveway/Route 20 intersection upon occupancy of the project site.	See Response to MassDOT PPDU Comment 3-7.
1-4	If the Corridor project has not been completed, MassDOT District 3 should be consulted regarding design of the Route 9/South Street intersection improvements.	The Corridor Project is not related to the Route 9/South Street intersection. See Repsonse to MassDOT PPDU Comment 3-3 regarding Route 9/South Street intersection improvements.
1-5	The Proponent should continue to identify ways to reduce parking.	Refer to Summary of Project Changes in Section I of the FEIR.
1-6	The FEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope.	The FEIR follows Section 11.07 of the MEPA regulations for outline and content.
1-7	The FEIR should include a comprehensive description of the project, quantify its impacts and clearly identify mitigation measures.	A comprehensive description of the Project, as well as mpacts and mitigations measures associated with the Project are described in further detail in the DEIR. Changes to the project since the DEIR are described in Summary of Project Changes in Section I of the FEIR. Refer to Section VIII of the FEIR for a summary of mitigation measures.
1-8	It should include an analysis of the project that demonstrates that the Preferred Alternative includes all feasible means to avoid Damage to the Environment, or to the extent that Damage to the Environment cannot be avoided, that it includes measures to minimize and mitigate Damage to the Environment to the maximum extent practicable.	Refer to Section II of the DEIR for an alternatives analysis and description of how the Preferred Master Plan is the best use of the property and results in a reduced impact alternative. The FEIR proposes further reductions to impacts to mimize and mitigate damage to the environment to the maximum extent practicable. Refer to Summary of Project Changes in Section I of the FEIR.
1-9	The FEIR should describe any changes to the project since the filing of the DEIR. It should include updated site plans, if applicable, for existing and post-development conditions at a legible scale.	Refer to Summary of Project Changes in Section I of the FEIR. Updated and new exhibits are provided in Appendix B.
1-10	Conceptual plans should clearly identify: all major project components (proposed buildings, access roads, 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 are provided in Appendix B of the DEIR. Appendix B of the FEIR includes a Revised Wetland Resources & Impacts Plan, Reserve & Compact Parking Exhibit, Potential Low Impact esign (LID) Locations Exhibit, and Approximate Pedestrian & Bicycle Circulation Exhibit.
1-11	Conceptual plans should be provided for on-site work as well as any proposed off-site work for transportation or utility improvements.	Conceptual plans identifying onsite utility and transportation improvements are provided in Appendix B of the DEIR. Plans identifying offsite utility and transportation improvements are included in the Traffic Impact and Access Study provided in Appendix F of the DEIR.
1-12	The FEIR should include a list of required Permits, Financial Assistance, or other State approvals and provide an update on status.	Refer to Required Permitting in Section I of the DEIR for a list of required permits, other state approvals, and an update on their associated statuses, if applicable. Refer to Project Funding in Section I of the DEIR for a summary of financial assistance expected for the Project.

1-13	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.	All aspects of the project will meet applicable statutory and regulatory standards and requirements. Discussions on how the project meets those standards is provided within the associated DEIR and FEIR sections.
1-14	The FEIR should provide an update on the federal and local review and permitting processes.	Refer to Required Permitting in Section I of the DEIR for a list of required permits, other state approvals, and a description of their processes. There are no updates to same since the DEIR.
1-15	The FEIR should demonstrate that the amount of land alteration has been limited to the maximum extent practicable and/or propose supplemental landscaping or tree planting to mitigate impacts associated with. land alteration.	Refer to Section III of the DEIR for a detailed description of land alteration proposed as part of the Project. Refer to Section II of the FEIR for a summary of how the Proponent will commit to providing open space and landscaping as required by the local regulations.
1-16	The Proponent should continue to reduce impervious area through the reduction of parking, incorporation of pervious surfaces and landscaped areas.	Refer to the Summary of Project Changes in Section I of the FEIR for a description of how the Proponent will strive to reduce onsite parking and ultimately impervious surfaces by proposing reserve and compact spaces as allowed by the Town.
1-17	The FEIR should quantify the total amount of alteration associated with the proposed project including areas to be altered for buildings, roadways, wastewater, water and stormwater infrastructure, landscaping, and other project components in a tabular format.	Refer to Table 3: Project Alternative Comparison and Table 4: Proposed Project Impacts in Section III of the DEIR for quantitative summaries of project impacts.
1-18	The FEIR should provide additional details on the proposed 29-acre open space area that is being considered for preservation. The FEIR should identify the area and the mechanism by which it will be preserved.	Refer to Open Space in Section II of the FEIR.
1-19	The FEIR should identify any changes to wetland impacts including the impacts associated with the potential pedestrian connection between the two subdistricts.	Bohler Engineering interprets the "potential pedestrian connection" in the comment as the "proposed water line connection", as there is no pedestrian crossing proposed between the two subdistricts. This water line connection is located in an area with minimal impacts and there have been no changes to the wetland impacts associated with this connection between the two subdistricts since the DEIR.
1-20	The FEIR should demonstrate that the project can be designed and constructed consistent with the Wetland Protection Act (WPA) performance standards for all impacted wetland resource areas.	The project will be designed and constructed consistent with the WPA performance standards for all impacted wetland resource areas. Refer to Mitigation and Performance Standards in Section III of the FEIR for more information.
1-21	It should include updated plans at a reasonable scale that clearly delineate all applicable resource area, including Bank, and buffer zone boundaries.	There are no changes to applicable resource areas, including bank and buffer zone boundaries. Refer to plans provided in Appendix B of the DEIR.
1-22	The FEIR should identify the permitting path for each component of the project, including off-site work, and whether multiple NOIs will be filed.	Refer to Required Permitting in Section I of the DEIR which describes the permitting path for the Project, including off site work, and how multiple NOI's will be filed as required for each individual use proposed on site.
1-23	The FEIR should clarify whether any stormwater will be discharged to MassDOT infrastructure within Route 20.	Refer to Mitigation and Stormwater Management Standards in Section V of the DEIR. There are no anticipated piped connections to off-site stormwater infrastructure proposed as part of the Project.
1-24	The FEIR should continue to evaluate use of LID techniques for stormwater management, including but not limited to: use of pervious pavement, raingardens/bioretention areas, bioswales, tree box filters, and green roofs, and reuse of roof runoff for irrigation.	Refer to Section IV of the FEIR for more information relative to the use of LID techniques. Refer to Potential Low Impact Design (LID) Locations Exhibit in Appendix B for potential LID techniques and locations.

1-25	Comments from MassDEP identify additional information that should be provided in the FEIR to demonstrate that feasible alternatives have been evaluated to avoid and minimize impacts associated with access to Building E and Building F including reconfiguration of the building.	Refer to Comment Response #2-3 addressing MassDEP's comment relative to wetland impacts associated with Building F. Refer to Comment Response #2-4 addressing MassDEP's comment relative to bank impacts associated with access to Building E.
1-26	The FEIR should review and respond to comments submitted by MassDOT to address outstanding concerns regarding project-related traffic and transportation impacts.	Refer to Comment Responses #3-1 to #3-16 in this matrix which address MassDOT comments.
1-27	The Proponent should continue consultation with MassDOT during preparation of the FEIR.	The Proponent will continue to consult with MassDOT as needed during preparation of the FEIR.
1-28	The FEIR should determine whether intersections along Route 9 west of the South Street intersection should be included in the study area based on the Transportation Impact Assessment Guidelines for intersections exceeding 100 vehicles on all approaches during peak travel periods. At a minimum, the Route 9/Grafton Street, Route 9/Lake Street, and Route 9/0ak Street intersections should be evaluated.	See Response to MassDOT PPDU Comment 3-1
1-29	Because the Route 20 Corridor Improvements project (MassDOT #607442) is not designed or funded, the FEIR should identify and evaluate interim mitigation that could be implemented at the Route 9/South Street to address the degraded operations in the 2026 Build condition. Based on the analysis, the Proponents should identify associated mitigation commitments.	The Corridor Project is not related to the Route 9/South Street intersection. See Response to MassDOT PPDU Comment 3-3 regarding Route 9/South Street intersection improvements.
1-30	The FEIR should include commitments to additional low-cost, short-term improvements identified in the Route 9/South Street RSA including reinstalling the bicycle pavement markings on detection zones, replacing the double left turn lane line extension markings on the South Street southbound approach, and replace sections of damaged end treatment/crash cushions.	See Response to MassDOT PPDU Comment 3-2
1-31	The Proponent should contact WRTA to examine the possibility of providing service to the project site and its surrounding area given the presence of employers within the area particularly along South Street; this service may benefit from connections to Worcester's Union Station and/or the Grafton MBT A Commuter Rail Station. The FEIR should include documentation of outreach to the WRTA regarding potential service to the project area.	See Response to MassDOT PPDU Comment 3-5
1-32	The Proponent should continue to study the feasibility of reducing parking and the potential to bank parking and not construct it until warranted by demand.	Refer to the Summary of Project Changes in Section I of the FEIR for changes made to the project since the filing of the DEIR, which proposes reduced parking by identifying reserve spaces. Refer to the Reserve & Compact Parking Exhibit provided in Appendix B.
1-33	The FEIR should identify electric vehicle charging stations with a goal of 10% of all parking being allocated for electric vehicles (5% constructed with charging stations and 5% EV ready).	Refer to Transportation Demand Management (TDM) Program in Section VII of the FEIR for information relative to electric vehicles and charging stations.
1-34	The FEIR should include an updated GHG analysis which reflects any changes or refinements in building size and/or use since the filing of the DEIR.	Since no significant changes were made to projected building uses and sizes, no updates to the GHG analysis were necessary.

1-35	The FEIR should provide a detailed response to the Department of Energy Resources' (DOER) comment letter regarding the opportunities for energy efficiency through electrification of the project.	Detailed responses to DOER comments are provided in Comment Responses #4-1 through #4-5.
1-36	We encourage the Proponent to commit to electrification based on the positive analysis presented in the DEIR and the ability to lower energy costs for businesses while significantly reducing GHG emissions over time.	For each building, the Proponent will construct core and shell space in which the tenants will fit-out mechanical systems and lighting. The decision whether to use heat pumps for space heating, cooling and hot water, or more conventional equipment, will be made by each tenant. The Proponent will provide prospective tenants with information on the energy and cost savings associated with the All Electric alternative, to encourage tenants to pursue full electrification, drawing upon the analysis in Section 4.4 of the DEIR Greenhouse Gas and Mesoscale Analysis report.
1-37	The FEIR should include a revised mobile source GHG analysis to reflect any changes to traffic mitigation (roadway improvements, signal timing, public transportation, etc.) since the DEIR.	No significant changes were made; refer to the mobile source GHG analysis in the DEIR Greenhouse Gas and Mesoscale Analysis report.
1-38	The FEIR should identify the quantity and location of electric charging stations proposed for the site.	The greatest demand for EV charging will be at the proposed Office Buildings D, G and H, and multiple charging stations are planned at each building. Refer to Section IV of the FEIR. Refer to the Potential Low Impact Design (LID) Locations Exhibit in Appendix B for potential electric charging station locations.
1-39	The FEIR should address comments in MassDEP's comment letter regarding the source of water for proposed irrigation.	Refer to Comment Response #2-1.
1-40	The FEIR should indicate whether wastewater from the project will be directed to the treatment plant in Westborough or through Worcester to the Upper Blackstone Water Pollution Abatement District treatment plant.	Refer to Wastewater Supply & Mitigation Strategies in Section V of the FEIR for a summary on proposed wastewater discharges.
1-41	The FEIR should identify whether I/I offsets will be required.	Refer to Wastewater Supply & Mitigation Strategies in Section V of the FEIR for a summary on proposed wastewater discharges.
1-42	The FEIR should include a separate chapter summarizing all proposed mitigation measures.	Refer to Section VIII of the FEIR which provides a summary of the revised mitigations measures proposed since the DEIR filing.
1-43	The FEIR should include draft Section 61 Findings for each Agency Action. The FEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and a schedule for implementation.	Refer to Appendix D for draft Section 61 findings for MassDOT and MassDOER. At construction completion for each building, the end user 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.
1-44	The FEIR should contain a copy of this Certificate and a copy of each comment letter received.	Refer to Appendix F of the FEIR for a copy of the DEIR Certificate and associated comments received.
1-45	In order to ensure that the issues raised by commenters are addressed, the FEIR should include direct responses to comments to the extent that they are within MEPA jurisdiction in a separate Response to Comments section of the FEIR. This directive is not intended to, and shall not be construed to enlarge the scope of the FEIR beyond what has been expressly identified in this Certificate.	Refer to Appendix F of the FEIR for responses to comments in a matrix format (this document).

1-46	The Proponent should circulate the FEIR to those parties who commented on the ENF and/or the DEIR 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.	Refer to Appendix G of the FEIR for an FEIR Circulation List.
1-47	A copy of the FEIR should be made available for review at the Shrewsbury public library.	A copy of the FEIR will be made available for review at the Shrewsbury Public Library.
1-48	The Proponent should make available a reasonable number of hard copies to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis.	Hard copies of the FEIR will be made available and distributed upon request on a first come, first served basis.
1-49	The Proponent should send a letter accompanying the digital copy or identifying the web address of the online version of the FEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments.	A letter will accompany the FEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and providing appropriate addresses for submission of comments.
1-50	The FEIR submitted to the MEPA office should include a digital copy of the complete document.	The FEIR submitted to the MEPA office will include a digital copy of the complete document.
MassDEP Comments		
2-1	The Proponent states in the DEIR that water conservation equipment will be installed on irrigation infrastructure, but does not discuss the source of water for irrigation. The Town of Shrewsbury's Water Department prohibits the connection of new irrigation systems to the municipal water supply.	The Project will consider capturing/reusing rainwater for irrigation on site and does not propose connections to the municipal water supply to service irrigation systems. This technique will be discussed in the future NOI filings developed for the proposed build-out of the property. Refer to Section VIII of the FEIR for updated mitigation efforts proposed relative to irrigation.
2-2	The DEIR does not indicate whether wastewater from the Project will be directed to the treatment plant in Westborough or through Worcester to the Upper Blackstone Water Pollution Abatement District treatment plant In the FEIR, the Proponent should confirm which treatment plant will receive the wastewater from the Project, and whether any I/I removal requirements will be triggered.	Refer to Wastewater Supply & Mitigation Strategies in Section V of the FEIR for a summary on proposed wastewater discharges and I/I mitigation.
2-3	The Proponent does not explain the necessity for the wetland alteration adjacent to Building F in the DEIR.	The wetland alteration adjacent to Building F has been removed from the scope of the Project, and the total wetland impact area has been reduced. Refer to Summary of Project Changes and Table 1 in Section I of the FEIR for a desciption and quantitative comparison of impacts to wetland resource areas since the DEIR filing. Refer to the Revised Wetland Resource & Associated Impacts Plan provided in Appendix B of the FEIR.
2-4	Bank impacts, which are often associated with wetland crossings, such as the access crossing to Building E, are not described nor quantified in the DEIR.	There are no Bank impacts anticipated as part of the Project.
2-5	Two Potential Vernal Pools ("PVPs") with verified vernal pool features are present on the property, however, because the DEIR plan set does not show the locations of these PVPs, MassDEP is unable to determine whether the Project will adversely impact these features.	Refer to the ACEC Map provided in Appendix A of the FEIR for the location of potential vernal pools onsite.

2-6	Site Plans show a proposed wetland replication area associated with the proposed crossing to Building E along the perimeter of a ponded area that is designated by the Massachusetts Natural Heritage and Endangered Species Program as a PVP. The Proponent should consider alternative locations for this replication area that will not require disturbance of soils and mature vegetation adjacent to a PVP.	Refer to Mitigation and Performance Standards in Section III of the FEIR. Refer to the Revised Wetland Resources & Associated Impacts Plan provided in Appendix B of the FEIR.
2-7	The Proponent shall design the remaining portions of the Project to meet all performance standards identified in the Massachusetts Wetlands Protection Act Regulations 310 CMR 10.00 for work proposed in each affected wetland resource areas.	The Proponent acknowledges this comment.
2-8	The NOI should include justification for the 864 square feet of BVW alteration proposed to the north of Building F in the NOI and the Proponent should consider alternative designs to reduce or eliminate this resource area alteration.	Refer to Comment Response #2-3.
2-9	If present, Bank shall be shown on the Site Plans at all crossing locations, the crossing shall be designed to meet the Massachusetts Stream Crossing Standards, and a Wildlife Habitat Evaluation shall be included with the NOI if Bank impacts exceed the thresholds for wildlife habitat significance permitted under 310 CMR 10.54(4)(a)(5).	Intermittent streams are located internal to Bordering Vegetated Wetland areas, and there are no Bank impacts anticipated as part of the Project.
2-10	The NOI for the remaining Phases of the Project should include documentation to demonstrate that source controls, pollution prevention measures, erosion and sediment controls, and the post-development drainage system will be designed in compliance with the stormwater elements of the Massachusetts Wetlands Protection Act regulations (310 CMR 10.00), applicable standards, and the Stormwater Management Handbook.	The Proponent acknowledges this comment.
2-11	The Proponent should use precipitation data as specified in TR-55 or that required by the local municipality, whichever is more conservative, for the purposes of preparing the stormwater analysis. MassDEP recommends that the potential impact of increased precipitation frequency and volume due to climate change be considered during the design of the stormwater management system.	Refer to Standard #2 in the Mitigation and Stormwater Management Standards subsection of Section V of the DEIR. The Proponent will consider the potential impact of increased precipitation frequency and volume due to climate change during the final design of the stormwater systems and during the local permitting process.
2-12	The NOI filing should include a stormwater management report with at a minimum, 1) calculations of water quality volume, infiltration volume, total suspended solids removal, and peak rates of runoff for predevelopment and post-development site, 2) a description of stormwater Best Management Practices (BMPs) and structural features, and 3) stormwater system design plans presented at a readable scale. Documentation to support statements that the stormwater system design provides adequate protection for wetland resources also should be included to show compliance with the stormwater standards and Stormwater Management Handbooks.	Refer to Mitigation and Stormwater Management Standards in Section V of the DEIR. The Proponent will submit NOI filings with associated drainage reports that demonstrate compliance with all applicable stormwater standards and the Shrewsbury Rules & Regulations.

2-13	The DEIR states that Potential Vernal Pools with verified vernal pool features are present on the subject site. Vernal Pools qualify as Outstanding Resource Waters (ORWs) and the stormwater management plan for the Project should be designed to meet all Stormwater Standards and setbacks associated with ORWs and Vernal Pools.	Refer to Standard #6 in the Mitigation and Stormwater Management Standards subsection of Section V of the DEIR. The stormwater systems will meet all ORW standards as may be applicable.
2-14	The Proponent should commit to incorporating LID measures into the design of the remaining phases of the Project.	The Town commits to encourage future developers of the site to incorporate LID measures into the design of the remaining phases of the Project. Refer to Potential Low Impact Design (LID) Locations Exhibit in Appendix B for potential LID techniques and locations.
2-15	MassDEP notes that unnecessary idling (i.e., in excess of five minutes), with limited exceptions, 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.	Refer to Secion VIII of the FEIR.
2-16	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.	Refer to Secion VIII of the FEIR.
2-17	The Proponent should be aware of and review MassDEP's noise regulations and policies concerning noise. Proper and considered placement of HVAC equipment and emergency generator(s), with the potential addition of noise abatement enclosure for HVAC roof top units or a noise abatement enclosure for generators, could prevent future noise complaints from abutters. Locations of loading docks and driveways could also contribute to noise generation.	Refer to Secion VIII of the FEIR.
MassDOT Comments		
3-1	The FEIR should determine whether intersections along Route 9 west of the South Street intersection are merited for inclusion in the study area based on the Transportation Impact Assessment Guidelines for intersections exceeding 100 vehicles on all approaches during peak travel periods. At a minimum the Route 9/Grafton Street, Route 9/Lake Street, and Route 9/0ak Street intersections should be evaluated.	The trip tracings have been extended through the intersection of Route 9/Grafton Street. The intersections the the west of Grafton Street; Route 9/Lake Street and Route 9 at Oak Street are below the 100 vehilce threshold for inclusion. The right-in/right out intersection of Route 9 easbound at Grafton Street is slighly above the 100 vehicle threshold during the weekday morning peak hour, therefore this intersection has been added to the study area. The remaining Route 9/Grafton Street locations remain below the 100 vehicle threshold for inclusion. The analysis for the supplimental study location is included in the FEIR Transporation Section. The baseline traffic volumes for Route 9 at Grafton Street, expanded trip tracings, and trip increase percentage calculations are also included in the FEIR Transportation Section.
3-2	The Proponent should additionally commit to reinstalling the bicycle pavement marking on the detection zones, replacing the double left turn lane line extension markings on the South Street southbound approach, and replace sections of damaged end treatment/crash cushions.	The State recently milled, overlayed and placed new pavement markings at the intersection; replication of prior bicycle markings and turn lane markings ("Skip Lines") as previously marked are the responsibility of MassDOT through its maintenance program. The damaged end treatment/crash cushions have been replaced by MassDOT since completion of the Road Safety Audit.

3-3	The Proponent notes the Route 20 Corridor Improvements project (MassDOT #607442) is under development and is considering alternatives to provide two travel lanes in each direction along Route 20, improve pedestrian and bicycle accommodations, and implement geometric modifications to approaches at the Route 20/South Street/Green Street, Route 20/Centech Boulevard/Cherry Street, and Route 20/Walnut Street intersections. As these improvements are not currently designed or funded, the FEIR should evaluate and, to the extent feasible, commit to components of these mitigation improvements at the Route 20/Centech Boulevard/Cherry Street intersection.	Upon consultation with MassDOT District 3 Office and PPDU, project impacts of the Sub District A are limited and do not warrant detailed study or mitigative actions at this location. However, the Proponent will conduct a Transportation Monitoring Program that includes this location to determine whether signal timing or phasing modifications are necessary to offset Project impacts beyond the Sub District A occupancy to achieve operations that are at or better than the No Build conditions as defined in the DEIR technical analysis. Such improvements if deemed necessary to support Sub District B occupancy including appropriate signal timing or phasing changes in accordance with MassDOT approved design guidelines shall be designed, permitted and implemented by the Proponent.
3-4	Similarly, the FEIR should evaluate and, to the extent feasible, commit to improvements at the Route 9/South Street intersection is order to address the deficient operations that are observed in the 2026 Build condition.	The Proponent has evaluated and discussed operations of the Route 9 at South Street intersection with MassDOT. Upon review, there are no short term improvements (i.e. signal timing modifications) that will improve operations at this location.
3-5	Given the presence of other employers in the vicinity of the project site, particularly along South Street, the Proponent should contact WRTA to examine the possibility of providing service to the project site and its surrounding environs; this service may benefit from connections to Worcester's Union Station and/or the Grafton MBTA Commuter Rail Station. The FEIR should include documentation of outreach to the WRTA regarding this matter.	The Proponent (Town of Shrewsbury) is a member of the WRTA board. As such the Town will continue to work with the WRTA to examine the possibility of providing service to the project site and its surrounding environs as individual tenants are identified for the Site and as additional growth occurs along the Route 20 corridor that would create a "critical mass" of potential ridership for the WRTA service.
3-6	The DEIR provides conceptual plans illustrating the extension of the sidewalk system along South Street from the CVS property through the Route 9 intersection to the Price Chopper property. Given South Street in this area is under the Town of Shrewsbury jurisdiction, the Proponent should work with the Town to provide adequate accommodation for pedestrians and bicyclists.	The Proponent has discussed pedestrain improvement initiatives for the Route 9/South Street intersection with MassDOT District 3 and PPDU staff. MassDOT acknowleges that there are no current plans to advancing pedestrian improvements within Route 9; likewise the The Town of Shrewsbury has no plans and does not propose to extend sidewalks along the South Street corridor. Given the remote location of the Site relative to Route 9 and the improbability of generating any meaningful change in pedestrian activity at this intersection by the Project, no pedestrian improvements are warranted or proposed by the Proponent at this location.
3-7	Crosswalks and ADA-compliant ramps should be provided at the Site Driveway/Route 20 intersection; the FEIR should commit to providing these improvements upon occupancy of the project site should the Route 20 Corridor Improvements Project not be completed at that time; MassDOT District 3 should be consulted with regarding design details for improvements at the Route 9/South Street intersection.	Crosswalks and ADA-compliant ramps are proposed at the Site Driveway/Route 20 intersection, as shown on Figure 14 of the DEIR. The crosswalks and ADA-compliant ramps will be installed upon installation of the Route 20 driveway should the Route 20 Corridor Improvements Project not be completed at that time. With respect to the Route 9 South Street intersection refer to Responses 3-4 and 3-6.
3-8	We encourage the Proponent to investigate reducing parking or land banking of parking spaces until and unless needed, based on monitoring conducted at a future date.	The Proponent will review the ability to reduce and/or land bank parking spaces during the site plan review for each building as the project moves forward. Sub District A has been approved at the master plan level with further review to be conducted as tenants are identified and refined site plans are developed. Monitoring will be conducted as occupancy occurs over time as a condition of local approvals to confirm that identified reserve parking areas are not necessary and may remain landscaped/pervious area.

3-9	The Proponent should work toward identifying the details of these measures as well as developing additional programs. We note that the DEIR seeks to "consider" and "encourage" many of these measures; commitment to providing individual measures should be made and documented in the FEIR.	The Proponet has looked to expand upon the details of the TDM program and has looked to enhance the TDM program, and will commit to specific TDM measures. An updated TMC section is provided in the FEIR Transporation Section.
3-10	The Proponent is invited to consult with MassDOT to help implement the TDM program.	The Proponent will continue to work with MassDOT to help implement the TDM program.
3-11	Please note that MassDOT recently launched the Workforce Transportation Program to provide funding to help employers meet workforce transportation needs, including first mile/last mile connections. The Proponent is encouraged to utilize this program moving forward.	The Proponent will consult MassDOT to help implement the TDM program and will look to include the Workforce Transportation Progam as part of the project.
3-12	The Proponent is required to conduct an annual traffic monitoring program for a period of five years, beginning six months after occupancy of the project.	The Proponent will implement a Transportation Monitoring Program as defined in the Letter of Committment included in the FEIR that will serve as the basis for a Section 61 Finding to be issued by MassDOT.
3-13	With regards to mitigation improvements at the Route 20/South Street/Green Street intersection, the Proponent will, within 90 days of occupancy of each building within Subdistrict A, conduct capacity analyses during the weekday evening peak hour and, should either an LOS E be observed at the South Street southbound approach or vehicle queues on South Street extend to or beyond Chestnut Street, commit to implementing intersection improvements described in the Traffic Operations section above. The FEIR should commit to implementation of these improvements upon discovery rather than prior to occupancy of any additional building space; MassDOT typically requires unacceptable operational impacts to be mitigated prior to their materialization.	The Proponent agrees with the mitigation commitments for the Route 20/South Street/Green Street intersection and commits to implementation of the improvements upon discovery rather than prior to occupancy of any additional building space.
3-14	The FEIR should include an updated Draft Section 61 Finding, outlining the mitigation measures the Proponent has committed to implementing in conjunction with this project.	The FEIR includes an updated Draft Letter of Commitment that serves as a basis for the Section 61 Finding.
3-15	The FEIR 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.	Sub District A has been approved at the master plan level with further review to be conducted as tenants are identified and refined site plans are developed. The Proponent will continue consult MassDOT before any transportation issues are discussed at local meetings or hearings with respect to any transportation issues on State Highway.
3-16	The Proponent should continue consultation with appropriate MassDOT units, including PPDU and the District 3 Office, to discuss preparation of the FEIR .	The proponent has consulted and met with MassDOT/PPDU regarding the preperation of the FEIR. The Proponent will continue to work with MassDOT/PPDU with respect to the Section 61 Finding.
MassDOER Comments		

4-1	The project is committing to better-than-code envelope for all buildings. As detailed in the DEIR, both the office and manufacturing building types are committing to envelope performance that is about a 20% improvement over code by using framed insulated wall sections and improved window performance. Curtain wall and spandrel assemblies are avoided. We encourage the project to maintain and consider further improving ·this commitment as high-performance envelopes not only improve energy efficiency but also provide more flexibility in HVAC choices, including efficient electrification.	The Project affirms the better-than-code envelope for all buildings, as presented in the DEIR.
4-2	The currently-proposed, above-code envelope should remain a commitment. Consider further improvements to envelope, as well.	The Project affirms the better-than-code envelope for all buildings, as presented in the DEIR.
4-3	The currently-proposed doubling of rooftop solar readiness should remain a commitment. a. Provide detailed, scaled roof plans showing set aside for proposed PV-ready areas.	The Project affirms the solar readiness commitment in the DEIR. Given the conceptual stage of the project, roof plans are not available.
4-4	The project should commit to efficient electrification of space and water heating with heat pumps/VRF. Analyses show that on an annual basis this would cost $6,200 less to operate, generate about $13,500 in AEC income, improve emissions reduction by a factor of 1.2 today, and improve emissions reduction by a factor of more than 2 by 2050.	The Air Source Heat Pumps Analysis in Section 4.4 of the DEIR Greenhouse Gas and Mesoscale Analysis report is consistent with the DOER comments regarding opportunities for energy efficiencies and reduced operating costs. The decision whether to use heat pumps for space heating, cooling and hot water, or more conventional equipment, will be made by each tenant. The Proponent will provide prospective tenants with information on the energy and cost savings associated with the All Electric alternative, to encourage tenants to pursue full electrification, drawing upon the analysis in Section 4.4 of the GHG report.

APPENDIX F: FEIR CIRCULATION LIST

FEIR 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

MASSDOT
PUBLIC/PRIVATE DEVELOPMENT UNIT
TEN PARK PLAZA #4150
BOSTON, MA 02116

MASSDOT – DISTRICT 3
ATTENTION: MEPA COORDINATOR
403 BELMONT STREET
WORCESTER, MA 01604

DEPARTMENT OF ENERGY RESOURCES
ATTENTION: MEPA COORDINATOR
100 CAMBRIDGE STREET, SUITE 1020 (10TH
FLOOR)
BOSTON, MA 02114

ENERGY FACILITIES SITING BOARD
ATTENTION: MEPA COORDINATOR
ONE SOUTH STATION
BOSTON, MA 02110

CENTRAL MASS REGIONAL PLANNING
COMMISSION
ATTENTION: MEPA COORDINATOR
2 WASHINGTON SQUARE
UNION STATION – 2ND FLOOR
WORCESTER, MA 01604

SHREWSBURY PUBLIC LIBRARY
609 MAIN STREET
SHREWSBURY, MA 01545

TOWN OF SHREWSBURY BOARD OF SELECTMEN
C/O KRISTEN LAS, ASSISTANT TOWN
MANAGER/ECONOMIC DEVELOPMENT
COORDINATOR
100 MAPLE AVENUE
SHREWSBURY, MA 01545

MASSDEVELOPMENT
ATTENTION: CLAIRE O'NEILL, VICE PRESIDENT
PLANNING & DEVELOPMENT
89 SHREWSBURY STREET, SUITE 300
WORCESTER, MA 01604