

**SELECT BOARD**  
**6:00 p.m. June 23, 2020**  
**Needham Town Hall**  
**Revised Agenda**

Under Governor Baker’s emergency “Order Suspending Certain Provisions of the Open Meeting Law G.L. c. 30A, S20”, issued March 12, 2020 and in effect until termination of the emergency, meetings of public bodies may be conducted virtually provided that adequate access is provided to the public.

To listen and view this virtual meeting on a phone, computer, laptop, or tablet, download the “Zoom Cloud Meeting” app in any app store or at [www.zoom.us](http://www.zoom.us). At the above date and time, click on “Join a Meeting” and enter the meeting 81178733033 or click the link below to join the webinar: <https://us02web.zoom.us/j/81178733033>.

	<b>5:45</b>	<p>Informal Meeting with Citizens</p> <p><i>One or more members of the Select Board will be available between 5:45 and 6:00 p.m. for informal discussion with citizens. While not required, citizens are encouraged to call the Select Board’s Office at (781) 455-7500 extension 204 in advance to arrange for an appointment. This enables the Board to better assure opportunities for participation and respond to citizen concerns.</i></p>
<b>1.</b>	<b>6:00</b>	<p>Zoning Change Proposal – 100 West Street</p> <ul style="list-style-type: none"> <li>• Roy Cramer, Counsel for LCB Senior Living</li> <li>• Evans Huber, Counsel for LCB Senior Living</li> <li>• Lee Bloom, LCB Senior Living</li> <li>• Ted Doyle, LCB Senior Living</li> <li>• David Kelly, Project Engineer</li> <li>• Anthony Vivirito, Project Architect.</li> <li>• Erin Fredette, Traffic Engineer.</li> <li>• Louise Gennakis, Counsel for current owner.</li> </ul>
<b>2.</b>	<b>6:30</b>	<p>Approval of the Sale of Bonds and Notes</p> <ul style="list-style-type: none"> <li>• David Davison, Assistant Town Manager/Finance</li> <li>• Evelyn Poness, Town Treasurer/Collector</li> </ul>
<b>3.</b>	<b>6:45</b>	<p>Town Manager</p> <ul style="list-style-type: none"> <li>• Spring License Renewal Extension</li> <li>• Unite Against Racism Initiative</li> </ul>
<b>4.</b>	<b>7:00</b>	<p>Board Discussion</p> <ul style="list-style-type: none"> <li>• Economic Development Efforts</li> <li>• Committee Reports</li> </ul>

## APPOINTMENTS

1.	Human Rights Committee	Sophia Dedek (term expires 6/30/2022)
2.	Human Rights Committee	Tina Burgos (term expires 6/30/2023)

## CONSENT AGENDA      \*=Backup attached

1.*	Approve open session minutes of June 3, 2020, June 8, 2020 and June 9, 2020.
2.*	Water & Sewer Abatement #1292.
3.	Accept a \$1,000 donation made to the Needham Health Division's Traveling Meals Program from an anonymous donor.
4.*	Approve a request from Robyn Isman to hold a Needham Rolling Pride parade on Sunday, June 28, 2020 to start at 3:00 p.m. and end by 6:00 p.m. The route of the parade has been approved by the following departments: Police, DPW, Fire, Park & Recreation and Health & Human Services.
5.	Authorize the Town Manager to designate David Davison and Katie King as Acting Town Manager in accordance with Section 20A (b) of the charter, for periods not to exceed two weeks.
6.	Set the Downtown and Heights Permit Parking rates for 2020/2021 at 60% of the current fee (or a new rate of \$120); the permits will expire on April 30, 2021.
7.	Authorize Free Parking Meter Parking for Two Hours through September 8, 2020.
8.	Approve placement of "Hate Has No Home Here" signs on Town Hall property for a period of two weeks.



**Select Board  
TOWN OF NEEDHAM  
AGENDA FACT SHEET**

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**MEETING DATE: 06/23/2020**

<b>Agenda Item</b>	Zoning Amendment – 100 West Street
<b>Presenter(s)</b>	Roy Cramer, Counsel for LCB Senior Living Evans Huber, Counsel for LCB Senior Living Lee Bloom, LCB Senior Living Ted Doyle, LCB Senior Living David Kelly, Project Engineer Anthony Vivirito, Project Architect. Erin Fredette, Traffic Engineer. Louise Gennakis, Counsel for current owner.

<b>1.</b>	<b>BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED</b>
<p>Mr. Cramer and the project representatives will make a presentation about a proposed zoning amendment that will enable the development of 100 West Street.</p>	
<b>2.</b>	<b>VOTE REQUIRED BY SELECT BOARD</b>
<p>Presentation Only.</p>	
<b>3.</b>	<b>BACK UP INFORMATION ATTACHED</b>
<p><b>(Describe backup below)</b></p> <ul style="list-style-type: none"> <li>a. Amend Zoning By-Law – Avery Square Overlay District</li> <li>b. Amend Zoning By-Law – Map Change to Avery Square Overlay District</li> <li>c. The Residence at Carter Mill Presentation</li> <li>d. 100 West Street Existing Conditions</li> <li>e. 100 West Street Traffic Impact Study</li> <li>f. 100 West Street Traffic Impact Study Appendix</li> <li>g. Fiscal Impact Study 100 West Street</li> </ul>	

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**ZONING/LAND USE ARTICLES**

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**ARTICLE 1: AMEND ZONING BY-LAW – AVERY SQUARE OVERLAY DISTRICT**

To see if the Town will vote to amend the Needham Zoning By-Law, as follows:

- (a) Amend the definition of “Independent Living Apartments” in Section 1.3, Definitions, by (i) adding the words “or Avery Square Overlay District” after the words “Elder Services Zoning District”; (ii) deleting the word “only” before the words “residential uses”; and (iii) adding to the end of the definition the sentence “; provided, however, that within the Avery Square Overlay District, as provided in Section 3.15.3.2(d), below, such Independent Living Apartments may be located in a building that also houses Assisted Living and/or Alzheimer’s/Memory Loss Facilities but need not be part of a Continuing Care Retirement Community.”, so that it reads as follows:

A building in the Elder Services Zoning District or Avery Square Overlay District containing three or more dwelling units, which building houses residential uses and support services accessory thereto, intended primarily as independent living units for individuals aged 55 years or older, and/or families with at least one family member aged 55 years or older, within a Continuing Care Retirement Community; provided, however that within the Avery Square Overlay District, as provided in Section 3.15.3.2(d), below, such Independent Living Apartments may be located in a building that also houses Assisted Living and/or Alzheimer’s/Memory Loss Facilities, but need not be part of a Continuing Care Retirement Community.

- (b) Amend Section 2.1 Classes of Districts by adding the following term and abbreviation under the subsection Overlay:

“ASOD                      --            Avery Square Overlay District”

- (c) Amend Section 3, Use Regulations, by adding a new Subsection 3.15, Avery Square Overlay District, to read as follows:

“3.15 Avery Square Overlay District

3.15.1 Purposes of District

The purposes of the Avery Square Overlay District (“ASOD”) are to promote the health, safety, and general welfare of the community by creating opportunities for housing primarily serving individuals 55 years old or older, who wish to live in independent apartments and/or who may need to live in Assisted Living and/or Alzheimer’s/Memory Loss facilities, within walking distance of goods and services, public transportation, and the civic life of the town; to promote a vibrant, walkable area within the ASOD, and to encourage and allow redevelopment of the existing property within the ASOD in a manner that will further these purposes. Toward these ends, development in the Avery Square Overlay District shall, as set forth in this Section 3.15, be permitted to exceed the

density and dimensional requirements that normally apply in the underlying zoning district provided that such development complies with all other requirements of this Section 3.15.

### 3.15.2 Scope of Authority

In the Avery Square Overlay District, all requirements of the underlying district shall remain in effect except where this Section 3.15 provides an alternative to such requirements, in which case the requirements of this Section 3.15 shall prevail. If the provisions of the Avery Square Overlay District are silent on a requirement that applies in the underlying district, the requirements of the underlying district shall apply.

By filing an application for a Special Permit, site plan review or building permit under this Section 3.15, an applicant shall be deemed to accept and agree to the provisions and requirements of this Section 3.15. If an applicant elects to proceed pursuant to zoning provisions of the underlying district, the provisions and requirements of this bylaw applicable in the underlying district shall control and the provision of the Avery Square Overlay District shall not apply.

### 3.15.3 Use Regulations

#### 3.15.3.1 Permitted Uses

The following uses are permitted in the Avery Square Overlay District as a matter of right:

- (a) Uses exempt from local zoning control under M.G.L. c.40A, s. 3.
- (b) Public, semi-public and institutional uses permitted as of right in the underlying district.
- (c) Business uses permitted as of right in the underlying district.
- (d) accessory uses permitted as of right in the underlying district.

#### 3.15.3.2 Special Permit Uses

The following uses are allowed in the Avery Square Overlay District by Special Permit issued by the Planning Board:

- (a) All uses allowed by special permit in the Avery Square Business District as set forth in Section 3.2.2 of this Bylaw, except those uses permitted as a matter of right as set forth in Section 3.15.3.1, above.
- (b) Assisted Living and/or Alzheimer's/Memory Loss Facilities

(c) Independent Living Apartments.

(d) Mixed-use buildings containing, as primary uses, such uses as are allowed by special permit or by right in the Avery Square Overlay District or the Avery Square Business District, as well as accessory uses subordinate to and customarily incidental to the primary uses.

### 3.15.4 Dimensional Regulations

#### 3.15.4.1 Building Height and Related Requirements

The maximum building height (including mechanical structures such as HVAC equipment) in the Avery Square Overlay District shall be 44 feet. This height limitation shall not apply to elevator shaft overruns, which shall not exceed a maximum height of 49 feet.

A building or structure which is located on property in the Avery Square Overlay District may include, but not exceed, four (4) stories, all of which may be occupied.

For the fourth story, minimum setback requirements, measured from the façade(s) of the building on which such fourth story is located, shall be as follows: from the eastern facade of the building (facing Highland Ave), fifteen (15) feet; from the northern façade of the building (closest to and facing West Street), one hundred and ten (110) feet; from the western facade of the building, zero (0) feet; from the southern facade of the building, thirty-five (35) feet. No fourth story setback from the north-facing building façade is required with respect to any portion of any building that is set back from West Street at least two hundred (200) feet.

The total floor area of any fourth floor addition to the existing building may not exceed thirty-five percent (35%) of the total roof area of the existing building. Mechanical equipment, including but not limited to HVAC equipment, whether or not enclosed, shall not be included in the calculation of maximum allowable floor area hereunder.

Buildings developed under the regulations of the Avery Square Overlay District shall not be subject to any other height limitations nor any other limitations contained in Section 4.4.3.

#### 3.15.4.2 Building Bulk and Other Requirements

The maximum floor area ratio in the Avery Square Overlay District shall be 1.1. Property contiguous with and in common ownership with property in the Avery Square Overlay District shall be included in the lot for purposes of calculating floor area ratio. The enclosed area of a building devoted to off-street parking shall not be counted as floor area for purposes of determining the maximum floor area ratio. Buildings developed under the regulations of the Avery Square Overlay District shall not be subject to any

other limitations on floor area ratio, lot coverage, or building bulk such as are contained in Sections 4.4.2, 4.4.7 and 4.4.9.

### 3.15.5 Off-Street Parking

Except as provided below, the off-street parking regulations in Section 5.1 and the regulations for enclosed parking in Section 4.4.6 shall apply in the Avery Square Overlay District.

- (a) The minimum number of off-street parking spaces in Section 5.1.2 shall apply except as follows:
  - (1) For Independent Living Apartments, there shall be one space per Apartment.
  - (2) For Assisted Living units and Alzheimer's/Memory Loss units, the parking requirement shall be one space for every two beds, plus one space for each two employees on the largest shift.
- (b) Notwithstanding anything to the contrary elsewhere in this Bylaw, including but not limited to Section 4.4.8.4, in the event that land located in the Single Residence B Zoning District
  - (1) is adjacent to the Avery Square Overlay District;
  - (2) is in common ownership with adjacent land located in the Avery Square Overlay District; and
  - (3) prior to approval of this Section 3.15, was improved as a parking area associated with a building located in the Avery Square Overlay District;

then, provided that said land extends into the Single residence B Zoning District not more than one hundred (100') feet from the boundary line between the Single Residence B Zoning District and the Avery Square Business District, said land may, as a matter of right, be used as a parking area accessory to uses permitted in the Avery Square Overlay District by right or by special permit.

### 3.15.6 Affordable Housing

Any mixed-use building with ten or more Independent Living Apartments shall include affordable housing units as defined in Section 1.3 of this By-Law. The following requirements shall apply to a development that includes affordable units:

- (a) If the Applicant provides at least one-half of the affordable Independent Living Apartments for households with incomes at or below 50% of area median income, the remaining affordable Independent Living Apartments may be rented to households with incomes up to 100% of area median income even if the latter units are not

eligible for the Subsidized Housing Inventory, regardless of any requirements to the contrary set forth in Section 1.3.

- (b) For a development with ten or more Independent Living Apartments, twelve and one-half percent (12.5%) of the Independent Living Apartments shall be affordable units. In the instance of a fraction, the fraction shall be rounded up to the nearest whole number. There shall be no affordable housing requirement for nursing homes, convalescent homes, Assisted Living and Alzheimer's/Memory Loss Facilities, or residential care institutions or facilities.
- (c) Affordable units shall be dispersed within the building and not concentrated in one area or on one floor. They shall generally be comparable in size, energy efficiency, quality, convenience, and unit-specific real estate-related amenities to the development's market-rate units. Services and other amenities that may be purchased by residents on a voluntary basis are not to be considered unit-specific real estate-related amenities and are excluded from such comparability requirements.
- (d) The selection of eligible homebuyers or renters for the affordable units shall be in accordance with a marketing plan approved by the Needham Planning Board prior to the issuance of any building permits for the development.
- (e) The affordable units shall be subject to an affordable housing restriction as defined in Section 1.3 of this By-Law with limitations on use, occupancy, resale prices or rents, as applicable, and which provides for periodic monitoring for compliance with the requirements of said restriction.

- (d) Amend Section 4.4.4 Front Setback, by adding the following paragraph after the fourth paragraph of that section:

In the Avery Square Overlay District, the setback, if any, shall be kept open and landscaped with grass, plants, and other non-paving materials such as mulch, and shall be unpaved except for patios, walks, and driveways as defined in section 4.4.5. Walls (including walls serving in part as retaining walls) no higher than 36 inches above the grade of the patios, as well as fencing and privacy screening, along the front and side edges of the patios, shall be allowed in the Avery Square Overlay District.

- (e) Amend Section 4.4.6 Enclosed Parking, by adding the phrase "for each square foot" before the words "of parking space (excluding driveways and aisles)" on the fourth line of the first paragraph of that section so that it reads as follows:

Whenever off-street parking is provided underground and/or within a building itself, the maximum area coverage of the building may be increased up to the

limits of the required setback as provided herein. The lot coverage of the building may be increased up to 2 ½ % points above the maximum allowed percentage, by one square foot for each square foot of parking space (excluding driveways and aisles) that is underground and/or within the building itself.

Parking which is under a building or partially underground shall, except for driveways, be separated from the street line by building space occupied by the principal use, not by parking.

In the Center Business District, enclosed parking shall be entirely below the grade of adjoining streets measured at their respective center lines. Access to enclosed parking shall be from the rear of the building. If provided, enclosed parking shall not be visible from the street. The placement of parking underground shall not raise the first non-parking floor of a structure above grade. Municipal parking facilities in the Center Business District shall be exempt from this provision.

- (f) Amend Section 7.6.1 Special Permit Granting Authority, by adding the number “3.15” after the number “3.14” on the second line of that Section so that it reads as follows:

The Planning Board shall act as a Special Permit Granting Authority only where so designated in Sections 3.4, 3.8, 3.9, 3.10, 3.14, 3.15, 4.2.10, 4.2.11, 4.2.12, 4.4.5, 4.4.9, 4.4.10, 5.1.1.6, 6.6, 6.8, and 7.4 of this Bylaw. In all other cases the Board of Appeals shall act as the Special Permit Granting Authority. Procedures and decision criteria for the Planning Board shall be the same as specified in Section 7.5.2 and Section 7.5.3 (second and fourth paragraphs) for special permits acted on by the Board of Appeals, except where alternative or supplemental criteria are specified, such as at Sections 3.4 and 6.6.

Or take any other action relative thereto.

INSERTED BY: Planning Board

FINANCE COMMITTEE RECOMMENDS THAT: Recommendation to be Made at Town Meeting

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**ARTICLE 2: AMEND ZONING BY-LAW – MAP CHANGE TO AVERY SQUARE OVERLAY DISTRICT**

To see if the Town will vote to amend the Needham Zoning By-Law by amending the Zoning Map as follows:

- (a) Place in the Avery Square Overlay District all that land described as follows, and superimposing that District over the existing Avery Square Business District:

Beginning at the point of intersection of the westerly sideline of Highland Avenue and the northerly sideline of what was formerly known as Hildreth Place (said former Hildreth Place as shown on Needham Town Assessors Map 63); thence running northerly by the westerly sideline of Highland Avenue to the point of curvature of a curve having a radius of 20 feet and an arc length of 29.27 feet; said curve being a property rounding of the intersection of the westerly sideline of Highland Avenue and the southerly sideline of West Street; thence running northerly, northwesterly, and westerly by said curve to the point of tangency of said curve located on the southerly sideline of West Street; thence running westerly by the southerly sideline of West Street to the point of intersection of the southerly sideline of West Street and the easterly right of way line of MBTA property; thence running southernly by said easterly right of way line of MBTA property to the intersection of the easterly right of way line of MBTA property and the northerly sideline of what was formerly known as Hildreth Place; thence running easterly by the northern boundary of what was formerly known as Hildreth Place, to the point of beginning.

The land is also shown on Needham Town Assessors Map 63, Parcel 37, but excluding any land to the south of the northerly sideline of what was formerly known as Hildreth Place.

Or take any other action relative thereto.

INSERTED BY: Planning Board

FINANCE COMMITTEE RECOMMENDS THAT: Recommendation to be Made at Town Meeting

*Article Explanation: This article describes the geographical boundaries of the new Avery Square Overlay District, which is bounded on the north by West Street; on the east by Highland Avenue; on the south by the northern and western boundaries of the property located at 1049 Highland Avenue and the northern boundary of the property located at 95 Dana Place; and on the west by the MBTA commuter railroad right-of-way.*

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*Independent & Assisted Living, Reflections Memory Care*



# The Residence at Carter Mill



# LCB: A 25-Year History

- LCB Senior Living, LLC is a Norwood-based senior housing operator and developer with roots that go back 25 years.
- Formed early in 2011, LCB owns and/or manages 28 communities throughout the Northeast.
  - Massachusetts, New Hampshire, Rhode Island, Connecticut, Vermont and Pennsylvania, with more in development.
- LCB currently assists ~2,000 residents and has ~1,800 associates.



# Basic Services & Amenities

LCB serves area seniors who are independent, but want the security of staff and services on-site.

- *Private apartment*
- *Utilities (heat, A/C, electric & water)*
- *Three nutritious, chef-prepared meals a day*
- *Visiting healthcare professionals on-site*
- *Maintenance and groundskeeping*



# Amenities

- Full-service restaurant (for resident use) with “Anytime Dining” & bistro
- Media room/theater
- Indoor pool
- Library
- Roof decks
- Exercise room
- Covered parking
- Bocce court
- Close to:
  - Senior Center, banks, Trader Joe’s, Post Office, library, nail salon, restaurants and coffee shops, pharmacy, Needham Heights commuter rail station





# A Low-Impact Use

- For-profit, tax-positive business
- Very low impact on municipal services
- High impact on local economics/commerce
- Quiet, attractive neighbor
- Needed housing infrastructure for local seniors
- Active, outward-facing member of the community



# Upgrades to the Property

- Demolition of interior space and reconfiguration of new units.
- Upgrades to exterior to improve access and window line.
- Addition of 10 apartments on the roof (35% of the roof area).
- Addition of gardens and terraces to the roof.
- Improved landscaping.
- Replacement of HVAC, electrical and life safety.
- Meet and exceed sound attenuation regulations.



# Proposed Development

The empty Carter mill building will be upgraded and renovated to create a 155 apartment senior housing community.

- 72 Independent Living apartments
- 55 Assisted Living apartments
- 28 Memory Care apartments



# History of the Carter Mill Building

- In 1865, William Carter and John & Mark Lee founded Carters, a clothing mill where, for the next 125 years until approximately 1990, the Carter factory and mill operated. By the 1960's, Carter also operated another knitting factory on Rosemary Lake. Carters was sold in 1990 to a company in Georgia. Soon after, the mill stopped creating clothes.
- For many years, starting in the 60's, Calverts was located across the street from the Carter building and sold Carter's clothing at a discount.
- In 1993, the building was approved for the Avery Crossing Assisted Living Facility and Avery Manor Nursing Home, as well as small medical office use. Welltower owned the property and Kindred Healthcare operated the nursing home and assisted living programs.
- In 2017, Kindred Healthcare decided to close Avery Crossing and Avery Manor. Welltower was the landlord and continued to care for the building and landscaping as it looked for an appropriate use for the building.
- Welltower is now partnering with LCB Senior Living to reuse the building for 72 age restricted Independent Living apartments, 55 (66 beds) Assisted Living apartments, and 28 (30 beds) Memory Care units.



THE  
**RESIDENCE**  
at Carter Mill

Image from the 70's





THE  
RESIDENCE  
at Carter Mill

Image from the 70's





# Program Details

155 senior housing apartments, to include:

- Independent Living: 72 Apartments (63 Market & 9 Affordable) (93 beds)
  - 48 one-bedroom (includes 6 Affordable) and 24 two-bedroom (includes 3 Affordable)
- Assisted Living: 55 Apartments (66 beds)
  - 10 studio, 34 one-bedroom, 11 two-bedroom
- Memory Care: 23 Apartments (30 beds)
  - 26 studio, two companion



# Parking Details

## Proposed:

- 115 spaces outside
- 34 spaces inside
- On-street parking

## Prior use:

- 110 spaces outside
- 83 spaces inside
- On-street parking



THE  
**RESIDENCE**  
at Carter Mill

# Aerial View





THE  
**RESIDENCE**  
at Carter Mill

Existing Building from  
Highland Avenue





THE  
**RESIDENCE**  
at Carter Mill

Proposed Building from  
Highland Avenue





THE  
**RESIDENCE**  
at Carter Mill

## Existing View from Highland Avenue





# THE RESIDENCE at Carter Mill

## Proposed View from Highland Avenue





THE  
**RESIDENCE**  
at Carter Mill

## Existing View from West Street





THE  
**RESIDENCE**  
at Carter Mill

Proposed View from  
West Street





THE  
**RESIDENCE**  
at Carter Mill

## View of Existing Roof





THE  
**RESIDENCE**  
at Carter Mill

## Proposed Roof Apartments





# THE RESIDENCE at Carter Mill

## Existing View from Mellen Street





Existing View from  
Highland Avenue and Morton Street





THE  
**RESIDENCE**  
at Carter Mill

Proposed View from  
Highland Avenue and Morton Street







THE  
**RESIDENCE**  
at Carter Mill

Proposed View from  
South Parking Lot





THE  
**RESIDENCE**  
at Carter Mill

Existing View from  
Hillside Avenue





THE  
**RESIDENCE**  
at Carter Mill

Proposed View from  
Hillside Avenue



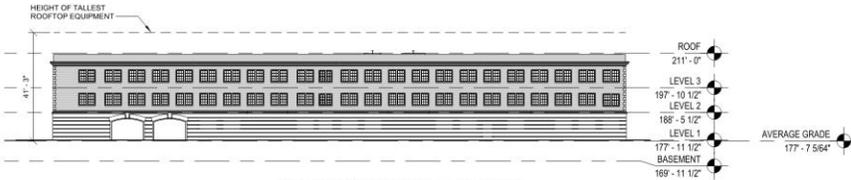
# Existing and Proposed Elevations



EXISTING EAST ELEVATION (HIGHLAND AVENUE)



PROPOSED EAST ELEVATION (HIGHLAND AVENUE)



EXISTING SOUTH ELEVATION



PROPOSED SOUTH ELEVATION



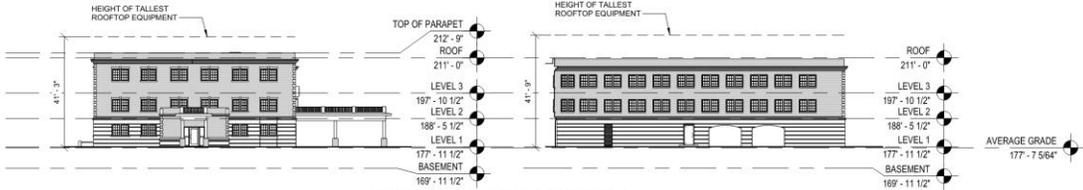
# Existing and Proposed Elevations



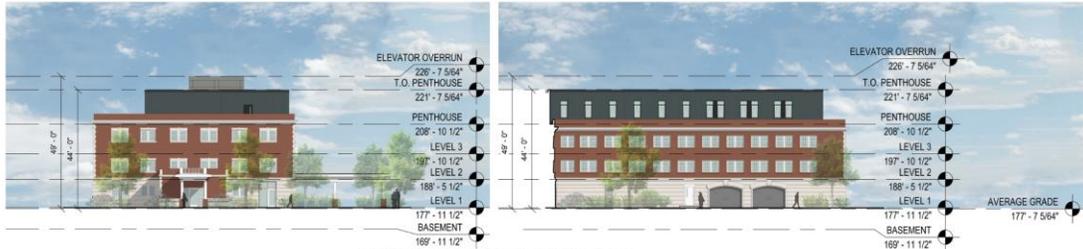
EXISTING WEST ELEVATION



PROPOSED WEST ELEVATION



EXISTING NORTH ELEVATION



PROPOSED NORTH ELEVATION





# THE RESIDENCE at Carter Mill

## Proposed First Floor





# THE RESIDENCE at Carter Mill

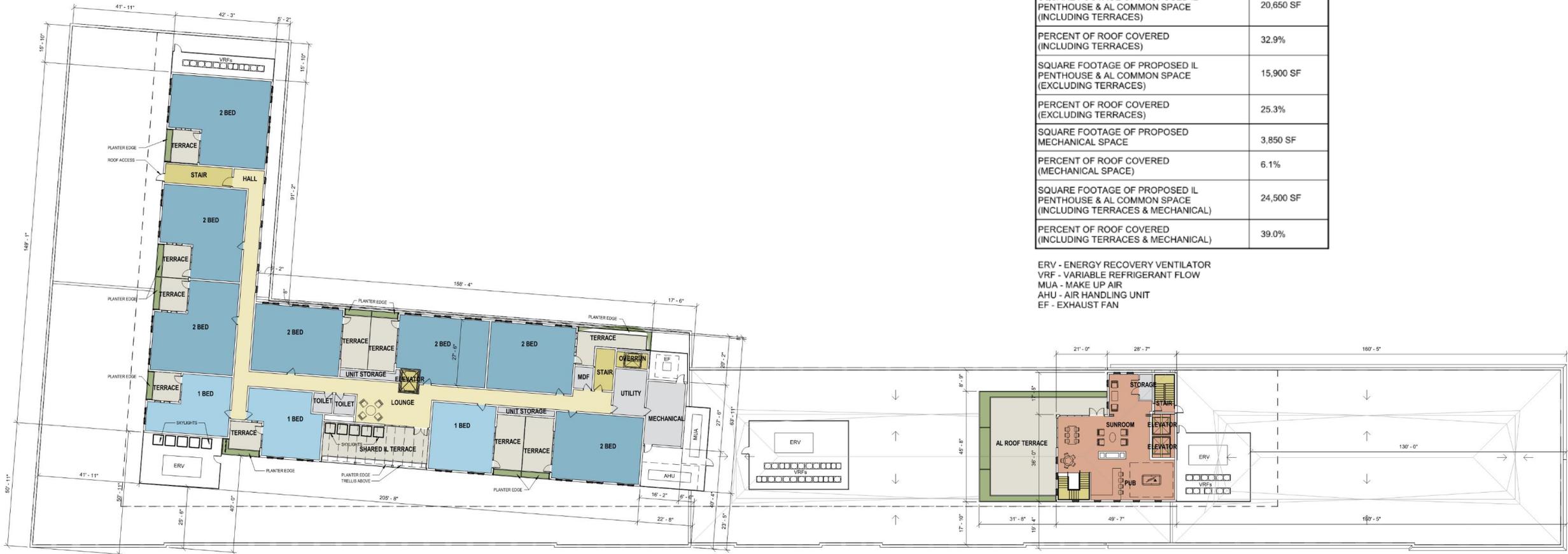
## Proposed Second Floor



# Proposed Third Floor



# Proposed Roof



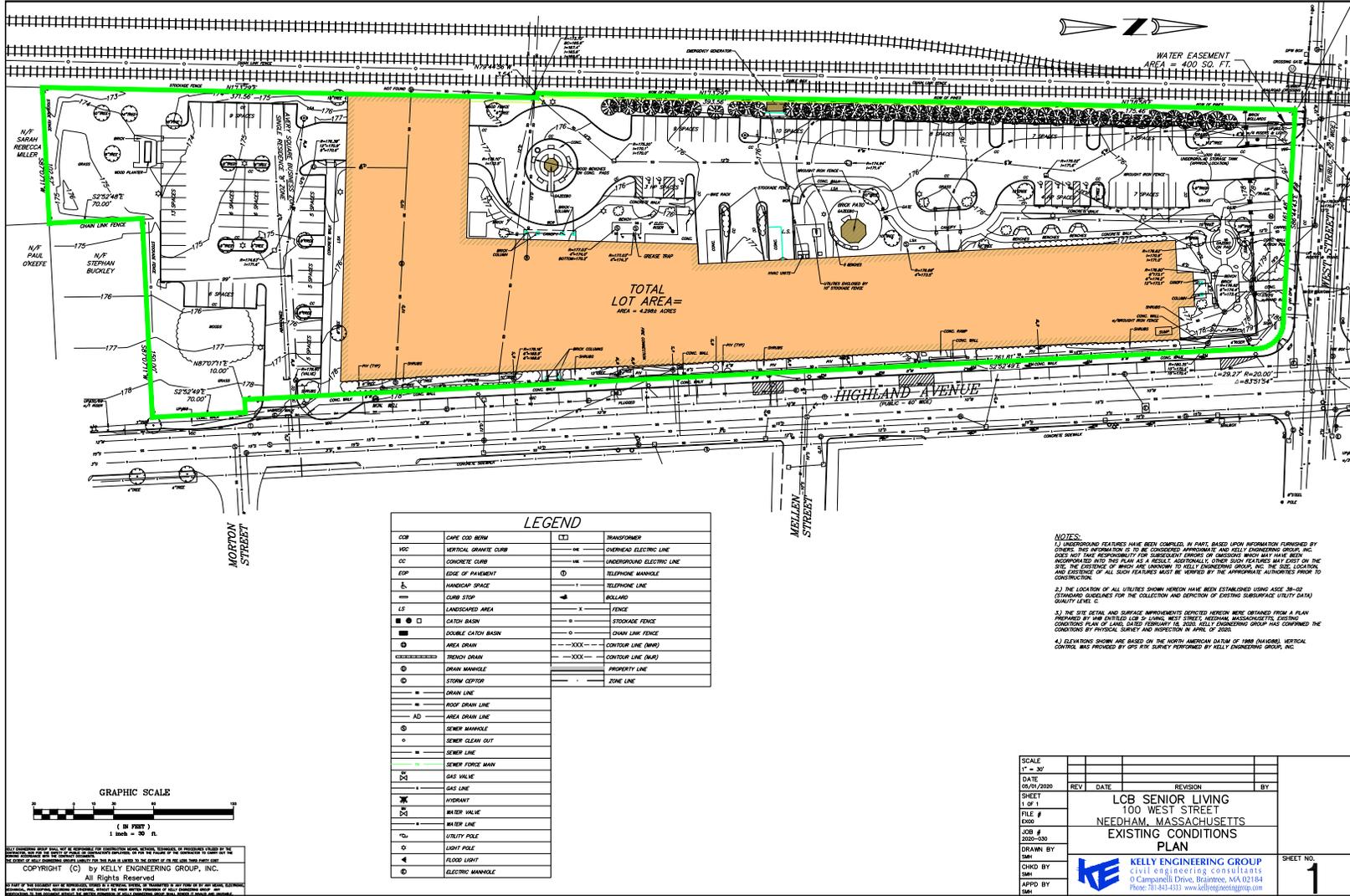
SQUARE FOOTAGE OF EXISTING ROOF	62,775 SF
SQUARE FOOTAGE OF PROPOSED IL PENTHOUSE & AL COMMON SPACE (INCLUDING TERRACES)	20,650 SF
PERCENT OF ROOF COVERED (INCLUDING TERRACES)	32.9%
SQUARE FOOTAGE OF PROPOSED IL PENTHOUSE & AL COMMON SPACE (EXCLUDING TERRACES)	15,900 SF
PERCENT OF ROOF COVERED (EXCLUDING TERRACES)	25.3%
SQUARE FOOTAGE OF PROPOSED MECHANICAL SPACE	3,850 SF
PERCENT OF ROOF COVERED (MECHANICAL SPACE)	6.1%
SQUARE FOOTAGE OF PROPOSED IL PENTHOUSE & AL COMMON SPACE (INCLUDING TERRACES & MECHANICAL)	24,500 SF
PERCENT OF ROOF COVERED (INCLUDING TERRACES & MECHANICAL)	39.0%

ERV - ENERGY RECOVERY VENTILATOR  
 VRF - VARIABLE REFRIGERANT FLOW  
 MUA - MAKE UP AIR  
 AHU - AIR HANDLING UNIT  
 EF - EXHAUST FAN



# THE RESIDENCE at Carter Mill

# Existing Conditions Plan



**LEGEND**

CCP	CAPE COD BERM	□	TRANSFORMER
VC	VERTICAL GRANITE CURB	—	OVERHEAD ELECTRIC LINE
CC	CONCRETE CURB	—	UNDERGROUND ELECTRIC LINE
EP	EDGE OF PAVEMENT	⊙	TELEPHONE MANHOLE
HS	HANDICAP SPACE	—	TELEPHONE LINE
CS	CURB STOP	—	BOLLARD
LS	LANDSCAPED AREA	X	FENCE
CB	CATCH BASIN	—	STORAGE FENCE
LCB	LOADING CATCH BASIN	—	CHAIN LINK FENCE
AD	AREA DRAIN	—	CONTOUR LINE (DWP)
TD	TRENCH DRAIN	—	CONTOUR LINE (DWP)
DM	DRAIN MANHOLE	—	PROPERTY LINE
SC	STORM CEPTOR	—	ZONE LINE
DL	DRAIN LINE		
RDL	ROOF DRAIN LINE		
ADL	AREA DRAIN LINE		
SM	SEWER MANHOLE		
SO	SEWER CLEAN OUT		
SL	SEWER LINE		
SFM	SEWER FORCE MAIN		
GV	GAS VALVE		
GL	GAS LINE		
H	HYDRANT		
BV	BA TER VALVE		
BL	BA TER LINE		
UP	UTILITY POLE		
LP	LIGHT POLE		
FL	FLOOD LIGHT		
EM	ELECTRIC MANHOLE		

**NOTES:**

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- 2) THE LOCATION OF ALL UTILITIES SHOWN HEREIN HAVE BEEN ESTABLISHED USING ASCE 38-02 (STANDARD GUIDELINES FOR THE COLLECTION AND REPORTING OF EXISTING SUBSURFACE UTILITY DATA) QUALITY LEVEL C.
- 3) THE SITE DETAIL AND SURFACE IMPROVEMENTS DEPICTED HEREIN WERE OBTAINED FROM A PLAN PREPARED BY LAW OFFICES OF LAW, WEST STREET, NEEDHAM, MASSACHUSETTS, DATED FEBRUARY 16, 2020. KELLY ENGINEERING GROUP HAS CONFIRMED THE CONDITIONS OF PHYSICAL SURVEY AND INSPECTION IN APRIL, OF 2020.
- 4) ELEVATIONS SHOWN ARE BASED ON THE NORTH AMERICAN DATUM OF 1988 (NA83). VERTICAL CONTROL WAS PROVIDED BY GPS K/R SURVEY PERFORMED BY KELLY ENGINEERING GROUP, INC.

SCALE	1" = 30'
DATE	05/01/2020
SHEET	1 OF 1
FILE #	EN006
JOB #	2020-030
DRAWN BY	SMH
CHECK BY	SMH
APPRO BY	SMH

REV	DATE	REVISION	BY
		LCB SENIOR LIVING	
		100 WEST STREET	
		NEEDHAM, MASSACHUSETTS	
		EXISTING CONDITIONS	
		PLAN	

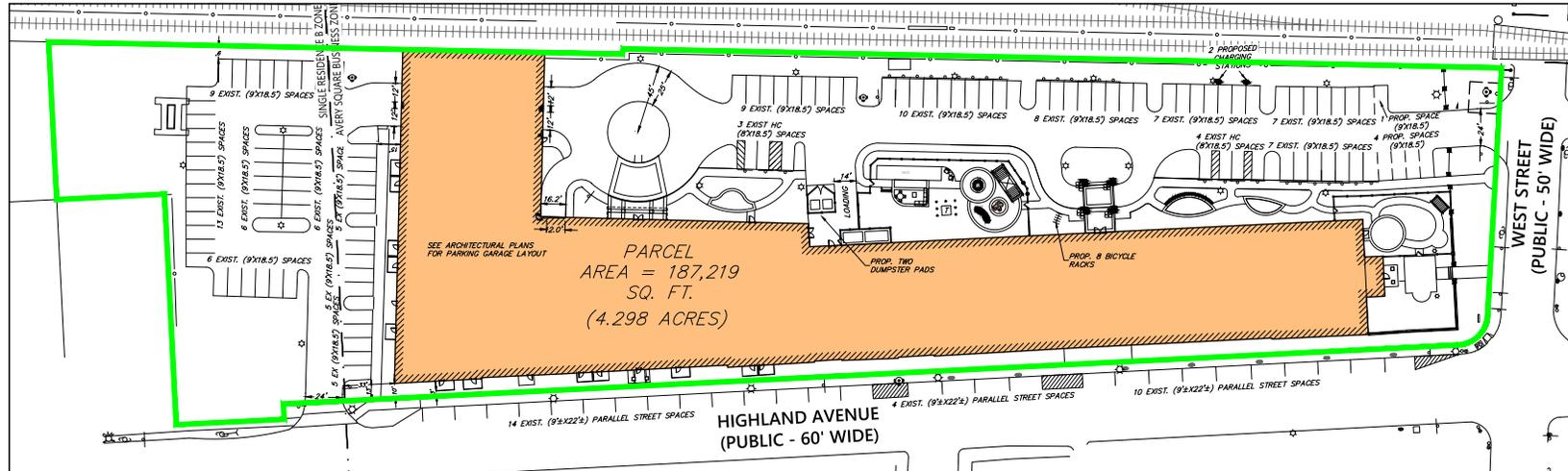
SHEET NO. **1**

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# THE RESIDENCE at Carter Mill

# Layout & Zoning Site Plan



### ZONING LEGEND

ZONING DISTRICT: AVERY SQUARE BUSINESS DISTRICT / SINGLE RESIDENCE B (DIMENSIONAL REQUIREMENTS PROVIDED FOR AVERY SQUARE BUSINESS DISTRICT ONLY)

	REQUIRED	EXISTING	PROPOSED	COMPLIANCE
MIN. AREA	10,000 S.F.	187,219 S.F. (4.298 AC)	SAME	YES
MIN. FRONTAGE	80'	856'±	SAME	YES
MIN. SETBACK FRONT	10'	10'±	10'	YES
MIN. SETBACK SIDE (RESIDENTIAL DISTRICT)	50' (NOTE 1)	33'±	SAME	NONCONFORMING
MIN. SETBACK SIDE	NA	0'±	SAME	YES
MIN. SETBACK REAR	NA	NA	NA	YES
MAX. STORES	2 (NOTE 2)	3	4	ZONING CHANGE
MAX. HEIGHT	35'	41'-9" (NOTE 3)	49' (NOTE 3)	ZONING CHANGE
BUILDING COVERAGE	NA (NOTE 4)	0.34	SAME	YES
FLOOR AREA RATIO	0.7 (NOTE 5)	1.00±	1.01	ZONING CHANGE
PARKING TOTAL	149 (NOTE 6)	193	177	ZONING CHANGE/SP
DRIVEWAY OPENINGS	18'-25' (TWO WAY)	24'	24'	YES

ZONING BYLAW 5.1.3 PARKING PLAN AND DESIGN REQUIREMENTS				
A) PARKING ILLUMINATION	AVG 1 FOOT CANDLE	NA	AVG 1 FOOT CANDLE	YES
B) LOADING REQUIREMENTS	1	2	1	YES
C) HANDICAPPED PARKING	6	7±	SAME	YES
D) DRIVEWAY OPENINGS	2	2	SAME	YES
E) COMPACT CARS	50% (9'x14')	36±%	23% (NOTE 7)	YES
F) PARKING SPACE SIZE	9'± x 18.5'	9'x18.5'	SAME	YES
G) BUMPER OVERHANG	1' OVERHANG	NONE REQUIRED	SAME	YES
H) PARKING SPACE LAYOUT	(NOTE 8)	0	INCL. 5 TANDEM (NOTE 8)	SPECIAL PERMIT
I) AISLE WIDTH EXTERIOR	24' (90 DEG. STALL)	24'	SAME	YES
J) AISLE WIDTH INTERIOR	24' (90 DEG. STALL)	16'-8"	SAME (NOTE 9)	SPECIAL PERMIT
K) PARKING SETBACK				
-FRONT	10'	13'±	SAME	YES
-SIDE	4'	9'±	SAME	YES
-REAR	4'	NA	SAME	YES
-BUILDING	5'	15'±	SAME	YES
L) LANDSCAPED AREAS	10%	>10% (NOTE 10)	11% - 12% (NOTE 10)	YES
M) TREES	1 PER 10 SPACES	(NOTE 11)	(NOTE 11)	YES
N) LOCATION	WITHIN LOT	WITHIN LOT	SAME	YES
O) BICYCLE RACKS	8	0	8	YES

NOTE 1. YARD ASSUMPTIONS: HIGHLAND AVE. AND WEST ST. ARE FRONT YARDS. METRA RAIL AND SOUTH LOT LINE ARE SIDE YARDS. THERE ARE NO REAR YARDS.

EXISTING BUILDING WILL REMAIN 10' FROM FRONT YARD. PROPOSED PATIOS ARE 3' FROM FRONT PROPERTY LINE, BUT ARE NOT CONSIDERED TO BE STRUCTURES. A ZONING CHANGE IS NEEDED BECAUSE, AT PRESENT, ZONING BYLAW SECTION 4.4.4 DOES NOT ALLOW PAVING IN THE ASB DISTRICT FRONT SETBACK AREAS, EXCEPT FOR WALKWAYS AND DRIVEWAYS.

NOTE 2. THE TOWN OF NEEDHAM ZONING BYLAW SECTION 4.4.8.4, 50' SETBACK TO RESIDENTIAL DISTRICT

NOTE 3. THE TOWN OF NEEDHAM ZONING BYLAW SECTION 4.4.1, 2 STORES INCLUDING GROUND COVERED PARKING

NOTE 3. EXISTING BUILDING HEIGHT OF 33±' TO TOP OF ROOF. 41'9" TO TOP OF HIGHEST POINT (MECHANICAL OR ELEVATOR OVERRIDE)

PROPOSED MAX ALLOWABLE BUILDING HEIGHT WILL BE 44' TO TOP OF PENTHOUSE AND ALL MECHANICALS OTHER THAN ELEVATOR OVERRIDE. 49' TO TOP OF ELEVATOR OVERRIDE. ACTUAL HEIGHTS ARE PLANNED TO BE SLIGHTLY LESS THAN MAX ALLOWABLE.

BUILDING HEIGHT WAS CALCULATED FROM THE AVERAGE GRADE PLANE OF THE EXISTING BUILDING OF 177.6±. THE PROPOSED PENTHOUSE ELEVATION IS 221.6±. THE PROPOSED ELEVATOR OVERRIDE ELEVATION IS 226.6±.

NOTE 4. THE TOWN OF NEEDHAM ZONING BYLAW SECTION 4.4.2 (E) THERE ARE NO LIMITATION ON LOT COVERAGE IN THE AVERY SQUARE BUSINESS DISTRICT

TOTAL BUILDING COVERAGE = 63,700 S.F. / 187,219 S.F. = 0.34

NOTE 5. FLOOR AREA RATIO: EXISTING FAR = 186,300 S.F. / 187,219 S.F. = 1.00 FAR PROPOSED FAR = 189,220 S.F. / 187,219 S.F. = 1.01 FAR

THE CALCULATION OF PROPOSED FAR DOES NOT INCLUDE UNDERGROUND PARKING. THE PROPOSED ZONING CHANGE ALLOWING A MAXIMUM FAR OF 1.1, EXCLUDES SQUARE FOOTAGE OF UNDERGROUND PARKING FROM FAR CALCULATIONS.

SINCE THE CURRENT BYLAW DEFINITION OF FLOOR AREA EXCLUDES UNENCLOSED PORCHES AND BALCONIES, THE PROPOSED FAR CALCULATION ALSO DOES NOT INCLUDE THE AREA OF PROPOSED FIRST FLOOR PATIOS AND TERRACES, ALL OF WHICH WILL BE UNENCLOSED.

NOTE 6. REQUIRED PARKING: 72± INDEPENDENT LIVING UNITS X 1.0 SPACES/UNIT (PROPOSED ZONING CHANGE) + 96± ASSISTED LIVING BEDS / BEDS (TOWN OF NEEDHAM ZONING BYLAW SECTION 5.1.2) + 96± EMPLOYEES X 1.0 SPACES/2 EMPLOYEES ON LARGEST SHIFT = 149± SPACES REQUIRED

PROVIDED: 34 GARAGE SPACES + 115 EXTERIOR PARKING SPACES = 149 SPACES (EXCLUDES 28 PARALLEL PARKING SPACES ON HIGHLAND AVE. ADJACENT TO THE PROPERTY THAT CAN BE COUNTED AS OFF-STREET PARKING PURSUANT TO SECTION 5.1.1.7 OF THE BYLAW FOR A TOTAL PARKING SUPPLY OF 177 SPACES.

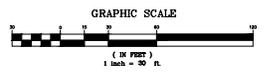
NOTE 7. COMPACT PARKING: 34 PROPOSED COMPACT SPACES IN PARKING GARAGE.

NOTE 8. PARKING SPACE LAYOUT: 5 TANDEM SPACES PROPOSED IN PARKING GARAGE. A SPECIAL PERMIT IS REQUESTED.

NOTE 9. INTERIOR AISLE WIDTHS IN THE GARAGE ARE 16'-8". SPECIAL PERMIT REQUESTED.

NOTE 10. LANDSCAPE AREAS: BETWEEN 11% AND 12% OF THE INTERIOR PORTION OF THE PARKING AREAS IS LANDSCAPED. THE AREAS OUTSIDE THE PERIMETER OF THE PAVED PARKING AREAS ARE NOT INCLUDED IN THIS CALCULATION. THE REQUIREMENT THAT 10% OF THE PARKING AREA BE LANDSCAPED, AS WELL AS THE REQUIREMENT THAT AT LEAST ONE QUARTER OF THE LANDSCAPED AREA BE LOCATED IN THE INTERIOR OF THE PARKING AREA.

NOTE 11. TREES: SEE LANDSCAPE PLAN BY HAWK DESIGN, INC.



ALL DIMENSIONS SHOWN ARE UNLESS OTHERWISE SPECIFIED. DIMENSIONS OF EXISTING STRUCTURES SHOWN ON THIS PLAN ARE FOR INFORMATION ONLY. THE PROPOSED DIMENSIONS SHOWN ON THIS PLAN ARE FOR INFORMATION ONLY. THE PROPOSED DIMENSIONS SHOWN ON THIS PLAN ARE FOR INFORMATION ONLY. THE PROPOSED DIMENSIONS SHOWN ON THIS PLAN ARE FOR INFORMATION ONLY.

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SCALE	1" = 30'		
DATE	05/28/20		
REV	DATE	REVISION	BY
SHEET	1 OF 1		
FILE #	THE RESIDENCE AT CARTER MILL		
JOB #	100 WEST STREET		
2020-030	NEEDHAM, MASSACHUSETTS		
	LAYOUT AND ZONING		
	PLAN		
DRAWN BY	KELLY ENGINEERING GROUP		
CHKD BY	KELLY ENGINEERING CONSULTANTS		
APPD BY	0 Campanelli Drive, Braintree, MA 02184		
DK	Phone: 781-843-0321 www.kellyengineering.com		

SHEET NO. 1



**Plant Legend:**

SYMBOL	DESCRIPTION	SAMPLE SPECIES	SYMBOL	DESCRIPTION	SAMPLE SPECIES
	EXISTING SHADE / FLOWERING TREE	MIXED SPECIES OF MAPLES, OAKS, BIRCH, ETC.		LARGE DECIDUOUS SHRUB	AMELANCHIER, VIBURNUM, ROSE OF SHARON, LIAC
	EXISTING TREELINE			PYRAMIDAL EVERGREEN	LIGHT-Y JANIKER, LIGHTLY HOLLY, EMERALD GREEN ARBOVITAE, ETC.
	PROPOSED SHADE TREE	RED MAPLE, OAK, TULIP TREE, LINEN, AMERICAN ELM, AMERICAN HORNBEEAM		LOW TO MEDIUM SHRUBS	INBERRY, RHODOCHORON, BOXWOOD, HYDRANGEA, REDTING DOGWOOD, ORNAMENTAL GRASSES
	FLOWERING TREE	DOGWOOD, YELLOWWOOD, EASTERN REDBUD, SOUTHWOOD, SARCENT CHERRY		GROUNDCOVER / PERENNIALS	ASSORTED GROUNDCOVERS, PERENNIALS + SEASONAL COLOR
	EVERGREEN TREE	WHITE PINE, WHITE SPRUCE, GREEN GIANT ARBOVITAE			



**Hawk Design, Inc.**  
Landscape Architecture  
Land Planning  
Sagamore, MA  
508-852-8800  
info@hawkdesigninc.com

Date: 4/22/20

Revisions:  
Rev. Date Description

**The Residence at Carter Mill**  
Highland Avenue Needham, Massachusetts  
LCS Senior Living, 3 Crigwater Drive, Norwood, MA

Drawn By: [ ] Checked By: TSM

Landscape Master Plan

Scale: 1" = 30'-0"

Sheet: **MP**

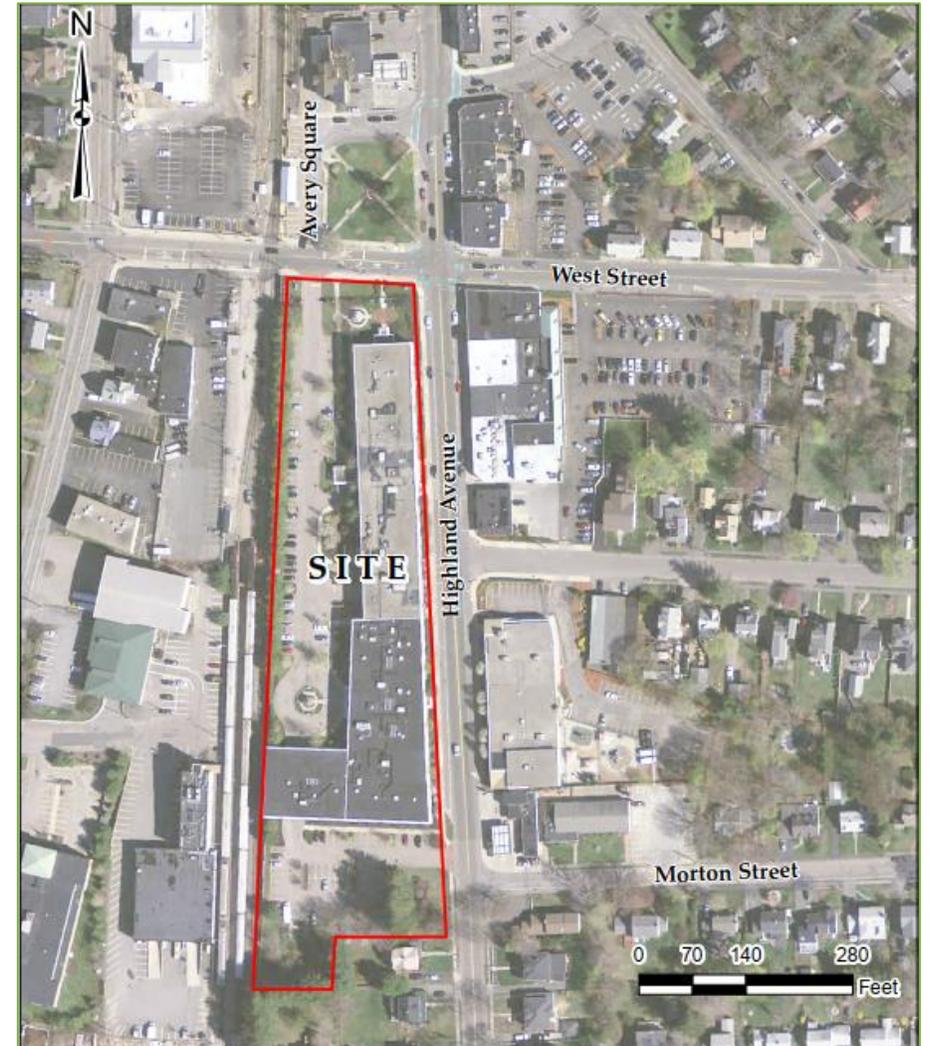


# Traffic Impacts

- McMahon Associates has completed a review of the existing traffic operations and potential impacts associated with the proposed senior living residential development project at 100-110 West Street in Needham, MA.
- Based on a review of this analysis, the proposed senior living development is not shown to have a significant impact on the overall traffic operations of the study area intersections and roadways. This proposal is expected to generate fewer vehicle trips than the previous use.
- Based on the analysis presented in this assessment, the proposed project is estimated to generate approximately 32 new vehicle trips (16 entering vehicles and 16 exiting vehicles) during the weekday morning peak hour and approximately 52 new vehicle trips (26 entering vehicles and 26 exiting vehicles) during the weekday afternoon peak hour.
- The signalized intersection of West Street at Highland Avenue is projected to operate at overall LOS D during the weekday morning and weekday afternoon peak hours under 2026 future conditions with or without the proposed project in place. Between 1994 and 2018, the building held 60 assisted living units, a 142 bed nursing home and a small medical office. The previous uses are estimated to have generated nearly twice as many vehicle trips as the proposed senior residential project during the weekday morning and weekday afternoon peak hours.
- A review of estimated parking demand shows that the proposed on-site parking supply is expected to meet the typical peak parking demand associated with the proposed project.

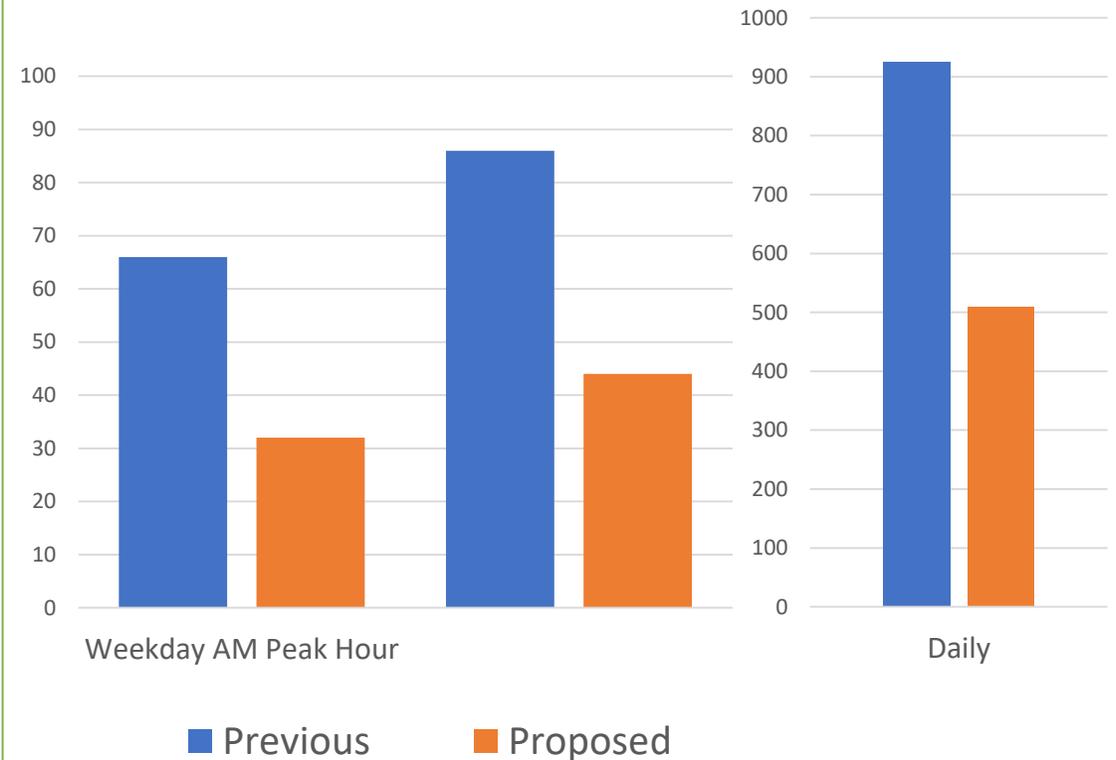
# Traffic Impact Study

- Full Study Completed
  - Weekday AM & PM Peak Hours
  - Existing, No Build and Build
  - Trip Generation & Distribution
  - Capacity Analysis
  - Parking Analysis
- Project is Low Traffic Generator
- Less Impact than Previous Use
- Analysis Shows Limited Impact



# Traffic Impact Study – Trip Generation

- Previous Land Use
  - Assisted Living (60 Beds)
  - Nursing Facility (142 Beds)
  - Medical Offices (11,000 SF)
- Proposed Land Use
  - Independent Living (72 Units)
  - Assisted Living (96 Beds)
- ITE Trip Generation





# Traffic Impact Study - Parking

Land Use	Proposed Zoning Ratio	Proposed Project	Parking Supply
Assisted Living (Bed)	0.5 spaces/bed	96 beds	48 spaces
Assisted Living (Employee)	1.0 space/2 employees of largest shift	58 employees on largest shift	29 spaces
Independent Living (Unit)	1.0 space/dwelling unit	72 dwelling units	72 spaces
		<b>TOTAL SUPPLY</b>	<b>149 spaces</b>

- Weekday Peak Period Demand of 80 spaces
- Additional On-Street Parking
- Proximity to Public Transit
- Nearby Services Available

- 1 space/unit > 0.5 space/unit in Elder Service Zoning District for Independent Living



# Fiscal Impact

- Net Annual Fiscal Impact of \$388,877.00
  - \$550,958 in projected revenue per year
    - Real estate tax revenue - \$470,572
    - Personal property tax revenue - \$49,100
    - Excise tax revenue - \$21,875
    - CPA revenue - \$9,411
  - Estimated municipal costs of \$162,081 for police, fire, ambulance, BOH
- The existing property assessment is anticipated to increase from \$9,471,500 to \$37,675,931 – an increase of over \$28,000,000
- Property taxes will increase from \$175,411 to \$470,572
- The construction lasting approximately 18 months will infuse a significant economic boost into the local and regional economy, with dozens of tradesmen involved in building the project and millions of dollars spent on construction supplies and materials.
- Approximately 87 FTE new jobs, additional meal taxes, local economic growth and new construction jobs.



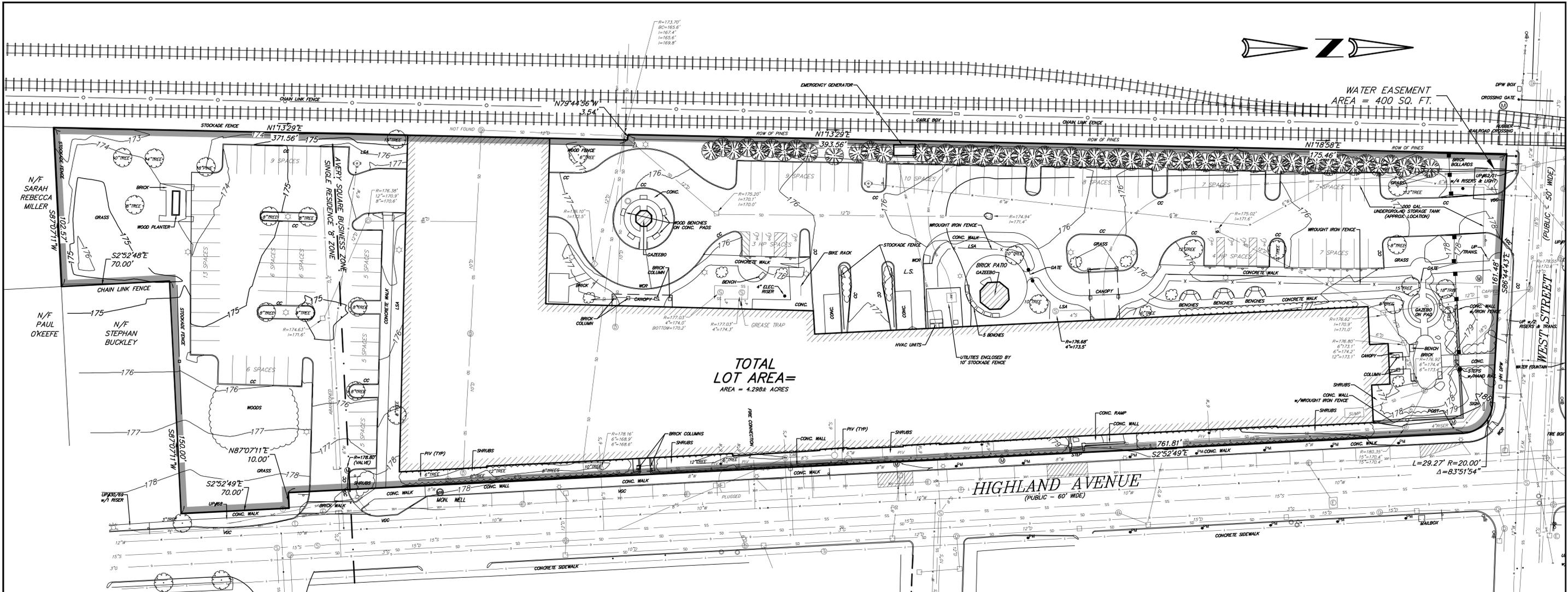
# Benefits to Needham

- The iconic Carter mill building on Highland Avenue will be preserved and upgraded.
- Rental housing will be available for people over 55 in a location rich in amenities. The new residents will be able to walk to grocery stores, restaurants, the commuter rail station, the senior center, the library and area businesses.
- The building will be refurbished and upgraded for a range of high quality, senior housing options. 72 independent living apartments and 83 assisted living apartments will allow residents to age in place.
- Included are 9 affordable independent living apartments – 6 targeted for Needham local preference.
- Approximately 111 full- and part-time jobs.
- Annual net revenue of close to \$388,877 from real estate and other taxes.
- Approximately \$3,000,000 in annual salaries and goods & services from purchasing.
- New use will generate less traffic than previous use.
- A new housing option for seniors who want to sell their home in Needham and rent a home in Needham in a walkable, vital neighborhood.
- Quality, Massachusetts based developer/operator, LCB Senior Living, LLC will be a new corporate citizen.



# Questions





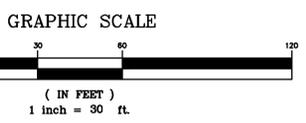
**TOTAL LOT AREA =**  
AREA = 4.298± ACRES

**LEGEND**

CCB	CAPE COD BERM	□	TRANSFORMER
VGC	VERTICAL GRANITE CURB	—○—	OVERHEAD ELECTRIC LINE
CC	CONCRETE CURB	—○—	UNDERGROUND ELECTRIC LINE
EOP	EDGE OF PAVEMENT	①	TELEPHONE MANHOLE
⊠	HANDICAP SPACE	—	TELEPHONE LINE
—	CURB STOP	⊠	BOLLARD
LS	LANDSCAPED AREA	—X—	FENCE
⊕	CATCH BASIN	—○—	STOCKADE FENCE
⊕⊕	DOUBLE CATCH BASIN	—○—	CHAIN LINK FENCE
⊕	AREA DRAIN	—XXX—	CONTOUR LINE (MNR)
—	TRENCH DRAIN	—XXX—	CONTOUR LINE (MUR)
⊕	DRAIN MANHOLE	—	PROPERTY LINE
⊕	STORM CEPTOR	—	ZONE LINE
—	DRAIN LINE		
—	ROOF DRAIN LINE		
—AD—	AREA DRAIN LINE		
⊕	SEWER MANHOLE		
⊕	SEWER CLEAN OUT		
—SS—	SEWER LINE		
—FM—	SEWER FORCE MAIN		
⊕	GAS VALVE		
—G—	GAS LINE		
⊕	HYDRANT		
⊕	WATER VALVE		
—W—	WATER LINE		
⊕	UTILITY POLE		
⊕	LIGHT POLE		
⊕	FLOOD LIGHT		
⊕	ELECTRIC MANHOLE		

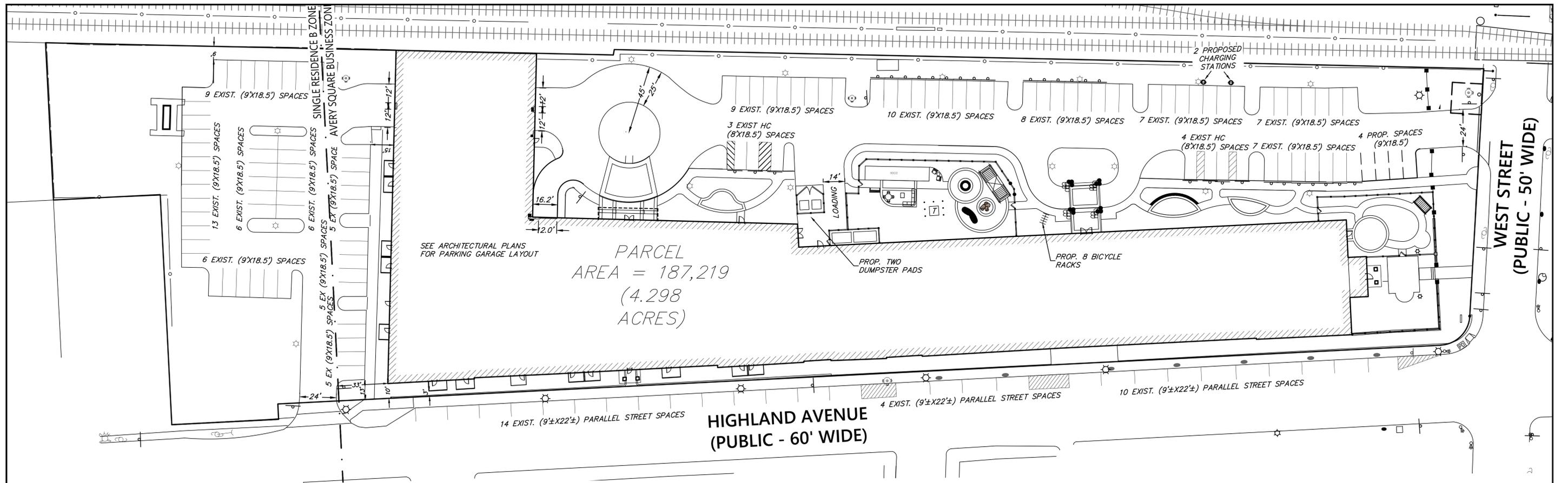
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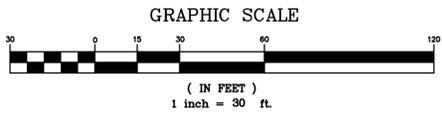
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CHKD BY	SMH		
APPD BY	SMH		
<b>LCB SENIOR LIVING</b> 100 WEST STREET NEEDHAM, MASSACHUSETTS <b>EXISTING CONDITIONS PLAN</b>		SHEET NO. <b>1</b>	
<b>KELLY ENGINEERING GROUP</b> civil engineering consultants 0 Campanelli Drive, Braintree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com			



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D) DRIVEWAY OPENINGS	50% (8'x16')	38±%	23% (NOTE 7)	YES
E) COMPACT CARS	9'x 18.5'	9'x18.5'	SAME	YES
F) PARKING SPACE SIZE	1' OVERHANG	NONE REQUIRED	SAME	YES
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-FRONT	10'	13'±	SAME	YES
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K) LANDSCAPED AREAS	10%	>10% (NOTE 10)	11%- 12% (NOTE 10)	YES
L) TREES	1 PER 10 SPACES	(NOTE 11)	(NOTE 11)	YES
M) LOCATION	WITHIN LOT	WITHIN LOT	SAME	YES
N) BICYCLE RACKS	8	0	8	YES



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- NOTE 3. EXISTING BUILDING HEIGHT OF 33±' TO TOP OF ROOF. 41'9" TO TOP OF HIGHEST POINT (MECHANICAL OR ELEVATOR OVERRIDE)
- PROPOSED MAX ALLOWABLE BUILDING HEIGHT WILL BE 44' TO TOP OF PENTHOUSE AND ALL MECHANICALS OTHER THAN ELEVATOR OVERRIDE; 49' TO TOP OF ELEVATOR OVERRIDE. ACTUAL HEIGHTS ARE PLANNED TO BE SLIGHTLY LESS THAN MAX ALLOWABLE.
- BUILDING HEIGHT WAS CALCULATED FROM THE AVERAGE GRADE PLANE OF THE EXISTING BUILDING OF 177.6±. THE PROPOSED PENTHOUSE ELEVATION IS 221.6±. THE PROPOSED ELEVATOR OVERRUN ELEVATION IS 226.6±.
- NOTE 4. THE TOWN OF NEEDHAM ZONING BYLAW SECTION 4.4.2 (E) THERE ARE NO LIMITATION ON LOT COVERAGE IN THE AVERY SQUARE BUSINESS DISTRICT
- TOTAL BUILDING COVERAGE= 63,700 S.F./ 187,219 S.F.= 0.34
- NOTE 5. FLOOR AREA RATIO:  
EXISTING FAR = 186,300 S.F./187,219 S.F. = 1.00 FAR  
PROPOSED FAR = 189,220 S.F./187,219 S.F. = 1.01 FAR
- THE CALCULATION OF PROPOSED FAR DOES NOT INCLUDE UNDERGROUND PARKING. THE PROPOSED ZONING CHANGE, ALLOWING A MAXIMUM FAR OF 1.1, EXCLUDES SQUARE FOOTAGE OF UNDERGROUND PARKING FROM FAR CALCULATIONS.
- SINCE THE CURRENT BYLAW DEFINITION OF FLOOR AREA EXCLUDES "UNENCLOSED PORCHES AND BALCONIES," THE PROPOSED FAR CALCULATION ALSO DOES NOT INCLUDE THE AREA OF PROPOSED FIRST FLOOR PATIOS AND ROOF TERRACES, ALL OF WHICH WILL BE UNENCLOSED.
- NOTE 6. REQUIRED PARKING:  
71± INDEPENDENT LIVING UNITS X 1.0 SPACES/UNIT (PROPOSED ZONING CHANGE)  
+ 96± ASSISTED LIVING BEDS X 0.5 SPACES/ BEDS (TOWN OF NEEDHAM ZONING BYLAW SECTION 5.1.2)  
+ 58± EMPLOYEES X 1 SPACE/2 EMPLOYEES ON LARGEST SHIFT  
= 148± SPACES REQUIRED
- PROVIDED:  
34 GARAGE SPACES & 114 EXTERIOR PARKING SPACES = 148 SPACES (EXCLUDES 28 PARALLEL PARKING SPACES ON HIGHLAND AVE. ADJACENT TO THE PROPERTY THAT CAN BE COUNTED AS OFF-STREET PARKING PURSUANT TO SECTION 5.1.1.7 OF THE BYLAW FOR A TOTAL PARKING SUPPLY OF 176 SPACES.
- NOTE 7. COMPACT PARKING: 34 PROPOSED COMPACT SPACES IN PARKING GARAGE.
- NOTE 8. PARKING SPACE LAYOUT:  
5 TANDEM SPACES PROPOSED IN PARKING GARAGE. A SPECIAL PERMIT IS REQUESTED.
- NOTE 9. INTERIOR AISLE WIDTHS IN THE GARAGE ARE 16'-8". SPECIAL PERMIT REQUESTED. THE EXISTING COLUMN TO COLUMN SPACING IS A UNIQUE CIRCUMSTANCE.
- NOTE 10. LANDSCAPE AREAS: BETWEEN 11% AND 12% OF THE INTERIOR PORTION OF THE PARKING AREAS IS LANDSCAPED. THE AREAS OUTSIDE THE PERIMETER OF THE PAVED PARKING AREAS ARE NOT INCLUDED IN THIS CALCULATION. THIS SATISFIES THE REQUIREMENT THAT 10% OF THE PARKING AREA BE LANDSCAPED, AS WELL AS THE REQUIREMENT THAT AT LEAST ONE QUARTER OF THE LANDSCAPED AREA BE LOCATED IN THE INTERIOR OF THE PARKING AREA.
- NOTE 11. TREES: SEE LANDSCAPE PLAN BY HAWK DESIGN, INC.

SCALE 1" = 30'			
DATE 05/04/20	REV	DATE	REVISION
SHEET 1 OF 1			
FILE # LA00	THE RESIDENCE AT CARTER MILL 100 WEST STREET NEEDHAM, MASSACHUSETTS LAYOUT AND ZONING PLAN		
JOB # 2020-030	DRAWN BY C&L		
	CHKD BY BGL		
	APPD BY DNK		
	KELLY ENGINEERING GROUP civil engineering consultants 0 Campanelli Drive, Braintree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com		SHEET NO. <b>1</b>



- OUTDOOR AMENITY AREA**
- OUTDOOR DINING AND LIVING
  - FIRE AND WATER FEATURES
  - SHADE STRUCTURE
  - BOCCIE COURT AND ACTIVITY LAWN

- MEMORY CARE AMENITY COURTYARD**
- OUTDOOR DINING AND LIVING
  - SHADE STRUCTURE AND SEATING AREAS
  - ACTIVITY LAWN

**Plant Legend:**

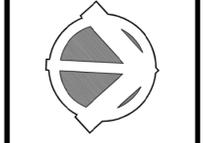
SYMBOL	DESCRIPTION	SAMPLE SPECIES
	EXISTING SHADE / FLOWERING TREE	MIXED SPECIES OF MAPLES, OAKS, BIRCH, ETC.
	EXISTING TREELINE	
	PROPOSED SHADE TREE	RED MAPLE, OAK, TULIP TREE, LINDEN, AMERICAN ELM, AMERICAN HORNBEEAM
	FLOWERING TREE	DOGWOOD, YELLOWWOOD, EASTERN REDBUD, SOURWOOD, SARGENT CHERRY
	EVERGREEN TREE	WHITE PINE, WHITE SPRUCE, GREEN GIANT ARBORVITAE

SYMBOL	DESCRIPTION	SAMPLE SPECIES
	LARGE DECIDUOUS SHRUB	AMELANCHIER, VIBURNUM, ROSE OF SHARON, LILAC
	PYRAMIDAL EVERGREEN	UPRIGHT JUNIPER, UPRIGHT HOLLY, EMERALD GREEN ARBORVITAE, ETC.
	LOW TO MEDIUM SHRUBS	INKBERRY, RHODODENDRON, BOXWOOD, HYDRANGEA, REDTIG DOGWOOD, ORNAMENTAL GRASSES
	GROUNDCOVER / PERENNIALS	ASSORTED GROUNDCOVERS, PERENNIALS & SEASONAL COLOR

SCALE: 1" = 30'  
 Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

**Hawk Design, Inc.**  
 Landscape Architecture  
 Land Planning  
 Sagamore, MA  
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Date: 4/22/20

Revisions:  
 Num. Date Description

**The Residence at Carter Mill**  
 Highland Avenue Needham, Massachusetts  
 LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL Checked By: TEM

**Landscape Master Plan**

Scale: 1" = 30'-0"

Sheet: **MP**

# Traffic Impact Study

## Senior Living Residential Redevelopment

100-110 West Street  
Needham, MA



Prepared by  
**McMahon Associates, Inc.**  
120 Water Street, 4<sup>th</sup> Floor  
Boston, MA 02109  
617.556.0020

Prepared for  
**LCB Senior Living**

April 2020

# TABLE OF CONTENTS

<b>INTRODUCTION</b> .....	<b>1</b>
<i>PROJECT DESCRIPTION</i> .....	<i>1</i>
<i>STUDY METHODOLOGY</i> .....	<i>3</i>
<i>STUDY AREA INTERSECTIONS</i> .....	<i>3</i>
<b>EXISTING CONDITIONS</b> .....	<b>4</b>
<i>ROADWAY NETWORK AND INTERSECTIONS</i> .....	<i>4</i>
<i>EXISTING TRAFFIC VOLUMES</i> .....	<i>5</i>
<i>CRASH SUMMARY</i> .....	<i>9</i>
<b>FUTURE CONDITIONS</b> .....	<b>10</b>
<i>FUTURE ROADWAY IMPROVEMENTS</i> .....	<i>10</i>
<i>BACKGROUND TRAFFIC GROWTH</i> .....	<i>11</i>
<i>2026 NO BUILD TRAFFIC VOLUMES</i> .....	<i>11</i>
<i>SITE-GENERATED TRAFFIC</i> .....	<i>14</i>
<i>PROJECT TRIP DISTRIBUTION AND ASSIGNMENT</i> .....	<i>15</i>
<i>2026 BUILD TRAFFIC VOLUMES</i> .....	<i>16</i>
<b>TRAFFIC OPERATIONS ANALYSIS</b> .....	<b>22</b>
<i>LEVEL-OF-SERVICE CRITERIA</i> .....	<i>22</i>
<i>CAPACITY ANALYSIS RESULTS</i> .....	<i>22</i>
<i>SITE-GENERATED PARKING DEMAND</i> .....	<i>24</i>
<i>SITE ACCESS AND CIRCULATION</i> .....	<i>26</i>
<i>SIGHT DISTANCE</i> .....	<i>26</i>
<b>CONCLUSION</b> .....	<b>29</b>

## LIST OF TABLES

Table 1: ATR Count Summary .....	5
Table 2: Proposed Project Trips .....	14
Table 3: Previous Site Trips .....	15
Table 4: Signalized Intersection Capacity Analysis .....	23
Table 5: Unsignalized Intersection Capacity Analysis .....	23
Table 6: Site Parking Generation .....	24
Table 7: Sight Distance Requirements.....	27

## LIST OF FIGURES

Figure 1: Site Location Map .....	2
Figure 2: 2019 Existing Weekday Morning Peak Hour Traffic Volumes .....	7
Figure 3: 2019 Existing Weekday Afternoon Peak Hour Traffic Volumes .....	8
Figure 4: 2026 No Build Weekday Morning Peak Hour Traffic Volumes .....	12
Figure 5: 2026 No Build Weekday Afternoon Peak Hour Traffic Volumes.....	13
Figure 6: Directions of Arrival and Departure .....	17
Figure 7: Weekday Morning Peak Hour New Project Trips.....	18
Figure 8: Weekday Afternoon Peak Hour New Project Trips.....	19
Figure 9: 2026 Build Weekday Morning Peak Hour Traffic Volumes.....	20
Figure 10: 2026 Build Weekday Afternoon Peak Hour Traffic Volumes .....	21

## LIST OF APPENDICES

Appendix A: Turning Movement Counts
Appendix B: Seasonal Adjustment Data
Appendix C: Crash Summary
Appendix D: Traffic Projection Model
Appendix E: Highway Capacity Manual Methodologies
Appendix F: 2019 Existing Capacity/Level-of-Service Analysis
Appendix G: 2026 No Build Capacity/Level-of-Service Analysis
Appendix H: 2026 Build Capacity/Level-of-Service Analysis
Appendix I: Capacity/Level-of-Service Analysis Summary

## INTRODUCTION

McMahon Associates has completed a review of the existing traffic operations and potential traffic impacts associated with the proposed senior living residential redevelopment project at 100-110 West Street in Needham, MA. The purpose of this traffic impact study is to evaluate existing and projected traffic operations and safety conditions associated with the proposed redevelopment within the study area.

The assessment documented in this traffic impact study is based on a review of existing traffic volumes, recent crash data, and the anticipated traffic generating characteristics of the proposed project. The study examines existing and projected traffic operations (both with and without the proposed redevelopment) at key intersections in the vicinity of the project site. The study area was selected based on a review of the surrounding roadway network and estimated trip generating characteristics of the proposed project. This study provides a detailed analysis of traffic operations during the weekday morning and weekday afternoon peak hours, when the combination of adjacent roadway volumes and project trips would be expected to be the greatest. The study also reviews the previous on-site uses and their impacts to traffic and parking within the study area relative to the proposed project.

Based on the analysis of the proposed project and a review of the previous land use, the proposed project is estimated to have a lesser impact on study area traffic and to require less parking than both the previous land use and the proposed on-site parking supply. The proposed project is shown to have a negligible impact on the area roadways and intersections. The following report documents these findings.

### *Project Description*

The proposed senior living residential redevelopment would be located at 100-110 West Street in Needham, MA, as shown in Figure 1. The site currently consists of a vacant building and associated parking that was previously used as an assisted living community, skilled nursing facility, and medical offices. The site is bounded by residential properties to the south, West Street to the north, Highland Avenue to the east, and Massachusetts Bay Transit Authority (MBTA) Commuter Rail tracks to the west. The proposed project would renovate the existing structure to include 83 units of senior assisted living (96 beds) and 71 units of independent senior housing. A total of 148 parking spaces would be provided on-site, including 34 interior garage spaces and 114 exterior spaces. Access to the site would continue to be provided via the two existing full-access driveways, one on West Street and one on Highland Avenue.

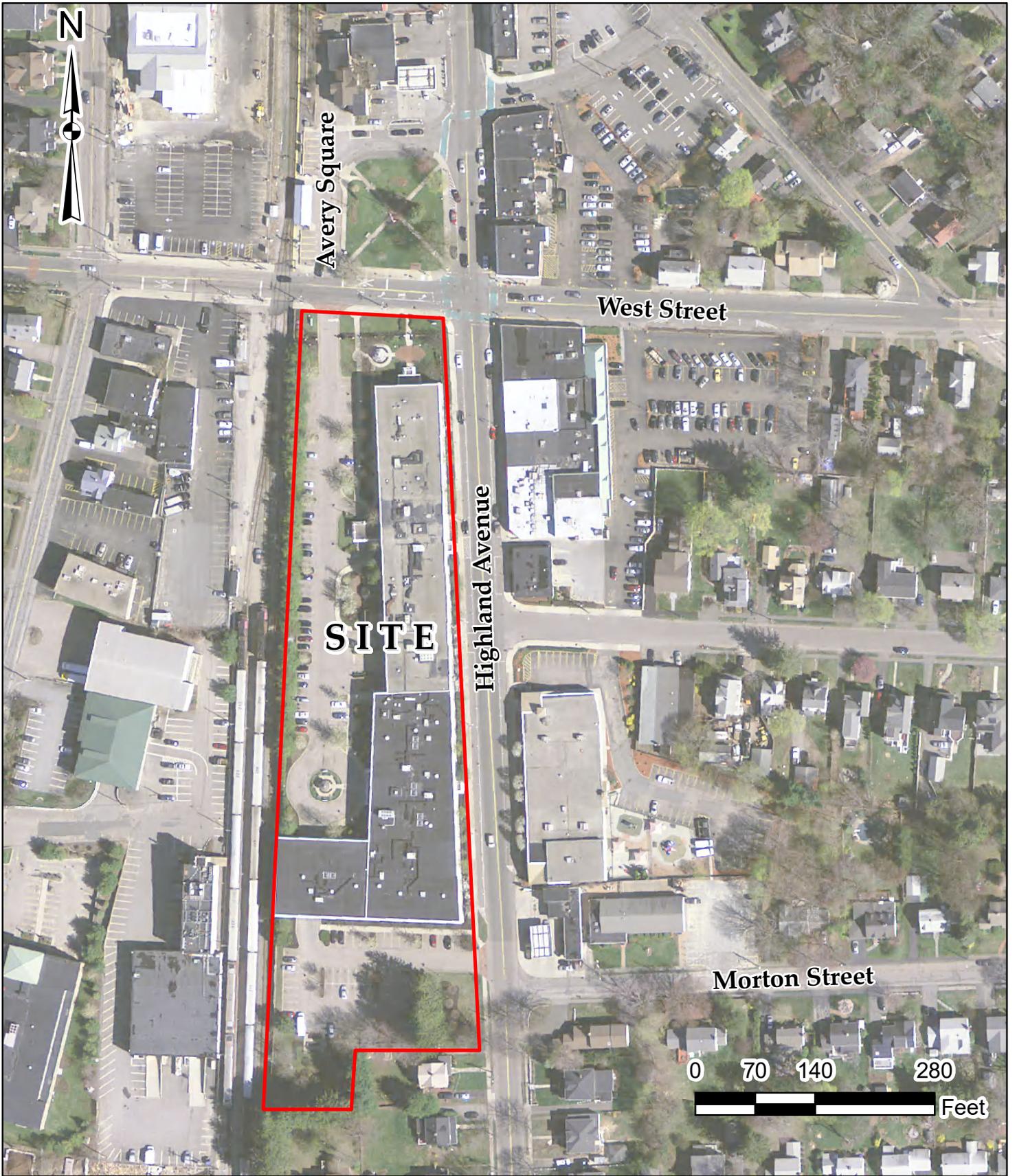


Figure 1  
Site Location Map  
Senior Living Residential Redevelopment  
Needham, Massachusetts

### ***Study Methodology***

This traffic impact study evaluates existing and projected traffic operations within the study area for the weekday morning and weekday afternoon peak hour traffic conditions when the combination of the adjacent roadway volumes and estimated project trips would be greatest.

The study was conducted in three steps. The first step consisted of an inventory of existing traffic conditions within the project study area. As part of this inventory, manual turning movement counts were collected at key intersections during the weekday morning and afternoon peak periods. A field visit was also completed to document intersection and roadway geometries and available sight distances at the site driveways. Crash data for the study area intersections was obtained from the Massachusetts Department of Transportation (MassDOT) to determine if the study area has any existing traffic safety deficiencies.

The second step of the study builds upon the data collected in the first step to establish the basis for evaluating potential transportation impacts associated with the projected future conditions. During this second step, the projected traffic demands associated with any planned future developments that could influence traffic volumes at the study area intersections were assessed. Consistent with MassDOT traffic study guidelines, 2019 Existing traffic volumes were forecasted to the future year 2026 to determine 2026 No Build (without project) conditions and 2026 Build (with project) conditions.

The third step of this study determined if measures are necessary to improve future traffic operations and safety, minimize potential traffic impacts, and provide safe and efficient access to the site with the proposed project in place.

### ***Study Area Intersections***

Based on a review of the anticipated traffic generating characteristics of the proposed project and a review of the adjacent roadways serving the project site, the following study area intersections were selected for analysis:

- West Street at Highland Avenue
- West Street at the Site Driveway/Avery Square
- Highland Avenue at the Site Driveway/Morton Street

The traffic impact study presented in this report documents existing and future traffic conditions for the study area intersections noted above.

## EXISTING CONDITIONS

An accurate assessment of the potential traffic impacts associated with the proposed senior living redevelopment requires a comprehensive understanding of the existing traffic conditions within the project study area. The existing conditions assessment included in this study consists of an inventory of intersection and roadway geometries, an inventory of traffic control devices, the collection of peak period traffic volumes, and a review of recent crash data. The existing conditions in the vicinity of the project site are summarized below.

### *Roadway Network and Intersections*

The project site benefits from excellent access via the local and regional roadway system. A brief description of the principal roadways and public transportation providing access to the project site is presented below.

#### West Street

West Street generally runs in the east-west direction through the Town of Needham. West Street is classified as an urban collector under Town of Needham jurisdiction. West of the site, West Street provides one travel lane in each direction, measuring approximately 16.5 feet wide in the eastbound direction and approximately 12.5 feet wide in the westbound direction. Sidewalks are provided on the north and south side of West Street. At the signalized intersection of West Street and Highland Avenue, crosswalks and left turn lanes are provided on the West Street approaches. No bicycle facilities are provided on West Street. An advisory speed limit of 30 miles per hour (mph) is posted west of the site for vehicles travelling westbound, and an advisory speed limit of 25 mph is posted in both directions of travel to the east of the site.

#### Highland Avenue

Highland Avenue generally runs in the north-south direction through the Town of Needham and is classified as an urban principal arterial under Town of Needham jurisdiction. Highland Avenue generally provides one travel lane in each direction, each measuring approximately 14 feet in width with 8 foot wide parking spaces on both sides of the roadway adjacent to the site. A sidewalk is provided on both sides of Highland Avenue. No bicycle facilities are provided. South of the site on Highland Avenue, a speed limit of 30 mph is posted for vehicles travelling in the southbound direction, and a speed limit of 25 mph is posted for vehicles travelling in the northbound direction.

#### Public Transportation

The MBTA Commuter Rail Needham Heights station is located north of the intersection of West Street, Avery Square, and the site driveway. The station services the Needham line, which provides rail service between Needham Heights and Boston's South Station between 6:05 AM and 12:00 AM. The MBTA bus route 59 provides stops along Highland Avenue with service between Needham Junction and Watertown Square. Bus stops in the vicinity of the

site are located at the intersection of Highland Avenue at Mark Lee Road to the north of the site, and the intersection of Highland Avenue at Dana Place south of the site.

***Existing Traffic Volumes***

Existing Peak Hour Traffic Volumes

To assess peak hour traffic conditions, manual turning movement counts were conducted at the study area intersections during the weekday morning and weekday afternoon peak periods.

Counts were conducted at the study area intersections on Thursday, December 5, 2019 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. The results of the turning movement counts are tabulated by 15-minute periods and are provided in Appendix A of this report. The four highest consecutive 15-minute intervals during each of these count periods constitute the peak hours that are the basis of the traffic analysis provided in this report. Based on a review of the peak period traffic data, the weekday morning peak hour at the study area intersections occurs between 7:15 AM and 8:15 AM and the weekday afternoon peak hour occurs between 4:30 PM and 5:30 PM.

A 48-hour Automatic Traffic Recorder (ATR) count was conducted on Highland Avenue north of Morton Street on from Wednesday, December 18 to Thursday, December 19, 2019. The results of the ATR count are provided in Appendix A of this report and are summarized in Table 1 below.

**Table 1: ATR Data Summary**

<b>Direction</b>	<b>ADT<sup>(1)</sup></b>	<b>AM Commuter<sup>(2)</sup></b>	<b>PM Commuter<sup>(3)</sup></b>	<b>85<sup>th</sup> Percentile</b>
		<b>Peak Hour</b>	<b>Peak Hour</b>	<b>Speed (mph)</b>
Northbound	6,190	492	407	32
<u>Southbound</u>	<u>5,950</u>	<u>320</u>	<u>518</u>	<u>34</u>
Combined	12,140	812	925	33

(1) Average daily traffic volume in vehicles per day.

(2) Weekday morning commuter peak (7:00 AM to 9:00 AM) occurs between 7:30 AM and 8:30 AM.

(3) Weekday afternoon commuter peak (4:00 PM to 6:00 PM) occurs between 4:30 PM and 5:30 PM.

As shown in Table 1, the ATR count on Highland Avenue shows an Average Daily Traffic (ADT) volume of approximately 6,200 vehicles in the northbound direction and approximately 5,950 vehicles in the southbound direction. The 85<sup>th</sup> percentile speeds in the northbound and southbound directions are 32 and 34 mph, respectively.

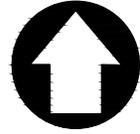
Seasonal Variation

In order to account for seasonal variation in traffic volumes, continuous count data from a MassDOT count station on I-95 in Newton, MA were reviewed. Based on the seasonal trends

of the data, traffic counts collected during the month December are shown to be approximately 4% lower than the average month. Therefore, in order to provide a conservative analysis, the existing peak hour traffic volumes were adjusted upward by approximately 4% to represent an average month. The seasonal adjustment data from the continuous count station referenced is provided in Appendix B of this report.

The peak hourly traffic flows for the 2019 Existing conditions are depicted in Figure 2 for the weekday morning peak hour and Figure 3 for the weekday afternoon peak hour.

The project site is currently vacant. However, the project site was previously occupied by an assisted living community, skilled nursing facility, and medical offices. The previous site uses are shown to have a higher number of trips and higher parking demand than the currently proposed redevelopment. The traffic components associated with the previous land use are discussed in subsequent sections of this report.



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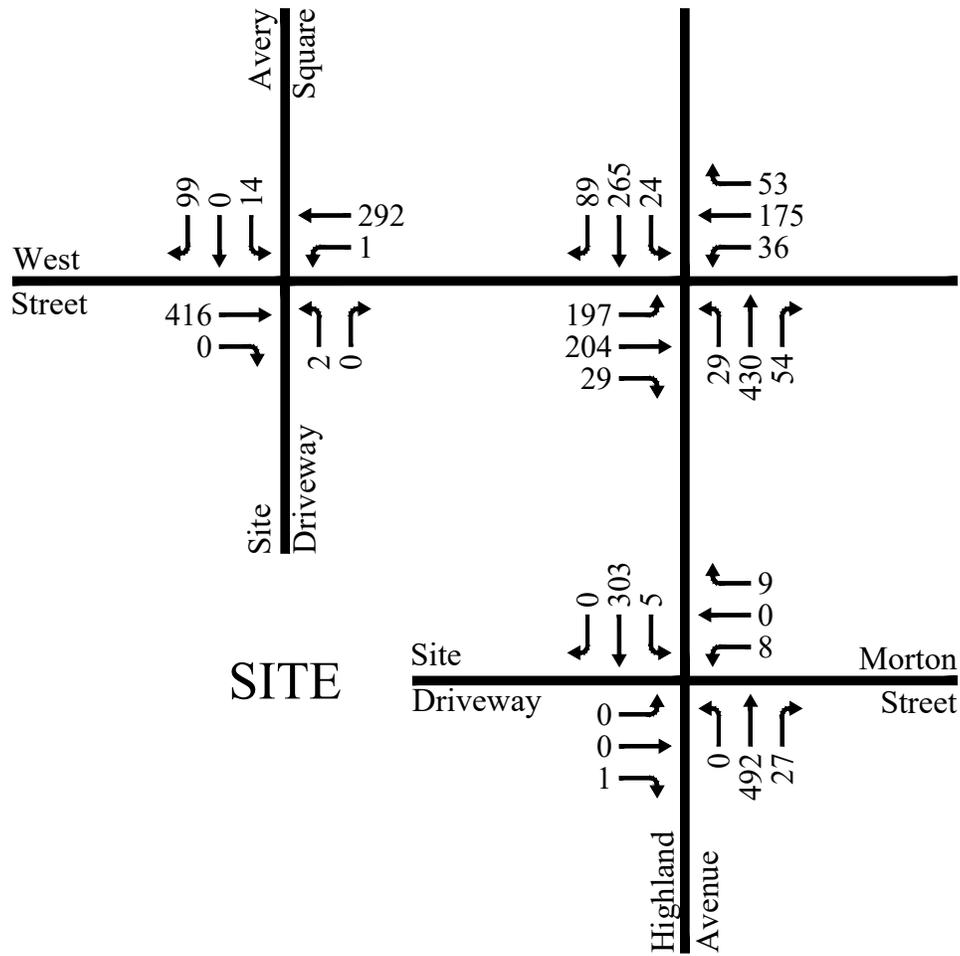
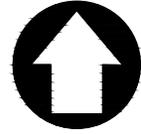


Figure 2  
2019 Existing Weekday Morning  
Peak Hour Traffic Volumes  
Senior Living Residential Redevelopment  
Needham, Massachusetts



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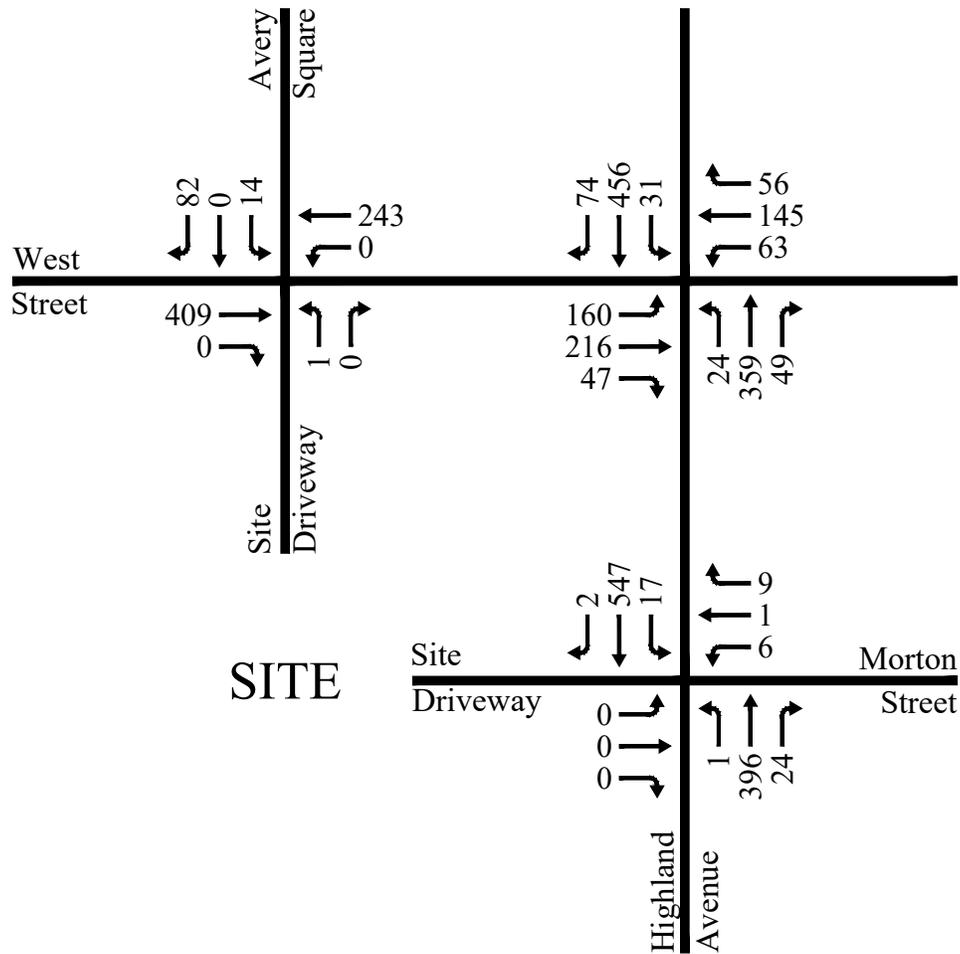


Figure 3  
2019 Existing Weekday Afternoon  
Peak Hour Traffic Volumes  
Senior Living Residential Redevelopment  
Needham, Massachusetts

### *Crash Summary*

Crash data for the study area intersections was obtained from MassDOT for the five-year period from 2013 through 2017. A summary of the crash data is presented in Appendix C.

The MassDOT Crash Rate Worksheet calculations were used to determine whether the crash frequencies at the study area intersections were unusually high given the travel demands at each location. The MassDOT Crash Rate Worksheet calculates a crash rate expressed in crashes per million entering vehicles. The calculated rate is then compared to the average rate for signalized and unsignalized intersections statewide and within MassDOT District 6. For signalized intersections, the statewide average crash rate is 0.78 crashes per million entering vehicles and the MassDOT District 6 crash rate is 0.71 crashes per million entering vehicles. For unsignalized intersections, the statewide average crash rate is 0.57 crashes per million entering vehicles and the MassDOT District 6 crash rate is 0.52 crashes per million entering vehicles. All of the crashes summarized as part of this analysis occurred during the time that the previous site was occupied and operational as the assisted living community, skilled nursing facility, and medical offices.

The signalized intersection of West Street at Highland Avenue is reported to have experienced a total of 30 crashes during the five-year period analyzed, resulting in a crash rate of 0.77 crashes per million entering vehicles, below the statewide average crash rate and above the MassDOT District 6 average crash rate. The intersection is not a MassDOT Highway Safety Improvement Project (HSIP) high-crash cluster. Of the 30 reported crashes at the intersection of West Street at Highland Avenue, ten were angle collisions, nine were rear-end collisions, and nine were sideswipe collisions. Four of the reported crashes resulted in personal injury, 25 resulted in property damage only, and the severity of one crash not reported. Based on conversations with the town of Needham, this intersection is anticipated to be reconstructed in the future to improve pedestrian lighting, drainage, and traffic operations.

A total of six crashes were reported at the intersection of West Street at the site driveway/Avery Square from 2013 to 2017, resulting in a crash rate of 0.34 crashes per million entering vehicles. Four of the reported crashes were angle collisions. All of the reported crashes at the intersection resulted in property damage only.

At the intersection of Highland Avenue at the site driveway/Morton Street, five crashes were reported during the five-year study period, resulting in a crash rate of 0.21 crashes per million entering vehicles. Of these crashes, three were rear-end collisions. Three of the five reported crashes resulted in personal injury, and the other two resulted in property damage only.

## **FUTURE CONDITIONS**

To determine future traffic demands on the study area roadways and intersections, the 2019 Existing traffic volumes were projected to the future-year 2026, in accordance with MassDOT guidelines. Traffic volumes on the study area roadways in 2026 are assumed to include all existing traffic, as well as new traffic resulting from general growth in the study area and from other planned development projects, independent of the proposed project. The potential background traffic growth, unrelated to the proposed project, was considered in the development of the 2026 No Build (without project) peak hour traffic volumes. The estimated traffic increases associated with the proposed project were then added to the 2026 No Build volumes to reflect the 2026 Build (with project) traffic conditions. A more detailed description of the development of the 2026 No Build and 2026 Build traffic volume networks is presented below.

### *Future Roadway Improvements*

Planned roadway improvement projects can impact travel patterns and future traffic operations. MassDOT project information and the Town of Needham were consulted to develop an understanding of future area roadway improvement projects. Two projects which may affect traffic conditions at the study area intersections were identified.

A MassDOT roadway improvement project on Highland Avenue is currently in the pre-construction phases, with construction planned for 2020. This project would construct roadway improvements such as widened sidewalks, separated bicycle facilities, and vehicle turn lanes at intersections along Highland Avenue between its intersections with Route 9 in Newton and Webster Street in Needham, just under 0.4 miles to the north of West Street. This project would alter traffic operations along Highland Avenue within its project limits, but is not expected to significantly affect travel volumes at the study area intersections for the proposed assisted living redevelopment. For this reason, changes associated with the Highland Avenue improvement project are expected to be captured within the overall background growth rate described below.

The Town of Needham is planning an intersection improvement project at the intersection of West Street at Highland Avenue. The project is currently in the design phase, with construction funding anticipated to be acquired in the summer of 2020. The exact scope of the improvement project is not known at this time, but is expected to include at a minimum updated traffic signal phasing and timings along with pedestrian and drainage improvements. The capacity analysis described in this report utilizes optimized traffic signal timings and phasing for future 2026 No Build and 2026 Build conditions. In order to present a conservative analysis of future traffic conditions, no geometric changes are included in these future-condition analyses.

### ***Background Traffic Growth***

Traffic growth is generally a function of changes in motor vehicle use and expected land development within the area. In order to predict the rate at which traffic on the study area roadways can be expected to grow during the seven-year forecast period (2019 to 2026), both planned area developments and historic traffic growth were reviewed.

### **Site-Specific Growth**

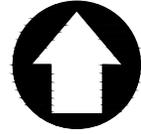
Based on discussions with the Town of Needham Planning Department, no site-specific developments were identified which would be anticipated to impact traffic volumes within the study area. A proposal for a zoning change in an area approximately 0.6 miles to the north of the site and bounded by Highland Avenue, Gould Street, and I-95 is currently being studied by the Town. This zoning change may allow additional development to occur in this area which could affect vehicle volumes along Highland Avenue, but the extent and exact scale of the impact is unknown at this time.

### **Historic Traffic Growth**

Based on discussions with the Town of Needham Engineering Department, an annual growth rate of one percent per year was identified. The one percent growth rate, compounded annually, was utilized to capture traffic growth associated with general changes in population, other smaller developments, and developments that may not be known at this time.

### ***2026 No Build Traffic Volumes***

The 2019 Existing peak hour traffic volumes were grown by one percent per year (compounded annually) over the seven-year study horizon (2019 to 2026) to establish the 2026 No Build weekday morning and afternoon peak hour traffic volumes, which are illustrated in Figure 4 and Figure 5, respectively, and are documented in the traffic projection model presented in Appendix D of this report.



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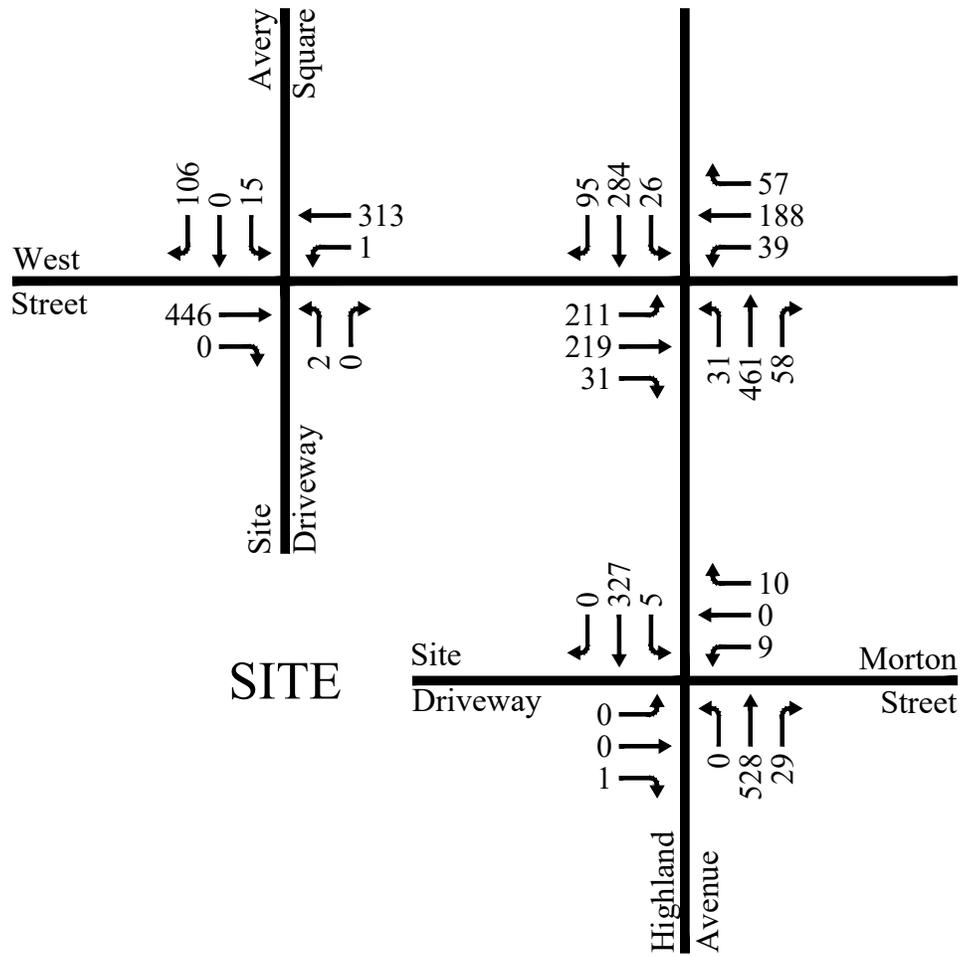
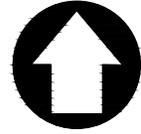


Figure 4  
2026 No Build Weekday Morning  
Peak Hour Traffic Volumes  
Senior Living Residential Redevelopment  
Needham, Massachusetts



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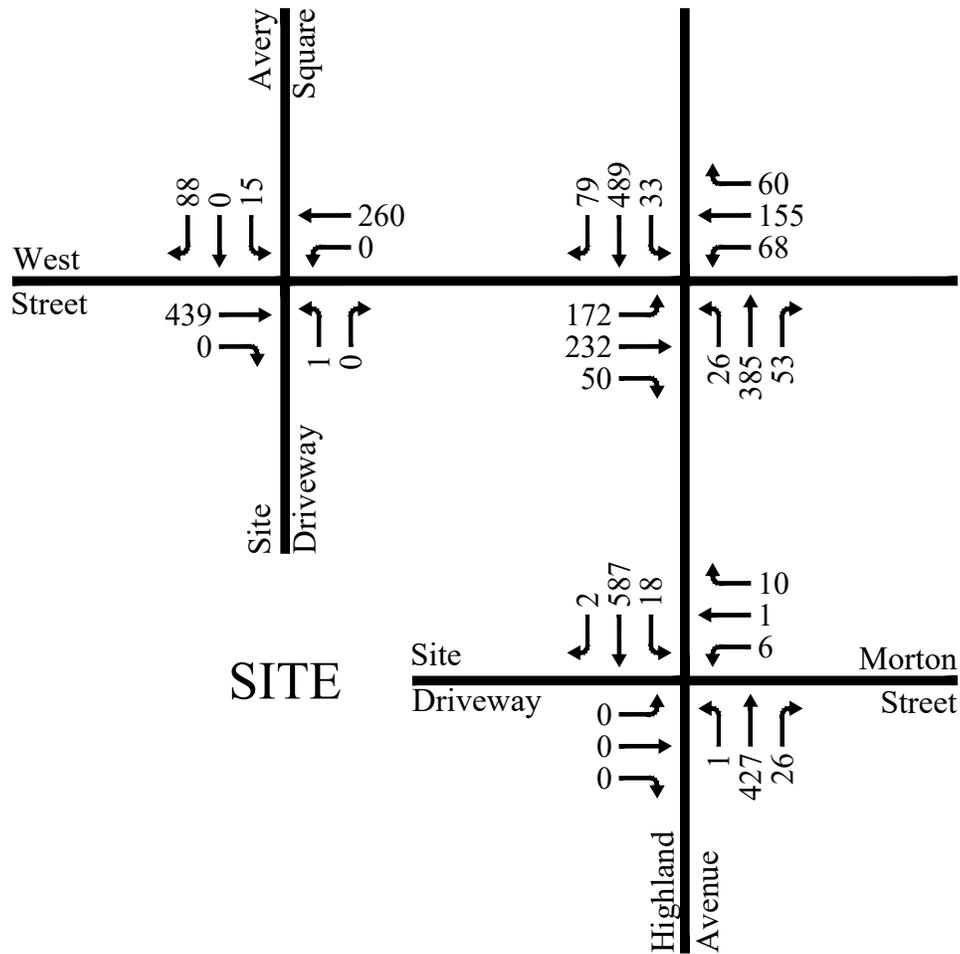


Figure 5  
2026 No Build Weekday Afternoon  
Peak Hour Traffic Volumes  
Senior Living Residential Redevelopment  
Needham, Massachusetts

**Site-Generated Traffic**

In order to estimate the number of vehicle trips associated with the proposed senior living residential redevelopment, the Institute of Transportation Engineers' (ITE) publication, *Trip Generation Manual, 10<sup>th</sup> Edition*, was referenced. ITE is a national research organization of transportation professionals, and *Trip Generation Manual, 10<sup>th</sup> Edition* provides traffic generation information for various land uses compiled from studies conducted by members nationwide. Vehicle trip estimates for the proposed senior living residential redevelopment were developed based on data presented in this publication for Land Use Codes 252 (Senior Adult Housing – Attached), and 254 (Assisted Living). This reference establishes vehicle trip rates (in this case expressed in trips per dwelling unit for senior adult housing and number of beds for assisted living) based on actual traffic counts conducted at similar types of existing land uses. Table 2 presents the estimated vehicle trips associated with the proposed senior living residential redevelopment.

**Table 2: Proposed Project Trips**

Description	Size	Weekday AM			Weekday PM		
		In	Out	Total	In	Out	Total
Senior Adult Housing <sup>(1)</sup>	71 Units	5	9	14	11	9	20
<u>Assisted Living<sup>(2)</sup></u>	<u>96 Beds</u>	<u>11</u>	<u>7</u>	<u>18</u>	<u>9</u>	<u>15</u>	<u>24</u>
Total Project Trips		16	16	32	20	24	44

(1) ITE Land Use Code 252 (Senior Adult Housing - Attached), based on 71 dwelling units.

(2) ITE Land Use Code 254 (Assisted Living), based on 96 beds.

As shown in Table 2, the proposed senior living residential redevelopment is estimated to result in approximately 32 new vehicle trips (16 entering vehicles and 16 exiting vehicles) during the weekday morning peak hour and approximately 44 new vehicle trips (20 entering vehicles and 24 exiting vehicles) during the weekday afternoon peak hour. The number of estimated peak hour trips would result in approximately one additional vehicle trip on the adjacent roadways every one to two minutes during the weekday morning and afternoon peak hours.

As outlined previously, the project site is served by both bus and rail transit. It can be expected that a portion of the trips to and from the project site would travel utilizing the existing MBTA transit service, reducing the number of overall site trips. Additionally, a number of services and amenities exist in the immediate area around the site which would be expected to reduce the number of vehicle trips by residents and visitors. The Needham Senior Center, a pharmacy, grocery store, USPS post office, and a number of doctor's offices and banks are located within an approximately ten-minute walking distance from the site.

Due to the building on site being currently vacant, there was no trip generation credit taken as part of the development of the project volumes shown in Table 1. However, for

comparison, and to demonstrate the lesser impact of the proposed redevelopment, Table 2 provides a summary of the trip generation associated with the previous assisted living community, nursing facility, and medical office estimated using ITE data.

**Table 3: Previous Site Trips**

Description	Size	Weekday AM			Weekday PM		
		In	Out	Total	In	Out	Total
Assisted Living <sup>(1)</sup>	60 Beds	7	4	11	6	10	16
Nursing Facility <sup>(2)</sup>	142 Beds	17	7	24	10	21	31
<u>Medical Office<sup>(3)</sup></u>	<u>11,000 sf</u>	<u>24</u>	<u>7</u>	<u>31</u>	<u>11</u>	<u>28</u>	<u>39</u>
Total Previous Use Trips		48	18	66	27	59	86

(1) ITE Land Use Code 254 (Assisted Living), based on 60 beds.

(2) ITE Land Use Code 620 (Nursing Home), based on 142 beds.

(3) ITE Land Use Code 720 (Medical-Dental Office Building) based on 11,000 square feet.

As seen in Table 3, the previous land uses are estimated to have generated nearly twice as many vehicle trips as the proposed senior living residential redevelopment during the weekday morning and weekday afternoon peak hours. The skilled nursing facility of the previous land use required far more employees than the proposed assisted living facility and the previous medical offices would have a higher number of employees and patients/visitors than the proposed independent living portion of the redevelopment. Together, the proposed redevelopment is shown to result in a significant decrease in the number of trips entering and exiting the project site, not just during the peak hours, but over the course of an entire typical day.

The proposed project is estimated to generate approximately 510 vehicle trips daily during a typical weekday while the previous land use is estimated to have generated approximately 925 vehicle trips per typical weekday. This reduced number of vehicle trips accessing the project site would also be expected to reduce the demands on parking and capacity of the adjacent roadways and intersections.

### ***Project Trip Distribution and Assignment***

The additional traffic estimated to be generated by the proposed redevelopment was distributed onto the study area roadways and intersections based on the existing travel patterns of the adjacent roadways. Vehicle trips accessing the project site were assigned to the site driveways based on ease of access to and from the roadway network. The resulting arrival and departure patterns are presented in Figure 6 and are documented in the traffic projection model found in Appendix D.

The project-related traffic was then assigned to the surrounding roadway network based on the project trip distribution patterns presented in Figure 6. The resulting distributed new

project trips are shown in Figure 7 and Figure 8 for the weekday morning and weekday afternoon peak hours, respectively.

### ***2026 Build Traffic Volumes***

To establish the 2026 Build peak hour traffic volumes, the distributed new project trips were then added to the 2026 No Build peak hour traffic volumes to reflect the 2026 Build peak hour traffic volumes. The resulting 2026 Build weekday morning and afternoon peak hour traffic volumes are presented in Figure 9 and Figure 10, respectively, and are documented in the traffic projection model presented in Appendix D of this report.

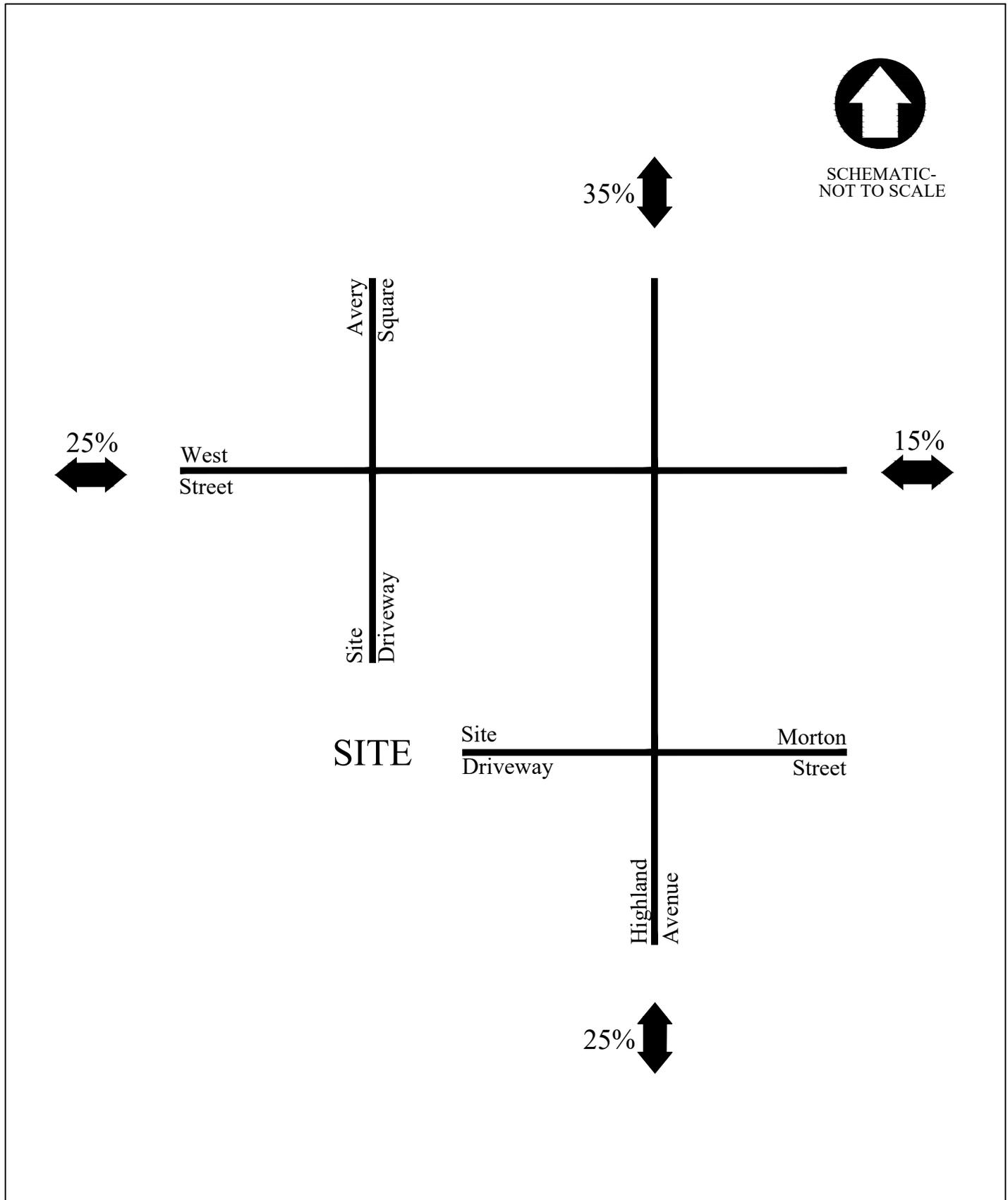
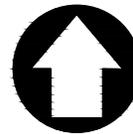
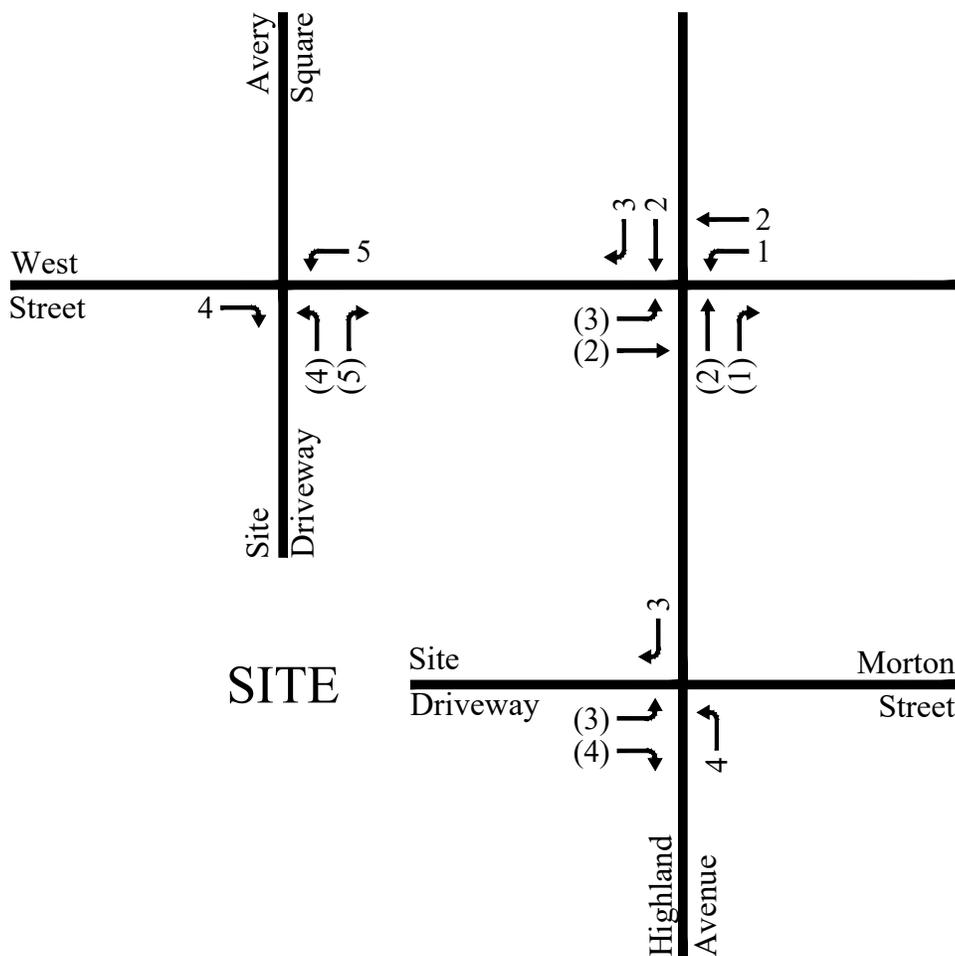


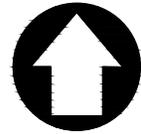
Figure 6  
Directions of Arrival and Departure  
Peak Hour Traffic Volumes  
Senior Living Residential Redevelopment  
Needham, Massachusetts



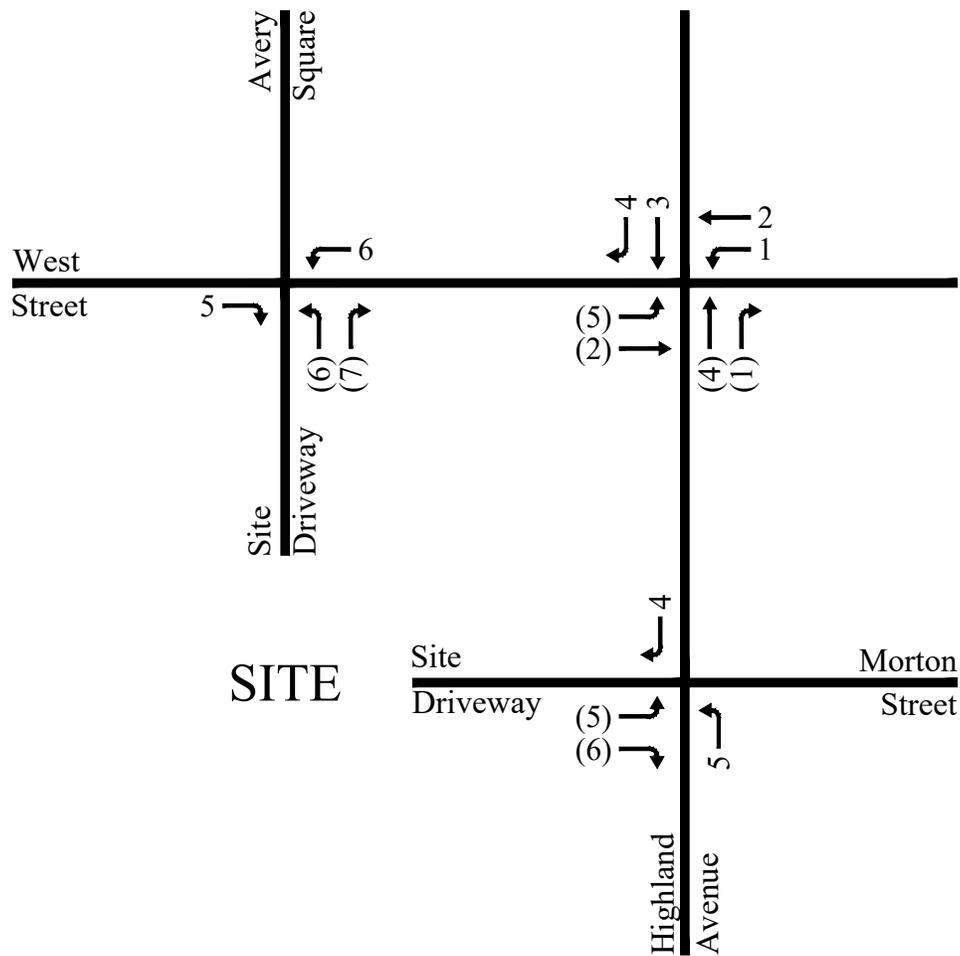
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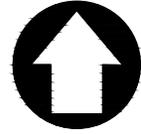
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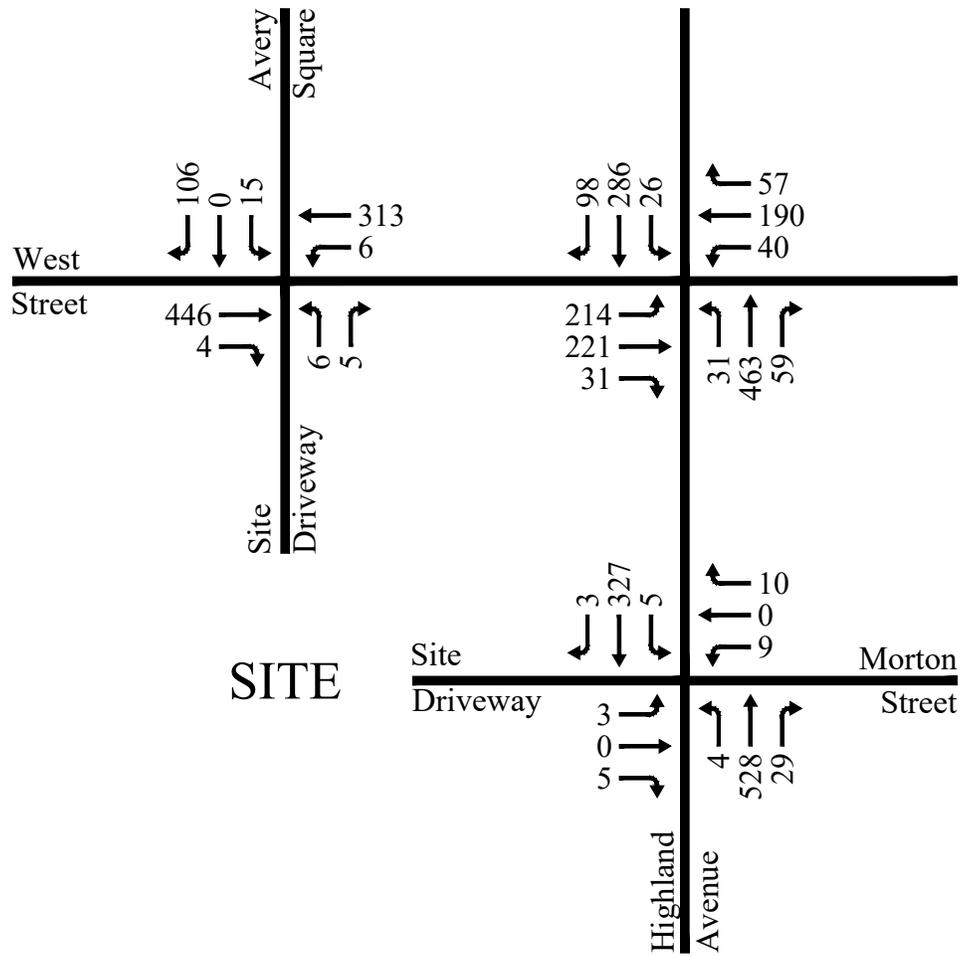
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NOT TO SCALE



Legend  
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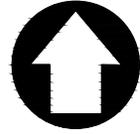


SCHEMATIC-  
NOT TO SCALE



**SITE**

Figure 9  
2026 Build Weekday Morning  
Peak Hour Traffic Volumes  
Senior Living Residential Redevelopment  
Needham, Massachusetts



SCHEMATIC-  
NOT TO SCALE

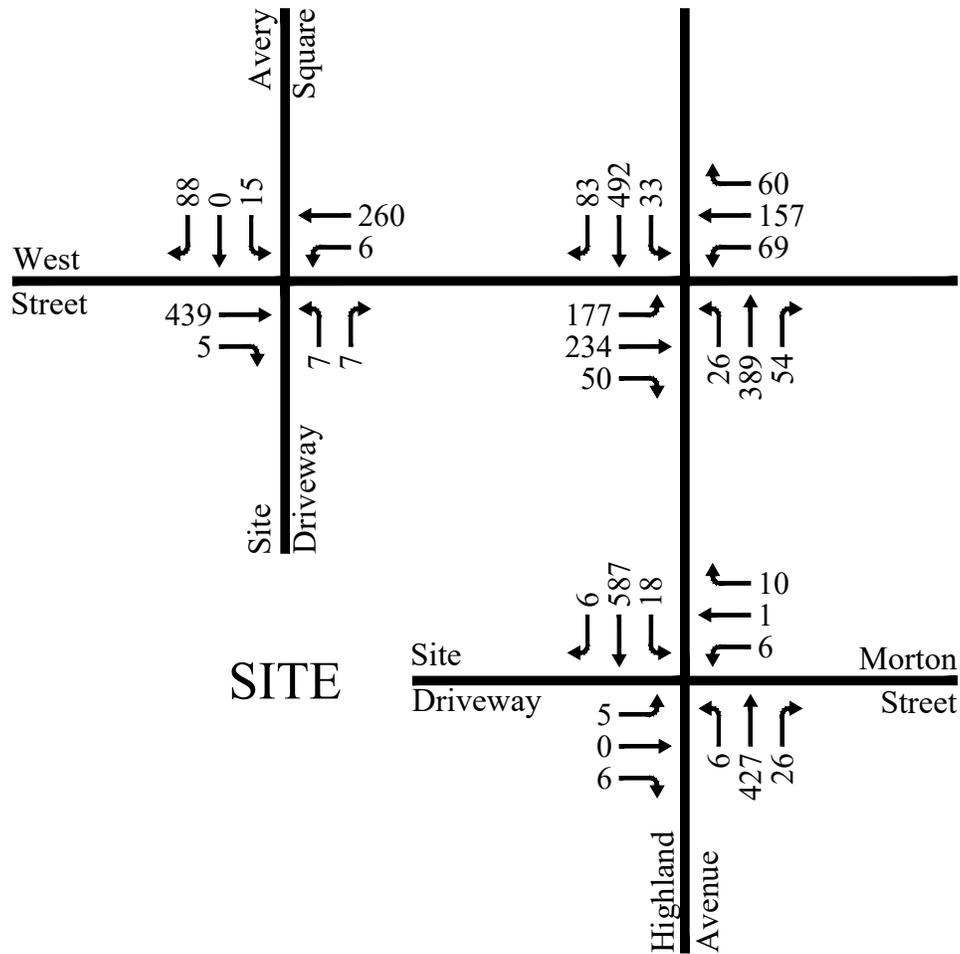


Figure 10  
2026 Build Weekday Afternoon  
Peak Hour Traffic Volumes  
Senior Living Residential Redevelopment  
Needham, Massachusetts

## TRAFFIC OPERATIONS ANALYSIS

In previous sections of this report, the quantity of traffic at the study area intersections has been discussed. This section describes the overall quality of the traffic flow at the study area intersections during the weekday morning and weekday afternoon peak hours. As a basis for this assessment, intersection capacity analysis was conducted using the Synchro capacity analysis software at the study area intersections under the 2019 Existing, 2026 No Build and 2026 Build peak hour traffic conditions. The analysis is based on Synchro capacity analysis methodologies and procedures contained in the *Highway Capacity Manual, 6<sup>th</sup> Edition* (HCM), which is summarized in Appendix E. A discussion of the evaluation criteria and a summary of the results of the capacity analysis are presented below.

### *Level-of-Service Criteria*

Average total vehicle delay is reported as level-of-service (LOS) on a scale of A to F. LOS A represents delays of 10 seconds or less and LOS F represents delays in excess of 50 seconds for unsignalized intersections and greater than 80 seconds for signalized intersections. A more detailed description of the LOS criteria is provided in Appendix E.

### *Capacity Analysis Results*

Intersection capacity analysis was conducted using Synchro capacity analysis software for the study area intersections to evaluate the 2019 Existing, 2026 No Build and 2026 Build traffic conditions during the weekday morning and weekday afternoon peak hours. As mentioned previously, the peak hour traffic volumes utilized as part of this analysis are provided in the traffic projection model, attached in Appendix D of this report.

The Synchro capacity analysis results for the 2019 Existing, 2026 No Build and 2026 Build traffic conditions are presented in Appendix F, Appendix G, and Appendix H, respectively. The overall results of the intersection capacity analysis for the signalized intersection of West Street at Highland Avenue are presented in Table 4 below, and the results for the critical approach at each of the unsignalized study area intersections are presented in Table 5. A more detailed summary of the capacity analysis for each study area intersection is provided in Appendix I. The results of the specific capacity analysis at the study area intersections are discussed below.

As stated previously, the study area intersections that were counted and analyzed during the weekday peak hours under the 2019 existing conditions do not include the site in operation under its previous land use. Therefore, the analysis summarized below does not reflect the operations that would have been associated with the previously operational site.

**Table 4: Signalized Intersection Capacity Analysis**

Intersection	Peak Period	2019 Existing			2026 No Build			2026 Build		
		LOS <sup>(1)</sup>	Delay <sup>(2)</sup>	V/C <sup>(3)</sup>	LOS	Delay	V/C	LOS	Delay	V/C
West Street at	AM	D	41.7	0.70	D	45.7	0.75	D	46.1	0.75
Highland Avenue	PM	D	40.3	0.71	D	45.4	0.75	D	45.8	0.76

(1) Level-of-Service

(2) Average vehicle delay in seconds

(3) Volume to capacity ratio

As shown in Table 4, the signalized intersection of West Street at Highland Avenue is shown to currently operate at overall LOS D during the weekday morning and weekday afternoon peak hours. Under future conditions, with and without the proposed project in place, the intersection is shown to continue to operate at overall LOS D during both peak hours. All movements at the intersection are projected to operate at the same LOS under 2026 No Build and 2026 Build conditions indicating limited impact on traffic operations due to the proposed redevelopment.

**Table 5: Unsignalized Intersection Capacity Analysis**

Intersection	Movement	Peak Period	2019 Existing			2026 No Build			2026 Build		
			LOS <sup>(1)</sup>	Delay <sup>(2)</sup>	V/C <sup>(3)</sup>	LOS	Delay	V/C	LOS	Delay	V/C
West Street at	NB LR	AM	C	21.7	0.02	C	23.9	0.02	C	18.8	0.04
Site Driveway/		PM	C	19.5	0.02	C	21.2	0.02	C	17.1	0.05
Avery Square	SB LTR	AM	B	13.1	0.25	B	13.9	0.29	B	14.0	0.29
		PM	B	12.2	0.19	B	12.7	0.21	B	12.9	0.22
Highland Avenue	EB LTR <sup>(4)</sup>	AM	B	10.2	0.01	B	10.4	0.01	C	16.1	0.03
at Site Driveway/		PM	A	0.0	0.00	A	0.0	0.00	C	23.3	0.06
Morton Street	WB LTR	AM	C	18.0	0.08	C	19.7	0.10	C	19.9	0.10
		PM	C	19.9	0.09	C	21.4	0.10	C	22.1	0.10

(1) Level-of-Service

(2) Average vehicle delay in seconds

(3) Volume to capacity ratio

(4) Change in LOS from No Build to Build due to the current vacant condition of the project site

As shown in Table 5, the northbound site driveway approach to West Street is shown to currently operate at LOS C during the weekday morning and weekday afternoon peak hours. Under 2026 No Build and 2026 Build conditions, the site driveway approach is projected to continue to operate at LOS C during both peak hours analyzed. The southbound Avery Square approach is shown to currently operate at LOS B during the weekday morning and afternoon peak hours, and is projected to continue to operate at LOS B under future conditions, with or without the proposed project in place.

At the site driveway opposite Morton Street on Highland Avenue, the stop-controlled westbound Morton Street approach is shown to currently operate at LOS C during the weekday morning and weekday afternoon peak hours. Under future conditions with or without the proposed project in place, the Morton Street westbound approach is projected to continue to operate at LOS C during both peak hours with a negligible amount of additional average vehicle delay. Under 20206 Build conditions, the site driveway on Highland Avenue is projected to operate at LOS C during both the weekday morning and weekday afternoon peak hours.

***Site-Generated Parking Demand***

The senior living residential redevelopment proposes to include a total of 148 parking spaces on-site, including 34 interior garage spaces and 114 exterior spaces. Ten of the interior garage spaces would be tandem spaces for individuals living in the independent living units that may have two cars.

In order to determine the projected parking demand for the senior living residential redevelopment, parking generation data from the ITE publication, *Parking Generation Manual, 5th Edition* was referenced. The *Parking Generation Manual* provides parking generation information for various land uses compiled from studies conducted by members nationwide. Weekday parking demand estimates for the proposed redevelopment were developed based on data presented in this publication for Land Use Codes 252 (Senior Adult Housing – Attached) and 254 (Assisted Living), and are presented in Table 6 below.

**Table 6: Proposed Site Parking Generation**

Description	Size	Weekday Peak Parking Demand
Senior Adult Housing <sup>(1)</sup>	71 Dwelling Units	43
<u>Assisted Living<sup>(2)</sup></u>	<u>96 Beds</u>	<u>37</u>
Total Estimated Parking Demand		80

(1) ITE Land Use Code 252 (Senior Adult Housing - Attached), based on 71 dwelling units.

(2) ITE Land Use Code 254 (Assisted Living), based on 96 beds.

As shown in Table 6, the proposed senior living residential redevelopment is projected to generate an average peak parking demand of 80 vehicles during a typical weekday based on ITE data. The project proposes to include 148 parking spaces: 34 interior garage spaces and 114 exterior spaces. Comparing the projected parking demand to the proposed parking supply shows that the site would have a peak period utilization rate of approximately 54%.

The *Parking Generation Manual* also provides information indicating how much parking is supplied at each of the studies included in the analysis. For senior adult attached housing, an average parking supply ratio of 0.9 parking spaces per independent senior housing unit was

identified. For an assisted living site that is located within a half mile of rail transit, an average parking supply ratio of 0.4 parking spaces per unit was identified. Using these average supply ratios provided by ITE, the number of parking spaces that would be supplied for a project similar in size and type to the proposed site would be approximately 98 parking spaces. The proposed project is providing 50 additional parking spaces than the parking supplies calculated based on ITE.

The zoning proposal for this project would include the following parking supply requirements:

- 0.5 parking spaces per bed for the assisted living community (96 beds proposed)
- 1 parking space for every two employees on the largest shift of the assisted living community (58 employees on the large shift)
- 1 parking space per unit of independent living (71 units proposed)

Based on a review of the data presented within the *Parking Generation Manual* for independent living, the proposed supply requirement of 1 parking space per independent dwelling unit is considered to be conservative. As identified previously, data from the *Parking Generation Manual* for independent senior living suggests that facilities where data was collected provided a parking supply ratio of 0.9 spaces per independent dwelling unit. Within the Town of Needham's Elder Services Zoning District, the parking supply requirement is 0.5 parking spaces per independent living dwelling unit.

Based on the proposed parking supply rates and the proposed build program, the zoning proposal would require 148 parking spaces and the project proposes to include 148 parking spaces.

Although the proposed project is shown to provide sufficient on-site parking to meet the anticipated average peak parking demands of the proposed senior living residential redevelopment, there are other sources of parking that could further increase the number of spaces available to residents, employees, and visitors of the site. As allowed by Section 5.1.1.7 of the Town of Needham zoning by-laws, the former site included the use of an additional 20 on-street spaces (on Highland Avenue) that are connected to the project site and could theoretically be included as part of the overall parking supply ratio for the redevelopment project. Additionally, there is a variety of on-street parking that could be used by visitors in close proximity to the project site which would further reduce the need for additional parking spaces to be supplied on site.

The previous land uses are shown to require more parking than the proposed project. Table 7, below, provides a summary of the estimated parking demand associated with the previous uses on the site, which included assisted living, a skilled nursing facility, and medical office land uses.

**Table 7: Previous Site Parking Demand**

Description	Size	Weekday Peak Parking Demand
Assisted Living <sup>(1)</sup>	60 Beds	26
Nursing Facility <sup>(2)</sup>	142 Beds	52
<u>Medical Office</u> <sup>(3)</sup>	<u>11,000 sf</u>	<u>32</u>
Total Estimated Parking Demand		110

(1) ITE Land Use Code 254 (Assisted Living), based on 60 beds.

(2) ITE Land Use Code 620 (Nursing Home), based on 142 beds.

(3) ITE Land Use Code 720 (Medical-Dental Office Building) based on 11,000 square feet.

As shown, the previous land uses are estimated to have had a peak weekday parking demand of approximately 110 vehicles which is 30 more parking spaces than the parking demand of the proposed senior living residential redevelopment.

Based on the parking review above, the proposed project is expected to provide a parking supply that exceeds the peak demand of the proposed assisted living and independent living uses on site. The analysis also shows that the proposed project is estimated to have a lesser parking demand than the previous land uses on site. The reduced parking demand of the redevelopment compared to the previous land uses may also reduce the need for on-street parking within the study area.

### *Site Access and Circulation*

Access to the project site is proposed to continue to be provided by two full-access driveways, one located on West Street opposite Avery Square, and one located on Highland Avenue opposite Morton Street. The proposed site driveways would not be significantly modified as part of the project and therefore, the safety and operations at the driveways are not expected to be impacted. The driveways are estimated to experience less traffic volume than the previously occupied site, further reducing potential operational issues associated with the site driveways.

### *Sight Distance*

A field review of the available sight distance was conducted at the site driveways on West Street and Highland Avenue. The American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on Geometric Design, 2018 Edition*, defines minimum and recommended sight distances at intersections. The minimum sight distance is based on the required stopping sight distance (SSD) for vehicles traveling along the main road. According to AASHTO, "If the available sight distance for an entering or

crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient time to anticipate and avoid collisions.”

In order to accurately assess required sight distance on West Street, a speed study of vehicles at free flow speeds was performed on West Street near the project site. The recorded speeds were reviewed and the 85<sup>th</sup> percentile speeds were determined to be 24 mph in the eastbound direction and 23 mph in the westbound direction. Because the measured speeds are lower than the posted advisory speed limits on West Street, in order to present a conservative analysis, the posted speed limits of 25 mph in the eastbound direction and 30 mph in the westbound direction were utilized to determine the required sight distance at the site driveway on West Street. For the site driveway on Highland Avenue, the 85<sup>th</sup> percentile speeds measured from the ATR counts were 32 mph in the northbound direction and 34 mph in the southbound direction and were utilized accordingly for the sight distance review.

Table 8 summarizes the AASHTO sight distance standards for the posted speeds on West Street, the 85<sup>th</sup> percentile speeds on Highland Avenue, and the available sight distance measured at each driveway.

**Table 8: Sight Distance Requirements**

Site Driveway Location	Looking	Speed Limit (mph)	85th % Speed (mph)	SSD <sup>(1)</sup> Required	Sight Distance Measured	Meets Required SSD?
West Street	Left (West)	25	24	155	210	Yes
	Right (East)	30	23	200	500+	Yes
Highland Avenue	Left (North)	30	34	240	150	No
	Right (South)	25	32	220	500+	Yes

(1) AASHTO stopping sight distance (see AASHTO equations 3-2 and 3-3) equations for the speed limits or 85th percentile speeds.

(2) AASHTO intersection sight distance (see AASHTO equations 9-1 and 9-2) equations for the speed limits or 85th percentile speeds.

As shown in Table 8, the available sight distance for vehicles exiting the site onto West Street looking left towards the west was measured to be approximately 210 feet which exceeds the required AASHTO sight distances for the 30 mph advisory speed limit. At the West Street site driveway looking right towards the east, available sight distance was measured at more than 500 feet down West Street, which exceeds the required and recommended AASHTO sight distances for the 25-mph advisory speed limit. Additional sight lines are available toward vehicles turning from Highland Avenue who would be expected to travel at slower rates of speed.

At the site driveway on Highland, the available sight distance for vehicles exiting the site looking left towards the north was observed to be restricted to approximately 150 feet due to existing on-street parking on the west side of Highland Avenue. The project is not proposing any site changes which would be expected to diminish sight lines more than the existing condition. The available sight distance would not meet the required AASHTO sight distance for the measured 85<sup>th</sup> percentile speed of 34 mph in the southbound direction. However, it is expected that vehicles exiting the site driveway would exit in two stages, first crossing the sidewalk then turning onto Highland Avenue. As such, sight distance at the site driveway was measured at a point approximately seven feet from the edge of Highland Avenue. The sight distance looking to the left from this point was measured to be approximately 400 feet, which exceeds the AASHTO sight distance for the measured 85<sup>th</sup> percentile speed of 34 mph in the southbound direction. At the Highland Avenue site driveway looking right towards the south, available sight distance was measured at more than 500 feet, which exceeds the required AASHTO sight distances for the measured 85<sup>th</sup> percentile speed of 32 mph in the northbound direction.

## CONCLUSION

The proposed project includes the redevelopment of the current vacant building at 100-110 West Street in Needham, MA into a senior living residential redevelopment consisting of 83 units of senior assisted living and 71 units of independent senior. Access to the site would continue to be provided via existing full-access driveways on West Street and Highland Avenue.

Based on the analysis presented in this assessment, the proposed project is estimated to generate approximately 32 new vehicle trips (16 entering vehicles and 16 exiting vehicles) during the weekday morning peak hour and approximately 52 new vehicle trips (26 entering vehicles and 26 exiting vehicles) during the weekday afternoon peak hour compared to the existing vacant site. The trip generation of the proposed redevelopment is shown to be significantly less than that of the previous land uses during the weekday peak hours and over the course of a typical work day.

The capacity analysis indicates that the proposed senior living residential redevelopment is projected to have a negligible impact on the operations of the roadway network adjacent to the site. The signalized intersection of West Street at Highland Avenue is projected to operate at overall LOS D during the weekday morning and weekday afternoon peak hours under 2026 future conditions with or without the proposed project in place. The intersection is shown to experience an increase of less than a half second of overall average vehicle delay during the analyzed peak hours as a result of the project. The project is projected to result in a negligible increase in delay on the stop-controlled Avery Square and Morton Street approaches opposite the site driveways. During both the weekday morning and weekday afternoon peak hours, the exiting movements from the site driveway on West Street are projected to operate at LOS B and the exiting movements from the site driveway on Highland Avenue are projected to operate at LOS C.

Available sight distances at the site driveway on West Street exceed required sight distances. Although the project is not proposing changes to the site access, sight distance looking north from the site driveway on Highland Avenue does not currently meet sight distance requirements. However, available sight lines are expected to provide safe access to the site via two-stage exiting, where a driver can assess the safety of turning onto Highland Avenue by moving closer to the roadway before making a turning decision from a distance closer to Highland Avenue than the AASHTO standard distance. With two-stage exiting, available sight distance looking north along Highland Avenue would exceed that required by AASHTO standards.

Based on the parking supply requirements included in the zoning proposal for the project would, the proposed project would require 148 parking spaces. A review of estimated parking demand shows that the proposed parking supply requirements and the proposed on-site parking supply of 148 spaces is expected to exceed the typical peak parking demand

of 80 spaces associated with the proposed redevelopment. The reduced parking demand of the redevelopment compared to the previous land uses may also reduce the need for on-street parking within the study area.

Based on a review of the analysis contained within this traffic impact study, the proposed senior living residential redevelopment is not shown to have a significant impact on the overall traffic operations of the study area intersections and roadways.

# Appendix for Traffic Impact Study

## Senior Living Residential Redevelopment

100-110 West Street  
Needham, MA



Prepared by  
**McMahon Associates, Inc.**  
120 Water Street, 4<sup>th</sup> Floor  
Boston, MA 02109  
617.556.0020

Prepared for  
**LCB Senior Living**

April 2020



## **APPENDIX A**

### Turning Movement Counts





120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: Morton Street/Hildreth Place  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at Morton-Hildreth AM  
 Site Code : 12051901  
 Start Date : 12/5/2019  
 Page No : 1

**Groups Printed- Cars - Heavy Vehicles - Bikes by Direction**

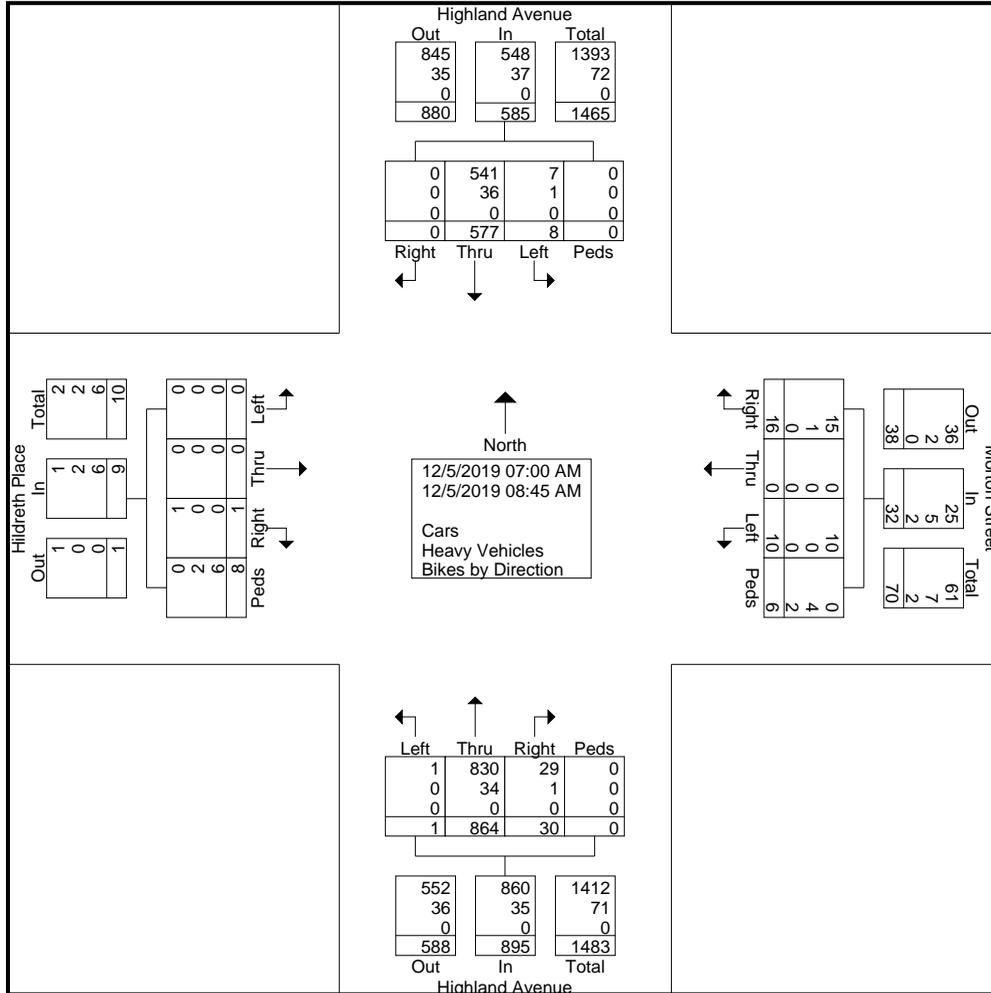
Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	50	2	0	52	2	0	0	1	3	0	70	0	0	70	0	0	0	0	0	125
07:15 AM	0	83	0	0	83	1	0	0	1	2	1	90	0	0	91	0	0	0	0	0	176
07:30 AM	0	85	0	0	85	3	0	1	1	5	1	116	0	0	117	0	0	0	4	4	211
07:45 AM	0	71	1	0	72	1	0	5	0	6	10	149	0	0	159	1	0	0	3	4	241
Total	0	289	3	0	292	7	0	6	3	16	12	425	0	0	437	1	0	0	7	8	753
08:00 AM	0	82	1	0	83	3	0	2	0	5	7	122	0	0	129	0	0	0	1	1	218
08:15 AM	0	65	1	0	66	4	0	0	2	6	4	99	0	0	103	0	0	0	0	0	175
08:30 AM	0	73	2	0	75	1	0	1	1	3	5	102	0	0	107	0	0	0	0	0	185
08:45 AM	0	68	1	0	69	1	0	1	0	2	2	116	1	0	119	0	0	0	0	0	190
Total	0	288	5	0	293	9	0	4	3	16	18	439	1	0	458	0	0	0	1	1	768
Grand Total	0	577	8	0	585	16	0	10	6	32	30	864	1	0	895	1	0	0	8	9	1521
Apprch %	0	98.6	1.4	0		50	0	31.2	18.8		3.4	96.5	0.1	0		11.1	0	0	88.9		
Total %	0	37.9	0.5	0	38.5	1.1	0	0.7	0.4	2.1	2	56.8	0.1	0	58.8	0.1	0	0	0.5	0.6	
Cars	0	541	7	0	548	15	0	10	0	25	29	830	1	0	860	1	0	0	0	1	1434
% Cars	0	93.8	87.5	0	93.7	93.8	0	100	0	78.1	96.7	96.1	100	0	96.1	100	0	0	0	11.1	94.3
Heavy Vehicles																					
% Heavy Vehicles	0	6.2	12.5	0	6.3	6.2	0	0	66.7	15.6	3.3	3.9	0	0	3.9	0	0	0	25	22.2	5.2
Bikes by Direction	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	8
% Bikes by Direction	0	0	0	0	0	0	0	0	33.3	6.2	0	0	0	0	0	0	0	0	75	66.7	0.5



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: Morton Street/Hildreth Place  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at Morton-Hildreth AM  
 Site Code : 12051901  
 Start Date : 12/5/2019  
 Page No : 2



Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	83	0	0	83	1	0	0	1	2	1	90	0	0	91	0	0	0	0	0	176
07:30 AM	0	85	0	0	85	3	0	1	1	5	1	116	0	0	117	0	0	0	4	4	211
07:45 AM	0	71	1	0	72	5	0	0	0	5	10	149	0	0	159	1	0	0	0	0	241
08:00 AM	0	82	1	0	83	3	0	2	0	5	7	122	0	0	129	0	0	0	1	1	218
Total Volume	0	321	2	0	323	8	0	8	2	18	19	477	0	0	496	1	0	0	8	9	846
% App. Total	0	99.4	0.6	0		44.4	0	44.4	11.1		3.8	96.2	0	0		11.1	0	0	88.9		
PHF	.000	.944	.500	.000	.950	.667	.000	.400	.500	.750	.475	.800	.000	.000	.780	.250	.000	.000	.500	.563	.878



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: Morton Street/Hildreth Place  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at Morton-Hildreth AM  
 Site Code : 12051901  
 Start Date : 12/5/2019  
 Page No : 1

Groups Printed- Cars

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	45	1	0	46	2	0	0	0	2	0	65	0	0	65	0	0	0	0	0	113
07:15 AM	0	78	0	0	78	1	0	0	0	1	1	83	0	0	84	0	0	0	0	0	163
07:30 AM	0	77	0	0	77	3	0	1	0	4	1	113	0	0	114	0	0	0	0	0	195
07:45 AM	0	70	1	0	71	1	0	5	0	6	10	145	0	0	155	1	0	0	0	1	233
Total	0	270	2	0	272	7	0	6	0	13	12	406	0	0	418	1	0	0	0	1	704
08:00 AM	0	79	1	0	80	3	0	2	0	5	7	117	0	0	124	0	0	0	0	0	209
08:15 AM	0	62	1	0	63	3	0	0	0	3	4	96	0	0	100	0	0	0	0	0	166
08:30 AM	0	69	2	0	71	1	0	1	0	2	5	98	0	0	103	0	0	0	0	0	176
08:45 AM	0	61	1	0	62	1	0	1	0	2	1	113	1	0	115	0	0	0	0	0	179
Total	0	271	5	0	276	8	0	4	0	12	17	424	1	0	442	0	0	0	0	0	730
Grand Total	0	541	7	0	548	15	0	10	0	25	29	830	1	0	860	1	0	0	0	1	1434
Apprch %	0	98.7	1.3	0		60	0	40	0		3.4	96.5	0.1	0		100	0	0	0		
Total %	0	37.7	0.5	0	38.2	1	0	0.7	0	1.7	2	57.9	0.1	0	60	0.1	0	0	0	0.1	

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:30 AM	0	77	0	0	77	3	0	1	0	4	1	113	0	0	114	0	0	0	0	0	195
07:45 AM	0	70	1	0	71			5	0	6	10	145	0	0	155	1	0	0	0	1	233
08:00 AM	0	79	1	0	80	3	0	2	0	5	7	117	0	0	124	0	0	0	0	0	209
08:15 AM	0	62	1	0	63	3	0	0	0	3	4	96	0	0	100	0	0	0	0	0	166
Total Volume	0	288	3	0	291	10	0	8	0	18	22	471	0	0	493	1	0	0	0	1	803
% App. Total	0	99	1	0		55.6	0	44.4	0		4.5	95.5	0	0		100	0	0	0		
PHF	.000	.911	.750	.000	.909	.833	.000	.400	.000	.750	.550	.812	.000	.000	.795	.250	.000	.000	.000	.250	.862

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
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 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at Morton-Hildreth AM  
 Site Code : 12051901  
 Start Date : 12/5/2019  
 Page No : 1

**Groups Printed- Heavy Vehicles**

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	5	1	0	6	0	0	0	1	1	0	5	0	0	5	0	0	0	0	0	0
07:15 AM	0	5	0	0	5	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0
07:30 AM	0	8	0	0	8	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	1	1	6
<b>Total</b>	0	19	1	0	20	0	0	0	1	1	0	19	0	0	19	0	0	0	1	1	41
08:00 AM	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	0	0	0	1	1	9
08:15 AM	0	3	0	0	3	1	0	0	2	3	0	3	0	0	3	0	0	0	0	0	9
08:30 AM	0	4	0	0	4	0	0	0	1	1	0	4	0	0	4	0	0	0	0	0	9
08:45 AM	0	7	0	0	7	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	11
<b>Total</b>	0	17	0	0	17	1	0	0	3	4	1	15	0	0	16	0	0	0	1	1	38
<b>Grand Total</b>	0	36	1	0	37	1	0	0	4	5	1	34	0	0	35	0	0	0	2	2	79
Apprch %	0	97.3	2.7	0		20	0	0	80		2.9	97.1	0	0		0	0	0	100		
Total %	0	45.6	1.3	0	46.8	1.3	0	0	5.1	6.3	1.3	43	0	0	44.3	0	0	0	2.5	2.5	

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	5	<b>1</b>						<b>1</b>	<b>1</b>	0	5	0	0	5	0	0	0	0	0	<b>12</b>
07:15 AM	0	5	0	0	5	0	0	0	0	0	0	7			7	0	0	0	0	0	12
07:30 AM	0	<b>8</b>	0	0	<b>8</b>	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	11
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	<b>1</b>	<b>1</b>	6
<b>Total Volume</b>	0	19	1	0	20	0	0	0	1	1	0	19	0	0	19	0	0	0	1	1	41
<b>% App. Total</b>	0	95	5	0		0	0	0	100		0	100	0	0		0	0	0	100		
<b>PHF</b>	.000	.594	.250	.000	.625	.000	.000	.000	.250	.250	.000	.679	.000	.000	.679	.000	.000	.000	.250	.250	.854

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

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 E/W: Morton Street/Hildreth Place  
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 Client: LCB Senior Living

File Name : Highland at Morton-Hildreth AM  
 Site Code : 12051901  
 Start Date : 12/5/2019  
 Page No : 1

**Groups Printed- Bikes by Direction**

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	4	4	5
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	8
08:00 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	8
Apprch %	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	100	100	
Total %	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	0	0	75	75	

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	4	4	5
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total Volume	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	8
% App. Total	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	100	100	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.375	.375	.400

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM



120 Water Street, 4th Floor  
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N/S: Highland Avenue  
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 Client: LCB Senior Living

File Name : Highland at Morton-Hildreth PM  
 Site Code : 12041900  
 Start Date : 12/4/2019  
 Page No : 1

**Groups Printed- Cars - Heavy Vehicles - Bikes by Direction**

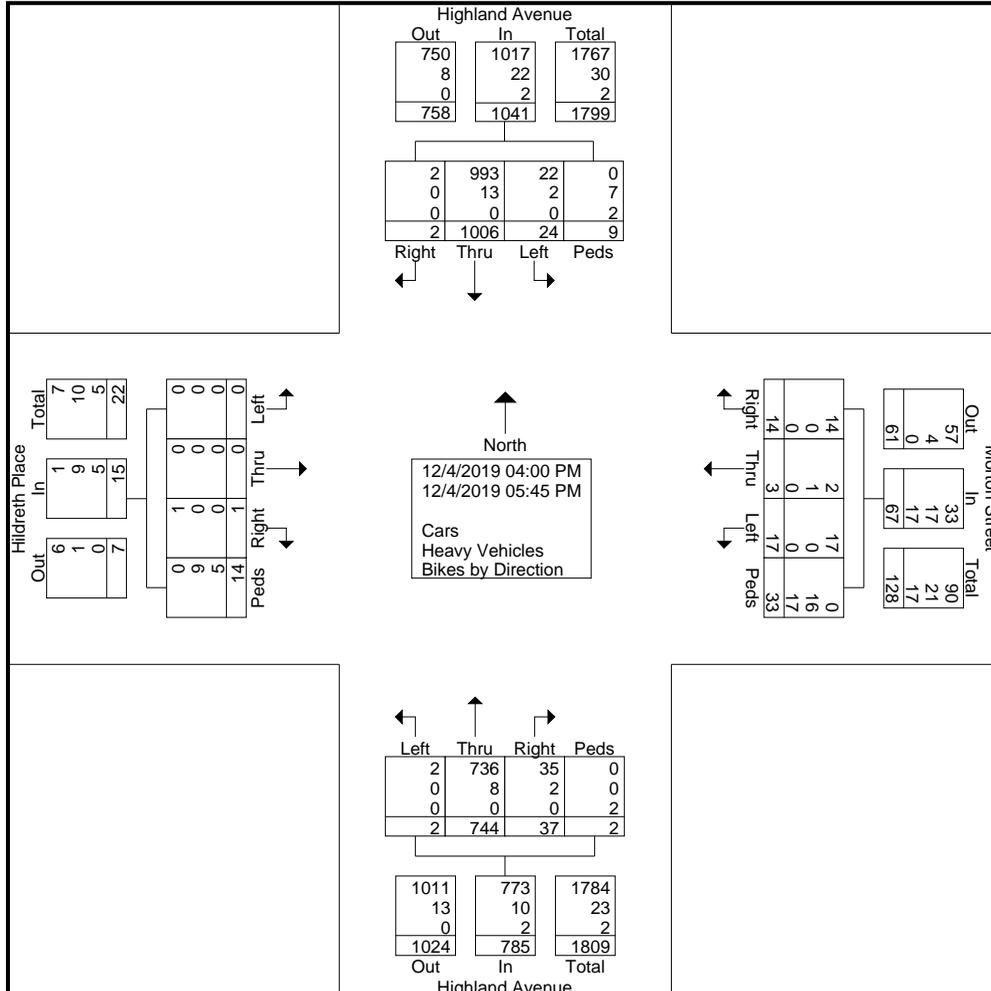
Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	109	1	0	110	1	0	2	1	4	0	98	0	0	98	1	0	0	3	4	216
04:15 PM	0	118	1	0	119	3	0	3	13	19	5	97	0	0	102	0	0	0	3	3	243
04:30 PM	1	112	4	0	117	3	0	0	12	15	6	117	0	0	123	0	0	0	1	1	256
04:45 PM	0	139	4	3	146	4	1	2	3	10	5	91	0	0	96	0	0	0	2	2	254
<b>Total</b>	<b>1</b>	<b>478</b>	<b>10</b>	<b>3</b>	<b>492</b>	<b>11</b>	<b>1</b>	<b>7</b>	<b>29</b>	<b>48</b>	<b>16</b>	<b>403</b>	<b>0</b>	<b>0</b>	<b>419</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>10</b>	<b>969</b>
05:00 PM	1	145	7	1	154	1	0	4	0	5	8	85	0	0	93	0	0	0	1	1	253
05:15 PM	0	130	1	0	131	1	0	0	1	2	4	86	1	0	91	0	0	0	1	1	225
05:30 PM	0	137	2	0	139	1	0	3	0	4	4	85	0	0	89	0	0	0	0	0	232
05:45 PM	0	116	4	5	125	0	2	3	3	8	5	85	1	2	93	0	0	0	3	3	229
<b>Total</b>	<b>1</b>	<b>528</b>	<b>14</b>	<b>6</b>	<b>549</b>	<b>3</b>	<b>2</b>	<b>10</b>	<b>4</b>	<b>19</b>	<b>21</b>	<b>341</b>	<b>2</b>	<b>2</b>	<b>366</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>939</b>
<b>Grand Total</b>	<b>2</b>	<b>1006</b>	<b>24</b>	<b>9</b>	<b>1041</b>	<b>14</b>	<b>3</b>	<b>17</b>	<b>33</b>	<b>67</b>	<b>37</b>	<b>744</b>	<b>2</b>	<b>2</b>	<b>785</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>15</b>	<b>1908</b>
Apprch %	0.2	96.6	2.3	0.9		20.9	4.5	25.4	49.3		4.7	94.8	0.3	0.3		6.7	0	0	93.3		
Total %	0.1	52.7	1.3	0.5	54.6	0.7	0.2	0.9	1.7	3.5	1.9	39	0.1	0.1	41.1	0.1	0	0	0.7	0.8	
Cars	2	993	22	0	1017	14	2	17	0	33	35	736	2	0	773	1	0	0	0	1	1824
% Cars	100	98.7	91.7	0	97.7	100	66.7	100	0	49.3	94.6	98.9	100	0	98.5	100	0	0	0	6.7	95.6
Heavy Vehicles	0	13	2	7	22	0	1	0	16	17	2	8	0	0	10	0	0	0	9	9	58
% Heavy Vehicles	0	1.3	8.3	77.8	2.1	0	33.3	0	48.5	25.4	5.4	1.1	0	0	1.3	0	0	0	64.3	60	3
Bikes by Direction	0	0	0	2	2	0	0	0	17	17	0	0	0	2	2	0	0	0	5	5	26
% Bikes by Direction	0	0	0	22.2	0.2	0	0	0	51.5	25.4	0	0	0	100	0.3	0	0	0	35.7	33.3	1.4



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File Name : Highland at Morton-Hildreth PM  
 Site Code : 12041900  
 Start Date : 12/4/2019  
 Page No : 2



Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	118	1	0	119	3	0	3	13	19	5	97	0	0	102	0	0	0	3	3	243
04:30 PM	1											117			123	0	0	0	1	1	256
04:45 PM	0	139	4	3		4	1				8	85	0	0	93	0	0	0	1	1	253
<b>05:00 PM</b>	<b>1</b>	<b>145</b>	<b>7</b>	<b>1</b>	<b>154</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>5</b>	<b>8</b>	<b>85</b>	<b>0</b>	<b>0</b>	<b>93</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>253</b>
Total Volume	2	514	16	4	536	11	1	9	28	49	24	390	0	0	414	0	0	0	7	7	1006
% App. Total	0.4	95.9	3	0.7		22.4	2	18.4	57.1		5.8	94.2	0	0		0	0	0	100		
PHF	.500	.886	.571	.333	.870	.688	.250	.563	.538	.645	.750	.833	.000	.000	.841	.000	.000	.000	.583	.583	.982



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 Site Code : 12041900  
 Start Date : 12/4/2019  
 Page No : 1

Groups Printed- Cars

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	107	1	0	108	1	0	2	0	3	0	97	0	0	97	1	0	0	0	1	209
04:15 PM	0	116	1	0	117	3	0	3	0	6	5	95	0	0	100	0	0	0	0	0	223
04:30 PM	1	112	4	0	117	3	0	0	0	3	6	115	0	0	121	0	0	0	0	0	241
04:45 PM	0	138	4	0	142	4	1	2	0	7	5	90	0	0	95	0	0	0	0	0	244
Total	1	473	10	0	484	11	1	7	0	19	16	397	0	0	413	1	0	0	0	1	917
05:00 PM	1	142	6	0	149	1	0	4	0	5	8	85	0	0	93	0	0	0	0	0	247
05:15 PM	0	127	1	0	128	1	0	0	0	1	4	86	1	0	91	0	0	0	0	0	220
05:30 PM	0	137	2	0	139	1	0	3	0	4	4	83	0	0	87	0	0	0	0	0	230
05:45 PM	0	114	3	0	117	0	1	3	0	4	3	85	1	0	89	0	0	0	0	0	210
Total	1	520	12	0	533	3	1	10	0	14	19	339	2	0	360	0	0	0	0	0	907
Grand Total	2	993	22	0	1017	14	2	17	0	33	35	736	2	0	773	1	0	0	0	1	1824
Apprch %	0.2	97.6	2.2	0		42.4	6.1	51.5	0		4.5	95.2	0.3	0		100	0	0	0		
Total %	0.1	54.4	1.2	0	55.8	0.8	0.1	0.9	0	1.8	1.9	40.4	0.1	0	42.4	0.1	0	0	0	0.1	

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:15 PM	0	116	1	0	117	3	0	3	0	6	5	95	0	0	100	0	0	0	0	0	223
04:30 PM	<b>1</b>										<b>115</b>			<b>121</b>							241
04:45 PM	0	138	4	0	142	<b>4</b>	<b>1</b>			<b>7</b>	5	90	0	0	95	0	0	0	0	0	244
05:00 PM	1	<b>142</b>	<b>6</b>		<b>149</b>	1	0	<b>4</b>			<b>8</b>										<b>247</b>
Total Volume	2	508	15	0	525	11	1	9	0	21	24	385	0	0	409	0	0	0	0	0	955
% App. Total	0.4	96.8	2.9	0		52.4	4.8	42.9	0		5.9	94.1	0	0		0	0	0	0		
PHF	.500	.894	.625	.000	.881	.688	.250	.563	.000	.750	.750	.837	.000	.000	.845	.000	.000	.000	.000	.000	.967

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: Morton Street/Hildreth Place  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at Morton-Hildreth PM  
 Site Code : 12041900  
 Start Date : 12/4/2019  
 Page No : 1

**Groups Printed- Heavy Vehicles**

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
04:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	2	5
04:15 PM	0	2	0	0	2	0	0	0	4	4	0	2	0	0	2	0	0	0	3	3	3	11
04:30 PM	0	0	0	0	0	0	0	0	7	7	0	2	0	0	2	0	0	0	0	0	0	9
04:45 PM	0	1	0	2	3	0	0	0	2	2	0	1	0	0	1	0	0	0	1	1	1	7
<b>Total</b>	0	5	0	2	7	0	0	0	13	13	0	6	0	0	6	0	0	0	6	6	6	32
05:00 PM	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
05:15 PM	0	3	0	0	3	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	1	5
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2
05:45 PM	0	2	1	5	8	0	1	0	2	3	2	0	0	0	2	0	0	0	2	2	2	15
<b>Total</b>	0	8	2	5	15	0	1	0	3	4	2	2	0	0	4	0	0	0	3	3	3	26
<b>Grand Total</b>	0	13	2	7	22	0	1	0	16	17	2	8	0	0	10	0	0	0	9	9	9	58
Apprch %	0	59.1	9.1	31.8		0	5.9	0	94.1		20	80	0	0		0	0	0	100			
Total %	0	22.4	3.4	12.1	37.9	0	1.7	0	27.6	29.3	3.4	13.8	0	0	17.2	0	0	0	15.5	15.5		

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
04:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	2	5
04:15 PM	0	2	0	0	2	0	0	0	4	4	0	2	0	0	2	0	0	0	3	3	3	11
04:30 PM	0	0	0	0	0	0	0	0	7	7	0	2	0	0	2	0	0	0	0	0	0	9
04:45 PM	0	1	0	2	3	0	0	0	2	2	0	1	0	0	1	0	0	0	1	1	1	7
<b>Total Volume</b>	0	5	0	2	7	0	0	0	13	13	0	6	0	0	6	0	0	0	6	6	6	32
<b>% App. Total</b>	0	71.4	0	28.6		0	0	0	100		0	100	0	0		0	0	0	100			
PHF	.000	.625	.000	.250	.583	.000	.000	.000	.464	.464	.000	.750	.000	.000	.750	.000	.000	.000	.500	.500		.727

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: Morton Street/Hildreth Place  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at Morton-Hildreth PM  
 Site Code : 12041900  
 Start Date : 12/4/2019  
 Page No : 1

**Groups Printed- Bikes by Direction**

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
04:15 PM	0	0	0	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	9
04:30 PM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	1	1	6
04:45 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	3
<b>Total</b>	0	0	0	1	1	0	0	0	16	16	0	0	0	0	0	0	0	0	3	3	20
05:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
05:15 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	0	0	0	1	1	4
<b>Total</b>	0	0	0	1	1	0	0	0	1	1	0	0	0	2	2	0	0	0	2	2	6
<b>Grand Total</b>	0	0	0	2	2	0	0	0	17	17	0	0	0	2	2	0	0	0	5	5	26
Apprch %	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
Total %	0	0	0	7.7	7.7	0	0	0	65.4	65.4	0	0	0	7.7	7.7	0	0	0	19.2	19.2	

Start Time	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
04:15 PM	0	0	0	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	9
04:30 PM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	1	1	6
04:45 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	3
<b>Total Volume</b>	0	0	0	1	1	0	0	0	16	16	0	0	0	0	0	0	0	0	3	3	20
% App. Total	0	0	0	100		0	0	0	100		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.444	.444	.000	.000	.000	.000	.000	.000	.000	.000	.750	.750	.556

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: West Street  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at West AM  
 Site Code : 12052019  
 Start Date : 12/5/2019  
 Page No : 1

**Groups Printed- Cars - Heavy Vehicles - Bikes by Direction**

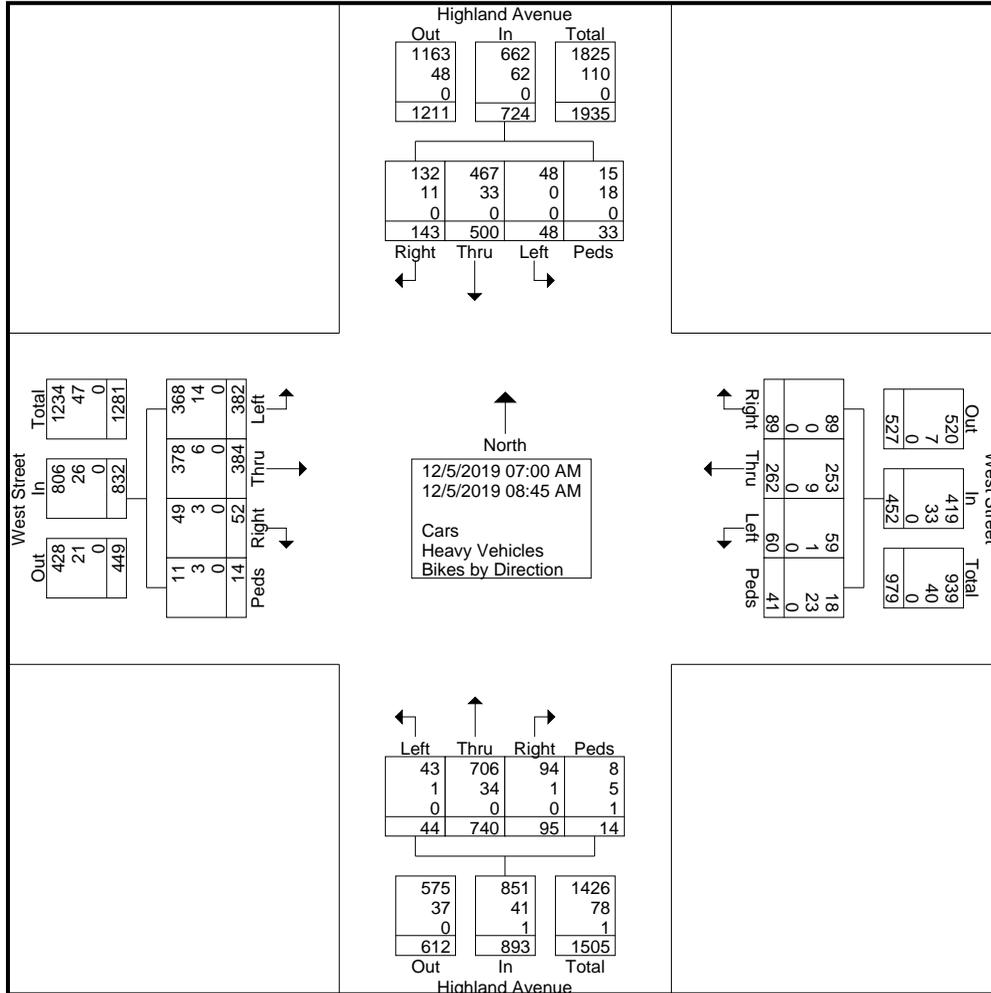
Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
07:00 AM	14	44	7	3	68	6	15	3	0	24	3	64	3	3	73	5	39	49	1	94	259	
07:15 AM	9	75	3	12	99	11	15	6	1	33	8	81	2	1	92	8	48	54	3	113	337	
07:30 AM	16	71	5	1	93	8	22	11	8	49	17	87	5	1	110	5	53	48	1	107	359	
07:45 AM	21	55	4	3	83	14	36	9	10	69	10	122	8	5	145	8	52	42	5	107	404	
Total	60	245	19	19	343	39	88	29	19	175	38	354	18	10	420	26	192	193	10	421	1359	
08:00 AM	27	66	3	4	100	8	52	13	10	83	11	117	7	1	136	5	46	46	1	98	417	
08:15 AM	21	65	6	5	97	18	37	4	6	65	19	85	5	0	109	8	52	46	1	107	378	
08:30 AM	17	69	10	4	100	11	43	9	3	66	12	89	8	3	112	7	46	55	2	110	388	
08:45 AM	18	55	10	1	84	13	42	5	3	63	15	95	6	0	116	6	48	42	0	96	359	
Total	83	255	29	14	381	50	174	31	22	277	57	386	26	4	473	26	192	189	4	411	1542	
Grand Total	143	500	48	33	724	89	262	60	41	452	95	740	44	14	893	52	384	382	14	832	2901	
Apprch %	19.8	69.1	6.6	4.6		19.7	58	13.3	9.1		10.6	82.9	4.9	1.6		6.2	46.2	45.9	1.7			
Total %	4.9	17.2	1.7	1.1	25	3.1	9	2.1	1.4	15.6	3.3	25.5	1.5	0.5	30.8	1.8	13.2	13.2	0.5	28.7		
Cars	132	467	48	15	662	89	253	59	18	419	94	706	43	8	851	49	378	368	11	806	2738	
% Cars	92.3	93.4	100	45.5	91.4	100	96.6	98.3	43.9	92.7	98.9	95.4	97.7	57.1	95.3	94.2	98.4	96.3	78.6	96.9	94.4	
Heavy Vehicles																						
% Heavy Vehicles	7.7	6.6	0	54.5	8.6	0	3.4	1.7	56.1	7.3	1.1	4.6	2.3	35.7	4.6	5.8	1.6	3.7	21.4	3.1	5.6	
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	7.1	0.1	0	0	0	0	0	0	



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: West Street  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at West AM  
 Site Code : 12052019  
 Start Date : 12/5/2019  
 Page No : 2



Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	21	55	4	3	83	14	36	9	10	69	10	122	8	5	145	8	52	42	5		
<b>08:00 AM</b>	<b>27</b>	<b>66</b>	<b>3</b>	<b>4</b>	<b>100</b>	8	52	13	10	83	11	117	7	1	136	5	46	46	1	98	<b>417</b>
08:15 AM	21	65	6	5		18	37	4	6	65	19										
<b>08:30 AM</b>	<b>17</b>	<b>69</b>	<b>10</b>	<b>4</b>	<b>100</b>	<b>11</b>	<b>43</b>	<b>9</b>	<b>3</b>	<b>66</b>	<b>12</b>	<b>89</b>	<b>8</b>	<b>3</b>	<b>112</b>	<b>7</b>	<b>46</b>	<b>55</b>	<b>2</b>	<b>110</b>	388
Total Volume	86	255	23	16	380	51	168	35	29	283	52	413	28	9	502	28	196	189	9	422	1587
% App. Total	22.6	67.1	6.1	4.2		18	59.4	12.4	10.2		10.4	82.3	5.6	1.8		6.6	46.4	44.8	2.1		
PHF	.796	.924	.575	.800	.950	.708	.808	.673	.725	.852	.684	.846	.875	.450	.866	.875	.942	.859	.450	.959	.951



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: West Street  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at West AM  
 Site Code : 12052019  
 Start Date : 12/5/2019  
 Page No : 1

Groups Printed- Cars

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	12	40	7	2	61	6	12	3	0	21	3	59	3	1	66	3	39	45	1	88	236
07:15 AM	7	70	3	6	86	11	13	6	0	30	8	74	2	1	85	8	48	53	3	112	313
07:30 AM	15	64	5	0	84	8	22	10	3	43	16	85	5	0	106	5	53	47	0	105	338
07:45 AM	19	55	4	2	80	14	36	9	3	62	10	118	8	3	139	8	49	42	4	103	384
Total	53	229	19	10	311	39	83	28	6	156	37	336	18	5	396	24	189	187	8	408	1271
08:00 AM	26	63	3	2	94	8	51	13	5	77	11	113	6	1	131	4	45	45	1	95	397
08:15 AM	19	62	6	2	89	18	37	4	4	63	19	81	5	0	105	8	51	43	0	102	359
08:30 AM	17	64	10	0	91	11	42	9	1	63	12	84	8	2	106	7	45	51	2	105	365
08:45 AM	17	49	10	1	77	13	40	5	2	60	15	92	6	0	113	6	48	42	0	96	346
Total	79	238	29	5	351	50	170	31	12	263	57	370	25	3	455	25	189	181	3	398	1467
Grand Total	132	467	48	15	662	89	253	59	18	419	94	706	43	8	851	49	378	368	11	806	2738
Apprch %	19.9	70.5	7.3	2.3		21.2	60.4	14.1	4.3		11	83	5.1	0.9		6.1	46.9	45.7	1.4		
Total %	4.8	17.1	1.8	0.5	24.2	3.3	9.2	2.2	0.7	15.3	3.4	25.8	1.6	0.3	31.1	1.8	13.8	13.4	0.4	29.4	

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:45 AM	19	55	4	2							<b>118</b>	<b>8</b>	<b>3</b>	<b>139</b>		<b>8</b>			<b>4</b>		
08:00 AM	26	63	3	2	94	8	51	13	5	77	11	113	6	1	131	4	45	45	1	95	397
08:15 AM	19	62	6	2	89	18	37	4	4	63	19	81	5	0	105	8	51	43	0	102	359
08:30 AM	17	64	10	0	91	11	42	9	1	63	12	84	8	2	106	7	45	51	2	105	365
Total Volume	81	244	23	6	354	51	166	35	13	265	52	396	27	6	481	27	190	181	7	405	1505
% App. Total	22.9	68.9	6.5	1.7		19.2	62.6	13.2	4.9		10.8	82.3	5.6	1.2		6.7	46.9	44.7	1.7		
PHF	.779	.953	.575	.750	.941	.708	.814	.673	.650	.860	.684	.839	.844	.500	.865	.844	.931	.887	.438	.964	.948

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: West Street  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at West AM  
 Site Code : 12052019  
 Start Date : 12/5/2019  
 Page No : 1

**Groups Printed- Heavy Vehicles**

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	2	4	0	1	7	0	3	0	0	3	0	5	0	2	7	2	0	4	0	6	23
07:15 AM	2	5	0	6	13	0	2	0	1	3	0	7	0	0	7	0	0	1	0	1	24
07:30 AM	1	7	0	1	9	0	0	1	5	6	1	2	0	1	4	0	0	1	1	2	21
07:45 AM	2	0	0	1	3	0	0	0	7	7	0	4	0	1	5	0	3	0	1	4	19
<b>Total</b>	<b>7</b>	<b>16</b>	<b>0</b>	<b>9</b>	<b>32</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>13</b>	<b>19</b>	<b>1</b>	<b>18</b>	<b>0</b>	<b>4</b>	<b>23</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>13</b>	<b>87</b>
08:00 AM	1	3	0	2	6	0	1	0	5	6	0	4	1	0	5	1	1	1	0	3	20
08:15 AM	2	3	0	3	8	0	0	0	2	2	0	4	0	0	4	0	1	3	1	5	19
08:30 AM	0	5	0	4	9	0	1	0	2	3	0	5	0	1	6	0	1	4	0	5	23
08:45 AM	1	6	0	0	7	0	2	0	1	3	0	3	0	0	3	0	0	0	0	0	13
<b>Total</b>	<b>4</b>	<b>17</b>	<b>0</b>	<b>9</b>	<b>30</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>10</b>	<b>14</b>	<b>0</b>	<b>16</b>	<b>1</b>	<b>1</b>	<b>18</b>	<b>1</b>	<b>3</b>	<b>8</b>	<b>1</b>	<b>13</b>	<b>75</b>
<b>Grand Total</b>	<b>11</b>	<b>33</b>	<b>0</b>	<b>18</b>	<b>62</b>	<b>0</b>	<b>9</b>	<b>1</b>	<b>23</b>	<b>33</b>	<b>1</b>	<b>34</b>	<b>1</b>	<b>5</b>	<b>41</b>	<b>3</b>	<b>6</b>	<b>14</b>	<b>3</b>	<b>26</b>	<b>162</b>
Apprch %	17.7	53.2	0	29		0	27.3	3	69.7		2.4	82.9	2.4	12.2		11.5	23.1	53.8	11.5		
Total %	6.8	20.4	0	11.1	38.3	0	5.6	0.6	14.2	20.4	0.6	21	0.6	3.1	25.3	1.9	3.7	8.6	1.9	16	

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
07:00 AM	2					3					2					2					6	23
07:15 AM	2	5	0	6	13	0	2	0	1	3	0	7										24
07:30 AM	1	7	0	1	9	0	0	1			1								1			21
<b>07:45 AM</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>19</b>	
Total Volume	7	16	0	9	32	0	5	1	13	19	1	18	0	4	23	2	3	6	2	13	87	
% App. Total	21.9	50	0	28.1		0	26.3	5.3	68.4		4.3	78.3	0	17.4		15.4	23.1	46.2	15.4			
PHF	.875	.571	.000	.375	.615	.000	.417	.250	.464	.679	.250	.643	.000	.500	.821	.250	.250	.375	.500	.542	.906	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: West Street  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at West AM  
 Site Code : 12052019  
 Start Date : 12/5/2019  
 Page No : 1

**Groups Printed- Bikes by Direction**

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	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	1	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	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	1	1	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

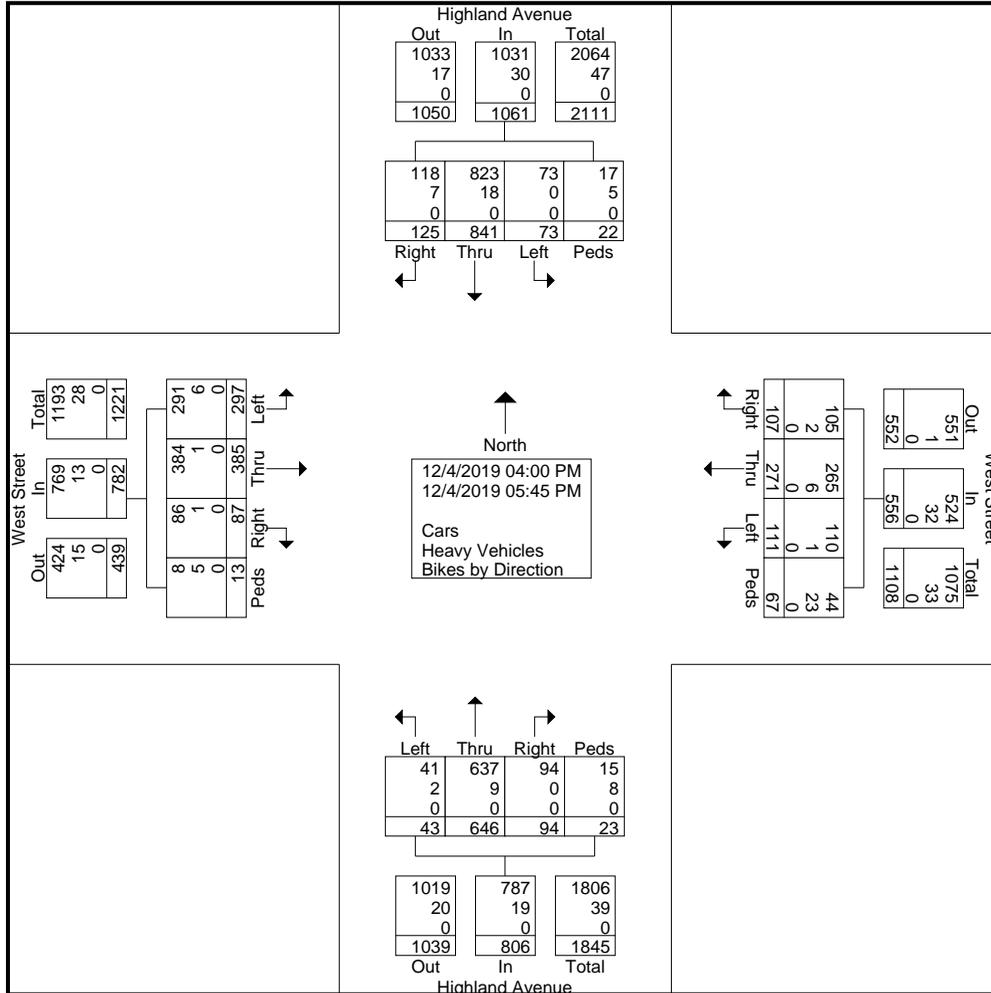




120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: West Street  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at West PM  
 Site Code : 12042019  
 Start Date : 12/4/2019  
 Page No : 2



Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	13	101	5	3					21	83	9	101		6	122	5	53	36	0	94	421
04:45 PM	12	118	2	2	134	15	26	11	7	59	20							43			
05:00 PM	16	113	14	1	144	13	39	22	5	79	11	71	9	0	91	12	62	43	1	118	432
05:15 PM	30				146	14	40				16					2					
Total Volume	71	438	30	7	546	54	139	61	36	290	47	345	23	8	423	45	208	154	4	411	1670
% App. Total	13	80.2	5.5	1.3		18.6	47.9	21	12.4		11.1	81.6	5.4	1.9		10.9	50.6	37.5	1		
PHF	.592	.928	.536	.583	.935	.900	.869	.693	.429	.873	.588	.854	.639	.333	.867	.703	.839	.895	.500	.871	.966



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
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 Client: LCB Senior Living

File Name : Highland at West PM  
 Site Code : 12042019  
 Start Date : 12/4/2019  
 Page No : 1

Groups Printed- Cars

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	11	82	10	1	104	14	37	10	1	62	16	89	2	4	111	11	50	41	3	105	382
04:15 PM	13	104	12	4	133	10	30	13	6	59	13	60	9	5	87	7	36	42	3	88	367
04:30 PM	11	98	5	1	115	12	32	16	11	71	9	97	5	5	116	5	53	34	0	92	394
04:45 PM	11	117	2	2	132	15	25	11	6	57	20	83	3	1	107	12	57	43	1	113	409
Total	46	401	29	8	484	51	124	50	24	249	58	329	19	15	421	35	196	160	7	398	1552
05:00 PM	16	108	14	0	138	13	39	22	4	78	11	71	9	0	91	12	62	41	0	115	422
05:15 PM	29	103	9	1	142	13	40	12	3	68	7	89	4	0	100	16	36	32	1	85	395
05:30 PM	8	116	8	0	132	14	31	8	2	55	10	68	7	0	85	14	38	30	0	82	354
05:45 PM	19	95	13	8	135	14	31	18	11	74	8	80	2	0	90	9	52	28	0	89	388
Total	72	422	44	9	547	54	141	60	20	275	36	308	22	0	366	51	188	131	1	371	1559
Grand Total	118	823	73	17	1031	105	265	110	44	524	94	637	41	15	787	86	384	291	8	769	3111
Apprch %	11.4	79.8	7.1	1.6		20	50.6	21	8.4		11.9	80.9	5.2	1.9		11.2	49.9	37.8	1		
Total %	3.8	26.5	2.3	0.5	33.1	3.4	8.5	3.5	1.4	16.8	3	20.5	1.3	0.5	25.3	2.8	12.3	9.4	0.3	24.7	

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:30 PM	11	98	5	1	115	12	32	16	<b>11</b>	71	9	<b>97</b>		<b>5</b>	<b>116</b>	5	53	34	0	92	394
04:45 PM	11	<b>117</b>	2	<b>2</b>		<b>15</b>	25	11	6	57	<b>20</b>							<b>43</b>	<b>1</b>		
<b>05:00 PM</b>	<b>16</b>	<b>108</b>	<b>14</b>	<b>0</b>	<b>138</b>	<b>13</b>	<b>39</b>	<b>22</b>	<b>4</b>	<b>78</b>	11	71	<b>9</b>	0	91	12	<b>62</b>	41	0	<b>115</b>	<b>422</b>
05:15 PM	<b>29</b>				<b>142</b>	13	<b>40</b>									<b>16</b>					
Total Volume	67	426	30	4	527	53	136	61	24	274	47	340	21	6	414	45	208	150	2	405	1620
% App. Total	12.7	80.8	5.7	0.8		19.3	49.6	22.3	8.8		11.4	82.1	5.1	1.4		11.1	51.4	37	0.5		
PHF	.578	.910	.536	.500	.928	.883	.850	.693	.545	.878	.588	.876	.583	.300	.892	.703	.839	.872	.500	.880	.960

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:30 PM



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: West Street  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at West PM  
 Site Code : 12042019  
 Start Date : 12/4/2019  
 Page No : 1

**Groups Printed- Heavy Vehicles**

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	2	0	0	2	0	1	0	2	3	0	1	0	3	4	0	0	2	1	3	12
04:15 PM	2	1	0	1	4	1	0	1	6	8	0	1	0	1	2	0	1	0	0	1	15
04:30 PM	2	3	0	2	7	0	2	0	10	12	0	4	1	1	6	0	0	2	0	2	27
04:45 PM	1	1	0	0	2	0	1	0	1	2	0	1	1	0	2	0	0	0	0	0	6
<b>Total</b>	<b>5</b>	<b>7</b>	<b>0</b>	<b>3</b>	<b>15</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>19</b>	<b>25</b>	<b>0</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>6</b>	<b>60</b>
05:00 PM	0	5	0	1	6	0	0	0	1	1	0	0	0	0	0	0	0	2	1	3	10
05:15 PM	1	3	0	0	4	1	0	0	0	1	0	0	0	1	1	0	0	0	1	1	7
05:30 PM	0	0	0	1	1	0	2	0	1	3	0	2	0	0	2	1	0	0	0	1	7
05:45 PM	1	3	0	0	4	0	0	0	2	2	0	0	0	2	2	0	0	0	2	2	10
<b>Total</b>	<b>2</b>	<b>11</b>	<b>0</b>	<b>2</b>	<b>15</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>7</b>	<b>34</b>
<b>Grand Total</b>	<b>7</b>	<b>18</b>	<b>0</b>	<b>5</b>	<b>30</b>	<b>2</b>	<b>6</b>	<b>1</b>	<b>23</b>	<b>32</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>8</b>	<b>19</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>5</b>	<b>13</b>	<b>94</b>
Apprch %	23.3	60	0	16.7		6.2	18.8	3.1	71.9		0	47.4	10.5	42.1		7.7	7.7	46.2	38.5		
Total %	7.4	19.1	0	5.3	31.9	2.1	6.4	1.1	24.5	34	0	9.6	2.1	8.5	20.2	1.1	1.1	6.4	5.3	13.8	

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	2	0	0	2	0	1	0	2	3	0	1	0	3				2	1	3	12
04:15 PM	2					1	0	1									1	0	0	1	15
04:30 PM	2	3	0	2	7	0	2		10	12	0	4	1	1	6	0	0	2	0	2	27
04:45 PM	1	1	0	0	2	0	1	0	1	2	0	1	1	0	2	0	0	0	0	0	6
<b>Total Volume</b>	<b>5</b>	<b>7</b>	<b>0</b>	<b>3</b>	<b>15</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>19</b>	<b>25</b>	<b>0</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>6</b>	<b>60</b>
% App. Total	33.3	46.7	0	20		4	16	4	76		0	50	14.3	35.7		0	16.7	66.7	16.7		
PHF	.625	.583	.000	.375	.536	.250	.500	.250	.475	.521	.000	.438	.500	.417	.583	.000	.250	.500	.250	.500	.556

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM



120 Water Street, 4th Floor  
 Boston, MA 02109  
 p. 617-556-0020

N/S: Highland Avenue  
 E/W: West Street  
 City, State: Needham, MA  
 Client: LCB Senior Living

File Name : Highland at West PM  
 Site Code : 12042019  
 Start Date : 12/4/2019  
 Page No : 1

**Groups Printed- Bikes by Direction**

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

Start Time	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

# McMahon Associates

350 Myles Standish Blvd. Suite 103  
Taunton, MA 02780

(508)-823-2245

N/S: Avery Square  
E/W: West Street  
McMahon Associates  
Needham Heights, MA

File Name : West St at Avery Sq\_AM  
Site Code : 12052019  
Start Date : 12/5/2019  
Page No : 1

Groups Printed- Cars & CW Pedestrians - HV & CCW Pedestrians - Bikes by Direction

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	18	0	2	3	23	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0
07:15 AM	15	0	3	8	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	17	0	3	0	20	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
07:45 AM	29	0	0	7	36	1	0	0	0	1	0	0	0	2	2	0	0	0	2	2	2
<b>Total</b>	<b>79</b>	<b>0</b>	<b>8</b>	<b>18</b>	<b>105</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>113</b>
08:00 AM	18	0	5	1	24	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	19	0	1	4	24	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0
08:30 AM	29	0	7	5	41	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	4
08:45 AM	18	0	2	1	21	0	0	1	0	1	1	0	1	1	3	0	0	0	0	0	0
<b>Total</b>	<b>84</b>	<b>0</b>	<b>15</b>	<b>11</b>	<b>110</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>120</b>
<b>Grand Total</b>	<b>163</b>	<b>0</b>	<b>23</b>	<b>29</b>	<b>215</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>6</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>233</b>
Apprch %	75.8	0	10.7	13.5		25	0	50	25		10	10	20	60		0	0	0	100		
Total %	70	0	9.9	12.4	92.3	0.4	0	0.9	0.4	1.7	0.4	0.4	0.9	2.6	4.3	0	0	0	1.7	1.7	
Cars & CW Pedestrians	163	0	23	29	215	1	0	2	1	4	1	1	2	6	10	0	0	0	4	4	233
% Cars & CW Pedestrians	100	0	100	100	100	100	0	100	100	100	100	100	100	100	100	0	0	0	100	100	100
HV & CCW Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% HV & CCW Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	29	0	0	7	36	1	0	0	0	1	0	0	0	2	2	0	0	0	2	2	41
08:00 AM	18	0	5	1	24	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	25
08:15 AM	19	0	1	4	24	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	26
08:30 AM	29	0	7	5	41	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	44
Total Volume	95	0	13	17	125	1	0	1	0	2	0	1	1	3	5	0	0	0	4	4	136
% App. Total	76	0	10.4	13.6		50	0	50	0		0	20	20	60		0	0	0	100		
PHF	.819	.000	.464	.607	.762	.250	.000	.250	.000	.500	.000	.250	.250	.375	.625	.000	.000	.000	.500	.500	.773

# McMahon Associates

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(508)-823-2245

N/S: Avery Square  
E/W: West Street  
McMahon Associates  
Needham Heights, MA

File Name : West St at Avery Sq\_AM  
Site Code : 12052019  
Start Date : 12/5/2019  
Page No : 1

### Groups Printed- Cars & CW Pedestrians

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
07:00 AM	18	0	2	3	23	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	25
07:15 AM	15	0	3	8	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
07:30 AM	17	0	3	0	20	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	21
07:45 AM	29	0	0	7	36	1	0	0	0	1	0	0	0	2	2	0	0	0	2	2	2	41
<b>Total</b>	79	0	8	18	105	1	0	0	1	2	0	0	0	4	4	0	0	0	2	2	2	113
08:00 AM	18	0	5	1	24	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	25
08:15 AM	19	0	1	4	24	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	26
08:30 AM	29	0	7	5	41	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	2	44
08:45 AM	18	0	2	1	21	0	0	1	0	1	1	0	1	1	3	0	0	0	0	0	0	25
<b>Total</b>	84	0	15	11	110	0	0	2	0	2	1	1	2	2	6	0	0	0	2	2	2	120
<b>Grand Total</b>	163	0	23	29	215	1	0	2	1	4	1	1	2	6	10	0	0	0	4	4	4	233
Apprch %	75.8	0	10.7	13.5		25	0	50	25		10	10	20	60		0	0	0	100			
Total %	70	0	9.9	12.4	92.3	0.4	0	0.9	0.4	1.7	0.4	0.4	0.9	2.6	4.3	0	0	0	1.7	1.7		

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	<b>29</b>	0	0	7	36	<b>1</b>	0	0	0	<b>1</b>	0	0	0	<b>2</b>	<b>2</b>	0	0	0	<b>2</b>	<b>2</b>	41
08:00 AM	18	0	5	1	24	0	0	<b>1</b>	0	1	0	0	0	0	0	0	0	0	0	0	25
08:15 AM	19	0	1	4	24	0	0	0	0	0	0	0	<b>1</b>	1	2	0	0	0	0	0	26
08:30 AM	29	0	<b>7</b>	5	<b>41</b>	0	0	0	0	0	0	<b>1</b>	0	0	1	0	0	0	2	2	<b>44</b>
Total Volume	95	0	13	17	125	1	0	1	0	2	0	1	1	3	5	0	0	0	4	4	136
% App. Total	76	0	10.4	13.6		50	0	50	0		0	20	20	60		0	0	0	100		
PHF	.819	.000	.464	.607	.762	.250	.000	.250	.000	.500	.000	.250	.250	.375	.625	.000	.000	.000	.500	.500	.773

# McMahon Associates

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N/S: Avery Square  
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Needham Heights, MA

File Name : West St at Avery Sq\_AM  
Site Code : 12052019  
Start Date : 12/5/2019  
Page No : 1

Groups Printed- HV & CCW Pedestrians

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 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	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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Needham Heights, MA

File Name : West St at Avery Sq\_AM  
Site Code : 12052019  
Start Date : 12/5/2019  
Page No : 1

### Groups Printed- Bikes by Direction

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 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	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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Needham Heights, MA

File Name : West St at Avery Sq\_PM  
Site Code : 12042019  
Start Date : 12/4/2019  
Page No : 1

Groups Printed- Cars & CW Pedestrians - HV & CCW Pedestrians - Bikes by Direction

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	19	0	1	4	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	10	0	2	4	16	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0
04:30 PM	13	0	3	3	19	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0
04:45 PM	23	0	5	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>65</b>	<b>0</b>	<b>11</b>	<b>14</b>	<b>90</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>95</b>
05:00 PM	24	0	4	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	19	0	1	1	21	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0
05:30 PM	20	0	3	2	25	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
05:45 PM	32	0	2	7	41	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
<b>Total</b>	<b>95</b>	<b>0</b>	<b>10</b>	<b>13</b>	<b>118</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>122</b>
<b>Grand Total</b>	<b>160</b>	<b>0</b>	<b>21</b>	<b>27</b>	<b>208</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>217</b>
Apprch %	76.9	0	10.1	13		0	0	0	100		0	0	14.3	85.7		0	0	0	100		
Total %	73.7	0	9.7	12.4	95.9	0	0	0	0.5	0.5	0	0	0.5	2.8	3.2	0	0	0	0.5	0.5	
Cars & CW Pedestrians	160	0	21	27	208	0	0	0	1	1	0	0	1	6	7	0	0	0	1	1	217
% Cars & CW Pedestrians	100	0	100	100	100	0	0	0	100	100	0	0	100	100	100	0	0	0	100	100	100
HV & CCW Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% HV & CCW Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	24	0	4	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	19	0	1	1	21	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0
05:30 PM	20	0	3	2	25	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
05:45 PM	32	0	2	7	41	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	42
Total Volume	95	0	10	13	118	0	0	0	0	0	0	0	1	2	3	0	0	0	1	1	122
% App. Total	80.5	0	8.5	11		0	0	0	0		0	0	33.3	66.7		0	0	0	100		
PHF	.742	.000	.625	.464	.720	.000	.000	.000	.000	.000	.000	.000	.250	.500	.375	.000	.000	.000	.250	.250	.726

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Start Date : 12/4/2019  
Page No : 1

### Groups Printed- Cars & CW Pedestrians

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
04:00 PM	19	0	1	4	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
04:15 PM	10	0	2	4	16	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	19
04:30 PM	13	0	3	3	19	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	21
04:45 PM	23	0	5	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
<b>Total</b>	<b>65</b>	<b>0</b>	<b>11</b>	<b>14</b>	<b>90</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>95</b>
05:00 PM	24	0	4	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
05:15 PM	19	0	1	1	21	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	23
05:30 PM	20	0	3	2	25	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	26
05:45 PM	32	0	2	7	41	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	42
<b>Total</b>	<b>95</b>	<b>0</b>	<b>10</b>	<b>13</b>	<b>118</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>122</b>
Grand Total	160	0	21	27	208	0	0	0	1	1	0	0	1	6	7	0	0	0	1	1	1	217
Apprch %	76.9	0	10.1	13		0	0	0	100		0	0	14.3	85.7		0	0	0	100			
Total %	73.7	0	9.7	12.4	95.9	0	0	0	0.5	0.5	0	0	0.5	2.8	3.2	0	0	0	0.5	0.5		

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	24	0	4	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
05:15 PM	19	0	1	1	21	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	23
05:30 PM	20	0	3	2	25	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	26
05:45 PM	32	0	2	7	41	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	42
Total Volume	95	0	10	13	118	0	0	0	0	0	0	0	1	2	3	0	0	0	1	1	122
% App. Total	80.5	0	8.5	11		0	0	0	0		0	0	33.3	66.7		0	0	0	100		
PHF	.742	.000	.625	.464	.720	.000	.000	.000	.000	.000	.000	.000	.250	.500	.375	.000	.000	.000	.250	.250	.726

# McMahon Associates

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Taunton, MA 02780

(508)-823-2245

N/S: Avery Square  
E/W: West Street  
McMahon Associates  
Needham Heights, MA

File Name : West St at Avery Sq\_PM  
Site Code : 12042019  
Start Date : 12/4/2019  
Page No : 1

### Groups Printed- HV & CCW Pedestrians

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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(508)-823-2245

N/S: Avery Square  
E/W: West Street  
McMahon Associates  
Needham Heights, MA

File Name : West St at Avery Sq\_PM  
Site Code : 12042019  
Start Date : 12/4/2019  
Page No : 1

### Groups Printed- Bikes by Direction

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
05:00 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Avery Square From North					West Street From East					Avery Square From South					West Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

## **APPENDIX B**

Seasonal Adjustment Data



## SEASONAL ADJUSTMENT DATA

### Senior Living Residential Redevelopment Needham, MA

MassDOT Continuous Count Station					December	% Above
ID	Town	Roadway	Year	AADT	ADT	AADT
4165	Newton	Yankee Division Highway	2014	145,000	139,000	-4%



## **APPENDIX C**

### Crash Summary



## CRASH ANALYSIS

### Senior Living Residential Redevelopment

#### Needham, MA

	West Street at Avery Square/ Site Driveway	West Street at Highland Avenue	Highland Avenue at Morton Street/ Site Driveway
<b>Year</b>			
2013	2	5	2
2014	0	10	1
2015	1	7	0
2016	1	3	1
2017	2	5	1
<b>Type</b>			
Angle	4	10	0
Rear-end	1	9	3
Sideswipe	0	9	1
Head-on	0	0	0
Single Vehicle	1	2	1
<b>Severity</b>			
Property Damage	6	25	2
Personal Injury	0	4	3
Fatality	0	0	0
Unknown	0	1	0
<b>Weather</b>			
Clear	5	24	4
Cloudy	0	3	1
Rain	1	2	0
Snow	0	1	0
<b>Time</b>			
7:00 AM to 9:00 AM	0	4	0
9:00 AM to 4:00 PM	3	17	3
4:00 PM to 6:00 PM	0	4	0
6:00 PM to 7:00 AM	3	5	2
<b>Total</b>	<b>6</b>	<b>30</b>	<b>5</b>
Crash Rate	0.34	0.77	0.21
State Average	0.57	0.78	0.57
District 6 Average	0.52	0.71	0.52

Source: MassDOT



## **APPENDIX D**

Traffic Projection Model



**TRAFFIC PROJECTION MODEL**

Weekday Morning Peak Hour  
 LCB Senior Living  
 Needham, MA

Intersection	Dir.	Turn	2019 Counted Volumes	Seasonal Adjustment	2019 Existing Volumes	Background Growth 7 yrs (at 1% per year)	2026 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	2026 Build Volumes
West Street at Site Driveway/Avery Square	EB	T	400	16	416	30	446		0		0	0	446
		R	0	0	0	0	0	25%	4		0	4	4
	WB	L	1	0	1	0	1	30%	5		0	5	6
		T	281	11	292	21	313		0		0	0	313
	NB	L	2	0	2	0	2		0	25%	4	4	6
		R	0	0	0	0	0		0	30%	5	5	5
	SB	L	13	1	14	1	15		0		0	0	15
		T	0	0	0	0	0		0		0	0	0
		R	95	4	99	7	106		0		0	0	106
West Street at Highland Avenue	EB	L	189	8	197	14	211		0	20%	3	3	214
		T	196	8	204	15	219		0	10%	2	2	221
		R	28	1	29	2	31		0		0	0	31
	WB	L	35	1	36	3	39	5%	1		0	1	40
		T	168	7	175	13	188	10%	2		0	2	190
		R	51	2	53	4	57		0		0	0	57
	NB	L	28	1	29	2	31		0		0	0	31
		T	413	17	430	31	461		0	15%	2	2	463
		R	52	2	54	4	58		0	5%	1	1	59
	SB	L	23	1	24	2	26		0		0	0	26
		T	255	10	265	19	284	15%	2		0	2	286
		R	86	3	89	6	95	20%	3		0	3	98
Highland Avenue at Site Driveway/Morton Street	EB	L	0	0	0	0	0		0	20%	3	3	3
		T	0	0	0	0	0		0		0	0	0
		R	1	0	1	0	1		0	25%	4	4	5
	WB	L	8	0	8	1	9		0		0	0	9
		T	0	0	0	0	0		0		0	0	0
		R	9	0	9	1	10		0		0	0	10
	NB	L	0	0	0	0	0	25%	4		0	4	4
		T	472	20	492	36	528		0		0	0	528
		R	26	1	27	2	29		0		0	0	29
	SB	L	5	0	5	0	5		0		0	0	5
		T	291	12	303	24	327		0		0	0	327
		R	0	0	0	0	0	20%	3		0	3	3

Peak Hour: 7:15 AM - 8:15 AM

## TRAFFIC PROJECTION MODEL

Weekday Afternoon Peak Hour

LCB Senior Living

Needham, MA

Intersection	Dir.	Turn	2019 Counted Volumes	Seasonal Adjustment	2019 Existing Volumes	Background Growth 7 yrs (at 1% per year)	2026 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	2026 Build Volumes
West Street at Site Driveway/Avery Square	EB	T	394	15	409	30	439		0		0	0	439
		R	0	0	0	0	0	25%	5		0	5	5
	WB	L	0	0	0	0	0	30%	6		0	6	6
		T	233	10	243	17	260		0		0	0	260
	NB	L	1	0	1	0	1		0	25%	6	6	7
		R	0	0	0	0	0		0	30%	7	7	7
	SB	L	13	1	14	1	15		0		0	0	15
		T	0	0	0	0	0		0		0	0	0
	R	79	3	82	6	88		0		0	0	88	
West Street at Highland Avenue	EB	L	154	6	160	12	172		0	20%	5	5	177
		T	208	8	216	16	232		0	10%	2	2	234
		R	45	2	47	3	50		0		0	0	50
	WB	L	61	2	63	5	68	5%	1		0	1	69
		T	139	6	145	10	155	10%	2		0	2	157
		R	54	2	56	4	60		0		0	0	60
	NB	L	23	1	24	2	26		0		0	0	26
		T	345	14	359	26	385		0	15%	4	4	389
		R	47	2	49	4	53		0	5%	1	1	54
	SB	L	30	1	31	2	33		0		0	0	33
	T	438	18	456	33	489	15%	3		0	3	492	
	R	71	3	74	5	79	20%	4		0	4	83	
Highland Avenue at Site Driveway/Morton Street	EB	L	0	0	0	0	0		0	20%	5	5	5
		T	0	0	0	0	0		0		0	0	0
		R	0	0	0	0	0		0	25%	6	6	6
	WB	L	6	0	6	0	6		0		0	0	6
		T	1	0	1	0	1		0		0	0	1
		R	9	0	9	1	10		0		0	0	10
	NB	L	1	0	1	0	1	25%	5		0	5	6
		T	379	17	396	31	427		0		0	0	427
		R	23	1	24	2	26		0		0	0	26
	SB	L	16	1	17	1	18		0		0	0	18
	T	526	21	547	40	587		0		0	0	587	
	R	2	0	2	0	2	20%	4		0	4	6	

Peak Hour: 4:30 PM - 5:30 PM

## **APPENDIX E**

### Highway Capacity Manual Methodologies

## CAPACITY/LEVEL-OF-SERVICE ANALYSES METHODOLOGY

The detailed capacity/level-of-service analysis contained in this traffic impact study was performed in accordance with the standard techniques contained in the *Highway Capacity Manual*.<sup>(1)</sup> By definition, capacity represents “the maximum rate of flow that can reasonably be expected to pass a point on a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions.” The level of functioning of an intersection or a uniform section of a lane or roadway can be expressed in terms of levels of service. Level of service (LOS) is defined as “a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers”. Such measures include “speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.”

At unsignalized intersections, a methodology for evaluating the relative functioning of intersections controlled by stop or yield signs has been developed, and is based on several assumptions, including:

- Major street flows are not affected by the minor (stop-sign controlled) street movements.
- Left turns from the major street to the minor street are influenced only by opposing major street through flow.
- Minor street left turns are impeded by all major street traffic plus opposing minor street traffic.
- Minor street through traffic is impeded by all major street traffic.
- Minor street right turns are impeded only by the major street traffic coming from the left.

The concept of stop-controlled or yield-controlled intersection analysis is based on the estimate of average total delay on minor streets. The methodology of analysis relies on three elements: the size and distribution of gaps in the major traffic stream, the usefulness of these gaps to the minor stream drivers, and the relative priority of the various traffic streams at the intersection. The results of the analysis provide an estimate of average total delay for the various critical movements at the unsignalized intersections. Correlation between average total delay and the respective levels of service are provided for unsignalized intersections as follows:

---

(1) *Transportation Research Board, Highway Capacity Manual, 6<sup>th</sup> Edition, published by the Transportation Research Board, Washington, DC, 2016.*

*Unsignalized Intersections*

Level of Service	Control Delay Per Vehicle (seconds)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	> 50

At signalized intersections, an additional element must be considered: time allocation. Level of service is based on the average control delay per vehicle for various movements within the intersection. Volume/capacity relationships also affect the operations of signalized intersections. Thus, both volume/capacity and delay must be considered to evaluate the overall operation of a signalized intersection. Correlation between average delay per vehicle and the respective levels of service are provided for signalized intersections as follows:

*Signalized Intersections*

Level of Service	Control Delay Per Vehicle (seconds)
A	$\leq 10$
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	> 80

## **APPENDIX F**

2019 Existing Capacity/Level-of-Service Analysis

LCB Needham  
2: Highland Avenue & West Street

Weekday Morning Peak Hour  
2019 Existing

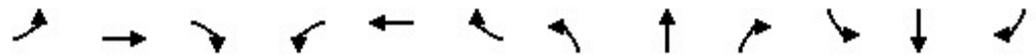


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	204	29	36	175	53	29	430	54	24	265	89
Future Volume (vph)	197	204	29	36	175	53	29	430	54	24	265	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1736	1807	0	1805	1820	0	0	1803	0	0	1759	0
Flt Permitted	0.270			0.608				0.963			0.943	
Satd. Flow (perm)	493	1807	0	1155	1820	0	0	1742	0	0	1664	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.87	0.87	0.87	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	3%	4%	0%	1%	0%	4%	4%	0%	0%	4%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	205	243	0	41	262	0	0	583	0	0	398	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4		4
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		15.0	15.0		15.0	15.0	
Total Split (s)	15.0	45.0		30.0	30.0		45.0	45.0		45.0	45.0	
Total Split (%)	13.4%	40.2%		26.8%	26.8%		40.2%	40.2%		40.2%	40.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effect Green (s)	35.1	35.1		19.3	19.3			37.1			37.1	
Actuated g/C Ratio	0.36	0.36		0.20	0.20			0.38			0.38	
v/c Ratio	0.67	0.38		0.18	0.74			0.89			0.64	
Control Delay	39.0	28.5		38.2	52.8			49.2			33.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	39.0	28.5		38.2	52.8			49.2			33.2	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	20%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

LCB Needham  
2: Highland Avenue & West Street

Weekday Morning Peak Hour  
2019 Existing

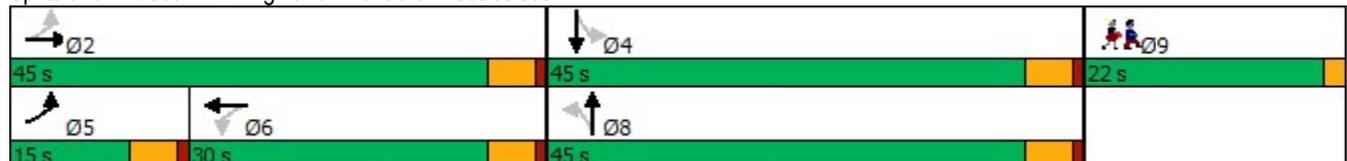


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		D	D			D			C	
Approach Delay		33.3			50.8			49.2			33.2	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	107	129		24	172			374			223	
Queue Length 95th (ft)	#185	198		54	251			#600			352	
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								
Base Capacity (vph)	308	777		310	489			749			715	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.67	0.31		0.13	0.54			0.78			0.56	

Intersection Summary

Area Type: Other  
 Cycle Length: 112  
 Actuated Cycle Length: 98.8  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 41.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 70.4%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Highland Avenue & West Street



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Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	416	0	1	292	0	2	0	0	14	0	99
Future Vol, veh/h	0	416	0	1	292	0	2	0	0	14	0	99
Conflicting Peds, #/hr	0	0	3	3	0	0	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	82	82	82	50	50	50	75	75	75
Heavy Vehicles, %	2	4	2	0	3	2	0	2	2	0	2	0
Mvmt Flow	0	438	0	1	356	0	4	0	0	19	0	132

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	441	0	0	869	799	441	796	799	360
Stage 1	-	-	-	-	-	-	441	441	-	358	358	-
Stage 2	-	-	-	-	-	-	428	358	-	438	441	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1130	-	0	274	319	616	307	319	689
Stage 1	0	-	-	-	-	0	599	577	-	664	628	-
Stage 2	0	-	-	-	-	0	609	628	-	601	577	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1127	-	-	220	318	614	307	318	686
Mov Cap-2 Maneuver	-	-	-	-	-	-	220	318	-	307	318	-
Stage 1	-	-	-	-	-	-	599	575	-	664	627	-
Stage 2	-	-	-	-	-	-	489	627	-	601	575	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			21.7			13.1		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	220	-	-	1127	-	595
HCM Lane V/C Ratio	0.018	-	-	0.001	-	0.253
HCM Control Delay (s)	21.7	-	-	8.2	0	13.1
HCM Lane LOS	C	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	1

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	0	1	8	0	9	0	492	27	5	303	0
Future Vol, veh/h	0	0	1	8	0	9	0	492	27	5	303	0
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	3	3	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	0	0	2	11	2	3	0	0	4	2
Mvmt Flow	0	0	4	11	0	13	0	631	35	6	340	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1011	1025	344	1006	1008	652	344	0	0	669	0	0
Stage 1	356	356	-	652	652	-	-	-	-	-	-	-
Stage 2	655	669	-	354	356	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.2	7.1	6.52	6.31	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.3	3.5	4.018	3.399	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	218	235	703	222	240	452	1215	-	-	931	-	-
Stage 1	661	629	-	460	464	-	-	-	-	-	-	-
Stage 2	455	456	-	667	629	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	210	231	700	219	236	451	1210	-	-	928	-	-
Mov Cap-2 Maneuver	210	231	-	219	236	-	-	-	-	-	-	-
Stage 1	658	621	-	459	463	-	-	-	-	-	-	-
Stage 2	442	455	-	658	621	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.2		18		0		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1210	-	-	700	301	928	-	-
HCM Lane V/C Ratio	-	-	-	0.006	0.08	0.006	-	-
HCM Control Delay (s)	0	-	-	10.2	18	8.9	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

LCB Needham  
2: Highland Avenue & West Street

Weekday Afternoon Peak Hour  
2019 Existing



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	216	47	63	145	56	24	359	49	31	456	74
Future Volume (vph)	160	216	47	63	145	56	24	359	49	31	456	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1752	1849	0	1805	1785	0	0	1841	0	0	1802	0
Flt Permitted	0.307			0.576				0.950			0.959	
Satd. Flow (perm)	566	1849	0	1094	1785	0	0	1755	0	0	1733	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	0%	0%	2%	2%	9%	1%	0%	0%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	184	302	0	73	234	0	0	485	0	0	603	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8				4
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4		4
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		15.0	15.0		15.0	15.0	
Total Split (s)	13.0	43.0		30.0	30.0		47.0	47.0		47.0	47.0	
Total Split (%)	11.6%	38.4%		26.8%	26.8%		42.0%	42.0%		42.0%	42.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)	32.1	32.1		18.2	18.2			38.4			38.4	
Actuated g/C Ratio	0.33	0.33		0.19	0.19			0.40			0.40	
v/c Ratio	0.63	0.49		0.36	0.70			0.70			0.88	
Control Delay	39.4	32.2		43.0	51.4			33.3			45.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	39.4	32.2		43.0	51.4			33.3			45.7	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	20%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

LCB Needham  
2: Highland Avenue & West Street

Weekday Afternoon Peak Hour  
2019 Existing

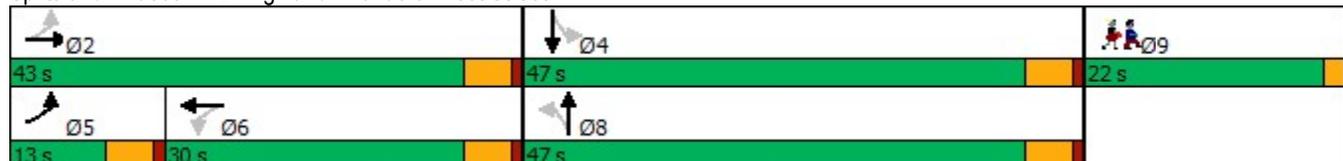


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		D	D			C			D	
Approach Delay		34.9			49.4			33.3			45.7	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	97	170		44	152			270			373	
Queue Length 95th (ft)	151	244		84	223			420			#636	
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								
Base Capacity (vph)	291	773		301	491			811			801	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.63	0.39		0.24	0.48			0.60			0.75	

Intersection Summary

Area Type: Other  
 Cycle Length: 112  
 Actuated Cycle Length: 97.1  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 40.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 70.9%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Highland Avenue & West Street



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Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	409	0	0	243	0	1	0	0	14	0	82
Future Vol, veh/h	0	409	0	0	243	0	1	0	0	14	0	82
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	79	79	79	25	25	25	82	82	82
Heavy Vehicles, %	2	1	2	2	4	2	0	2	2	0	2	0
Mvmt Flow	0	470	0	0	308	0	4	0	0	17	0	100

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	472	0	0	830	780	473	779	780	308
Stage 1	-	-	-	-	-	-	472	472	-	308	308	-
Stage 2	-	-	-	-	-	-	358	308	-	471	472	-
Critical Hdwy	-	-	-	4.12	-	-	7.1	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.5	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1090	-	0	292	327	591	316	327	737
Stage 1	0	-	-	-	-	0	576	559	-	706	660	-
Stage 2	0	-	-	-	-	0	664	660	-	577	559	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1088	-	-	252	326	589	316	326	737
Mov Cap-2 Maneuver	-	-	-	-	-	-	252	326	-	316	326	-
Stage 1	-	-	-	-	-	-	576	558	-	706	660	-
Stage 2	-	-	-	-	-	-	574	660	-	576	558	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			19.5			12.2		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	252	-	-	1088	-	617
HCM Lane V/C Ratio	0.016	-	-	-	-	0.19
HCM Control Delay (s)	19.5	-	-	0	-	12.2
HCM Lane LOS	C	-	-	A	-	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.7

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	6	1	9	1	396	24	17	547	2
Future Vol, veh/h	0	0	0	6	1	9	1	396	24	17	547	2
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	16	16	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	2	0	0	0	0	1	0	6	1	0
Mvmt Flow	0	0	0	8	1	13	1	508	31	19	615	2

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1196	1216	621	1196	1202	544	622	0	0	555	0	0
Stage 1	659	659	-	542	542	-	-	-	-	-	-	-
Stage 2	537	557	-	654	660	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.16	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	163	181	487	164	186	543	969	-	-	996	-	-
Stage 1	453	461	-	528	523	-	-	-	-	-	-	-
Stage 2	528	512	-	459	463	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	153	172	485	158	177	533	964	-	-	981	-	-
Mov Cap-2 Maneuver	153	172	-	158	177	-	-	-	-	-	-	-
Stage 1	450	445	-	520	515	-	-	-	-	-	-	-
Stage 2	512	504	-	446	447	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		19.9		0		0.3	
HCM LOS	A		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	964	-	-	-	264	981	-	-
HCM Lane V/C Ratio	0.001	-	-	-	0.085	0.019	-	-
HCM Control Delay (s)	8.7	0	-	0	19.9	8.7	0	-
HCM Lane LOS	A	A	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0.1	-	-

## **APPENDIX G**

2026 No Build Capacity/Level-of-Service Analysis

LCB Needham  
2: Highland Avenue & West Street

Weekday Morning Peak Hour  
2026 No Build

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	219	31	39	188	57	31	461	58	26	284	95
Future Volume (vph)	211	219	31	39	188	57	31	461	58	26	284	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1736	1809	0	1805	1820	0	0	1803	0	0	1760	0
Flt Permitted	0.253			0.573				0.961			0.935	
Satd. Flow (perm)	462	1809	0	1089	1820	0	0	1738	0	0	1650	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.87	0.87	0.87	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	3%	4%	0%	1%	0%	4%	4%	0%	0%	4%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	260	0	45	282	0	0	625	0	0	426	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	6.0		5.0	6.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		10.0	11.0		15.0	15.0		15.0	15.0	
Total Split (s)	15.0	34.0		10.0	29.0		54.0	54.0		54.0	54.0	
Total Split (%)	12.5%	28.3%		8.3%	24.2%		45.0%	45.0%		45.0%	45.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)	37.0	29.7		26.2	20.8			42.2			42.2	
Actuated g/C Ratio	0.35	0.28		0.25	0.20			0.40			0.40	
v/c Ratio	0.76	0.51		0.15	0.79			0.90			0.65	
Control Delay	49.7	42.1		29.6	60.0			49.3			32.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	49.7	42.1		29.6	60.0			49.3			32.6	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

LCB Needham  
2: Highland Avenue & West Street

Weekday Morning Peak Hour  
2026 No Build

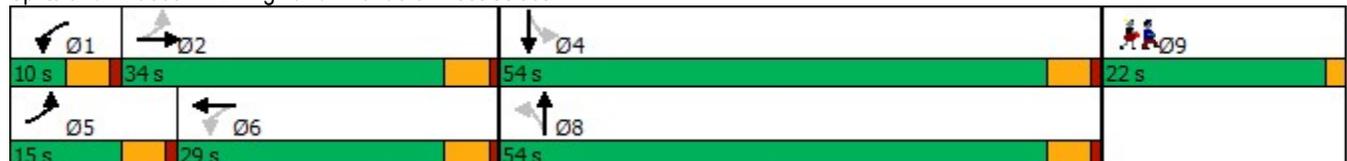


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	D		C	E			D			C	
Approach Delay		45.6			55.8			49.3			32.6	
Approach LOS		D			E			D			C	
Queue Length 50th (ft)	131	179		24	209			441			259	
Queue Length 95th (ft)	#263	270		50	#314			#634			373	
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								
Base Capacity (vph)	290	532		306	443			864			820	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.76	0.49		0.15	0.64			0.72			0.52	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 105.8  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 45.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 74.5%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Highland Avenue & West Street



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Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	446	0	1	313	0	2	0	0	15	0	106
Future Vol, veh/h	0	446	0	1	313	0	2	0	0	15	0	106
Conflicting Peds, #/hr	0	0	3	3	0	0	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	82	82	82	50	50	50	75	75	75
Heavy Vehicles, %	2	4	2	0	3	2	0	2	2	0	2	0
Mvmt Flow	0	469	0	1	382	0	4	0	0	20	0	141

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	472	0	0	931	856	472	853	856	386
Stage 1	-	-	-	-	-	-	472	472	-	384	384	-
Stage 2	-	-	-	-	-	-	459	384	-	469	472	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1100	-	0	249	295	592	281	295	666
Stage 1	0	-	-	-	-	0	576	559	-	643	611	-
Stage 2	0	-	-	-	-	0	586	611	-	579	559	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1097	-	-	194	294	590	281	294	663
Mov Cap-2 Maneuver	-	-	-	-	-	-	194	294	-	281	294	-
Stage 1	-	-	-	-	-	-	576	557	-	643	610	-
Stage 2	-	-	-	-	-	-	459	610	-	579	557	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			23.9			13.9		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	194	-	-	1097	-	567
HCM Lane V/C Ratio	0.021	-	-	0.001	-	0.285
HCM Control Delay (s)	23.9	-	-	8.3	0	13.9
HCM Lane LOS	C	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	1.2

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	1	9	0	10	0	528	29	5	327	0
Future Vol, veh/h	0	0	1	9	0	10	0	528	29	5	327	0
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	3	3	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	0	0	2	11	2	3	0	0	4	2
Mvmt Flow	0	0	4	13	0	14	0	677	37	6	367	0

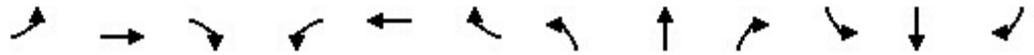
Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1086	1100	371	1080	1082	699	371	0	0	717	0	0
Stage 1	383	383	-	699	699	-	-	-	-	-	-	-
Stage 2	703	717	-	381	383	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.2	7.1	6.52	6.31	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.3	3.5	4.018	3.399	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	194	212	679	197	217	425	1188	-	-	893	-	-
Stage 1	640	612	-	434	442	-	-	-	-	-	-	-
Stage 2	428	434	-	645	612	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	186	209	676	194	214	424	1183	-	-	890	-	-
Mov Cap-2 Maneuver	186	209	-	194	214	-	-	-	-	-	-	-
Stage 1	637	605	-	433	441	-	-	-	-	-	-	-
Stage 2	414	433	-	636	605	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	10.4		19.7		0			0.1		
HCM LOS	B		C							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1183	-	-	676	272	890	-	-
HCM Lane V/C Ratio	-	-	-	0.006	0.098	0.006	-	-
HCM Control Delay (s)	0	-	-	10.4	19.7	9.1	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

LCB Needham  
2: Highland Avenue & West Street

Weekday Afternoon Peak Hour  
2026 No Build



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	232	50	68	155	60	26	385	53	33	489	79
Future Volume (vph)	172	232	50	68	155	60	26	385	53	33	489	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1752	1851	0	1805	1785	0	0	1840	0	0	1802	0
Flt Permitted	0.275			0.423				0.942			0.953	
Satd. Flow (perm)	507	1851	0	804	1785	0	0	1738	0	0	1722	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	0%	0%	2%	2%	9%	1%	0%	0%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	198	324	0	79	250	0	0	522	0	0	646	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	6.0		5.0	6.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		10.0	11.0		15.0	15.0		15.0	15.0	
Total Split (s)	15.0	31.0		10.0	26.0		57.0	57.0		57.0	57.0	
Total Split (%)	12.5%	25.8%		8.3%	21.7%		47.5%	47.5%		47.5%	47.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)	34.9	27.7		24.1	18.8			43.9			43.9	
Actuated g/C Ratio	0.33	0.26		0.23	0.18			0.42			0.42	
v/c Ratio	0.67	0.67		0.34	0.79			0.72			0.90	
Control Delay	45.2	49.0		36.2	63.7			33.4			47.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	45.2	49.0		36.2	63.7			33.4			47.2	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

LCB Needham  
2: Highland Avenue & West Street

Weekday Afternoon Peak Hour  
2026 No Build

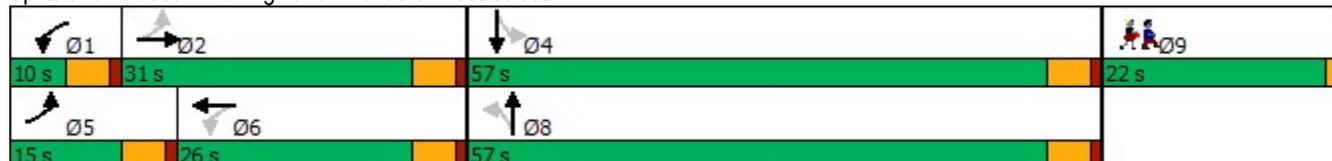


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	D		D	E			C			D	
Approach Delay		47.5			57.1			33.4			47.2	
Approach LOS		D			E			C			D	
Queue Length 50th (ft)	121	240		45	187			321			445	
Queue Length 95th (ft)	#208	#359		80	#291			445			#669	
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								
Base Capacity (vph)	294	494		234	382			922			913	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.67	0.66		0.34	0.65			0.57			0.71	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 105.5  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 45.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 75.0%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Highland Avenue & West Street



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Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	439	0	0	260	0	1	0	0	15	0	88
Future Vol, veh/h	0	439	0	0	260	0	1	0	0	15	0	88
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	79	79	79	25	25	25	82	82	82
Heavy Vehicles, %	2	1	2	2	4	2	0	2	2	0	2	0
Mvmt Flow	0	505	0	0	329	0	4	0	0	18	0	107

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	-	0	0	507	0	0	890	836	508	835	836	329
Stage 1	-	-	-	-	-	-	507	507	-	329	329	-
Stage 2	-	-	-	-	-	-	383	329	-	506	507	-
Critical Hdwy	-	-	-	4.12	-	-	7.1	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.5	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1058	-	0	266	303	565	289	303	717
Stage 1	0	-	-	-	-	0	552	539	-	688	646	-
Stage 2	0	-	-	-	-	0	644	646	-	552	539	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1056	-	-	226	302	563	289	302	717
Mov Cap-2 Maneuver	-	-	-	-	-	-	226	302	-	289	302	-
Stage 1	-	-	-	-	-	-	552	538	-	688	646	-
Stage 2	-	-	-	-	-	-	548	646	-	551	538	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	21.2	12.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	226	-	-	1056	-	590
HCM Lane V/C Ratio	0.018	-	-	-	-	0.213
HCM Control Delay (s)	21.2	-	-	0	-	12.7
HCM Lane LOS	C	-	-	A	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	0.8

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	0	0	6	1	10	1	427	26	18	587	2
Future Vol, veh/h	0	0	0	6	1	10	1	427	26	18	587	2
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	16	16	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	2	0	0	0	0	1	0	6	1	0
Mvmt Flow	0	0	0	8	1	14	1	547	33	20	660	2

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1283	1304	666	1283	1289	584	667	0	0	596	0	0
Stage 1	706	706	-	582	582	-	-	-	-	-	-	-
Stage 2	577	598	-	701	707	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.16	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	142	160	459	143	165	515	932	-	-	961	-	-
Stage 1	427	439	-	502	502	-	-	-	-	-	-	-
Stage 2	502	491	-	433	441	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	132	151	457	137	156	505	928	-	-	946	-	-
Mov Cap-2 Maneuver	132	151	-	137	156	-	-	-	-	-	-	-
Stage 1	424	422	-	493	493	-	-	-	-	-	-	-
Stage 2	484	483	-	419	424	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		21.4		0		0.3	
HCM LOS	A		C					

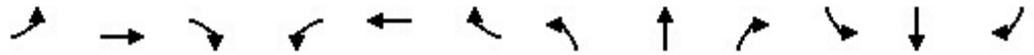
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	928	-	-	-	243	946	-	-
HCM Lane V/C Ratio	0.001	-	-	-	0.099	0.021	-	-
HCM Control Delay (s)	8.9	0	-	0	21.4	8.9	0	-
HCM Lane LOS	A	A	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0.1	-	-

## **APPENDIX H**

2026 Build Capacity/Level-of-Service Analysis

LCB Needham  
2: Highland Avenue & West Street

Weekday Morning Peak Hour  
2026 Build



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	221	31	40	190	57	31	463	59	26	286	98
Future Volume (vph)	214	221	31	40	190	57	31	463	59	26	286	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1736	1809	0	1805	1820	0	0	1803	0	0	1759	0
Flt Permitted	0.251			0.568				0.960			0.936	
Satd. Flow (perm)	459	1809	0	1079	1820	0	0	1736	0	0	1652	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.87	0.87	0.87	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	3%	4%	0%	1%	0%	4%	4%	0%	0%	4%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	262	0	46	284	0	0	628	0	0	431	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	6.0		5.0	6.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		10.0	11.0		15.0	15.0		15.0	15.0	
Total Split (s)	15.0	34.0		10.0	29.0		54.0	54.0		54.0	54.0	
Total Split (%)	12.5%	28.3%		8.3%	24.2%		45.0%	45.0%		45.0%	45.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)	37.0	29.8		26.3	20.9			42.4			42.4	
Actuated g/C Ratio	0.35	0.28		0.25	0.20			0.40			0.40	
v/c Ratio	0.77	0.52		0.15	0.79			0.90			0.65	
Control Delay	51.1	42.3		29.7	60.4			49.7			32.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	51.1	42.3		29.7	60.4			49.7			32.8	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

LCB Needham  
2: Highland Avenue & West Street

Weekday Morning Peak Hour  
2026 Build

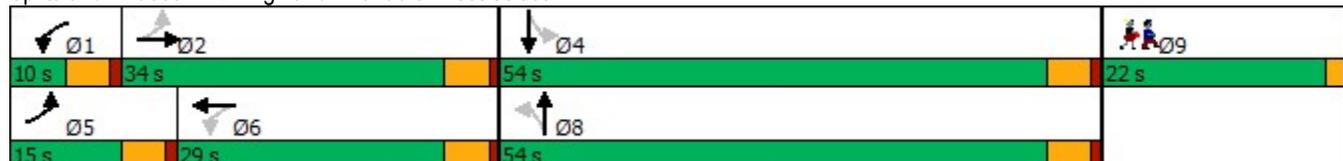


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	D		C	E			D			C	
Approach Delay		46.3			56.2			49.7			32.8	
Approach LOS		D			E			D			C	
Queue Length 50th (ft)	133	181		25	210			444			263	
Queue Length 95th (ft)	#269	272		51	#318			#641			379	
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								
Base Capacity (vph)	289	530		304	442			860			818	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.77	0.49		0.15	0.64			0.73			0.53	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 106.1  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 46.1      Intersection LOS: D  
 Intersection Capacity Utilization 75.0%      ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Highland Avenue & West Street



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Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

---

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	446	4	6	313	0	6	0	5	15	0	106
Future Vol, veh/h	0	446	4	6	313	0	6	0	5	15	0	106
Conflicting Peds, #/hr	0	0	3	3	0	0	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	82	82	82	92	92	92	75	75	75
Heavy Vehicles, %	2	4	2	2	3	2	2	2	2	0	2	0
Mvmt Flow	0	469	4	7	382	0	7	0	5	20	0	141

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	476	0	0	945	870	474	870	872	386
Stage 1	-	-	-	-	-	-	474	474	-	396	396	-
Stage 2	-	-	-	-	-	-	471	396	-	474	476	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1086	-	0	242	290	590	274	289	666
Stage 1	0	-	-	-	-	0	571	558	-	633	604	-
Stage 2	0	-	-	-	-	0	573	604	-	575	557	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1083	-	-	188	287	588	270	286	663
Mov Cap-2 Maneuver	-	-	-	-	-	-	188	287	-	270	286	-
Stage 1	-	-	-	-	-	-	571	556	-	633	599	-
Stage 2	-	-	-	-	-	-	446	599	-	570	555	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.2			18.8			14		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	272	-	-	1083	-	562
HCM Lane V/C Ratio	0.044	-	-	0.007	-	0.287
HCM Control Delay (s)	18.8	-	-	8.3	0	14
HCM Lane LOS	C	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	1.2

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	3	0	5	9	0	10	4	528	29	5	327	3
Future Vol, veh/h	3	0	5	9	0	10	4	528	29	5	327	3
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	3	3	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	2	0	2	11	2	3	0	0	4	2
Mvmt Flow	3	0	5	13	0	14	5	677	37	6	367	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1098	1112	373	1092	1095	699	374	0	0	717	0	0
Stage 1	385	385	-	709	709	-	-	-	-	-	-	-
Stage 2	713	727	-	383	386	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.31	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.399	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	190	209	673	194	214	425	1184	-	-	893	-	-
Stage 1	638	611	-	428	437	-	-	-	-	-	-	-
Stage 2	423	429	-	644	610	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	181	204	670	190	209	424	1179	-	-	890	-	-
Mov Cap-2 Maneuver	181	204	-	190	209	-	-	-	-	-	-	-
Stage 1	631	604	-	424	433	-	-	-	-	-	-	-
Stage 2	406	425	-	634	603	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.1		19.9		0.1		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1179	-	-	333	268	890	-	-
HCM Lane V/C Ratio	0.004	-	-	0.026	0.1	0.006	-	-
HCM Control Delay (s)	8.1	0	-	16.1	19.9	9.1	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-

LCB Needham  
2: Highland Avenue & West Street

Weekday Afternoon Peak Hour  
2026 Build



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	234	50	69	157	60	26	389	54	33	492	83
Future Volume (vph)	177	234	50	69	157	60	26	389	54	33	492	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1752	1851	0	1805	1785	0	0	1840	0	0	1802	0
Flt Permitted	0.268			0.412				0.942			0.954	
Satd. Flow (perm)	494	1851	0	783	1785	0	0	1738	0	0	1724	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	0%	0%	2%	2%	9%	1%	0%	0%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	203	326	0	80	253	0	0	527	0	0	653	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	6.0		5.0	6.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		10.0	11.0		15.0	15.0		15.0	15.0	
Total Split (s)	15.0	31.0		10.0	26.0		57.0	57.0		57.0	57.0	
Total Split (%)	12.5%	25.8%		8.3%	21.7%		47.5%	47.5%		47.5%	47.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)	34.9	27.7		24.2	18.9			44.6			44.6	
Actuated g/C Ratio	0.33	0.26		0.23	0.18			0.42			0.42	
v/c Ratio	0.70	0.68		0.35	0.80			0.72			0.90	
Control Delay	47.3	49.4		36.7	64.7			33.4			47.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	47.3	49.4		36.7	64.7			33.4			47.2	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

LCB Needham  
2: Highland Avenue & West Street

Weekday Afternoon Peak Hour  
2026 Build

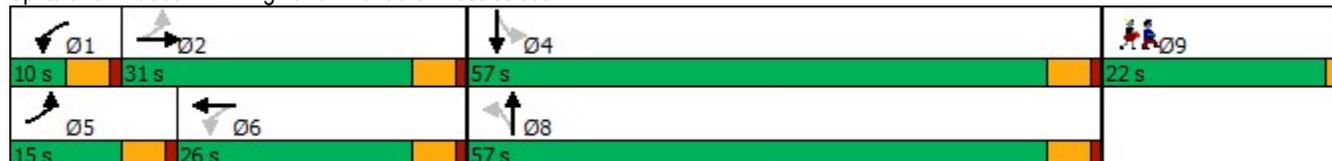


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	D		D	E			C			D	
Approach Delay		48.6			57.9			33.4			47.2	
Approach LOS		D			E			C			D	
Queue Length 50th (ft)	124	242		45	190			326			453	
Queue Length 95th (ft)	#219	#362		81	#298			451			#679	
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								
Base Capacity (vph)	289	490		230	377			910			903	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.70	0.67		0.35	0.67			0.58			0.72	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 106.2  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 45.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 75.9%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Highland Avenue & West Street



---

Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

---

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗			↖			↔			↔	
Traffic Vol, veh/h	0	439	5	6	260	0	7	0	7	15	0	88
Future Vol, veh/h	0	439	5	6	260	0	7	0	7	15	0	88
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	79	79	79	92	92	92	82	82	82
Heavy Vehicles, %	2	1	2	2	4	2	2	2	2	0	2	0
Mvmt Flow	0	505	6	8	329	0	8	0	8	18	0	107

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	513	0	0	909	855	511	858	858	329
Stage 1	-	-	-	-	-	-	510	510	-	345	345	-
Stage 2	-	-	-	-	-	-	399	345	-	513	513	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1052	-	0	256	296	563	279	294	717
Stage 1	0	-	-	-	-	0	546	538	-	675	636	-
Stage 2	0	-	-	-	-	0	627	636	-	548	536	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1050	-	-	216	293	561	273	291	717
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	293	-	273	291	-
Stage 1	-	-	-	-	-	-	546	537	-	675	630	-
Stage 2	-	-	-	-	-	-	528	630	-	540	535	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	17.1	12.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	312	-	-	1050	-	580
HCM Lane V/C Ratio	0.049	-	-	0.007	-	0.217
HCM Control Delay (s)	17.1	-	-	8.5	0	12.9
HCM Lane LOS	C	-	-	A	A	B
HCM 95th %tile Q(veh)	0.2	-	-	0	-	0.8

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	6	6	1	10	6	427	26	18	587	6
Future Vol, veh/h	5	0	6	6	1	10	6	427	26	18	587	6
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	16	16	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	2	0	2	0	2	1	0	6	1	2
Mvmt Flow	5	0	7	8	1	14	8	547	33	20	660	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1300	1321	669	1303	1308	584	672	0	0	596	0	0
Stage 1	709	709	-	596	596	-	-	-	-	-	-	-
Stage 2	591	612	-	707	712	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.16	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.254	-	-
Pot Cap-1 Maneuver	138	157	458	139	159	515	919	-	-	961	-	-
Stage 1	425	437	-	494	492	-	-	-	-	-	-	-
Stage 2	493	484	-	429	436	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	127	147	456	130	149	505	915	-	-	946	-	-
Mov Cap-2 Maneuver	127	147	-	130	149	-	-	-	-	-	-	-
Stage 1	417	420	-	480	478	-	-	-	-	-	-	-
Stage 2	470	470	-	408	419	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.3		22.1		0.1		0.3	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	915	-	-	209	234	946	-	-
HCM Lane V/C Ratio	0.008	-	-	0.057	0.102	0.021	-	-
HCM Control Delay (s)	9	0	-	23.3	22.1	8.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0.1	-	-

## **APPENDIX I**

### Capacity/Level-of-Service Analysis Summary

# CAPACITY ANALYSIS SUMMARY

**Weekday Morning Peak Hour**

**Senior Living Residential Redevelopment**

**Needham, MA**

Intersection	Movement	2019 Existing			2026 No Build			2026 Build		
		LOS <sup>(1)</sup>	Delay <sup>(2)</sup>	V/C <sup>(3)</sup>	LOS	Delay	V/C	LOS	Delay	V/C
West Street at	EB TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Site Driveway/Avery Square	WB LT	A	0.0	0.00	A	0.0	0.00	A	0.2	0.01
	NB LR	C	21.7	0.02	C	23.9	0.02	C	18.8	0.04
	SB LTR	B	13.1	0.25	B	13.9	0.29	B	14.0	0.29
West Street at Highland Avenue	EB L	D	39.0	0.67	D	49.7	0.76	D	51.1	0.77
	TR	C	28.5	0.38	D	42.1	0.51	D	42.3	0.52
	WB L	D	38.2	0.18	C	29.6	0.15	C	29.7	0.15
	TR	D	52.8	0.74	E	60.0	0.79	E	60.4	0.79
	NB LTR	D	49.2	0.89	D	49.3	0.90	D	49.7	0.90
	SB LTR	C	33.2	0.64	C	32.6	0.65	C	32.8	0.65
	<i>Overall</i>	<i>D</i>	<i>41.7</i>	<i>0.70</i>	<i>D</i>	<i>45.7</i>	<i>0.75</i>	<i>D</i>	<i>46.1</i>	<i>0.75</i>
Highland Avenue at Site Driveway/Morton Street	EB LTR	B	10.2	0.01	B	10.4	0.01	C	16.1	0.03
	WB LTR	C	18.0	0.08	C	19.7	0.10	C	19.9	0.10
	NB LTR	A	0.0	0.00	A	0.0	0.00	A	0.1	0.00
	SB LTR	A	0.1	0.01	A	0.1	0.01	A	0.1	0.01

(1) Level-of-Service

(2) Average vehicle delay in seconds

(3) Volume to capacity ratio

n/a Not Applicable

## QUEUE SUMMARY

**Weekday Morning Peak Hour**  
**Senior Living Residential Redevelopment**  
**Needham, MA**

Intersection	Movement	2019 Existing		2026 No Build		2026 Build	
		50th Queue <sup>(1)</sup>	95th Queue <sup>(2)</sup>	50th Queue	95th Queue	50th Queue	95th Queue
West Street at	EB TR	n/a	0	n/a	0	n/a	0
Site Driveway/Avery Square	WB LT	n/a	0	n/a	0	n/a	0
	NB LR	n/a	3	n/a	3	n/a	3
	SB LTR	n/a	25	n/a	30	n/a	30
West Street at Highland Avenue	EB L	107	185	131	263	133	269
	TR	129	198	179	270	181	272
	WB L	24	54	24	50	25	51
	TR	172	251	209	314	210	318
	NB LTR	374	600	441	634	444	641
	SB LTR	223	352	259	373	263	379
Highland Avenue at Site Driveway/Morton Street	EB LTR	n/a	0	n/a	0	n/a	3
	WB LTR	n/a	8	n/a	8	n/a	8
	NB LTR	n/a	0	n/a	0	n/a	0
	SB LTR	n/a	0	n/a	0	n/a	0

(1) 50th Percentile Queue Length (ft)

(2) 95th Percentile Queue Length (ft)

n/a Not Applicable

# CAPACITY ANALYSIS SUMMARY

## Weekday Afternoon Peak Hour

### Senior Living Residential Redevelopment

#### Needham, MA

Intersection	Movement	2019 Existing			2026 No Build			2026 Build		
		LOS <sup>(1)</sup>	Delay <sup>(2)</sup>	V/C <sup>(3)</sup>	LOS	Delay	V/C	LOS	Delay	V/C
West Street at	EB TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Site Driveway/Avery Square	WB LT	A	0.0	0.00	A	0.0	0.00	A	0.2	0.01
	NB LR	C	19.5	0.02	C	21.2	0.02	C	17.1	0.05
	SB LTR	B	12.2	0.19	B	12.7	0.21	B	12.9	0.22
West Street at Highland Avenue	EB L	D	39.4	0.63	D	45.2	0.67	D	47.3	0.70
	TR	C	32.2	0.49	D	49.0	0.67	D	49.4	0.68
	WB L	D	43.0	0.36	D	36.2	0.34	D	36.7	0.35
	TR	D	51.4	0.70	E	63.7	0.79	E	64.7	0.80
	NB LTR	C	33.3	0.70	C	33.4	0.72	C	33.4	0.72
	SB LTR	D	45.7	0.88	D	47.2	0.90	D	47.2	0.90
	<i>Overall</i>	<i>D</i>	<i>40.3</i>	<i>0.71</i>	<i>D</i>	<i>45.4</i>	<i>0.75</i>	<i>D</i>	<i>45.8</i>	<i>0.76</i>
Highland Avenue at Site Driveway/Morton Street	EB LTR	A	0.0	0.00	A	0.0	0.00	C	23.3	0.06
	WB LTR	C	19.9	0.09	C	21.4	0.10	C	22.1	0.10
	NB LTR	A	0.0	0.00	A	0.0	0.00	A	0.1	0.01
	SB LTR	A	0.3	0.02	A	0.3	0.02	A	0.3	0.02

(1) Level-of-Service

(2) Average vehicle delay in seconds

(3) Volume to capacity ratio

n/a Not Applicable

## QUEUE SUMMARY

**Weekday Afternoon Peak Hour  
Senior Living Residential Redevelopment  
Needham, MA**

Intersection	Movement	2019 Existing		2026 No Build		2026 Build	
		50th Queue <sup>(1)</sup>	95th Queue <sup>(2)</sup>	50th Queue	95th Queue	50th Queue	95th Queue
West Street at	EB TR	n/a	0	n/a	0	n/a	0
Site Driveway/Avery Square	WB LT	n/a	0	n/a	0	n/a	0
	NB LR	n/a	0	n/a	3	n/a	5
	SB LTR	n/a	18	n/a	20	n/a	20
West Street at Highland Avenue	EB L	97	151	121	208	124	219
	TR	170	244	240	359	242	362
	WB L	44	84	45	80	45	81
	TR	152	223	187	291	190	298
	NB LTR	270	420	321	445	326	451
	SB LTR	373	636	445	669	453	679
Highland Avenue at Site Driveway/Morton Street	EB LTR	n/a	0	n/a	0	n/a	5
	WB LTR	n/a	8	n/a	8	n/a	8
	NB LTR	n/a	0	n/a	0	n/a	0
	SB LTR	n/a	3	n/a	3	n/a	3

(1) 50th Percentile Queue Length (ft)

(2) 95th Percentile Queue Length (ft)

n/a Not Applicable

# **Fiscal Impact Analysis**

**The Residence at Carter Mill  
100 – 110 West Street  
Needham, MA**

**LCB Senior Living  
Independent Senior Housing & Assisted Living  
May 4, 2020**



# **FOUGERE PLANNING & DEVELOPMENT, Inc.**

## **Mark J. Fougere, AICP**

### **1. Introduction**

Fougere Planning and Development, Inc. has been engaged by LCB Senior Living to undertake a Fiscal Impact Analysis in order to outline estimated revenues and service demands to the Town of Needham from a proposal to redevelop the former Avery Square nursing home/assisted living complex (200 beds) and a medical office space (11,800 sq. ft.) to a 154 senior housing unit community serving 83 assisted living units and 71 independent senior housing apartments. The proposed project will be located at 100 West Street and will occupy an existing three story vacant building on a 4.29 acre site. Fourth story penthouse apartment units are proposed on part of the roof and existing surface parking and garage parking will be available. Numerous on site amenities are proposed including full meal service, an indoor pool, gym, bocce court , transportation, outdoor gathering areas; along with support services to those who are in need. Construction is anticipated to take 18 months to complete, with an estimated opening in the spring of 2023. In addition, Needham's senior center, The Center at the Heights, the library, the commuter rail station and numerous retail and service businesses are all within walking distance of the property.

### **2. Local Trends**

#### **Population**

Needham's population has seen measured growth over the last 17 years, with most population growth occurring from the sale of existing housing units.

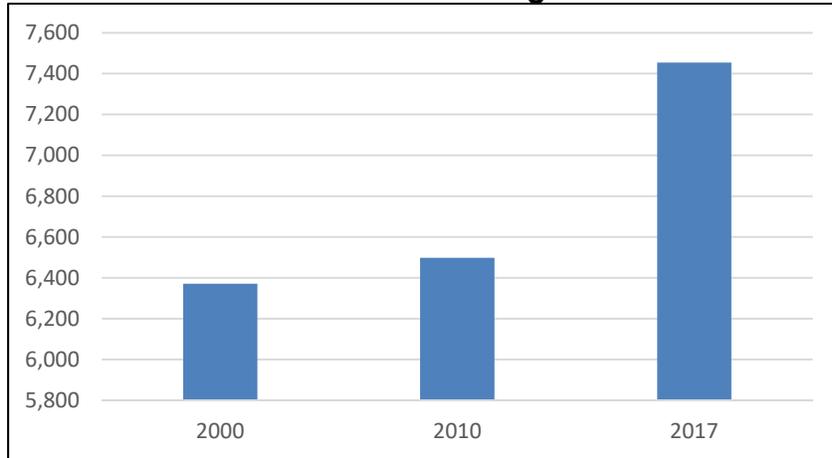
Census<sup>1</sup> figures report that from 2000 to 2017 Needham's population increased from 28,991 to 30,429 representing a 5% growth rate over the 17-year census period. During this same time frame children age 5 – 19 have increased 17.5%, rising from 6,009 to 7,064. Even with the migration of young families, Needham

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<sup>1</sup> 2000 - 2010 Census figures and 2017 American Community Survey.

has aged, with those over the age of 60 increasing from 6,371 to 7,454 (a 17% increase) since 2000, Figure One. LCB Senior Living will be serving this aging population, as it is estimated that 35% - 40% of their residents will be from Needham.

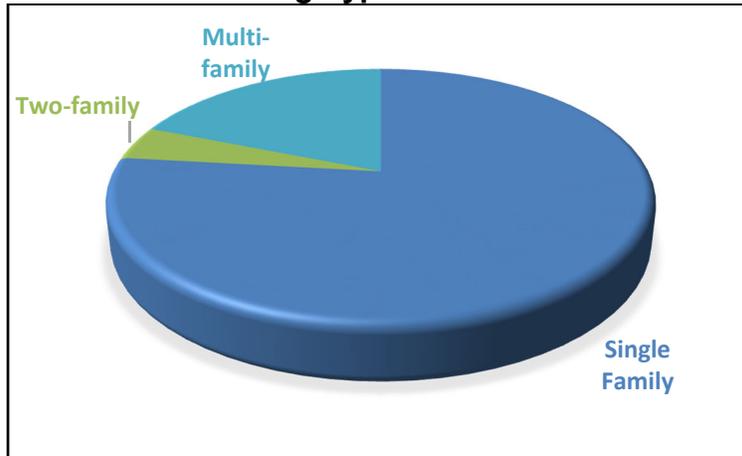
**Figure One**  
**Residents Over the Age of 60**



## Housing

The majority of Needham's housing stock consists of single family homes, with Census data<sup>2</sup> showing 8,420 units (76.8%) out of a total housing stock of 10,963 as detailed in Figure Two.

**Figure Two**  
**Housing Type Breakdown**

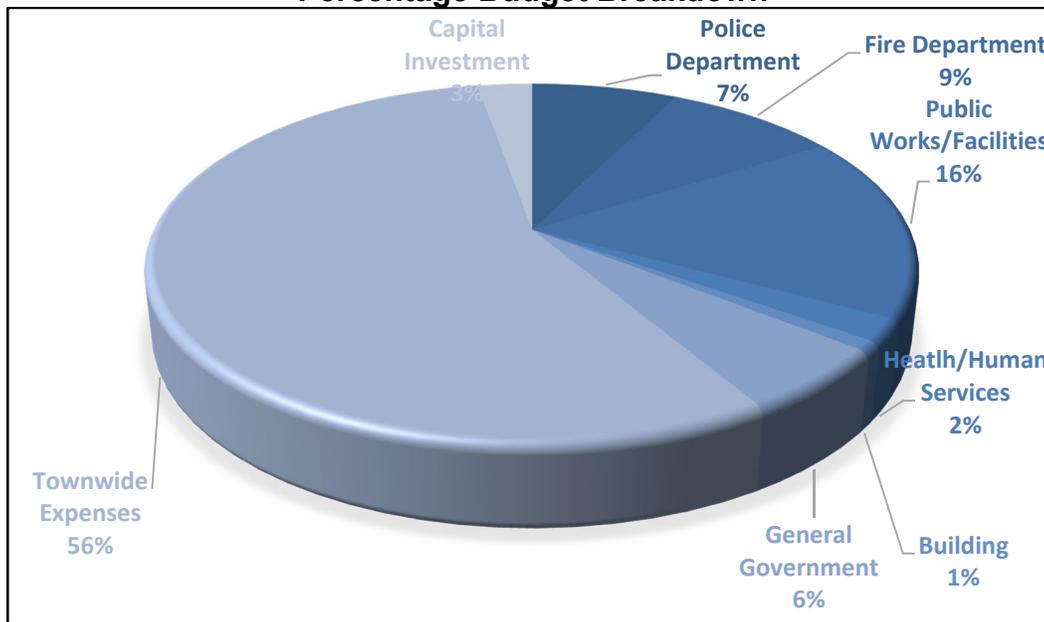


<sup>2</sup> American Community Survey 2017

## Budget History

Needham's total operating budget for 2019 was \$165,139,644. Public Safety and Education account for 53.1% of the total budget as detailed in Figure Three. As will be seen from the analysis outlined below, the Public Safety Department's will have the most measureable service impacts from the proposed use.

**Figure Three**  
**Percentage Budget Breakdown**



### 3. Fiscal Methodology

There are a number of methodologies that are used to estimate fiscal impacts of proposed development projects. The Per Capita Multiplier Method is the most often used analysis to determine municipal cost allocation. This method is the classic "average" costing method for projecting the impact of population growth on local spending patterns and is used to establish the costs of existing services for a new development. The basic premise of this method is that current revenue/cost ratios per person and per unit are a potential indicator of future revenue/cost impacts occasioned by growth. New capital expenditures required for provision of services to a development are not added to current costs; instead, the present debt service for previous improvements is included to represent ongoing capital projects. The advantage of this approach is its

simplicity of implementation and its wide acceptance by both consultants and local officials. The downside of this approach is that the methodology calculates the “average” cost as being the expected cost, which is often not the case and costs are exaggerated - significantly in some instances. (For example, if one student is added to a school system, limited cost impacts will occur; however based on an “average” cost to educate one student the cost could be noted as \$15,000/year, which includes such costs as existing debt, building maintenance, administrative and other factors, all of which will be minimally impacted by the addition of one student. The “true cost” could be significantly less, especially in those communities with declining enrollment.)

The Marginal Cost Approach is a more realistic methodology that can be used to estimate and measure developmental impacts based on actual costs that occur in the community. At this time, a “level of service” exists in Needham to serve the community. This existing service level, for the most part, addresses the needs of the community through existing tax collections. As new development occurs, pressures are placed on some departments to address increased demands, while other departments experience negligible, if any impacts. In reviewing the potentially impacted town departments specifically, a truer picture of anticipated cost impacts can be determined.

Given the nature of the contemplated redevelopment of the 100 West Street property, as will be shown by the analysis below, measurable impacts will be limited to a few Town departments. Any required off-site traffic and roadway improvements are expected to be addressed during the approval processes with the Town. Also, a very similar use existed on the property for many years with little traffic impact. Solid waste generated by the proposed use will be removed by a private hauler, consistent with existing practices. Any ongoing sewer and water expenses associated with potable water use and sewage generated by the proposed use will be offset through user fees. All on-site property improvements will be private and all maintenance expenses will be paid for by this project owner. This report does not intend to imply that no costs will occur as a result of this project. Measurable impacts of the redevelopment are expected to result to

a few Town departments, most notably the Police and Fire Departments. Other Town agencies are projected to experience little or no measurable impacts from the project redevelopment proposal.

#### 4. Local Revenues

##### Property Tax Revenue

Local property taxes provide the bulk of General Fund Revenues<sup>3</sup> for Needham, with 2019 figures showing that 77.8% came from this source, with remaining income being derived from state aid and other receipts. The 2020 Real Estate Tax Rate for residential uses is \$12.49 and \$24.55 for Commercial/Industrial uses and Personal Property.

Table One outlines the estimated municipal property tax revenue that will be generated by the proposed project. The income approach is traditional used to estimate project values. At this time project revenues and expenses have not been finalized and therefore this methodology will not be used in this analysis. After speaking to local assessing officials and reviewing the Needham marketplace for comparable properties, we have estimated a project’s value of \$37,675,931 which will generate \$470,572 in annual revenues to the General Fund. This major investment into the property will increase the value of the site by over \$28,000,000 compared to its existing assessment.

**Table One  
Anticipated Yearly Property Tax Revenue**

Site	Use Type	Assessed Value	Units	Value Per Unit
Avita of Needham	Assisted Lvg. & memory	\$10,912,000	62	\$176,000
Wingate of Needham	Assisted & Independent	\$33,614,100	120	\$280,118
<b>Average</b>		<b>\$44,526,100</b>	<b>182</b>	<b>\$244,649</b>
<b>LCB Senior Living</b>		<b>154 Units</b>	<b>\$37,675,931</b>	
Estimated Property Taxes @ \$12.49		\$470,572		

<sup>3</sup> FY2020 Recommended Budget.

## Personal Property

Another source of income will be from Personal Property, which LCB Senior Living estimates will be worth \$2,000,000. These assets are taxed at the Commercial rate of \$24.55 and will generate **\$49,100** in yearly revenue.

## Excise Taxes

Another major source of income for communities is from motor vehicle excise taxes. In 2019 the Town of Needham collected \$4,900,000 for this revenue source. Transportation services will be made available to residents of the planned community. It is anticipated that those residing within the assisted living units will not own cars. For the independent senior living residents, we have assumed that 50% of these residents will own cars (35 vehicles). As outlined in Table Two, we estimate \$21,875 in yearly excise taxes from this revenue source.

Table Two  
Annual Excise Taxes

# Cars	Value	Total Value
35	\$25,000	\$875,000
\$25 x \$875		<b>\$21,875</b>

## Community Preservation Surcharge

The Town of Needham has adopted the Community Preservation Act allowing the community to impose a 2% surcharge on property taxes. Based upon the projected taxes outlined in Table One, an estimated CPA surcharge of \$9,411 was calculated as outlined in Table Three.

Table Three  
Community Preservation Surcharge

Property Taxes	CPA Surcharge	Surcharge
\$470,572	2%	<b>\$9,411</b>

## Total Estimated Yearly Project Revenues

The proposed West Street development is estimated to generate \$550,958 in annual revenues from property taxes, personal property taxes, excise taxed and CPA surcharge as outlined in Table Four.

Table Four  
Estimated Yearly Revenue

Property Taxes	\$470,572
Personal Property	\$49,100
Excise Taxes	\$21,875
Total Taxes	\$541,547
CPA Surcharge	\$9,411
<b>Total Revenues</b>	<b>\$550,958</b>

Additional one-time payment revenues will also be realized as part of the development, these will be detailed further below.

## 5. Department Impacts

### Public Safety

The Police and Fire Departments are projected to have the most measurable operational influences from the proposed project. To assess the degree of impact this project will have on these departments, emergency calls from similar uses in other communities and from two Needham comparable facilities were analyzed. The call data was averaged to determine the numbers of annual calls per unit. Table Five and Six summarizes these findings.

Table Five  
Emergency Police Service Calls

Project	Units	Avg. Police Calls Per Year	Avg. Call Per Unit	Projected Yearly Calls
Assisted Living Projects <sup>4</sup>	300	101	0.2790	
Avita Needham	62	10	0.1613	
Total Average	362	111	<b>0.3066</b>	
<b>Estimated LCB - Assisted</b>	<b>83</b>			<b>25</b>
Senior Independent Apts. <sup>5</sup>	252	272	1.0794	
<b>Estimated LCB-Independent</b>	<b>71</b>			<b>77</b>
<b>Total Police Calls</b>				<b>102</b>
Wingate Needham (68 assisted/ 52 independent)	120	31	0.1230	
Avery Square - closed Nursing Home/Assisted living	200	17	0.0675	

<sup>4</sup> Waltham Crossings, Bridges Westford & Whitney Place Natick.

<sup>5</sup> Heatherwood Tewksbury & Highland Westborough.

Table Six  
Emergency Fire/EMS Service Calls

Project	Units	Avg. Fire Call Per Year	Avg. Call Per Unit	Projected Yearly Calls
Assisted Living Projects <sup>6</sup>	300	185	0.511	
Avita Needham	62	2	0.032	
Total Average	362	187		<b>0.517</b>
<b>Estimated LCB-Assisted</b>	<b>83</b>			<b>43</b>
Senior Independent Apts. <sup>7</sup>	252	40	0.159	
<b>Estimated LCB-Independent</b>	<b>71</b>			<b>11</b>
<b>Total Fire Calls</b>				<b>54</b>
Wingate Needham (68 assisted/ 52 independent)	120	10		<b>0.083</b>
Avery Square - closed Nursing Home/Assisted living	200	10		<b>0.050</b>
Project	Units	Avg. EMS Calls Per Year	Avg. Call Per Unit	Projected Yearly Calls
Assisted Living Projects	300	250	0.833	
Avita Needham	62	31	0.500	
Total Average	362	281	<b>0.776</b>	
<b>Projected LCB-Assisted</b>	<b>83</b>			<b>64</b>
Senior Independent Apts.	252	240	0.952	
<b>Estimated LCB-Independent</b>	<b>70</b>			<b>67</b>
<b>Total EMS Calls</b>				<b>131</b>
Wingate Needham (68 assisted/ 52 independent)	120	246	2.050	
Avery Square - closed Nursing Home/Assisted living	200	68	0.340	

Extrapolating from the comparable call data, increases are projected to the Town's Police and Fire Departments. Annual police calls are projected to increase by 102 calls, annual fire/EMS calls are projected to increase by 185 calls. It should also be noted that the former Avery Square use generated<sup>8</sup> 17 police calls a year and 78 fire/EMS calls yearly.

<sup>6</sup> Waltham Crossings, Bridges Westford & Whitney Place Natick.

<sup>7</sup> Heatherwood Tewksbury & Highland Westborough.

<sup>8</sup> Historical call data obtained from the Police and Fire Departments.

LCB Senior Living regularly undertakes census audits of its existing communities and typically finds that between 35% and 40% of the residents who reside in a facility are from the town where the community is located. For the West Street development it is anticipated that 64 +/- residents (total population 185) will be from Needham. As existing residents of the community they may already be placing demands on Public Safety services and therefore are not creating any “new” demand. Although estimated emergency calls will not be discounted to account for these existing demands, they should be taken into consideration when evaluating police and fire impacts.

**Police Department**

The total gross Police Department budget in 2020 was \$7,050,521. As noted above, the Police Department is estimated to realize a yearly increase of 102 calls which represents less than a .003% increase total calls (Calls from 2016-18 range from 33,610 to 48,098). To assign some cost for the proposed increased call volume, the department’s total budget was divided by the lowest number Calls for Service over the last three years. Based on a cost of \$210 per call, an impact of \$21,240 was calculated as outlined in Table Seven.

Table Seven  
Estimated Police Department Costs

<b>Budget</b>	<b>Calls Per Year<sup>9</sup></b>	<b>Cost Per Call</b>	<b>Est. Calls</b>	<b>Cost</b>
\$7,050,521	33,610	\$210	102	\$21,420

We discussed these findings and with the Chief of Police John Schlittler. He thought the estimated calls were reasonable and was not surprised that they would increase over the activity seen at the former nursing home that occupied the site. The Chief noted that these types of land uses can generate more demands on the Department such as investigations into theft and other allegations. These investigations can take time and may involve detective work, leading to many hours of effort on the part of his officers. The Chief felt the estimated cost impact to his Department may be too low. The full cost of a

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<sup>9</sup> To be conservative, the lower call volume over the last three years was used to result in a higher cost per call.

police officer for the Town is \$100,000. To be conservative, we will carry allocate the cost of ½ an officers salary for this project, \$50,000. The Chief was satisfied with this cost allocation.

**Fire Department**

The 2020 Fire Department gross budget was \$9,316,814. The Fire Department will realize a greater impact from the proposed facility, with an estimated 54 fire calls and 131 EMS calls. Taking into consideration the former Avery nursing home’s demands on the Department, 78 calls a year, results in an increased demand of service of 107 new calls. As with the police department, a cost per call has been calculated for the Department to arrive at a gross cost of \$179,332, Table Eight.

Table Eight  
Estimated Fire Department Costs - Gross

<b>Budget</b>	<b>Calls Per Year</b>	<b>Cost Per Call</b>	<b>Est. Calls</b>	<b>Cost</b>
\$9,316,814	5,560	\$1,676	107	\$179,332

The Town of Needham collected \$1,081,616 in ambulance revenue in 2019, an average of \$521 a call. To arrive at a net cost for fire services, annual ambulance income of \$68,251 has been taken into account. Given the high levels of income in the community and the expectation that most of the residents will have adequate health care coverage, it is anticipated that estimated ambulance revenue will be higher than noted. Table Nine summarizes a net department cost of \$111,081 after taking into account anticipated annual ambulance revenue.

Table Nine  
Estimated Fire Department Costs - Net

<b>EMS Rev./Call</b>	<b>Calls Per Year</b>	<b>Rev. Per Year</b>	<b>Net Cost</b>
\$543	131	\$68,251	\$111,081

A meeting was held with Fire Chief Dennis Condon, as well as Fire Inspectors Ron Gavel and Jay Steeves. The proposed project was discussed, along with the estimated calls for service. The Chief noted that although this one project will not significantly impact his Department, general growth in the community is

straining operations. He has applied for grants to increase the number of fire fighter personal to help address the increased demands he has seen. The Chief felt the estimated cost of \$111,081 was a fair assessment of potential costs to his Department, which would cover the expenses of one full time fire fighter.

## **5. Health Department**

Given the proposed use, it is estimated that two to three inspections are anticipated per year of the new facility. The kitchen area, along with other spaces will be inspected to ensure all relevant standards are being adhered to. Determining cost impacts is challenging and required annual fees will cover most costs. To account for unexpected expenses, we will carry a \$1,000 cost impact for this Department.

## **6. Other Departments**

In reviewing other Town department, no other measurable impacts were seen. Building permit costs, \$10/\$1000 were more than offset any costs in the Building Department. Based upon the estimated construction costs of \$47,000,000 it is anticipated that \$470,000 will be generated in buildings fees. Additional fees will be paid for plumbing and electrical work.

## **7. Other Benefits**

Other economic benefits are projected as a result of the proposed residential community, including additional meals taxes, local economic growth, and new construction jobs. The single phase construction lasting approximately 18 months will infuse a significant economic boost into the local and regional economy, with dozens of tradesmen involved in building the project and millions of dollars spent on construction supplies and materials.

## **8. Summary**

Table Ten summarizes the estimated revenues and expenses associated with the proposed assisted living development. Gross revenues are anticipated to be

\$550,988 a year with a net positive yearly benefit of \$388,877. This cost estimate is not inferring the Needham's budget will increase as a result of the proposed development, but assigns a "cost" to account for this new land use in the community. Appropriate discussions with key decision makers within the community will determine if budgets need to be adjusted to address demands estimated in the Report. It is anticipated that these total costs will not actually be realized.

Table Ten  
Revenue & Expense Summary

<b>Projected Tax Revenue</b>	\$550,958
<b>Projected Municipal Costs</b>	
<b>Police</b>	-\$50,000
<b>Fire</b>	-\$111,081
<b>Board of Health</b>	-\$1,000
<b>Total Costs</b>	<b>-\$162,081</b>
<b>Net Positive Fiscal Impact</b>	<b>+\$388,877</b>

## Summary of Findings

Given the following facts and the nature of the proposed LCB Senior Living project few impacts will be felt by town departments:

- All on site improvements will be private and all maintenance expenses will be paid for by this project owner.
- No school related impacts will occur.
- Solid waste generated by this project will be removed by a private hauler.
- Any water/sewer expenses will be offset through user fees.
- Measureable financial impacts upon non-Public Safety departments will be minimal.

This is not to infer that no costs will occur as a result of this project. Measurable demands for services will be felt by the Police and Fire Departments.

Key findings of the assisted living analysis include:

- Reflective of New England wide trends, Needham is aging with those individuals over the age of 60 increasing 17% since 2000.
- The proposed community will generate approximately \$550,958 in gross revenue per year. Taking into consideration estimated municipal costs of \$162,081, the proposed project will yield approximately **\$388,877** in net positive yearly revenue annually.
- The existing property assessment is anticipated to increase from \$9,471,500 to \$37,675,931, an increase of over \$28,000,000. Property taxes will increase from \$175,411 to \$470,572.
- Annual calls to the Police Department are projected to increase by 102 calls (.002%), recent annual call volume over 48,098. The former use generated approximately 17 calls annually.

- The Fire Department is projected to receive approximately 185 new fire calls annually from the proposed use. Ambulance calls are to generate \$68,251 annual revenue for the community. The former use generated 78 yearly calls.
- For the senior living project, all onsite maintenance will be private; along with all trash collection. Therefore, there is no projected impact to the DPW Department.



**Select Board  
TOWN OF NEEDHAM  
AGENDA FACT SHEET**

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**MEETING DATE: 06/23/2020**

<b>Agenda Item</b>	Approval of the Sale of Bonds and Notes
<b>Presenter(s)</b>	David Davison, Assistant Town Manager/Finance Evelyn Poness, Town Treasurer/Collector
<b>1.</b>	<b>BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED</b>
<p><b>We will review the results of the sale of bonds which included refunding bonds, and the sale of a note and discuss future borrowings.</b></p> <p>Under Governor Baker’s emergency “Order Suspending Certain Provisions of the Open Meeting Law G.L. c. 30A, S20”, issued March 12, 2020 and in effect until termination of the emergency, meetings of public bodies may be conducted virtually provided that adequate access is provided to the public.</p> <p>To listen and view this virtual meeting on a phone, computer, laptop, or tablet, download the “Zoom Cloud Meeting” app in any app store or at <a href="http://www.zoom.us">www.zoom.us</a>. At the above date and time, click on “Join a Meeting” and enter the meeting 81178733033 or click the link below to join the webinar: <a href="https://us02web.zoom.us/j/81178733033">https://us02web.zoom.us/j/81178733033</a>.</p>	
<b>2.</b>	<b>VOTE REQUIRED BY SELECT BOARD</b>
<p>Suggested Motions: (please note there are eleven (11) motions to be acted upon by the Board)</p> <p><b>Motion A</b> Move that in order to reduce interest costs, the Treasurer is authorized to issue refunding bonds, at one time or from time to time, pursuant to Chapter 44, Section 21A of the General Laws, or pursuant to any other enabling authority, to refund all or a portion of the Town’s \$15,815,000 General Obligation Municipal Purpose Loan of 2009 Bonds dated December 15, 2009 maturing on August 1 in the years 2021 through 2028 (inclusive) (collectively, the “Refunded Bonds”) and that the proceeds of any refunding bonds issued pursuant to this vote shall be used to pay the principal, redemption premium and interest on the Refunded Bonds and costs of issuance of the refunding bonds.</p> <p><b>Motion B</b> Move that the sale of the \$25,185,000 General Obligation Municipal Purpose Loan of 2020 Bonds of the Town dated June 25, 2020 (the “Bonds”), to UMB Bank, N.A. at the price of \$28,215,818.69 and accrued interest, if any, is hereby approved and confirmed. The Bonds shall be payable on February 1, of the years and in the principal amounts and bear interest at the respective rates, as follows:</p> <p style="text-align: center;">(Continues Next Page)</p>	



**Select Board  
TOWN OF NEEDHAM  
AGENDA FACT SHEET**

Year	Amount	Interest Rate	Year	Amount	Interest Rate
2021	\$1,990,000	5.00%	2031	\$895,000	4.00%
2022	1,905,000	5	2032	895,000	4
2023	1,895,000	5	2033	895,000	3
2024	1,905,000	5	2034	895,000	2
2025	1,770,000	5	2035	895,000	2
2026	1,575,000	4	2036	895,000	2
2027	1,565,000	4	2037	895,000	2
2028	1,375,000	4	2038	895,000	2
2029	1,365,000	4	2039	895,000	2
2030	895,000	4	2040	890,000	2

**Motion C**

Move to approve the sale of a \$1,200,000 1.30 percent General Obligation Bond Anticipation Note of the Town dated June 25, 2020, and payable December 18, 2020 (the “Note”), to Century Bank and Trust Company at par and accrued interest, if any, plus a premium of \$3,600.00.

**Motion D**

Move that in connection with the marketing and sale of the Bonds, the preparation and distribution of a Notice of Sale and Preliminary Official Statement dated June 2, 2020, as revised on June 5, 2020, and a final Official Statement dated June 9, 2020 (the “Official Statement”), each in such form as may be approved by the Town Treasurer, be and hereby are ratified, confirmed, approved and adopted.

**Motion E**

Move that in connection with the marketing and sale of the Note, the preparation and distribution of a Notice of Sale and Preliminary Official Statement dated June 9, 2020, and a final Official Statement dated June 10, 2020, each in such form as may be approved by the Town Treasurer, be and hereby are ratified, confirmed, approved and adopted.

**Motion F**

Move that the Bonds shall be subject to redemption, at the option of the Town, upon such terms and conditions as are set forth in the Official Statement.

**Motion G**

Move to authorize the execution and delivery of a Refunding Escrow Agreement to be dated June 25, 2020, between the Town and U.S. Bank National Association, as Refunding Escrow Agent.

**Motion H**

Move that that the Town Treasurer and the Select Board be, and hereby are, authorized to execute and deliver a continuing and significant events disclosure undertakings in compliance with SEC Rule 15c2-12 in such forms as may be approved by bond counsel to the Town, which undertakings shall be incorporated by reference in the Bonds and Notes, as applicable, for the benefit of the holders of the Bonds and Notes from time to time.

(Continues Next Page)



**Select Board  
TOWN OF NEEDHAM  
AGENDA FACT SHEET**

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**Motion I**

Move that we authorize and direct the Town Treasurer to establish post issuance federal tax compliance procedures and continuing disclosure procedures in such forms as the Town Treasurer and bond counsel deem sufficient, or if such procedures are currently in place, to review and update said procedures, in order to monitor and maintain the tax-exempt status of the Bonds and Notes and to comply with relevant securities laws.

**Motion J**

Move that any certificates or documents relating to the Bonds and the Notes (collectively, the “Documents”), may be executed in several counterparts, each of which shall be regarded as an original and all of which shall constitute one and the same document; delivery of an executed counterpart of a signature page to a Document by electronic mail in a “.pdf” file or by other electronic transmission shall be as effective as delivery of a manually executed counterpart signature page to such Document; and electronic signatures on any of the Documents shall be deemed original signatures for the purposes of the Documents and all matters relating thereto, having the same legal effect as original signatures.

**Motion K**

Move that each member of the Select Board, the Town Clerk and the Town Treasurer be and hereby are, authorized to take any and all such actions, and execute and deliver such certificates, receipts or other documents as may be determined by them, or any of them, to be necessary or convenient to carry into effect the provisions of the foregoing votes.

**BACK UP INFORMATION ATTACHED**

- a. Under Separate Cover

## Memorandum

To: Select Board  
From: David Davison, Assistant Town Manager/Director of Finance  
CC: Kate Fitzpatrick, Town Manager; Evelyn Pones, Treasurer/Collector; Michelle Vaillancourt, Town Accountant  
Date: June 19, 2020  
Re: Sale of Bonds and Note

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The Town maintained its “AAA” rating with Standard and Poor’s (S&P), which has reaffirmed the rating, and still views Needham’s outlook as stable after our review with them on Thursday, May 28, 2020. This was especially significant as the rating agencies have been expressing a negative outlook on governmental debt. We discussed the Town’s overall financial position, the fiscal measures the Town has taken and/or anticipates taking related to the COVID-19 pandemic, the impact on the local and regional economy, and the Town’s debt issuance plans in the coming 12 to 24 months. We reviewed the actions taken to reduce spending for the balance of FY2020 to lessen the possibility that operating expenses will exceed actual revenue collected for the year. We discussed the changes to the revenue estimates for FY2021, the deferral of some capital and other funding requests which were planned for the Annual Town Meeting, and that the Town was moving forward with the original budget plan and maintaining a level of capital investment. The contingencies that we have in place (special town meeting in the fall), the fact that we planned to keep to the Town’s practice on limiting the use of Free Cash to fund the operating budget, that we reduced the amount of reserves which would be used to fund requests this spring, and our monitoring and adjusting of revenue estimates were reassuring. S&P again stressed the need for the Town to maintain adequate reserves. The S&P June 5, 2020 rationale for the rating is attached.

The municipal bond market has seen some significant swings in demand and interest rates. Over the past two/three months there were times when governments were unable to secure financing or were able to secure financing but at much higher interest rates than before. However, liquidity has improved and the competition for highly rated bonds has pushed interest rates down, lowering the debt expense. Another benefit of the current lower interest rates is that the Town is able to reduce the interest expense on some of the outstanding debt which callable. Part of the bond issue is for refunding bonds. The Town is also able to pay down \$370,000 of the outstanding water and sewer principal from budgeted funds which further reduces future debt expense and provides more flexibility later. The effect of this refunding, over the nine-year period, is a savings of \$1,200,932.50, and on a present value basis the calculated savings is \$769,699.43 (savings summary attached).

The Town received nine competitive bids for the 20 year bond issue. The lowest bidder, **UMB Bank, N.A. of Dallas Texas** offered a coupon rate that ranges from a low of 2.000% to a high of 5.000% per year, with an initial premium of \$3,078,704.50. By using the premium to reduce the size of the bond issue, reducing it from \$27,155,000 to \$25,185,000, and paying the debt issuance costs, the revised premium of \$3,030,818.69

resulted in a true interest cost (TIC) of 1.516477%. The amortization schedule for the \$25 million bond is attached. A summary of the nine bids for the bonds is shown in table one.

**Table One**

Bidder	Amount	Range	Interest	Premium	Net Interest	True Interest Cost Rate
UMB Bank, N.A.	\$27,155,000	2.000% - 5.000%	\$6,472,970.00	\$3,078,704.50	\$3,394,265.50	1.512433%
Citigroup Global Markets Inc	\$27,155,000	2.000% - 5.000%	\$7,025,858.75	\$3,487,199.85	\$3,538,658.90	1.561675%
Raymond James & Associates, Inc	\$27,155,000	2.000% - 5.000%	\$6,971,141.25	\$3,424,030.40	\$3,547,110.85	1.568371%
Piper Sandler & Company	\$27,155,000	2.000% - 5.000%	\$6,781,401.25	\$3,215,825.24	\$3,565,576.01	1.585059%
J.P. Morgan Securities LLC	\$27,155,000	2.000% - 5.000%	\$7,101,811.25	\$3,502,926.01	\$3,598,885.24	1.586870%
Janney Montgomery Scott LLC	\$27,155,000	2.000% - 5.000%	\$7,103,800.50	\$3,488,745.86	\$3,615,054.64	1.593827%
Robert W Baird & Co., Inc.	\$27,155,000	2.000% - 5.000%	\$7,019,772.75	\$3,388,447.74	\$3,631,325.01	1.607693%
UBS Financial Services Inc.	\$27,155,000	2.000% - 5.000%	\$6,895,188.75	\$3,172,991.98	\$3,722,196.77	1.658494%
Bank of America Merrill Lynch	\$27,155,000	3.000% - 5.000%	\$8,009,400.00	\$4,086,612.50	\$3,922,787.50	1.689096%
<b>Resized</b>						
UMB Bank, N.A.	\$25,185,000	2.000% - 5.000%	\$6,416,740.00	\$3,030,818.69	\$3,385,921.31	1.516477%

The Town is also issuing a \$1,200,000 Bond Anticipation Note (BAN), which will mature on December 18, 2020. This is temporary financing pending the close out of the Sunita Williams School project. After the Town submits the final documentation to the Massachusetts School Building Authority (MSBA) to review, the MSBA will complete its audit of the project and calculate the final payment that is due to the Town. The portion of the BAN which is not covered by the State will be rolled to another debt issue. The Town received two bids and the winning bidder was Century Bank, which offered a coupon rate of 1.30% with a premium of \$3,600, which results in a Net Interest Cost (NIC) of 0.6757%. The NIC is the basis for determining award. The gross interest expense is \$7,496.67. The bid results are shown in table two.

**Table Two**

Bidder	Amount	Rate	Interest	Premium	Net Interest	NIC
Century Bank	\$1,200,000	1.300%	\$7,496.67	\$3,600.00	\$3,896.67	0.675700%
Piper Sandler & Company	\$1,200,000	1.750%	\$10,091.67	\$5,520.00	\$4,571.67	0.792800%

The premium that was offered on the bond by the winning bidder permitted the Town to reduce the size of the bond issue from \$27,155,000 to \$25,185,000. This is in accordance with Massachusetts law on municipal debt financing, which allows the Town to apply the net proceeds (the premium less the issuance expenses) to projects being funded by the debt issue. Furthermore, a like amount is reduced from the Town Meeting debt authorizations being funded in part by the premium, meaning the Town will not spend any more than was authorized to spend by appropriation. A majority of the bond issue was related to the Public Safety building projects, which are funded by debt exclusion, so we applied the largest portion of the premium to those projects (the law requires premiums to be allocated by group). This reduced the amount of principal that was borrowed and hence reduced the amount that will be added to the tax levy to pay for the projects. Table three shows how the required new money was financed.

**Table Three**

Project	Required Funds	Portion Financed by Premium	Portion Financed by Bond	Portion Financed by BAN
<b>New Money</b>				
Rosemary Recreational Complex	7,500		7,500	
High School Expansion Design	15,500	15,500		
Public Works Storage Facility	1,025,000		1,025,000	
High School Expansion Construction	87,000	81,500	5,500	
Memorial Park Building Project	440,000		440,000	
Public Works Infrastructure Program	95,000		95,000	
RTS Property Improvements	60,000	60,000		
Wastewater System Rehabilitation	46,000		46,000	
Sunita William School	1,416,000	216,000		1,200,000
Public Safety Building & Station 2 Design	218,000	218,000		
Public Safety Buildings Construction	20,000,000	1,460,000	\$18,540,000	
<b>Totals</b>	<b>23,410,000</b>	<b>2,051,000</b>	<b>20,159,000</b>	<b>1,200,000</b>

The Board will be asked to approve the refunding and the sale of the bonds and the note. Because the meeting is remote, your signatures have been electronically applied to the documents. To assist in the identification of the various documents referenced below, please refer to the letter code which appears in the upper right corner of each of the documents.

- A) General Obligation Bond Anticipation Note (4 pages)
- B) General Obligation Municipal Purpose Loan of 2020 Bond (6 pages) – the Treasurer has one for each of the twenty years.
- C) Vote of the Select Board (3 pages)
- D) Signature, No Litigation and Official Statement for the Note (4 pages) – to view the official statement for the Note, here is the link to the Town’s web page:  
<https://www.needhamma.gov/DocumentCenter/View/21560/June-25-2020-1200000-Bond-Anticipation-Note-PDF?bidId=>
- E) Signature, No Litigation and Official Statement for the Bonds (9 pages) – to view the official statement for the Bonds, here is the link to the Town’s web page:  
<https://www.needhamma.gov/DocumentCenter/View/21561/June-25-2020-252-million-bond-Issue-PDF?bidId=>
- F) Tax Certificate relates to the Note and the Bonds (29 pages)
- G) Continuing Disclosure Certificate (7 pages)

Please do not hesitate to contact me if you have any questions prior to the meeting.

Registered  
Number 1

Registered  
\$1,200,000

United States of America

The Commonwealth of Massachusetts

TOWN OF NEEDHAM

GENERAL OBLIGATION  
BOND ANTICIPATION NOTE  
(School Project Loan, Chapter 70B)

	<u>Interest Rate</u>	<u>Maturity Date</u>	<u>Registration and Original Issue Date</u>
	1.30%	December 18, 2020	June 25, 2020
PRINCIPAL AMOUNT:		ONE MILLION TWO HUNDRED THOUSAND DOLLARS	
REGISTERED OWNER:		CENTURY BANK AND TRUST COMPANY	
REGISTRAR AND PAYING AGENT:		U.S. BANK NATIONAL ASSOCIATION	

The Town of Needham, Massachusetts (the "Town") for value received, promises to pay to the Registered Owner of this note or registered assigns the Principal Amount specified above in lawful money of the United States of America on the Maturity Date upon presentation and surrender hereof, with interest (calculated on the basis of a 30-day month and a 360-day year) at the Interest Rate per annum, payable on the Maturity Date. This note will bear interest from the Original Issue Date.

This note certificate is the only instrument representing an issue of \$1,200,000 principal amount issued by the Town pursuant to Chapter 70B of the General Laws as amended in anticipation of bonds authorized for school purposes.

The note is a general obligation of the Town and the full faith and credit of the Town is pledged for the payment of principal of and interest on the note as the same shall become due.

The principal of and interest on this note are payable by U.S. Bank National Association, or its successor as paying agent (the "Paying Agent") for the Town, in immediately available funds to the Registered Owner of this note.

**COPY**

This note is transferable only upon the registration books kept by the Paying Agent as registrar.

The Town hereby covenants that it will take all lawful action necessary to comply with all requirements of the Internal Revenue Code of 1986, as amended, that must be satisfied subsequent to the issuance of the note in order that interest on the note be and continue to be excluded from gross income for federal income tax purposes and it will refrain from taking any action that would cause interest on the note to become included in gross income for federal income tax purposes.

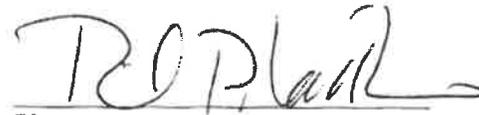
In connection with the offering of the note the Town has executed a Significant Events Disclosure Certificate dated as of the date hereof (as it may be amended from time to time, the "Certificate"). The Town hereby covenants to comply with the provisions of the Certificate, and reference is made to the Certificate for a description of the nature and extent of the obligations of the Town and the rights of the owners of the note under the Certificate. The Certificate is described in the Official Statement relating to the note. A copy of the Certificate is available from the Town upon request.

TOWN OF NEEDHAM,  
MASSACHUSETTS

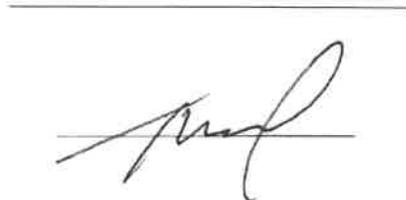
By: \_\_\_\_\_  
Treasurer

Countersigned:

  
\_\_\_\_\_

  
\_\_\_\_\_

*Matthew Borrelli*

  
\_\_\_\_\_

*MBCoo*

(Town Seal)

Select Board

**COPY**

## LEGAL OPINION

The following opinion is based on facts and the law existing on the date of original delivery of the notes described therein.

LOCKE LORD LLP  
111 Huntington Avenue  
Boston, Massachusetts

Evelyn M. Poness, Treasurer  
Town of Needham  
Needham, Massachusetts

**COPY**

\$1,200,000  
Town of Needham, Massachusetts  
General Obligation Bond Anticipation Note

We have acted as bond counsel to the Town of Needham, Massachusetts (the "Town") in connection with the issuance by the Town of the above-referenced note (the "Note") dated June 25, 2020 and payable December 18, 2020. In such capacity, we have examined the law and such certified proceedings and other papers as we have deemed necessary to render this opinion.

As to questions of fact material to our opinion we have relied upon representations and covenants of the Town contained in the certified proceedings and other certifications of public officials furnished to us, without undertaking to verify the same by independent investigation.

Based on our examination, we are of the opinion, under existing law, as follows:

1. The Note is a valid and binding general obligation of the Town and, except to the extent it is paid from the proceeds of the bonds in anticipation of which it is issued or from any other available moneys, the principal of and interest on the Note are payable from taxes which may be levied upon all taxable property in the Town without limitation as to rate or amount, except as provided under Chapter 44, Section 20 of the General Laws.

2. Interest on the Note is excluded from the gross income of the owners of the Note for federal income tax purposes. In addition, interest on the Note is not a specific preference item for purposes of the federal individual alternative minimum tax. In rendering the opinions set forth in this paragraph, we have assumed compliance by the Town with all requirements of the Internal Revenue Code of 1986, as amended, that must be satisfied subsequent to the issuance of the Note in order that interest thereon be, and continue to be, excluded from gross income for federal income tax purposes. The Town has covenanted to comply with all such requirements. Failure by the Town to comply with certain of such requirements may cause interest on the Note to become included in gross income for federal income tax purposes.

retroactive to the date of issuance of the Note. We express no opinion regarding any other federal tax consequences arising with respect to the Note.

3. Interest on the Note is exempt from Massachusetts personal income taxes and the Note are exempt from Massachusetts personal property taxes. We express no opinion regarding any other Massachusetts tax consequences arising with respect to the Note or any tax consequences arising with respect to the Note under the laws of any state other than Massachusetts.

This opinion is expressed as of the date hereof, and we neither assume nor undertake any obligation to update, revise, supplement or restate this opinion to reflect any action taken or omitted, or any facts or circumstances or changes in law or in the interpretation thereof, that may hereafter arise or occur, or for any other reason.

The rights of the holders of the Note and the enforceability of the Note may be subject to bankruptcy, insolvency, reorganization, moratorium and other similar laws affecting creditors' rights heretofore or hereafter enacted to the extent constitutionally applicable, and their enforcement may also be subject to the exercise of judicial discretion in appropriate cases.

/s/ LOCKE LORD LLP

**COPY**

R-«a»

\$«b»

United States of America  
 The Commonwealth of Massachusetts  
 TOWN OF NEEDHAM  
 GENERAL OBLIGATION  
 MUNICIPAL PURPOSE LOAN OF 2020 BOND

<u>Interest Rate</u>	<u>Maturity Date</u>	<u>CUSIP</u>	<u>Original Issue Date</u>
«c»%	February 1, «d»	639846 «e»	June 25, 2020

PRINCIPAL AMOUNT: «f» THOUSAND DOLLARS

REGISTERED OWNER: CEDE & CO.

REGISTRATION DATE: JUNE 25, 2020

REGISTRAR AND  
PAYING AGENT: U.S. BANK NATIONAL ASSOCIATION

**COPY**

The Town of Needham, Massachusetts (the "Town"), for value received, promises to pay to the Registered Owner of this bond or registered assigns the Principal Amount specified above, in lawful money of the United States of America, on the Maturity Date unless this bond is called for earlier redemption, upon presentation and surrender hereof, with interest (calculated on the basis of a 360-day year of twelve 30-day months) at the Interest Rate per annum, payable on February 1, 2021 and semiannually thereafter on August 1 and February 1 of each year (each, an "Interest Payment Date") until the Principal Amount is paid or has been duly provided for. This bond will bear interest from the most recent Interest Payment Date to which interest has been paid or, if no interest has been paid, from the Original Issue Date. The record date for the payment of interest on this Bond (the "Record Date") shall be the fifteenth day of the month preceding an interest payment date. If such date is not a business day, the Record Date shall be the next succeeding business day.

This bond is one of an issue of \$25,185,000 aggregate principal amount issued by the Town pursuant to Chapters 44, 44B, and 70B of the General Laws as amended for school, municipal buildings design, construction and

improvement, recreational facilities and refunding purposes. The bonds are issuable only in fully registered form in the denomination of five thousand dollars (\$5,000) or any integral multiple thereof.

The bonds are general obligations of the Town and the full faith and credit of the Town is pledged for the payment of principal of and interest on the bonds as the same shall become due and payable.

The bonds are being issued by means of a book entry system, with bond certificates immobilized at The Depository Trust Company, New York, New York (“DTC”) evidencing ownership of the bonds in principal amounts of five thousand dollars (\$5,000) or integral multiples thereof, and with transfers of beneficial ownership effected on the records of DTC and its participants pursuant to rules and procedures established by DTC. Bond certificates are not available for distribution to the public. The principal or redemption price, if any, of and interest on this bond are payable by U.S. Bank National Association, or its successor as paying agent (the “Paying Agent”) for the Town, to the Registered Owner of this bond, as nominee of DTC. Transfer of principal, redemption price, if any, and interest payments to participants of DTC is the responsibility of DTC; transfer of principal, redemption price, if any, and interest payments to beneficial owners by participants of DTC will be the responsibility of such participants and other nominees of beneficial owners. The Town is not responsible or liable for maintaining, supervising or reviewing the records maintained by DTC, its participants or persons acting through such participants.

In the event that (a) DTC determines not to continue to act as securities depository for the bonds or (b) the Town Treasurer determines that continuation of the book entry system of evidence and transfer of ownership would adversely affect the interests of the beneficial owners of the bonds, the Town will discontinue the book entry system with DTC. If the Town fails to identify another qualified securities depository to replace DTC, the Paying Agent will authenticate and deliver replacement bonds in the form of fully registered certificates.

This bond is transferable only upon the books of the Town which shall be kept for such purpose by the Paying Agent. This bond may not be transferred or exchanged in a manner which would involve the delivery of bond certificates to the beneficial owners of bonds unless the book entry system has been discontinued by the Town in accordance with the preceding paragraph, in which case replacement bonds may be issued in accordance with law and such procedures as the Town Treasurer shall deem appropriate.

The bonds of this issue (except the bonds maturing on or before February 1, 2029, which are not subject to redemption prior to maturity) are redeemable prior to maturity on or after February 1, 2029, at the option of the Town, as a whole or in part at any time, at a price equal to the principal amount to be redeemed (without premium) plus accrued interest to the redemption date.

**COPY**

In the event any bonds are called for redemption, notice will be sent by mail, or in such other manner acceptable to DTC, not more than sixty (60) days nor less than thirty (30) days prior to the redemption date to the registered owner of such bonds, as nominee of DTC. It will be the responsibility of DTC and its participants to give notice of the redemption to beneficial owners of the bonds to be redeemed. With respect to the redemption of any such bond, failure to mail notice to the registered owner of any other bond, any defect in the notice to the registered owner of any other bond, or failure by DTC and its participants to provide notice of redemption to the beneficial owners of such bond will not affect the redemption of such bond. Notice of redemption having been duly given, the bonds to be redeemed, or the portions called for redemption, will become due and payable on the redemption date at the applicable redemption price and, moneys for the redemption having been deposited with the Paying Agent, from and after the date fixed for redemption interest on such bonds, or such portions, will no longer accrue.

With respect to any bond subject to redemption, portions of the principal amount of such bond in the amount of five thousand dollars (\$5,000) or any multiple thereof may be redeemed. In the event of such a partial redemption, the identity of the beneficial owners whose beneficial interests in any such bond are to be redeemed and the amount of any such redemption shall be determined by DTC and its participants by lot in such manner as DTC and its participants shall deem appropriate. If less than all of the principal amount of any bond is to be redeemed, upon surrender of such bond to the Paying Agent there will be issued to the registered owner, without charge, a new bond for the unredeemed principal sum.

The Town hereby covenants that it will take all lawful action necessary to comply with all requirements of the Internal Revenue Code of 1986, as amended, that must be satisfied subsequent to the issuance of the bonds in order that interest on the bonds be and continue to be excluded from gross income for federal income tax purposes and it will refrain from taking any action that would cause interest on the bonds to become included in gross income for federal income tax purposes.

In connection with the offering of the bonds the Town has executed a Continuing Disclosure Certificate (as it may be amended from time to time, the "Certificate"). The Town hereby covenants to comply with the provisions of the Certificate, and reference is made to the Certificate for a description of the nature and extent of the obligations of the Town and the rights of the owners of the

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bonds under the Certificate. The Certificate is described in the Official Statement relating to the bonds. A copy of the Certificate is available from the Town upon request.

TOWN OF NEEDHAM,  
MASSACHUSETTS

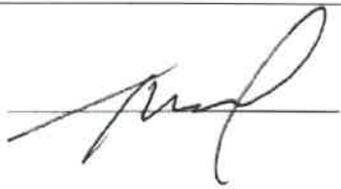
By: \_\_\_\_\_  
Treasurer

Countersigned:

\_\_\_\_\_  


\_\_\_\_\_  


*Matthew Borrelli*

\_\_\_\_\_  


\_\_\_\_\_  


Select Board

(Town Seal)

**COPY**

## LEGAL OPINION

The following opinion is based on facts and the law existing on the date of original delivery of the bonds described therein.

LOCKE LORD LLP  
111 Huntington Avenue  
Boston, Massachusetts

Evelyn M. Pones, Treasurer  
Town of Needham  
Needham, Massachusetts

\$25,185,000  
Town of Needham, Massachusetts  
General Obligation Municipal Purpose Loan of 2020 Bonds  
Dated June 25, 2020

We have acted as bond counsel to the Town of Needham, Massachusetts (the "Town") in connection with the issuance by the Town of the above-referenced bonds (the "Bonds"). In such capacity, we have examined the law and such certified proceedings and other papers as we have deemed necessary to render this opinion.

As to questions of fact material to our opinion we have relied upon representations and covenants of the Town contained in the certified proceedings and other certifications of public officials furnished to us, without undertaking to verify the same by independent investigation.

Based on our examination, we are of the opinion, under existing law, as follows:

1. The Bonds are valid and binding general obligations of the Town and, except to the extent they are paid from other sources, the principal of and interest on the Bonds are payable from taxes which may be levied upon all taxable property in the Town without limitation as to rate or amount, except as provided under Chapter 44, Section 20 of the General Laws, with respect to that portion of the principal and interest payments that the Town has voted to exempt from the limit imposed by Chapter 59, Section 21C of the General Laws, and subject to the limit imposed by Chapter 59, Section 21C of the General Laws with respect to that portion of the principal and interest payments that the Town has not voted to exempt from that limit.

2. Interest on the Bonds is excluded from the gross income of the owners of the Bonds for federal income tax purposes. In addition, interest on the Bonds is not a specific preference item for purposes of the federal individual alternative minimum tax. In rendering the opinions set forth in this paragraph, we have assumed compliance by the Town with all

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requirements of the Internal Revenue Code of 1986, as amended that must be satisfied subsequent to the issuance of the Bonds in order that interest thereon be, and continue to be, excluded from gross income for federal income tax purposes. The Town has covenanted to comply with all such requirements. Failure by the Town to comply with certain of such requirements may cause interest on the Bonds to become included in gross income for federal income tax purposes retroactive to the date of issuance of the Bonds. We express no opinion regarding any other federal tax consequences arising with respect to the Bonds.

3. Interest on the Bonds is exempt from Massachusetts personal income taxes and the Bonds are exempt from Massachusetts personal property taxes. We express no opinion regarding any other Massachusetts tax consequences arising with respect to the Bonds or any tax consequences arising with respect to the Bonds under the laws of any state other than Massachusetts.

This opinion is expressed as of the date hereof, and we neither assume nor undertake any obligation to update, revise, supplement or restate this opinion to reflect any action taken or omitted, or any facts or circumstances or changes in law or in the interpretation thereof, that may hereafter arise or occur, or for any other reason.

The rights of the holders of the Bonds and the enforceability of the Bonds may be subject to bankruptcy, insolvency, reorganization, moratorium and other similar laws affecting creditors' rights heretofore or hereafter enacted to the extent constitutionally applicable, and their enforcement may also be subject to the exercise of judicial discretion in appropriate cases.

LOCKE LORD LLP

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VOTE OF THE SELECT BOARD

I, the Clerk of the Select Board of the Town of Needham, Massachusetts (the "Town"), certify that at a meeting of the board held June 23, 2020, of which meeting all members of the board were duly notified and at which a quorum was present, the following votes were unanimously passed, all of which appear upon the official record of the board in my custody:

Voted: That in order to reduce interest costs, the Treasurer is authorized to issue refunding bonds, at one time or from time to time, pursuant to Chapter 44, Section 21A of the General Laws, or pursuant to any other enabling authority, to refund all or a portion of the Town's \$15,815,000 General Obligation Municipal Purpose Loan of 2009 Bonds dated December 15, 2009 maturing on August 1 in the years 2021 through 2028 (inclusive) (collectively, the "Refunded Bonds") and that the proceeds of any refunding bonds issued pursuant to this vote shall be used to pay the principal, redemption premium and interest on the Refunded Bonds and costs of issuance of the refunding bonds.

Further Voted: that the sale of the \$25,185,000 General Obligation Municipal Purpose Loan of 2020 Bonds of the Town dated June 25, 2020 (the "Bonds"), to UMB Bank, N.A. at the price of \$28,215,818.69 and accrued interest, if any, is hereby approved and confirmed. The Bonds shall be payable on February 1, of the years and in the principal amounts and bear interest at the respective rates, as follows:

<u>Year</u>	<u>Amount</u>	<u>Interest Rate</u>	<u>Year</u>	<u>Amount</u>	<u>Interest Rate</u>
2021	\$1,990,000	5.00%	2031	\$895,000	4.00%
2022	1,905,000	5.00	2032	895,000	4.00
2023	1,895,000	5.00	2033	895,000	3.00
2024	1,905,000	5.00	2034	895,000	2.00
2025	1,770,000	5.00	2035	895,000	2.00
2026	1,575,000	4.00	2036	895,000	2.00
2027	1,565,000	4.00	2037	895,000	2.00
2028	1,375,000	4.00	2038	895,000	2.00
2029	1,365,000	4.00	2039	895,000	2.00
2030	895,000	4.00	2040	890,000	2.00

Further Voted: to approve the sale of a \$1,200,000 1.30 percent General Obligation Bond Anticipation Note of the Town dated June 25, 2020, and payable December 18, 2020 (the "Note"), to Century Bank and Trust Company at par and accrued interest, if any, plus a premium of \$3,600.00.

Further Voted: that in connection with the marketing and sale of the Bonds, the preparation and distribution of a Notice of Sale and Preliminary Official Statement dated June 2, 2020, as revised on June 5, 2020, and a final Official Statement dated June 9, 2020 (the "Official Statement"), each in such form as may be approved by the Town Treasurer, be and hereby are ratified, confirmed, approved and adopted.

Further Voted: that in connection with the marketing and sale of the Note, the preparation and distribution of a Notice of Sale and Preliminary Official Statement dated June 9, 2020, and a final Official Statement dated June 10, 2020, each in such form as may be approved by the Town Treasurer, be and hereby are ratified, confirmed, approved and adopted.

Further Voted: that the Bonds shall be subject to redemption, at the option of the Town, upon such terms and conditions as are set forth in the Official Statement.

Further Voted: to authorize the execution and delivery of a Refunding Escrow Agreement to be dated June 25, 2020, between the Town and U.S. Bank National Association, as Refunding Escrow Agent.

Further Voted: that the Town Treasurer and the Select Board be, and hereby are, authorized to execute and deliver a continuing and significant events disclosure undertakings in compliance with SEC Rule 15c2-12 in such forms as may be approved by bond counsel to the Town, which undertakings shall be incorporated by reference in the Bonds and Notes, as applicable, for the benefit of the holders of the Bonds and Notes from time to time.

Further Voted: that we authorize and direct the Town Treasurer to establish post issuance federal tax compliance procedures and continuing disclosure procedures in such forms as the Town Treasurer and bond counsel deem sufficient, or if such procedures are currently in place, to review and update said procedures, in order to monitor and maintain the tax-exempt status of the Bonds and Notes and to comply with relevant securities laws.

Further Voted: that any certificates or documents relating to the Bonds and the Notes (collectively, the “Documents”), may be executed in several counterparts, each of which shall be regarded as an original and all of which shall constitute one and the same document; delivery of an executed counterpart of a signature page to a Document by electronic mail in a “.pdf” file or by other electronic transmission shall be as effective as delivery of a manually executed counterpart signature page to such Document; and electronic signatures on any of the Documents shall be deemed original signatures for the purposes of the Documents and all matters relating thereto, having the same legal effect as original signatures.

Further Voted: that each member of the Select Board, the Town Clerk and the Town Treasurer be and hereby are, authorized to take any and all such actions, and execute and deliver such certificates, receipts or other documents as may be determined by them, or any of them, to be necessary or convenient to carry into effect the provisions of the foregoing votes.

I further certify that the votes were taken at a meeting open to the public, that no vote was taken by secret ballot, that a notice stating the place, date, time and agenda for the meeting (which agenda included the adoption of the above votes) was filed with the Town Clerk and a copy thereof posted in a manner conspicuously visible to the public at all hours in or on the municipal building that the office of the Town Clerk is located or, if applicable, in accordance

with an alternative method of notice prescribed or approved by the Attorney General as set forth in 940 CMR 29.03(2)(b), at least 48 hours, not including Saturdays, Sundays and legal holidays, prior to the time of the meeting and remained so posted at the time of the meeting, that no deliberations or decision in connection with the sale of the Bonds or the Notes were taken in executive session, all in accordance with G.L. c.30A, §§18-25, as amended, further suspended, supplemented or modified by the Executive Order of the Governor of The Commonwealth of Massachusetts Suspending Certain Provisions of the Open Meeting Law, Chapter 30A, §20 dated March 12, 2020.

Dated: June 23, 2020



Clerk of the Select Board

83032189v.1

**COPY**

DMP/RAM 6/15/2020

(Please Note: The following statements are an essential part of the permanent record. Read them carefully before signing this certificate. Advise Locke Lord LLP of any inaccuracy.)

Town of Needham, Massachusetts  
\$1,200,000 General Obligation Bond Anticipation Note  
dated June 25, 2020

SIGNATURE, NO LITIGATION AND OFFICIAL STATEMENT CERTIFICATE

A. Certificate of Authorized Officers. We, the Treasurer and Select Board of the Town of Needham, Massachusetts (the "Town"), certify that we have signed the \$1,200,000 1.30 percent General Obligation Bond Anticipation Note (the "Note") of the Town dated June 25, 2020 and payable December 18, 2020. The Note is issued in the form of a single Note for the full principal amount, registered in the name of "Century Bank and Trust Company". The Note bears the Town seal which is also affixed to this certificate.

We, the Select Board of the Town, certify that we have authorized the use of any facsimiles of our signatures that may be printed on the Note and certificates.

We, the said officers, also certify as follows:

1. Authority. The Note is issued in anticipation of the sale of \$57,542,500 School Construction (Hillside School) Bonds under G.L. c.70B and a vote of the Town passed on October 5, 2016 (Article 2), excluded from the limitations of Proposition 2 ½, so-called, on November 8, 2016 (Question 5); and a vote of the Select Board duly adopted on June 23, 2020.

2. Description and Purpose of Note. The Town is issuing and delivering the Note simultaneously with the delivery of this certificate. The Note is being issued for the purpose of architectural design, engineering, and construction of Hillside School.

3. Other Debt. No other debt has been incurred under that vote, except for \$575,000 was paid from revenue funds of the Town on November 17, 2017; \$2,865,000 was paid with revenue funds of the Town on August 1, 2018; \$19,745,331 bonds and premium dated July 31, 2018 (and notes issued in anticipation thereof); \$7,400,000 bonds and premium dated October 1, 2019 (and notes issued in anticipation thereof); \$2,600,000 was paid with revenue funds of the Town and \$1,100,000 was paid with unspent proceeds, each on October 1, 2019; and \$216,000 Bonds and premium dated June 25, 2020.

4. School Building Assistance Grant. On or before the date hereof, the Town received a grant in the aggregate amount of \$11,956,677 from the Massachusetts School Building Authority for the Hillside School Construction project being financed in part with the proceeds of the Note.

**COPY**

5. Approval of Sale. We approve the sale of the Note to Century Bank and Trust Company (the "Purchaser") at par and accrued interest, if any, plus a premium of \$3,600.00.

B. Delivery and Receipt. I, the Treasurer, further certify that the Note was delivered on this date and that the full purchase price including accrued interest for the period, if any, from the date of the Note to this date was received from the Purchaser on or before this date.

C. Certification Regarding Official Statement. I, the Treasurer, certify as follows:

(a) I have reviewed the Preliminary Official Statement dated June 9, 2020 (the "Preliminary Official Statement") and the Official Statement dated June 10, 2020 (the "Official Statement") relating to the sale of the Note.

(b) To the best of my knowledge and belief, the Preliminary Official Statement did not, as of its date and as of the date of sale of the Note, and the Official Statement (excluding the price or yield on the cover page, as to which no view is expressed) did not as of its date and does not as of this date (which is the date of delivery of the Note), contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made therein, in light of the circumstances under which they were made, not misleading.

(c) Since the date of the Official Statement there has been no material adverse change in the financial condition or affairs of the Town except as set forth in or contemplated by the Official Statement.

D. Debt Limit. I, the Treasurer, certify that at the time of their authorization, the Note and the bonds in anticipation of which it is issued were and on the date hereof are within every applicable debt and other limit prescribed by law or otherwise.

E. Certificate of Town Clerk. I, the Town Clerk, certify as follows:

(a) Signatures and Incumbency. The signatures of the Treasurer and Select Board as appearing below are the genuine, electronic, or facsimile signatures of the persons who executed the Note and who held those offices when the Note was signed and when the Note was delivered.

(b) Open Meeting Law. Except for the town meeting called pursuant to G.L. c.39, §10, all proceedings essential to the issue of the Note and the authorization of the bonds and deliberations of a quorum relating thereto have been taken at a meeting or meetings open to the public; notice of each such meeting was filed in my office and publicly posted in the time and manner set forth in the General Laws, as amended, in effect at the time of each such meeting (Chapter 39, §23B for proceedings occurring prior to July 1, 2010 and Chapter 30A, §§18-25 for proceedings occurring on or after July 1, 2010) and as further suspended, supplemented, amended or modified by the Executive Order of the Governor of The Commonwealth of Massachusetts Suspending Certain Provisions of the Open Meeting Law, Chapter 30A, §20 dated March 12, 2020 (the "Executive Order"), or, if applicable, in accordance with an alternative method of notice prescribed or approved by the Attorney General as set forth in 940 CMR 29.03(2)(b); no

deliberations, decision or vote in connection with the Note or bonds were taken in executive session and no vote was taken by secret ballot; and the official record of each such meeting was made available to the public and remains available to the public as set forth in G.L. c.39, §23B or c.30A, §§18-25, as further suspended, supplemented, amended or modified by the Executive Order, as applicable.

(c) Proceedings. No proceeding essential to the issue of the Note or bonds has been repealed or amended except as stated in paragraph (1) above and no proceedings have been taken relating to the Note or bonds other than those certified to Locke Lord LLP.

(d) Bylaws. The bylaws described below are the only bylaws or standing votes of the Town affecting the authorization, sale or issue of the Note or bonds, including the calling and conduct of town meetings, or the use of assessments or other charges imposed to pay for any project financed by the Note, and there has been no change therein affecting those matters in any way except as may be indicated below:

Town of Needham, General By-Laws July 2013 Compilation, as amended through November 2, 2015, as certified to Locke Lord LLP on April 22, 2019.

(e) Home Rule. The Town has not amended its home rule charter (Chapter 403 of the Acts of 1971) adopted March 6, 1976 except for the amendments by Chapter 9 of the Acts of 1975, Chapter 217 of the Acts of 1995, Chapter 202 of the Acts of 2001, Chapter 175 of the Acts of 2004 and Chapter 114 of the Acts of 2015, as certified to Locke Lord LLP on April 22, 2019 and the Town has not amended or repealed any special law relating to the Town through the use of home rule procedures except by adoption of the charter.

(f) No Referendum. No petition for a referendum has been filed with respect to any of the proceedings essential to the issue of the Note or the bonds.

(g) Development Districts. The Town has not established any development districts pursuant to G.L. c.40Q.

F. Execution of Counterparts and Delivery by Electronic Means. This certificate, as well as any other certificates or documents relating to the Note (collectively, the "Documents"), may be executed in several counterparts, each of which shall be regarded as an original and all of which shall constitute one and the same document. Delivery of an executed counterpart of a signature page to a Document by electronic mail in a ".pdf" file or by other electronic transmission shall be as effective as delivery of a manually executed counterpart signature page to such Document. Electronic signatures on any of the Documents shall be deemed original signatures for the purposes of the Documents and all matters relating thereto, having the same legal effect as original signatures.

G. No Litigation; No Financial Interest. All of the undersigned certify that there has been no litigation affecting the validity of the Note or bonds or the power of the Town to levy and collect taxes to pay them; that none is pending or to our knowledge threatened; that neither

the corporate existence nor boundaries of the Town nor the title of any of us to our respective offices is being contested; and that none of us and, to the best of our knowledge, no other official of the Town has any direct or indirect financial interest in or relationship with the Purchaser.

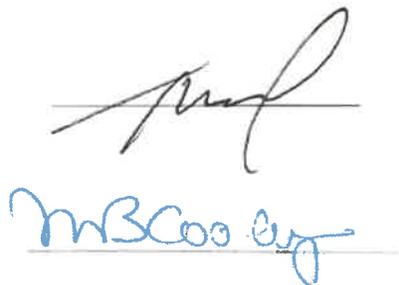
Date: June 25, 2020  
(Date of delivery of and  
payment for the Note)



Matthew Borrelli

Treasurer

Town Clerk



Select Board

(Town Seal)

**COPY**

(Please Note: The following statements are an essential part of the permanent bond record. Read them carefully before signing this certificate. Advise Locke Lord LLP of any inaccuracy.)

Town of Needham, Massachusetts

\$25,185,000  
General Obligation Municipal Purpose Loan of 2020 Bonds  
dated June 25, 2020

SIGNATURE, NO LITIGATION AND OFFICIAL STATEMENT CERTIFICATE

A. Certificate of Authorized Officers. We, the Select Board and the Treasurer of the Town of Needham, Massachusetts (the "Town"), certify that we have signed each of the \$25,185,000 General Obligation Municipal Purpose Loan of 2020 Bonds (the "Bonds") of the Town dated June 25, 2020, payable February 1 of the years and in the principal amounts, and bearing interest at the respective rates as follows:

<u>Year</u>	<u>Amount</u>	<u>Interest Rate</u>	<u>Year</u>	<u>Amount</u>	<u>Interest Rate</u>
2021	\$1,990,000	5.00%	2031	\$895,000	4.00%
2022	1,905,000	5.00	2032	895,000	4.00
2023	1,895,000	5.00	2033	895,000	3.00
2024	1,905,000	5.00	2034	895,000	2.00
2025	1,770,000	5.00	2035	895,000	2.00
2026	1,575,000	4.00	2036	895,000	2.00
2027	1,565,000	4.00	2037	895,000	2.00
2028	1,375,000	4.00	2038	895,000	2.00
2029	1,365,000	4.00	2039	895,000	2.00
2030	895,000	4.00	2040	890,000	2.00

The Bonds shall be subject to redemption, at the option of the Town, upon such terms and conditions as are set forth in the Official Statement prepared in connection with the Bonds dated June 9, 2020 (the "Official Statement").

A book entry system is being used to evidence ownership and transfer of the Bonds on the records of The Depository Trust Company ("DTC"). The Bonds are registered in the name of "CEDE & CO." as nominee for DTC and immobilized in the custody of DTC. All of the Bonds are similar in form and similarly executed, and each Bond bears (either by impression or in facsimile) the Town seal, which is also affixed to this certificate.

We, the Select Board of the Town, certify that we have authorized the use of any facsimiles of our signatures that may be printed on the Bonds.

**COPY**

We, the said officers, also certify as follows:

1. Authority. The Bonds<sup>1</sup> are issued pursuant to a vote of the Select Board adopted at a meeting duly called and held on June 25, 2020 and the following statutes and votes of the Town:

- (a) \$18,540,000 - under G.L. c.44, §7(1) and a vote of the Town passed on October 10, 2018 (Article 10), excluded from the limitations of Proposition 2 ½, so-called, on November 6, 2018 (Question 4);
- (b) \$5,026,000 - under G.L. c.44, §21A;
- (c) \$1,025,000 - under G.L. c.44, §7(1) and a vote of the Town passed on May 14, 2018 (Article 35);
- (d) \$440,000 under G.L. c.44, §7(1) and a vote of the Town passed on May 14, 2018 (Article 30);
- (e) \$0 under G.L. c.44, §7(7) and a vote of the Town passed on October 2, 2017 (Article 10), excluded from the limitations of Proposition 2 ½, so-called, on November 6, 2018 (Question 4).
- (f) \$0 under G.L. c.70B and a vote of the Town passed on October 5, 2016 (Article 2), excluded from the limitations of Proposition 2 ½, so-called, on November 8, 2016 (Question 5);
- (g) \$95,000 under G.L. c.44, §7(1) and a vote of the Town passed on May 14, 2018 (Article 37);
- (h) \$5,500 under G.L. c.44, §7(1) and a vote of the Town passed on October 2, 2017 (Article 11);
- (i) \$0 under G.L. c.44, §7(1) and a vote of the Town passed on May 14, 2018 (Article 34);
- (j) \$46,000 under G.L. c.44, §7(1) and a vote of the Town passed on May 10, 2017 (Article 48);
- (k) \$0 under G.L. c.44, §7(7) and a vote of the Town passed on May 10, 2017 (Article 43);
- (l) \$7,500 under G.L. c.44B and a vote of the Town passed on May 8, 2017 (Article 33);.

<sup>1</sup>See Paragraph A(2) below for the amount of bond premium which will be applied to reduce the borrowing authority under certain of the town meeting votes.

2. Description and Purpose of Bonds. The Town is issuing and delivering the Bonds simultaneously with the delivery of this certificate. The following amounts of the issue are for the following purposes:

<u>Principal</u>	<u>Premium<sup>2</sup></u>	<u>Total Amount of Proceeds</u>	<u>Purpose</u>
\$18,540,000	\$1,460,000	\$20,000,000	construction and/or reconstruction of the Public Safety Building and Fire Station #2
\$5,026,000	\$854,406.50	\$5,880,406.50	refunding on a current basis the Town’s General Obligation Municipal Purpose Loan of 2009 Bonds dated December 15, 2009 maturing on and after August 1, 2021 in the aggregate principal amount of \$6,165,000 (the “Refunded Bonds”), which financed various municipal projects
\$1,025,000	\$0	\$1,025,000	design, construction of the public works storage facility
\$440,000	\$0	\$440,000	construction of the Memorial Park Fieldhouse
\$0	\$218,000	\$218,000	engineering and design for reconstruction of the Public Safety Building and Fire Station #2
\$0	\$216,000	\$216,000	architectural design, engineering, and construction of Hillside School
\$95,000	\$0	\$95,000	repairs to RTS Property
\$5,500	\$81,500	\$87,000	reconstruction and expansion of Needham High School
\$0	\$60,000	\$60,000	improvements to the Town’s infrastructure including but not limited to roads, bridges, sidewalks,

<sup>2</sup> \$2,695,000.00 of the net premium received by the Town in connection with the sale of the Bonds has been allocated to project costs pursuant to G.L. c. 44, §20, as amended, and the amount authorized to be borrowed for each project has been reduced accordingly. The remaining unallocated net premium on the Bonds in the amount of \$150,091.05 will be appropriated by town meeting for eligible capital projects at a later date.

			intersections, drains, brooks, and culverts
\$46,000	\$0	\$46,000	improvements to the sewer pump station
\$0	\$15,500	\$15,500	engineering and design for the expansion of Needham High School
\$7,500	\$0	\$7,500	design, engineering and construction of the Rosemary Recreation Complex

3. Other Debt. No other debt has been incurred under those votes except for the following bonds and bond anticipation notes:

- (a) - \$12,000,000 bonds dated October 1, 2019 (and notes issued in anticipation thereof);
- (b) - none;
- (c) - none;
- (d) - \$1,670,000 bonds dated October 1, 2019 (and notes issued in anticipation thereof); and \$680,000 was paid with revenue funds of the Town on October 19, 2019;
- (e) - \$1,500,000 notes dated June 18, 2018, renewed August 1, 2018 and payable July 15, 2019, on which date \$1,500,000 was paid with revenue funds of the Town; \$1,540,000 bonds dated October 1, 2019 (and notes issued in anticipation thereof); and \$460,000 was paid with revenue funds of the Town on October 19, 2019;
- (f) - \$575,000 was paid from revenue funds of the Town on November 17, 2017; \$2,865,000 was paid with revenue funds of the Town on August 1, 2018; \$19,745,331 bonds and premium dated July 31, 2018 (and notes issued in anticipation thereof); \$7,400,000 bonds and premium dated October 1, 2019 (and notes issued in anticipation thereof); and \$2,600,000 was paid with revenue funds of the Town and \$1,100,000 was paid with unspent proceeds, each on October 1, 2019;
- (g) - none;
- (h) - \$6,500,000 bonds dated July 31, 2018 (and notes issued in anticipation thereof); \$450,000 was paid with revenue funds of the Town on August 1, 2018; and \$4,004,000 bonds dated October 1, 2019 (and notes issued in anticipation thereof);

- (i) none;
- (j) \$179,547.50 MWRA Sewer Bonds dated June 11, 2018; and \$146,902.50 MWRA Grant received June 14, 2018; \$220,000 was paid with revenue funds of the Town June 27, 2019;
- (k) none; and
- (l) \$6,260,000 bonds dated July 31, 2018 (and notes issued in anticipation thereof); \$740,000 was paid with revenue funds of the Town on August 1, 2018; \$3,581,000 bonds dated October 1, 2019 (and notes issued in anticipation thereof); and \$304,000 was paid with revenue funds of the Town on October 1, 2019.

4. Maturity Schedule. The Bonds constitute a consolidated issue for purposes of G.L. c.44, §16 of the General Laws. Each component of the Bonds matures at such times and in such amounts as set forth in Appendix A attached hereto.

5. Federal and State Aid. The Town has received \$146,902.50 MWRA Grant on June 14, 2018 for the sewer project referred to in Paragraph (1)(j) above.

6. School Building Assistance Grant. On or before the date hereof, the Town received a grant in the aggregate amount of \$11,956,677 from the Massachusetts School Building Authority for the Hillside School Construction project being financed in part with the proceeds of the \$216,000 portion of the Bonds referred to in Paragraph (1)(f) above.

7. Approval of Sale. We approve the sale of the Bonds to UMB Bank, N.A. (the "Purchaser") at par and accrued interest, if any, plus a premium of \$3,123,365.10.

8. Refunding Trust. I, the Treasurer, covenant and certify that the proceeds of the Refunding Bonds, together with other available funds of the Town, sufficient to provide for the payment of the interest on and principal of the Refunded Bonds on August 1, 2020, will be held in a separate fund and in trust solely for the payment of such interest on and principal of the Refunded Bonds and shall be invested pursuant to G.L. c.44, §55, provided that any such investment shall not mature after July 31, 2020.

9. Present Value Savings. In reliance on the Certificate of the Municipal Advisor dated the date hereof from Hilltop Securities Inc., as municipal advisor to the Town, the net present value savings to the Town as a result of the refunding of the Refunded Bonds are at least \$769,699.43.

B. Delivery and Receipt. I, the Treasurer, certify that the Bonds were delivered on this date and that the full purchase price including accrued interest for the period, if any, from the date of the Bonds to this date was received from the Purchaser on this date.

C. Certificate as to Official Statement. I, the Town Treasurer, certify as follows:



(a) I have reviewed the Preliminary Official Statement dated June 2, 2020, as revised on June 5, 2020 (the "Preliminary Official Statement") and the Official Statement relating to the sale of the Bonds.

(b) To the best of my knowledge and belief, the Preliminary Official Statement (excluding Appendices B and C, as to which no view is expressed) did not, as of its date and as of the date of sale of the Bonds, and the Official Statement (excluding the prices or yields on the cover page, and Appendices B and C, as to which no view is expressed) did not as of its date and does not as of this date (which is the date of delivery of the Bonds), contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made therein, in the light of the circumstances under which they were made, not misleading.

(c) Since the date of the Official Statement there has been no material adverse change in the financial condition or affairs of the Town except as set forth in or contemplated by the Official Statement.

D. Debt Limit. I, the Treasurer, certify that at the time of their authorization, the Bonds were, and on the date hereof are, within every applicable debt and other limit prescribed by law or otherwise.

E. Certificate of Town Clerk. I, the Town Clerk, certify as follows:

(a) Signatures and Incumbency. The signatures of the Treasurer and Select Board as appearing below are the genuine, electronic, or facsimile signatures of the persons who executed the Bonds and who held those offices when the Bonds were executed and when the Bonds were delivered.

(b) Open Meeting Law. Except for the town meetings called pursuant to G.L. c.39, §10, all proceedings essential to the authorization and issue of the Bonds and deliberations of a quorum relating thereto have been taken at a meeting or meetings open to the public; notice of each such meeting was filed in my office and publicly posted in the time and manner set forth in the General Laws, as amended, in effect at the time of each such meeting (Chapter 39, §23B for proceedings occurring prior to July 1, 2010 and Chapter 30A, §§18-25 for proceedings occurring on or after July 1, 2010) and as further suspended, supplemented, amended or modified by the Executive Order of the Governor of The Commonwealth of Massachusetts Suspending Certain Provisions of the Open Meeting Law, Chapter 30A, §20 dated March 12, 2020 (the "Executive Order"), or, if applicable, in accordance with an alternative method of notice prescribed or approved by the Attorney General as set forth in 940 CMR 29.03(2)(b); no deliberations, decision or vote in connection with the Bonds were taken in executive session and no vote was taken by secret ballot; and the official record of each such meeting was made available to the public and remains available to the public as set forth in G.L. c.39, §23B or c.30A, §§18-25, as further suspended, supplemented, amended or modified by the Executive Order, as applicable.

**COPY**

(c) Proceedings. No proceeding essential to the issue of the Bonds has been repealed or amended except as stated in Paragraph A(1) above, and no proceedings have been taken relating to the Bonds other than those certified to Locke Lord LLP.

(d) Bylaws. The bylaws described below are the only bylaws or standing votes of the Town affecting the authorization, sale or issue of the Bonds, including the calling and conduct of town meetings, or the use of assessments or other charges imposed to pay for any project financed by the Bonds, and there has been no change therein affecting those matters in any way except as may be indicated below:

Town of Needham, General By-Laws July 2013 Compilation, as amended through November 2, 2015, as certified to Locke Lord LLP on April 22, 2019.

(e) Home Rule. The Town has not amended its home rule charter (Chapter 403 of the Acts of 1971) adopted March 6, 1976 except for the amendments by Chapter 9 of the Acts of 1975, Chapter 217 of the Acts of 1995, Chapter 202 of the Acts of 2001, Chapter 175 of the Acts of 2004 and Chapter 114 of the Acts of 2015, as certified to Locke Lord LLP on April 22, 2019 and the Town has not amended or repealed any special law relating to the Town through the use of home rule procedures except by adoption of the charter.

(f) No Referendum. No petition for a referendum has been filed with respect to any of the proceedings essential to the issue of the Bonds.

(g) Development Districts. The Town has not established any development districts pursuant to G.L. c.40Q.

F. Repayment Schedule. We, the Treasurer and the Select Board certify that the maturities of each component of the Bonds, in our opinion, are arranged so that the amounts payable in the several years for principal and interest combined are as nearly equal as practicable or are in accordance with a schedule providing a more rapid amortization of principal.

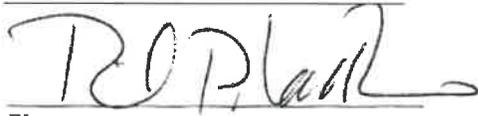
G. Sewer Enterprise Fund. I, the Town Accountant, certify to the Treasurer that rates and charges have been set at a sufficient level to cover the estimated operating expenses and debt service related to the Sewer Enterprise Fund including debt service payments on the Bonds.

H. Execution of Counterparts and Delivery by Electronic Means. This certificate, as well as any other certificates or documents relating to the Bonds (collectively, the "Documents"), may be executed in several counterparts, each of which shall be regarded as an original and all of which shall constitute one and the same document. Delivery of an executed counterpart of a signature page to a Document by electronic mail in a ".pdf" file or by other electronic transmission shall be as effective as delivery of a manually executed counterpart signature page to such Document. Electronic signatures on any of the Documents shall be deemed original signatures for the purposes of the Documents and all matters relating thereto, having the same legal effect as original signatures.

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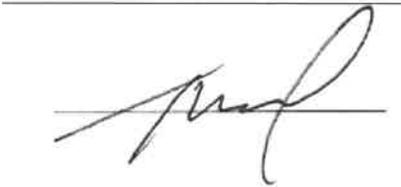
I. No Litigation; No Financial Interest. All of the undersigned certify that there has been no litigation affecting the validity of the Bonds or the power of the Town to levy and collect taxes to pay them; that none is pending or to our knowledge threatened; that neither the corporate existence nor boundaries of the Town nor the title of any of us to our respective offices is being contested; and that none of us and, to the best of our knowledge, no other official of the Town has any direct or indirect financial interest in or relationship with the Purchaser.

Dated: June 25, 2020  
(Date of delivery of and  
payment for the Bonds)



Matthew Borrelli

Treasurer



Town Accountant



Town Clerk

Select Board

(Town Seal)

**COPY**

APPENDIX A

Maturity by Purpose Schedule

1	2	3	4	5			7	8			11	Total	
				General Fund (non-exempt)				Exempt					Sewer
CPA	High School Expansion Design	Public Works Storage Facility	High School Expansion Construction	Memorial Park Building Project	Public Works Infrastructure Program	KPS Property Improvements	Total General	Central Avenue Elementary School (Williams)	Public Safety Building & Station 2 Design	Public Safety Buildings Construction	Total Exempt	Wastewater System Rehabilitation	
													CPA
1	7/5/20	7/5/20	5,500	110,000	95,000	415,500	0	0	0	0	0	0	0
2	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
3	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
4	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
5	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
6	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
7	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
8	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
9	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
10	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
11	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
12	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
13	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
14	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
15	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
16	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
17	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
18	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
19	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
20	7/5/20	7/5/20	205,000	110,000	0	315,000	0	0	0	0	0	0	0
Total	7,500	7,500	5,500	440,000	95,000	1,595,500	0	0	0	18,540,000	18,540,000	46,000	46,000

Amount Required	\$ 7,500	\$ 15,500	\$ 1,025,000	\$ 87,000	\$ 95,000	\$ 60,000	\$ 46,000	\$ 218,000	\$ 20,000,000	\$ 20,000,000	\$ 46,000	\$ 46,000	\$ 22,210,000
Less: Premium to be applied to project	\$ -	\$ 35,500	\$ -	\$ 81,500	\$ -	\$ 60,000	\$ -	\$ 218,000	\$ 1,440,000	\$ 1,440,000	\$ -	\$ -	\$ 2,053,000
Exempt Required Per Amount	\$ 7,500	\$ -	\$ 1,025,000	\$ 5,500	\$ 95,000	\$ -	\$ -	\$ -	\$ 18,540,000	\$ 18,540,000	\$ 46,000	\$ 46,000	\$ 20,157,000

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Please Note: The following statements are an essential part of the permanent bond record. Read them carefully before signing this certificate. Advise Locke Lord LLP of any inaccuracy.)

## TAX CERTIFICATE

This Tax Certificate is executed and delivered by the Town of Needham, Massachusetts (“Issuer”), in connection with the issuance of (i) \$25,185,000 aggregated stated principal amount of its General Obligation Municipal Purpose of 2020 Bonds dated the Issue Date (“Bonds”) and (ii) \$1,200,000 stated principal amount of its General Obligation Bond Anticipation Notes dated the Issue Date (“Notes” and together with the Bonds, “Issue”). The Issue is issued pursuant to Votes duly adopted by the Issuer and the Massachusetts General Laws. Pursuant to Reg §§ 1.141-2(d)(1) and 1.148-2(b)(2)(i), the Issuer certifies, covenants, warrants and represents as follows in connection with the issuance of the Issue:

### ARTICLE I. IN GENERAL

**1.1 Delivery of the Bonds of the Issue.** On the Issue Date, in exchange for receipt of good funds, the Issuer is delivering the Bonds of the Issue to the Successful Bond Bidder, for resale to the Public.

**1.2 Delivery of the Notes of the Issue.** On the Issue Date, in exchange for receipt of good funds, the Issuer is delivering the Notes of the Issue to the Note Purchaser.

**1.3 Purpose of Tax Certificate.** The Issuer is delivering this Tax Certificate to Bond Counsel, with the understanding that Bond Counsel will rely in part upon this Tax Certificate in rendering its opinion that interest on the Issue is excluded from gross income for federal income tax purposes under Section 103.

**1.4 Definitions and References.** All capitalized terms used in this Tax Certificate include either the singular or the plural. All terms used in this Tax Certificate, including terms specifically defined, shall be interpreted in a manner consistent with Sections 103 and 141-150 and the applicable Regulations thereunder except as otherwise specified. Capitalized terms used and not otherwise defined herein and in the exhibits hereto and in the schedules and attachments to those exhibits shall have the respective meanings set forth in Appendix A and Appendix B hereto. Reference to a Section means a section of the Code. Reference by number only (for example, “2.10”) means that numbered paragraph of this Tax Certificate.

**1.5 Purpose of Financing.** The Issue is being issued to provide funds (i) to finance on a “new money” basis the capital costs of certain municipal projects as more fully described in the Signature Certificate relating to the Issue, including the payment of Capitalized Interest, if any (“New Money Projects”), and Funded Interest, if any, (ii) to refund on a current basis the Refunded Bonds, which were originally issued to finance and/or refinance the capital costs of certain municipal projects as more fully described in the Signature Certificate relating to the Issue, including the payment of Capitalized Interest, if any (“Currently Refinanced Projects” and

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together with the New Money Projects, "Projects"), and Funded Interest, if any, and (iii) to pay Issuance Costs and other common costs of the Issue.

**1.6 Single Issue.** The Bonds of the Issue were sold to the Successful Bond Bidder and the Notes of the Issue were sold to the Note Purchaser on the Sale Date. No other governmental obligations of the Issuer which are expected to be paid out of substantially the same source of funds as the Issue have been or will be sold less than 15 days apart from the Sale Date pursuant to the same plan of financing as the Issue.

**1.7 Reliance.** With respect to certain matters contained in this Tax Certificate, the Issuer specifically relies upon the certifications of the Successful Bond Bidder and Note Purchaser set forth in Exhibit A, the certifications of the Municipal Advisor set forth in Exhibit B, and upon the certifications set forth in the other exhibits attached hereto or as otherwise described herein. The Issuer is not aware of any facts or circumstances that would cause it to question the accuracy or reasonableness of any representation made in this Tax Certificate including the exhibits hereto.

**ARTICLE II. GENERAL TAX LIMITATIONS**

**2.1 Application of Sale Proceeds and Certain Other Moneys.** On the Issue Date, the Sale Proceeds, \$29,511,965.10, less a bond underwriter's discount of \$92,546.41, will be deposited to the General Fund and applied as follows:

New Money Projects	\$23,410,000.00
Payment of Refunded Bonds	5,880,406.50
Issuance Costs	126,030.00
Payment of a portion of the interest on the Issue due February 1, 2021	2,982.19
TOTAL:	\$29,419,418.69

Investment Proceeds earned on the amounts in the General Fund will be commingled with substantial tax and other revenues of the Issuer, and are expected to be expended for operating or other expenses of the Issuer within six months after deposit of the Investment Proceeds therein. Pursuant to Reg § 1.148-6(d)(6), all such Investment Proceeds will be treated as expended when so commingled.

**2.2 Expenditure of Gross Proceeds.** For purposes of this Tax Certificate, Sale Proceeds and, to the extent not deemed expended as described in 2.1, Investment Proceeds allocable to the Nonrefunding Portion will be treated as spent when they are used to pay or reimburse disbursements by the Issuer that are (i) capital expenditures, including any Capitalized Interest, if any and to the extent allowable, (ii) Issuance Costs with respect to the Nonrefunding Portion, (iii) Funded Interest, (iv) initial operating expenses directly associated with the New Money Projects (in aggregate amount not exceeding 5% of the Sale Proceeds), or (v) other miscellaneous expenditures described in Reg § 1.148-6(d)(3)(ii).

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The Issuer hereby certifies that no disbursement to be paid or reimbursed from Gross Proceeds allocable to the Nonrefunding Portion shall have been previously paid or reimbursed from the proceeds of any other obligation, whether issued by the Issuer or any other party.

To the extent that Sale Proceeds allocable to the Nonrefunding Portion will be applied to reimburse expenditures made by the Issuer prior to the Issue Date, the Issuer hereby certifies that such expenditures either (i) constitute capital expenditures incurred not earlier than 60 days prior to the applicable Vote, which Votes constitute the Issuer's declarations of official intent to issue debt to finance the costs of the New Money Projects, or (ii) constitute Preliminary Expenditures to the extent permitted by Massachusetts law.

The Issuer further certifies that any such reimbursement described in clause (i) of the preceding sentence shall be made no later than the later of 18 months after the date of the expenditure or the date on which the New Money Project component to which such expenditure relates is placed in service, but in no event later than 3 years after the date of such expenditure.

**2.3 Governmental Bond Status.** Absent an Opinion of Bond Counsel, the Issuer will not loan more than 5% of the Proceeds to one or more Nongovernmental Persons. Absent an Opinion of Bond Counsel, the Issuer has not allowed and will not allow more than 10% of the Proceeds, any of the Prior Issues, or the Projects to be used directly or indirectly by any Nongovernmental Person in any trade or business, other than as a member of the general public, and has not allowed and will not allow more than 5% of the Proceeds, any of the Prior Issues, or the Projects to be so used to the extent such use is unrelated or disproportionate to the governmental uses thereof. Absent an Opinion of Bond Counsel, for purposes of this 2.3, a Nongovernmental Person will be treated as "using" Proceeds, proceeds of the Prior Issues or the Projects to the extent the Nongovernmental Person:

- (i) borrows Proceeds of the Issue or any Prior Issues;
- (ii) uses any portion of the Projects as owner, lessee, service provider, operator, or manager;
- (iii) acquires the output of the Projects; or
- (iv) enters into any other arrangement that provides a special legal entitlement or special economic benefit to a Nongovernmental Person.

As of the Issue Date, the Issuer certifies that there are no contracts or other arrangements for any such use of any component of the Projects by any party other than a Governmental Unit. Absent an Opinion of Bond Counsel, the Issuer will not enter into any contract or other arrangement after the Issue Date for any such use of any component of the Projects by any party other than a Governmental Unit.

**2.4 Qualified Equity.** The Issuer reasonably expects that a portion of the cost of the Projects being financed and/or refinanced in part with the Sale Proceeds may be paid from Qualified Equity. In this regard, the Issuer expects to receive (i) a grant in the amount of \$12,825,487 from the Massachusetts School Building Authority ("MSBA") for the design and construction of Hillside School project and has received \$11,956,677 in MSBA grant payments

to date for such project (ii) a transfer from the Capital Facility Fund in the amount of \$1,817,000 for the High School project, (iii) \$1,030,000 from Community Preservation receipts, a transfer of \$1,535,000 from FY2017 Community Preservation General Fund, a transfer of \$1,425,000 from CPA Free Cash, and a transfer of \$800,000 from Overlay Surplus, each for the Rosemary Recreation Complex, (iv) a transfer of \$1,382,000 from Free Cash, a transfer of \$944,000 from the Sewer Enterprise Fund Retained Earnings, and a transfer of \$1,786,000 from the Water Enterprise Fund Retained Earnings, each for the public works storage facility project, (v) a transfer of \$500,000 from CPA receipts, a transfer of \$1,032,000 from Free Cash, and a transfer of \$1,800,000 from the Athletic Facility Improvement Fund, each for the Memorial Park Fieldhouse project, and (vi) a transfer in the amount of \$1,523,500 from Free Cash for various infrastructure projects. The Issuer intends that the undivided portion or portions of any of the Projects paid with Qualified Equity may be used for Private Business Use without restriction. Qualified Equity will be allocated to any Private Business Use of the Projects before any Proceeds are allocated to any such Private Business Use. To the extent that Private Business Use of the Projects ever exceeds the applicable limitation under the “private business tests” imposed pursuant to Section 141(b), the Issuer hereby allocates Qualified Equity to the Projects. In addition, the Issuer reserves the right to allocate this Qualified Equity to the Projects if and as needed in the future.

**2.5 Change in Use.** The Issuer reasonably expects to use all Proceeds and all facilities that are financed and refinanced therewith as set forth in 2.3 for the entire stated term to maturity of the Issue. Absent an Opinion of Bond Counsel, the Issuer in fact will use all Proceeds and each facility financed and refinanced therewith as set forth in 2.3.

**2.6 Registered Form.** The Bonds and Notes of the Issue are being issued in registered form.

**2.7 Federal Guarantee.** The Issuer will not directly or indirectly use or permit the use of any Proceeds or any other funds of the Issuer or any Related Party or take or omit to take any action that would cause the bonds and notes of the Issue to be obligations that are “federally guaranteed.” In furtherance of this covenant, the Issuer will not allow the payment of principal or interest with respect to the Issue to be guaranteed (directly or indirectly) in whole or in part by the United States or any agency or instrumentality thereof. Except as provided in the next sentence, the Issuer will not use 5% or more of the Proceeds to make or finance loans the payment of principal or interest with respect to which is guaranteed in whole or in part by the United States or any agency or instrumentality thereof, nor will it invest 5% or more of the Proceeds in federally insured deposits or accounts. The preceding sentence shall not apply to (i) investments in the portions of the General Fund described in 3.7 and 3.8 during the temporary period described therein, (ii) investments in the Bona Fide Debt Service Fund, and (iii) investments in obligations issued by the United States Department of Treasury.

**2.8 Information Reporting.** The Issuer will cause a properly completed and executed IRS Form 8038-G to be filed with respect to the Issue no later than the 15th day of the second month of the calendar quarter immediately following the calendar quarter of the Issue Date.

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**2.9 Partial Current Refunding.** The Issuer will use Sale Proceeds allocable to the Refunding Portion in the amount of \$5,880,406.50 to pay the Refunded Bonds on August 1, 2020. Proceeds will not be used directly or indirectly to make principal, interest or redemption premium payments with respect to any governmental obligation other than the Refunded Bonds and, to the extent described in 2.1, the Issue.

**2.10 No Unexpended Proceeds.** No Proceeds of the 2009 Issue remain unspent as of the Issue Date of the Issue.

**2.11 No Pooling.** The Issuer will not use any Proceeds directly or indirectly to make or finance loans to two or more ultimate borrowers.

**2.12 No Hedge Bonds.** As of the respective issue dates of each issue comprising the Original Issues, the Issuer reasonably expected to expend more than 85% of the Net Sale Proceeds of each such issue within three years of original issuance for the governmental purposes of such Original Issues. Not more than 50% of the Proceeds of each such issue was invested at a substantially guaranteed yield for four years or more. The Issuer reasonably expects that more than 85% of Net Sale Proceeds of the Nonrefunding Portion of the Issue will be expended for the governmental purposes thereof within three years after the Issue Date. Not more than 50% of the Nonrefunding Portion of the Proceeds will be invested at a substantially guaranteed yield for four years or more.

**2.13 Useful Life.** The weighted average maturity of the Issue is 7.7919 years, which does not exceed 120% of the remaining average reasonably expected economic life of the assets comprising the Projects.

**ARTICLE III. ARBITRAGE GENERAL**

**3.1 Reasonable Expectations.** This Article III states the Issuer’s reasonable expectations with respect to the amounts and uses of Proceeds and certain other moneys.

**3.2 Issue Price of the Bonds.** On the Issue Date, the Issuer is delivering the Bonds of the Issue to the Successful Bond Bidder in exchange for an aggregate payment of \$28,215,818.69 (which represents the total amount of Sale Proceeds allocable to the Bonds, \$28,308,365.10, less an underwriter’s discount of \$92,546.41). As reflected in Exhibit B, the Municipal Advisor has certified that the competitive sale requirements (as defined in the Bond Notice of Sale) were met with respect to the Bonds of the Issue. Accordingly, based on the advice of the Successful Bond Bidder as set forth in Exhibit A, the Issue Price of the Bonds of the Issue is \$28,308,365.10, which is the reasonably expected initial offering prices to the Public for the Bonds of the Issue.

**3.3 Issue Price of the Notes.** On the Issue Date, the Issuer is delivering the Notes of the Issue to the Note Purchaser in exchange for a payment of \$1,203,600.00. Accordingly, based on the advice of the Note Purchaser as set forth in Exhibit A, the Issue Price of the Notes of the Issue is \$1,203,600.00, which is the price paid by the Note Purchaser.

**3.4 Aggregate Issue Price.** The aggregate Issue Price of the Issue is the sum of the Issue Price of the Bonds of the Issue and the Issue Price of the Notes of the Issue, \$29,511,965.10.

**3.5 Funds and Accounts.** The Issuer will use certain portions of its General Fund (or accounts or subaccounts within the General Fund) to hold certain of the Proceeds, as more particularly described in this Article III. The Issuer does not expect that either it or any other Person benefiting from the issuance of the Issue will use any moneys in any fund or account other than the Bona Fide Debt Service Fund to pay debt service on the Issue; nor is any other fund or account so pledged as security for the Issue that there is a reasonable assurance that amounts held in such other fund or account will be available if needed to pay debt service on the Issue.

**3.6 Bona Fide Debt Service Fund.**

**3.6.1 Payment of the Issue.** The Bonds and Notes of the Issue are general obligations of the Issuer payable from revenues available therefor pursuant to the Massachusetts General Laws, from a portion of the Sale Proceeds and Investment Proceeds, and from the proceeds of future issues of bond anticipation notes or longer-term obligations.

**3.6.2 Revenues.** Except for the debt service to be paid from a portion of the Sale Proceeds, Investment Proceeds, and the proceeds of future issues of bond anticipation notes or longer-term obligations, payments of debt service on the Issue are expected to be derived from current revenues of the Issuer and current revenues are expected to equal or exceed such amount of debt service on the Issue during the payment period.

**3.6.3 Match Between Revenues and Debt Service.** The portions of the Issuer's General Fund that are reasonably expected to be used to pay debt service on the Issue (such portions of the Issuer's General Fund being referred to herein as the "Debt Service Fund") will be allocated to the payment of debt service on the Issue on a "first in, first out" (FiFo) basis. Accordingly, the Debt Service Fund will be used primarily to achieve a proper matching of revenues and debt service within the Bond Year. Amounts in the Debt Service Fund will be invested without regard to yield.

**3.7 Three-Year Temporary Period.** A portion of the Sale Proceeds allocable to the Nonrefunding Portion in the amount of \$23,410,000.00, will be deposited in the General Fund for the purpose of paying costs of the New Money Projects. The Issuer's expenditure expectations with respect to the Proceeds allocable to the New Money Projects are reflected in Exhibit C. The Issuer reasonably expects that at least 85% of the Net Sale Proceeds will be spent to pay costs of the New Money Projects within three years from the Issue Date. The Issuer heretofore has incurred or within six months hereafter will incur a binding obligation to one or more unrelated parties involving an expenditure of not less than 5% of Net Sale Proceeds. Completion of the New Money Projects and allocations of Net Sale Proceeds and Investment Proceeds to costs of the New Money Projects will proceed with due diligence. Net Sale Proceeds allocable to paying costs of the New Money Projects held in the General Fund, and Investment Proceeds earned thereon, will be invested without regard to yield during the period ending on the third anniversary of the Issue Date.

**3.8 90-Day Temporary Period.** As reflected in 2.1 and 2.9, (i) a portion of Sale Proceeds allocable to the Refunding Portion in the amount of \$5,880,406.50 will be deposited in the General Fund and used to retire the Refunded Bonds on August 1, 2020 and (ii) a portion of Sale Proceeds in the amount of \$126,030.00 will be deposited to the General Fund pending its expenditure for Issuance Costs. Such portions of the Sale Proceeds may be invested without regard to yield during the period that ends 90 days after the Issue Date of the Issue.

**3.9 No Overissuance.** Taking into account anticipated Investment Proceeds, the Sale Proceeds do not exceed the amount necessary to pay (i) costs of the New Money Projects, (ii) the Refunded Bonds, (iii) Funded Interest, if applicable, and (iv) Issuance Costs and other common costs of the Issue.

**3.10 No Other Replacement Proceeds.** Neither the Issuer nor any Related Party will use any Gross Proceeds directly or indirectly to replace funds of the Issuer or any Related Party, which funds are or will be used directly or indirectly to acquire Investment Property reasonably expected to produce a yield that is materially higher than the Yield on the Issue.

**3.11 No Expected Sale.** It is not expected that the Projects or any part thereof financed and/or refinanced in whole or in part by the Issue will be sold or otherwise disposed of before February 1, 2040, the scheduled final maturity date of the Issue, except for minor portions due to normal wear or obsolescence.

#### ARTICLE IV. ARBITRAGE - YIELD AND YIELD RESTRICTION

**4.1 Yield.** The Yield on the Issue, adjusted as may be required for substantial original issue premium or discount, has been calculated by the Municipal Advisor to be 1.3856%, as reflected in Exhibit B.

**4.2 No Qualified Hedges.** No Qualified Hedge has been, and (absent an Opinion of Bond Counsel) no Qualified Hedge will be, entered into such that failure to take the Qualified Hedge into account would distort the Yield on the Issue or otherwise would fail clearly to reflect the economic substance of the transaction.

**4.3 Yield Restriction.** Absent an Opinion of Bond Counsel, if the sum of (A) any Proceeds allocable to the payment of the Projects held in the General Fund after the third anniversary of the Issue Date, or, if applicable, the Issue Date of any Original Issue, plus (B) any amounts held in the Bona Fide Debt Service Fund and remaining unexpended after 13 months from the date of accumulation in such fund (excluding any amounts held for Capitalized Interest and Funded Interest), plus, if applicable, (C) any Proceeds allocable to the retirement of any Refunded Bonds and Refunded Notes held in the General Fund after 90 days from the Issue Date, plus, if applicable, (D) any Transferred Proceeds held in the General Fund after the third anniversary of any Original Issue, plus (E) any Proceeds held in the Issuer's General Fund to pay Issuance Costs after 90 days from the Issue Date, at any time in the aggregate exceeds \$100,000, the excess will be invested as follows: (i) in Investment Property with a yield not exceeding the Yield on the Issue, or such other issue of Tax-Exempt Bonds to which such amounts are then allocated as proceeds, (ii) in assets that are not treated as Investment Property (e.g., Tax-Exempt Bonds), or (iii) in assets that satisfy the requirements for Yield Reduction Payments.

## ARTICLE V. REBATE

**5.1 Undertakings.** The Issuer hereby covenants to comply with requirements of the Code pertaining to the Rebate Requirement. The Issuer acknowledges that the United States Department of the Treasury has issued Regulations with respect to certain of these undertakings, including the proper method for computing whether any rebate amount is due the federal government under Section 148(f). (Reg §§ 1.148-1 through 1.148-11A, 1.150-1, and 1.150-2.) The Issuer further acknowledges that the United States Department of the Treasury may yet issue additional Regulations with respect to certain of these undertakings. The Issuer covenants that it will undertake to determine what is required with respect to the rebate provisions contained in Section 148(f) and said Regulations from time to time and will comply with any requirements that may apply to the Issue.

**5.2 Recordkeeping.** The Issuer shall maintain or cause to be maintained detailed records with respect to each Nonpurpose Investment allocable to Gross Proceeds, including: (a) purchase date; (b) purchase price; (c) information establishing fair market value on the date such investment became a Nonpurpose Investment; (d) any accrued interest paid; (e) face amount; (f) coupon rate; (g) periodicity of interest payments; (h) disposition price; (i) any accrued interest received; and (j) disposition date. Such detailed recordkeeping is required to facilitate the calculation of the Rebate Requirement.

### **5.3 Exceptions to the Rebate Requirement.**

**5.3.1 Bona Fide Debt Service Fund Exception.** Based on the representations set forth in 3.6.3 and this 5.3.1, no rebate calculations need be made in respect of amounts in the Bona Fide Debt Service Fund (i) if (a) the weighted average maturity of the Issue is longer than 5 years and (b) the Issue is a Fixed Yield Issue or (ii) if clause (i) does not apply, to the extent the earnings thereon in the Bond Year are less than \$100,000.

**5.3.2 Six-Month Expenditure Exception.** If applicable, no rebate calculations will be required to be made with respect to the Adjusted Gross Proceeds allocable to the Refunding Portion if all such Adjusted Gross Proceeds are expended within six months of the Issue Date.

**5.3.3 Eighteen Month Spending Exception.** In general, when applicable, no rebate calculations will be required with respect to Adjusted Gross Proceeds of the Nonrefunding Portion if the Eighteen Month Spending Exception is met. The Issuer's spending expectations with respect to the Adjusted Gross Proceeds are included in Exhibit C.

**5.3.4 Two Year Spending Exception.** The Issuer reasonably expects that at least 75% of Available Construction Proceeds will be expended for Construction Expenditures with respect to the Projects. The Issuer's spending expectations with respect to the Proceeds allocable to the New Money Projects or the Projects, as applicable, are reflected in Exhibit C. In general, when applicable, no rebate calculations will be required with respect to Available Construction Proceeds if Available Construction Proceeds are spent in accordance with the Two Year Spending Exception. Additionally, Proceeds of the Issue that are used to pay Issuance Costs will be treated, together with all Investment Proceeds thereon, as satisfying the Rebate

Requirement if the Two Year Spending Exception is satisfied and all such Issuance Costs are paid within twenty-four months after the Issue Date.

**5.4 Rebate Requirement with Respect to the Prior Issues.** The Issuer covenants to, and will, pay any Rebate Requirement or Yield Reduction Payments due with respect to the Prior Issues within 60 days from the maturity date of the respective obligations or, if later, within 60 days of missing one of the relevant spending milestones set forth in 5.3, as required by Section 148(f)(3).

**5.5 Rebate Requirement or Yield Reduction Payments with Respect to the Issue.** The Issuer covenants to, and will, pay any Rebate Requirement or Yield Reduction Payments due with respect to the Issue within 60 days from the maturity date of the Issue or, if later, within 60 days of missing one of the spending milestones set forth in 5.3, as required by Section 148(f)(3).

**ARTICLE VI. OTHER MATTERS**

**6.1 Expectations.** The undersigned are authorized representatives of the Issuer acting for and on behalf of the Issuer in executing this Tax Certificate. To the best of the knowledge and belief of the undersigned, there are no other facts, estimates or circumstances that would materially change the expectations as set forth herein, and said expectations are reasonable.

**6.2 Covenant to Comply.** The Issuer hereby covenants that it will not take or permit to be taken on its behalf any action or actions that would adversely affect the exclusion from federal income taxation of interest on the Issue and will take or require to be taken such acts as may reasonably be within its ability and as may from time to time be required under applicable law to maintain the exclusion from federal income taxation of interest on the Issue.

**6.3 Post Issuance Compliance Procedures.** The Issuer has written procedures to monitor compliance with the arbitrage Yield restriction and rebate requirements of Section 148 after the Issue Date. The Issuer also has written procedures to ensure that all Nonqualified Bonds are remediated in accordance with Reg § 1.141-12. Such procedures are substantially in the form attached hereto as Appendix C. The Issuer will monitor the expenditure of Gross Proceeds and the use of facilities financed and/or refinanced by the Issue, and will undertake, if necessary, any available measures under Reg § 1.141-12 to ensure compliance after the Issue Date with the applicable covenants contained herein.

**6.4 Record Retention.** In order to ensure that interest on the Issue continues to be excluded from gross income for federal tax law purposes, the Issuer acknowledges that records should be maintained to support the representations, certifications, and expectations set forth in this Tax Certificate (including the exhibits hereto) at least until the date three (3) years after the later of (a) the date on which the Issue is retired, or (b) the date on which the last of the Refunding Obligations is retired. In addition to the items described in 5.2, records to be retained include, but are not limited to:

- (i) basic records and documents relating to the Issue, and, when applicable, the Prior Issues and any Qualified Equity relating to the Projects;

(ii) documentation evidencing the expenditure of the Proceeds and, when applicable, Proceeds of the Prior Issues;

(iii) documentation evidencing the use of the Projects or any component thereof by public and private sources (i.e., copies of management contracts, research agreements, leases, etc.);

(iv) documentation evidencing all sources of payment or security for the Issue and, when applicable, the Prior Issues;

(v) documentation evidencing compliance with the timing and allocation of expenditures of the Proceeds, and, when applicable, Proceeds of the Prior Issues and any Qualified Equity relating to the Projects; and

(vi) records of all amounts paid to the United States in satisfaction of the Rebate Requirement for the Issue and IRS Forms 8038-T (or successor forms thereto) related to such payments or to Yield Reduction Payments.

**6.5 Amendments.** Notwithstanding any other provision of this Tax Certificate, the Issuer may amend this Tax Certificate and thereby alter any actions allowed or required by this Tax Certificate if such amendment is signed by an authorized officer and is supported by an Opinion of Bond Counsel.

*[Remainder of page intentionally left blank; signature page follows.]*

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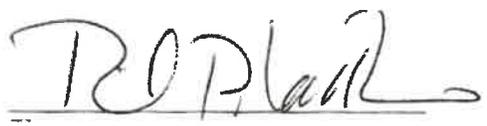
**6.6 Survival of Payment or Defeasance.** Notwithstanding any provision in this Tax Certificate or in any other agreement or instrument relating to the Issue to the contrary, the obligation to remit the Rebate Requirement, if any, to the United States Department of the Treasury and to comply with all other requirements contained in this Tax Certificate shall survive payment or defeasance of the Issue.

**6.7 Execution of Counterparts and Delivery by Electronic Means.** This Certificate, as well as any other certificates or documents relating to the Issue (collectively, the "Documents"), may be executed in several counterparts, each of which shall be regarded as an original and all of which shall constitute one and the same document. Delivery of an executed counterpart of a signature page to a Document by electronic mail in a ".pdf" file or by other electronic transmission shall be as effective as delivery of a manually executed counterpart signature page to such Document. Electronic signatures on any of the Documents shall be deemed original signatures for the purposes of the Documents and all matters relating thereto, having the same legal effect as original signatures.

Dated: June 25, 2020

TOWN OF NEEDHAM, MASSACHUSETTS

By: \_\_\_\_\_  
Treasurer



Matthew Borrelli

\_\_\_\_\_



Select Board

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## APPENDIX A GENERAL DEFINITIONS

For purposes of the Tax Certificate to which this Appendix A is attached, and the exhibits to the Tax Certificate and any schedules or attachments to those exhibits, the following capitalized terms have the following meanings:

**501(c)(3) Organization** means any entity described in Section 501(c)(3).

**Adjusted Gross Proceeds** generally means Gross Proceeds, less amounts held in the Bona Fide Debt Service Fund.

**Available Construction Proceeds** has the meaning set forth in Reg § 1.148-7(i) and generally means all Sale Proceeds reduced by Issuance Costs or, if applicable, all Sale Proceeds allocable to the Nonrefunding Portion, reduced by Issuance Costs allocable to the Nonrefunding Portion financed with Sale Proceeds, plus all Investment Proceeds earned thereon before the earlier of two years after the Issue Date or substantial completion of the New Money Projects or Projects, as applicable. In determining the amount of Available Construction Proceeds as of any date, there shall be included the amount of investment earnings reasonably expected after such date, together with investment earnings actually received or accrued as of such date.

**Bona Fide Debt Service Fund** has the meaning set forth in Reg § 1.148-1(b) and generally means the Debt Service Fund identified in 3.6.3.

**Bond Counsel** means Locke Lord LLP or, if applicable, another law firm with a nationally recognized public finance practice.

**Bond Notice of Sale** means, when applicable, the separate Notice of Sale for the bonds of the Issue.

**Bond Purchaser** means, when applicable, an entity that purchases the bonds of the Issue, or, when applicable, a Prior Issue, for its own account without a present intent to resell.

**Capitalized Interest** means interest on the Issue, or, when applicable, a Prior Issue, from the Issue Date to the placed in service date of the Projects, that is properly capitalized in the cost of the Projects under general federal income tax principles.

**Code** means the Internal Revenue Code of 1986, as amended.

**Construction Expenditures** has the meaning set forth in Reg § 1.148-7(g)(1) and generally means capital expenditures that are allocable to the cost of real property or constructed personal property and includes costs of reconstruction and rehabilitation, but does not include costs of acquiring any interest in land or other existing real or personal property.

**Controlled Group** has the meaning set forth in Reg § 1.150-1(c) and generally means a group of entities controlled directly or indirectly by the same entity or group of entities.

**Debt Service Fund** means the Debt Service Fund described in Article III.

**Deliberate Action** has the meaning set forth in Reg § 1.141-2(d)(3) and generally means any action taken by the Issuer that is within its control, but excludes (i) an involuntary or compulsory conversion under Section 1033 or (ii) an action taken in response to a regulatory directive made by the federal government.

**Eighteen Month Spending Exception** has the meaning set forth in Reg § 1.148-7(d) and generally means Adjusted Gross Proceeds are spent at least as quickly as follows:

15% within six months after the Issue Date

60% within twelve months after the Issue Date

100% within eighteen months after the Issue Date

The requirement that 100% of Adjusted Gross Proceeds be spent within eighteen months after the Issue Date will be met if at least 95% of Adjusted Gross Proceeds is spent within eighteen months and the remainder is held as a Reasonable Retainage, as permitted by contracts with the Issuer's contractors, and such remainder is spent within thirty months after the Issue Date.

**Fixed Yield Bond** has the meaning set forth in Reg § 1.148-1(b) and generally means any bond whose yield is fixed and determinable on its Issue Date.

**Fixed Yield Issue** has the meaning set forth in Reg § 1.148-1(b) and generally means any issue of which each bond of the issue is a Fixed Yield Bond.

**Funded Interest** means interest on the Issue, or, when applicable, a Prior Issue, other than Capitalized Interest, through the later of three years after the Issue Date or one year after the first component of the Projects is placed in service as set forth in Reg § 1.148-6(d)(3)(ii)(A)(3).

**General Rule Maturities** means, when applicable, those Maturities listed as the general rule maturities in Schedule A to the attached Issue Price Certificate for the Bonds of the Issue or the Notes of the Issue, as applicable.

**Governmental Person** has the meaning set forth in Reg § 1.141-1(b) and generally means a Governmental Unit.

**Governmental Unit** means a State or Local Governmental Unit.

**Gross Proceeds** has the meaning set forth in Reg § 1.148-1(b) and generally means all proceeds derived from or relating to the Issue, or, when applicable, a Prior Issue, including Proceeds and Replacement Proceeds.

**Guidelines** means Reg § 1.141-3(b)(4) and Revenue Procedure 2017-13 or any applicable predecessor or successor thereto.

**Hold-the-Offering-Price Maturities** means, when applicable, those Maturities listed as the hold-the-offering-price maturities in Schedule A to the attached Issue Price Certificate for the Bonds of the Issue or the Notes of the Issue, as applicable.

**Holding Period** means, with respect to a Hold-the-Offering-Price Maturity, the period starting on the Sale Date and ending on the earlier of (i) the close of the fifth business day after the Sale Date, or (ii) the date on which the Successful Bidder/Successful Bond Bidder/Successful Note Bidder sold at least 10% of such Hold-the-Offering-Price Maturity to the Public at prices that are no higher than the initial offering price for such Hold-the-Offering-Price Maturity.

**Investment Proceeds** has the meaning set forth in Reg § 1.148-1(b) and generally means earnings received from investing and reinvesting Proceeds and from investing and reinvesting such earnings.

**Investment Property** has the meaning set forth in Section 148(b)(2) and generally means any security or obligation, any annuity contract, or any other investment-type property, but does not include any Tax-Exempt Bond.

**Issuance Costs** has the meaning set forth in Reg § 1.150-1(b) and generally means costs, to the extent incurred in connection with, and allocable to, the issuance of the Issue within the meaning of Section 147(g), and includes: underwriters' spread; counsel fees; financial advisory fees; credit rating fees; trustee fees; paying agent fees; bond registrar, certification, and authentication fees; accounting fees; printing costs; public approval process costs; engineering and feasibility study costs; and similar costs.

**Issue Date** has the meaning set forth in Reg § 1.150-1(b) and generally means the date the Issue, or, when applicable, a Prior Issue, was delivered to the Underwriter or Purchaser thereof and payment was received therefor.

**Issue Price** has the meaning set forth in Reg § 1.148-1(f) and generally means (i) the Expected Offering Price of a Successful Bidder/Successful Bond Bidder/Successful Note Bidder, (ii) the amount paid by the Purchaser for the Issue, the notes of the Issue, and/or the bonds of the Issue, and/or (iii) the price at which at least 10% of each maturity of the General Rule Maturities were sold by the Successful Bidder/Successful Bond Bidder/Successful Note Bidder, all as set forth in Exhibit A, or, when applicable, the sum of the applicable clauses above.

**Maturity** means bonds and/or notes of the Issue with the same credit and payment terms. Bonds and/or notes of the Issue with different maturity dates, or with the same maturity date but different stated interest rates, are treated as separate maturities.

**Minor Portion** has the meaning set forth in Section 148(e) and generally means any amount of Gross Proceeds that does not exceed the lesser of (i) 5% of the Proceeds or (ii) \$100,000.

**Net Sale Proceeds** has the meaning set forth in Reg § 1.148-1(b) and generally means the Sale Proceeds allocable to the Nonrefunding Portion, less the portion of those Sale Proceeds invested in a reasonably required reserve or replacement fund pursuant to Section 148(d) or as part of the Minor Portion.

***Nongovernmental Person*** means any Person other than a Governmental Person. Nongovernmental Person includes the United States and any agency or instrumentality of the United States.

***Nonpurpose Investment*** means any Investment Property in which Gross Proceeds are invested that is not a Purpose Investment.

***Nonqualified Bonds*** has the meaning set forth in Reg § 1.141-12(j) and generally means the portion of outstanding bonds of an Issue that, as of the date of a Deliberate Action, would not meet the private business use test in Section 141(b) or the private loan financing test in Section 141(c).

***Nonrefunding Portion*** means, when applicable, the portion of the Issue or the Prior Issue, as applicable, that is not allocable to the Refunding Portion.

***Note Notice of Sale*** means, when applicable, the separate Notice of Sale for the notes of the Issue.

***Note Purchaser*** means, when applicable, an entity that purchases the notes of the Issue, or, when applicable, a Prior Issue, for its own account without a present intent to resell.

***Notice of Sale*** means the Notice of Sale, or, when applicable, collectively the Bond Notice of Sale and Note Notice of Sale, attached as Attachment 1 to Exhibit B.

***Opinion of Bond Counsel*** means a written opinion of nationally recognized bond counsel, delivered to the Issuer, to the effect that the exclusion from gross income for federal income tax purposes of interest on the Issue will not be adversely affected.

***Original Issues*** means, when applicable, collectively, the portions of the Refunded Bonds and/or Refunded Notes and the issues that were issued to finance the Projects on a “new money” basis and any other obligations all or a portion of which were issued to finance the Projects on a new money basis which have been ultimately refinanced by this Issue.

***Person*** has the meaning set forth in Section 7701(a)(1) and generally includes an individual, trust, estate, partnership, association, company or corporation.

***Preliminary Expenditures*** has the meaning set forth in Reg § 1.150-2(f)(2) and generally means architectural, engineering, surveying, soil testing, Issuance Costs, including, when applicable, Issuance Costs allocable to the Nonrefunding Portion, and similar costs paid with respect to the Projects in an aggregate amount not exceeding 20% of the Issue Price of the Issue, or, when applicable, the Issue Price of the Issue allocable to the Nonrefunding Portion. However, Preliminary Expenditures do not include land acquisition, site preparation or similar costs incident to the commencement of construction.

***Prior Issue(s)*** means, when applicable, individually or collectively, the Original Issues and each series of exclusively current refunding obligations all or a portion of which were thereafter issued to refinance the Original Issues.

**Private Business Use** has the meaning set forth in Reg § 1.141-3(a) and generally means use (directly or indirectly) in a trade or business carried on by any Nongovernmental Person other than use (i) as a member of, and on the same basis as, the general public or (ii) pursuant to the Guidelines or the Research Guidelines. Any activity carried on by a Nongovernmental Person (other than a natural Person) shall be treated as a trade or business.

**Proceeds** has the meaning set forth in Reg § 1.148-1(b) and generally means Sale Proceeds, Investment Proceeds and Transferred Proceeds of the Issue or, when applicable, a Prior Issue.

**Public** has the meaning set forth in Reg § 1.148-1(f)(3)(ii) and generally means any Person other than an Underwriter or a Related Party to an Underwriter.

**Purchaser** means, when applicable, an entity, including a Successful Bidder, that purchases the Issue, or, when applicable, a Prior Issue, for its own account without a present intent to resell.

**Purpose Investment** has the meaning set forth in Reg § 1.148-1(b) and generally means an investment that is acquired by the Issuer to carry out the governmental purpose of the Issue.

**Qualified Equity** has the meaning set forth in Reg § 1.141-6(b)(3) and generally means funds that are not derived from proceeds of a Tax-Advantaged Bond.

**Qualified Guarantee** has the meaning set forth in Reg § 1.148-4(f) and generally means an arrangement that imposes a secondary liability that unconditionally shifts substantially all of the credit risk for all or part of the payments on the Issue to the guarantor under that arrangement.

**Qualified Hedge** has the meaning set forth in Reg § 1.148-4(h) and generally means a contract entered into by the Issuer with a hedge provider primarily to modify the Issuer's risk of interest rate changes with respect to all or a part of the Issue.

**Reasonable Retainage** has the meaning set forth in Reg § 1.148-7(h) and generally means an amount, not to exceed 5% of Available Construction Proceeds or Adjustable Gross Proceeds, as applicable, on the date 24 months, or 18 months, as applicable, after the Issue Date, that is retained for reasonable business purposes relating to the Projects, including to ensure or promote compliance with a construction contract.

**Rebate Requirement** means the amount of rebatable arbitrage with respect to the Issue, computed as of the last day of any Bond Year pursuant to Reg § 1.148-3.

**Refunded Bonds** means, when applicable, all or the portion of each of the series of bonds being refunded by the Issue, as identified in Appendix B.

**Refunded Notes** means, when applicable, all or the portion of each of the series of notes being refunded by the Issue, as identified in Appendix B.

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**Refunding Obligations** means a Tax-Advantaged Bond issued to refund any portion of the Issue, including any subsequent Tax-Advantaged Bond in a series of refundings thereof.

**Refunding Portion** means, when applicable, the portion of the Issue allocable to the refunding of the Refunded Bonds and/or Refunded Notes, together with the portion of the Issue allocable to the financing of a ratable share of Issuance Costs and other common costs of the Issue.

**Regulations or Reg** means the applicable Treasury Regulations promulgated by the Secretary of the Treasury of the United States under the Code.

**Related Party** has the meaning set forth in Reg §1.150-1(b) and generally means, in reference to a Governmental Unit or a 501(c)(3) Organization, any member of the same Controlled Group, and in any reference to any other Person, any two or more Persons who have more than fifty percent (50%) common ownership, directly or indirectly.

**Replacement Proceeds** has the meaning set forth in Reg §1.148-1(c) and generally means amounts that have a sufficiently direct nexus to the Issue or to the governmental purpose of the Issue to conclude that the amounts would have been used for that governmental purpose if the Proceeds of the Issue were not used, and includes a sinking fund, a pledged fund, and other replacement proceeds, each as defined in Reg § 1.148-1(c).

**Research Guidelines** means Reg §1.141-3(b)(6) and Revenue Procedure 2007-47 or any applicable successor thereto.

**Sale Date** has the meaning set forth in Reg § 1.150-1(c)(6) and generally means the first day on which there is a binding contract in writing for the sale of a Maturity.

**Sale Proceeds** has the meaning set forth in Reg § 1.148-1(b) and generally means amounts actually or constructively received from the sale of the Issue, or, when applicable, a Prior Issue.

**Signature Certificate** means the Signature, No Litigation and Official Statement Certificate or similar certificate prepared by Bond Counsel relating to the Issue or, when applicable, a Prior Issue.

**Small Issuer Exception** has the meaning set forth in Reg § 1.148-8(a) and generally means that, as of the Issue Date, the Issuer reasonably expects that the aggregate Issue Price of tax-exempt bonds (other than (a) current refunding bonds to the extent the amount thereof does not exceed the outstanding amount of the obligations to be refunded thereby and (b) qualified private activity bonds) issued and to be issued by or on behalf of the Issuer during the current calendar year will not exceed \$5,000,000 except by the lesser of (i) \$10,000,000 or (ii) the aggregate face amount of bonds, in either case attributable to financing the construction of public school facilities, as provided in Section 148(f)(4)(D)(vii). In addition, the Issuer must have the power to impose or to cause the imposition of taxes of general applicability which, when collected, may be used for the general purposes of the Issuer. The Issuer's power to impose or cause the imposition of such taxes cannot be contingent on approval by any other Governmental

Unit. The Issuer cannot form or avail itself of an entity for the purpose of avoiding the volume limitation described above.

**State or Local Governmental Unit** has the meaning set forth in Reg § 1.103-1(a) and is generally a state or any political subdivision of a state, but excludes the United States and its agencies or instrumentalities.

**Successful Bidder(s)** means, when applicable, the Successful Bidder(s) set forth in Appendix B.

**Successful Bond Bidder** means, when applicable, the Successful Bond Bidder set forth in Appendix B.

**Successful Note Bidder** means, when applicable, the Successful Note Bidder set forth in Appendix B.

**Tax-Advantaged Bond** has the meaning set forth in Reg § 1.150-1(b) and generally means a tax-exempt bond or a taxable bond that provides a federal tax benefit that reduces the Issuer's borrowing costs.

**Tax Certificate** means the Tax Certificate to which this Appendix A is attached.

**Tax-Exempt Bond** means any obligation the interest on which is excluded from gross income for federal income tax purposes pursuant to Section 103, other than a "specified private activity bond" within the meaning of Section 57(a)(5)(C), as well as (i) stock in a "regulated investment company" (within the meaning of Section 852) to the extent at least 95 percent of income to the stockholder is treated as interest on Tax-Exempt Bonds and (ii) any demand deposit obligation issued by the United States Department of the Treasury pursuant to Subpart C of 31 CFR Part 344.

**Transferred Proceeds** has the meaning set forth in Reg § 1.148-9(b) and generally means Proceeds of a Prior Issue that become Proceeds of the Issue under the transferred proceeds allocation rule in Reg § 1.148-9(b).

**Two Year Spending Exception** has the meaning set forth in Reg § 1.148-7(e) and generally means Available Construction Proceeds are expended at least as quickly as follows:

10% within six months after the Issue Date

45% within twelve months after the Issue Date

75% within eighteen months after the Issue Date

100% within twenty-four months after the Issue Date

The requirement that 100% of Available Construction Proceeds be spent within twenty-four months after the Issue Date will be met if at least 95% of Available Construction Proceeds is spent within twenty-four months and the remainder is held as Reasonable Retainage, as

permitted by contracts with the Issuer's contractors, and such remainder is spent within thirty-six months after the Issue Date.

**Underwriter** means (i) any Person, including, when applicable, a Successful Bidder/Successful Bond Bidder/Successful Note Bidder, that agrees pursuant to a written contract with the Issuer (or with the lead underwriter to form an underwriting syndicate) to participate in the initial sale of the bonds and/or notes of the Issue, or, when applicable, a Prior Issue, to the Public, and (ii) any Person that agrees pursuant to a written contract directly or indirectly with a Person described in clause (i) of this paragraph to participate in the initial sale of such bonds and/or notes of the Issue, or, when applicable, a Prior Issue, to the Public (including a member of a selling group or a party to a third-party distribution agreement participating in the initial sale of such bonds and/or notes of the Issue, or, when applicable, a Prior Issue, to the Public).

**Votes** means the authorizations for the Issue specified in the Signature Certificate.

**Yield** has the meaning set forth in Reg § 1.148-4 for an issue and Reg § 1.148-5 for investments, and generally means, as to the Issue, or, when applicable, a Prior Issue, or Investment Property, as applicable, that discount rate which, when used in computing the present value of all unconditionally payable payments representing (i) principal, adjusted, as required, for any substantial discounts or premiums, (ii) interest, including costs of Qualified Guarantees, and (iii) payments or receipts on Qualified Hedges, produces an amount equal to the Issue Price of the Issue, or, when applicable, a Prior Issue, or the purchase price of Investment Property, as appropriate.

**Yield Reduction Payment** means a "qualified yield reduction payment" to the United States Department of the Treasury that reduces the yield on Investment Property, as set forth in Reg § 1.148-5(c).

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**APPENDIX B  
ISSUE SPECIFIC DEFINITIONS**

For purposes of the Tax Certificate to which this Appendix B is attached, and the exhibits to the Tax Certificate and any schedules or attachments to those exhibits, the following capitalized terms have the following meanings:

***Bond Year*** means the period beginning on the Issue Date and ending on June 25, 2021 (or on an earlier date selected by the Issuer in accordance with Reg § 1.148-1(b)), and each successive one-year period thereafter. The last Bond Year will end on the last day on which any Bonds of the Issue and Notes of the Issue will remain outstanding for federal tax purposes.

***Issue Date*** means, as to the Issue, the date of this Tax Certificate, June 25, 2020.

***Municipal Advisor*** means Hilltop Securities Inc., as municipal advisor to the Issuer in connection with the Issue.

***Note Purchaser*** means Century Bank and Trust Company.

***Refunded Bonds*** means the \$5,880,406.50 portion of the bonds of the 2009 Issue maturing in the years 2021 through 2028.

***Sale Date*** of the issue is June 9, 2020 for the Bonds and June 10, 2020 for the Notes.

***Sale Proceeds*** means the sum of the amounts of \$28,308,365.10, comprising the stated principal amount of the Bonds of the Issue (\$25,185,000), plus original issue premium thereon in the amount of \$3,123,365.10, and \$1,203,600.00, comprising the stated principal amount of the Notes of the Issue (\$1,200,000), plus original issue premium thereon in the amount of \$3,600.00, totaling \$29,511,965.10.

***Successful Bond Bidder*** means UMB Bank, N.A.

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**APPENDIX C  
POST-ISSUANCE TAX COMPLIANCE PROCEDURES  
TAX-EXEMPT OBLIGATIONS AND OTHER TAX-BENEFITED OBLIGATIONS**

**I. Introduction**

These post-issuance compliance procedures of the Issuer are designed to provide for the effective management of the Issuer’s post issuance compliance program for tax-exempt and other tax-benefited obligations in a manner consistent with state and federal laws applicable to such obligations.

**II. Post-Issuance Tax Compliance**

The Treasurer of the Issuer, or such other designated officer (the “Compliance Officer”) shall be the primary bond compliance officer responsible for each issuance by the Issuer of tax-exempt (or otherwise tax-benefited) bonds, notes, financing leases, or other obligations (herein, collectively referred to as “bonds”). All information related to each bond issue and the facilities, equipment and other assets financed by such issue shall be maintained by or on behalf of the Compliance Officer and the actions taken under subsections A through C of this Section II shall be taken by the Compliance Officer or on behalf of the Compliance Officer by such other officers or employees of the Issuer as appropriate.

**A. Tax Certificate and Continuing Education**

1. **Tax Certificate** – A Tax Certificate is prepared for each issuance of bonds. Immediately upon issuing any bonds, the Compliance Officer, in conjunction with the Issuer’s bond counsel and financial advisor, shall review the Tax Certificate and make notes regarding specific compliance issues for such bond issue on the Post-Issuance Compliance Notes form at Exhibit A. The Tax Certificate and Notes shall clearly define the roles and responsibilities relating to the ongoing compliance activities for each bond issue and will identify specific compliance requirements.
  
2. **Continuing Education** – The Compliance Officer will actively seek out advice of bond counsel on any matters that appear to raise ongoing compliance concerns and may attend or participate in seminars, teleconferences, etc. sponsored by organizations such as the Massachusetts Collector-Treasurer Association and the Massachusetts Government Finance Officers Association that address compliance issues and developments in the public finance bond arena. In addition, national organizations such as the Securities Industry and Financial Markets Association (SIFMA) and the National Association of Bond Lawyers (NABL) offer numerous training opportunities and materials which may be useful to the Compliance Officer.

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**B. Tax-Exempt Bonds Compliance Monitoring**

1. **Restrictions against Private Use** – The Compliance Officer will continuously monitor the expenditure of bond proceeds and the use of facilities or equipment financed or refinanced with bonds to ensure compliance with Section 141 of the Internal Revenue

Code (the “Code”) which generally establishes limitations on the use of bond-financed facilities by non-state or local governmental entities, such as individuals using bond-financed assets on a basis other than as a member of the general public, corporations and the federal government and its agencies and instrumentalities.

a. **Use of Bond Proceeds** – The Compliance Officer will monitor and maintain records with respect to expenditures to ensure that bond proceeds are being used on capital expenditures for governmental purposes in accordance with the bond documents and document the allocation of all bond proceeds. Such monitoring is required not only for tax-exempt bonds, but also for tax credit bonds.

**b. Use of the Bond-Financed Facility or Equipment**

i. **Equipment assets financed with bonds** will be listed in a schedule for each bond issue, which schedule may be included in the Tax Certificate. Equipment assets generally are not to be disposed of prior to the earlier of (a) the date the bonds and all subsequent refundings of such bonds are fully paid, or (b) the end of the useful life of such equipment. The Compliance Officer will maintain the list of all bond-financed equipment for each bond issue, together with the equipment’s expected useful life.

ii. **Constructed or acquired assets financed with bonds** – In order to ensure that assets constructed or acquired using bond proceeds, such as infrastructure assets, are not leased, sold or disposed of prior to the end of the term of the bonds and of all subsequent refundings of such bonds:

- Any asset constructed or acquired with bond proceeds shall be flagged in the Issuer’s records, and
- These projects will be monitored by the Compliance Officer.

iii. If there is any proposal to change the use of a bond-financed facility from a governmental purpose to a use in which a private entity may have the use or benefit of such a facility on a basis that is different from the rest of the general public, the Compliance Officer will consult with bond counsel prior to the occurrence of the proposed change in use.

**2. Qualification for Initial Temporary Periods and Compliance with Restrictions against Hedge Bonds**

**a. Expectations as to Expenditure of “New Money” Bond Proceeds**

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i. In order to qualify under the arbitrage rules for an initial temporary period of 3 years for “new money” issues during which bond proceeds can be invested without regard to yield (but potentially subject to rebate), the Issuer must reasonably expect to spend at least 85% of “spendable proceeds” by the end of the temporary period. In general under Code Section 149, in order to avoid classification of an issue of bonds as “hedge bonds,” the Issuer must both (x) reasonably expect to spend 85% of the “spendable proceeds” of the bond issue within the 3 year period beginning on the date the bonds are issued and (y)

invest not more than 50% of the proceeds of the issue in investments having a substantially guaranteed yield for 4 years or more. These expectations have been documented for the Issuer’s outstanding bond issues in the tax certificates executed in connection with each bond issue.

- ii. If, for any reason, the Issuer’s expectations concerning the period over which the bond proceeds are to be expended change from what was documented in the applicable tax certificate, the Compliance Officer will consult with bond counsel.

**b. Project Draw Schedule Compliance Monitoring** – While there are unspent proceeds of a bond issue, the Compliance Officer will compare and analyze the original anticipated project draw schedule and the actual expenditure payouts and reimbursements on each bond-financed project on an annual or more frequent basis. The purpose of this analysis is to determine the variances from the original expected draw schedule for each project and to document the reasons for these variances to provide a continual record on the spending progress of each bond-financed project. Factors relevant to the analysis include unexpected delays in the project timelines, extreme weather, contract time extensions due to unexpected events, supplemental agreements and any other factor with a potential to impact the progress or completion of the projects. Generally, there should be no effect on the tax-exempt status of the bonds under either the temporary period rules or the hedge bond rules if the actual disbursements do not meet the original project draw schedule, unless circumstances surrounding the actual events cast doubt on the reasonableness of the stated expectations on the issuance date. Therefore, it is important for the Compliance Officer to update the progress of each project at least annually, and consult with bond counsel as to any variance from the original schedule.

**c. Bond Proceeds Expenditure Schedule Compliance Monitoring** – While there are unspent proceeds of bonds, the Compliance Officer will compare and analyze the bond proceeds expenditure schedule and the actual investment earnings on each project on an annual or more frequent basis. The purpose of this analysis is to determine any variances from the expected expenditure schedule and to document the reasons for these variances.

**3. Arbitrage Rebate Compliance**

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- a. Bonds may lose their tax-favored status, retroactive to the date of issuance, if they do not comply with the arbitrage restrictions of section 148 of the Code. Two general sets of requirements under the Code must be applied in order to determine whether governmental bonds are arbitrage bonds: the yield restriction requirements of section 148(a) and the rebate requirements of section 148(f).
- b. **Yield Restriction Requirements** – The yield restriction requirements provide, in general terms, that gross proceeds of a bond issue may not be invested in investments earning a yield higher than the yield of the bond issue, except for investments (i) during one of the temporary periods permitted under the regulations (including the

initial three year temporary period described above), (ii) in a reasonably required reserve or replacement fund or (iii) in an amount not in excess of the lesser of 5% of the sale proceeds of the issue or \$100,000 (the “minor portion”). Under limited circumstances, the yield on investments subject to yield restriction can be reduced through payments to the IRS known as “yield reduction payments.” The Tax Certificate will identify those funds and accounts associated with a particular issue of bonds known, as of the date of issuance, to be subject to yield restriction.

**c. Rebate Requirements**

- i. If, consistent with the yield restriction requirements, amounts treated as bond proceeds are permitted to be invested at a yield in excess of the yield on the bonds (pursuant to one of the exceptions to yield restriction referred to above), rebate payments may be required to be made to the U.S. Treasury. Under the applicable regulations, the aggregate rebate amount is the excess of the future value of all the receipts from bond funded investments over the future value of all the payments to acquire such investments. The future value is computed as of the computation date using the bond yield as the interest factor. At least 90% of the rebate amount calculated for the first computation period must be paid no later than 60 days after the end of the first computation period. The amount of rebate payments required for subsequent computation periods (other than the final period) is that amount which, when added to the future value of prior rebate payments, equals at least 90% of the rebate amount. For the final computation period, 100% of the calculated amount must be paid. Rebate exceptions and expectations are documented for each bond issue in the tax certificate executed at the time of such bond issue.
- ii. **While there are unspent proceeds of bonds, the Issuer will engage an experienced independent rebate analyst to annually calculate any rebate that may result for that year and annually provide a rebate report to the Compliance Officer. Bond counsel can assist with referrals to qualified rebate analysts.**

**d. Timing of Rebate Payments**

The Compliance Officer will work with the rebate analyst to ensure the proper calculation and payment of any rebate payment and/or yield-reduction payment at the required time:

- i. First installment due no later than 60 days after the end of the fifth anniversary of each bond issuance;
- ii. Succeeding installments at least every five years;

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- iii. Final installment no later than 60 days after retirement of last bond in the issue.<sup>1</sup>

**4. Refunding Requirements**

- a. **Refunded Projects** – The Compliance Officer will maintain records of all bond financed assets for each bond issue, including assets originally financed with a refunded bond issue.
- b. **Yield Restriction** – The Compliance Officer will work with its financial advisor and bond counsel to maintain records of allocation of bond proceeds for current and advance refundings of prior bond issues to ensure that such bond proceeds are expended as set forth in the applicable tax certificate executed at the time the refunding bonds are issued. Any yield restricted escrows will be monitored for ongoing compliance.

**C. Record Retention**

- 1. Section 6001 of the Code provides the general rule for the proper retention of records for federal tax purposes. The IRS regularly advises taxpayers to maintain sufficient records to support their tax deductions, credits and exclusions. In the case of a tax-exempt bond transaction, the primary taxpayers are the bondholders. In the case of other tax benefited bonds, such as “build America bonds” or “recovery zone economic development bonds”, the Issuer will be treated as the taxpayer. In order to ensure the continued exclusion of interest to such bondholders, it is important that the Issuer retain sufficient records to support such exclusion.

**2. In General**

- a. All records associated with any bond issue shall be stored electronically or in hard copy form at the Issuer’s offices or at another location conveniently accessible to the Issuer.
- b. The Compliance Officer will ensure that the Issuer provides for appropriate storage of these records.
- c. If storing documents electronically, the Issuer shall conform with Rev. Proc. 97-22, 1997-1 C.B. 652 (as the same may be amended, supplemented or superseded), which provides guidance on maintaining books and records by using an electronic storage system. Bond counsel can furnish a copy of this Revenue Procedure if needed.

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<sup>1</sup> Generally, rebate payments must be paid not later than 60 days after retirement of the last bond in the issue.

3. **Bonds** – Unless a longer period of time is required by state law, the Issuer shall maintain the bond record as defined in this section for the longer of the life of the bonds plus 3 years or the life of refunding bonds (or series of refunding bonds) which refunded the bonds plus 3 years. The bond record shall include the following documents:

**a. Pre-Issuance Documents**

- i. Guaranteed Investment Contracts (“GICs”) and Investments (other than Treasury’s State and Local Government Series Securities, “SLGs”)** – If applicable, the Compliance Officer shall retain all documentation regarding the procurement of each GIC or other investment acquired on or before the date of bond issuance, including as applicable the request for bids, bid sheets, documentation of procurement method (i.e., competitive vs. negotiated), etc. If investments other than SLGs are used for a defeasance escrow, the documentation should include an explanation of the reason for the purchase of open market securities and documentation establishing the fair value of the securities and compliance with safe harbor bidding rules. If SLGs are purchased, a copy of the final subscription shall be maintained.
- ii. Project Draw Schedule** – The Compliance Officer shall retain all documentation and calculations relating to the draw schedule used to meet the “reasonable expectations” test and use of proceeds tests (including copies of contracts with general and sub-contractors or summaries thereof).
- iii. Issue Sizing** – The Compliance Officer shall maintain a copy of all financial advisor’s or underwriter’s structuring information.
- iv. Bond Insurance** – If procured by the Issuer, the Compliance Officer shall maintain a copy of insurance quotes and calculations supporting the cost benefit of bond insurance, if any.
- v. Costs of Issuance documentation** – The Compliance Officer shall retain all invoices, payments and certificates related to costs of issuance of the bonds.

**b. Issuance Documents** – The Compliance Officer shall retain the bound bond transcript delivered from bond counsel.

**c. Post-Issuance Documents**

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- i. Post-Issuance Guaranteed Investment Contracts and Investments (Other than SLGs)** – the Compliance Officer shall retain all documentation regarding the procurement of any GIC or other investment acquired after bond issuance, including as applicable the request for bids, bid sheets, documentation of procurement method (i.e., competitive vs. negotiated), etc. If investments other than SLGs are used for a defeasance escrow, the documentation should include an

explanation of the reason for the purchase of open market securities and documentation establishing the fair value of the securities and compliance with safe harbor bidding rules.

- ii. **Records of Investments** shall be retained by the Compliance Officer.
- iii. **Investment Activity Statements** shall be retained by the Compliance Officer.
- iv. **Records of Expenditures** – The Compliance Officer shall maintain or shall cause to be maintained all invoices, etc. relating to equipment purchases and constructed or acquired projects, either electronically or in hard copy.
- v. **Records of Compliance**
  - **Qualification for Initial Temporary Periods and Compliance with Restrictions against Hedge Bond Documentation** – The Compliance Officer shall prepare the annual analysis described in Section II(B)(2) above and maintain these records.
  - **Arbitrage Rebate Reports** may be prepared by the Compliance Officer or a third party as described in section II (B)(3) of this document and retained by the Compliance Officer.
  - **Returns and Payment** – Shall be prepared at the direction of the Compliance Officer and filed as described in Section II(B)(3) of this document.
  - **Contracts under which any bond proceeds are spent (consulting engineering, acquisition, construction, etc.)** – The Compliance Officer shall obtain copies of these contracts and retain them for the bond record.

**d. General**

- i. **Audited Financial Statements** – The Compliance Officer will maintain copies of the Issuer’s annual audited Financial Statements.
- ii. **Reports of any prior IRS Examinations** – The Compliance Officer will maintain copies of any written materials pertaining to any IRS examination of the Issuer’s bonds.

**III. Voluntarily Correcting Failures to Comply with Post-Issuance Compliance Activities**

If, in the effort to exercise due diligence in complying with applicable federal tax laws, a potential violation is discovered, the Issuer may address the violation through the applicable method listed below. The Issuer should work with its bond counsel to determine the appropriate way to proceed.

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**A. Taking remedial actions as described in Section 141 of the Internal Revenue Code**

**B. Utilizing the Voluntary Closing Agreement Program (VCAP)** – Section 7.2.3 of the Internal Revenue Manual establishes the voluntary closing agreement program for tax-exempt

bonds (TEB VCAP) whereby issuers of tax-exempt bonds can resolve violations of the Internal Revenue Code through closing agreements with the Internal Revenue Service.

#### **IV. Post Issuance Tax Compliance Procedures Review**

The Compliance Officer shall review these procedures at least annually, and implement revisions or updates as deemed appropriate, in consultation with bond counsel.

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**Exhibit A**

**POST ISSUANCE COMPLIANCE NOTES**  
**[Name of Bond]**

**Transaction Parties**

Overall Responsible Party for Debt Management Activities \_\_\_\_\_  
Bond Counsel \_\_\_\_\_  
Paying Agent \_\_\_\_\_  
Rebate Specialist \_\_\_\_\_  
Other \_\_\_\_\_

**COPY**

(Please Note: The following certificate is an essential part of the permanent record and creates ongoing obligations of the Issuer. Please read it carefully before signing. Advise Locke Lord LLP of any inaccuracy.)

## CONTINUING DISCLOSURE CERTIFICATE

This Continuing Disclosure Certificate (the “Disclosure Certificate”) is executed and delivered by the Town of Needham, Massachusetts (the “Issuer”) in connection with the issuance of its \$25,185,000 General Obligation Municipal Purpose Loan of 2020 Bonds dated June 25, 2020 (the “Bonds”). The Issuer covenants and agrees as follows:

**SECTION 1. Purpose of the Disclosure Certificate.** This Disclosure Certificate is being executed and delivered by the Issuer for the benefit of the Owners of the Bonds and in order to assist the Participating Underwriters in complying with the Rule.

**SECTION 2. Definitions.** For purposes of this Disclosure Certificate the following capitalized terms shall have the following meanings:

“Annual Report” shall mean any Annual Report provided by the Issuer pursuant to, and as described in, Sections 3 and 4 of this Disclosure Certificate.

“Listed Events” shall mean any of the events listed in Section 5(a) of this Disclosure Certificate.

“MSRB” shall mean the Municipal Securities Rulemaking Board as established pursuant to Section 15B(b)(1) of the Securities Exchange Act of 1934, or any successor thereto or to the functions of the MSRB contemplated by this Disclosure Certificate. Filing information relating to the MSRB is set forth in Exhibit A attached hereto.

“Obligated Person” shall mean the Issuer.

“Owners of the Bonds” shall mean the registered owners, including beneficial owners, of the Bonds.

“Participating Underwriter” shall mean any of the original underwriters of the Bonds required to comply with the Rule in connection with offering of the Bonds.

“Rule” shall mean Rule 15c2-12 adopted by the Securities and Exchange Commission under the Securities Exchange Act of 1934, as the same may be amended from time to time.

### **SECTION 3. Provision of Annual Reports.**

(a) The Issuer shall, not later than 270 days after the end of each fiscal year, provide to the MSRB an Annual Report which is consistent with the requirements of Section 4 of this Disclosure Certificate. The Annual Report may be submitted as a single document or as separate documents comprising a package, and may cross-reference other information as provided in Section 4 of this Disclosure Certificate; provided that the audited financial statements of the Issuer may be submitted when available separately from the balance of the Annual Report.

**COPY**

(b) If the Issuer is unable to provide to the MSRB an Annual Report by the date required in subsection (a), the Issuer shall send a notice to the MSRB in a timely manner, in substantially the form attached as Exhibit B.

SECTION 4. Content of Annual Reports. The Issuer’s Annual Report shall contain or incorporate by reference the following:

(a) quantitative information for the preceding fiscal year of the type presented in the Issuer’s Official Statement dated June 9, 2020 relating to the Bonds regarding (i) the revenues and expenditures of the Issuer relating to its operating budget, (ii) capital expenditures, (iii) fund balances, (iv) property tax information, (v) outstanding indebtedness and overlapping debt of the Issuer, (vi) pension obligations of the Issuer, and (vii) other post-employment benefits liability of the Issuer, and

(b) the most recently available audited financial statements of the Issuer, prepared in accordance with generally accepted accounting principles, with certain exceptions permitted by the Massachusetts Uniform Municipal Accounting System promulgated by the Department of Revenue of the Commonwealth. If audited financial statements for the preceding fiscal year are not available when the Annual Report is submitted, the Annual Report will include unaudited financial statements for the preceding fiscal year and audited financial statements for such fiscal year shall be submitted when available.

Any or all of the items listed above may be incorporated by reference from other documents, including official statements of debt issues of the Issuer or related public entities, which (i) are available to the public on the MSRB internet website or (ii) have been filed with the Securities and Exchange Commission. The Issuer shall clearly identify each such other document so incorporated by reference.

SECTION 5. Reporting of Significant Events.

(a) The Issuer shall give notice, in accordance with the provisions of this Section 5, of the occurrence of any of the following events with respect to the Bonds:

1. Principal and interest payment delinquencies.
2. Non-payment related defaults, if material.
3. Unscheduled draws on debt service reserves reflecting financial difficulties.
4. Unscheduled draws on credit enhancements reflecting financial difficulties.
5. Substitution of credit or liquidity providers, or their failure to perform.
6. Adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the Bonds, or other material events affecting the tax status of the Bonds.

**COPY**

7. Modifications to rights of the Owners of the Bonds, if material.
  8. Bond calls, if material, and tender offers.
  9. Defeasances.
  10. Release, substitution or sale of property securing repayment of the Bonds, if material.
  11. Rating changes.
  12. Bankruptcy, insolvency, receivership or similar event of the Obligated Person.\*
  13. The consummation of a merger, consolidation, or acquisition involving an Obligated Person or the sale of all or substantially all of the assets of the Obligated Person, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material.
  14. Appointment of a successor or additional trustee or the change of name of a trustee, if material.
  15. Incurrence of a financial obligation of the Obligated Person, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a financial obligation of the Obligated Person, any of which affect Owners of the Bonds, if material.†
  16. Default, event of acceleration, termination event, modification of terms, or other similar events under the terms of a financial obligation of the Obligated Person, any of which reflect financial difficulties.†
- (b) Upon the occurrence of a Listed Event, the Issuer shall, in a timely manner not in excess of ten (10) business days after the occurrence of the event, file a notice of such occurrence with the MSRB.

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\* As noted in the Rule, this event is considered to occur when any of the following occur: (i) the appointment of a receiver, fiscal agent or similar officer for the Obligated Person in a proceeding under the U.S. Bankruptcy Code or in any proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the Obligated Person, or if such jurisdiction has been assumed by leaving the existing governing body and officials or officers in possession but subject to the supervision and orders of a court or governmental authority, or (ii) the entry of an order confirming a plan of reorganization, arrangement or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the Obligated Person.

† For purposes of event numbers 15 and 16 in Section 5(a) of this Disclosure Certificate, the term “financial obligation” means a (i) debt obligation; (ii) derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation; or (iii) guarantee of (i) or (ii). The term “financial obligation” excludes municipal securities for which a final official statement has been provided to the MSRB consistent with the Rule.

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SECTION 6. Transmission of Information and Notices. Unless otherwise required by law, all notices, documents and information provided to the MSRB shall be provided in electronic format as prescribed by the MSRB and shall be accompanied by identifying information as prescribed by the MSRB.

SECTION 7. Termination of Reporting Obligation. The Issuer’s obligations under this Disclosure Certificate shall terminate upon the prior redemption or payment in full of all of the Bonds. If such termination occurs prior to the final maturity of the Bonds, the Issuer shall give notice of such termination in the same manner as for a Listed Event under Section 5(b).

SECTION 8. Amendment; Waiver. Notwithstanding any other provision of this Disclosure Certificate, the Issuer may amend this Disclosure Certificate and any provision of this Disclosure Certificate may be waived if such amendment or waiver is permitted by the Rule, as evidenced by an opinion of counsel expert in federal securities law (which may include bond counsel to the Issuer), to the effect that such amendment or waiver would not cause the Disclosure Certificate to violate the Rule. The first Annual Report filed after enactment of any amendment to or waiver of this Disclosure Certificate shall explain, in narrative form, the reasons for the amendment or waiver and the impact of the change in the type of information being provided in the Annual Report.

If the amendment provides for a change in the accounting principles to be followed in preparing financial statements, the Annual Report for the year in which the change is made shall present a comparison between the financial statements or information prepared on the basis of the new accounting principles and those prepared on the basis of the former accounting principles. The comparison shall include a qualitative discussion of the differences in the accounting principles and the impact of the change in the accounting principles on the presentation of the financial information in order to provide information to investors to enable them to evaluate the ability of the Issuer to meet its obligations. To the extent reasonably feasible, the comparison shall also be quantitative. A notice of the change in the accounting principles shall be sent to the MSRB.

SECTION 9. Default. In the event of a failure of the Issuer to comply with any provision of this Disclosure Certificate any Owner of the Bonds may seek a court order for specific performance by the Issuer of its obligations under this Disclosure Certificate. A default under this Disclosure Certificate shall not constitute a default with respect to the Bonds, and the sole remedy under this Disclosure Certificate in the event of any failure of the Issuer to comply with this Disclosure Certificate shall be an action for specific performance of the Issuer’s obligations hereunder and not for money damages in any amount.

COPY

SECTION 10. Beneficiaries. This Disclosure Certificate shall inure solely to the benefit of the Owners of the Bonds from time to time, and shall create no rights in any other person or entity.

Date: June 25, 2020

TOWN OF NEEDHAM,  
MASSACHUSETTS

By: \_\_\_\_\_  
Treasurer



Matthew Borrelli



Select Board

**COPY**

EXHIBIT A

Filing information relating to the Municipal Securities Rulemaking Board is as follows:

Municipal Securities Rulemaking Board  
<http://emma.msrb.org>

**COPY**

EXHIBIT B

NOTICE OF FAILURE TO FILE ANNUAL REPORT

Name of Issuer: Town of Needham, Massachusetts  
Name of Issue: \$25,185,000 General Obligation Municipal Purpose Loan of 2020 Bonds  
Date of Issuance: June 25, 2020

NOTICE IS HEREBY GIVEN that the Issuer has not provided an Annual Report with respect to the above-named Bonds as required by the Continuing Disclosure Certificate of the Issuer dated June 25, 2020. The Issuer anticipates that the Annual Report will be filed by

\_\_\_\_\_.

Dated: \_\_\_\_\_

TOWN OF NEEDHAM,  
MASSACHUSETTS

By: \_\_\_\_\_

**COPY**

# RatingsDirect®

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## Summary:

# Needham, Massachusetts; General Obligation

### Primary Credit Analyst:

Krystal Tena, New York + 1 (212) 438-1628; [krystal.tena@spglobal.com](mailto:krystal.tena@spglobal.com)

### Secondary Contact:

Victor M Medeiros, Boston (1) 617-530-8305; [victor.medeiros@spglobal.com](mailto:victor.medeiros@spglobal.com)

## Table Of Contents

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Rating Action

Stable Outlook

Credit Opinion

Related Research

## Summary:

# Needham, Massachusetts; General Obligation

### Credit Profile

US\$7.305 mil GO muni purpose loan of 2020 bnds due 02/01/2040

*Long Term Rating* AAA/Stable New

Needham GO

*Long Term Rating* AAA/Stable Affirmed

Needham GO mun purp loan bnds

*Long Term Rating* AAA/Stable Affirmed

### Rating Action

S&P Global Ratings assigned its 'AAA' rating to Needham, Mass.' series 2020 general obligation (GO) municipal-purpose loan bonds. At the same time, S&P Global Ratings affirmed its 'AAA' rating on the town's existing GO debt. The outlook on all ratings is stable.

The town's full-faith-and-credit pledge secures the bonds, subject to Proposition 2 1/2 limitations, thus we view this debt as a limited tax obligation limits. Despite limitations imposed by the commonwealth's levy-limit law on municipal bonds, we do not make a rating distinction between the limited-tax GO pledge and Needham's general creditworthiness, as we have already embedded the tax limitation imposed on the town's ability to raise revenue and resource fungibility into our analysis of its financial and economic conditions.

We rate the town higher than the sovereign because we believe it can maintain better credit characteristics than the nation in a stress scenario based on its predominantly locally derived revenue base and our view that the pledged revenue supporting debt service on the bonds is at limited risk of negative sovereign intervention. In fiscal 2019, local property taxes generated about 80% of general fund revenue, which demonstrated a lack of dependence on central government revenue. Under our criteria, U.S. state and local governments are considered to have moderate sensitivity to country risk. (For more information, see "Ratings Above The Sovereign--Corporate And Government Ratings: Methodology And Assumptions," published Nov. 19, 2013, on RatingsDirect.)

Proceeds from the 2020 bonds, totaling approximately \$27.2 million, will be used to refund the outstanding debt on the town's 2009 GO bonds (\$4.9 million), as well as to provide new money funding (\$22.2 million) for various capital outlay projects, primarily the construction of a public safety building.

### Credit overview

Needham, a suburb of Boston, is predominantly residential and supported by very strong and wealth and income metrics, which have been longstanding attributes of the town. The town has experienced consistent economic growth and, in combination with its strong financial management practices, this has facilitated consistently positive operating results and increases in its overall reserve levels, which we believe place the town in a comparatively strong position to

absorb potential short-term budgetary pressures caused by the recession. (For more information on S&P Global Ratings latest economic forecast, see the article "An Already Historic U.S. Downturn Now Looks Even Worse," published April 16, 2020.) We expect the recession to pose some risk of reduced local excise tax receipts; however, we believe the fiscal impact of the recession will be relatively subdued on the town's operations due to its broad reliance on property taxes, which make up 87% of the town's total assessed value and for which collections regularly exceed 100%. Furthermore, the town's healthy fund balance provide it with significant flexibility should it need to drawdown to meet revenue shortfalls while continuing to maintain levels we consider strong. Therefore, although economic uncertainty caused by the pandemic still remains, we expect Needham's overall credit quality to remain stable; however, we will continue to monitor for any material adverse effects on the region and town.

The following factors also help determine the rating:

- Very strong economy, with access to a broad and diverse metropolitan statistical area (MSA);
- Strong management, with good financial policies and practices under our Financial Management Assessment methodology;
- Adequate budgetary performance, with balanced operating results in the general fund and an operating surplus at the total governmental fund level in fiscal 2019;
- Very strong budgetary flexibility, with an available fund balance in fiscal 2019 of 25% of operating expenditures;
- Very strong liquidity, with total government available cash at 37.0% of total governmental fund expenditures and 7.6x governmental debt service, and access to external liquidity we consider strong;
- Very strong debt and contingent liability position, with debt service carrying charges at 4.9% of expenditures and net direct debt that is 60.6% of total governmental fund revenue, as well as low overall net debt at less than 3% of market value and rapid amortization, with 67.7% of debt scheduled to be retired in 10 years; and
- Strong institutional framework score.

### **Environmental, social, governance factors**

Our rating action incorporates our view regarding the health and safety risks posed by the COVID-19 pandemic. Absent the implications of COVID-19, we consider the town's social risks in line with that of the sector. Furthermore, we view the town's social and governance risks as being in line with the sector.

## **Stable Outlook**

### **Downside scenario**

Needham has done well managing potential budgetary challenges regarding pension and other postemployment benefits (OPEB) costs, while also budgeting discretionary funding for capital projects. However, we could lower the rating should the town's financial performance substantially deteriorate and reserve levels decline significantly relative to the budget.

## Credit Opinion

### Very strong economy

We consider Needham's economy very strong. The town, with an estimated population of 30,252, is located in Norfolk County in the Boston-Cambridge-Newton, Mass.-N.H. MSA, which we consider to be broad and diverse. The town has a projected per capita effective buying income of 240% of the national level, which we view as extremely high and a positive credit factor and per capita market value of \$357,126. Overall, the town's market value grew by 6.2% over the past year to \$10.8 billion in 2020. The county unemployment rate was 2.5% in 2019, which we expect will deteriorate somewhat in the near-term given recent labor market deterioration resulting from the COVID-19 pandemic.

Interstate highway 95, as well as State Routes 9 and 135 service the town, connecting it to the Boston metropolitan employment opportunities. The town's assessed value (AV) in fiscal 2019 consisted of 87% residential properties, and approximately 11% commercial and industrial properties. Property tax collections trend consistently strong over 100%. While building permits have moderated more recently, total AV has grown by just under 20% since 2015. The town's location just outside of Boston and its access to public transit continues to attract employers. In addition to NBCUniversal's recent opening in Needham, global technology firm IDG announced in May 2020 that it will relocate its operations to the town's mixed-use center, Needham Crossing. Furthermore, Boston Children's Hospital also announced plans to develop a pediatric medical facility in Needham.

Overall, despite the economic slowdown resulting from the COVID-19 pandemic, we believe Needham's economy will be relatively less affected due to its strong and stable residential tax base and proximity to Boston's employment opportunities, in addition to its increasing economic development. As such, we our assessment is that Needham's economy could experience some softening, but will remain very strong throughout the medium-term.

### Strong management

We view the town's management as strong, with good financial policies and practices under our Financial Management Assessment methodology, indicating financial practices exist in most areas, but that governance officials might not formalize or monitor all of them on a regular basis.

Needham is conservative in its management and budgeting practices. Management seeks to reduce costs and maintain financial sustainability when drafting the town's budget. Management considers historical trends and forecasts of key economic indicators when developing revenue and expenditure assumptions. The town manager receives budget-to-actual reports monthly while the select board receives reports regularly.

Needham maintains a five-year financial forecast and a five-year rolling capital improvement plan, both of which are included and presented with the annual budget. The town currently maintains a formal debt management policy, and while it does not have a formal reserve policy, the town adheres to an informal reserve policy. Needham uses commonwealth guidelines for investment management, which is reported regularly.

Highlights of Needham's management practices include systematic collaboration and communication among critical units, including with the local school department. As evidenced by Needham's strong fiscal operating results, the management team, with its depth of experience, demonstrates prudence and effectiveness in its affairs.

### **Adequate budgetary performance**

Needham's budgetary performance is adequate in our opinion. This assessment incorporates our belief that heightened uncertainty exists relative to the recessionary pressures related to the COVID-19 pandemic. The town had balanced operating results in the general fund of negative 0.2% of expenditures, and surplus results across all governmental funds of 2.5% in fiscal 2019.

For analytical consistency, we adjusted for recurring transfers out of the general fund to the capital projects fund and other project funds. Management attributes its consistent operating surpluses to a focus on conservative budgeting practices, along with numerous ongoing developments aiding in revenue growth. The town receives most of its general fund revenues from property taxes and intergovernmental aid, at 80% and 12%, respectively.

For fiscal 2020, on a budget of about \$178 million, Needham expects positive year-end results, as actuals are tracking generally according to budget. In addition, management has instituted freezes on discretionary spending, has deferred some expenses to fiscal 2021, and has deferred hiring for non-essential positions. While the town opted to defer its tax payment deadline from May 1 to June 1, it is continuing to experience a strong collection rate, and thus expects no shortfalls. The town has been committed to utilizing pay-go financing to fund many capital projects, a practice it continued to incorporate in its fiscal 2020 and fiscal 2021 budgets.

For its fiscal 2021 budget, the town is moving forward with its initially proposed budget of \$203.5 million, which is scheduled to be voted on June 8 by town residents. Overall, the proposal consists of a level services budget compared with fiscal 2020, and while management expects general budgetary stability in fiscal 2021, given its broad reliance on property tax revenues, it has conducted sensitivity analysis on potential revenue shortfalls. Management's contingency plan to close a potential budget gap is to closely review budget-to-actuals and make intra-year adjustments, such as using fund balance and decrease discretionary spending, during the October and May town meetings, if necessary.

While we expect for the recession resulting from the COVID-19 pandemic to have some muting effect on Needham's economic activity, we believe Needham maintains an overall stable and predictable revenue profile that is largely independent of state or federal funds and benefits from a very strong property tax base. As such, we expect Needham to maintain at least balanced budgetary performance.

### **Very strong budgetary flexibility**

Needham's budgetary flexibility is very strong, in our view, with an available fund balance in fiscal 2019 of 25% of operating expenditures, or \$44.3 million.

The town's available funds include assigned, unassigned, and committed funds. Needham has historically maintained very strong budgetary flexibility, keeping its available reserves in excess of 20% of general fund expenditures over the past three fiscal years. In accordance with its fund balance policy, management expects to continue to maintain a level of at least 19% of revenue for available funds and a minimum of 8% of revenue for unassigned funds.

Needham's fiscal 2019 included a planned reserve fund drawdown due to increased investment in its cash capital fund. As budgeted, and in accordance with its capital investment plan, management expects another drawdown of reserves to post at the end of fiscal 2020. The town is also prepared to use some of its fund balance to bridge potential budget gaps in fiscal 2021, if necessary. Anticipated drawdowns notwithstanding, given the town's very strong fund balance

and its expressed willingness and ability to make intra-year budgetary adjustments, we expect the town's flexibility to remain very strong over the medium-term.

### **Very strong liquidity**

In our opinion, Needham's liquidity is very strong, with total government available cash at 37.0% of total governmental fund expenditures and 7.6x governmental debt service in 2019. In our view, the town has strong access to external liquidity if necessary.

Needham is a frequent issuer of GO debt, which allows for strong access to external liquidity. In addition, it does not currently have any variable-rate or direct-purchase debt. Based on the 2020 year-end expectations, we expected the town's liquidity profile to remain very strong.

### **Very strong debt and contingent liability profile**

In our view, Needham's debt and contingent liability profile is very strong. Total governmental fund debt service is 4.9% of total governmental fund expenditures, and net direct debt is 60.6% of total governmental fund revenue. Overall net debt is low at 1.2% of market value, and approximately 67.7% of the direct debt is scheduled to be repaid within 10 years, which are in our view positive credit factors.

Including this bond issue, direct debt totals roughly \$135.5 million, of which \$10.5 million is fully self-supported from the town's water and sewer enterprise funds. Of the town's current debt, 66% is scheduled to be amortized over the next 10 years. The town expects to issue approximately \$35 million in new money debt in the next one-to-two years, which has been factored into this analysis.

### **Pension and other postemployment benefits**

Needham's combined required pension and actual OPEB contributions totaled 7.2% of total governmental fund expenditures in 2019. Of that amount, 3.8% represented required contributions to pension obligations, and 3.4% represented OPEB payments. The town made its full annual required pension contribution in 2019.

We view the town's pension and OPEB obligations as currently manageable, in particular as the town is fully funding its OPEB obligation.

Needham participated in the following plans of June 30, 2019:

- Needham Contributory Retirement System, 66.5% funded, with a net pension liability of \$78.8 million, and a discount rate of 7.25%.
- A defined-benefit benefit health care plan that provides healthcare benefits for retired employees; 100% funded, with a net OPEB liability of \$66.6 million.

In fiscal 2019, Needham paid its annual required contribution. Needham is one of the few communities in Massachusetts that fully funds its OPEB obligation. As of June 30, 2019, the OPEB trust fund had a balance of approximately \$32.9 million. The town has been appropriating its annual required contributions toward its OPEB fund for the past five years and pays for annual health care costs from the fund.

## **Strong institutional framework**

The institutional framework score is strong.

## **Related Research**

Through The ESG Lens 2.0: A Deeper Dive Into U.S. Public Finance Credit Factors, April 28, 2020

Certain terms used in this report, particularly certain adjectives used to express our view on rating relevant factors, have specific meanings ascribed to them in our criteria, and should therefore be read in conjunction with such criteria. Please see Ratings Criteria at [www.standardandpoors.com](http://www.standardandpoors.com) for further information. Complete ratings information is available to subscribers of RatingsDirect at [www.capitaliq.com](http://www.capitaliq.com). All ratings affected by this rating action can be found on S&P Global Ratings' public website at [www.standardandpoors.com](http://www.standardandpoors.com). Use the Ratings search box located in the left column.

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SAVINGS

Town of Needham, Massachusetts  
General Obligation Municipal Purpose Loan of 2020 Bonds  
Current Refunding of December 15, 2009  
Plus New Money

Date	Prior Debt Service	Refunding Debt Service	Non-Called Debt Service	Refunding Net Cash Flow	Savings	Annual Savings
08/01/2020	960,450.00	-	847,525.00	847,525.00	112,925.00	-
02/01/2021	112,925.00	137,980.00	-	137,980.00	(25,055.00)	-
06/30/2021	-	-	-	-	-	87,870.00
08/01/2021	947,925.00	114,125.00	-	114,125.00	833,800.00	-
02/01/2022	99,356.25	789,125.00	-	789,125.00	(689,768.75)	-
06/30/2022	-	-	-	-	-	144,031.25
08/01/2022	934,356.25	97,250.00	-	97,250.00	837,106.25	-
02/01/2023	85,787.50	782,250.00	-	782,250.00	(696,462.50)	-
06/30/2023	-	-	-	-	-	140,643.75
08/01/2023	920,787.50	80,125.00	-	80,125.00	840,662.50	-
02/01/2024	71,175.00	775,125.00	-	775,125.00	(703,950.00)	-
06/30/2024	-	-	-	-	-	136,712.50
08/01/2024	881,175.00	62,750.00	-	62,750.00	818,425.00	-
02/01/2025	57,000.00	732,750.00	-	732,750.00	(675,750.00)	-
06/30/2025	-	-	-	-	-	142,675.00
08/01/2025	867,000.00	46,000.00	-	46,000.00	821,000.00	-
02/01/2026	40,800.00	726,000.00	-	726,000.00	(685,200.00)	-
06/30/2026	-	-	-	-	-	135,800.00
08/01/2026	845,800.00	32,400.00	-	32,400.00	813,400.00	-
02/01/2027	24,700.00	702,400.00	-	702,400.00	(677,700.00)	-
06/30/2027	-	-	-	-	-	135,700.00
08/01/2027	644,700.00	19,000.00	-	19,000.00	625,700.00	-
02/01/2028	12,300.00	499,000.00	-	499,000.00	(486,700.00)	-
06/30/2028	-	-	-	-	-	139,000.00
08/01/2028	627,300.00	9,400.00	-	9,400.00	617,900.00	-
02/01/2029	-	479,400.00	-	479,400.00	(479,400.00)	-
06/30/2029	-	-	-	-	-	138,500.00
	8,133,537.50	6,085,080.00	847,525.00	6,932,605.00	1,200,932.50	1,200,932.50

Savings Summary

Savings PV date	06/25/2020
Savings PV rate	1.387632%
PV of savings from cash flow	1,166,357.06
Less: Prior funds on hand	(397,518.50)
Plus: Refunding funds on hand	860.87

Net PV Savings

769,699.43

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BOND DEBT SERVICE

Town of Needham, Massachusetts  
 General Obligation Municipal Purpose Loan of 2020 Bonds  
 Current Refunding of December 15, 2009  
 Plus New Money

Dated Date 06/25/2020  
 Delivery Date 06/25/2020

Period Ending	Principal	Coupon	Interest	Debt Service	Annual Debt Service
02/01/2021	1,990,000.00	5.000%	580,740.00	2,570,740.00	-
06/30/2021	-	-	-	-	2,570,740.00
08/01/2021	-	-	434,200.00	434,200.00	-
02/01/2022	1,905,000.00	5.000%	434,200.00	2,339,200.00	-
06/30/2022	-	-	-	-	2,773,400.00
08/01/2022	-	-	386,575.00	386,575.00	-
02/01/2023	1,895,000.00	5.000%	386,575.00	2,281,575.00	-
06/30/2023	-	-	-	-	2,668,150.00
08/01/2023	-	-	339,200.00	339,200.00	-
02/01/2024	1,905,000.00	5.000%	339,200.00	2,244,200.00	-
06/30/2024	-	-	-	-	2,583,400.00
08/01/2024	-	-	291,575.00	291,575.00	-
02/01/2025	1,770,000.00	5.000%	291,575.00	2,061,575.00	-
06/30/2025	-	-	-	-	2,353,150.00
08/01/2025	-	-	247,325.00	247,325.00	-
02/01/2026	1,575,000.00	4.000%	247,325.00	1,822,325.00	-
06/30/2026	-	-	-	-	2,069,650.00
08/01/2026	-	-	215,825.00	215,825.00	-
02/01/2027	1,565,000.00	4.000%	215,825.00	1,780,825.00	-
06/30/2027	-	-	-	-	1,996,650.00
08/01/2027	-	-	184,525.00	184,525.00	-
02/01/2028	1,375,000.00	4.000%	184,525.00	1,559,525.00	-
06/30/2028	-	-	-	-	1,744,050.00
08/01/2028	-	-	157,025.00	157,025.00	-
02/01/2029	1,365,000.00	4.000%	157,025.00	1,522,025.00	-
06/30/2029	-	-	-	-	1,679,050.00
08/01/2029	-	-	129,725.00	129,725.00	-
02/01/2030	895,000.00	4.000%	129,725.00	1,024,725.00	-
06/30/2030	-	-	-	-	1,154,450.00
08/01/2030	-	-	111,825.00	111,825.00	-
02/01/2031	895,000.00	4.000%	111,825.00	1,006,825.00	-
06/30/2031	-	-	-	-	1,118,650.00
08/01/2031	-	-	93,925.00	93,925.00	-
02/01/2032	895,000.00	4.000%	93,925.00	988,925.00	-
06/30/2032	-	-	-	-	1,082,850.00
08/01/2032	-	-	76,025.00	76,025.00	-
02/01/2033	895,000.00	3.000%	76,025.00	971,025.00	-
06/30/2033	-	-	-	-	1,047,050.00
08/01/2033	-	-	62,600.00	62,600.00	-
02/01/2034	895,000.00	2.000%	62,600.00	957,600.00	-
06/30/2034	-	-	-	-	1,020,200.00
08/01/2034	-	-	53,650.00	53,650.00	-
02/01/2035	895,000.00	2.000%	53,650.00	948,650.00	-
06/30/2035	-	-	-	-	1,002,300.00
08/01/2035	-	-	44,700.00	44,700.00	-
02/01/2036	895,000.00	2.000%	44,700.00	939,700.00	-
06/30/2036	-	-	-	-	984,400.00
08/01/2036	-	-	35,750.00	35,750.00	-
02/01/2037	895,000.00	2.000%	35,750.00	930,750.00	-
06/30/2037	-	-	-	-	966,500.00
08/01/2037	-	-	26,800.00	26,800.00	-
02/01/2038	895,000.00	2.000%	26,800.00	921,800.00	-
06/30/2038	-	-	-	-	948,600.00
08/01/2038	-	-	17,850.00	17,850.00	-
02/01/2039	895,000.00	2.000%	17,850.00	912,850.00	-
06/30/2039	-	-	-	-	930,700.00
08/01/2039	-	-	8,900.00	8,900.00	-
02/01/2040	890,000.00	2.000%	8,900.00	898,900.00	-
06/30/2040	-	-	-	-	907,800.00
	25,185,000.00		6,416,740.00	31,601,740.00	31,601,740.00

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**Select Board  
TOWN OF NEEDHAM  
AGENDA FACT SHEET**

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**MEETING DATE: 06/23/2020**

<b>Agenda Item</b>	Spring License Renewal Extension
<b>Presenter(s)</b>	Kate Fitzpatrick, Town Manager

<b>1.</b>	<b>BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED</b>
<p>The Town Manager will recommend that the Board extend the spring license renewals to August 31, 2020.</p> <p>The licenses were originally extended from May 1 to June 30 at the Board's meeting on April 3, 2020. The licenses include sale of secondhand articles, pool tables, taxi/livery, and bowling alley. The extension will provide additional time for businesses to re-open and complete the renewal paperwork.</p>	
<b>2.</b>	<b>VOTE REQUIRED BY SELECT BOARD</b>
<p><i>Suggested Motion:</i> that the Board vote to extend the Spring License Renewals from June 30, 2020 to August 31, 2020.</p>	
<b>3.</b>	<b>BACK UP INFORMATION ATTACHED</b>
<p><b>(Describe backup below)</b></p> <p>None</p>	



**Select Board  
TOWN OF NEEDHAM  
AGENDA FACT SHEET**

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**MEETING DATE: 6/23/2020**

<b>Agenda Item</b>	Unite Against Racism Initiative
<b>Presenter(s)</b>	Kate Fitzpatrick, Town Manager

<b>1.</b>	<b>BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED</b>
<p>The Town Manager will discuss options for responding to community questions and suggestions and starting a dialogue about understanding and uniting against racism.</p>	
<b>2.</b>	<b>VOTE REQUIRED BY SELECT BOARD</b>
<p><i>Discussion Only.</i></p>	
<b>3.</b>	<b>BACK UP INFORMATION ATTACHED</b>
<p>none</p>	



**Select Board  
TOWN OF NEEDHAM  
AGENDA FACT SHEET**

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**MEETING DATE: 06/23/2020**

<b>Agenda Item</b>	Economic Development
<b>Presenter(s)</b>	Board Discussion

<b>1.</b>	<b>BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED</b>
Board members will discuss efforts to help local restaurants and other local businesses impacted by the pandemic.	
<b>2.</b>	<b>VOTE REQUIRED BY SELECT BOARD</b>
<b>3.</b>	<b>BACK UP INFORMATION ATTACHED</b>
<b>(Describe backup below)</b>	
None	



**Select Board  
TOWN OF NEEDHAM  
AGENDA FACT SHEET**

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**MEETING DATE: 06/23/2020**

<b>Agenda Item</b>	Committee Reports
<b>Presenter(s)</b>	Board Discussion

<b>1.</b>	<b>BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED</b>
<i>Board members will report on the progress and / or activities of their Committee assignments.</i>	
<b>2.</b>	<b>VOTE REQUIRED BY SELECT BOARD</b>
<b>3.</b>	<b>BACK UP INFORMATION ATTACHED</b>
<b>(Describe backup below)</b>	
None	

**Town of Needham**  
**Select Board**  
**Minutes for Wednesday, June 3, 2020**  
**By Zoom Video Conference**  
<https://us02web.zoom.us/j/81178733033>

5:00 p.m. Call to Order:  
A special meeting of the Select Board was convened by Chair Maurice P. Handel. Those participating were Matthew D. Borrelli, Marianne B. Cooley, Daniel P. Matthews, John A. Bulian, and Town Manager Kate Fitzpatrick. Recording Secretary Mary Hunt recorded the meeting remotely.

Mr. Handel announced this open meeting is being conducted remotely consistent with Governor Baker's Executive Order of March 12, 2020 due to the current state of emergency from the outbreak of the COVID-19 virus. He noted all public gatherings have been suspended as advised and directed by the Commonwealth. And, as such, suspending the requirement of the open meeting law to have all meetings in a public, accessible, physical location while encouraging and allowing members of all public bodies to participate remotely. Mr. Handel stated the meeting will not include public comment and the Needham Select Board and all attendees are convening by Zoom, as posted on the Town's website identifying how the public may join. He said all supporting documents used at this meeting are available on the Town's website [www.needhamma.gov](http://www.needhamma.gov).

5:03 p.m. Select Board/Town Response to Current National Crisis:  
Ms. Cooley read a statement acknowledging the current national crisis and which expresses the unanimous sentiments of the Select Board.

**Motion by Ms. Cooley that the Town of Needham stands with all well-meaning people in remorse and resolution over the most recent examples of racial disparities and racism in America. We denounce the actions and inactions of the police officers involved in the incident that lead to the death of George Floyd. The behavior is unacceptable and out of line with the high standards and professionalism that we hold our officers to in Needham. For healing to begin, there must be a transparent and honest investigation. In Needham, we continue to take action to ensure that what happened to George Floyd and to many other black victims never happens here. Needham's police officers undergo cultural diversity training and practice community policing principles including de-escalation techniques. Our officers continue building and growing relationships every day, getting to know people for who they are, not for the color of their skin, their beliefs, or orientation. They are here to protect each and every person in our town, and they serve us honorably and well. As evidenced by peaceful vigils and protests across this country, people of every color demand an end to the racism and intolerance that has led to the undeniable deaths of so many Americans. These are difficult times. Hatred**

**and discrimination will not be cured through violence. We encourage continued dialogue and hard work to end racial injustice.**

**Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.**

5:06 p.m.

Presentation by Police Chief Schlittler About Community Policing in Needham:

Mr. Handel stated the actions of some police officers across the country do not reflect the incredible work being done by the Needham police force. He said the Needham police department emphasizes and promotes training and cultural diversity, use of force and de-escalation tactics. As a town, he said, we are committed to ensure that this good work continues through the work they do every day to keep our community safe.

John Schlittler, Chief of Police read a statement saying “First and foremost, the senseless killing of George Floyd is a tragedy. We denounce the actions of any of the police officers involved that resulted in the death of Mr. Floyd. This type of behavior is unacceptable and not in accordance with the high standards and professionalism we hold all officers to. We are heartbroken for the family of George Floyd. While what happened to George Floyd happened 1,400 miles away from Needham, it resonates deeply with all of us here. While it may be uncomfortable to talk about racism, it is only by speaking about it that we can begin to overcome it. We understand and support the peaceful protests of police brutality against people of color past and present. We are listening to your message of love, grief, anger, and call for justice. We see your pain, we see your anger, and see your frustration. We will support necessary reform. We support you and stand with you. I am proud of the men and women of the Needham Police Department who come to work every day to provide the highest level of professional police services to all people they encounter. Police officers say they took the job to help, serve, and protect people. This must be all people, regardless of differences. There is no exception. We will continue to strive to earn trust and respect. We will strive to preserve life above all else. This was clearly not the case in this tragedy and others like it. We will continue to train and relay that message to make sure that it is the case with our officers from the top down. Inclusion, mutual respect, and partnership will be our driving force.”

Chief Schlittler spoke about de-escalation training and annual training opportunities that all involve some level of de-escalation. He commented on the annual Use of Force review and the Massachusetts criminal justice training Use of Force model. He commented on defensive tactics, the importance of having knowledge of the Use of Force policy, and proper escorting handcuffing, open hand techniques, blocks, strikes, baton use, and taser use. He spoke about firearms training and various decision-making drills to test an officer's ability. He said the police force in Needham is very fortunate to have a robust training program.

Mr. Bulian commented on the recent silent vigil in Needham. He asked how the police department handle, prepare, work with, and keep people safe when there is a large gathering?

Chief Schlitter said 99% of protests are peaceful, but there must be a game plan ready for anything that may transpire. He said generally, police have shown support at a vigil by staying on the periphery of the event, but that aspect may change because of what police officers are doing across the country. He said mutual aid is set up, but he anticipates protests in Needham to be very peaceful.

Mr. Borrelli thanked Chief Schlitter for his statement. He said police safety is also important. He commented on the situation in Minneapolis and the proactive training steps in Needham on use of force. He thanked Chief Schlitter for his service.

Mr. Matthews said it is a tough time and he appreciates the work of the police force.

Chief Schlitter said the support the department receives from the community, Select Board, and Town Manager resonates with the officers. He said it has been a difficult set of circumstances with the pandemic and the situation in Minneapolis. He said the department has made positive inroads in the community, but there is still work to be done.

Ms. Cooley said she appreciates the report from Chief Schlitter. She said it was impossible to watch what happened in Minneapolis and not feel outrage and heartbreak at the same time.

Mr. Handel thanked Chief Schlitter for his commitment and that of his department.

5:25 p.m.

Pride Month Proclamation:

Mr. Matthews read a proclamation declaring June 2020 to be Pride Month in the Town of Needham.

**Motion by Mr. Matthews that June 2020 be declared Pride Month in the Town of Needham and that all residents be encouraged to recognize and acknowledge the contributions of the LGBTQ members of our community as we continue to advance the principles of liberty, equality, and inclusivity for all.**

**Second: Mr. Bulian. Unanimously approved 5-0 by roll call vote.**

5:29 p.m.

Town Meeting:

Ms. Fitzpatrick reminded the Board Town Meeting will be held next week, June 8, 2020 at 5 p.m. at Memorial Park Field. She said every effort has been taken to ensure social distancing and to keep people safe. She said people can rest assured everything that can be done, is being done in cooperation with all departments. She said a map will be posted on the Town's website showing Town Meeting Members where each precinct may enter for Town Meeting.

The Board discussed the Annual Town Meeting warrant.

**Motion by Mr. Bulian that the Board vote to amend Article 21 - in the 2020 Annual Town Meeting Warrant as follows:**

**That the main motion under Article 21 be amended by deleting the sum \$4,003,168 and inserting in place thereof, the sum of \$3,939,433 and by deleting the items “library furniture, \$84,168” and “library space planning, \$60,000.”**

**Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.**

Mr. Handel urged all Town Meeting Members to review information on the Town’s website and the presentations explaining each article to be voted upon.

Mr. Matthews emphasized the Town’s website has very robust information about Town Meeting on June 8, 2020. He encouraged Members to review the information in advance of the meeting, beginning with the Moderator’s plans for the format of the meeting, health precautions, arrival prior to the 5 p.m. start time, and avoiding socializing, and that people should dress in layers. He said the usual presentations have been videoed and are available on the Town’s website. He commented people must be informed ahead of the meeting so the evening can run smoothly.

5:36 p.m.

**Economic Development Activity**

Ms. Cooley updated the Board on ways the Town is trying to help restaurants and merchants reopen. She said picnic tables are now on the Town Common, in the Heights, and at Eaton Square. Ms. Cooley said more tables will be placed at Greene’s Field and the Chestnut Street parking lot. She stated parking lots are now permitted for use as an option for restaurants to serve customers. Ms. Cooley said discussion of using parking along the street is being considered, as long as it is safe. She asked restaurants and merchants to bring forward any proposal they may have that would help their business reopen successfully. Ms. Cooley commented on changes the state has made regarding outdoor dining, asking the Board for their thoughts on how to work with the alteration of premises and outdoor dining proposals. She requested the Board consider placing Economic Development Activity discussion on the agenda for the next Select Board meeting on June 9, 2020, and perhaps longer, as necessary. Ms. Cooley acknowledged outdoor table service would require notice be sent to neighbors and a public hearing be held.

Mr. Handel thanked Ms. Cooley and Sandy Cincotta for their work in responding to the issue. He said Needham is becoming a model for other towns in how it is responding to help restaurants and merchants.

Mr. Borrelli concurred the Board should meet weekly to expedite requests to amend licenses. He said site visits by the Select Board would be helpful to find out what restaurants need. Mr. Borrelli said restaurant owners will need direction and an accepted framework from the Town to open quickly.

Mr. Matthews said things are fast moving and favors having the subject on the agenda for the next month or so, until things stabilize. He said contacting the Common Victualler and Liquor Licensees would be helpful, suggesting a workshop to explain regulations. He said the Town can have a role in facilitating discussion.

Ms. Cooley concurred, and license holders have been contacted.

Mr. Bulian said Ms. Cincotta will help restaurant owners navigate how things need to be done for a successful reopening.

5:50 p.m.

Personal Remarks:

Mr. Handel recognized Mr. Bulian to make personal remarks concerning the events of this week.

Mr. Bulian said the pandemic has affected everyone, made more difficult by what is happening in many cities in the nation. He said he was particularly shocked at the ordering of military personnel in Washington, D.C. to use tear gas and rubber bullets on peaceful protesters. He said he can never forgive looters who harm businesses already hurting and who only want to get “back on the feet.” He asked, “What purpose does it serve to harm businesses and people already hurting?” Mr. Bulian said he is moved by and very supportive of people peacefully protesting around the country, and people in silent vigil as witnessed in Needham. Mr. Bulian reiterated the Town Meeting Moderator’s phrase at every Town Meeting that “we are one community; we are one Town Meeting.” He said people need to come together as a town, state, and country, acknowledging he is not sure how that will happen. Mr. Bulian said the pandemic does not seem real and that over 100,000 people have died and are still dying. Mr. Bulian said as a small business owner, he understands the frustration of people wanting to get back to their lives. He said everything the Select Board does is to help the Town and people get back to normalcy, acknowledging there is a long way to go. Mr. Bulian said he is pleased by what Police Chief John Schlittler had to say. He concluded, Needham is a special place but there is still a way to go with the pandemic, economic hurt, and people suffering because of many of the transgressions that have taken place in this country. He said he looks forward to being a part of helping Needham get back on its feet.

Mr. Matthews said times are challenging, but we can make it through. He said there are no guarantees and the burden lies on us. He said people need to be careful, honor their obligations, be persistent, resolute, and be good neighbors.

Mr. Handel said it is important people recognize we are all in this together, and that no one should be targeted. He said we all face a common problem and we all need to work together.

Ms. Cooley said everything since the tragedy with George Floyd is all highly regrettable, and only makes the challenge more difficult. She said she doesn't want

to forget what started this latest round, which is the recognition of systemic racism in the United States. She said the point can't get lost in everything else that has happened. Ms. Cooley referred to Lee Pelton, president of Emerson College who has said he is "sick and tired of being sick and tired." She said it is one thing to recognize that for us, in a position of white privilege, that we feel like we haven't been here before. But, if you are black or brown, it is something you live with day in and day out. She said we come from a different place with the privilege that we have, and it is up to each and every one of us to do our best to learn and understand what that's like, to let some of those situations of haunting nightmares that people live with day in and day out. She quoted Maya Angelou saying "do the best you can until you know better, and when you know better, do better." She said she hopes we can all do better.

5:55 p.m.

Adjourn:

**Motion by Mr. Bulian that the Select Board vote to adjourn the Select Board meeting of Wednesday, June 03, 2020.**

**Second: Mrs. Cooley. Unanimously approved 5-0 by roll call vote.**

## SELECT BOARD

### \* MINUTES \*

**June 8, 2020**

4:50 p.m. A special meeting of the Select Board was convened by Chair Moe Handel at the Memorial Park Field House Parking Lot. Present were Mr. Matthew Borrelli, Ms. Marianne Cooley, Mr. Daniel Matthews, Mr. John Bulian, and Town Manager Kate Fitzpatrick.

#### Town Meeting Preparation

Article 21/Cash Capital

**Motion: Mr. Bulian moved that the Board vote to oppose the motion to amend Article 21 proposed by Town Meeting Member Doug Fox. Mr. Borrelli seconded the motion. Unanimous 5 – 0.**

4:55 p.m. **Motion: Mr. Matthews moved that the Board adjourn its meeting contemporaneously with the adjournment of Town Meeting. Ms. Cooley seconded the motion. Unanimous: 5-0.**

Note: The Annual Town Meeting adjourned for the evening at 7:40 p.m.

**Town of Needham**  
**Select Board**  
**Minutes for Tuesday, June 9, 2020**  
**By Zoom Video Conference**  
<https://us02web.zoom.us/j/81178733033>

5:45 p.m. Informal Meeting with Citizens:  
Doug Fox, 43 Marked Tree Road spoke with the Board about anti-racism concerns.

6:00 p.m. Call to Order:  
A meeting of the Select Board was convened by Chair Maurice P. Handel. Those participating were Matthew D. Borrelli, Marianne B. Cooley, Daniel P. Matthews, John A. Bulian, and Town Manager Kate Fitzpatrick. Also viewing the meeting were Dave Davison, ATM/Finance and Katie King, ATM/Operations. Recording Secretary Mary Hunt recorded the meeting remotely.

Mr. Handel announced this open meeting is being conducted remotely consistent with Governor Baker's Executive Order of March 12, 2020 due to the current state of emergency from the outbreak of the COVID-19 virus. He noted all public gatherings have been suspended as advised and directed by the Commonwealth. And, as such, suspending the requirement of the open meeting law to have all meetings in a public, accessible, physical location while encouraging and allowing members of all public bodies to participate remotely. Mr. Handel stated the meeting will not include public comment and the Needham Select Board and all attendees are convening by Zoom, as posted on the Town's website identifying how the public may join. He said all supporting documents used at this meeting are available on the Town's website [www.needhamma.gov](http://www.needhamma.gov).

Mr. Handel acknowledged the work of Carys Lustig, Director of Finance and Administration for Public Services and Town staff for a very successful and historic Town Meeting held June 8, 2020 outside at the Memorial Park Fieldhouse due to the COVID-19 pandemic.

6:07 p.m. Public Hearing: Change of LLC Membership Interest, Change of LLC Manager, and Change of Manager of Record for Spiga, LLC d/b/a Spiga located at 18 Highland Circle  
Steven Miller, Attorney and Marisa Iocco, Proposed Manager spoke with the Board requesting a multiple license amendment for Change of LLC Manager, Change in Manager, and Change of Ownership Interest from Spiga LLC d/b/a Spiga, a restaurant with a license to serve All Alcoholic beverages at 18 Highland Circle. The new proposed manager is Marisa Iocco.

It was noted this public hearing was advertised in the Needham Times February 27, 2020 and was originally scheduled for March 24, 2020, but due to COVID-19 was rescheduled until May 15, 2020, where it was continued to the meeting of June 9, 2020

Kate Fitzpatrick, Town Manager said all paperwork is in order.

Mr. Handel invited public comment. No comments were heard.

**Motion by Mr. Bulian that the Board vote to approve Spiga’s application for a change of Officers, Ownership Interest, and Change of Manager to Marisa Iocco for its restaurant located at 18 Highland Circle and to forward this application to the ABCC for approval.**

**Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.**

6:13 p.m. Appointments and Consent Agenda:

**Motion by Mr. Bulian that the Select Board vote to approve the Appointments and Consent Agenda as presented.**

**Appointments: No Appointments were made at this meeting.**

**Consent Agenda:**

- 1. Accept a \$60 donation made to the Needham Health Division’s Traveling Meals program from Douglas and Susan Carpenter.**
- 2. Approve placement of “June is Pride Month in Needham” signs on Town Hall property for a period of two weeks.**
- 3. Approve minutes of May 20, 2020 and May 27, 2020.**
- 4. Approve a fee waiver for tents on commercial properties of \$200 in support of assisting the economic recovery of area restaurants.**

**Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.**

6:13 p.m.

Updates to Needham’s Hazard Mitigation Plan and about the Municipal Vulnerability Preparedness Program:

Anne Herbst, Senior Environmental Planner with the Metropolitan Area Planning Council (MAPC) presented the Select Board the final draft of Needham’s update to the existing Hazard Mitigation Plan (HMP). The plan documents natural hazards that affect the Town, such as floods, hurricane’s, and severe winter storms, and recommends actions the Town can take to reduce its vulnerability to these hazards. HMP’s are prepared under the auspices of FEMA. Approval of the plan by FEMA will make Needham eligible for grants to address recommended actions. The Select Board will not be asked to adopt the plan at this time. After a two-week comment period ending June 23, 2020, the Plan will go to MEMA and FEMA for review and then will come to the Select Board for adoption. Ms. Herbst also updated the Select Board on the completion of the Municipal Vulnerability Preparedness (MVP) program. Certification as an MVP community makes Needham eligible to apply for state grants to address climate vulnerabilities. It was noted the Hazard Mitigation Plan and the Municipal Vulnerability Report are available for review on the Town website at: <http://www.needhamma.gov/4931/Municipal-Vulnerability-Preparedness>

Ms. Herbst acknowledged staff from Needham who worked on the project including Rebecca Ping, Emergency Management Administrator, Kim Donovan, DPW/Compliance Coordinator, and Eleanor Rosellini, Green Needham Collaborative.

A PowerPoint presentation was viewed.

Ms. Cooley commented on the tree mitigation plan and referenced the City of Cambridge's study on the amount of tree canopy lost over the last decade. She asked if this was considered when developing Needham's study? Ms. Herbst said a tree canopy study is a next step in the process.

Mr. Borrelli said trees are a blessing and a curse, commenting the right type of trees must be planted.

Mr. Matthews commented on the categorization of the Rosemary Street pond as a dam, and properties repeatedly damaged by flooding.

The Board thanked Ms. Herbst for the update.

6:30 p.m.

Joint Meeting with Park & Recreation Commission:

The Select Board and members of the Park & Recreation Commission including Chris Gerstel, Chair, Cindy Chaston, Vice Chair, and Michelle Geddes, member met jointly to discuss and recommend Matthew Toolan to be appointed to the vacant Commission seat due to the passing of one of the Commissioners (Dave DiCicco).

**Motion by Mr. Gerstel that the Park and Recreation Commission vote to appoint Matthew Toolan to the Park and Recreation Commission for the final year of Mr. DiCicco's term, which ends in 2021.**

**Second: Ms. Chaston. Unanimously approved 3-0 by roll call vote.**

**Motion by Mr. Bulian that the Select Board vote to appoint Matthew Toolan to the Park and Recreation Commission for the final year of Mr. DiCicco's term, which ends in 2021.**

**Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.**

Mr. Matthews said it is important to fill the vacancy. He noted the pandemic has disrupted the efforts of civic life throughout the country, placing tremendous stress on town resources. He said as businesses reopen, the public will be looking to utilize the programs of Park and Recreation, however due to regulations and staff resources some programs may open, and some may not which, he said, the public must understand.

Mr. Gerstel thanked the Board and Ms. Fitzpatrick for the overwhelming support during these trying times.

The Select Board thanked members of the Park and Recreation Commission for their work at this difficult time.

6:38 p.m.

Alteration of Premises for Liquor License Establishments: Ray's New Garden, 40 Chestnut Place

COVID-19 Order No. 35 from the Office of the Governor of the Commonwealth of Massachusetts includes language for the Preparations and Accommodation for Outdoor Restaurant Dining Service. Specifically it addresses outdoor table service being allowed and the permission for the Local Licensing Authority (LLA) to grant approval for a change in the description of the licensed premises for the purpose of permitting outdoor alcohol service as the LLA may deem reasonable and proper, and issue an amended license to existing license holder, without further review or approval by the Alcoholic Beverages Control Commission (ABCC).

Ray's New Garden has presented a plan providing outdoor seating in the privately-owned parking lot on the premises. A map and photographs of the proposed area were viewed.

Ms. Fitzpatrick said paperwork is in order for the application.

Mr. Borrelli said the outside dining plan is terrific.

Ms. Cooley thanked Ray's for working with the Town to develop an excellent plan for outdoor dining.

Ms. Fitzpatrick concurred, saying jersey barriers were purchased to help keep people safe, which can also be used in the future by the Department of Public Works. She encouraged other businesses to come forward with ideas to help them reopen.

Mr. Handel said the proposal is an example of what can be done to help businesses reopen, and that this is a time of great experimentation and innovation due to circumstances.

Mr. Matthews thanked Ray for his plan to have all areas clean by 11 p.m., noting residents live in the area. He said usually a public hearing would have been held, but it makes sense to get the proposal moving to help Ray and other businesses to open. Mr. Matthews said noise could be an issue and managed properly.

Mr. Bulian commented on the weather with respect to rain, asking for thoughts.

Mr. Ray said a tent is too expensive, but each table will have a canopy for cover in case of rain.

**Motion by Mr. Borrelli that the Select Board vote, pursuant to COVID-19 Order No. 35, to authorize the alteration of premises of Ray's New Garden, 40 Chestnut Place, Needham to include a portion of the parking lot as shown on attached drawings. Second: Mr. Bulian. Unanimously approved 5-0 by roll call vote.**

6:45 p.m.

Town Manager:

Kate Fitzpatrick, Town Manager appeared spoke with the Board regarding 2 items:

1. Naming of Public Safety Building Community Room

Ms. Fitzpatrick reminded the Select Board that at its last meeting on May 27, 2020, Police Chief John Schlittler proposed that the Board consider naming the community room of the new Public Safety Complex in honor of police officers Francis Oliver Haddock and Forbes Alexander McLeod, who lost their lives in service to the Town of Needham on February 2, 1934.

In accordance with the Board's policy, a proposal to name a facility must be reviewed at one meeting and voted on no sooner than the next regular meeting in order to allow for public comment.

Ms. Fitzpatrick said no comments were received since the last meeting and recommended the Board vote to name the community room.

**Motion by Mr. Borrelli that the Board vote to name the community room of the new Public Safety Complex in honor of police officers Francis Oliver Haddock and Forbes Alexander McLeod, who lost their lives in service to the Town of Needham.  
Second: Ms. Cooley. Unanimously approved 5-0 by roll call vote.**

Mr. Borrelli said naming the community room to honor the sacrifice of officers Haddock and McLeod is a great tribute.

Mr. Handel observed that while the events of February 2, 1934 seems a long time ago, there are residents in Needham who clearly remember that day.

2. Town Manager's Report

Ms. Fitzpatrick recognized Town staff for their work to make Town Meeting a success at Memorial Park Fieldhouse. She said feedback indicates people felt health precautions were adequate. She said it was a beautiful night, and thanked Town Meeting Members for their support and attendance, despite worries of health concerns. She also thanked the Select Board and Finance Committee for keeping to the budget plan, which was the best way for the Town to move forward.

Mr. Handel thanked Ms. Fitzpatrick, Theodora Eaton, Town Clerk, and Michael Fee, Moderator for their work.

6:55 p.m.

Board Discussion:

1. Economic Development

Ms. Cooley updated the Board on the continuing work being done to help businesses reopen. She said discussion is taking place on the possibility of using the Chapel Street parking lot for restaurants to share for additional outdoor space. She said Ms. Cincotta is working with restaurants who want to submit plans for outdoor seating at their location. Cabaret tables for two people are proposed for use on sidewalks, as long as there is four feet of clearance and safe for the public. She said jersey barriers will be necessary for dining in parking lots. Ms. Cooley said she is grateful the State of Massachusetts passed legislative relief giving towns the ability to make alteration of premises for the purpose of outdoor dining. Ms. Cooley said this is a time of experimentation and the public has been great.

She thanked Tim McDonald, Director of Public Health for identifying a grant which could help the Town pay for some jersey barriers and Ed Olsen, Tree Warden and his staff for their efforts to get picnic tables available for outdoor dining use.

Ms. Cooley suggested a motion authorizing the Town Manager to take immediate and timely action in response to outdoor dining requests from merchants until November 1, 2020 or until the state of emergency in Massachusetts is lifted, subject to change.

Mr. Borrelli commended Ms. Cooley and staff for their work. He suggested asking the public for donations of outdoor tables and chairs for restaurants who need seating for diners.

**Motion by Ms. Cooley that consistent with Governor Baker’s Declaration of Emergency and to provide timely response to businesses re-opening in the Town of Needham under occupancy and other operational limitations, the Select Board hereby authorizes the Town Manager to grant all local approvals necessary to allow existing local businesses to utilize outdoor seating in parking lots, on-street parking spaces, sidewalks, landscaped yard areas or other appropriate locations to provide more space to serve patrons. This delegation of authority will remain in effect until November 1, 2020 or until the Declaration of Emergency is rescinded, whichever is sooner.**

**Applications for modifications to existing permits and licenses to allow for outdoor seating in response to COVID, including but not limited to right of way occupations, alcohol licenses, common victualers licensing, entertainment licenses, and zoning permits, will be reviewed by Town staff and may be approved by the Town Manager. Approvals shall be temporary and consistent with the terms of the Declaration of Emergency and the Orders issued in response thereto. In accordance with current Emergency Orders issued by the Governor and the ABCC, and notwithstanding any statutory authorization to the contrary, strict adherence to local bylaws may be altered or waived administratively as part of this process on a temporary basis.**

**Approvals of outdoor seating areas and other permitted uses of the public spaces may be subject to terms and conditions and shall be subject to change or revocation at the Town’s sole discretion. Operators may be required to work with the Town and nearby businesses to accommodate the greatest number of operators as possible within limited available outdoor spaces. Periodic reports from the Town Manager to the Select Board will be given on these applications, and a detailed record of all approved modifications will be maintained on the Town website: [www.needhamma.gov](http://www.needhamma.gov).**

**Second: Mr. Borrelli. Unanimously approved 5-0 by roll call vote.**

2. Committee Reports

No Committee Reports were made.

7:05 p.m.

Adjourn:

**Motion by Mr. Borrelli that the Select Board vote to adjourn the Select Board meeting on Tuesday, June 9, 2020.**

**Second: Mr. Bulian. Unanimously approved 5-0 by roll call vote.**

A list of all documents used at this Select Board meeting are available at:

<http://www.needhamma.gov/Archive.aspx?AMID=99&Type=&ADID=>

Town of Needham  
Water Sewer Billing System  
Adjustment Form

DEPARTMENT OF PUBLIC WORKS

TO: TOWN TREASURER AND COLLECTOR  
cc: TOWN ACCOUNTANT, WATER AND SEWER SUPERINTENDENT

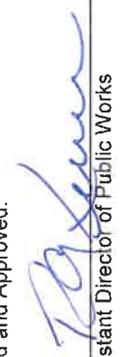
WHEREAS the appropriate divisions of the Department of Public Works have submitted to you the following commitment(s) on the dates listed below for the collection of water, sewer revenue and

WHEREAS certain inadvertent error(s) were made in said commitment(s), it is hereby requested that you abate these particular account(s) in the amount(s) stated below.

Water Sales:	\$0.00
Water Irrigation:	-\$212.07
Water Admin Fees	\$0.00
Sewer Sales:	\$0.00
Transfer Station Charges:	\$0.00
Total Abatement:	-\$212.07

Order #: 1292

Read and Approved:

  
Assistant Director of Public Works

  
Director of Public Works

For the Select Board

6/23/20

Town of Needham  
Water Sewer Billing System  
Adjustment Form

Prepared By:	DB	Last Name	METCALF	First Name	JAMES & EVELYN	Customer ID#	26645	Location ID#	24080	Street Number	85	Street Name	ROBINWOOD AVENUE	Irrigation Water	-\$212.07	Domestic Water	\$0.00	Sewer	\$0.00	Total	-\$212.07	Reason	ACC	Corrected Last Read Y/N	N
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Total: -\$212.07

ALSO, LET THIS SERVE AS AUTHORIZATION TO ABATE ANY PENALTY OR INTEREST WHICH HAS ACCRUED DUE TO THE NON-PAYMENT OF AMOUNTS AS STATED ABOVE.

Legend:

- O.I. = O.I. reading slower than inside meter causing large bill when inside meter is read.
- TWN = Town Project caused damage to private property
- EC = Extenuating Circumstances
- Equip = Equipment Malfunction
- UEW = Unexplained water loss
- ACC = Accidental Water Loss
- BP = Billing Period beyond 100 days
- COA = Council on Aging

e-mailed 6/22/20  
\* no fee



Town of Needham, Massachusetts  
Road Event Form

RECEIVED  
NEEDHAM  
SELECT BOARD

2020 JUN 19 A 11:36

INTERNAL USE ONLY

DPW       Police  
 Fire       OTM  
 Park & Rec  
 PFD       Paid Health

<b>TYPE OF EVENT:</b> (check all that apply) <input checked="" type="checkbox"/> Car <input type="checkbox"/> RUN <input type="checkbox"/> WALK <input type="checkbox"/> BICYCLE <input type="checkbox"/> MOTORCYCLE	
<b>Name of Event:</b> Needham Rolling Pride Parade	<b>Name of Organization:</b> Robyn Luman - Person
<b>Event Date(s) and Rain Date if requesting:</b> ① Jun 28  <del>② June 27</del>	<b>Earliest Time Expected in Needham:</b> 3pm  <b>Latest Time Expected in Needham:</b> 6pm
<b>Has this event been conducted in other Towns in the past?</b> <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<b>If yes, name of Town and date:</b> Hudson MA 6/13/20 Chron
<b>Has this event been held in Needham in the past?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<b>If yes, are you repeating the same route as in prior year(s)?</b> <input type="checkbox"/> YES <input type="checkbox"/> NO
<b>Organization Mailing Address:</b> 429 Warner Street Needham MA 02492	<input type="checkbox"/> <b>Organization is Not-for-Profit</b>
<b>Organization Billing Address (if Police Detail is required):</b>	
<b>Primary Contact:</b> Robyn Luman	<b>Contact Title:</b>
<b>Contact Address:</b> 429 Warner Street Needham MA 02492	
<b>Contact Phone (Day):</b> 518 441 3996	<b>Contact Phone (Cell):</b>

518 441-3996

Contact Email: Robyn.Isman@gmail.com  
Robyn.Isman@gmail.com

Number of Expected Participants:  
50

Number of Expected Spectators at Peak Time: 50-100

Are participants charged a fee?  YES  NO

Estimated Number of Vehicles:  
25-50

What type of Parking is required:  
None

Describe Parking Plan, include where participants and spectators will park and length of time expected to be parked:  
N/A

Are event organizers available to meet with members of the Town to plan event?  
 YES  NO  
200m?

Do event organizers foresee the need for any road closures (subject to police review)?  YES  NO  
ideally - not required

What will be done in case of inclement weather?  
we can do it

Will neighborhoods be impacted by parking and traffic?  
traffic as the cars pass

What activities are planned for the start of the race (if in Needham)?  
None

What activities are planned for the end of the race (if in Needham)?  
None

What facilities are needed for the start of the race (if in Needham)?  
None

What facilities are needed for the end of the race (if in Needham)?  
None

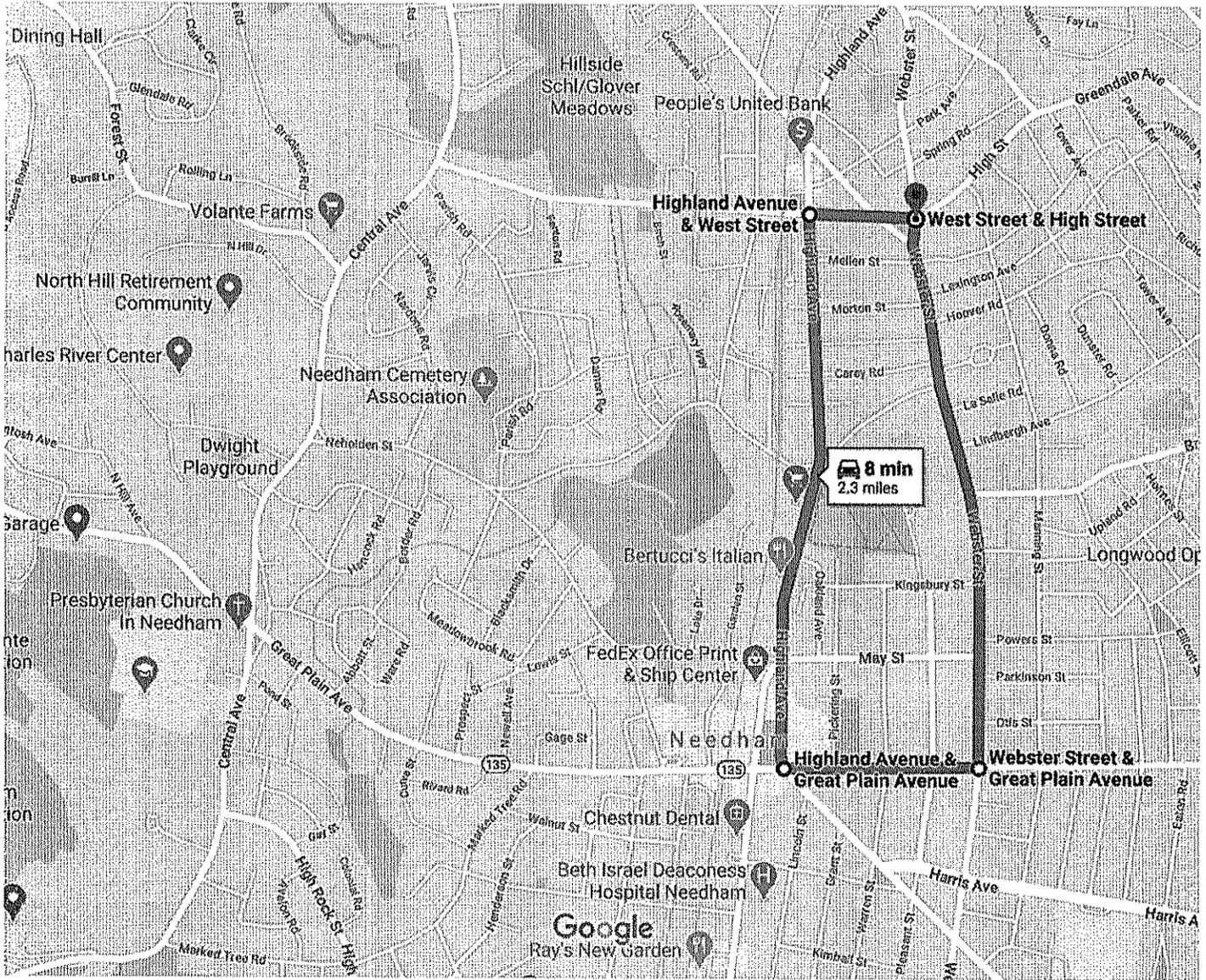
<b>Once the event begins, how long will it take to complete the event?</b>	
	about 1 hr
<b>Are signs requested to post at the start of the race? At the end of the race? Are signs requested for along the route?</b>	No
<b>Will volunteers be placed along the route?</b>	No
<b>Will you be using a sound system? (includes music) If yes, please describe where and when it will be used.</b>	No
<b>Will there be any food served? (contact Needham Health Dept: 781-455-7500 x262)</b>	No
<b>Will portable toilets be used? List locations.</b>	No
<b>Will hydration stops be set up along route? If yes, please include these on route plan.</b>	No
<b>If the event takes place after dark, what is the plan to meet lighting needs?</b>	N/A
<b>What safety measures are being made for participants and spectators? What are plans for handling first aid and medical emergencies?</b>	N/A
<b>Does the event take place during commuter times?</b>	No
<b>Is school in session during the event? Will school drop off or pick up be impacted by the event?</b>	No
<b>Are businesses open during the time of the event?</b>	Yes
<b>Does the route pass any business that might be impacted by the event? (e.g. funeral homes, markets, restaurants)</b>	yes
<b>Are there any churches/houses of worship located along the event route? Will church/house of worship services take place during the event?</b>	yes
<b>What is the plan to handle trash?</b>	N/A

***Please return the completed application and attachments to the Office of the Town Manager, Needham Town Hall, 1471 Highland Avenue, Needham, MA 02492:***

- *event route map (include map and text of route, parking plan, volunteer placement)*
- *application fee (\$25 events that start and end in Needham; \$50 event passes through Needham)*
- *certificate of insurance*

***PLEASE NOTE:***

***For Road Events scheduled more than 4 months out from application receipt date, a soft hold will be placed on the date, but final approval will not be granted until under the 4 month window. This is due to unforeseen conditions which may impact this event.***



via Webster St

8 min

8 min without traffic

2.3 miles

Explore West St & High St



Groceries



Hotels



Gas stations



Parking Lots



More