Memorandum

To: Mayor's Office of Strategic Planning
And Community Development
City of Somerville
93 Highland Avenue
Somerville, MA 02143

Date: November 8, 2022

Project #: 15486.00

From: Randall Hart, Principal
Ashley Domogala, EIT, Transportation Consultant

Re: Transportation Access Plan
299 Broadway Redevelopment
Somerville, Massachusetts

The following information is being provided to document the Transportation Access Plan (TAP) for the proposed redevelopment located at 299 Broadway in Somerville, Massachusetts (the "Site"). This document and accompanying information depict the proposed Site access for vehicle, bicycle, and pedestrian traffic. Information regarding truck deliveries and service vehicles (trash, recycling, etc.) also is provided for review.

Development Proposal

The Site is located in the Winter Hill neighborhood of Somerville and is bordered by Broadway to the south, Temple Street to the west, and residential and commercial uses to the east and north. The Site includes two existing parcels at 299 Broadway and at 15 Temple Street. Under existing conditions, 299 Broadway consists of an approximately 27,100 square foot (sf) building previously occupied by a Star Market grocery store that closed in 2007 and 15 Temple Street consists of an approximately 12,600 sf building currently occupied by a Walgreens pharmacy. A parking lot consisting of approximately 125 parking spaces is shared by the two buildings as well as by the building at 313 Broadway that is currently occupied by a liquor store and barber shop.

The proposed development will consist of two building with a total of approximately 288 residential units, 13,643 sf of ground-floor retail, and 3,001 sf of community space (the "Project"). The Project will be constructed without any dedicated vehicle parking but will include one indoor, secure bicycle parking space per residential unit located in ground-floor bicycle rooms in each building with direct outdoor access. The focal point of the Project will be a new civic plaza fronting Broadway. The civic plaza will be open to members of the public and will serve as a new central gathering place for residents and guests to the Winter Hill neighborhood. On the northern edge of the Site, the Project will include another public open space known as Sewall Park. A pedestrian walkway will be constructed between the civic plaza and Sewall Park, creating a new connection for pedestrians between Broadway and Sewall Street.

It should be noted that the parcel at 313 Broadway (on the corner of Broadway and Temple Street) is not included in the proposed development. Under the proposed plan, a surface parking lot consisting of approximately seven spaces will remain for the building at 313 Broadway.

Site Access

Existing Site Access

Under existing conditions, the parking lot for the Site is accessed by one driveway on Temple Street and two driveways on Broadway. A third curb cut on Broadway serves the loading dock behind the former Star Market. There

are no on-street parking spaces along the Broadway site frontage, but there is on-street parking along the Temple Street site frontage.

Proposed Site Access

Under proposed conditions, no parking will be provided on-Site for the Project. However, a surface parking lot consisting of approximately seven spaces will remain for the liquor store and barber shop at 313 Broadway and will be accessed via the existing western curb cut on Broadway and the existing cub cut on Temple Street. Access will be one-way with entering vehicles using the curb cut on Broadway and exiting vehicles using the curb cut on Temple Street. The existing eastern parking lot driveway on Broadway will be eliminated while the existing curb cut on Broadway for the loading dock behind the former Star Market will be maintained to accommodate loading and deliveries for the proposed Project.

As part of this project, the site frontage on Broadway between Grant Street and Temple Street will be modified to move the existing bus stop slightly west, add seven on-street parking spaces, and add a loading/drop-off area. The final regulation of any on-street parking will be determined by the City of Somerville.

Site Plans

A variety of site plans depict the proposed ground floor layout and transportation elements, as well as pedestrian, bicycle, and vehicular accommodations.

Ground Floor Illustrative Plan

Refer to Figure A-1 for a plan depicting the combined ground floor level and landscaping plan.

Transportation Elements Plan

Refer to Figure A-2 for a plan depicting the transportation elements of the Project, including pavement markings, parking spaces, and street furniture.

Pedestrian Access Plan

Refer to Figure A-3 for a plan depicting the sidewalk network and Project building entrance locations. The primary entrances for the building lobbies and ground-floor retail spaces are shown, as well as all secondary entrances to the building.

Bicycle Access and Parking Plan

Refer to Figures A-4a through A-4e for the bicycle access and parking plans.

Figure A-4a illustrates the overall site bicycle access and parking plan, including the location of all indoor and outdoor bicycle parking spaces.

Figures A-4b and A-4c illustrate the bicycle access plans for Building A and Building B, respectively. Building A will include 118 indoor secured bicycle parking spaces and Building B will include 175 indoor secured bicycle parking spaces.

Figures A-4d and A-4e detail the proposed outdoor and indoor bicycle racks, respectively, which are consistent with bicycle racks used at other developments in Somerville, including 101 South in Boynton Yards.

Vehicle Access and Parking Plan

Refer to Figure A-5 for a plan showing the proposed on-street parking configuration and loading access for the Project, as well as the revised parking access for 313 Broadway. As noted previously, no on-Site parking will be provided for the Project but seven surface parking spaces will remain for the building at 313 Broadway.

Vehicle Movement Plans

Refer to Figures A-6a and A-6b for vehicle movement plans for the loading area and surface parking lot serving 313 Broadway, respectively.

Figure A-6a illustrates the tracking diagrams that demonstrate the ability of large vehicles (SU-30) to navigate in and out of the Site's loading facility. Building B will have loading access on the east side of the Site on Broadway, approximately in the location of the existing loading facility for the former Star Market.

Figure A-6b illustrates the passenger vehicle tracking diagrams for the surface parking lot serving the seven parking spaces for the liquor store and barber shop at 313 Broadway. Access to this area is proposed to be one-way entering from Broadway and exiting onto Temple Street.

Memorandum

Attachments

- Figure A-1: Ground Floor Illustrative Plan
- Figure A-2: Transportation Elements Plan
- Figure A-3: Pedestrian Access Plan
- Figures A-4a, A-4b, and A-4c: Bicycle Parking and Bicycle Access Plans
- Figured A-4d and A-4e: Bicycle Rack Details
- Figure A-5: Vehicle Access and Parking Plan
- Figures A-6a and A-6b: Vehicle Movement Plans

hb.com\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\cad\Consultants\Incoming\Bohler CAD_2022-10-26\TAP BASE.dwg

Key:
- = Residential
- = Common Space
- = Commercial
- = Management & Leasing Offices
- = Maintenance, Mechanical, Etc.

REVISIONS

#	DATE	DESCRIPTION

299 BROADWAY REDEVELOPMENT

299 BROADWAY & 15 TEMPLE STREET
SOMERVILLE, MA

vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

BASED ON PLANS BY:

Utile Design
115 Kingston Street
Boston, MA 02111
617.423.7200

Bohler Engineering
45 Franklin Street
Boston, MA 02110
617.849.8040

PREPARED FOR:

Mark Development
275 Grove Street
Newton, MA 02466
617.614.9149

NOT FOR CONSTRUCTION

Figure A-1
Ground Floor
Illustrative Plan

SCALE	PROJECT #	DATE ISSU
1" = 20'	15486.00	10.14.2022

hb.com\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\cad\Consultants\Incoming\Bohler CAD_2022-10-26\TRANSPORTATION MENTS PLAN.dwg

SEWALL STREET
(PUBLIC - 40' WIDE)
ONE WAY TRAFFIC
(ASPHALT ROADWAY)

TEMPLE STREET
(PUBLIC - 66' WIDE)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

SEWALL COURT
(PRIVATE - 25' WIDE)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

GRANT STREET
(PUBLIC - 40' WIDE)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

BROADWAY
(PUBLIC - VARIABLE WIDTH)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

Sewall Park

Proposed Bike Rack (Typical)

Narrow existing curb cut

Restripe 7 Parking Spaces for Liquor Mart (8 existing along building)

One-Way Circulation for Liquor Mart

"Safety Zone Speed Limit 20"

Remove existing 299/Walgreens sign

"Begin Right Turn Lane"
"Yield to Buses and Bikes"

Bus stop sign

"No Turn on Red"

Narrow existing curb cut

Maintain bus stop

Lane use control sign

Bus stop sign

Remove existing curb cut

7 Proposed Metered On-Street Parking Spaces

Remove "No Parking Fire Lane" signage and replace with appropriate curb restriction signage

No Parking in front of Fire Hydrant

Proposed Tree (typical)

Loading Dock

Proposed Loading/Drop-Off Zone

0 10 20 40 Feet

GRAY = EXISTING TO REMAIN
BLUE = PROPOSED
RED = REMOVED
BLACK = SITE

Principal Entrance (Lobby)
Principal Entrance (Other)
Secondary Entrance

Note: Final on-street parking regulations will be determined by the City of Somerville.

REVISIONS

#	DATE	DESCRIPTION

299 BROADWAY REDEVELOPMENT

299 BROADWAY & 15 TEMPLE STREET
SOMERVILLE, MA

vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

BASED ON PLANS BY:

Utile Design
115 Kingston Street
Boston, MA 02111
617.423.7200

Bohler Engineering
45 Franklin Street
Boston, MA 02110
617.849.8040

PREPARED FOR:

Mark Development
275 Grove Street
Newton, MA 02466
617.614.9149

NOT FOR CONSTRUCTION

Figure A-2
Transportation Elements Plan

SCALE	PROJECT #	DATE ISSU
1" = 20'	15486.00	10.14.2022

hb.com\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\cad\Consultants\Incoming\Bohler CAD_2022-10-26\TAP BASE.dwg

REVISIONS

#	DATE	DESCRIPTION

299 BROADWAY REDEVELOPMENT

299 BROADWAY & 15 TEMPLE STREET
SOMERVILLE, MA

vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

BASED ON PLANS BY:

Utile Design
115 Kingston Street
Boston, MA 02111
617.423.7200

Bohler Engineering
45 Franklin Street
Boston, MA 02110
617.849.8040

PREPARED FOR:

Mark Development
275 Grove Street
Newton, MA 02466
617.614.9149

NOT FOR CONSTRUCTION

Figure A-3
Pedestrian Access Plan

SCALE	PROJECT #	DATE ISSU
1" = 20'	15486.00	10.14.2022

Note: All dimensions approximate.

hb.com\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\cad\Consultants\Incoming\Bohler CAD_2022-10-26\TAP BASE.dwg

SEWALL STREET
(PUBLIC - 40' WIDE)
ONE WAY TRAFFIC
(ASPHALT ROADWAY)

TEMPLE STREET
(PUBLIC - 66' WIDE)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

SEWALL COURT
(PRIVATE - 25' WIDE)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

GRANT STREET
(PUBLIC - 40' WIDE)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

BROADWAY
(PUBLIC - VARIABLE WIDTH)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

1 Bike Rack
(2 Spaces)

6 Bike Racks
(12 Spaces)

Bike Room
(118 Spaces)

Bike Room
(175 Spaces)

3 Bike Racks
(6 Spaces)

1 Bike Rack
(2 Spaces)

9 Bike Racks
(18 Spaces)

2 Bike Racks
(4 Spaces)

1 Bike Rack
(2 Spaces)

2 BR 841 SF
2 BR 893 SF
MAINTENANCE
1 BR 785 SF
WINTER HILL COMMUNITY ROOM
MGMT OFFICE
1 BR 736 SF
COMMON ROOM
FLEX
PKG
COMPUTER
LOBBY
MAIL
CORRIDOR
ACE
LAUNDRY
DOG WASH
COMPACTOR ROOM
MAIN ELEC
2 BR 628 SF
2 BR 628 SF
2 BR 846 SF
3 BR 922 SF
RETAIL
RETAIL
2 BR 2 BA M 1050 SF
1 BR S 599 SF
STUDIO 395 SF
1 BR JR 459 SF
1 BR JR 459 SF
1 BR JR 459 SF
1 BR JR 459 SF
BR DEN 711 SF
1 BR S 674 SF
1 BR S 673 SF
2 BR 1 BA 880 SF
1 BR JR 574 SF
1 BR S 689 SF
STUDIO 434 SF
MECH
PLAZA LOBBY
RETAIL
AMENITY
CORRIDOR
RETAIL
LEASING
RETAIL
LOBBY
MAIL
PKG
MECH
TRASH COMPACTOR
CORRIDOR
RETAIL

BUS ONLY
BIKE ONLY

Bike Room Entrance
Bicycle Path

0 10 20 40 Feet

REVISIONS
DATE DESCRIPTION

299 BROADWAY REDEVELOPMENT

299 BROADWAY & 15 TEMPLE STREET
SOMERVILLE, MA

vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

BASED ON PLANS BY:

Utile Design
115 Kingston Street
Boston, MA 02111
617.423.7200

Bohler Engineering
45 Franklin Street
Boston, MA 02110
617.849.8040

PREPARED FOR:

Mark Development
275 Grove Street
Newton, MA 02466
617.614.9149

NOT FOR CONSTRUCTION

Figure A-4a
Bicycle Access and Parking Plan

SCALE	PROJECT #	DATE ISSU
1" = 20'	15486.00	10.14.2022

Note: All dimensions approximate.

hb.com\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\cad\Consultants\Incoming\Bohler CAD_2022-10-26\TAP BASE.dwg

SEWALL STREET
(PUBLIC - 40' WIDE)
ONE WAY TRAFFIC
(ASPHALT ROADWAY)

TEMPLE STREET
(PUBLIC - 66' WIDE)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

SEWALL COURT
(PRIVATE - 25' WIDE)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

GRANT STREET
(PUBLIC - 40' WIDE)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

BROADWAY
(PUBLIC - VARIABLE WIDTH)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

WINTER HILL COMMUNITY ROOM
MAINTENANCE
MGMT OFFICE
LOBBY
MAIL
ACE
PKG
COMPUTER
COMMON ROOM
FLEX
CORRIDOR
BIKE
LAUNDRY
DOG WASH
COMPACTOR ROOM
MAIN ELEC
RETAIL
RETAIL
RETAIL
STUDIO
PLAZA LOBBY
MECH
AMENITY
CORRIDOR
BIKE STORAGE
LEASING
RETAIL
RETAIL
LOBBY
MAIL
PKG
MECH
TRASH COMPACTOR
CORRIDOR
RETAIL
Loading Dock

2 BR 841 SF
2 BR 893 SF
1 BR 785 SF
1 BR 736 SF
2 BR 629 SF
2 BR 628 SF
2 BR 846 SF
3 BR 922 SF
2 BR 2 BA M 1050 SF
1 BR S 599 SF
STUDIO 395 SF
1 BR JR 459 SF
1 BR JR 459 SF
1 BR JR 459 SF
1 BR JR 459 SF
BR DEN 711 SF
1 BR S 674 SF
1 BR S 673 SF
2 BR 1 BA 1 [illegible] SF
1 BR JR 574 SF
1 BR S 689 SF
STUDIO 434 SF

7 Off-Street Parking Spaces for Liquor Mart

One-Way Circulation for Liquor Mart

20.0 ft

20.0 ft

20.0 ft

7 Metered On-Street Parking Spaces

No Parking in front of Fire Hydrant

Loading/Drop-Off Zone

Note: Final on-street parking regulations will be determined by the City of Somerville.

0 10 20 40 Feet

REVISIONS

#	DATE	DESCRIPTION

299 BROADWAY REDEVELOPMENT

299 BROADWAY & 15 TEMPLE STREET
SOMERVILLE, MA

vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

BASED ON PLANS BY:

Utile Design
115 Kingston Street
Boston, MA 02111
617.423.7200

Bohler Engineering
45 Franklin Street
Boston, MA 02110
617.849.8040

PREPARED FOR:

Mark Development
275 Grove Street
Newton, MA 02466
617.614.9149

NOT FOR CONSTRUCTION

Figure A-5
Vehicle Access and Parking Plan

SCALE	PROJECT #	DATE ISSU
1" = 20'	15486.00	10.14.2022

Note: All dimensions approximate.

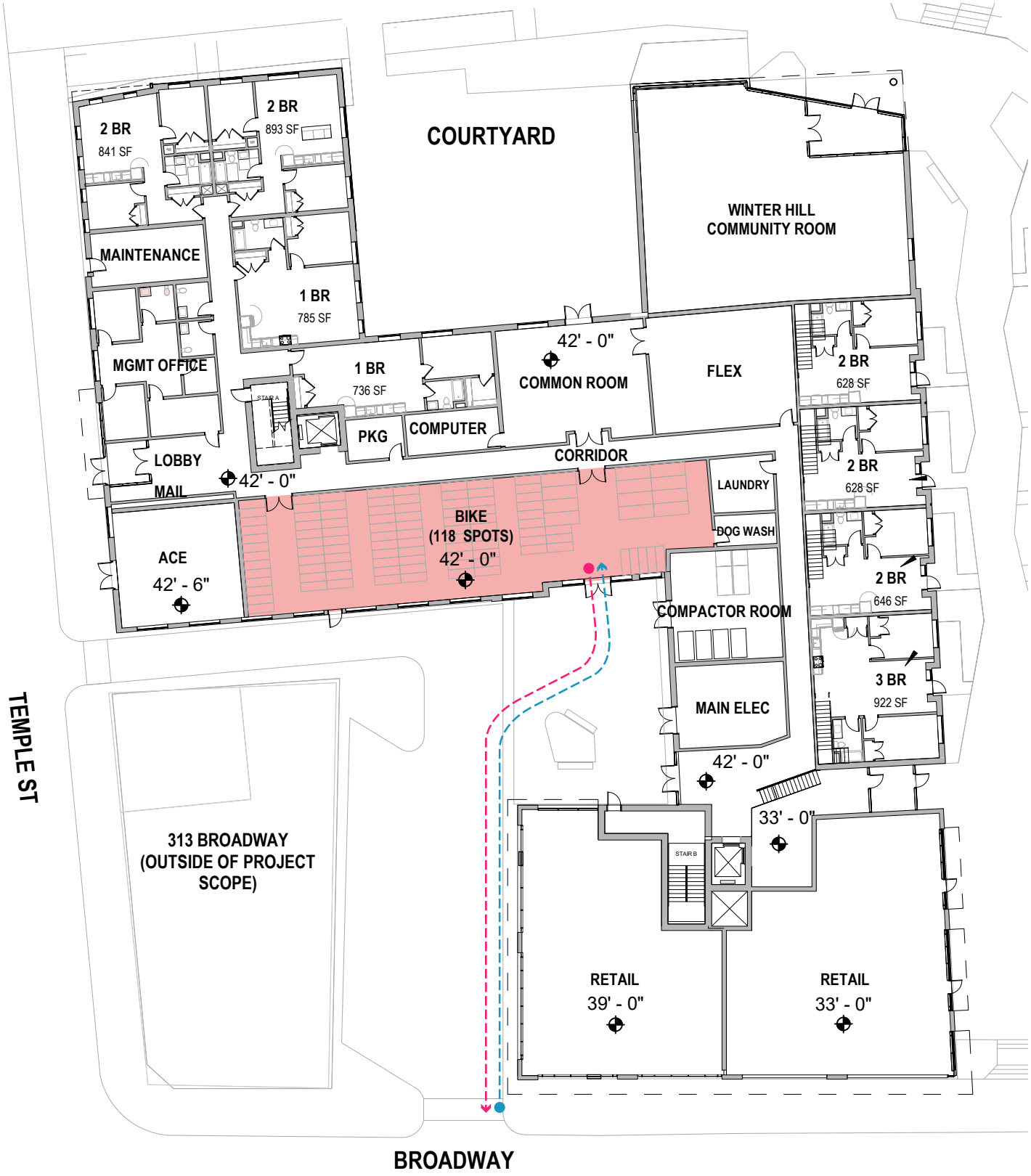


Figure A-4b: Bicycle Access Plan - Building A

BUILDING A - LEVEL1

299 BROADWAY - COMPREHENSIVE PERMIT APPLICATION

P&Z 22-092

299 Broadway
Somerville, MA, 02145

Entry sequence from street to bike storage.

Exit sequence from bike storage to street.

0' 16' 32' 64'

utile
Architecture & Planning

Figure A-4c: Bicycle Access Plan - Building B

BUILDING B - LEVEL1

299 BROADWAY - COMPREHENSIVE PERMIT APPLICATION

P&Z 22-092

299 Broadway
Somerville, MA, 02145

Entry sequence from street to bike storage.

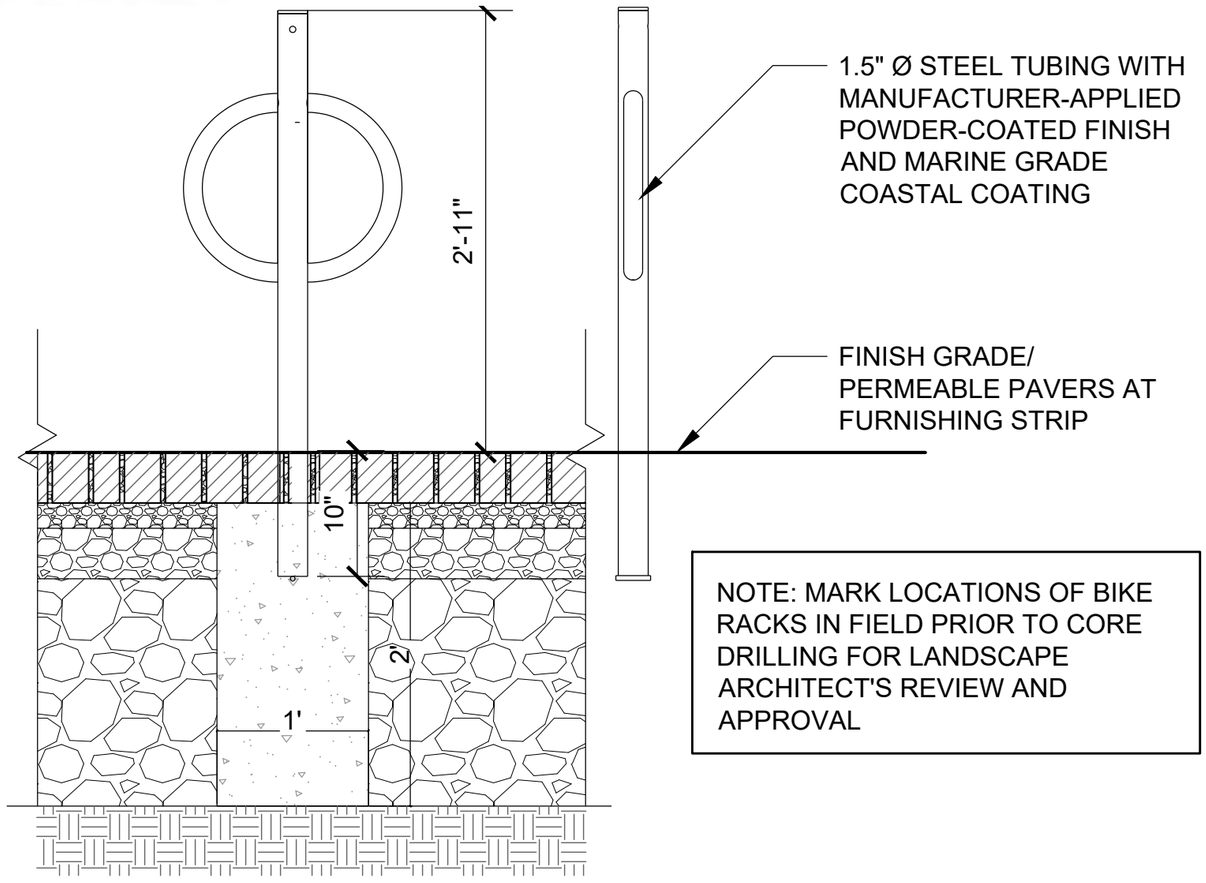
Exit sequence from bike storage to street.

0' 16' 32' 64'

utile
Architecture & Planning

Bike **Hitch**™

The Bike Hitch uses thick tube construction and a full radius bend of the ring, making it extremely difficult to cut with a pipe cutter. This popular bike rack has street appeal, a slim silhouette, and accommodates all bike locks.



4 BICYCLE RACK

SCALE: 1" = 1'-0"

The same bicycle rack has been installed at 101 South in Boynton Yards (pictured above).

Sources: Copley Wolff Design Group; Dero; *Boynton Yards - Building 3 (99 South) TAP, September 16, 2022*

Figure A-4d: Outdoor Bicycle Rack Detail

Figure A-4d

Outdoor Bicycle Rack Detail

Hoop Rack

The Hoop Rack is a proven design that provides high security and easy bike parking. The Hoop Rack uses thick pipe construction and the full radius of the bend makes the Hoop an attractive and functional bike rack. This bike rack can also be put on rails for mobility and is popular in bike corrals.

The same bicycle rack has been installed at 101 South in Boynton Yards (pictured above).

Sources: CBT Architects; Dero; *Boynton Yards - Building 3 (99 South) TAP, September 16, 2022*

Figure A-4e: Indoor Bicycle Rack Detail

Figure A-4e

Indoor Bicycle Rack Detail

SU-40

	feet
Width	8.00
Track	8.00
Lock to Lock Time	6.0
Steering Angle	31.8

SU-40 VEHICLE PROFILE

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY

811 Know what's below. Call before you dig.
ALWAYS CALL 811
It's fast. It's free. It's the law.

FOR EXHIBIT PURPOSES ONLY

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	M211074
DRAWN BY:	JJW
CHECKED BY:	SPM
DATE:	10/24/22
CAD I.D.:	M211074-X-TTB

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

MARK DEVELOPMENT, LLC

PROPOSED DEVELOPMENT

MAP: 70, BLOCK: D, LOTS: 5 & 27
299 BROADWAY,
CITY OF SOMERVILLE,
MIDDLESEX COUNTY,
MASSACHUSETTS 02145

BOHLER
45 FRANKLIN STREET, 5th FLOOR
BOSTON, MA 02110
Phone: (617) 849-8040
www.BohlerEngineering.com

SHEET TITLE:

Figure A-6a
Vehicle Movement Plan - Loading

SHEET NUMBER:

EXH-1

ORG. DATE - 10/24/22

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY

811 Know what's below. Call before you dig.
ALWAYS CALL 811
It's fast. It's free. It's the law.

FOR EXHIBIT PURPOSES ONLY

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	M211074
DRAWN BY:	JJW
CHECKED BY:	SPM
DATE:	10/24/22
CAD I.D.:	M211074-X-TTB

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

MARK DEVELOPMENT, LLC

PROPOSED DEVELOPMENT

MAP: 70, BLOCK: D, LOTS: 5 & 27
299 BROADWAY,
CITY OF SOMERVILLE,
MIDDLESEX COUNTY,
MASSACHUSETTS 02145

BOHLER
45 FRANKLIN STREET, 5th FLOOR
BOSTON, MA 02110
Phone: (617) 849-8040
www.BohlerEngineering.com

SHEET TITLE:

Figure A-6b
Vehicle Movement Plan - Liquor Parking

SHEET NUMBER:

EXH-2

ORG. DATE - 10/24/22

299 Broadway Redevelopment Mobility Management Plan

Somerville, Massachusetts

PREPARED FOR

Mark Development, LLC

Contact:
Mark Development, LLC
57 River Street, Suite 106
Wellesley, MA 02481-2052

PREPARED BY

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

November 2022

This page is intentionally left blank.

Table of Contents

List of Tables

List of Figures

1

Project Information

Contact Information

The Project address and contact information is as follows:

Site Address:
299 Broadway
Somerville, Massachusetts 02145

Contact:
Mark Development, LLC
275 Grove Street Suite 2-150
Newton, MA 02466

Project Description

Mark Development, LLC, (the "Proponent") is proposing to develop a pedestrian and transit oriented residential development at 299 Broadway in Somerville, Massachusetts (the "Site"). The Site is bordered by Broadway to the south, Temple Street to the west, and a residential neighborhood to the north and east.

Existing Conditions

Under existing conditions, the Site consists of an approximately 27,100 square foot (sf) building previously occupied by a Star Market grocery store that closed in 2007 and an approximately 12,600 sf building currently occupied by a Walgreens pharmacy. A parking lot consisting of approximately 125 parking spaces is shared by the two buildings as well as by the building at 313 Broadway that is currently occupied by a liquor store and barber shop.

The parking lot is accessed via one driveway on Temple Street and two driveways on Broadway. A third curb cut on Broadway serves the loading dock behind the former Star Market. Both existing buildings will be demolished under proposed conditions with the Project in place.

Proposed Conditions

The proposed development consists of two buildings with a total of approximately 288 residential units and 13,643 sf of ground-floor supporting retail. In addition, one of the buildings will host 3,001 sf of community space (the "Project"). No on-Site parking will be provided, and the Proponent is pursuing a limited number of neighborhood parking permits. Indoor, secure bicycle parking will be provided with at least one indoor, secure bicycle parking space per residential unit located in ground-floor bicycle rooms in each building with direct outdoor access.

It should be noted that the parcel at 313 Broadway (on the corner of Broadway and Temple Street) is not included in the proposed development. Under the proposed plan, a surface parking lot consisting of approximately seven spaces will remain for the liquor store and barber shop at 313 Broadway and will be accessed via the existing western curb cut on Broadway and the existing cub cut on Temple Street. Access will be one-way with entering vehicles using the curb cut on Broadway and exiting vehicles using the curb cut on Temple Street.

Associated infrastructure improvements along the Site frontage on Broadway will also be provided to accommodate this development, including the designation of a pick-up/drop-off/loading zone on the north side of Broadway along the Site frontage.

The Project provides several public realm improvements. The focal point of the Project will be a new civic plaza fronting Broadway. The civic plaza will be open to members of the public and will serve as a new central gathering place for residents and guests to the Winter Hill neighborhood. On the northern edge of the Site, the Project will include another public open space known as Sewall Park. A pedestrian walkway will be constructed between the civic plaza and Sewall Park, creating a new connection for pedestrians between Broadway and Sewall Street.

Bicycle Parking

The bicycle parking needs for the proposed Project will be accommodated through the provision of long-term secured and short-term bicycle parking within and around the proposed buildings. In total, approximately 293 long-term secured and 46 short-term bicycle parking spaces will be provided on-Site. The indoor bicycle parking spaces will be located in ground floor bicycle parking rooms in each building that will have direct access to the outdoors. 118 bicycle parking spaces will be provided in the west building and 175 bicycle parking spaces will be provided in the east building with one indoor bicycle parking space provided per residential unit. The outdoor bicycle parking spaces will be available for patrons and guests to the Project and will be located throughout the Site.

Loading/Deliveries

Loading and deliveries on-Site will be accommodated via a single-access driveway on Broadway at the location of the current curb cut for the loading dock behind the former Star Market. This off-

street loading area will allow for loadings and deliveries to occur without block pedestrian, bicycle, and vehicular operations on Broadway.

On-street Curb Use

On-street parking/loading spaces will be provided along Broadway adjacent to the Site. Approximately seven short-term metered parking spaces and two dedicated loading/pick-up/drop-off spaces are proposed along the curb fronting the Site that is currently signed as a taxi stand and occupied by the east Site driveway. The east Site driveway will be closed, increasing the length of available curb space. The new short-term metered parking spaces and dedicated loading/pick-up/drop-off spaces will be intended to serve patrons visiting the ground floor retail businesses as well as residents being picked-up/dropped-off for the Site. Short term loading and deliveries via small vehicles that will not use the dedicated loading space on-Site are also expected to utilize the dedicated curb space along Broadway. The final curbside regulations will be determined in coordination with the City of Somerville Mobility Division.

Transit Services

Ample public transportation services by the Massachusetts Bay Transportation Authority (MBTA) are currently provided in the study area, with significant enhancements planned and under construction. A summary of existing public transportation amenities in the area is provided below, followed by a discussion of the future transit improvement projects and planning studies.

Existing Conditions

The Project study area is currently served by five MBTA bus routes within one-half mile of the Project Site. The nearest outbound bus stop is located adjacent to the Site is Broadway at Temple Street and the nearest inbound bus stop is Broadway at Marshall Street. Both stops are served by MBTA Bus Routes 89 and 101. MBTA Bus Routes 89 and 101 travel along Broadway in the project area. MBTA Bus Route 90 also travels along Broadway east of Cross Street, with the nearest stop to the Project Site located at the intersection of Broadway at Cross Street. South of the Project Site, MBTA Bus Route 80 travels along Medford Street and Pearl Street, parallel to Broadway, with the nearest stop at the intersection of Medford Street at School Street. North of the Project Site, MBTA Bus Route 95 travels along Mystic Avenue, with the nearest stop at the intersection of Mystic Avenue at Temple Street.

The existing MBTA bus routes as well as future Green Line Extension service (expected to open in late 2022) are shown graphically in Figure 1. Ridership data for MBTA bus services within the study area is summarized in Table 1. All existing data is from Fall 2019 as it is reflective of typical pre-pandemic conditions.

Figure 1 Existing Public Transportation Services

Table 1 MBTA Ridership of Routes Serving the Project Area

Bus Route	Origin/Destination	Peak-Hour Frequency (minutes)	Direction	Weekday	Saturday	Sunday
80	Arlington Center – Lechmere Station	30-40	Inbound	834	495	292
			Outbound	788	408	274
			Total	1,622	903	566
89	Clarendon Hill or Davis Square - Sullivan Square Station	6-12	Inbound	1,713	901	492
			Outbound	1,766	813	478
			Total	3,479	1,714	970
90	Davis Square – Assembly Row	35-40	Inbound	549	266	187
			Outbound	525	299	144
			Total	1,074	565	331
95	West Medford or Arlington Center – Sullivan Square Station	10-25	Inbound	737	322	177
			Outbound	690	326	168
			Total	1,427	648	345
101	Malden Center Station – Sullivan Square Station	6-8	Inbound	2,390	793	567
			Outbound	1,847	736	494
			Total	4,237	1,529	1,061

Source: Fall 2019 MBTA Ridership data, reflective of pre-COVID-19 pandemic conditions

The location and distance of the nearest bus stops are summarized in Table 2. All bus stops shown in Table 2 are within ten minutes walking time from the Site.

Table 2 Nearest MBTA Bus Stops

Bus Route	Closest Stop	Direction	Walking Distance to/from Site[a] (ft)	Avg Walking Time to/from Site [b] (min)
80	Medford Street at School Street	Inbound (EB)	2350	8.9
	Medford Street at School Street	Outbound (WB)	2250	8.9
89, 101	Broadway at Marshall Street	Inbound (EB)	450	1.7
	Broadway at Temple Street	Outbound (WB)	50	0.2
90	Cross Street at Broadway	Inbound (EB)	2250	8.5
	Cross Street at Broadway	Outbound (WB)	2250	8.5
95	Mystic Avenue at Temple Street	Inbound (EB)	1900	7.2
	Mystic Avenue at Temple Street	Outbound (WB)	2000	7.6

a Measured from approximate location of plaza.

b Average walking time based on walking speed of 3 mph, or 4.4 feet per second.

Future Conditions

The following sections summarize planned projects and on-going planning studies that will improve transit services within the vicinity of the Site. The future transportation services are shown graphically in Figure 2.

Figure 2 Future Public Transportation Services

MBTA Green Line Extension Project

In early 2017, the Federal Transit Administration granted final approvals for the 4.3-mile extension of the MBTA's Green Line light rail from its current terminus at Lechmere Station in Cambridge into Somerville and Medford. Following the GLX project, approximately 85-percent of Somerville's population will be within reasonable walking distance of train service.[1]

The extension will have two branches; a 0.9-mile southerly branch that will terminate near Somerville's Union Square, and a 3.4-mile northerly branch that will parallel the Lowell Line of the commuter rail through Somerville and will terminate at College Avenue in Medford. The Union Square branch of GLX opened in March 2022 and the Medford branch is expected to be completed in November 2022. Overall GLX will include seven new stations, one at Union Square, five on the Medford branch, and a rebuilt Lechmere Station. Headways for the trains servicing the new stations are scheduled to be six- and five-minutes during the respective weekday morning and evening peak periods, and under ten minutes for all other time periods while the Green Line is in operation.

The Site is situated within a half-mile north of the new Gilman Square Station, which will be located at the south corner of the intersection of Medford Street at School Street. Construction of this new station will change the transportation dynamic of the Project study area, with a significant increase in transit ridership expected, corresponding to a decrease in automobile travel.

MBTA Bus Network Redesign

The MBTA is in the planning stages of the Bus Network Redesign, a project intended to use rider feedback to guide recommendations for changes that address route design, frequency of service, hours of service, and coverage area. The plan is designed to prioritize transit-critical communities while responding to the changing needs of the region. A revised map of the Bus Network Redesign was released in late October 2022 and includes the following five bus routes within a 0.5-mile radius of the Site:

- **Bus Route 85:** This route would travel between Assembly Square and Ruggles Station via Union Square, Kendall Square, and Longwood Medical Area. This route would operate weekdays only with service provided every 90 minutes or better between 6:00 AM and 7:00 PM, with peak period service of 30 minutes or better 6:00 AM to 9:00 AM and 4:00 PM to 7:00 PM. The nearest stops to the Project Site would be at Broadway at Cross Street, approximately 0.40 miles east of the Site.
- **Bus Route 89:** This route would travel between Davis Square and Sullivan Square via Winter Hill. This route would operate seven days per week with service provided every 30 minutes or better between 5:00 AM and 10:00 PM and every 45 minutes or better between 10:00 PM and 1:00 AM. The nearest stops to the Project Site would be adjacent to the Site at Broadway and Temple Street inbound and Broadway at Marshall Street outbound.
- **Bus Route 90**: This route would travel between Clarendon Hill and Assembly Square via Davis Square and East Somerville. This route would operate seven days per week with service provided every 20 minutes or better between 5:00 AM and 10:00 PM and every 30 minutes or better between 10:00 PM and 1:00 AM. The nearest stops to the Project Site would be at Broadway at Cross Street, approximately 0.40 miles east of the Site.

[1] Somerville: Open Space & Recreation Plan (2016 – 2023)

- **Bus Route 95:** This route would travel between Arlington Center and Sullivan Square via Medford Square. This route would operate seven days per week with service provided every 20 minutes or better between 5:00 AM and 10:00 PM and every 30 minutes or better between 10:00 PM and 1:00 AM. The nearest stops to the Project Site would be at Mystic Avenue at Temple Street, approximately 0.30 miles north of the Site.
- **Bus Route T101:** This route would travel between Medford Square and Kendall Square via Sullivan Square. This route would operate as a key bus route seven days per week with service provided every 15 minutes or better between 5:00 AM and 1:00 AM. The nearest stops to the Project Site would be adjacent to the Site at Broadway and Temple Street inbound and Broadway at Marshall Street outbound.

The project is currently in the planning stages. Implementation is expected to occur in several phases from 2023 to 2028.

Table 3 summarizes the proposed project area bus service.

Table 3 Proposed Future Project Area MBTA Service

Service Type	Route	Origin/Destination	Frequency (minutes)
Light Rail	Green Line E Branch	Medford – Heath St	5-6 minutes in peak hours
Bus	85	Assembly Sq to Ruggles via Union Sq, Kendall/MIT, and Longwood Medical Area	6 AM to 9 AM: 30 or better 9 AM to 4 PM: 90 or better 4 PM to 7 PM: 30 or better
Bus	89	Davis Sq to Sullivan via Winter Hill	5 AM to 10 PM: 30 or better 10 PM to 1 AM: 45 or better
Bus	90	Clarendon Hill to Assembly Sq via Davis Sq and East Somerville	5 AM to 10 PM: 20 or better 10 PM to 1 AM: 30 or better
Bus	95	Arlington to Sullivan via Medford Sq	5 AM to 10 PM: 20 or better 10 PM to 1 AM: 30 or better
Bus	101	Medford to Kendall/MIT via Sullivan	15 or better (5 AM – 1 AM)

Source: MBTA Bus Network Redesign Proposal

MBTA Silver Line Extension Alternatives Analysis

The MBTA and MassDOT announced the launch of the MBTA Silver Line Extension Alternatives Analysis study in January 2021. The study will assess the feasibility, utility, and cost of various alignment and service frequency options for extending Silver Line service to Everett, Somerville, Cambridge, and Boston. The focus of this study, which is expected to be completed in Spring 2023, was identified as a key objective in MBTA's Focus40 plan. One of the six potential alignments presented at the second public meeting in September 2021, the Kendall via Wellington Alignment, would run along Route 28, which intersects with Broadway approximately one-third mile east of the Site.

Bicycle Accommodations

Existing Bicycle Accommodations

Bicycle accommodations were recently improved on Broadway in 2019 between Main Street and Route 28 (McGrath Highway). In the eastbound direction, a shared bus and bike lane is provided between Medford Street and Route 28 (McGrath Highway). In the westbound direction, separate bus and protected bike lanes are provided between Route 28 (McGrath Highway) and Walnut Street, a shared bus and bike lane is provided between Walnut Street and Temple Street, and separate bus and protected bike lanes are provided between Temple Street and Main Street. The shared bus and bike lanes are painted red with sharrows and "BUS BIKE ONLY" pavement markings.

Bicycle accommodations have also been recently improved on other study area roadways. Bike lanes were painted on Temple Street in 2019 in both the northbound and southbound directions, with sharrow markings north of Derby Street in the northbound direction. Marshall Street was given a contraflow bike lane in the northbound direction and sharrows in the southbound direction in 2018. School Street was refreshed with green painted sharrows in both directions in 2017. All other study area roadways have no formal bicycle accommodations, as they are primarily local residential streets with low vehicle speeds.

Figure 3 shows the existing bicycle facilities within the area.

Bluebikes Stations

Bluebikes began operating in July 2011 and currently provides over 4,000 bikes at more than 400 bike-sharing stations across 11 municipalities in Metro Boston. The closest permanent Bluebikes bike share station to the Site is located approximately 0.1 miles to the east at Foss Park along Broadway, in the northeast corner of the intersection of Broadway at Walnut Street. That station includes approximately 15 bicycle docks.

Proposed Bicycle Accommodations

The bicycle parking needs for the proposed Project will be accommodated through the provision of long-term secured and short-term bicycle parking within and around the proposed buildings. In total, approximately 293 long-term secured and 46 short-term bicycle parking spaces will be provided on-Site. The indoor bicycle parking spaces will be located in ground floor bicycle parking rooms in each building that will have direct access to the outdoors with one indoor bicycle parking space provided per residential unit. The Site is located within 0.10 miles of an existing Bluebikes bike-share station at the intersection of Broadway and Walnut Street.

While bicycle accommodations within the study area are considered adequate (including dedicated facilities on Broadway and other study area roadways), the Proponent will continue to coordinate with the City of Somerville's Mobility Division to enhance bicycle facilities.

Figure 3 Existing Bicycle Network

Pedestrian Accommodations

Existing Pedestrian Accommodations

Sidewalks exist along both sides of all streets in the study area, with ADA-compliant sidewalk ramps at major intersections. The sidewalks are generally in good condition.

Figure 4 illustrates the existing pedestrian network with 0.25-miles of the Site, including the locations of the nearest bus stops, Bluebikes station, and Zipcar rental station.

Proposed Pedestrian Accommodations

The Proponent is committed to refreshing crosswalk pavement markings and preserving the integrity of the sidewalk network adjacent to the Site throughout construction. While pedestrian accommodations within the study area are considered adequate, the Proponent will continue to coordinate with the City of Somerville's Mobility Division to enhance pedestrian facilities.

The Project provides several public realm improvements. The focal point of the Project will be a new civic plaza fronting Broadway. The civic plaza will be open to members of the public and will serve as a new central gathering place for residents and guests to the Winter Hill neighborhood. On the northern edge of the Site, the Project will include another public open space known as Sewall Park. A pedestrian walkway will be constructed between the civic plaza and Sewall Park, creating a new connection for pedestrians between Broadway and Sewall Street.

Figure 4 Existing Pedestrian Network

2

Trip Generation

The Project consists of approximately 288 residential units, 13,643 sf of ground-floor supporting retail, and 3,001 sf of community space. The residential units and ground-floor supporting retail will be distributed across two buildings. With their proximity, trip generation estimates were not developed separately for each building but, instead, were estimated as a single total development. Further, the community space is expected to be used "by-occasion" as a public gathering space and therefore will not generate trips in a regular pattern during peak commuting periods as with typical land use codes. Trip generation was not estimated for this portion of the Project.

The resulting trip generation analyses for the Project are summarized as follows.

Project-Generated Traffic Volumes

The rate at which a development generates traffic is dependent upon several factors such as size, location, and concentration of surrounding developments. Trip generation estimates for the proposed uses were projected using data published by the Institute of Transportation Engineers (ITE)[2]. The trip generation analyses are presented below.

Existing Site-Generated Traffic

Prior to estimating future-conditions traffic volumes, the current use of the Site was evaluated. As mentioned, the northwest corner of the Site is currently occupied by an approximately 12,576 sf Walgreens building and the east side is occupied by a vacated Star Market, with surface-level parking spaces in between. Both buildings will be eliminated as part of the Project.

Per the Somerville TIS Guidelines, existing trips may be subtracted from new trips to generate a net new vehicle trip total with Mobility Division approval. Trip generation estimates for the existing Walgreens were projected using trip generation rates for LUC 822 (Strip Retail Plaza). ITE trips were

2 Trip Generation Manual – 11th Edition; Institute of Transportation Engineers (Washington, D.C.); 2021.

used as opposed to the existing driveway counts as the existing parking lot is shared with the liquor store and barber shop at 313 Broadway that will be remaining with the Project in place. There is no trip generation associated with the former Star Market as it has been vacant for over a decade.

As part of the Project, the existing Walgreens will be relocated to the site of a former Walgreens at 343 Broadway, approximately 500 feet west of the Site[3]. While the relocated Walgreens is expected to generate trips at a similar rate to the existing Walgreens, the building at 343 Broadway could be re-tenanted without the Project and would add additional trips to the roadway network not associated with the Project. Therefore, the existing trips generated by the Walgreens on Site today can be subtracted from new trips to generate a net new vehicle trip total, as the trips generated by the building at 343 Broadway will be independent from the proposed Project.

Table 4 summarizes the Site-generated trips for the existing Walgreens on Site for which credit was taken as it will be demolished to make way for the redevelopment. It should be noted that the existing Site-generated trips have been adjusted following the same methodology, including mode share and pass-by credit, as the proposed Site-generated trips as detailed in the following sections.

Table 4 Adjusted Existing Site Trip Generation

	Existing Walgreens [a]
Weekday Daily	
Enter	185
Exit	185
Total	370
Weekday Morning	
Enter	9
Exit	5
Total	14
Weekday Evening	
Enter	22
Exit	22
Total	44
Saturday Daily	
Enter	167
Exit	167
Total	334
Saturday Midday	
Enter	20
Exit	20
Total	40

a Based on ITE LUC 822 (Strip Retail Plaza), for 12,576 SF. Assumed 65% existing vehicular mode split based on 2019 ACS Census Data for the Site's Census Tract. Not including pass-by.

3 Prior to 2019, the existing Site was home to a Rite Aid and the building at 343 Broadway was occupied by a Walgreens. At that time, the Rite Aid on Site was re-branded as a Walgreens and the former Walgreens at 343 Broadway closed.

Full Build-Out Unadjusted ITE Vehicle Trips

As previously discussed, the Project consists of approximately 288 residential units and 13,643 sf of retail space. Trip generation estimates for the proposed uses were projected using trip generation rates for LUC 221 (Mid-Rise Residential) and LUC 822 (Strip Retail Plaza).

It should be noted that the proposed Site retail uses are expected to be small, service-oriented businesses. While exact tenants have not yet been identified, these tenants are not expected to be significant destination-retail uses. Instead, the potential uses are intended to complement the proposed residential use on Site. In fact, most retail business is expected to be in the form of shared trips with the residential use on Site, or pedestrians or bicyclists. Due to these factors, and the absence of a dedicated retail-only parking supply, vehicular traffic associated with the retail uses should be far less than that estimated based on the ITE data.

The unadjusted vehicle trip estimates are presented in Table 5.

Table 5 Project Trip Generation – Total Unadjusted Vehicle Trips by Land Use

Time Period	Proposed		Total Unadjusted Vehicle Trips
	Residential [1]	Retail [2]	
Weekday Daily			
Enter	664	403	1,067
Exit	664	403	1,067
Total	1,328	806	2,134
Trips per unit or ksf	*4.61*	*59.08*	
Weekday Morning			
Enter	26	19	45
Exit	89	13	102
Total	115	32	147
Trips per unit or ksf	*0.40*	*2.35*	
Weekday Evening			
Enter	74	49	123
Exit	48	49	97
Total	122	98	220
Trips per unit or ksf	*0.42*	*7.18*	
Saturday Daily			
Enter	646	370	1,016
Exit	646	370	1,016
Total	1,292	740	2,032
Trips per unit or ksf	*4.49*	*54.24*	
Saturday Midday			
Enter	59	46	105
Exit	57	44	101
Total	116	90	206
Trips per unit or ksf	*0.40*	*6.60*	

1 Based on ITE LUC 221 (Mid-Rise Residential) for 288 units
2 Based on ITE LUC 822 (Strip Retail Plaza) for 13,643 sf.

Person Trips

The unadjusted vehicle trips estimated using the ITE data were subsequently converted into person trips by applying average vehicle occupancy rates (VOR) based on national data[4] for each use. The national average vehicle occupancy rates applied were 1.18 persons/vehicle for residential trips and 1.82 persons/vehicle for retail trips. The national rates are applied when converting to person trips to be consistent with ITE data, which is also based on national data.

4 Summary of Travel Trends – National Household Travel Survey; USDOT Federal Highway Administration (Washington, DC); 2017.

Internal Capture Trips

Because the proposed redevelopment is a mixed-use project, the trip generation characteristics of the Project will be different from a single-use project. Some of the traffic to be generated by the proposed redevelopment will be contained on the Site as "internal" or "shared vehicle" trips. For example, residents are anticipated to patronize the retail space. While these shared trips represent new traffic to the individual uses, they would not show up as new vehicle trips on the surrounding roadway network.

As described in the ITE Trip Generation Handbook[5], "because of the complementary nature of these land uses, some trips are made among the on-site uses. This capture of trips internal to the site has the net effect of reducing vehicle trip generation between the overall site and the external street system (compared to the total number of trips generated by comparable land uses developed individually on stand-alone sites) … an internal capture rate can generally be defined as the percentage of total person trips generated by a site that are made entirely within the site. The trip origin, destination, and travel path are all within the site."

Net Person Trips

Based on the methodology outlined in the ITE Trip Generation Handbook, internal capture rates were applied to the gross person trips. The resulting peak-hour person trip estimates for the Project and are presented in Table 6.

5 Trip Generation Handbook, 3rd Edition; Institute of Transportation Engineers; Washington, D.C.; 2017.

Table 6 Project Trip Generation – Net Person Trips by Land Use

	Proposed		
Time Period	**Residential**	**Retail**	**Net Person Trips**
Weekday Daily			
Enter	703	667	1,370
Exit	718	652	1,370
Total	1,421	1,319	2,740
Weekday Morning			
Enter	30	34	64
Exit	104	23	127
Total	134	57	191
Weekday Evening			
Enter	64	80	144
Exit	48	66	114
Total	112	146	258
Saturday Daily			
Enter	688	612	1,300
Exit	701	599	1,300
Total	1,389	1,211	2,600
Saturday Midday			
Enter	49	75	124
Exit	58	59	117
Total	107	134	241

Note Person trip generation estimates by land use with internal capture credits applied.

Mode Share

Existing mode shares for the Project Site were determined based on census data from the American Community Survey (ACS) 2019 five-year estimates for Census Tract 3501.04 (the census tract for this area of Somerville). The existing mode shares are presented in Table 7.

Table 7 Mode Share

Vehicle	Transit	Bike	Walk	Other [a]
65%	27%	3%	2%	3%

Source: Based on 2019 ACS Census Data for Census Tract 3501.04 (the Site's Census Tract).
a Other includes work-from-home and other modes not listed in the table.

The Project design and Transportation Demand Management program are being developed with the intent of minimizing travel by single occupant automobile and maximizing transit use. As noted previously, no on-Site parking will be provided, and the Proponent is pursuing a limited number of neighborhood parking permits. Indoor, secure bicycle parking will be provided with at least one indoor, secure bicycle parking space per residential unit located in ground-floor bicycle rooms in each building with direct outdoor access. In addition, due to the proximity of the upcoming MBTA

Green Line Extension (GLX) project and improvements to bus service in the area, the existing modal split from this census tract is not necessarily representative of future conditions in this area. The Green Line Extension is expected to open in late 2022 with the nearest stop to the Site at Gilman Square, approximately 0.4 miles south of the Site.

With no on-Site parking provided and with the upcoming Green Line Extension, it is expected that vehicular mode shares will be lower and transit, walk, and bike mode shares will be higher than what is reported in Table 7. However, to follow the directive provided by the City of Somerville Mobility Department, this study assumes the existing census tract mode shares will be applicable to the proposed Project. This provides a conservative analysis of the Project's vehicular impacts.

It should be noted that because the retail component of the Project is complementary to the residential space on Site, it can be expected to mirror the residential mode share as opposed to having its own mode share, as is common with larger, destination retail land uses.

Pass-By Trips

While the ITE rates provide estimates for all the traffic associated with each land use, not all of the traffic generated by the Project will be new to the area roadways. In reality, a portion of the vehicle-trips generated by the retail land use will likely be drawn from the traffic volume roadways adjacent to the Site. For example, someone traveling on Broadway may choose to deviate from their original travel path to visit the Site retail uses, before continuing to their final destination.

As ITE pass-by data for LUC 822 (Retail Strip Plaza) is not available, ITE data for LUC 821 (Shopping Plaza) was reviewed. ITE data for LUC 821 (Shopping Plaza) shows the pass-by rate for retail is 40-percent during the weekday evening peak and 31-percent during the Saturday midday peak. However, consistent with Somerville TIS Guidelines, a 25-percent pass-by rate was assumed for all time periods. Even with these adjustments, the new trip estimates for the retail uses likely are overstated due to the factors discussed earlier.

Project-Generated Trips

The mode shares discussed above and presented in Table 7 were applied to the net person trips shown in Table 6 to generate the adjusted Project person trips by mode. To reflect the number of vehicle trips generated by the Site, the adjusted person trips are converted back to vehicle trips by applying the local average vehicle occupancy rates (VOR). Based on 2019 American Community Survey data[6], a local VOR of 1.25 for residential use was determined. Local VOR data is not available for retail uses, so the national average vehicle occupancy rate of 1.82 persons/vehicle was used.

The mode share and local average vehicle occupancy were applied to the person trips to estimate proposed trips by mode, and then the pass-by adjustments noted previously were applied to the vehicle trips generated by the retail portion of the Project. Following these calculations, trip generation associated with the existing Site use was deducted, which resulted in the net new trips from the Project.

Table 8 summarizes the proposed trips by mode.

6 American Community Survey 2019 5-Year Estimates, Table S0801: Commuting Characteristics by Sex for Census Tract 3501.04

Table 8 Project-Generated Trips by Mode

	Vehicle [a]	Transit	Bike	Walk	Other [b]
Weekday Daily					
Enter	545	370	41	27	41
Exit	547	370	41	28	42
Total	1,092	740	82	55	83
Weekday Morning					
Enter	25	17	2	2	2
Exit	59	34	4	2	4
Total	84	51	6	4	6
Weekday Evening					
Enter	55	39	4	3	4
Exit	42	31	3	2	3
Total	97	70	7	5	7
Saturday Daily					
Enter	523	351	39	26	39
Exit	525	351	39	26	39
Total	1,048	702	78	54	78
Saturday Midday					
Enter	46	33	4	2	3
Exit	45	32	4	2	4
Total	91	65	8	4	7

a Total development vehicle trips (including pass-by trips associated with the retail portion).

b Other includes work-from-home and other modes not listed in the table.

As shown in Table 8, the Project would be expected to generate between 84 and 97 total vehicle trips during the peak hours studied, without crediting pass-by trips or trips associated with the existing Site use. This can be considered a conservatively high estimate of the number of vehicle trips generated by the proposed Project as it does not consider the fact that no parking will be provided on-Site and that the new Green Line Extension will be located less than 0.5 miles from the Site.

The breakdown of these trips by use is provided in Table 9, while Table 10 summarizes the total net new trips to be generated by the Project.

Table 9 Project-Generated Vehicle Trips by Use

	Residential	Retail	Total Vehicle Trips [a]	Retail Pass-By [b]	Total New Vehicle Trips [c]
Weekday Daily					
Enter	366	238	604	59	**545**
Exit	373	233	606	59	**547**
Total	739	471	1,210	118	**1,092**
Weekday Morning					
Enter	16	12	28	3	**25**
Exit	54	8	62	3	**59**
Total	70	20	90	6	**84**
Weekday Evening					
Enter	33	29	62	7	**55**
Exit	25	24	49	7	**42**
Total	58	53	111	14	**97**
Saturday Daily					
Enter	358	219	577	54	**523**
Exit	365	214	579	54	**525**
Total	723	433	1,156	108	**1,048**
Saturday Midday					
Enter	25	27	52	6	**46**
Exit	30	21	51	6	**45**
Total	55	48	103	12	**91**

a Total adjusted vehicle trips with internal capture credits applied.

b 25% pass-by credit for all time periods.

c Total adjusted vehicle trips with internal capture and pass-by credits applied.

Table 10 Project-Generated Net New Vehicle Trips

	Total New Vehicle Trips [a]	Existing Vehicle Trips [b]	Total Net New Vehicle Trips [c]
Weekday Daily			
Enter	545	185	**360**
Exit	547	185	**362**
Total	1,092	370	**722**
Weekday Morning			
Enter	25	9	**16**
Exit	59	5	**54**
Total	84	14	**70**
Weekday Evening			
Enter	55	22	**33**
Exit	42	22	**20**
Total	97	44	**53**
Saturday Daily			
Enter	523	167	**356**
Exit	525	167	**358**
Total	1,048	334	**714**
Saturday Midday			
Enter	46	20	**26**
Exit	45	20	**25**
Total	91	40	**51**

a Total adjusted vehicle trips with internal capture and pass-by credits applied, from Table 9.
b Existing Site-generated trips with mode share applied, from Table 4.
c Total net new vehicle trips minus existing trips. Reflects total new trips generated by the project.

As shown in Table 10, the Project is projected to generate 722 weekday daily net new vehicle trips (360 entering, 362 exiting), 70 weekday morning peak hour net new vehicle trips (16 entering, 54 exiting), 53 weekday evening peak hour vehicle trips (33 entering, 20 exiting), 714 Saturday daily net new vehicle trips (356 entering, 358 exiting) and 51 Saturday midday peak hour net new vehicle trips (26 entering, 25 exiting). This can be considered a conservatively high estimate of the number of vehicle trips generated by the proposed Project as it does not consider the fact that no parking will be provided on-Site and that the new Green Line Extension will be located less than 0.5 miles from the Site.

The proposed Project-generated vehicle trips were assigned to the study area roadways and intersections based on trip distribution patterns developed as discussed in the following section.

Trip Distribution

The directional distribution of the traffic approaching and departing the Site is a function of population densities, the location of employment opportunities, existing travel patterns, and the

efficiency of the roadway system. Trips made to and from the Project during the peak hours are expected to be predominantly home-to-work and work-to-home trips in the morning and evening peak hours, respectively. Accordingly, the trip distribution for the residential portion of the Project has been derived based on Journey-to-Work data for the City of Somerville with the (2012-2016) U.S. Census data. The trip distribution for the retail portion of the Project is assumed to follow similar trip distribution patterns as the residential space. Larger-scale retail uses frequently will have unique trip distribution patterns that are dependent on their customer base and, therefore, may be different than those for a residential use. However, in this instance, the retail uses are smaller, generally non-destination uses as compared to a standard shopping center. Accordingly, the retail distribution should closely mimic that of the residential use.

Table 11 and Figure 5 illustrate the trip distribution.

Table 11 Project Trip Distribution

Travel Route	Direction (from/to)	Entering Trips	Exiting Trips
Broadway	East	25%	25%
	West	25%	25%
Temple Street	North	45%	45%
School Street	South	5%	4%
Marshall Street	South	n/a	1%
Total		100%	100%

Source: US Census data (2012-2016).

As noted previously, there will be no dedicated on-Site parking provided for the Project and the Proponent is pursuing a limited number of neighborhood parking permits. To provide a conservative analysis, it is assumed that a portion of the vehicle trips generated will travel straight to the neighborhood to park, a portion will stop at the Site to pick-up or drop-off supplies or passengers, and a portion will consist of taxis, Ubers, and/or Lyfts. Table 12 summarizes the estimated local destination trip distribution of the Project-generated vehicle trips.

Table 12 Local Destination Trip Distribution

Local Destination	Residential Trips	Retail Trips
Direct to Neighborhood Parking	33%	50%
Neighborhood Parking via Site	33%	n/a
Taxis/Ubers/Lyfts [a]	34%	50%

a Deadhead trips included in trip distribution.

Site Access Plans

In addition to the regional distribution summarized above, the vehicle access plan for the Site is provided in Figure 6. The Site access points for trucks is also shown on Figure 6. The access plans for pedestrians and bicyclists are shown in Figures 7 and 8, respectively, with the proposed bicycle parking supplies for each building also highlighted in Figure 8.

Figure 5 Regional Trip Distribution

Figure 6 Vehicle Access Plan

This page is intentionally left blank.

Figure 7 Bicycle Access Plan

This page is intentionally left blank.

Figure 8 Pedestrian Access Plan

This page is intentionally left blank.

3

Proposed Programs and Services

An MMP is required by the Somerville Zoning Ordinance. The purpose of an MMP is to ensure that the developers are fully aware of the mobility management responsibilities of future property owners and tenants – namely employers – and that advance notice of the operational expectations necessary for successful plan implementation is provided to future property owners, tenants, parking facility operators, and property management firms.

The following section summarizes the City's Zoning Ordinance requirements for MMPs. Each requirement will be applied to the Project, if applicable.

- Property owners of a residential building with 20 or more dwelling units are required to provide the following for their tenants:
  - Posted mobility management information;
  - Distributed mobility management information; and
  - Unbundled parking (if parking is provided)
- Property owners of buildings with 50,000 sf or more of commercial space OR multi-tenant buildings that in combination have 50 or more employees are required to provide the following for their tenants:
  - An on-site transportation coordinator;
  - An annual mobility management education meeting for tenants and their employees;
  - Posted mobility management information;
  - Distributed mobility management information; and
  - Unbundled parking (if parking is provided)
- These same property owners must require future tenants to provide the following through lease agreements:
  - Qualified transportation fringe benefits for employees; and
  - A guaranteed ride home program for employees.

- Employers with 50 or more employees are required to provide the following for their employees:
  - An on-site transportation coordinator;
  - An annual mobility management education meeting for tenants and their employees;
  - Posted mobility management information;
  - Distributed mobility management information;
  - Qualified transportation fringe benefits for employees; and
  - A guaranteed ride home program for employees

The following sections outline the MMP responsibilities and commitments for the various stakeholders of the Project, including the Proponent, future tenants, and property management firms. While best efforts have been made to assign these commitments accordingly, specific duties outlined subsequently may be fulfilled by other stakeholders as tenant-specific MMP policies are drafted.

Proponent / Property Owner Commitments

Transportation Coordinator

In conjunction with the initial phase of development, an overall on-site Transportation Demand Management (TDM) coordinator will be designated to oversee all TDM programs for each of the Project's buildings and the overall Project in its entirety. In keeping with the requirements of the City of Somerville, TDM coordinators will be provided for each tenant occupying a building. The person(s) in this role will coordinate with the City of Somerville Mobility Division or any future Transportation Management Associations (TMAs)formed in the future which the Project may possibly join to help promote a reduced reliance on single-occupant automobile travel to the Project. To that end, the TDM measures identified in the following sections will be implemented under the direction and supervision of this person.

The final job description for this role will be determined over time, but the duties of the on-site TDM coordinator(s) may include, but not be limited to:

- Assist Site employees with ride matching and transportation planning;
- Develop and implement appropriate TDM measures;
- Disseminate information regarding alternate modes of transportation and developing transportation-related marketing and educational materials;
- Develop and maintain information pertaining to pedestrian and cycling access to and from the Site;
- Host occasional transportation-related events to promote the use of commuting alternatives;
- Distribute transit maps and passes;
- Advocate with the state and local governments to improve transportation infrastructure and services;
- Monitor the effectiveness of TDM measures through surveys and other tools;
- Complete regulatory reports to state and city agencies, as required; and

› Implement a website that provides travel-related information and promotes awareness of the items listed above.

SomerVision 2040

SomerVision2040 lays out a set of goals, one of which is to reduce the percentage of trips made by vehicles to 37.5% or less by 2030 and 25% or less by 2040. The Project is committed to making reasonable efforts to the achieve these goals, and one significant effort to do so is by eliminating dedicated onsite parking for both residents of the building as well as employees and patrons of the commercial ground floor spaces.

Furthermore, if annual monitoring and reporting identifies a shortfall in meeting this goal, the Proponent will implement additional mobility programs and services. The decision not to provide dedicated vehicle parking on-site makes this project a strong candidate to exceed the SomerVision goal of vehicular trip reduction.

Trip Reduction Initiative

As noted above, the project will not contain any onsite parking. However, the Proponent believes not providing residents an alternative parking option is not a viable option currently. As a result, the Proponent is requesting that 50% of the market rate units be eligible for an on-street parking pass from the City. In line with the SomerVision trip reduction goals and its stated time frame, the proponent would commit to reducing the amount of eligible on street parking spaces at the same ratios as the Vision lays out (i.e. 37.5% in 2030 and 25% in 2040), assuming that both the Proponent and the City agree that the data supports this reduction. This data would be dependent both on activity of the residents and area parking availability.

The decision not to have parking onsite coupled with a cap on street parking, in and of itself is a traffic reducing action as it will encourage residents and customers to seek alternative transportation opportunities, which are readily available in the area.

Ride-Sharing Services

Alternative means of travel, such as taxi and private ride services, such as Uber and Lyft, will be encouraged by the lack of on-site parking. The exact level of usage by these private ride-sharing services can be quantified through post-opening monitoring studies to be conducted as discussed later in this document.

A dedicated pick-up/drop-off/loading zone is proposed along the north side of Broadway adjacent to the Site to accommodate taxi and private ride share operations.

Promote Transit Use

In addition to the existing bus services near the Site, the Green Line Extension will provide light rail service. The new Gilman Square Station, located less than a half mile from the Site, is planned to open in November 2022.

The on-site TDM coordinator will provide a central commuter information center within the Project in a prominent location, such as in a building's lobby. This will provide employees, residents, and visitors with transit maps, transportation schedules, and route information for pedestrians and cyclists.

To further encourage use of area transit, real time transit information will consist of a connected transit screen (or equivalent service) in the building lobby's (both buildings) displaying real time MBTA and Bike Share information. In addition, a transit screen will be provided on the exterior for the general public. The location of the exterior screen will be determined through discussion with the city.

The Proponent also feels that subsidizing transit alternatives for residents and employees of the commercial spaces will be a valuable tool for promoting alternative modes of transit. More specifically providing the following subsidies, with a cap on total subsidy dollars to be agreed upon with the City of Somerville:

- Provide contribution towards a MBTA Charlie Card, Up to two Charlie Cards per household will be provided.
- Provide contribution towards supporting either a monthly membership to Blue Bike or the infrastructure associated with operating Blue Bike.

Bike Sharing Service

Bluebikes began operating in July 2011 and currently provides over 4,000 bikes at more than 400 bike-sharing stations across 11 municipalities in Metro Boston. The closest permanent Bluebikes bike share station to the Site is located approximately 0.1 miles to the east at Foss Park along Broadway, in the northeast corner of the intersection of Broadway at Walnut Street. That station includes approximately 15 bicycle docks.

Transportation Management Association Involvement

While there are not any active Transportation Management Associations (TMAs) in the vicinity of the Project, the Proponent is committed to be an active member of any TMAs formed in the future. The mission of most TMAs is to enhance quality of life through focusing on Transportation and Infrastructure, Land Use and Development, and Energy and the Environment. In the absence of a formal, established TMA, the Proponent will support local efforts in Somerville in improving and expanding public transportation in the area. Through this involvement, the pedestrian-friendly nature of the Project's design creates a framework for offering alternative transportation services. If a TMA is formed in the future, the Proponent will consult with TMA management to confirm that the TMA structure, fees, and other details are compatible with the Project prior to officially becoming a

member. With or without participation in any TMA, the Proponent is committed to implementing all of the TDM measures outlined in this MMP. Post-construction traffic monitoring and evaluation of TDM programs will also be the responsibility of the Proponent.

Monitoring and Annual Reporting

The Proponent is committed to a transportation monitoring program for the overall Project that will consist of annual transportation monitoring for a period of five years beginning six months after the first Certificate of Occupancy is issued. Each monitoring period will include an evaluation for each of the buildings that are currently open and occupied at that time. The monitoring program will include:

- Annual travel surveys of residents and employees of the Project conducted by the on-Site appointed TDM coordinators. These surveys will be developed through consultation with the City of Somerville to determine the number of Project residents and employees using the different travel modes of private automobile, car-sharing services, public transportation, biking, and walking.
- Annual counts of bike parking occupancy at the Site. This will be done through a field inventory to be conducted during a representative weekday period when it can reasonably be assumed that the peak bike parking demand for residents, employees, and visitors would occur; and
- As part of the summary report to be provided to the City of Somerville, a status summary of the MMP in place at the Project also will be provided.

Tenant Commitments

The following sections discuss the tenant types for which MMP programs will be implemented for the Project as well as overall MMP programs for all tenants. A description of the MMP elements is presented in this section along with information on how those elements aid residents, visitors, employees, and retail patrons getting to and from the Project. The following plan first addresses general MMP measures that apply to all tenants with 50 or more employees, then special programs for the residential space and retail uses. Select duties outlined below may alternatively be fulfilled by the property management team or the Proponent's appointed TDM coordinator on behalf of the tenants.

As there will likely be multiple tenants located within the Project, MMP obligations will need to be included as part of the lease language between tenants and the property owner. If there are any tenants with more than 50 employees, they will also be required to submit their own MMP, along with a copy of the leases with financial aspects and other non-MMP elements redacted, or an affidavit signed by the owner and tenant(s) verifying that this language was included and agreed to in the lease. This documentation will be provided to the City of Somerville prior to the issuance of the Certificate of Occupancy of a space by these tenants.

General Tenant Measures

The following section describes overall commitments of all future tenants with 50 or more employees, if applicable.

Transportation Coordinator

As required by the Zoning Ordinance, an on-site TDM coordinator will be designated for each tenant with 50 or more employees. This person may be the office manager, human resources employee, or other individual serving a dual role in another job.

The person(s) in this role will coordinate with the property owner's overall TDM to help promote a reduced reliance on single-occupant automobile vehicle travel to and from the Site. To that end, the tenant-specific TDM measures identified in the following sections will be implemented under the direction and supervision of this person. Alternatively, the Project's appointed overall TDM coordinator may fulfill the duties outlined below. The final job description for this role will be determined over time, but the duties of the on-site TDM coordinator will include, but not be limited to:

- Assist employees with ride-matching and transportation planning;
- Disseminate information on alternate modes of transportation and information pertaining to pedestrian and cycling access to and from the Site;
- Develop transportation-related marketing and education materials;
- Distribute transit maps and passes; and
- Host an annual mobility management educational meeting for employees.

Retail Tenants

The Proponent will seek to attract a variety of retail shops, restaurants, and service tenants as ground-floor supporting uses. As most of these businesses will be small shops, the same levels of TDM opportunities internal to each individual business will not be as available as with larger employers, but employees who work at the Project will be able to take advantage of the transportation guidance and programs coordinated by the TDM coordinator.

The suite of TDM measures to be implemented in association with the retail shops are fewer than for traditional offices but will still have an impact in reducing single-occupant vehicle travel. The retail TDM program may include the following:

- Improved Site amenities, such as cycling paths and pedestrian crossings, which enhance the ability of employees to walk or cycle to work;
- Ride matching services and transit information provided by the on-site TDM coordinator or MassRIDES;
- Secured bicycle storage with a bicycle repair facility, locker rooms, and showers;
- Promotional events for cyclists, pedestrians, and transit-riders; and
- Direct deposits to employees.

Residential Buildings

Several of the TDM measures will be attractive to new residents. Specifically, the provision of secured bicycle storage (with a bicycle repair facility, locker rooms, and showers), outdoor bicycle racks, pedestrian walkways, and proximity to public transportation (including several bus lines and the new Gilman Square station) should help to minimize the need for vehicular travel and parking spaces.

The residential component of the Project also will need to post and distribute mobility management information. The physical posting of information will be handled by the building manager, and the information will be provided within either a bulletin board or wall display case to be provided in the residential lobby of one of the buildings. These boards/cases will display MBTA maps and schedules for busses in the Project area and for the MBTA Green Line. Maps showing bicycle and pedestrian facilities in the vicinity of the Site also will be posted. Similar information identifying the locations of nearby car-sharing stations, Bluebikes stations, and the availability of carpool/vanpool opportunities also will be posted. Yearly emails with this information also will be sent to Site residents with additional emails sent if there are any notable changes to public transportation schedules, bicycle/pedestrian infrastructure, or the availability of ride-share or car-share services in the area.

SomerVision 2040

The Project is committed to making reasonable efforts to achieve the City's goal to control the percentage of trips made by automobile at 50 percent or less. If annual monitoring and reporting identifies a shortfall in meeting this goal, the Proponent will implement additional mobility management programs and services. With the lack of dedicated vehicle parking on-Site, the Project is expected to exceed the goal having less than 50 percent of trips made by automobile.

TRANSPORTATION IMPACT STUDY

299 Broadway Redevelopment

Somerville, Massachusetts

PREPARED FOR

Mark Development, LLC

Contact:
Mark Development, LLC
275 Grove Street, Suite 2-150
Newton, Massachusetts 02466

PREPARED BY

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

November 2022

This page is intentionally left blank.

Table of Contents

List of Tables

List of Figures

1

Introduction

VHB, on behalf of Mark Development, LLC, (the "Proponent"), has prepared a detailed Transportation Impact Study (TIS or the "Study") for the proposed pedestrian and transit-oriented residential development (the "Project") located at 299 Broadway in Somerville, Massachusetts (the "Site").

The Study quantifies existing traffic conditions without and with the Project and projected future traffic conditions with the Project. The TIS also presents an investigation into the existing and planned public transportation services and bicycling and walking infrastructure. Based on the analysis of the future transportation conditions, the proposed Project's impacts are expected to be mitigated by the lack of parking supply, proximity to public transportation, and robust transportation demand management (TDM) program.

This transportation study has been prepared in conformance with the City of Somerville's Transportation Impact Study (TIS) Guidelines[1]. A transportation scoping letter was submitted to the City of Somerville's Mobility division prior to initiating work on this TIS and the study has been prepared according to the Mobility Division's direction on the TIS scope of work. The transportation scoping letter is included in the Appendix for reference.

Project Summary

The proposed pedestrian and transit-oriented residential development is located at 299 Broadway in the Winter Hill neighborhood of Somerville, Massachusetts. The Site is bordered by Broadway to the south, Temple Street to the west, and a residential neighborhood to the north and east.

Existing Conditions

Under existing conditions, the Site consists of an approximately 27,100 square foot (sf) building previously occupied by a Star Market grocery store that closed in 2007 and an approximately 12,600 sf building currently occupied by a Walgreens pharmacy. A parking lot consisting of approximately

1 *City of Somerville Transportation Impact Study (TIS) Guidelines*, Mobility Division, Mayor's Office of Strategic Planning & Community Development, Revised July 29, 2021.

125 parking spaces is shared by the two buildings as well as by the building at 313 Broadway that is currently occupied by a liquor store and barber shop.

The parking lot is accessed via one driveway on Temple Street and two driveways on Broadway. A third curb cut on Broadway serves the loading dock behind the former Star Market. Both existing buildings will be demolished under proposed conditions with the Project in place.

Proposed Conditions

The proposed development consists of two buildings with a total of approximately 288 residential units and 13,643 sf of ground-floor supporting retail. In addition, one of the buildings will host 3,001 sf of community space (the "Project"). No on-Site vehicle parking will be provided, and the Proponent is pursuing a limited number of neighborhood parking permits. Indoor, secure bicycle parking will be provided with at least one indoor, secure bicycle parking space per residential unit located in ground-floor bicycle rooms in each building with direct outdoor access.

It should be noted that the parcel at 313 Broadway (on the corner of Broadway and Temple Street) is not included in the proposed development. Under the proposed plan, a surface parking lot consisting of approximately seven spaces will remain for the liquor store and barber shop at 313 Broadway and will be accessed via the existing western curb cut on Broadway and the existing cub cut on Temple Street. Access will be one-way with entering vehicles using the curb cut on Broadway and exiting vehicles using the curb cut on Temple Street.

Deliveries for the Project will be accommodated via a single-access driveway on Broadway at the location of the existing curb cut for the loading dock behind the former Star Market. Associated infrastructure improvements along the Site frontage on Broadway will also be provided to accommodate this development, including the designation of a pick-up/drop-off/loading zone on the north side of Broadway along the Site frontage.

The Project provides several public realm improvements. The focal point of the Project will be a new civic plaza fronting Broadway. The civic plaza will be open to members of the public and will serve as a new central gathering place for residents and guests to the Winter Hill neighborhood. On the northern edge of the Site, the Project will include another public open space known as Sewall Park. A pedestrian walkway will be constructed between the civic plaza and Sewall Park, creating a new connection for pedestrians between Broadway and Sewall Street.

Study Methodology

VHB prepared the Study in three stages. The first stage involved an assessment of existing transportation conditions within the Project study area, including an inventory of existing roadway geometry and pedestrian and bicycle accommodations; observations of traffic flow (including daily and peak period multimodal traffic counts); a review of exiting transit services in the study area; and a review of vehicular crash data.

The second stage of the Study established the framework for evaluating the transportation impacts of the Project. Specific travel demand forecasts for the Project were assessed along with existing traffic demand and future traffic demands on the study area roadways resulting from other proposed area

developments that may occur independent of the proposed development. The year 2027, a five-year time horizon, was used, consistent with City of Somerville Transportation Impact Study (TIS) Guidelines for future traffic conditions.

The third and final stage of the Study discusses possible measures to improve existing and future traffic operations in the area and offset the transportation-related impacts associated with the Project.

As part of this evaluation, VHB considered traffic conditions under the following conditions as previously discussed with the City of Somerville's Mobility Division:

- **2022 Existing conditions** – This scenario considers the existing roadway infrastructure and recently observed traffic volumes.
- **2022 Build conditions** – This scenario involves adding the additional Project-generated traffic to the 2022 Existing volumes on the existing roadway network.
- **2027 Build conditions** – This scenario involves adding site-specific traffic generated by other definitively-known development projects to 2022 Build conditions on the future roadway network. Traffic generated by these definitively-known development projects was obtained from available project traffic studies or estimated as part of this evaluation. No background growth rate was used as confirmed by the City of Somerville Mobility Division.

Details on each condition considered as part of this evaluation are included in subsequent sections of this TIS.

2

Existing Conditions

Evaluation of the transportation impacts associated with the Project requires a thorough understanding of the existing transportation conditions in the study area including roadway geometry, traffic controls, multimodal daily and peak-hour traffic flow, public transportation services, and traffic safety data. Each of these elements is described in detail below.

Site Conditions

The Site is bordered by Broadway to the south, Temple Street to the west, and a residential neighborhood to the north and east. Figure 1 shows the Site location map.

The Site is currently occupied by a 12,576 square foot (sf) Walgreens store located in the northwest corner of the Site and a 27,130 sf vacant building in the southeast corner of the Site that was previously occupied a Star Market until 2008. Both buildings will be demolished under proposed conditions with the Project in place.

The Site is located in a mainly residential and commercial area. Figure 2 shows land uses surrounding the Site.

Existing Site Access

Existing Site access is provided via two unsignalized curb-cuts located along Broadway and one unsignalized curb-cut along Temple Street. A third curb cut on Broadway serves the loading dock behind the former Star Market.

Figure 1: Site Location Map

299 Broadway | Somerville, Massachusetts

October 2022

Source: MassGIS

Figure 2: Study Area Land Uses

299 Broadway | Somerville, Massachusetts

October 2022

Note: Many sites zoned "mixed use" are currently only commercial uses.

Source: MassGIS, Somerville Zoning Map

Study Area

The following intersections and their approach roadways were included in the assessment based on the direction of the City of Somerville Mobility Division. The study area intersections are shown in Figure 3.

- Broadway at School Street – *signalized*
- Broadway at Temple Street – *signalized*
- Broadway at West Site Driveway/ Marshall Street – *mostly unsignalized*[2]
- Broadway at Walnut Street – *default flashing signal, pedestrian/emergency activated*
- Broadway at Fellsway West – *default flashing signal, pedestrian/emergency activated*
- Temple Street at Site Driveway – *unsignalized*
- Temple Street at Heath Street/Sewall Street – *unsignalized*
- Temple Street at Jaques Street – *signalized*

Roadway and Intersection Geometry

Descriptions of the study area roadways and intersections are provided below, including lane configurations, traffic control, roadway jurisdiction, and existing bicycle and pedestrian infrastructure. Figure 4 presents the existing study area intersection lane geometry and traffic control.

Roadways

Broadway

Broadway falls under local City of Somerville jurisdiction and is classified as an urban minor arterial roadway west of Route 28 (McGrath Highway). Broadway generally runs east/west and provides access across the City of Somerville from Arlington in the west to Charlestown in the east, with connections to Route 16 and Route 28 (McGrath Highway). In the vicinity of the Site, Broadway has a single general vehicular travel lane in each direction, with additional lanes at major intersections. In the eastbound direction, a shared bus and bike lane is provided between Main Street and Route 28 (McGrath Highway). In the westbound direction, separate bus and protected bike lanes are provided between Route 28 (McGrath Highway) and Fellsway West, a shared bus and bike lane is provided between Fellsway West and Temple Street, and separate bus and protected bike lanes are provided between Temple Street and Main Street. Sidewalks are provided on both sides of the roadway and crosswalks across Broadway are provided at School Street, Temple Street, and Walnut Street in the study area. Within the study area limits, short-term metered parking is available on the south side of the roadway and on-street parking is prohibited on the north side, except for short segments between Walnut Street and Temple Street. Parking regulations vary outside the study area limits. The posted speed limit is 25 mph. Land use along Broadway is primarily commercial and residential.

2 The westbound left-turn movement at the intersection of Broadway at West Site Driveway / Walnut Street is under signalized control while all other movements at the intersection are unsignalized.

Figure 3: Study Area Intersections

299 Broadway | Somerville, Massachusetts

October 2022

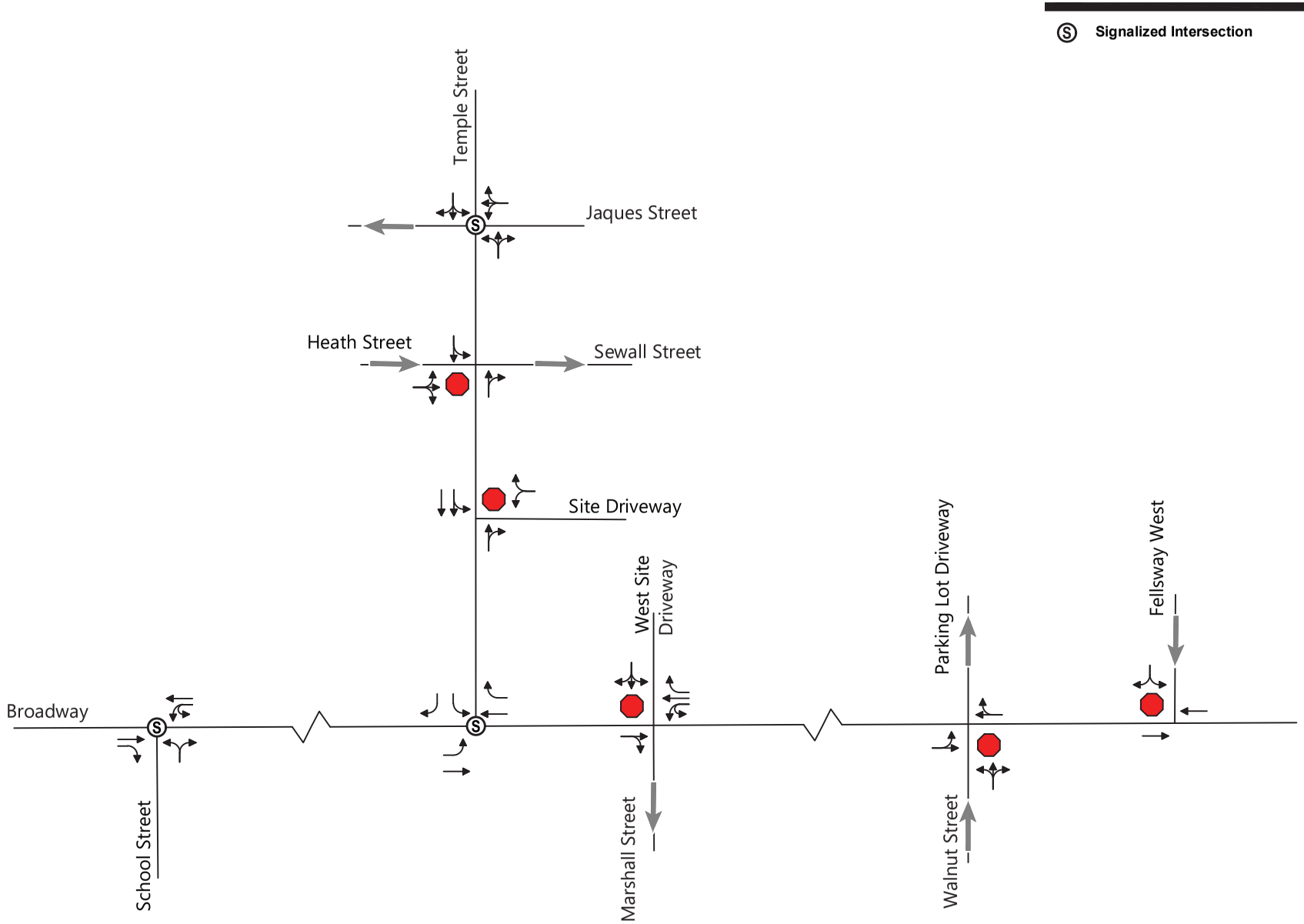
\\vhb.com\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\Graphics\FIGURES\TIS Figures.indd

(#) Signalized Intersection

(#) Unsignalized Intersection

1. Broadway at School Street
2. Broadway at Temple Street
3. Broadway at Marshall Street/West Site Driveway
   (westbound left-turn movement under signalized control)
4. Broadway at Walnut Street
   (default flashing signal, pedestrian/emergency activated)
5. Broadway at Fellsway West
   (default flashing signal, pedestrian/emergency activated)
6. Temple Street at Site Driveway
7. Temple Street at Heath Street/Sewall Street
8. Temple Street at Jacques Street

Source: MassGIS



Not to Scale

Figure 4
Intersection Lane Geometry and Traffic Control

299 Broadway
Somerville, Massachusetts

School Street

School Street falls under local City of Somerville jurisdiction and is classified as an urban collector roadway. School Street generally runs north/south and has a single travel lane in both directions. Sharrow pavement markings exist in both directions and sidewalks are provided along both sides of the roadway with crosswalks at major intersections. Parking by permit is allowed on both sides of School Street. The posted speed limit in the northbound direction is 25 mph and the posted speed limit in the southbound direction departing Broadway is 20 mph. Land use along School Street is primarily commercial and residential.

Temple Street

Temple Street falls under local City of Somerville jurisdiction and is classified as an urban collector roadway. Temple Street generally runs north/south and has a single travel lane in both directions with an additional turn lane at Broadway. On-road bicycle lanes are provided in each direction. Sidewalks are provided along both sides of the roadway, with crosswalks across Temple Street at Jaques Street and Sydney Street. Parking by permit is allowed on both sides of Temple Street. South of Jaques Street, the posted speed limit is 20 mph in both directions. Land use along Temple Street is primarily commercial and residential.

Walnut Street

Walnut Street falls under local City of Somerville jurisdiction and is classified as an urban collector roadway. Walnut Street is one-way northbound. No formal bicycle accommodations are provided. Sidewalks are provided along both sides of the roadway, with crosswalks at various intersections. Parking by permit is allowed on both sides of Walnut Street. The posted speed limit is 20 mph in the study area. Land use along Walnut Street is primarily residential.

Fellsway West

Fellsway West falls under Department of Conservation and Recreation (DCR) jurisdiction and is classified as an urban collector roadway. Fellsway West is one-way southbound connecting Mystic Avenue and Broadway. No formal bicycle accommodations are provided. Sidewalks are provided along both sides of the roadway, with crosswalks at each intersection. Parking by permit is allowed on both sides of Fellsway West. The posted speed limit is 20 mph. Land use along Fellsway West is primarily residential and civic, with residences on the west side and Foss Park on the east side.

Intersections

Broadway at School Street

School Street intersects Broadway from the south to form a three-legged signalized intersection. The eastbound Broadway approach consists of a through lane and a shared bus/bike lane from which passenger vehicles can turn right. The westbound Broadway approach consists of a left-turn lane, a through lane, a bus lane, and a protected bike lane. The northbound School Street approach consists of a single general-purpose lane. School Street has sharrow pavement markings in both directions.

Sidewalks exist along both sides of all roadways with crosswalks across each approach. Land use around the intersection is a mix of commercial and residential.

Broadway at Temple Street

Temple Street intersects Broadway from the north to form a three-legged signalized intersection. The eastbound Broadway approach consists of a left-turn lane, a through lane, and a shared bus/bike lane. The westbound Broadway approach consists of a through lane, a shared bus/bike lane, and a right-turn lane. A westbound buffered bike lane begins on the west side of the intersection and continues along Broadway. The southbound Temple Street approach consists of a left-turn lane and a right-turn lane. On-road bicycle lanes exist in both directions along Temple Street, with the southbound bike lane transitioning to sharrow pavement markings approximately 150 feet prior to its intersection with Broadway. Sidewalks exist along both sides of all roadways with crosswalks across the north and east legs of the intersection. Land use around the intersection is a mix of commercial and residential.

Broadway at Marshall Street/West Site Driveway

Marshall Street and the existing West Site Driveway intersect Broadway from the south and north respectively to form a four-legged intersection. The eastbound Broadway approach consists of a through lane and a shared bus/bike. The westbound Broadway approach consists of a left-turn lane, a through lane, and a shared bus/bike lane. The westbound left-turn movement onto Marshall Street is under signal control while the westbound through and right-turn movements are free-flowing. Eastbound traffic at this location is free flowing but is managed by the signal at Temple Street to allow for westbound left-turns onto Marshall Street. Marshall Street is one-way southbound for vehicles and provides a contraflow northbound bicycle lane. A green bike box is provided in the Broadway median for bicyclists turning left from Marshall Street northbound to Broadway westbound. The West Site Driveway consists of a single right-turn lane which is unsigned but operates under stop-control. Sidewalks exist along both sides of Broadway and Marshall Street, with a crosswalk provided across Marshall Street. Land use around the intersection is a mix of commercial and residential.

Broadway at Walnut Street

Walnut Street intersects Broadway from the south and a parking lot driveway intersects Broadway from the north to form a four-legged intersection. The intersection has a flashing signal that is activated by pedestrians on the crosswalk to the east and the fire station in the southwest corner of the intersection to stop traffic from all approaches. The default control for the through movements on Broadway is flashing yellow (free flow) while the default control for movements on Walnut Street is flashing red (stop-controlled). The eastbound Broadway approach consists of a single vehicle travel lane and a shared bus/bike lane. The westbound Broadway approach consists of a single vehicular travel lane, a bus lane, and a buffered bicycle lane which merges with the bus lane departing the intersection. Walnut Street is one-way northbound and consists of a single general-purpose lane. The parking lot driveway operates as entrance-only. A signalized crosswalk exists across the west leg of the intersection, and an unsignalized crosswalk is provided across Walnut Street. Sidewalks are provided along both sides of Broadway and Marshall Street. Land use around the intersection is a mix of commercial, residential, and civic.

Broadway at Fellsway West

Fellsway West intersects Broadway from the north to form a three-legged intersection. The intersection has a flashing signal that is activated by pedestrians on the crosswalk to the west and the fire station in the southwest corner of the intersection of Broadway at Walnut Street to stop traffic from all approaches. The default control for the through movements on Broadway is flashing yellow (free flow) while the default control for movements on Fellsway West is flashing red (stop-controlled). The eastbound Broadway approach consists of a single vehicle travel lane and a shared bus/bike lane. The westbound Broadway approach consists of a single vehicular travel lane, a bus lane, and a buffered bicycle lane. Fellsway West is one-way southbound and consists of a single general-purpose lane. No crosswalks are provided directly at the Broadway intersection. Sidewalks are provided along both sides of Broadway and Fellsway West. Land use around the intersection is a mix of commercial, residential, and civic. Foss Park is located in the northeast corner of the intersection.

Temple Street at Site Driveway

The Site Driveway intersects Temple Street from the east to form a three-legged unsignalized intersection. The northbound Temple Street approach consists of a one general-purpose lane and a bike lane. The southbound Temple Street approach consists of one general purpose lane which splits into two lanes for the Broadway approach directly at the intersection. The Site driveway consists of a single general-purpose lane. Sidewalks exist along both sides of Temple Street. Land use around the intersection is a mix of commercial and residential.

Temple Street at Heath Street/Sewall Street

Temple Street is intersected by Heath Street from the west and Sewall Street from the east to form a four-legged unsignalized intersection. Heath Street is one-way approaching the intersection and consists of a single stop-controlled general-purpose lane. Sewall Street is one-way departing the intersection and consists of a single departing lane. The northbound and southbound Temple Street approaches each consist of a single general-purpose lane and an on-road bicycle lane. Crosswalks exist across the minor streets and sidewalks exist along both sides of all roadways. Land use around the intersection is a mix of commercial and residential.

Temple Street at Jaques Street

Temple Street runs north/south and is bisected by Jaques Street from the east and west to form a four-legged signalized intersection. West of the intersection, Jaques Street is one-way departing the intersection and consists of a single departing lane. East of the intersection, Jaques Street has bi-directional traffic flow and acts as a “courtesy” street where vehicles must make room for each other to pass due to the narrow width of the roadway between vehicles parked on each side. The northbound and southbound Temple Street approaches each consist of a single general-purpose lane and an on-road bicycle lane. Crosswalks exist across all intersection legs and sidewalks exist on both sides of all roadways. Land use around the intersection is a mix of commercial and residential.

Bicycle Network

Bicycle accommodations were recently improved on Broadway in 2019 between Main Street and Route 28 (McGrath Highway). In the eastbound direction, a shared bus and bike lane is provided between Medford Street and Route 28 (McGrath Highway). In the westbound direction, separate bus and protected bike lanes are provided between Route 28 (McGrath Highway) and Walnut Street, a shared bus and bike lane is provided between Walnut Street and Temple Street, and separate bus and protected bike lanes are provided between Temple Street and Main Street. The shared bus and bike lanes are painted red with sharrows and "BUS BIKE ONLY" pavement markings.

Bicycle accommodations have also been recently improved on other study area roadways. Bike lanes were painted on Temple Street in 2019 in both the northbound and southbound directions, with sharrow markings north of Derby Street in the northbound direction. Marshall Street was given a contraflow bike lane in the northbound direction and sharrows in the southbound direction in 2018. School Street was refreshed with green painted sharrows in both directions in 2017. All other study area roadways have no formal bicycle accommodations, as they are primarily local residential streets with low vehicle speeds.

Figure 5 shows the existing bicycle facilities within the area.

Bluebikes Stations

Bluebikes began operating in July 2011 and currently provides over 4,000 bikes at more than 400 bike-sharing stations across 11 municipalities in Metro Boston. The closest permanent Bluebikes bike share station to the Site is located approximately 0.1 miles to the east at Foss Park along Broadway, in the northeast corner of the intersection of Broadway at Walnut Street. That station includes approximately 15 bicycle docks.

Pedestrian Network

Sidewalks exist along both sides of all streets in the study area, with ADA-compliant sidewalk ramps at major intersections. The sidewalks are generally in good condition.

Figure 6 illustrates the existing pedestrian network with 0.25-miles of the Site, including the locations of the nearest bus stops, Bluebikes station, and Zipcar rental station.

Figure 5: Existing Bicycle Network

299 Broadway | Somerville, Massachusetts

October 2022

- Shared Bus and Bike Lane
- Protected Bike Lane
- Bike Lane
- Sharrow Pavement Markings
- Bluebikes Station

Source: MassGIS

Figure 6: Existing Pedestrian Network

299 Broadway | Somerville, Massachusetts

October 2022

Sidewalk

Crosswalk

Bluebikes Station

ZipCar Location

MBTA Bus Stop

Source: MassGIS

Traffic Volumes

In compliance with the City of Somerville TIS Guidelines, turning movement counts (TMCs) were conducted at study area intersections on Thursday, May 19, 2022, for 14 hours (6:00 AM – 8:00 PM) and on Saturday, May 21, 2022, for four hours (10:00 AM – 2:00 PM). Concurrent with the TMCs, daily traffic volumes and speed data were collected on Broadway, Temple Street, and Sewall Street over a 72-hour period (Thursday through Saturday) using automatic traffic recorders (ATRs). These dates represent typical days for traffic count purposes (non-holidays) while local schools were in session.

Vehicle Volumes

The May 2022 counts were considered existing without any adjustments, as directed by the City of Somerville Mobility Division and consistent with current MassDOT guidance.

Daily Roadway Volumes

The ATR data collected on Broadway, Temple Street, and Sewall Street during May 2022 is summarized in Table 1. All traffic count data is included in the Appendix.

Table 1 Observed Traffic Volumes

		Weekday Daily[a]	Weekday Morning Peak Hour			Weekday Evening Peak Hour			Saturday Daily	Saturday Midday Peak Hour		
Location		Volume	Volume[b]	K Factor[c]	Dir. Dist.[d]	Volume	K Factor	Dir. Dist.	Volume	Volume	K Factor	Dir. Dist.
Broadway, west of Sargent Avenue	EB	9,800	750			645			9,200	685		
	WB	7,800	500		EB	660		WB	6,800	425		EB
	Total	17,600	1,250	7.1%	60%	1,305	7.4%	51%	16,000	1,100	7.0%	62%
Temple Street, north of Site Driveway	NB	3,600	240			275			3,200	255		
	SB	6,500	450		SB	430		SB	6,400	430		SB
	Total	10,100	690	6.9%	65%	705	7.0%	61%	9,600	685	7.1%	63%
Sewall Street, east of Temple Street	EB[e]	500	35	6.7%	EB 100%	50	9.4%	EB 100%	500	35	7.6%	EB 100%

Source: VHB; Based on automatic traffic recorder (ATR) counts conducted in May 2022.
Note: Peak hours do not necessarily with the peak hours of turning movement counts.
a Average Daily Traffic volume, expressed in vehicles per day
b Peak period traffic volume, expressed in vehicles per hour
c Represents the percent daily traffic which occurs during the peak hour
d Directional distribution of peak hour traffic
e Sewall Street is one-way eastbound

As shown in Table 1, Broadway, west of Sargent Avenue, carries approximately 17,600 vehicles on a typical weekday, with the morning and evening peak hours accounting for 7.1 percent and 7.4 percent of the daily traffic flow, respectively. Broadway, west of Sargent Avenue, carries approximately 16,000 vehicles on a typical Saturday, with the midday peak hour accounting for 7.0 percent of the daily traffic flow. The predominant flow of traffic along Broadway is in the eastbound

direction during the weekday morning and Saturday midday peak hours and is nearly evenly split during the weekday evening peak hour.

Temple Street, north of the Site driveway, carries approximately 10,100 vehicles on a typical weekday, with the morning and evening peak hours accounting for 6.9 percent and 7.0 percent of the daily traffic flow, respectively. Temple Street, north of the Site driveway, carries approximately 9,600 vehicles on a typical Saturday, with the midday peak hour accounting for 7.1 percent of the daily traffic flow. The predominant flow of traffic along Temple Street is in the southbound direction during all peak hours.

Sewall Street, east of Temple Street, carries approximately 500 vehicles on a typical weekday, with the morning and evening peak hours accounting for 6.7 percent and 9.4 percent of the daily traffic flow, respectively. Sewall Street, east of Temple Street, carries approximately 500 vehicles on a typical Saturday, with the midday peak hour accounting for 7.6 percent of the daily traffic flow. Sewall Street is one-way in the eastbound direction.

Seasonal Adjustment

Seasonal factors published by MassDOT[3] were reviewed for the months in which traffic data was collected. For May, traffic volumes were shown to be higher than or equal to average-month conditions, so no seasonal factors were applied for a conservative analysis. The MassDOT seasonal factor data are included in the Appendix.

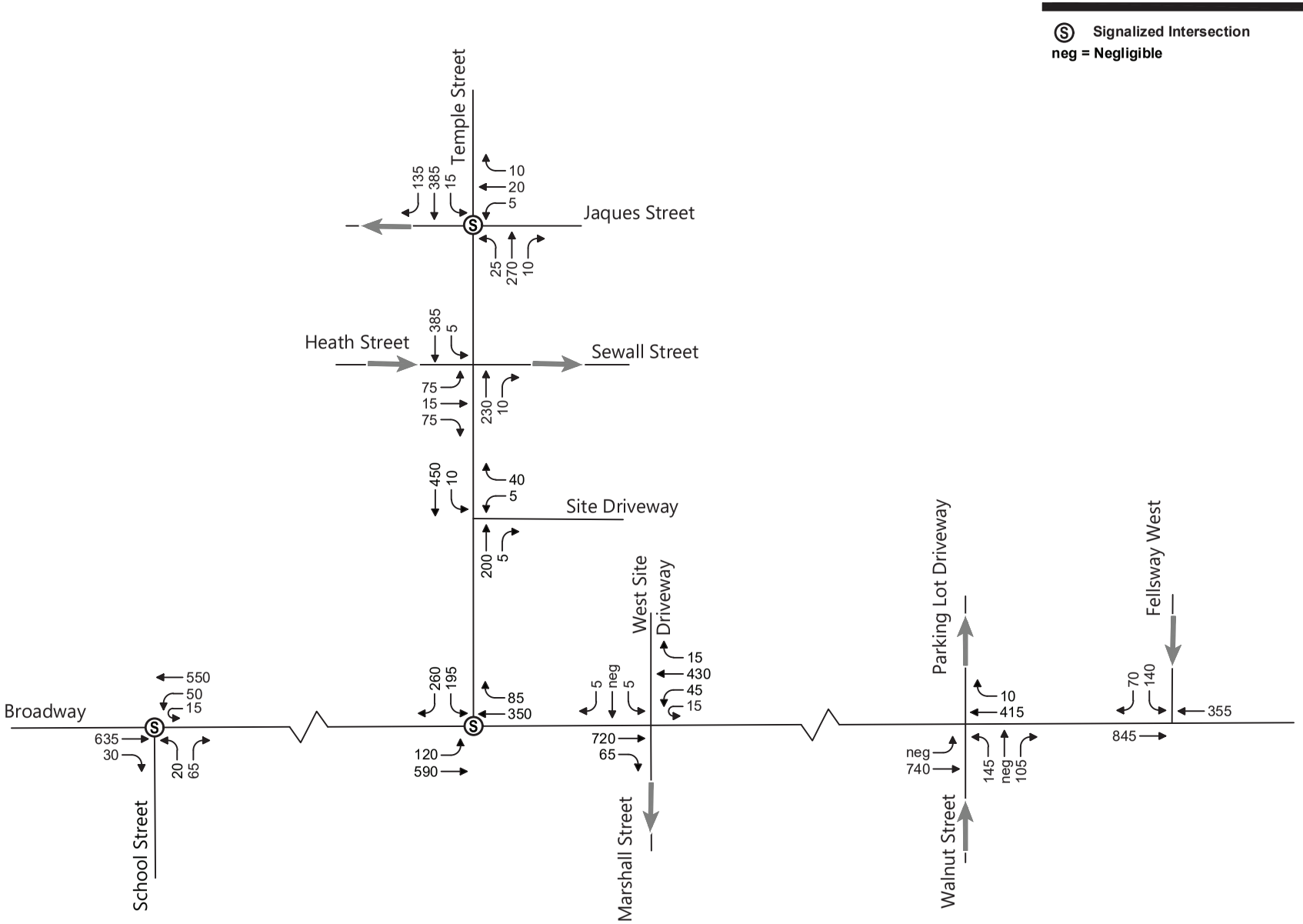
2022 Existing Peak Hour Traffic Volumes

The May 2022 turning movement counts were used as-is with no adjustments. The peak hours for the study area were found to be 7:45-8:45 AM for the weekday morning, 5:30-6:30 PM for the weekday evening, and 12:15-1:15 PM for the Saturday midday. The resulting 2022 Existing conditions weekday morning, weekday evening, and Saturday midday peak hour vehicular traffic volumes are shown in Figures 7, 8, and 9, respectively.

Bicycle and Pedestrian Volumes

As part of the traffic data collection effort for the Project, bicycle and pedestrian volumes were observed during the same weekday morning, weekday evening, and Saturday midday peak hours. The Existing conditions weekday morning, weekday evening, and Saturday midday peak hour bicycle traffic volumes are shown in Figures 10, 11, and 12 respectively. The Existing conditions weekday morning, weekday evening, and Saturday midday peak hour pedestrian traffic volumes are shown in Figures 13, 14, and 15, respectively. The bicycle and pedestrian volumes are included in the traffic count data provided in the Appendix.

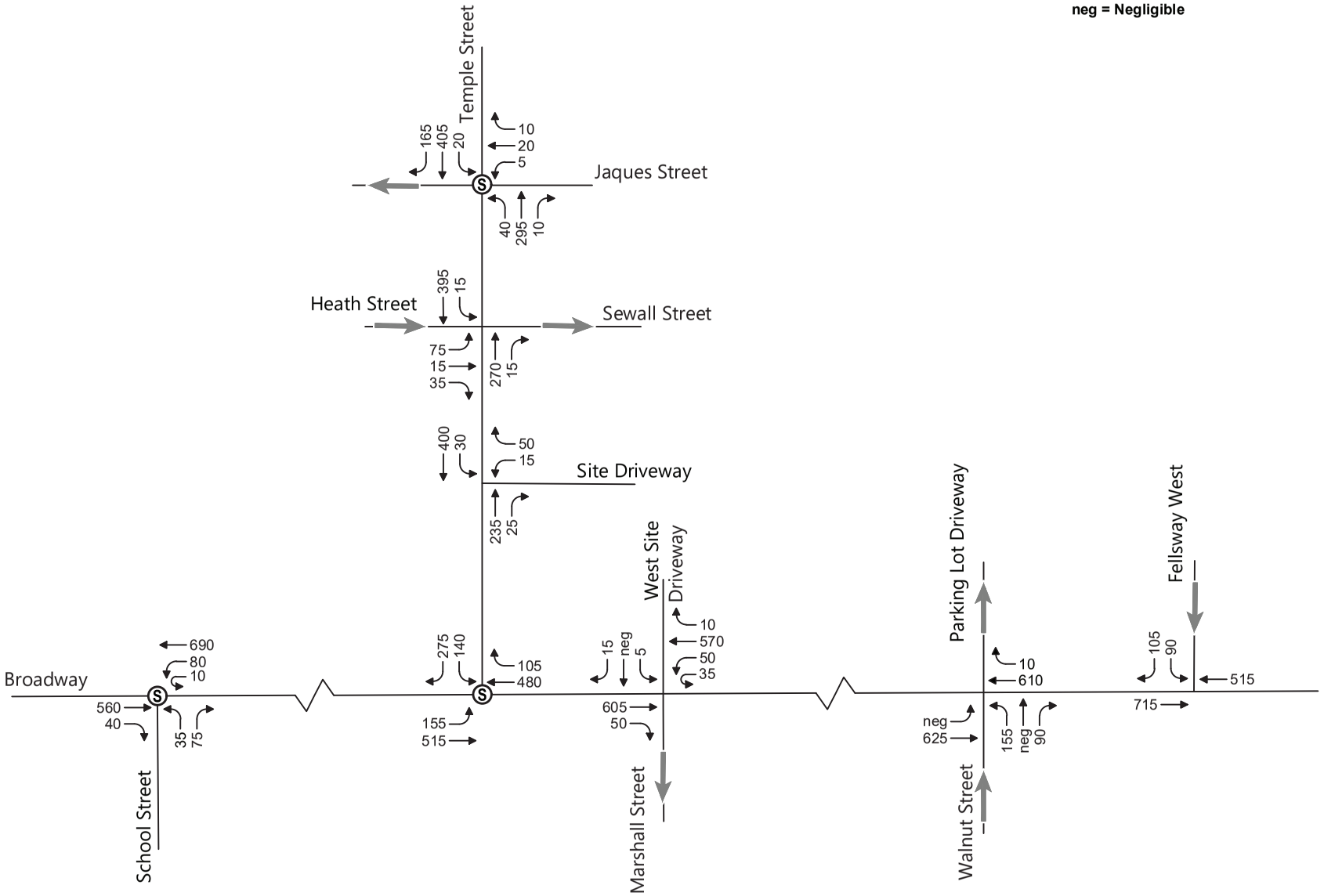
3 MassDOT 2019 Seasonal Adjustment Factors



Not to Scale

Figure 7

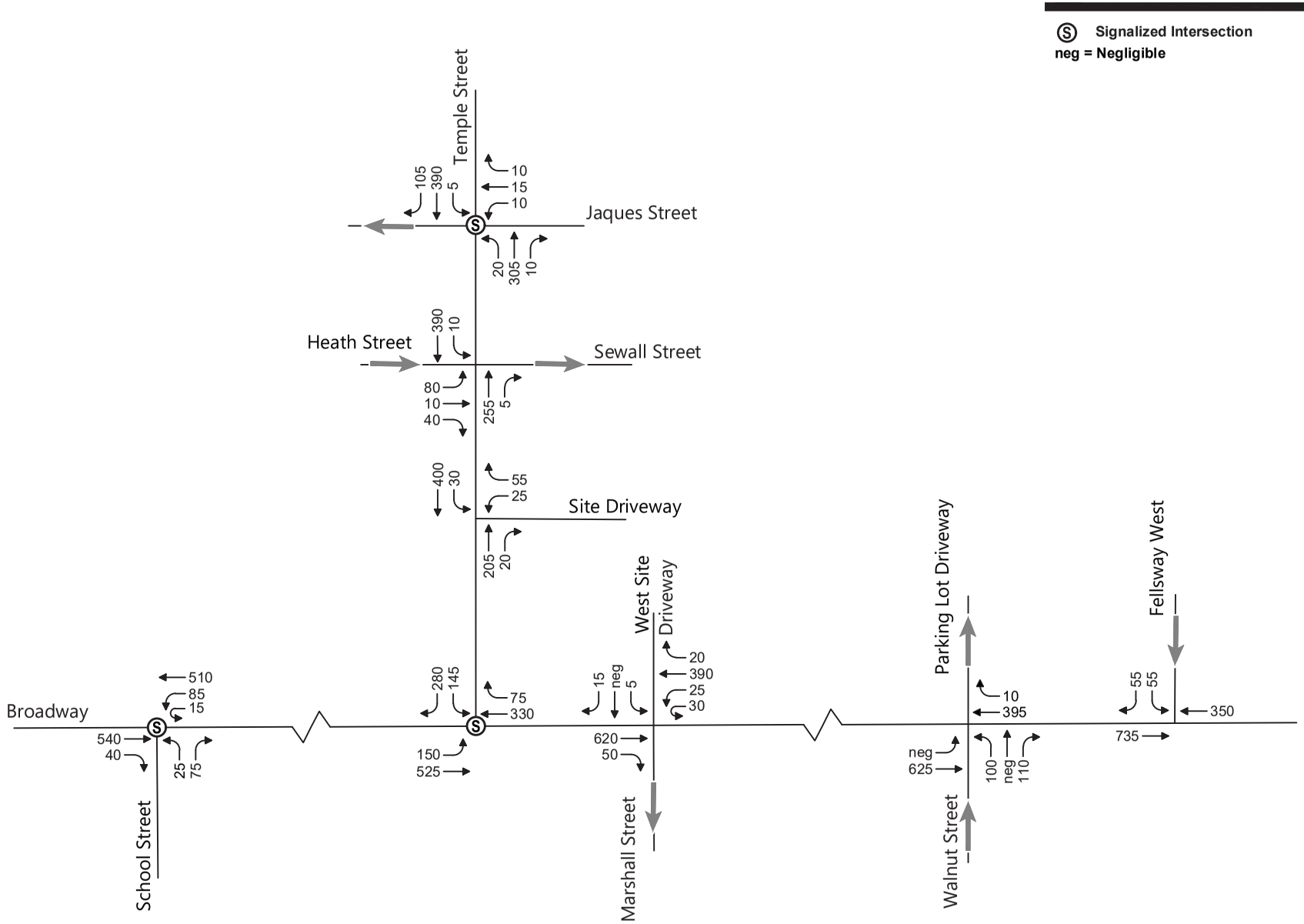
2022 Existing Conditions
Weekday Morning Peak Hour Traffic Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

Figure 8

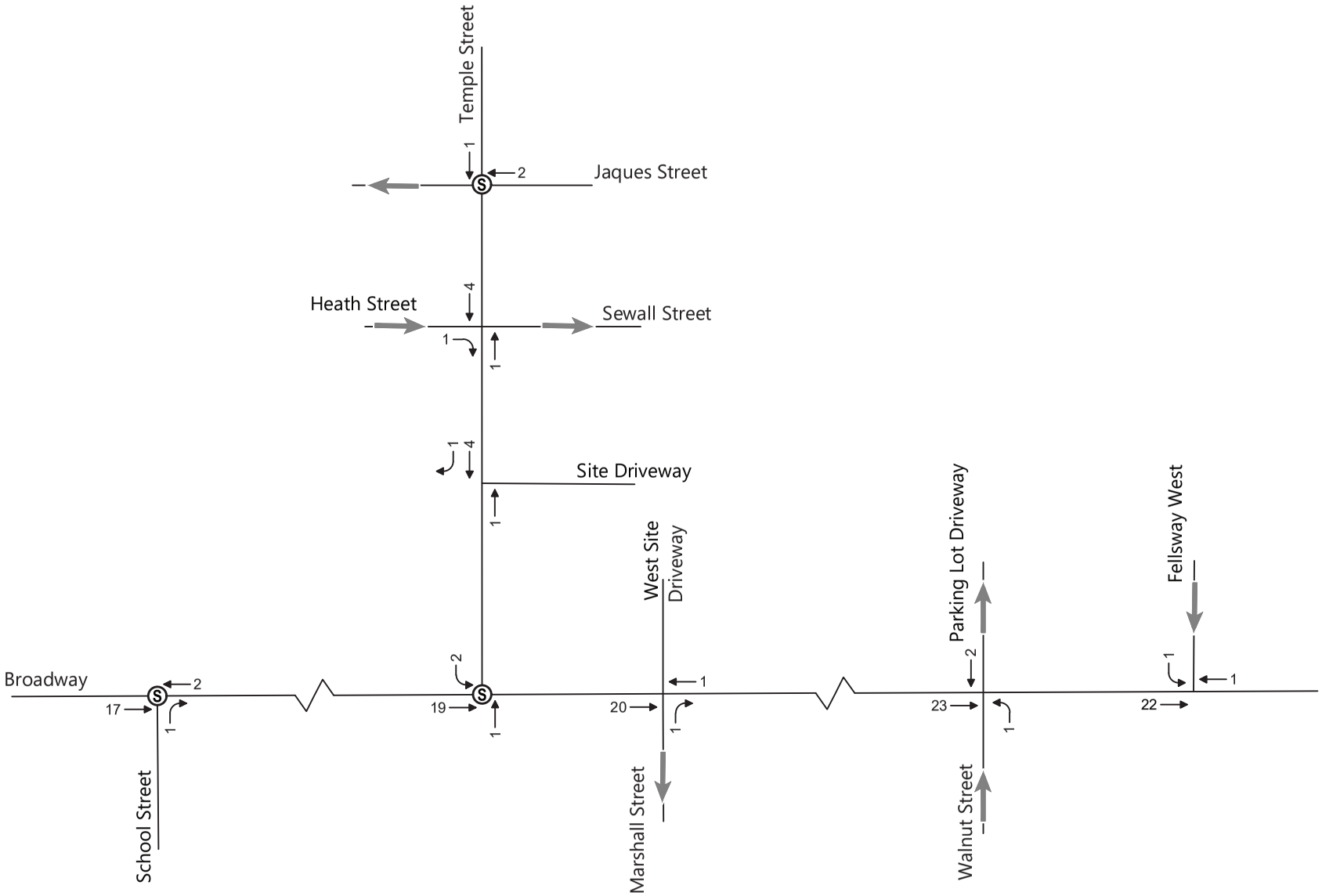
2022 Existing Conditions
Weekday Evening Peak Hour Traffic Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

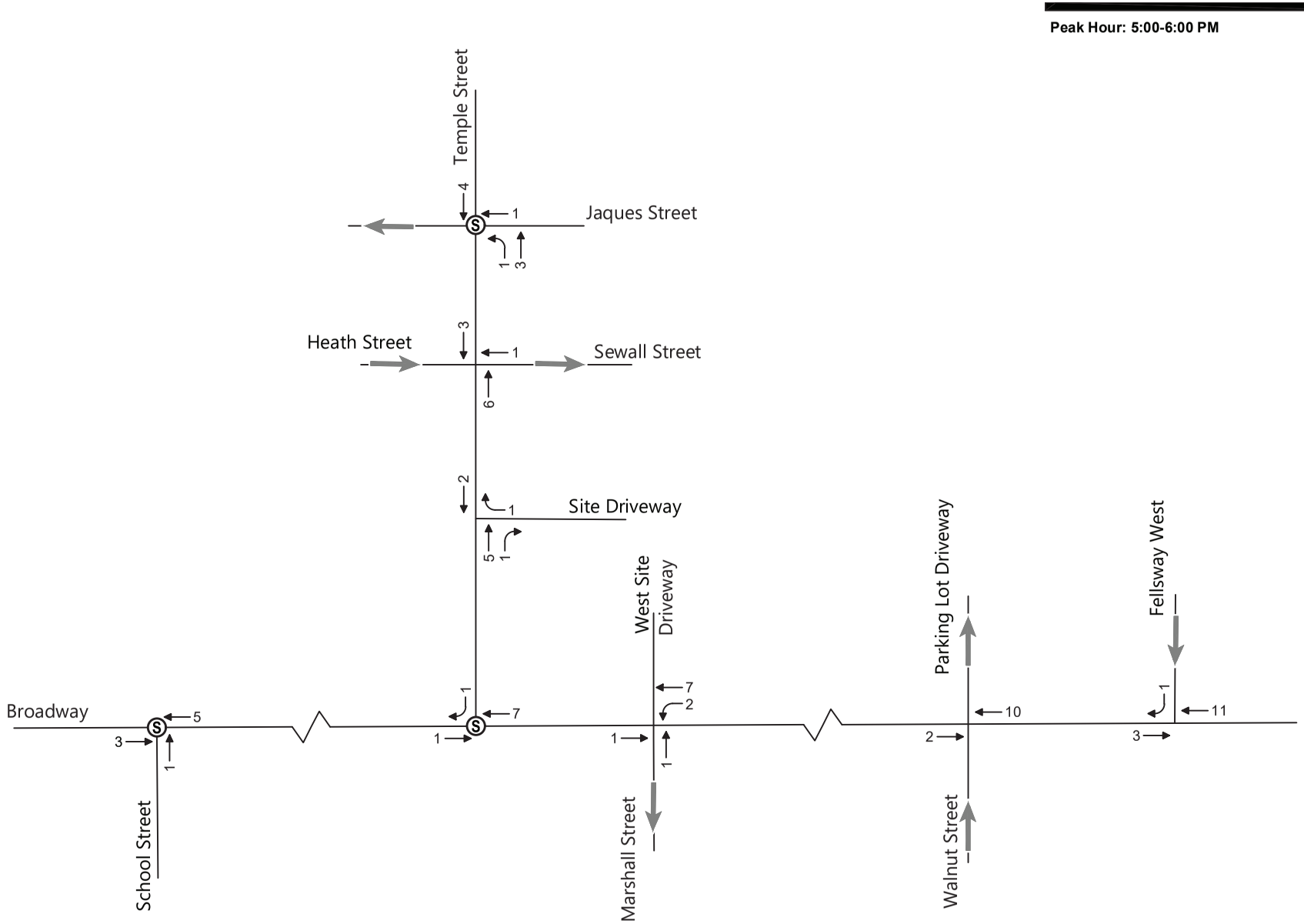
Figure 9
2022 Existing Conditions
Saturday Midday Peak Hour Traffic Volumes
299 Broadway
Somerville, Massachusetts

Peak Hour: 7:45-8:45 AM



Not to Scale

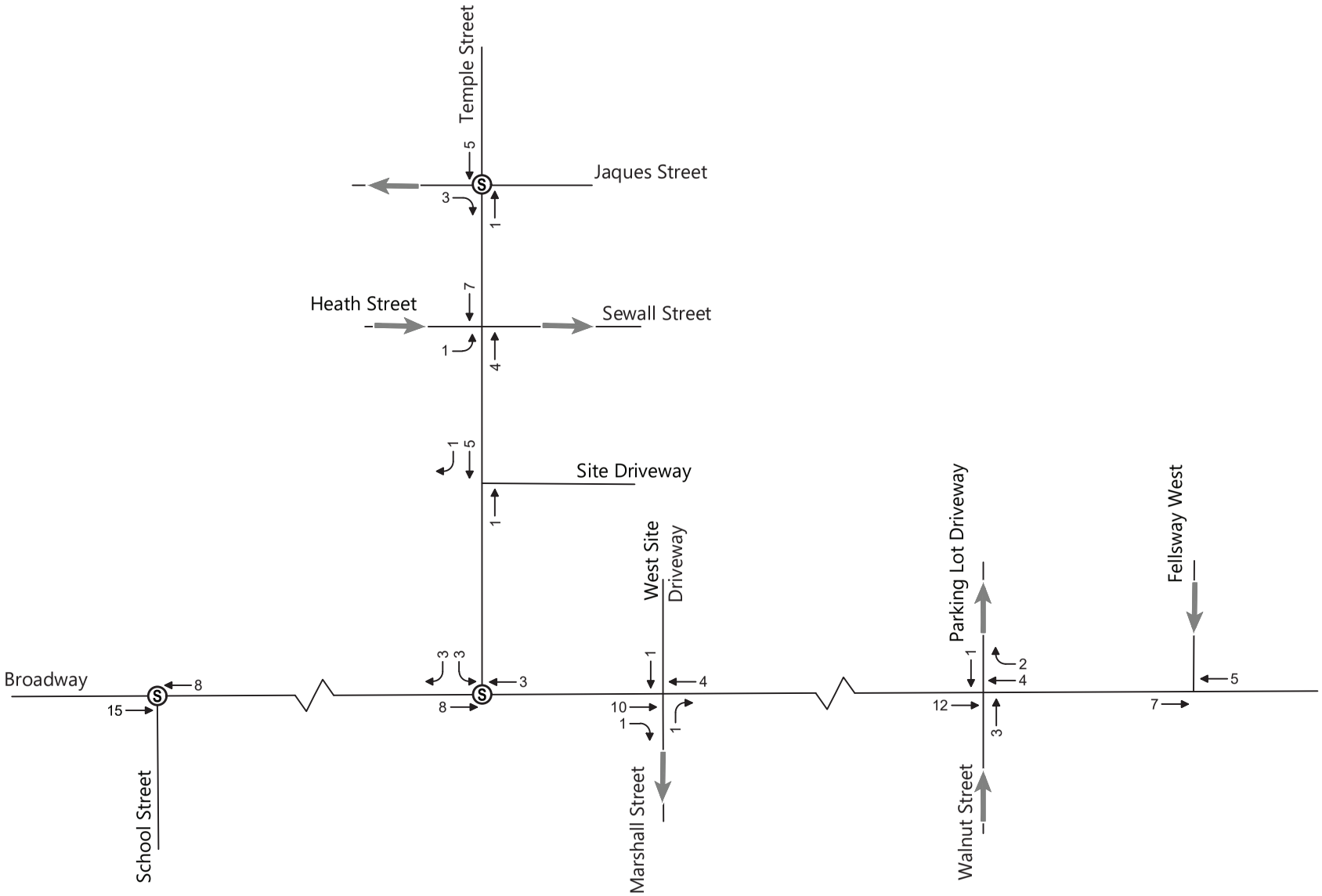
Figure 10
2022 Existing Conditions
Weekday Morning Peak Hour Bicycle Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

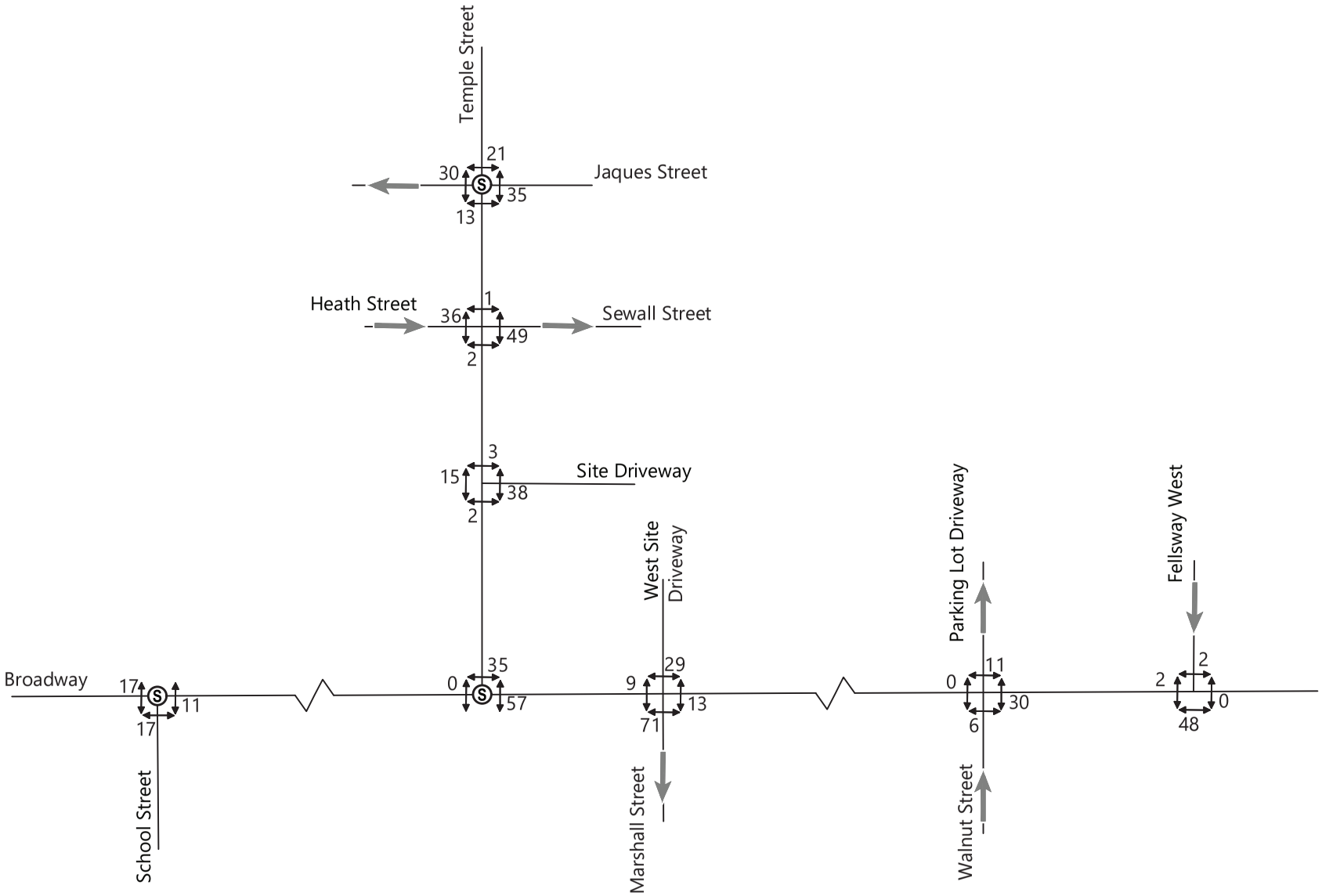
Figure 11
2022 Existing Conditions
Weekday Evening Peak Hour Bicycle Volumes
299 Broadway
Somerville, Massachusetts

Peak Hour: 11:30 AM - 12:30 PM



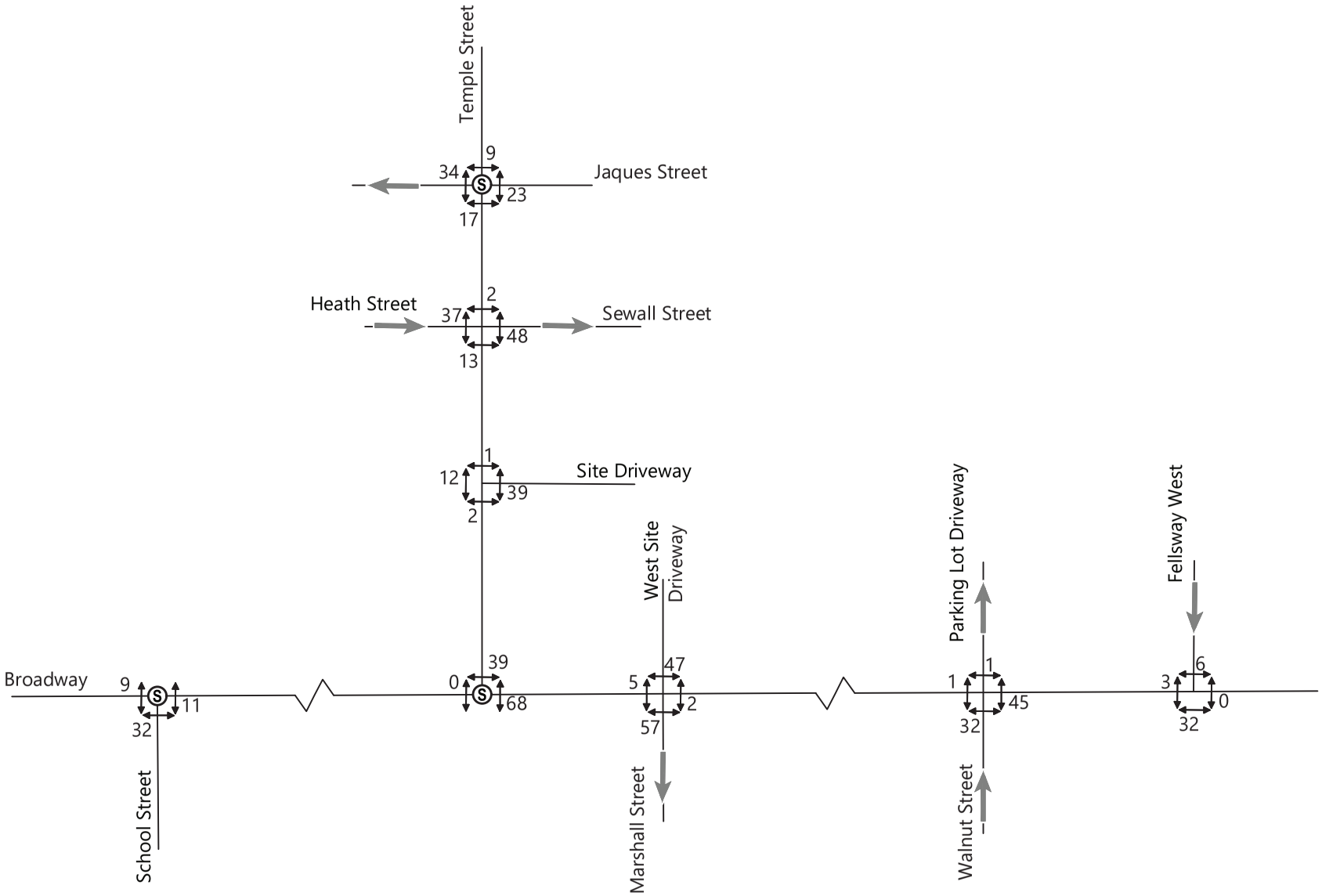
Not to Scale

Figure 12
2022 Existing Conditions
Saturday Midday Peak Hour Bicycle Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

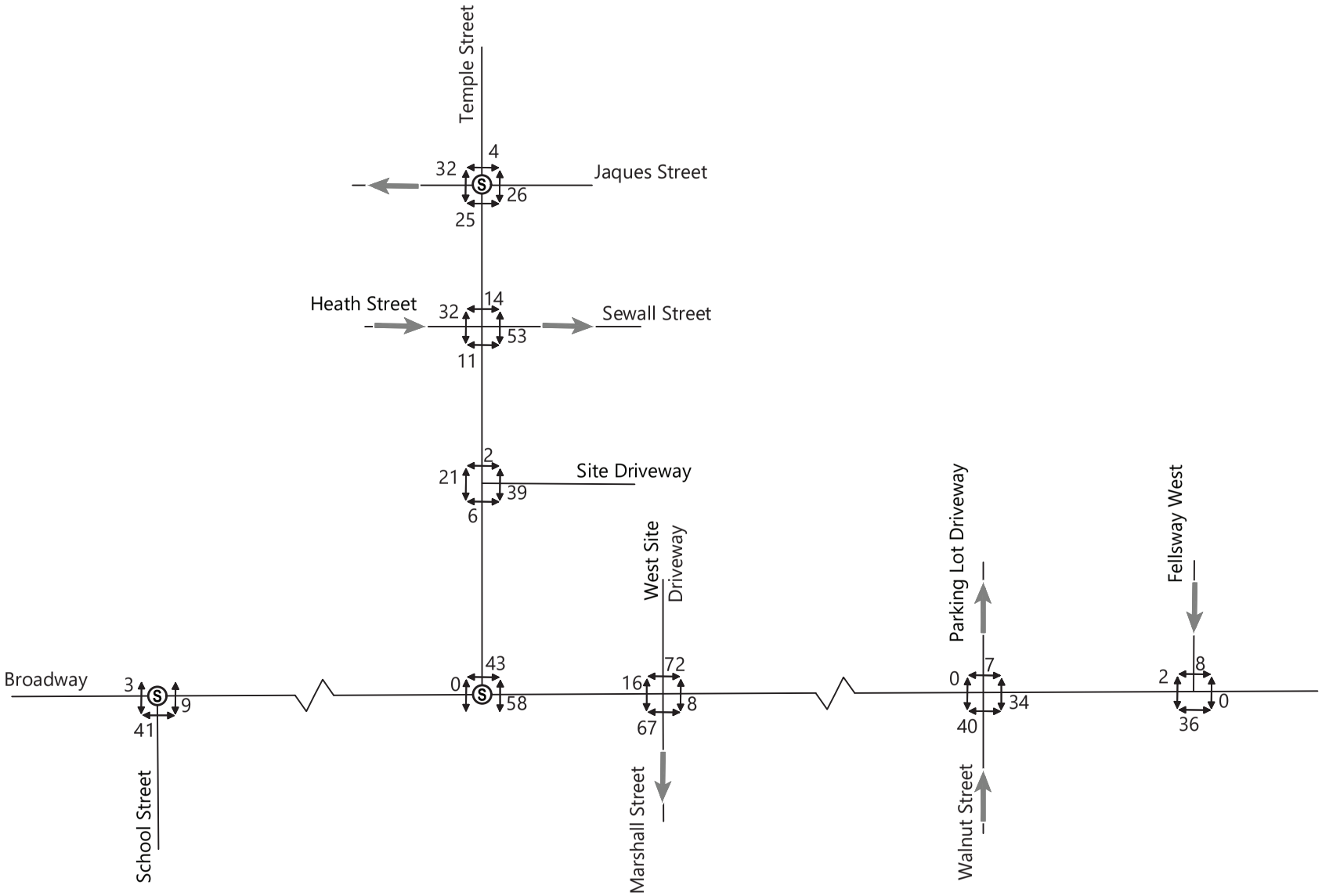
Figure 13
2022 Existing Conditions
Weekday Morning Peak Hour Pedestrian Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

Figure 14

2022 Existing Conditions
Weekday Evening Peak Hour Pedestrian Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

Figure 15
2022 Existing Conditions
Saturday Midday Peak Hour Pedestrian Volumes
299 Broadway
Somerville, Massachusetts

Public Transportation

Ample public transportation services by the Massachusetts Bay Transportation Authority (MBTA) currently are provided in the study area, with significant enhancements planned and under construction. A summary of existing public transportation amenities in the area is provided below, with a discussion of the future transit improvement projects and planning studies in the following chapter.

The Project study area is currently served by five MBTA bus routes within one-half mile of the Project Site. The nearest outbound bus stop is located adjacent to the Site is Broadway at Temple Street and the nearest inbound bus stop is Broadway at Marshall Street. Both stops are served by MBTA Bus Routes 89 and 101. MBTA Bus Routes 89 and 101 travel along Broadway in the project area. MBTA Bus Route 90 also travels along Broadway east of Cross Street, with the nearest stop to the Project Site located at the intersection of Broadway at Cross Street. South of the Project Site, MBTA Bus Route 80 travels along Medford Street and Pearl Street, parallel to Broadway, with the nearest stop at the intersection of Medford Street at School Street. North of the Project Site, MBTA Bus Route 95 travels along Mystic Avenue, with the nearest stop at the intersection of Mystic Avenue at Temple Street.

The existing MBTA bus routes as well as future Green Line Extension service (expected to open in late 2022) are shown graphically in Figure 15.

Ridership Data

Ridership data for MBTA bus services within the study area is summarized in Table 2. All existing data is from Fall 2019 as it is reflective of typical pre-pandemic conditions.

Table 2 MBTA Ridership of Routes Serving the Project Area

Bus Route	Origin/ Destination	Direction	Weekday	Saturday	Sunday
80	Arlington Center – Lechmere Station	Inbound	834	495	292
		Outbound	788	408	274
		Total	1,622	903	566
89	Clarendon Hill or Davis Square - Sullivan Square Station	Inbound	1,713	901	492
		Outbound	1,766	813	478
		Total	3,479	1,714	970
90	Davis Square – Assembly Row	Inbound	549	266	187
		Outbound	525	299	144
		Total	1,074	565	331
95	West Medford or Arlington Center – Sullivan Square Station	Inbound	737	322	177
		Outbound	690	326	168
		Total	1,427	648	345
101	Malden Center Station – Sullivan Square Station	Inbound	2,390	793	567
		Outbound	1,847	736	494
		Total	4,237	1,529	1,061

Source: Fall 2019 MBTA Ridership data, reflective of pre-COVID-19 pandemic conditions

Figure 16: Existing Public Transportation Services

299 Broadway | Somerville, Massachusetts

October 2022

MBTA Green Line Extension (anticipated opening November 2022)

MBTA Commuter Rail - Lowell Line

MBTA Bus Route

Source: MassGIS, MBTA

Bus Service Characteristics

Table 3 summarizes the headways, average wait times, on-time performance, and spans of service of the bus routes within the vicinity of the site for Fall 2019, which is reflective of typical pre-pandemic conditions.

The most frequent headways correspond to the routes with the most ridership, with Route 101 having the most frequent approximate headways of 6-8 minutes in the weekday peak periods followed by Route 89 with approximate headways of 6-12 minutes in the weekday peak periods.

Table 3 Project Area MBTA Bus Service Characteristics (Fall 2019)

Bus Route	80	89	90	95	101
Bus Headways (min) [a]					
Weekday Peak	30-40	6-12	35-40	10-25	6-8
Saturday	35-45	20-40	50-60	35-40	30-40
Average Wait Times (min) [b]					
Weekday Peak	15-20	3-6	18-20	5-13	3-4
Saturday	18-23	10-20	25-30	18-20	15-20
On-Time Performance [c]					
Weekday Peak Period	48%	50%	44%	56%	65%
Weekday Non-Peak Period	69%	61%	51%	71%	60%
Saturday	69%	67%	49%	64%	64%
Span of Service [d]					
Weekday	5:00 AM – 1:26 AM	4:31 AM – 1:48 AM	6:30 AM – 10:19 PM	4:39 AM – 1:24 AM	4:56 AM – 12:52 AM
Saturday	5:05 AM – 1:30 AM	4:38 AM – 1:49 AM	7:30 AM – 10:20 PM	5:45 AM – 1:21 AM	5:00 AM – 1:30 AM

Note: Information is based on pre-COVID schedules (Fall 2019) and current schedule information may differ.

a Headways represent typical, approximate headways for each period and may vary.

b Average wait times reflect half of the typical headways. Passenger use of schedules or customer technology (e.g., apps identifying the time of the next trip in real time) may affect average wait times.

c On-time performance is for the full route and is calculated for period from September 1, 2019 – December 21, 2019, and excludes holidays (September 2, October 14, November 11, and November 28). Weekday on-time performance is available across peak periods instead of for each peak period individually.

d Span of service reflects the time the first bus begins service to the time the last bus finishes service.

Bus Boarding, Alighting, and Average Load Data

Fall 2019 boarding, alighting, and average load data, which is reflective of typical pre-pandemic conditions, for the closest stops to the Site are summarized in Table 4.

The busiest stops near the Site are located at Broadway at Marshall Street and Broadway at Temple Street, across the street from and adjacent to the Site. At the Broadway at Marshall Street stop serving the inbound direction, Route 89 and Route 101 have a combined 18 boardings and three alightings in the morning and nine boardings and three alightings in the evening. At the Broadway at

Temple Street stop serving the outbound direction, Route 89 and Route 101 have a combined four boardings and six alightings in the morning and four boardings and 13 alightings in the evening.

Table 4 Project Area MBTA Bus Service Boarding, Alighting, and Average Load Data (Fall 2019)

			Weekday Daily			AM Peak (7-9 AM)			PM Peak (4-6:30 PM)		
Stop	Direction	Bus Route	Board	Alight	Avg Load	Board	Alight	Avg Load	Board	Alight	Avg Load
Medford Street at School Street	Inbound (EB)	80	9	4	14	4	1	34	0	1	14
	Outbound (WB)	80	2	7	11	1	0	11	0	2	29
Broadway at Marshall Street	Inbound (EB)	89	39	27	13	9	2	26	3	5	13
		101	31	6	16	9	1	32	1	1	9
Broadway at Temple Street	Outbound (WB)	89	31	44	13	9	2	18	3	9	21
		101	7	20	14	0	1	9	1	4	23
Cross Street at Broadway	Inbound (EB)	90	3	4	12	1	0	22	0	1	14
	Outbound (WB)	90	5	3	9	1	0	12	2	1	16
Mystic Avenue at Temple Street	Inbound (EB)	95	24	3	14	6	0	20	2	1	13
	Outbound (WB)	95	5	17	12	1	1	11	0	4	21

Source: Fall 2019 MBTA Ridership data

Bus Stop Characteristics

The amenities and deficiencies of the nearest bus stops are summarized in Table 5.

All bus stops shown in Table 5 are within ten minutes walking time from the Site. A shelter and bike rack are provided at the Broadway at Temple Street outbound bus stop adjacent to the Site, while a bike rack but no shelter or bench is provided at the Broadway at Marshall Street inbound bus stop across from the Site.

Table 5 Amenities and Deficiencies at Nearest MBTA Bus Stops

Bus Route	Closest Stop	Direction	Walking Distance to/from Site[a] (ft)	Avg Walking Time to/from Site [b] (min)	Bus Stop Amenities	Bus Stop Deficiencies
80	Medford Street at School Street	Inbound (EB)	2350	8.9		No shelter or bench
	Medford Street at School Street	Outbound (WB)	2250	8.9		No shelter or bench
89, 101	Broadway at Marshall Street	Inbound (EB)	450	1.7	Bike rack	No shelter or bench 8.5-ft wide bus pull-out space
	Broadway at Temple Street	Outbound (WB)	50	0.2	Shelter Bike rack	8-ft wide bus pull-out space
90	Cross Street at Broadway	Inbound (EB)	2250	8.5	Bike rack	No shelter or bench 8-ft wide bus pull-out space
	Cross Street at Broadway	Outbound (WB)	2250	8.5	Shelter Bench Bike rack	9-ft wide bus pull-out space Bus crosses over bike lane
95	Mystic Avenue at Temple Street	Inbound (EB)	1900	7.2	Shelter 14.5-ft wide bus pull-out	
	Mystic Avenue at Temple Street	Outbound (WB)	2000	7.6	11-ft wide bus pull-out	No shelter or bench

a Measured from approximate location of plaza.
b Average walking time based on walking speed of 3 mph, or 4.4 feet per second.

Safety Review

A detailed crash analysis was conducted to identify potential vehicle crash trends and/or roadway deficiencies in the traffic study area. The vehicle crash data for the traffic study area intersections were obtained from MassDOT for the years 2017 to 2019, the most recent available three-year period. The MassDOT database is comprised of crash data from the Massachusetts Registry of Motor Vehicles (RMV) Division primarily for use in traffic studies and safety evaluations. Data files are provided for an entire city or town for an entire year, though it is possible that some crash records may be omitted either due to individual crashes not being reported, or the city crash records not being provided in a compatible format for RMV use.

A summary of the study intersections vehicle crash history based on the available RMV data is presented in Table 6 and the detailed crash data is provided in the Appendix.

Crash rates are calculated based on the number of crashes at an intersection and the volume of traffic traveling through that intersection on a daily basis. Rates that exceed MassDOT's average for crashes at intersections in the MassDOT district in which the town or city is located could indicate safety or geometric issues for a particular intersection. For this study area, the calculated crash rates were compared to MassDOT's District 4 average, as Somerville is located in District 4. In District 4, the

average crash rate is 0.73 per million entering vehicles (MEV) for signalized intersections and 0.57 per MEV for unsignalized intersections. By comparison, the Statewide average crash rate is 0.78 per MEV for signalized intersections and 0.57 per MEV for unsignalized intersections. It should be noted that some crashes may have occurred but were either not reported or not included in the database, and therefore were not considered.

As shown in Table 6, a review of the crash data indicates that one study area intersection has calculated crash rates above the district crash rate averages: Temple Street at Heath Street / Sewall Street.

The majority of crashes throughout the study area were sideswipe same direction, rear-end, angle, and single vehicle crashes occurring on dry pavement resulting in non-fatal injury and property damage only. Based on the MassDOT records, there were no fatal crashes during the three-year period studied. In addition, five of the eight study area intersections had crashes involving bicycles or pedestrians during the three-year period.

Highway Safety Improvement Program

In addition to calculating the crash rate, study area intersections should also be reviewed in MassDOT's Highway Safety Improvement Program (HSIP) database. The HSIP database identifies crash clusters. An HSIP-eligible cluster is one in which the total number of equivalent property damage only[4] (EPDO) crashes in the area is within the top five percent of all clusters in that region. An HSIP-eligible location is eligible for FHWA and MassDOT funds to address the identified safety issues at these locations.

As part of this effort, VHB reviewed this database and found that the following study area intersections are part of 2010-2019 HSIP pedestrian and bicycle clusters:

- Broadway at Temple Street (bicycle and pedestrian)
- Broadway at Marshall Street/ West Site Driveway (bicycle and pedestrian)
- Broadway at Walnut Street (bicycle only)
- Broadway at Fellsway West (bicycle only)
- Temple Street at Site Driveway (bicycle and pedestrian)
- Temple Street at Heath Street/Sewall Street (pedestrian only)
- Temple Street at Jaques Street (pedestrian only)

It should be noted that this crash data reflects conditions before Temple Street and Broadway were restriped in 2019 to provide formal bicycle facilities.

4 Equivalent property damage only (EPDO) is a method of combining the number of crashes with the severity of the crashes based on a weighted scale. Crashes involving property damage only are reported at a minimal level of importance, while collisions involving personal injury (or fatalities) are weighted more heavily.

Table 6 Vehicular Crash Data (2017 – 2019)

	Broadway at:					Temple Street at:		
	School Street	Temple Street	Marshall Street	Walnut Street	Fellsway West	Site Dwy	Heath Street/Sewall Street	Jaques Street
Signalized?	Yes	Yes	No	No	No	No	No	Yes
MassDOT D4 Average Crash Rate	0.73	0.73	0.57	0.57	0.57	0.57	0.57	0.73
Calculated Crash Rate	0.23	0.65	0.10	0.36	0.24	0.08	0.62	0.20
Exceeds Average?	No	No	No	No	No	No	Yes	No
Year								
2017	1	8	2	2	0	0	2	0
2018	2	2	0	4	2	0	3	0
2019	2	6	0	2	3	1	3	3
Total	**5**	**16**	**2**	**8**	**5**	**1**	**8**	**3**
Crash Type								
Single Vehicle	0	4	2	2	0	0	0	0
Rear-End	1	5	0	1	1	0	1	1
Angle	2	0	0	4	4	1	5	0
Sideswipe, same direction	1	5	0	1	0	0	0	0
Sideswipe, opposite direction	0	0	0	0	0	0	1	1
Head On	1	1	0	0	0	0	1	1
Unknown/Not Reported	0	1	0	0	0	0	0	0
Severity								
Fatal Injury	0	0	0	0	0	0	0	0
Non-Fatal Injury	3	2	1	4	1	0	2	2
Property Damage Only	1	11	0	4	3	1	6	1
Unknown/Not Reported	1	3	1	0	1	0	0	0
Parties Involved								
Truck	1	5	0	0	0	0	0	0
Bus	0	0	0	0	0	0	0	0
Pedestrian	0	1	1	0	0	0	0	0
Cyclist	2	0	1	2	0	0	0	1
Time of day								
Weekday, 7:00 AM - 9:00 AM	0	2	0	3	1	0	1	1
Weekday, 4:00 – 6:00 PM	0	2	0	1	2	1	0	0
Saturday, 11:00 AM – 2:00 PM	0	0	0	0	0	0	0	0
Weekday, other time	5	9	1	1	1	0	4	2
Weekend, other time	0	3	1	3	1	0	3	0
Lighting								
Daylight	4	11	1	4	5	1	5	1
Dawn/Dusk	1	2	0	0	0	0	0	0
Dark – lighted roadway	0	3	1	4	0	0	3	2
Dark – roadway not lighted	0	0	0	0	0	0	0	0
Other/Unknown/Not Reported	0	0	0	0	0	0	0	0
Road Surface Conditions								
Dry	5	13	2	5	5	1	5	2
Wet	0	3	0	2	0	0	3	1
Snow/Ice/Slush	0	0	0	0	0	0	0	0
Other/Unknown/Not Reported	0	0	0	1	0	0	0	0
Weather								
Clear	4	13	2	6	5	1	5	3
Cloudy	1	1	0	1	0	0	1	0
Rain	0	2	0	1	0	0	2	0
Snow	0	0	0	0	0	0	0	0
Sleet, hail, freezing rain	0	0	0	0	0	0	0	0
Other/Unknown/Not Reported	0	0	0	0	0	0	0	0

Source: MassDOT IMPACT Portal

This page is intentionally left blank.

3

Build Conditions

Future conditions, with the Project in place, were evaluated as part of this study. Based on the City of Somerville's TIS Guidelines, two future conditions were evaluated: 2022 Build conditions, which involves adding the Project-generated traffic to the 2022 Existing volumes on the existing roadway network, and 2027 Build conditions, which involves adding Site specific traffic generated by other definitively known development projects to 2022 Build conditions on the future roadway network.

2022 Build Conditions

The 2022 Build conditions add the Project-generated traffic to the 2022 Existing volumes on the existing roadway network. These conditions are described further below.

Trip Generation

The Project consists of approximately 288 residential units, 13,643 sf of ground-floor supporting retail, and 3,001 sf of community space. The residential units and ground-floor supporting retail will be distributed across two buildings. With their proximity, trip generation estimates were not developed separately for each building but, instead, were estimated as a single total development. Further, the community space is expected to be used "by-occasion" as a public gathering space and therefore will not generate trips in a regular pattern during peak commuting periods as with typical land use codes. Trip generation was not estimated for this portion of the Project.

The rate at which a development generates traffic is dependent upon several factors such as size, location, and concentration of surrounding developments. Trip generation estimates for the proposed uses were projected using data published by the Institute of Transportation Engineers (ITE)[5] for the uses proposed. The trip generation analyses are presented below.

Existing Site-Generated Traffic

Prior to estimating future-conditions traffic volumes, the current use of the Site was evaluated. As mentioned, the northwest corner of the Site is currently occupied by an approximately 12,576 sf

5 Trip Generation Manual – 11th Edition; Institute of Transportation Engineers (Washington, D.C.); 2021.

Walgreens building and the east side is occupied by a vacated Star Market, with surface-level parking spaces in between. Both buildings will be eliminated as part of the Project.

Per the Somerville TIS Guidelines, existing trips may be subtracted from new trips to generate a net new vehicle trip total with Mobility Division approval. Trip generation estimates for the existing Walgreens were projected using trip generation rates for LUC 822 (Strip Retail Plaza). ITE trips were used as opposed to the existing driveway counts as the existing parking lot is shared with the liquor store and barber shop at 313 Broadway that will be remaining with the Project in place. There is no trip generation associated with the former Star Market as it has been vacant for over a decade.

As part of the Project, the existing Walgreens will be relocated to the site of a former Walgreens at 343 Broadway, approximately 500 feet west of the Site[6]. While the relocated Walgreens is expected to generate trips at a similar rate to the existing Walgreens, the building at 343 Broadway could be re-tenanted without the Project and would add additional trips to the roadway network not associated with the Project. Therefore, the existing trips generated by the Walgreens on Site today can be subtracted from new trips to generate a net new vehicle trip total, as the trips generated by the building at 343 Broadway will be independent from the proposed Project.

Table 7 summarizes the Site-generated trips for the existing Walgreens on Site for which credit was taken as it will be demolished to make way for the redevelopment. It should be noted that the existing Site-generated trips have been adjusted following the same methodology, including mode share and pass-by credit, as with the proposed Site-generated trips, as detailed in the following sections.

6 Prior to 2019, the existing Site was home to a Rite Aid and the building at 343 Broadway was occupied by a Walgreens. At that time, the Rite Aid on Site was re-branded as a Walgreens and the former Walgreens at 343 Broadway closed.

Table 7 Adjusted Existing Site Trip Generation

	Existing Walgreens [a]
Weekday Daily	
Enter	185
Exit	185
Total	370
Weekday Morning	
Enter	9
Exit	5
Total	14
Weekday Evening	
Enter	22
Exit	22
Total	44
Saturday Daily	
Enter	167
Exit	167
Total	334
Saturday Midday	
Enter	20
Exit	20
Total	40

a Based on ITE LUC 822 (Strip Retail Plaza), for 12,576 SF. Assumed 65% existing vehicular mode split based on 2019 ACS Census Data for the Site's Census Tract.

Full Build-Out Unadjusted ITE Vehicle Trips

As previously discussed, the Project consists of approximately 288 residential units and 13,643 sf of retail space. Trip generation estimates for the proposed uses were projected using trip generation rates for LUC 221 (Mid-Rise Residential) and LUC 822 (Strip Retail Plaza).

It should be noted that the proposed Site retail uses are expected to be small, service-oriented businesses. While exact tenants have not yet been identified, these tenants are not expected to be significant destination-retail uses. Instead, the potential uses are intended to complement the proposed residential use on Site. In fact, most retail business is expected to be in the form of shared trips with the residential use on Site, or pedestrians or bicyclists. Due to these factors, and the absence of a dedicated retail-only parking supply, vehicular traffic associated with the retail uses should be far less than that estimated based on the ITE data.

The unadjusted vehicle trip estimates are presented in Table 8.

Table 8 Project Trip Generation – Total Unadjusted Vehicle Trips by Land Use

Time Period	Proposed		Total Unadjusted Vehicle Trips
	Residential [1]	Retail [2]	
Weekday Daily			
Enter	664	403	1,067
Exit	664	403	1,067
Total	1,328	806	2,134
Trips per unit or ksf	*4.61*	*59.08*	
Weekday Morning			
Enter	26	19	45
Exit	89	13	102
Total	115	32	147
Trips per unit or ksf	*0.40*	*2.35*	
Weekday Evening			
Enter	74	49	123
Exit	48	49	97
Total	122	98	220
Trips per unit or ksf	*0.42*	*7.18*	
Saturday Daily			
Enter	646	370	1,016
Exit	646	370	1,016
Total	1,292	740	2,032
Trips per unit or ksf	*4.49*	*54.24*	
Saturday Midday			
Enter	59	46	105
Exit	57	44	101
Total	116	90	206
Trips per unit or ksf	*0.40*	*6.60*	

1 Based on ITE LUC 221 (Mid-Rise Residential) for 288 units
2 Based on ITE LUC 822 (Strip Retail Plaza) for 13,643 sf.

Person Trips

The unadjusted vehicle trips estimated using the ITE data were subsequently converted into person trips by applying average vehicle occupancy rates (VOR) based on national data[7] for each use. The national average vehicle occupancy rates applied were 1.18 persons/vehicle for residential trips and 1.82 persons/vehicle for retail trips. The national rates are applied when converting to person trips to be consistent with ITE data, which is also based on national data.

7 Summary of Travel Trends – National Household Travel Survey; USDOT Federal Highway Administration (Washington, DC); 2017.

Internal Capture Trips

Because the proposed redevelopment is a mixed-use project, the trip generation characteristics of the Project will be different from a single-use project. Some of the traffic to be generated by the proposed redevelopment will be contained on the Site as "internal" or "shared vehicle" trips. For example, residents are anticipated to patronize the retail space. While these shared trips represent new traffic to the individual uses, they would not show up as new vehicle trips on the surrounding roadway network.

As described in the ITE Trip Generation Handbook[8], "because of the complementary nature of these land uses, some trips are made among the on-site uses. This capture of trips internal to the site has the net effect of reducing vehicle trip generation between the overall site and the external street system (compared to the total number of trips generated by comparable land uses developed individually on stand-alone sites) … an internal capture rate can generally be defined as the percentage of total person trips generated by a site that are made entirely within the site. The trip origin, destination, and travel path are all within the site."

Net Person Trips

Based on the methodology outlined in the ITE Trip Generation Handbook, internal capture rates were applied to the gross person trips. The resulting peak-hour person trip estimates for the Project are presented in Table 9.

8 Trip Generation Handbook, 3rd Edition; Institute of Transportation Engineers; Washington, D.C.; 2017.

Table 9 Project Trip Generation – Net Person Trips by Land Use

	Proposed		
Time Period	Residential	Retail	Net Person Trips
Weekday Daily			
Enter	703	667	1,370
Exit	718	652	1,370
Total	1,421	1,319	2,740
Weekday Morning			
Enter	30	34	64
Exit	104	23	127
Total	134	57	191
Weekday Evening			
Enter	64	80	144
Exit	48	66	114
Total	112	146	258
Saturday Daily			
Enter	688	612	1,300
Exit	701	599	1,300
Total	1,389	1,211	2,600
Saturday Midday			
Enter	49	75	124
Exit	58	59	117
Total	107	134	241

Note Person trip generation estimates by land use with internal capture credits applied.

Mode Share

Existing mode shares for the Project Site were determined based on census data from the American Community Survey (ACS) 2019 five-year estimates for Census Tract 3501.04 (the census tract for this area of Somerville). The existing mode shares are presented in Table 10.

Table 10 Mode Share

Vehicle	Transit	Bike	Walk	Other [a]
65%	27%	3%	2%	3%

Source: Based on 2019 ACS Census Data for Census Tract 3501.04 (the Site's Census Tract).
a Other includes work-from-home and other modes not listed in the table.

The Project design and Transportation Demand Management program are being developed with the intent of minimizing travel by single occupant automobile and maximizing transit use. As noted previously, no on-Site parking will be provided, and the Proponent is pursuing a limited number of neighborhood parking permits. Indoor, secure bicycle parking will be provided with at least one indoor, secure bicycle parking space per residential unit located in ground-floor bicycle rooms in each building with direct outdoor access. In addition, due to the proximity of the upcoming MBTA

Green Line Extension (GLX) project and improvements to bus service in the area, the existing modal split from this census tract is not necessarily representative of future conditions in this area. The Green Line Extension is expected to open in late 2022 with the nearest stop to the Site at Gilman Square, approximately 0.4 miles south of the Site.

With no on-Site parking provided and with the upcoming Green Line Extension, it is expected that vehicular mode shares will be lower and transit, walk, and bike mode shares will be higher than what is reported in Table 10. However, to follow the directive provided by the City of Somerville Mobility Department, this study assumes the existing census tract mode shares will be applicable to the proposed Project. This provides a conservative analysis of the Project's vehicular impacts.

It should be noted that because the retail component of the Project is complementary to the residential space on Site, it can be expected to mirror the residential mode share as opposed to having its own mode share, as is common with larger, destination retail land uses.

Pass-By Trips

While the ITE rates provide estimates for all the traffic associated with each land use, not all of the traffic generated by the Project will be new to the area roadways. In reality, a portion of the vehicle-trips generated by the retail land use will likely be drawn from the traffic volume roadways adjacent to the Site. For example, someone traveling on Broadway may choose to deviate from their original travel path to visit the Site retail uses, before continuing to their final destination.

As ITE pass-by data for LUC 822 (Retail Strip Plaza) is not available, ITE data for LUC 821 (Shopping Plaza) was reviewed. ITE data for LUC 821 (Shopping Plaza) shows the pass-by rate for retail is 40-percent during the weekday evening peak and 31-percent during the Saturday midday peak. However, consistent with Somerville TIS Guidelines, a 25-percent pass-by rate was assumed for all time periods. Even with these adjustments, the new trip estimates for the retail uses likely are overstated due to the factors discussed earlier.

Project-Generated Trips

The mode shares discussed above and presented in Table 10 were applied to the net person trips shown in Table 9 to generate the adjusted Project person trips by mode. To reflect the number of vehicle trips generated by the Site, the adjusted person trips are converted back to vehicle trips by applying the local average vehicle occupancy rates (VOR). Based on 2019 American Community Survey data[9], a local VOR of 1.25 for residential use was determined. Local VOR data is not available for retail uses, so the national average vehicle occupancy rate of 1.82 persons/vehicle was used.

The mode share and local average vehicle occupancy were applied to the person trips to estimate proposed trips by mode, and then the pass-by adjustments noted previously were applied to the vehicle trips generated by the retail portion of the Project. Following these calculations, trip generation associated with the existing Site use was deducted, which resulted in the net new trips from the Project.

Table 11 summarizes the proposed trips by mode.

9 American Community Survey 2019 5-Year Estimates, Table S0801: Commuting Characteristics by Sex for Census Tract 3501.04

Table 11 Project-Generated Trips by Mode

	Vehicle [a]	Transit	Bike	Walk	Other [b]
Weekday Daily					
Enter	545	370	41	27	41
Exit	547	370	41	28	42
Total	1,092	740	82	55	83
Weekday Morning					
Enter	25	17	2	2	2
Exit	59	34	4	2	4
Total	84	51	6	4	6
Weekday Evening					
Enter	55	39	4	3	4
Exit	42	31	3	2	3
Total	97	70	7	5	7
Saturday Daily					
Enter	523	351	39	26	39
Exit	525	351	39	26	39
Total	1,048	702	78	54	78
Saturday Midday					
Enter	46	33	4	2	3
Exit	45	32	4	2	4
Total	91	65	8	4	7

a Total development vehicle trips (not including pass-by trips associated with the retail portion).

b Other includes work-from-home and other modes not listed in the table.

As shown in Table 11, the Project would be expected to generate between 84 and 97 total vehicle trips during the peak hours studied, without crediting pass-by trips or trips associated with the existing Site use. This can be considered a conservatively high estimate of the number of vehicle trips generated by the proposed Project as it does not consider the fact that no parking will be provided on-Site and that the new Green Line Extension will be located less than 0.5 miles from the Site.

The breakdown of these trips by use is provided in Table 12 and Table 13 summarizes the total net new trips to be generated by the Project.

Table 12 Project-Generated Vehicle Trips by Use

	Residential	Retail	Total Vehicle Trips [a]	Retail Pass-By [b]	Total New Vehicle Trips [c]
Weekday Daily					
Enter	366	238	604	59	**545**
Exit	373	233	606	59	**547**
Total	739	471	1,210	118	**1,092**
Weekday Morning					
Enter	16	12	28	3	**25**
Exit	54	8	62	3	**59**
Total	70	20	90	6	**84**
Weekday Evening					
Enter	33	29	62	7	**55**
Exit	25	24	49	7	**42**
Total	58	53	111	14	**97**
Saturday Daily					
Enter	358	219	577	54	**523**
Exit	365	214	579	54	**525**
Total	723	433	1,156	108	**1,048**
Saturday Midday					
Enter	25	27	52	6	**46**
Exit	30	21	51	6	**45**
Total	55	48	103	12	**91**

a Total adjusted vehicle trips with internal capture credits applied.
b 25% pass-by credit for all time periods peak hour
c Total adjusted vehicle trips with internal capture and pass-by credits applied.

Table 13 Project-Generated Net New Vehicle Trips

	Total New Vehicle Trips [a]	Existing Vehicle Trips [b]	Total Net New Vehicle Trips [c]
Weekday Daily			
Enter	545	185	**360**
Exit	547	185	**362**
Total	1,092	370	**722**
Weekday Morning			
Enter	25	9	**16**
Exit	59	5	**54**
Total	84	14	**70**
Weekday Evening			
Enter	55	22	**33**
Exit	42	22	**20**
Total	97	44	**53**
Saturday Daily			
Enter	523	167	**356**
Exit	525	167	**358**
Total	1,048	334	**714**
Saturday Midday			
Enter	46	20	**26**
Exit	45	20	**25**
Total	91	40	**51**

a Total adjusted vehicle trips with internal capture and pass-by credits applied, from Table 12.
b Existing Site-generated trips with mode share applied, from Table 7.
c Total net new vehicle trips minus existing trips. Reflects total new trips generated by the project.

As shown in Table 13, the Project is projected to generate 722 weekday daily net new vehicle trips (360 entering, 362 exiting), 70 weekday morning peak hour net new vehicle trips (16 entering, 54 exiting), 53 weekday evening peak hour vehicle trips (33 entering, 20 exiting), 714 Saturday daily net new vehicle trips (356 entering, 358 exiting) and 51 Saturday midday peak hour net new vehicle trips (26 entering, 25 exiting). This can be considered a conservatively high estimate of the number of vehicle trips generated by the proposed Project as it does not consider the fact that no parking will be provided on-Site and that the new Green Line Extension will be located less than 0.5 miles from the Site.

The proposed Project-generated vehicle trips were assigned to the study area roadways and intersections based on trip distribution patterns developed as discussed in the following section.

Trip Distribution

The directional distribution of the traffic approaching and departing the Site is a function of population densities, the location of employment opportunities, existing travel patterns, and the efficiency of the roadway system. Trips made to and from the Project during the peak hours are

expected to be predominantly home-to-work and work-to-home trips in the morning and evening peak hours, respectively. Accordingly, the trip distribution for the residential portion of the Project has been derived based on Journey-to-Work data for the City of Somerville with the (2012-2016) U.S. Census data. The trip distribution for the retail portion of the Project is assumed to follow similar trip distribution patterns as the residential space. Larger-scale retail uses frequently will have unique trip distribution patterns that are dependent on their customer base and, therefore, may be different than those for a residential use. However, in this instance, the retail uses are smaller, generally non-destination uses as compared to a standard shopping center. Accordingly, the retail distribution should closely mimic that of the residential use.

Table 14 and Figure 17 summarize and illustrate the regional trip distribution, respectively.

Table 14 Regional Trip Distribution

Travel Route	Direction (from/to)	Entering Trips	Exiting Trips
Broadway	East	25%	25%
	West	25%	25%
Temple Street	North	45%	45%
School Street	South	5%	4%
Marshall Street	South	n/a	1%
Total		100%	100%

Source: US Census data (2012-2016).

As noted previously, there will be no dedicated on-Site parking provided for the Project and the Proponent is pursuing a limited number of neighborhood parking permits. To provide a conservative analysis, it is assumed that a portion of the vehicle trips generated will travel straight to the neighborhood to park, a portion will stop at the Site to pick-up or drop-off supplies or passengers, and a portion will consist of taxis, Ubers, and/or Lyfts. Table 15 summarizes the estimated local destination trip distribution of the Project-generated vehicle trips.

Table 15 Local Destination Trip Distribution

Local Destination	Residential Trips	Retail Trips
Direct to Neighborhood Parking	33%	50%
Neighborhood Parking via Site	33%	n/a
Taxis/Ubers/Lyfts [a]	34%	50%

a Deadhead trips included in trip distribution.

2022 Build Traffic Volumes

The 2022 Build conditions vehicle traffic volumes were developed by adding the Site-generated traffic volumes as shown in Table 13 to the 2022 Existing peak hour vehicle traffic volumes, based on the trip distribution patterns shown in Table 14. Figures 18, 19, and 20 show the resulting 2022 Build conditions vehicle traffic volume networks for the weekday morning, weekday evening, and Saturday midday peak hours, respectively. Volumes for the Site-generated vehicle traffic volumes are included in the Appendix.

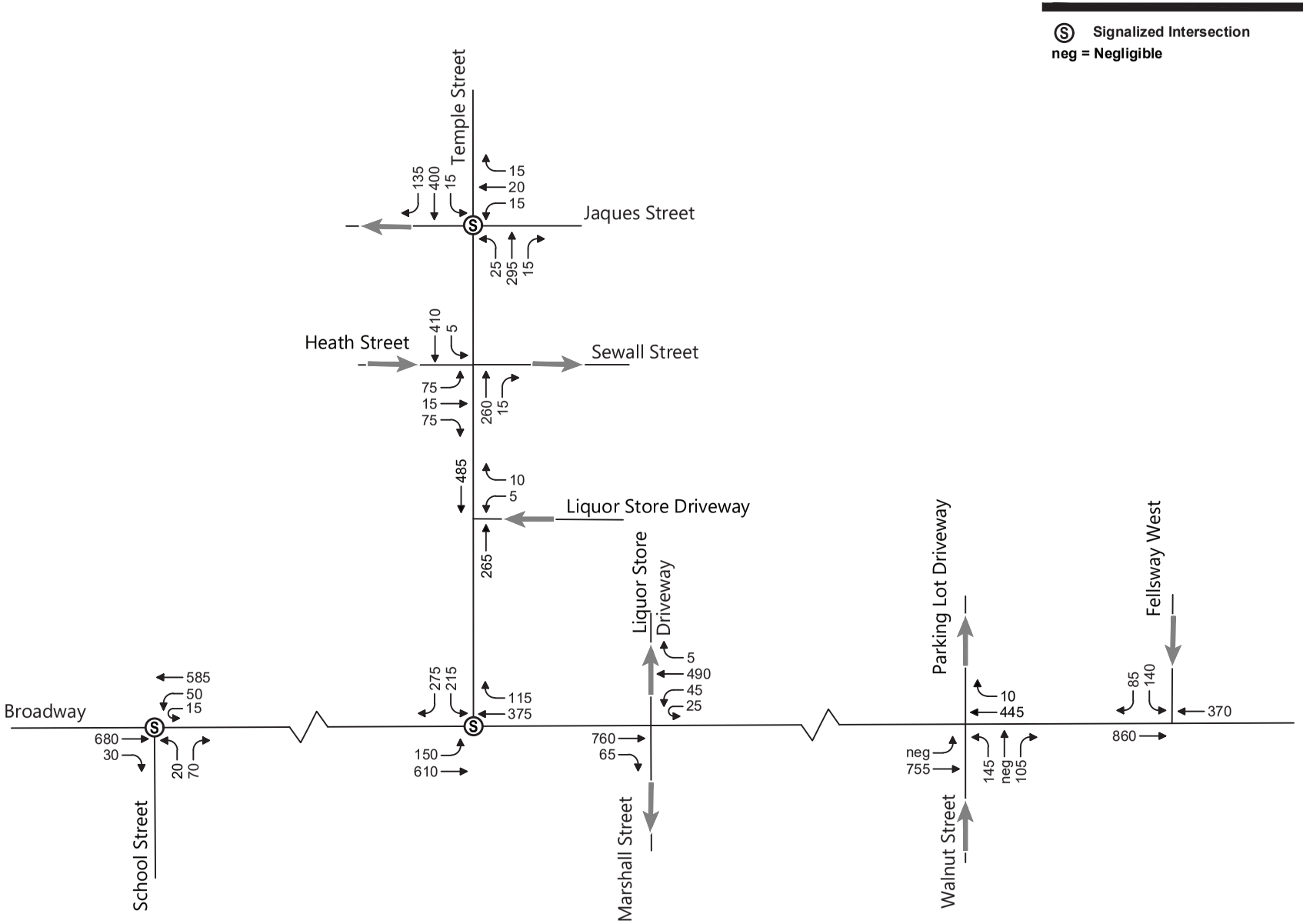
Figure 17: Regional Trip Distribution

299 Broadway | Somerville, Massachusetts

October 2022

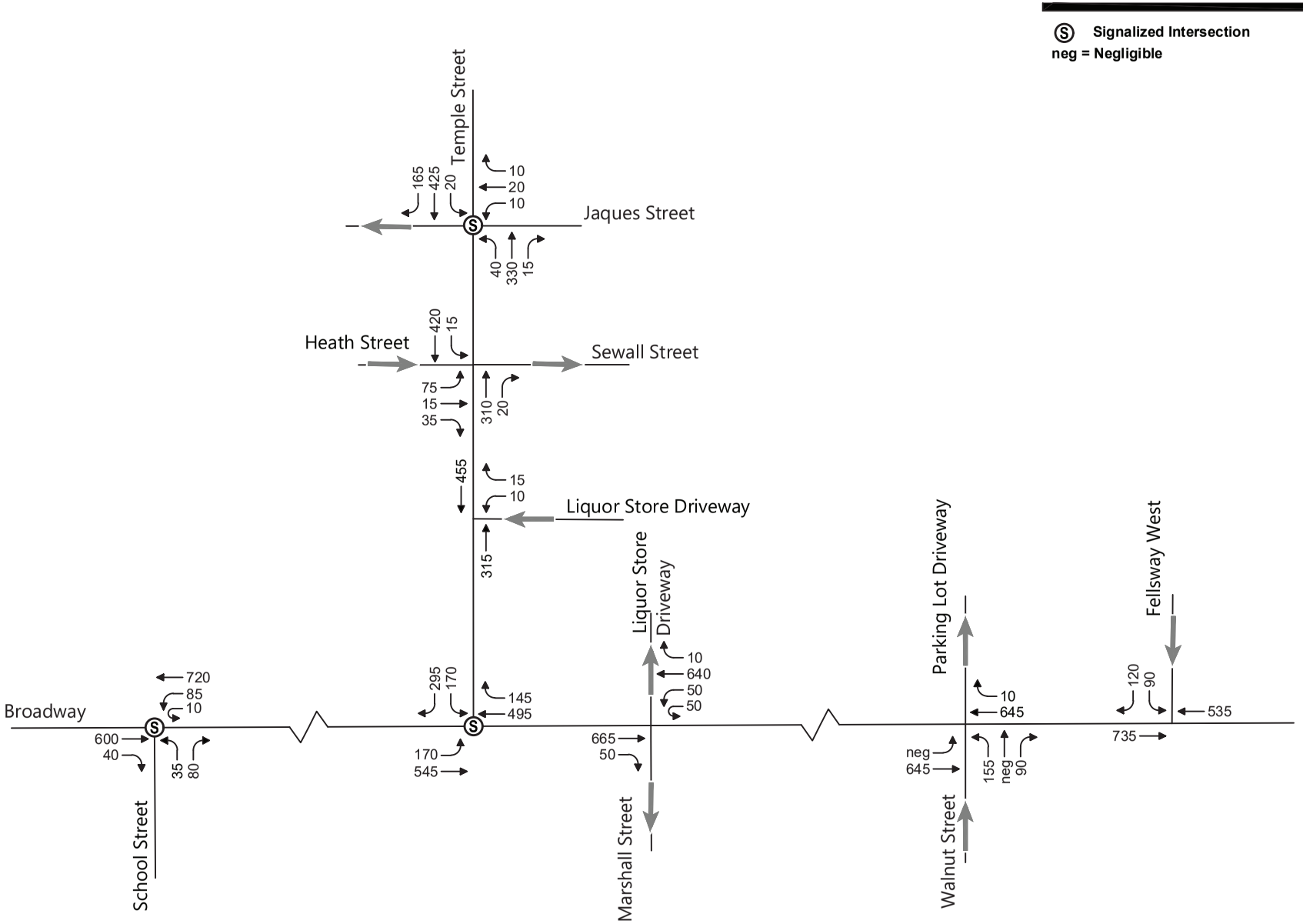
XX% Percentage of Trips Entering/Exiting Site

Source: MassGIS



Not to Scale

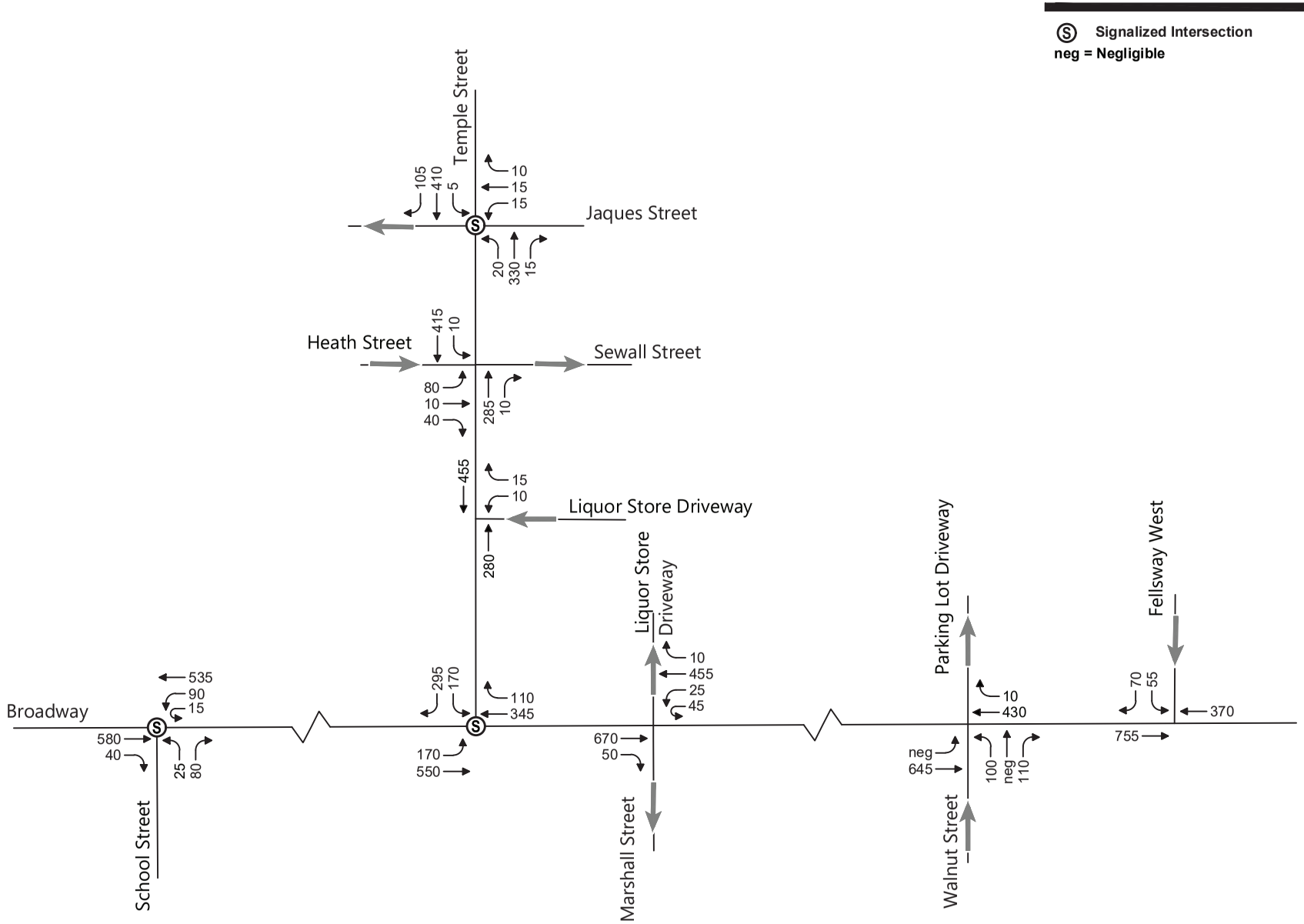
Figure 18
2022 Build Conditions
Weekday Morning Peak Hour Traffic Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

Figure 19

2022 Build Conditions
Weekday Evening Peak Hour Traffic Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

Figure 20

2022 Build Conditions
Saturday Midday Peak Hour Traffic Volumes
299 Broadway
Somerville, Massachusetts

2027 Build Conditions

The 2022 Build conditions analysis discussed above is beneficial in that it allows for the impacts associated solely with the Project to be isolated and identified. However, it also is important that future conditions with other planned development and infrastructure projects within the study horizon be considered to determine how the surrounding infrastructure will function with the addition of the Project. Accordingly, 2027 Build conditions were evaluated by adding Site-specific traffic generated by other definitively known development projects to the 2022 Build conditions vehicle traffic volumes on the future roadway network. These conditions are described further below.

Background Traffic Growth

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. Several methods can be used to estimate this growth.

A procedure frequently employed is to estimate an annual percentage increase and apply that increase to study area traffic volumes. An alternative procedure is to identify estimated traffic generated by planned new major developments that would be expected to impact the project study area roadways.

Based on direction by the City of Somerville Mobility Division, no background traffic growth rate was applied and only traffic associated with other planned and/or approved developments within the design year horizon is accounted for in this analysis.

Future Background Projects

In addition to accounting for background growth, the traffic associated with other planned and/or approved developments within the five-year horizon was considered. Based on research by VHB, there are 16 planned development projects within the vicinity of the study area that were considered as part of the background development. Projected traffic volumes expected to be generated by each planned development will be obtained from the published traffic studies submitted as part of the permitting process for each project.

Details of each background project is provided below.

- **Union Square Revitalization Project:** The proposed project being developed by US2 is a large mixed-use development in Union Square, consisting of a total of 1,159,000 sf of office, 984 residential units, 143,000 sf of retail and a 175-room hotel.
- **304 Somerville Avenue:** This project involves converting an existing medical marijuana dispensary into a recreational marijuana dispensary.
- **515 Somerville Avenue:** This project consists of the construction of a 164-room Cambria Hotel at 515 Somerville Avenue. The development is currently open but was under construction at the time of the traffic counts in May 2022.
- **518-524 Somerville Avenue:** This project includes the re-tenanting of approximately 3,910 square feet of retail space at 518-524 Somerville Avenue by a proposed recreational marijuana dispensary.

- **599 Somerville Avenue:** The project being developed at 599 Somerville Avenue is proposed to consist of approximately 43,200 sf of R&D space with ground-floor retail. The project is currently under construction.
- **73 Summer Street:** The project being developed at 73 Summer Street is proposed to consist of 27 residential units. The project is currently under construction.
- **76 Central Street:** This project includes the re-tenanting of approximately 1,900 square feet of retail space at 76 Central Street by a proposed recreational marijuana dispensary.
- **10 Washington Street:** The project is proposed to consist of approximately 77,245 sf of R&D space. The project is currently in the planning stages.
- **44 Broadway:** The project being developed at 44 Broadway is proposed to consist of 91 residential units and approximately 11,200 sf of retail. The project is currently under construction.
- **67 Broadway:** This project includes an approximately 1,100 sf expansion of the current building at 67 Broadway to be occupied by a proposed recreational marijuana dispensary.
- **620 Broadway:** The project being developed at 620 Broadway is proposed to consist of an approximately 4,700 sf recreational marijuana dispensary and 1,800 sf of café space.
- **690 Broadway:** This project includes the re-tenanting of approximately 3,700 square feet of retail space at 690 Broadway by a proposed recreational marijuana dispensary.
- **5 Middlesex Avenue:** This project is a proposed 1.6 million sf mixed-use developed at 5 Middlesex Avenue that will be constructed in multiple phases. Once complete, the full build of the project is proposed to consist of approximately 329 residential units, 1,220,000 sf of office/R&D space, 24,500 sf of retail, and a 15,000-sf fire station. The project is currently under construction.
- **74 Middlesex Avenue:** The project being developed at 74 Middlesex Avenue is proposed to consist of approximately 489,500 sf of office/R&D space and 4,500 sf of retail. The project is currently under construction.
- **120 Middlesex Avenue:** The project being developed at 120 Middlesex Avenue (also known as Brickyard at Assembly) is proposed to consist of approximately 592,500 sf of office/R&D space and 3,500 sf of retail. The project is currently in the planning stages.
- **Assembly Row:** This project includes the remaining build-out of the Assembly Row development, including the upcoming building at Block 7A that will consist of approximately 364.600 sf of office/R&D space and 16,900 sf of retail.

A map illustrating the locations each background project is provided in Figure 21.

Figure 21: Background Projects

299 Broadway | Somerville, Massachusetts

October 2022

Roadway and Public Transportation Improvements

In assessing future traffic conditions for the Project, proposed roadway and public transportation improvements within the study area were considered. Based on research by VHB and discussions with the City of Somerville, there are no proposed roadway projects within the study area that may affect travel patterns but there are several transit projects and on-going planning studies that will change future transit conditions within the study area.

MBTA Green Line Extension (GLX)

In early 2017, the Federal Transit Administration granted final approvals for the 4.3-mile extension of the MBTA's Green Line light rail from its current terminus at Lechmere Station in Cambridge into Somerville and Medford. Following the GLX project, approximately 85-percent of Somerville's population will be within reasonable walking distance of train service.[10]

The extension will have two branches; a 0.9-mile southerly branch that will terminate near Somerville's Union Square, and a 3.4-mile northerly branch that will parallel the Lowell Line of the commuter rail through Somerville and will terminate at College Avenue in Medford. The Union Square branch of GLX opened in March 2022 and the Medford branch is expected to be completed in November 2022. Overall GLX will include seven new stations, one at Union Square, five on the Medford branch, and a rebuilt Lechmere Station. Headways for the trains servicing the new stations are scheduled to be six- and five-minutes during the respective weekday morning and evening peak periods, and under ten minutes for all other time periods while the Green Line is in operation.

The Site is situated within a half-mile north of the new Gilman Square Station, which will be located at the south corner of the intersection of Medford Street at School Street. Construction of this new station will change the transportation dynamic of the Project study area, with a significant increase in transit ridership expected, corresponding to a decrease in automobile travel.

MBTA Bus Network Redesign

The MBTA is in the planning stages of the Bus Network Redesign, a project intended to use rider feedback to guide recommendations for changes that address route design, frequency of service, hours of service, and coverage area. The plan is designed to prioritize transit-critical communities while responding to the changing needs of the region. A revised map of the Bus Network Redesign was released in late October 2022 and includes the following five bus routes within a 0.5-mile radius of the Site:

- **Bus Route 85:** This route would travel between Assembly Square and Ruggles Station via Union Square, Kendall Square, and Longwood Medical Area. This route would operate weekdays only with service provided every 90 minutes or better between 6:00 AM and 7:00 PM, with peak period service of 30 minutes or better 6:00 AM to 9:00 AM and 4:00 PM to 7:00 PM. The nearest stops to the Project Site would be at Broadway at Cross Street, approximately 0.40 miles east of the Site.
- **Bus Route 89:** This route would travel between Davis Square and Sullivan Square via Winter Hill. This route would operate seven days per week with service provided every 30 minutes or better

10 Somerville: Open Space & Recreation Plan (2016 – 2023)

between 5:00 AM and 10:00 PM and every 45 minutes or better between 10:00 PM and 1:00 AM. The nearest stops to the Project Site would be adjacent to the Site at Broadway and Temple Street inbound and Broadway at Marshall Street outbound.

- **Bus Route 90**: This route would travel between Clarendon Hill and Assembly Square via Davis Square and East Somerville. This route would operate seven days per week with service provided every 20 minutes or better between 5:00 AM and 10:00 PM and every 30 minutes or better between 10:00 PM and 1:00 AM. The nearest stops to the Project Site would be at Broadway at Cross Street, approximately 0.40 miles east of the Site.
- **Bus Route 95:** This route would travel between Arlington Center and Sullivan Square via Medford Square. This route would operate seven days per week with service provided every 20 minutes or better between 5:00 AM and 10:00 PM and every 30 minutes or better between 10:00 PM and 1:00 AM. The nearest stops to the Project Site would be at Mystic Avenue at Temple Street, approximately 0.30 miles north of the Site.
- **Bus Route T101**: This route would travel between Medford Square and Kendall Square via Sullivan Square. This route would operate as a key bus route seven days per week with service provided every 15 minutes or better between 5:00 AM and 1:00 AM. The nearest stops to the Project Site would be adjacent to the Site at Broadway and Temple Street inbound and Broadway at Marshall Street outbound.

The project is currently in the planning stages. Implementation is expected to occur in several phases from 2023 to 2028.

A map of the proposed future bus services and GLX service is provided in Figure 22.

MBTA Silver Line Extension Alternatives Analysis

The MBTA and MassDOT announced the launch of the MBTA Silver Line Extension Alternatives Analysis study in January 2021. The study will assess the feasibility, utility, and cost of various alignment and service frequency options for extending Silver Line service to Everett, Somerville, Cambridge, and Boston. The focus of this study, which is expected to be completed in Spring 2023, was identified as a key objective in MBTA's Focus40 plan. One of the six potential alignments presented at the second public meeting in September 2021, the Kendall via Wellington Alignment, would run along Route 28, which intersects with Broadway approximately one-third mile east of the Site.

2027 Build Traffic Volumes

The 2027 Build traffic volumes consist of the anticipated trips to be generated by the planned and/or approved development projects described above added to 2022 Build traffic volumes. The 2027 Build roadway network reflects the planned improvements described above that are anticipated to occur within the study horizon. Figures 23, 24, and 25 show the 2027 Build conditions vehicle traffic volume networks for the weekday morning, weekday evening, and Saturday midday peak hours, respectively.

Figure 22: Future Public Transportation Services

299 Broadway | Somerville, Massachusetts

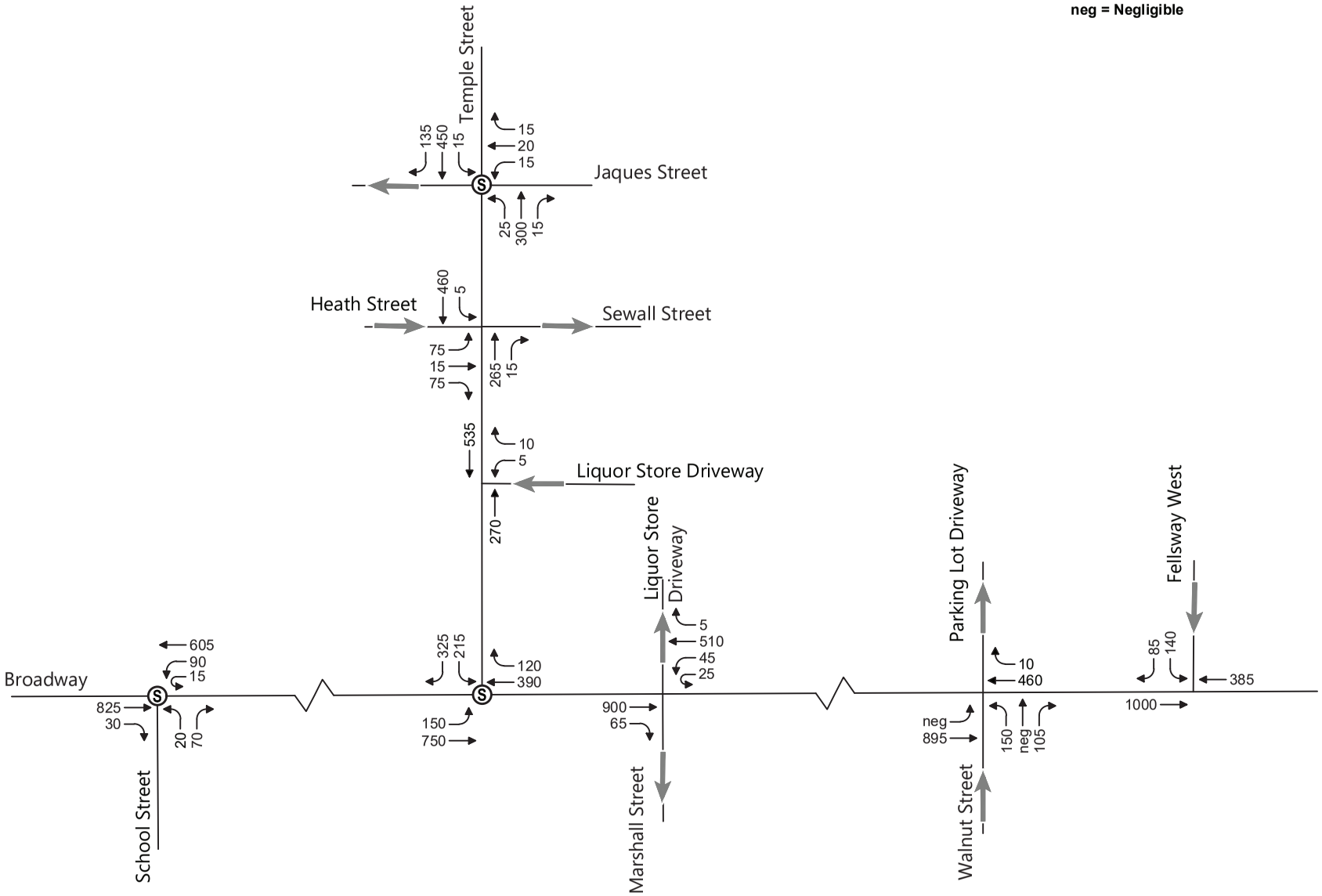
October 2022

MBTA Green Line Extension (anticipated opening November 2022)

MBTA Commuter Rail - Lowell Line

MBTA Bus Route (based on revised Bus Network Redesign proposal released in October 2022)

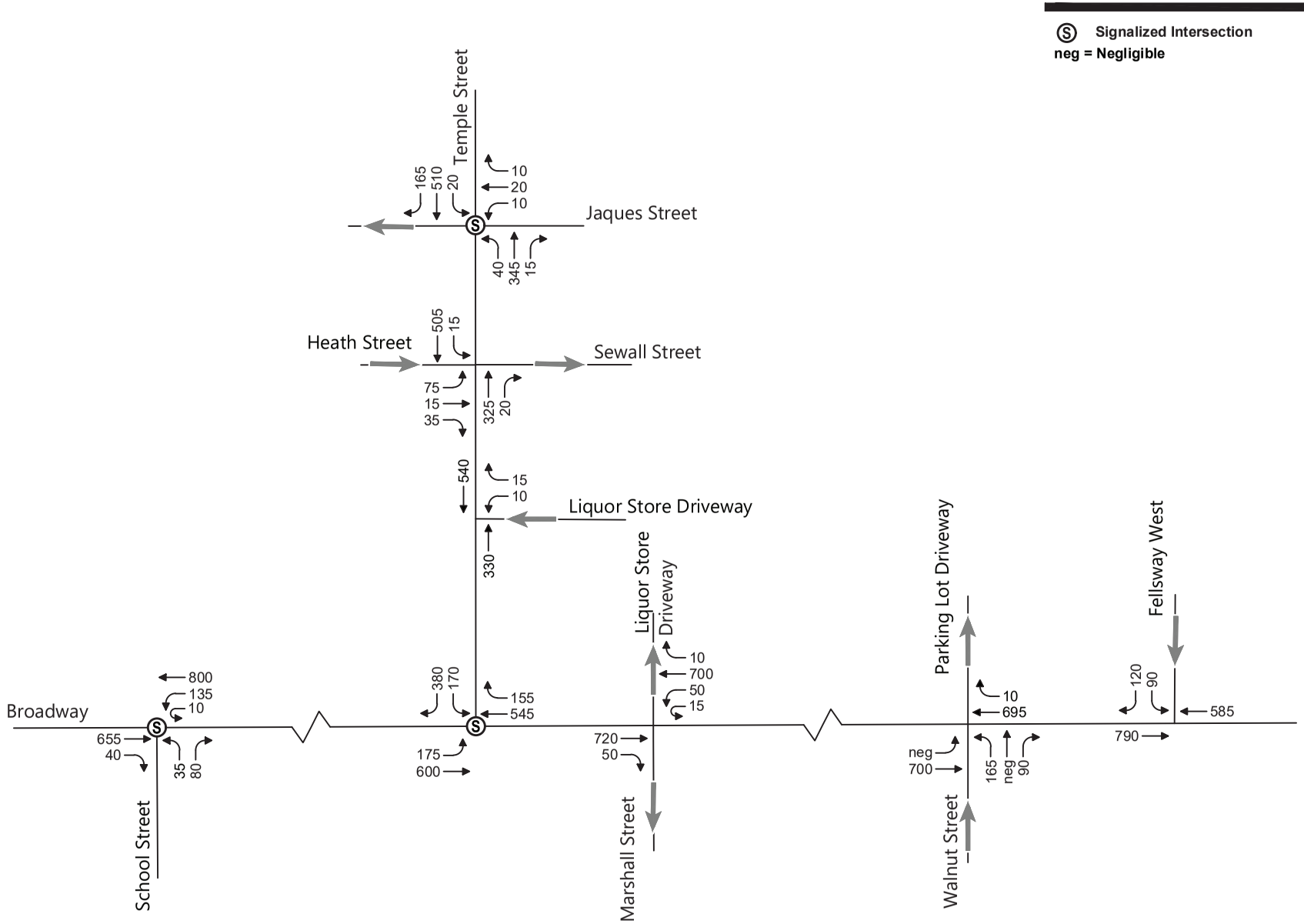
Source: MassGIS, MBTA



Not to Scale

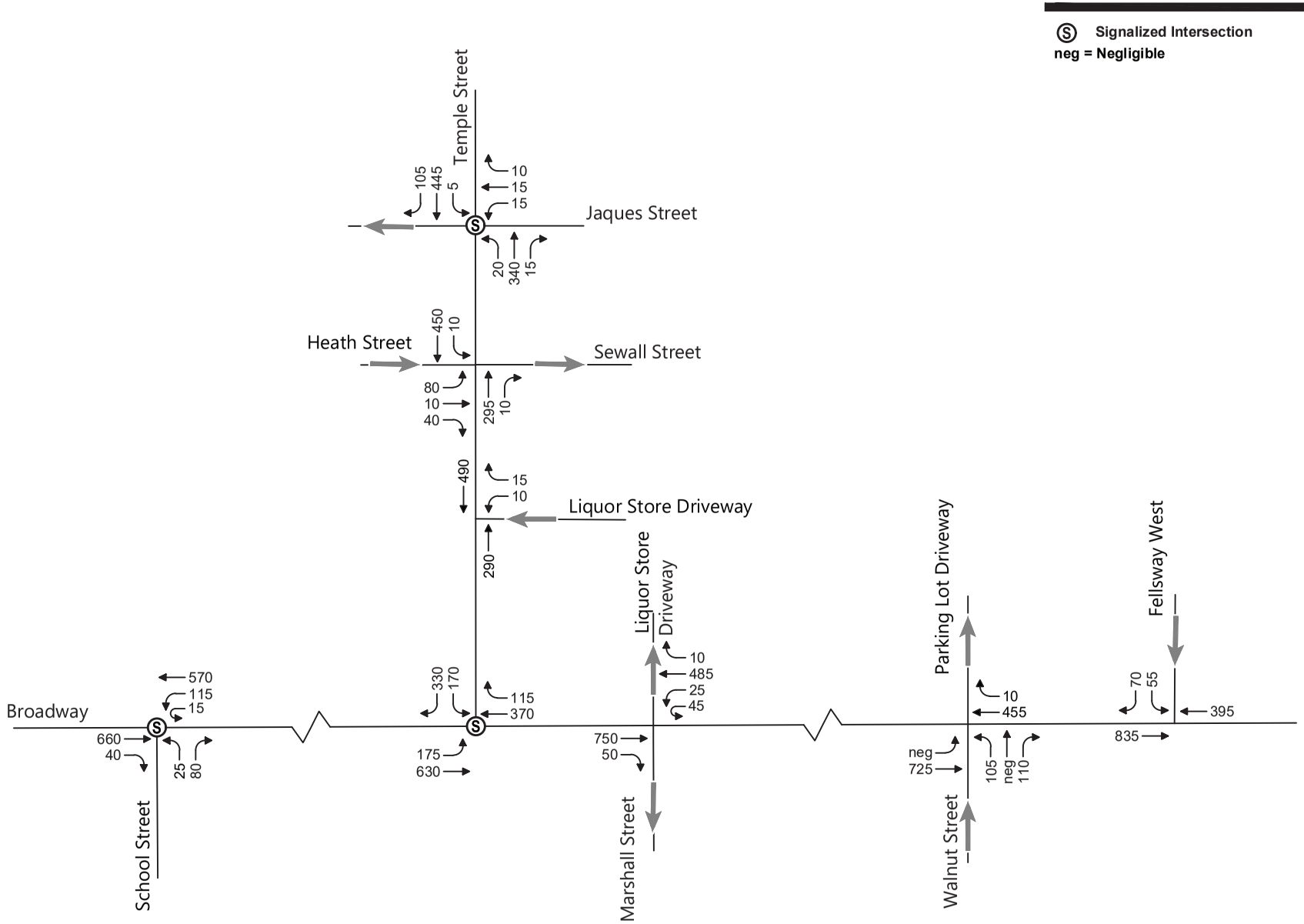
Figure 23

2027 Build Conditions
Weekday Morning Peak Hour Traffic Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

Figure 24
2027 Build Conditions
Weekday Evening Peak Hour Traffic Volumes
299 Broadway
Somerville, Massachusetts



Not to Scale

Figure 25
2027 Build Conditions
Saturday Midday Peak Hour Traffic Volumes
299 Broadway
Somerville, Massachusetts

Proposed Multimodal Accommodations

The proposed Site conditions, including Site access and multimodal accommodations, are described further below. Figure 26 shows the proposed Site plan.

Site Access

Under existing conditions, the parking lot on-Site is accessed via one driveway on Temple Street and two driveways on Broadway. A third curb cut on Broadway serves the loading dock behind the former Star Market. Under proposed conditions, no parking will be provided on-Site for the Project. However, a surface parking lot consisting of approximately seven spaces will remain for the liquor store and barber shop at 313 Broadway and will be accessed via the existing western curb cut on Broadway and the existing cub cut on Temple Street. Access will be one-way with entering vehicles using the curb cut on Broadway and exiting vehicles using the curb cut on Temple Street. The existing eastern parking lot driveway on Broadway will be eliminated while the existing curb cut on Broadway for the loading dock behind the former Star Market will be maintained to accommodate loading and deliveries for the proposed Project.

Bicycle Accommodations

The bicycle parking needs for the proposed Project will be accommodated through the provision of long-term secured and short-term bicycle parking within and around the proposed buildings. In total, approximately 293 long-term secured and 46 short-term bicycle parking spaces will be provided on-Site. The indoor bicycle parking spaces will be located in ground floor bicycle parking rooms in each building that will have direct access to the outdoors. 118 bicycle parking spaces will be provided in the west building and 175 bicycle parking spaces will be provided in the east building with one indoor bicycle parking space provided per residential unit. The outdoor bicycle parking spaces will be available for patrons and guests to the Project and will be located throughout the Site.

The Site is located within 0.10 miles of an existing Bluebikes bike-share station at the intersection of Broadway and Walnut Street. While bicycle accommodations within the study area are considered adequate (including dedicated facilities on Broadway and other study area roadways), the Proponent will continue to coordinate with the City of Somerville's Mobility Division to enhance bicycle facilities.

Pedestrian Accommodations

The Proponent is committed to refreshing crosswalk pavement markings and preserving the integrity of the sidewalk network adjacent to the Site throughout construction. While pedestrian accommodations within the study area are considered adequate, the Proponent will continue to coordinate with the City of Somerville's Mobility Division to enhance pedestrian facilities.

The Project provides several public realm improvements. The focal point of the Project will be a new civic plaza fronting Broadway. The civic plaza will be open to members of the public and will serve as a new central gathering place for residents and guests to the Winter Hill neighborhood. On the northern edge of the Site, the Project will include another public open space known as Sewall Park. A pedestrian walkway will be constructed between the civic plaza and Sewall Park, creating a new connection for pedestrians between Broadway and Sewall Street.

This page is intentionally left blank.

Figure 26: Proposed Site Plan

299 Broadway | Somerville, Massachusetts

October 2022

This page is intentionally left blank.

4

Vehicular Operations Analysis

The purpose of this analysis is to measure existing traffic volumes and to project future traffic volumes that quantify traffic flow within the study area. To assess quality flow, roadway capacity analyses were conducted with respect to Existing and projected Build traffic volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them. Roadway operating conditions are classified by calculated levels of service. The capacity analyses were conducted with approved methodologies using Synchro™ software.

Level-of-Service Criteria

The evaluation criteria used to analyze area intersections in this traffic study are based on the percentile delay method for signalized intersections and the Highway Capacity Manual (HCM), 6th Edition[11] for unsignalized intersections. The term 'Level of Service' (LOS) is used to denote the different operating conditions that occur on a given roadway segment under various traffic volume loads. It is a qualitative measure that considers several factors including roadway geometry, speed, travel delay, and freedom to maneuver. LOS provides an index to the operational qualities of a roadway segment or an intersection. LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

In addition to LOS, two other measures of effectiveness (MOEs) are typically used to quantify the traffic operations at intersections; volume-to-capacity ratio (v/c) and delay (expressed in seconds per vehicle). For example, an existing v/c ratio of 0.90 for an intersection indicates that the intersection is operating at 90-percent of its available capacity. A delay of 15 seconds for a particular vehicular movement or approach indicates that vehicles on the movement or approach will experience an average additional travel time of 15 seconds. For a given LOS letter designation there may be a wide range of values for both v/c ratios and delay. Comparison of intersection capacity results therefore requires that, in addition to the LOS, the other MOEs should also be considered.

The LOS designations, which are based on delay, are reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection and the LOS designation is for overall conditions at the intersection.

11 *Highway Capacity Manual, 6th Edition*, Transportation Research Board, Washington, D.C., 2016.

For unsignalized intersections, however, the analysis assumes that traffic on the mainline is not affected by traffic on the side streets. Thus, the LOS designation is for the critical movement exiting the side street, which is generally the left turn out of the side street or site driveway. Table 16 shows the LOS criteria for both signalized intersections and unsignalized intersections.

Table 16 Level-of-service Criteria

Level of Service	Delay – Signalized Intersection	Delay – Unsignalized Intersection
A	0 to 10 seconds	0 to 10 seconds
B	10 to 20 seconds	10 to 15 seconds
C	20 to 35 seconds	15 to 25 seconds
D	35 to 55 seconds	25 to 35 seconds
E	55 to 80 seconds	35 to 50 seconds
F	Greater than 80 seconds	Greater than 50 seconds

Source: Highway Capacity Manual

It should be noted that the analytical methodologies typically used for the analysis of unsignalized intersections use conservative analysis parameters, such as long critical gaps. Actual field observations indicate that drivers on minor streets generally accept shorter gaps in traffic than those used in the analysis procedures and therefore experience less delay than reported by the analysis software. The analysis methodologies also do not fully take into account the beneficial grouping effects caused by nearby signalized intersections. The net effect of these analysis procedures is the over-estimation of calculated delays at unsignalized intersections in the study area. Cautious judgment should therefore be exercised when interpreting the capacity analysis results at unsignalized intersections.

Intersection Capacity Analysis

Signalized Intersections

Capacity analyses conducted for the signalized study area intersections are summarized in Table 17. The capacity analyses were conducted for the 2022 Existing, 2022 Build, and 2027 Build conditions and the detailed results are included in the Appendix.

As noted previously, the trip generation estimates for the Project are based on existing mode share data for the local area and do not consider that no dedicated parking will be provided on-Site and that a stop on the Green Line Extension will be located within 0.5 miles of the Site. Therefore, the intersection capacity analyses presented in Table 17 represent a conservative assessment of future traffic conditions with the Project in-place and it is likely that the vehicular impacts of the Project will be less than what is reported.

As shown in Table 17, all signalized intersections are expected to operate at overall LOS D or better under the 2022 Existing, 2022 Build, and 2027 Build Conditions under all time periods. The following intersections are expected to experience a degrade in LOS between the 2022 Existing and 2022 Build

Conditions due to the addition of the Project-generated trips but are still expected to operate at acceptable level of services:

- Broadway at School Street: From LOS B to LOS C during the weekday evening peak hour
- Broadway at Temple Street: From LOS C to LOS D during the weekday morning peak hour
- Temple Street at Jaques Street: From LOS B to LOS C during the Saturday midday peak hour

All individual movements are expected to operate at LOS E or better, except for the Broadway eastbound approach to School Street under the 2027 Build Conditions during the weekday morning and Saturday midday peak hours, which is expected to operate at LOS F. This movement degrades from LOS D to LOS F between the 2022 Build Conditions and the 2027 Build Conditions due to the trips generated by additional background projects not associated by the Project.

Roadway improvements were recently completed on Broadway in 2019 that included the installation of dedicated bus-only or bus/bicycle-only lanes in each direction throughout the study area. To install the bus lanes, the capacity of Broadway was reduced from two general-purpose lanes in each direction to a single general-purpose lane in each direction. The capacity analyses presented in Table 17 are based on the current geometry of a single general-purpose lane in each direction and generally indicate that Broadway can accommodate the future traffic projections without the need to provide two general purpose lanes in each direction.

Table 17 Signalized Intersection Capacity Analysis

Location / Movement	2022 Existing Conditions					2022 Build Conditions					2027 Build Conditions				
	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c	Del	LOS	50 Q	95 Q	v/c	Del	LOS	50 Q	95 Q
Broadway at School Street															
Weekday Morning															
EB T	0.79	31	C	365	507	0.85	38	D	409	#577	0.98	91	F	539	#823
EB R	0.05	5	A	0	15	0.05	5	A	0	15	0.04	6	A	1	17
WB L	0.38	48	D	52	91	0.38	47	D	52	90	0.55	50	D	75	133
WB T	0.57	11	B	185	216	0.61	12	B	198	229	0.56	11	B	199	261
NB L/R	0.25	11	B	14	34	0.26	11	B	14	34	0.21	11	B	11	50
Overall		**22**	**C**				**25**	**C**				**53**	**D**		
Weekday Evening															
EB T	0.69	27	C	289	418	0.75	29	C	321	463	0.84	36	D	387	#605
EB R	0.06	5	A	0	18	0.06	5	A	0	18	0.06	5	A	0	19
WB L	0.35	50	D	66	m105	0.38	50	D	71	m109	0.55	51	D	104	m154
WB T	0.64	11	B	177	218	0.67	11	B	191	236	0.71	14	B	241	300
NB L/R	0.25	13	B	19	62	0.26	12	B	19	63	0.25	12	B	18	64
Overall		**19**	**B**				**20**	**C**				**25**	**C**		
Saturday Midday															
EB T	0.87	41	D	275	#457	0.93	54	D	307	#509	1.03	95	F	~372	#593
EB R	0.08	6	A	0	20	0.08	6	A	0	20	0.08	6	A	0	20
WB L	0.41	37	D	56	106	0.43	37	D	58	110	0.53	39	D	73	130
WB T	0.52	11	B	140	195	0.54	12	B	149	213	0.58	13	B	160	246
NB L/R	0.19	8	A	10	44	0.20	8	A	10	44	0.19	8	A	9	44
Overall		**25**	**C**				**31**	**C**				**51**	**D**		

a Volume to capacity ratio.
b Average total delay, in seconds per vehicle.
c Level-of-service.
d 50th percentile queue, in feet.
e 95th percentile queue, in feet.
95th percentile volume exceeds capacity, queue may be longer.
~ Volume exceeds capacity, queue is theoretically infinite.
m Volume for 95th percentile queue is metered by upstream signal.

Table 17 Signalized Intersection Capacity Analysis (continued)

Location / Movement	2022 Existing Conditions					2022 Build Conditions					2027 Build Conditions				
	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c	Del	LOS	50 Q	95 Q	v/c	Del	LOS	50 Q	95 Q
Broadway at Temple Street															
Weekday Morning															
EB L	0.39	54	D	95	m125	0.49	55	E	119	m146	0.46	53	D	112	m120
EB T	0.88	27	C	72	#551	0.91	36	D	74	#579	1.05	70	E	~549	m#589
WB T	0.53	24	C	187	261	0.57	25	C	205	284	0.56	25	C	197	293
WB R	0.34	40	D	56	100	0.47	43	D	77	130	0.45	42	D	75	134
SB L	0.65	49	D	126	204	0.72	53	D	140	#243	0.73	53	D	142	#248
SB R	0.40	21	C	116	184	0.42	21	C	124	195	0.51	23	C	156	240
Overall		**31**	**C**				**36**	**D**				**48**	**D**		
Weekday Evening															
EB L	0.43	47	D	107	m157	0.48	47	D	117	m161	0.53	47	D	129	m162
EB T	0.66	17	B	83	166	0.69	19	B	87	193	0.82	27	C	132	m227
WB T	0.69	29	C	278	382	0.71	29	C	290	396	0.74	31	C	307	444
WB R	0.43	42	D	69	121	0.59	47	D	99	162	0.59	47	D	99	169
SB L	0.47	42	D	87	150	0.57	45	D	108	179	0.58	46	D	109	180
SB R	0.41	21	C	123	192	0.44	21	C	134	208	0.57	25	C	189	286
Overall		**28**	**C**				**30**	**C**				**33**	**C**		
Saturday Midday															
EB L	0.36	38	D	86	m107	0.41	38	D	98	m115	0.43	37	D	102	m112
EB T	0.81	18	B	50	m99	0.85	22	C	64	m96	0.98	52	D	99	m#110
WB T	0.50	22	C	132	210	0.53	23	C	140	220	0.58	24	C	157	246
WB R	0.37	37	D	37	78	0.53	42	D	55	107	0.57	44	D	59	#115
SB L	0.66	47	D	77	#156	0.77	56	E	93	#195	0.76	54	D	90	#189
SB R	0.41	16	B	97	159	0.43	16	B	103	169	0.47	17	B	116	188
Overall		**24**	**C**				**27**	**C**				**37**	**D**		
Temple Street at Jaques Street															
Weekday Morning															
WB L/T/R	0.18	39	D	27	50	0.27	41	D	38	65	0.22	40	D	31	67
NB L/T/R	0.40	17	B	132	195	0.44	18	B	149	217	0.43	18	B	143	216
SB L/T/R	0.75	26	C	313	380	0.77	27	C	328	398	0.74	25	C	306	451
Overall		**24**	**C**				**25**	**C**				**23**	**C**		
Weekday Evening															
WB L/T/R	0.26	41	D	38	44	0.30	41	D	44	50	0.17	39	D	25	57
NB L/T/R	0.46	19	B	154	229	0.51	20	B	178	262	0.52	20	B	180	269
SB L/T/R	0.69	23	C	278	410	0.72	24	C	294	434	0.84	31	C	387	#623
Overall		**23**	**C**				**24**	**C**				**27**	**C**		
Saturday Midday															
WB L/T/R	0.18	39	D	26	49	0.21	40	D	30	55	0.17	39	D	24	57
NB L/T/R	0.39	17	B	134	203	0.43	18	B	150	224	0.46	18	B	162	241
SB L/T/R	0.57	20	B	212	313	0.59	21	C	225	332	0.67	23	C	269	394
Overall		**20**	**B**				**21**	**C**				**22**	**C**		

a Volume to capacity ratio.
b Average total delay, in seconds per vehicle.
c Level-of-service.
d 50th percentile queue, in feet.
e 95th percentile queue, in feet.
95th percentile volume exceeds capacity, queue may be longer.
~ Volume exceeds capacity, queue is theoretically infinite.
m Volume for 95th percentile queue is metered by upstream signal.

Unsignalized Intersections

The capacity analysis results for the unsignalized study area intersections are summarized in Table 18. The capacity analyses were conducted for the 2022 Existing, 2022 Build, and 2027 Build conditions and the detailed results are included in the Appendix.

As noted previously, the trip generation estimates for the Project are based on existing mode share data for the local area and do not consider that no dedicated parking will be provided on-Site and that a stop on the Green Line Extension will be located within 0.5 miles of the Site. Therefore, the intersection capacity analyses presented in Table 18 represent a conservative assessment of future traffic conditions with the Project in-place and it is likely that the vehicular impacts of the Project will be less than what is reported.

As shown in Table 18, all unsignalized movements are expected to operate at LOS D or better under the 2022 Existing, 2022 Build, and 2027 Build Conditions under all time periods except for the following two movements:

- **Walnut Street northbound approach to Broadway**: LOS F under all conditions and time periods except under the 2022 Existing Conditions during the Saturday midday peak hour.
- **Fellsway West southbound approach to Broadway**: LOS F under all conditions during the weekday morning and weekday evening peak hours.

The Walnut Street and Fellsway West approaches are expected to operate over capacity with and without the Project in place. The addition of the Site-generated vehicle trips is not expected to notably worsen conditions on these two approaches beyond what would be expected without the Project in place.

Under existing conditions, the West Site driveway on Broadway and the Site driveway on Temple Street both accommodate two-way traffic, and the departing approaches operate at LOS C and LOS B, respectively. Under proposed conditions, the only parking provided will be for the businesses at 313 Broadway (a liquor store and a barber shop) and access to the parking area will be one-way entering from Broadway and exiting onto Temple Street. The unsignalized exiting driveway onto Temple Street is expected to operate at LOS B during all time periods with queues of less than one vehicle.

Table 18 Unsignalized Intersection Capacity Analysis

Location / Movement	2022 Existing Conditions					2022 Build Conditions					2027 Build Conditions				
	D [a]	v/c [b]	Del [c]	LOS [d]	95 Q [e]	D	v/c	Del	LOS	95 Q	D	v/c	Del	LOS	95 Q
Broadway at Marshall Street / West Site Driveway (Liquor Store Driveway)															
Weekday Morning															
WB L [f]		0.20	35	D	73		0.24	36	D	82		0.22	36	D	82
SB L	10	0.07	24	C	5	-	-	-	-	-	-	-	-	-	-
Weekday Evening															
WB L [f]		0.27	36	D	97		0.32	37	D	111		0.20	35	D	77
SB L	20	0.09	20	C	8	-	-	-	-	-	-	-	-	-	-
Saturday Midday															
WB L [f]		0.14	24	C	53		0.17	25	C	62		0.18	25	C	64
SB L	20	0.08	17	C	8	-	-	-	-	-	-	-	-	-	-
Broadway at Walnut Street / Parking Lot Driveway [g]															
Weekday Morning															
EB L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NB L/T/R	250	>1.20	>120	F	418	250	>1.20	>120	F	448	255	>1.20	>120	F	460
Weekday Evening															
EB L	2	0.00	9	A	0	2	0.00	9	A	0	2	0.00	9	A	0
NB L/T/R	246	>1.20	>120	F	360	246	>1.20	>120	F	393	256	>1.20	>120	F	485
Saturday Midday															
EB L	2	0.00	8	A	0	2	0.00	8	A	0	2	0.00	8	A	0
NB L/T/R	210	0.75	46	E	140	210	0.80	54	F	158	215	0.96	92	F	220
Broadway at Fellsway West [g]															
Weekday Morning															
SB L/R	210	1.18	>120	F	298	225	>1.20	>120	F	340	225	>1.20	>120	F	343
Weekday Evening															
SB L/R	195	0.87	68	F	185	210	0.95	85	F	223	210	0.99	103	F	228
Saturday Midday															
SB L/R	110	0.40	23	C	45	125	0.45	25	C	55	125	0.48	29	D	60
Temple Street at Site Driveway (Liquor Store Driveway)															
Weekday Morning															
WB L/R	45	0.11	11	B	10	15	0.04	12	B	3	15	0.03	11	B	3
SB L	10	0.01	8	A	0	-	-	-	-	-	-	-	-	-	-
Weekday Evening															
WB L/R	65	0.15	12	B	13	25	0.06	12	B	5	25	0.05	12	B	5
SB L	30	0.03	8	A	3	-	-	-	-	-	-	-	-	-	-
Saturday Midday															
WB L/R	80	0.17	12	B	15	25	0.05	11	B	5	25	0.05	11	B	3
SB L	30	0.03	8	A	3	-	-	-	-	-	-	-	-	-	-
Temple Street at Heath Street / Sewall Street															
Weekday Morning															
EB L/T/R	165	0.43	18	C	53	165	0.46	20	C	60	165	0.41	19	C	50
SB L	5	0.01	8	A	0	5	0.01	8	A	0	5	0.00	8	A	0
Weekday Evening															
EB L/T/R	125	0.37	19	C	43	125	0.40	21	C	48	125	0.41	23	C	48
SB L	15	0.01	8	A	0	15	0.01	8	A	0	15	0.01	8	A	0
Saturday Midday															
EB L/T/R	130	0.32	17	C	35	130	0.34	18	C	38	130	0.37	20	C	43
SB L	10	0.01	8	A	0	10	0.01	8	A	0	10	0.01	8	A	0

a Demand
b Volume to capacity ratio.
c Average total delay, in seconds per vehicle.
d Level-of-service.
e 95th percentile queue, in feet.
f Westbound left-turn movement is under signalized control
g Intersection is under flashing signal control. Default movement is free flow on Broadway and stop-control on side street approaches.

5

Transit Capacity Analysis

A transit capacity analysis was conducted to estimate the impacts of the additional Project-generated transit trips (riders) on the various MBTA bus routes that directly serve the site. For this study, Routes 80, 89, 90, 95, and 101 bus service were evaluated for Project impacts on passenger capacity.

The analysis requires estimating future passenger activity and establishing assumptions for future transit service levels. These future conditions are compared against existing conditions. The analysis helps inform how well the transit system can accommodate future passenger demands.

Conclusions from this evaluation suggest that the MBTA services in the area will be over capacity on two additional trips and five additional passengers due to the Project, and that the Project will minimally impact public transit service.

Passenger Crowding Evaluation Methodology

The capacity analysis compares the expected demand for transit to the existing and planned capacity of the service. Thus, for service routes, the first step is to identify the service segments that are expected to be used by riders generated by the proposed development project. For each service, the peak passenger load point is identified—the service segment that is most crowded, based on existing ridership, for each bus trip. These passenger loads are compared against the service capacity.

The capacity threshold of the transit services available at area bus stops is based on the MBTA's *Service Delivery Policy (SDP).*[12] For the passenger comfort standard, which is based on vehicle capacity and riders, the SDP sets the level of passenger crowding that is acceptable by transit mode and period (or trip). Generally, the vehicle load assumes all seats on the vehicle will be occupied and some passengers may stand before the condition is determined to be "overcrowded." The standard varies by service period: generally, high-volume (peak periods) have a higher threshold than low volume (off-peak) periods. (In

12 *Service Delivery Policy, 2021 Update*; Massachusetts Bay Transportation Authority (MBTA); June 7, 2021. Table B-1, p. 46.

other words, the standard "accepts" more crowding during rush hour service than at other service periods during the day.)

The intent of applying this method is to identify segments of the MBTA system that may need additional service (more trips) to address overcrowding. These transit capacity analyses have been performed consistent with MassDOT Office of Performance Management and Innovation (OPMI) and MBTA analysis methods used since the issuance of the SDP.

MBTA Bus Services

Passenger Comfort (Existing/Baseline)

The MBTA *Service Delivery Policy* (SDP) defines a passenger comfort standard for the percent of passenger travel time experienced in comfortable conditions that includes a minimum of 92 percent of bus passenger travel time and a target of 96 percent of bus passenger travel time experienced in comfortable conditions. This is a metric that is calculated by OPMI for the MBTA and is reported in Table 19 for reference for each bus route in the study area.

Table 19 Passenger Comfort Metric (Fall 2019)

Bus Route [13]	Comfort Metric
80	97.4 %
89	94.2 %
90	100 %
95	100 %
101	93.6 %

Bus Routes 80, 90, and 95 service exceed (meet) the target standard with an SDP comfort metric of 97.4, 100 and 100 percent of passenger minutes in comfortable conditions (weekday service), respectively. Routes 89 and 101 bus service each had an SDP comfort metric between 92 and 96 percent. These routes exceed (meet) the MBTA's minimum standard for this metric while falling below the desired target level.

Evaluation of Bus Passenger Crowding

For the passenger crowding analysis, the vehicle (bus) load standard dictated by MBTA's *Service Delivery Policy*[14] is applied. The MBTA's average bus fleet has a seated capacity of 38 passengers (for 40-foot buses), resulting in a policy capacity (hereafter referred to as the passenger crowding threshold) equal to 53 passengers during the peak periods (trips scheduled to start between 7:00 a.m. and 8:59 p.m. or between 4:00 p.m. and 6:29 p.m.

13 Passenger comfort metric for bus routes 77, 83, 87, 89, 90, 94, and 96 provided by MBTA Better Bus Profiles (2018), available at cdn.mbta.com/sites/default/files/projects/betterbus/route-profiles/. Passenger comfort metric for bus route 88 provided by MassDOT OPMI, July 6, 2020; value represents Fall 2019 weekday conditions.

14 *Service Delivery Policy, 2021 Update*, MBTA, pp. 26-28 and Table B-1, p. 46.

weekdays) and equal to 47 passengers during off-peak periods (other times and weekends).[15]

Table 20, along with Figures A1-A5 included in the Appendix, present the average passenger levels at the peak load point for the study's analysis segments for each of the bus services. These passenger loads have been compared against the crowding threshold. Based on the Fall 2019 ridership levels (pre-COVID-19 pandemic), MBTA Routes 80, 90, 95, and 101 did not experience average passenger loads exceeding the MBTA's SDP passenger crowding threshold. MBTA Route 89 experiences one trip that, on average, has passenger loads that exceed the MBTA's SDP passenger crowing threshold by an average of three passengers.

Table 20 Route-Level Summary of Passenger Crowding (Weekday Bus Service, Fall 2019)

	Existing (Fall 2019)		
Service Route (analysis segment)	**Number of Trips at Project Site**	**Number of Trips Exceeding Threshold**	**Total Passengers Over Threshold**
80 Inbound (Arlington Center-Lechmere)	35	-	-
80 Outbound (Lechmere-Arlington Center)	35	-	-
	70	Average per Trip:	-
89 Inbound (Davis-Sullivan)	65	-	-
89 Outbound (Sullivan-Davis)	65	1	3
	130	Average per Trip:	3
90 Inbound (Davis-Assembly)	26	-	-
90 Outbound (Assembly-Davis)	27	-	-
	53	Average per Trip:	-
95 Inbound (Arlington Center or West Medford-Sullivan)	39	-	-
95 Outbound (Sullivan-Arlington Center or West Medford)	38	-	-
	77	Average per Trip:	-
101 Inbound (Malden-Sullivan)	70	-	-
101 Outbound (Sullivan-Malden)	58	-	-
	128	Average per Trip:	-
Total	**458**	**1**	**3**

15 MBTA Average Fleet Seating – CY2019, as provided by MassDOT OPMI on July 6, 2020. Note that the capacities presented are rounded down to the nearest whole number. Seated capacity on MBTA buses ranges from 37 to 40 seats for its fleet of 40-foot vehicles. The off-peak load standard is 125 percent of seated capacity, whereas the peak load standard is 140 percent of seated capacity.

Future Conditions: Service Levels

Green Line Extension

The MBTA's Green Line Extension is an ongoing project that will extend Green Line service to Somerville and Medford. The Union Square Branch opened in Spring 2022, and the Medford Branch is proposed to open in November 2022. The proposed Gilman Square stop on the Medford Branch is located approximately 0.4 miles to the south of the project site. More detail on the Green Line Extension is provided in Chapter 3.

While ridership predictions exist for the Green Line Extension, changes in demand during the pandemic have affected ridership across the system and service on the Medford Branch is not yet operating (so does not have existing ridership). The previous projections were not included as part of this analysis, as the Project is expected to minimally impact Green Line crowding.

Bus Network Redesign

The MBTA's ongoing Bus Network Redesign, part of the MBTA's Bus Transformation, released an initial proposed network and gathered public feedback in Spring/Summer 2022. A revised bus network was released in late October 2022, and implementation of the new network is anticipated to begin in Summer 2023. The proposed changes will address route design, frequency of service, span of service, bus stop spacing, and coverage area. More detail on the proposed Bus Network Redesign is provided in Chapter 3.

The existing bus passenger crowding assessment is based on service conditions that were present in 2019. Due to the ongoing nature of the initiative and potential for additional changes to the proposed network, the Bus Network Redesign was not considered for this analysis.

Transit Ridership: Project-Generated Riders

The distribution of Project transit trips among transit services are assigned as follows: approximately 60 percent of riders would use MBTA bus route 89, while approximately 40 percent of riders would use MBTA Bus Route 101. The passenger assignment percentages were based on Fall 2019 ridership data for MBTA Routes 89 and 101 at the stops closest to the project site. Project trips were not assigned to Routes 80, 90, or 95 due to the further distance of their stops, at approximately 0.4 miles from the project site, and their approximately parallel alignment compared to Routes 89 and 101. It was assumed that all project generated riders would choose Routes 89 and 101. This would also provide a conservative analysis given the existing higher levels of crowding on Routes 89 and 101.

When applied to the expected daily transit trip generation of 366 (183 entering/183 exiting) new passengers (based on trip generation calculations included in the Appendix), this route distribution yields a total of 218 (114 entering/104 exiting) daily bus passengers on Route 89 and 148 (69 entering/79 exiting) daily bus passengers on Route 101. Further details of the distribution of generated trips are included below in Table 21.

Table 21 Assignment of Project Transit Riders to Bus Services

Route	To Site % In	To Site % Out
Bus 80 Inbound	-	-
Bus 80 Outbound	-	-
Bus 89 Inbound	24%	30%
Bus 89 Outbound	38%	26%
Bus 90 Inbound	-	-
Bus 90 Outbound	-	-
Bus 95 Inbound	-	-
Bus 95 Outbound	-	-
Bus 101 Inbound	9%	34%
Bus 101 Outbound	29%	9%
Total	**100%**	**100%**

To evaluate the passenger loads on each bus trip, the daily ridership is then distributed among all scheduled service trips. Passenger distribution among the trips is based on the existing passenger load patterns experienced collectively on the bus services that directly serve the Project Site.

Bus Passenger Crowding: Results

The Build Condition represents existing passenger conditions plus Project-generated trips, without any future service changes, resulting in an evaluation of Project impacts on existing condition operations. Under these conditions, the Project is expected to generate passenger levels that will trigger two new trips exceeding the MBTA's policy capacity thresholds for passenger crowding. A Future Build Scenario was not analyzed in this report due to upcoming service changes (e.g., Bus Network Redesign and Green Line Extension). Projected ridership data is not available for these future service conditions.

The Build Condition represents existing passenger conditions plus Project-generated trips. At future build ridership levels and today's service levels (number of trips), there may be up to two extra trips exceeding the MBTA's policy capacity thresholds for passenger crowding. Route 89 Outbound would continue to experience one trip with average passenger loads above the policy threshold, with an increase in passengers over the threshold from three to seven. Route 101 Inbound would experience two new trips with average passenger loads above the policy threshold, with one passenger over the threshold. Routes 80, 90, and 95 are each expected to remain within the MBTA passenger crowding policy thresholds.

The Build Condition bus passenger crowding is presented in Table 22 below and in Figures A6 and A7 in the Appendix. These charts illustrate the Fall 2019 ridership and estimated build ridership levels at the peak passenger load point for each bus trip in comparison to the available policy capacity. The charts illustrate the added passenger demand on the bus routes for a future condition, accounting for Project-generated trips.

Table 22 Weekday Daily Bus Passenger Bus Boardings (Estimated for Project Build)

		Existing (Fall 2019)		Project Build (with Existing)	
Service Route (analysis segment)	**Number of Trips at Project Site**	**Number of Trips Exceeding Threshold**	**Total Passengers Over Threshold**	**Number of Trips Exceeding Threshold**	**Total Passengers Over Threshold**
80 Inbound (Arlington Center-Lechmere)	35	-	-	n/a	n/a
80 Outbound (Lechmere-Arlington Center)	35	-	-	n/a	n/a
	70	Average per Trip:	-		n/a
89 Inbound (Davis-Sullivan)	65	-	-	-	-
89 Outbound (Sullivan-Davis)	65	1	3	1	7
	130	Average per Trip:	3		n/a
90 Inbound (Davis-Assembly)	26	-	-	n/a	n/a
90 Outbound (Assembly-Davis)	27	-	-	n/a	n/a
	53	Average per Trip:	-		n/a
95 Inbound (Arlington Center or West Medford-Sullivan)	39	-	-	n/a	n/a
95 Outbound (Sullivan-Arlington Center or West Medford)	38	-	-	n/a	n/a
	77	Average per Trip:	-		n/a
101 Inbound (Malden-Sullivan)	70	-	-	2	1*
101 Outbound (Sullivan-Malden)	58	-	-	-	-
	128	Average per Trip:	-		1
Total	**458**	**1**	**3**	**3**	**8**

Note: The passenger crowding analysis is based on Fall 2019 passenger loads and activity patterns. Values are rounded up to the nearest passenger in total for each route. For example, two trips on Route 101 Inbound are each projected to exceed the crowding threshold by less than 1 passenger per trip on average. Summed, the unrounded exceedance is still below 1 passenger in total across the two trips and is rounded to 1 for inclusion in the table.

6

Bicycle and Pedestrian Analyses

Bicycle Analysis

An evaluation was completed along each study area roadway segment and intersection using the Bicycle Level of Traffic Stress (BLTS) methodology provided by the City of Somerville in its Transportation Impact Study (TIS) Guidelines. Each street segment or unsignalized intersection crossing is given a BLTS score 1 through 4. BLTS 1 indicates favorable conditions for bicycling suitable for all types of bicyclists, where the bicyclists are physically separated or among low speed, low volume traffic. In contrast, BLTS 4 indicates highly stressful conditions suitable for experienced bicyclists, where bicyclists are not sufficiently separated from high-speed traffic.

BLTS along Street Segments

The analysis of bicycle facilities along street segments considers factors such as street width (through lanes per direction), bike lane plus parking lane width, speed limit or prevailing speed, and bike lane blockage. The results of the BLTS along street segments analysis for 2022 Existing conditions is shown in Figure 27 with color-coded segments.

In 2022 Existing conditions, BLTS 1 and 2 is assigned to Broadway due to the separated bike lanes or shared bus/bike lanes. BLTS 1 is also assigned to the side streets due to the relatively low vehicular speeds as a result of the residential nature of the streets. BLTS 2 is assigned to School Street because it lacks dedicated bicyclist space (only sharrows are painted). BLTS 3 is assigned to Temple Street due to the prevailing speed of 25 mph (based on ATR data collected in the Safety Zone) and the lack of buffers for the bike lanes.

No changes are expected in 2022 or 2027 Build conditions. The Project will maintain the bicycle accommodations along the site frontage.

Figure 27: 2022 Existing Conditions - Bicycle Level of Traffic Stress

299 Broadway | Somerville, Massachusetts

October 2022

BLTS through Unsignalized Street Crossings

The analysis of bicycle facilities along unsignalized street crossings considers factors including speed of crossings, width of street being crossed, and presence of a median refuge island. Crossings of major driveways were considered to be street crossings for the purposes of this analysis. The "speed limit" of crossings was determined by the speed at which vehicles could cross the bicyclists' path.

Table 23 shows the BLTS analysis for the unsignalized street crossings within the study area. As shown, all unsignalized intersections received a BLTS score of 1, meaning that these locations provide minimal levels of traffic stress for bicyclists. The BLTS remains the same through all conditions for these intersections.

Table 23 BLTS Through Unsignalized Street Crossings

Intersection	Intersection Leg	Bike Travel Direction	BLTS
Broadway at Marshall Street	South	Eastbound	1
Broadway at Sargent Avenue	South	Eastbound	1
Broadway at Kenneson Road	South	Eastbound	1
Broadway at Walnut Street	South	Eastbound	1
Broadway at Montgomery Avenue	South	Eastbound	1
Broadway at Melvin Street	South	Eastbound	1
Broadway at Fellsway West	North	Westbound	1
Broadway at Wheatland Street	North	Westbound	1
Broadway at Grant Street	North	Westbound	1
Broadway at East Site Driveway	North	Westbound	1
Broadway at West Site Driveway	North	Westbound	1
Broadway at Langmaid Avenue	North	Westbound	1
School Street at Richdale Avenue	West	Southbound	1
School Street at Stickney Avenue	East	Northbound	1
School Street at Howe Street	East	Northbound	1
School Street at Maple Avenue	East	Northbound	1
School Street at Evergreen Avenue	East	Northbound	1
	West	Southbound	1
School Street at Oakland Avenue	East	Northbound	1
School Street at Bradford Avenue	East	Northbound	1
Temple Street at Heath Street/Sewall Street	East	Northbound	1
	West	Southbound	1
Temple Street at Derby Street	East	Northbound	1
Temple Street at Memorial Road	West	Southbound	1
Temple Street at Sydney Street	East	Northbound	1

BLTS Through Signalized Intersections

The analysis of bicycle facilities at signalized intersections is a qualitative analysis. The presence of accommodations such as bike boxes, two-stage left-turn boxes, and conflict striping can improve bicyclists' comfort at signalized intersections. An evaluation of signalized intersections is presented in Table 24. This table provides details regarding bicycle accommodations at signalized intersections, and notes conflicts that can add to bicyclist stress. The bicycle accommodations at signalized intersections are expected to remain the same through all conditions.

Table 24 BLTS Through Signalized Intersections

Signalized Intersection	Bicycle Accommodations	Notes
Broadway at School Street	› Eastbound shared bus-bike lane/right-turn lane (painted red) with low right-turn volume › Westbound protected bike lane through intersection (no vehicle conflicts for westbound through movement) › Westbound two-stage left-turn box (painted green) › Conflict markings painted for eastbound bus-bike lane and westbound two-stage left-turn › Sharrow markings (painted green) provided on School Street in both directions	
Broadway at Temple Street	› Eastbound shared bus-bike lane (painted red) through intersection (no vehicle conflicts for eastbound through movement) › Westbound shared bus-bike lane (painted red) on approach and protected bike lane on departure › Conflict markings painted for westbound bike lane › Sharrow markings (painted green) provided on Temple Street southbound approach › Bike lane provided on Temple Street northbound departure	› Westbound right-turning vehicles must cross over shared bus-bike lane to get to right-turn lane
Broadway at Marshall Street	› Eastbound shared bus-bike lane (painted red) › Westbound shared bus-bike lane (painted red) › Conflict markings painted for bus-bike lanes › Northbound left-turn box (painted green) provided in Broadway median › Contraflow bike lane provided on Marshall Street northbound approach › Sharrow markings provided on Marshall Street southbound departure	
Temple Street at Jaques Street	› Northbound and southbound bike lanes › Green conflict markings painted for bike lanes	

Pedestrian Analysis

An evaluation was completed along each study area street segment and unsignalized street crossing using the Pedestrian Level of Traffic Stress (PLTS) methodology provided by the City of Somerville in its TIS Guidelines. Each street segment or intersection crossing is given a PLTS score 1 through 4. PLTS 1 indicates favorable conditions for walking with wide and separated sidewalks. In contrast, PLTS 4 indicates high stress conditions where pedestrians are not sufficiently separated from high-speed traffic and/or are provided a sidewalk which is narrow or in poor condition.

In addition to the PLTS analysis, a pedestrian delay analysis was performed at signalized intersections.

PLTS Along Street Segments

The analysis of pedestrian facilities along street segments considers factors such as sidewalk width and condition as well as buffer type and buffer width compared to the speed of adjacent traffic and width of the street. The results of the PLTS along street segments analysis for 2022 Existing conditions is shown in Figure 28 with color-coded segments.

In 2022 Existing conditions, most study area roadways are assigned PLTS 1 or 2. PLTS 1 is assigned to the segments of Broadway and Temple Street with sidewalks with an effective width of 6 feet or more and a buffer between pedestrians and moving traffic of more than 10 feet. The remaining study area roadway segments are assigned PLTS 2 as they provide sidewalk in acceptable condition that lack the wide width and buffers of the other segments, except for PLTS 3 at the Broadway at School Street northbound approach and Broadway at Temple Street westbound approach because they provide no buffer between the sidewalks and traffic in order to provide right-turn lanes.

No changes are expected in 2022 or 2027 Build conditions. The Project will maintain the pedestrian accommodations along the site frontage.

PLTS Through Unsignalized Street Crossings

The analysis of pedestrian facilities along unsignalized street crossings considers factors including speed of crossing vehicles, width of the street being crossed, presence of a median refuge island, and average daily traffic (ADT) volumes. Crossings of major driveways were considered to be street crossings for the purposes of this analysis. The "speed limit" of crossings was determined by the speed at which vehicles could cross the pedestrians' path. It should be noted that the methodology indicates crossings with non-ADA compliant ramps could be ranked no better than PLTS 3, while crossings without ramps were assigned PLTS 4.

Figure 28: 2022 Existing Conditions - Pedestrian Level of Traffic Stress

299 Broadway | Somerville, Massachusetts

October 2022

Table 25 shows the PLTS analysis for the unsignalized street crossings within the study area. All but one crossing received PLTS 1 due to the low vehicular volumes and speeds at the crossings. The crossings of Broadway at Sargent Avenue and Wheatland Street received PLTS 3 as they are not ADA-compliant due to the lack of detectable warning surfaces at the ramps.

Table 25 PLTS Through Unsignalized Street Crossings

Intersection	Intersection Leg	Crosswalk Direction	PLTS
Broadway at Marshall Street	South	EB/WB	1
Broadway at Sargent Avenue	South	EB/WB	3
Broadway at Kenneson Road	South	EB/WB	1
Broadway at Walnut Street	South	EB/WB	1
Broadway at Montgomery Avenue	South	EB/WB	1
Broadway at Melvin Street	South	EB/WB	1
Broadway at Fellsway West	North	EB/WB	1
Broadway at Wheatland Street	North	EB/WB	3
Broadway at Grant Street	North	EB/WB	1
Broadway at East Site Driveway	North	EB/WB	1
Broadway at West Site Driveway	North	EB/WB	1
Broadway at Langmaid Avenue	North	EB/WB	1
School Street at Richdale Avenue	West	NB/SB	1
School Street at Stickney Avenue	East	NB/SB	1
School Street at Howe Street	East	NB/SB	1
School Street at Maple Avenue	East	NB/SB	1
School Street at Evergreen Avenue	East	NB/SB	1
	West	NB/SB	1
School Street at Oakland Avenue	East	NB/SB	1
School Street at Bradford Avenue	East	NB/SB	1
Temple Street at Heath Street/Sewall Street	East	NB/SB	1
	West	NB/SB	1
Temple Street at Derby Street	East	NB/SB	1
Temple Street at Memorial Road	West	NB/SB	1
Temple Street at Sydney Street	East	NB/SB	1

Pedestrian Delay Analysis for Signalized Intersections

A pedestrian delay analysis was performed for each study area intersection per the City's TIS guidelines. The crosswalk location, length, available crossing time, and type of pedestrian phasing were noted. The provided "WALK" and flashing "DON'T WALK" (FDW) times were compared to the time required by the MUTCD, based on a walking speed of 3.5 feet per second. Table 26 shows the pedestrian delay analysis for each crosswalk at both signalized study area intersections.

Table 26 Pedestrian Delay Analysis for Signalized Intersections

Intersection	Crosswalk Leg	Push Button to Far Curb Length (ft)	Curb to Curb Length (ft)	Cycle Length (s)	Time Provided (s)		Time Required (s)		Maximum Pedestrian Delay (s)	Type of Pedestrian Phasing	Notes
					WALK	FDW	WALK [a]	FDW [b]			
Broadway at School Street	West	85	79	100	7	19	7	23	89	Concurrent	
	East	90	80	100	7	19	7	23	89	Concurrent	
	South	59	33	100	7	11	10	10	89	Concurrent	
Broadway at Temple Street	East	92	83	100	4	20	7	24	92	Concurrent	FDW through yellow
	North	53	45	100	7	10	7	13	89	Concurrent	
Broadway at Walnut Street	East	55	48	N/A	7	10	7	14	0*	Exclusive	Walk time only long enough to cross one side of Broadway at a time, but both Broadway approaches stopped
Temple Street at Jaques Street	East	41	34	100	7	15	7	10	89	Exclusive	
	West	42	36	100	7	15	7	11	89	Exclusive	
	North	60	55	100	7	15	7	16	89	Exclusive	
	South	57	51	100	7	15	7	15	89	Exclusive	

a Per MUTCD guidance, the walk interval should be at least 7 seconds. Also, per MUTCD guidance, the sum of the walk interval and pedestrian clearance time should be sufficient for a pedestrian to travel from the pedestrian detector to the far curb at a walking speed of 3 fps. Any additional time required to satisfy this condition should be added to the walk interval.

b Per MUTCD standard, the buffer interval (consisting of the yellow change interval and/or red clearance interval) may be used to satisfy the required pedestrian clearance time. It was assumed for this analysis that the buffer interval is not used to satisfy the required pedestrian clearance time. In other words, it was assumed that the FDW time must satisfy the entire pedestrian clearance time required.

* Pedestrians immediately served upon push button activation.

7

Parking Analysis

The Project will not include any on-Site parking. To support the vehicular needs of the Site, the Project will include a dedicated pick-up/drop-off area on Broadway and the Proponent is pursuing a limited number of neighborhood parking permits. The Project will also include dedicated bicycle parking on-Site for residents, employees, patrons, and guests, with at least one indoor, secure bicycle parking space per residential unit. To determine if there is potential additional capacity for future residents of the Project to obtain resident parking stickers and park on-street, an assessment of existing on-street parking facilities and parking demand was conducted for the area surrounding the Site.

This chapter summarizes the proposed accommodations on-Site and off-Site for the Project as well as the on-street parking assessment conducted and general findings.

Proposed Accommodations

Off-street Vehicular Parking

The Project will not include any on-Site parking for the Project. A small parking lot with approximately seven parking spaces will remain for the liquor store and barber shop at 313 Broadway and will be accessed via the existing western curb cut on Broadway and the existing cub cut on Temple Street. Access will be one-way with entering vehicles using the curb cut on Broadway and exiting vehicles using the curb cut on Temple Street.

The Project is expected to attract residents that want to live a car-free lifestyle with many nearby businesses in walking and biking distance as well as easy access to bus service along Broadway and the upcoming Green Line Extension at Gilman Square.

Bicycle Parking

The bicycle parking needs for the proposed Project will be accommodated through the provision of long-term secured and short-term bicycle parking within and around the proposed buildings. In total, approximately 293 long-term secured and 46 short-term bicycle parking spaces will be provided on-Site. The indoor bicycle parking spaces will be located in ground floor bicycle parking

rooms in each building that will have direct access to the outdoors. 118 bicycle parking spaces will be provided in the west building and 175 bicycle parking spaces will be provided in the east building with one indoor bicycle parking space provided per residential unit. The outdoor bicycle parking spaces will be available for patrons and guests to the Project and will be located throughout the Site.

Loading/Deliveries

Loading and deliveries on-Site will be accommodated via a single-access driveway on Broadway at the location of the current curb cut for the loading dock behind the former Star Market. This off-street loading area will allow for loadings and deliveries to occur without block pedestrian, bicycle, and vehicular operations on Broadway.

On-street Curb Use

On-street parking/loading spaces will be provided along Broadway adjacent to the Site. Approximately seven short-term metered parking spaces and two dedicated loading/pick-up/drop-off spaces are proposed along the curb fronting the Site that is currently signed as a taxi stand and occupied by the east Site driveway. The east Site driveway will be closed, increasing the length of available curb space. The new short-term metered parking spaces and dedicated loading/pick-up/drop-off spaces will be intended to serve patrons visiting the ground floor retail businesses as well as residents being picked-up/dropped-off for the Site. Short term loading and deliveries via small vehicles that will not use the dedicated loading space on-Site are also expected to utilize the dedicated curb space along Broadway. The final curbside regulations will be determined in coordination with the City of Somerville Mobility Division.

Neighborhood Parking Assessment

To understand the current parking demand on the streets surrounding the Site, VHB conducted an assessment for all streets within a five-minute and ten-minute walking radius of the Site on a typical weekday, two typical weeknights, and a typical Saturday in May 2022. VHB first conducted a parking inventory to determine the existing parking facilities within the study area, followed by an occupancy study conducted over four time periods. Each unique time period was observed to account for variations in peak parking demand and to adequately determine availability in a "worst-case" scenario.

The parking assessment and general findings were summarized by VHB in a memorandum to the City of Somerville dated June 23, 2022. The following section presents the information and summaries included in that memorandum.

Parking Assessment Study Area

The parking assessment included all on-street parking spaces provided within a ten-minute walkshed (an approximately 0.40-mile radius) from the Project Site. The study area is roughly bounded by Mystic Avenue and property owned by the Somerville Housing Authority to the north, Foss Park and Route 28 (McGrath Highway) to the east, Medford Street and Pearl Street to the south, and Central Street and Edgar Street to the west. The parking study did not include any roadways beyond Route

28 (McGrath Highway) or I-93 even though some of those areas may be within a ten-minute walkshed of the Project Site as those corridors act as barriers for pedestrians. The parking assessment study area was confirmed through consultation with the City of Somerville Mobility Division.

A map of the parking assessment study area is outlined in Figure 29.

Data Collection

Parking Inventory

VHB established a parking inventory via data collection in the field and supplemented by a desktop review of Google Maps Street View and Nearmap aerial imagery. The data collection process enabled VHB to establish the number and type of existing parking facilities within the parking assessment study area. All spaces were clearly demarked with appropriate signage. Based on these findings the available parking space types include:

- Resident Only
- Metered
- Short-Term (non-metered)
- Accessible

It should be noted that the short-term (non-metered) spaces include a variety of signage including, but not limited to, two-hour parking, loading zones, and drop-off/pick-up areas. It should also be noted that most short-term and metered parking spaces allow overnight parking for vehicles with resident stickers and therefore the different parking designations have minimal impact on overall availability for resident parking.

Parking Occupancy Counts

To assess existing parking utilization, parking counts were conducted on a typical weekday, two typical weeknights, and a typical Saturday to capture peak parking periods. Observations were made during different time periods to understand the parking demand during different times of day, as the weekday represents a time when many residents are at work and away from their homes, the weeknight presumably represents peak parking demand when most residents are usually home, and Saturday represents a time when residents may be away from their homes for social or recreational activities.

Specifically, the observations were conducted during the following four time periods:

- Typical Weekday: Wednesday, May 18, 2022, between 1:00 PM and 4:00 PM
- Typical Weeknight 1: Tuesday, May 17, 2022, between 10:00 PM and 1:00 AM
- Typical Weeknight 2: Wednesday, May 25, 2022, between 10:00 PM and 1:00 AM
- Typical Saturday: Saturday, May 21, 2022, between 10:00 AM and 1:00 PM

Figure 29: Parking Occupancy Study Area

299 Broadway | Somerville, Massachusetts

October 2022

Not to Scale

Study Area Boundary

Study Area Streets

Note: The parking study did not include any roadways beyond Route 28 or I-93, even though some of those areas may be within a 10-minute walkshed of the Project Site, as those corridors act as barriers for pedestrians.

File Path Goes Here...

Source: \\vhb\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\Graphics\FIGURES

The parking occupancy counts were conducted on non-holiday weeks while local schools were in session in May 2022. No major community events (such as Porchfest or Somerville Open Studios) that could have impacted typical parking demand occurred during the parking observations periods. In addition, the daytime parking observations counts were not conducted on days that had scheduled street cleaning in the neighborhood and the nighttime parking observation counts were not conducted on nights where street cleaning was scheduled for the following morning.

The parking occupancy counts were conducted by two engineers in the field. The number of vehicles parked on each street within the study area was recorded electronically during each time period. The parking occupancy was recorded one time for each study area roadway during the four time periods and was documented by block and by sides of the street. The parking occupancy data is summarized in the following section and the raw data is included in the Appendix.

Parking Observations

The parking occupancy has been segmented into parking spaces that are located within a five-minute walking radius (approximately 0.25-miles) and ten-minute walking radius (approximately 0.40-miles) from the Project Site. The number of vehicles parked on-street for each time period has been compared to the total number of on-street parking spaces to determine the percent of spaces that are occupied and the total number of available spaces. There are a total of 1,776 on-street parking spaces within a five-minute walking radius, and a total of 2,583 on-street parking spaces within a ten-minute walking radius.

Table 27 below illustrates the existing parking occupancy during the four observation periods.

Table 27 On-Street Parking Occupancy

	5-Minute Walking Radius [a]			10-Minute Walking Radius [b]		
Total Capacity	1,776 spaces			2,583 spaces		
	Total Occupied Spaces	**Percent Occupied**	**Total Available Spaces**	**Total Occupied Spaces**	**Percent Occupied**	**Total Available Spaces**
Weekday (midday)	826	47%	950	1,268	49%	1,315
Weeknight 1	1,361	77%	415	1,946	75%	637
Weeknight 2	1,349	76%	427	1,918	74%	665
Saturday (midday)	1,077	60%	699	1,577	61%	1,006
Average	*1,153*	*65%*	*623*	*1,677*	*65%*	*906*

Source: Parking counts conducted by VHB in May 2022.
a Parking spaces available within a 0.25-mile radius of the Site including metered, resident-only, short-term, and accessible spaces.
b Parking spaces available within a 0.40-mile radius of the Site including metered, resident-only, short-term, and accessible spaces.

As shown in Table 27 above, the peak parking occupancy based on all four count periods was approximately 74-77 percent after 10:00 PM on a typical weekday. This indicates that the study area is at its peak occupancy when residents are home for the night and most businesses are closed. During peak period occupancy on a typical weeknight, on average, there are approximately 421 spaces available out of 1,776 spaces surveyed within a five-minute walk of the Project Site and 651

spaces available out of the 2,583 spaces surveyed within a ten-minute walk. It should also be noted that the average occupancy across the four data collection periods was approximately 65-percent.

Parking trends and observations are described below in detail for each of the specific count periods on which parking counts occurred. Figures 30, 31, 32, and 33 illustrate the percent of occupied parking and the number of available spaces, by street, for a typical weekday midday, two typical weeknights, and a typical Saturday midday.

Typical Weekday Midday

Parking demand midday during a weekday was the lowest of the different observation periods. This is most likely due to residents with on-street parking permit stickers using their vehicles on weekdays to drive to work and then returning home in the evening. The parking occupancy after 1:00 PM on a typical weekday was 47-percent within a five-minute walking distance of the Project Site (approximately 0.25-miles), and 49-percent within a ten-minute walking distance of the Project Site (approximately 0.40-miles). Approximately 950 on-street parking spaces were available within a five-minute walk of the Project Site and approximately 1,315 on-street parking spaces were available within a ten-minute walk of the Project Site midday during a typical weekday.

Typical Weeknight

Parking demand overnight during a weekday was the highest of the different observation periods. This is most likely due a high percentage of to residents being home overnight on a weekday and housing their vehicles on-street. The parking occupancy after 10:00 PM on a typical weekday was 76-77 percent within a five-minute walking distance of the Project Site (approximately 0.25-miles), and 74-75 percent within a ten-minute walking distance of the Project Site (approximately 0.40-miles). Approximately 415-427 on-street parking spaces were available within a five-minute walk of the Project Site and approximately 637-665 on-street parking spaces were available within a ten-minute walk of the Project Site overnight during a typical weekday.

Typical Saturday Midday

Parking demand midday during a Saturday was higher than midday on a weekday, but lower than overnight on a weekday. This is most likely due to residents with on-street parking permit stickers using their vehicles on the weekend for recreational and social activities as opposed to primarily for commuting purposes. The parking occupancy after 10:00 AM on a typical Saturday was 60-percent within a five-minute walking distance of the Project Site (approximately 0.25-miles), and 61-percent within a ten-minute walking distance of the Project Site (approximately 0.40-miles). Approximately 699 on-street parking spaces were available within a five-minute walk of the Project Site and approximately 1,006 on-street parking spaces were available within a ten-minute walk of the Project Site midday during a typical Saturday.

Figure 30: Weekday Midday Parking Occupancy

299 Broadway | Somerville, Massachusetts

October 2022

Not to Scale

File Path Goes Here...

- Study Area Boundary
- Study Area Streets
- 0%-50% Occupied
- 50%-75% Occupied
- 75%-90% Occupied
- >90% Occupied

Note: Parking occupancy data collected on Wednesday, May 18, 2022, between 1:00 PM and 4:00 PM

Source: \\vhb\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\Graphics\FIGURES

Figure 31: Weeknight 1 Parking Occupancy

299 Broadway | Somerville, Massachusetts

October 2022

Not to Scale

Study Area Boundary

Study Area Streets

0%-50% Occupied

50%-75% Occupied

75%-90% Occupied

>90% Occupied

Note: Parking occupancy data collected on Tuesday, May 17, 2022, between 10:00 PM and 1:00 AM

File Path Goes Here...

Source: \\vhb\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\Graphics\FIGURES

Figure 32: Weeknight 2 Parking Occupancy

299 Broadway | Somerville, Massachusetts

October 2022

Not to Scale

Study Area Boundary

Study Area Streets

0%-50% Occupied

50%-75% Occupied

75%-90% Occupied

>90% Occupied

Note: Parking occupancy data collected on Wednesday, May 25, 2022, between 10:00 PM and 1:00 AM

File Path Goes Here...

Source: \\vhb\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\Graphics\FIGURES

Figure 33: Saturday Midday Parking Occupancy

299 Broadway | Somerville, Massachusetts

October 2022

Study Area Boundary

Study Area Streets

0%-50% Occupied

50%-75% Occupied

75%-90% Occupied

>90% Occupied

Note: Parking occupancy data collected on Saturday, May 21, 2022, between 10:00 AM and 1:00 PM

Source: \\vhb\gbl\proj\Wat-TS\15486.00 299 Broadway Somerville\Graphics\FIGURES

File Path Goes Here...

Parking Assessment Conclusion

VHB performed a parking inventory and occupancy study within a five-minute walking radius (approximately 0.25 miles) and within a ten-minute walking radius (approximately 0.40-mile) of the proposed Project Site at 299 Broadway and found the following:

- The peak parking occupancy period occurs during a typical weeknight after 10:00 PM at roughly 75-77 percent occupancy.
- Within a five-minute walk of the Project Site, approximately 415 on-street parking spaces are available during the peak parking occupancy period overnight on a typical weekday
- Within a ten-minute walk of the Project Site, approximately 637 on-street parking spaces are available during the peak parking occupancy period overnight on a typical weekday

Based on the findings above, there is adequate available parking supply to allow future residents of the Project Site to obtain resident parking stickers and park on-street. If 100 residents of the proposed development are granted on-street resident parking stickers and all park overnight during a typical weekday, there will still be over 300 available spaces within a five-minute walk of the Project Site and over 500 available spaces within a ten-minute walk of the Project Site.

Parking Demand

As the Project will not include any dedicated off-street parking, the parking demand will be significantly less than a typical residential development that includes on-Site parking. The Project is expected to attract residents that want to live a car-free lifestyle with many nearby businesses in walking and biking distance as well as easy access to bus service along Broadway and the upcoming Green Line Extension at Gilman Square. Amenities associated with the Project also will promote bicycle and pedestrian travel and alternate means of travel, such as taxi and private ride services (Uber, Lyft, and others), should continue to reduce the parking needs for this area.

Off-street parking demand for the Project will be limited by the number of residential parking permits that will be issued for residents of the Site. The Proponent will coordinate with the City of Somerville Mobility Division to determine the exact number of residential parking permits that will be available for residents of the Site.

8

Mobility Strategies

This section provides an overview of the proposed mobility strategies for the proposed Project which are designed to minimize Project-related impacts and promote travel by non-vehicles. As noted in the previous chapters, the Project is expected to have minimal impacts on the vehicular and transit operations within the study area.

Streetscape, Pedestrian, and Bicycle Accommodation Improvements

Improving safety, livability, and connectivity of the Site to the greater Winter Hill neighborhood is central to the development of the Project. Consistent with the goals of the City of Somerville, the Project's proposed streetscape design prioritizes the pedestrian experience and is designed to establish a clear hierarchy for pedestrian, bicycle, transit, and vehicular travel, and to provide opportunities for the creation of new publicly accessible open space and a vibrant public realm.

The Project provides several public realm improvements. The focal point of the Project will be a new civic plaza fronting Broadway. The civic plaza will be open to members of the public and will serve as a new central gathering place for residents and guests to the Winter Hill neighborhood. On the northern edge of the Site, the Project will include another public open space known as Sewall Park. A pedestrian walkway will be constructed between the civic plaza and Sewall Park, creating a new connection for pedestrians between Broadway and Sewall Street.

The bicycle parking needs for the proposed Project will be accommodated through the provision of long-term secured and short-term bicycle parking within and around the proposed buildings. In total, approximately 293 long-term secured and 46 short-term bicycle parking spaces will be provided on-Site. The indoor bicycle parking spaces will be located in ground floor bicycle parking rooms in each building that will have direct access to the outdoors with one indoor bicycle parking space provided per residential unit. The Site is located within 0.10 miles of an existing Bluebikes bike-share station at the intersection of Broadway and Walnut Street. While bicycle accommodations within the study area are considered adequate (including dedicated facilities on Broadway and other study area roadways), the Proponent will continue to coordinate with the City of Somerville's Mobility Division to enhance bicycle facilities.

The Proponent is committed to refreshing crosswalk pavement markings and preserving the integrity of the sidewalk network adjacent to the Site throughout construction. While pedestrian accommodations within the study area are considered adequate, the Proponent will continue to coordinate with the City of Somerville's Mobility Division to enhance pedestrian facilities.

Parking Policy

The Project will not provide any dedicated on-Site parking for the residents, employees, patrons, and guests to the Site and the Proponent is pursuing a limited number of neighborhood parking permits. The lack of dedicated parking on-Site will encourage residents of the Project to live a car-free lifestyle and take advantage of the nearby businesses in walking distance. In addition, residents of the Site will be able to access the bus accommodations on Broadway and the upcoming Green Line Extension at Gilman Square. This parking policy of not providing residential or retail parking on-Site will encourage residents to utilize the existing and proposed pedestrian, bicycle, and transit networks and this development model can be used as an example for future developments in the City of Somerville.

Transportation Demand Management

The Proponent has agreed to implement the various transportation demand management (TDM) measures as outlined in the Project's Mobility Management Plan (MMP) which was submitted to the City of Somerville's Mobility Division in tandem with this TIS. The City of Somerville's Mobility Division will review the MMP and provided feedback on the proposed TDM measures. The Project will be responsible for implementing the robust TDM program contained in the final, certified MMP.

The TDM plan includes measures to reduce the number of single occupancy vehicle trips generated by the Site. Some of the components of the TDM plan are as follows:

- Provide an on-Site Transportation Coordinator
- Post mobility management information
- Distribute mobility management information
- Promote transit use
- Encourage alternative means of travel
- Become an active member of any Transportation Management Associations (TMAs) that may be formed in the future
- Conduct post-occupancy transportation monitoring and annual reporting

Full details on the TDM plan are provided in the MMP.

9

Conclusion

The proposed Project is consistent with the City of Somerville's transportation-related goals for the area. The Site has been designed to encourage residents to live a car-free lifestyle and to maximize the amount and quality of open space available to the public. In summary, the Project will provide the following transportation-related benefits:

- The Project will be a mixed-use, transit-oriented development consistent with the City of Somerville's goals of increasing open space and reducing dependency on private vehicles.
- There will be no dedicated parking on-Site for the residents, patrons, employees, and guests of the Project. The Proponent is pursuing a limited number of neighborhood parking permits. The lack of on-Site parking will promote travel by biking, walking, or using MBTA transit service, including the new MBTA Green Line Extension which is expected to be operational in late 2022.
- Ample bicycle parking will be provided on-Site, with outdoor bicycle racks provided at key points near the building entrances for patrons and guests and at least one indoor, secure bicycle parking space provided per residential unit in ground-floor bicycle rooms with direct outdoor access.
- The Project will include a significant improvement to the neighborhood's public realm, including a new civic plaza along Broadway and a new neighborhood park along Sewall Street with a pedestrian-only accommodation between the two.
- The transportation analysis for the Project was conducted in a highly conservative manner. The underlying mode shares used assume higher automobile use than is anticipated for this area based on the future transit accommodations and the proposed Project parking supply. However, the conservatively high auto use was assumed so that the maximum potential vehicular traffic on the study area roadways would be evaluated.
- The Project will implement a robust program of Transportation Demand Management (TDM) strategies to take full advantage of its proximity to multiple mobility options and to reduce vehicles traveling to and from the Site.

Overall, the additional new traffic generated by proposed Project can be accommodated on the surrounding roadway network with the robust transportation mitigation program proposed.