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January 8, 2020

BY HAND

Ms. Jennifer Caira
Deputy Director
Planning and Development
Newton City Hall
1000 Commonwealth Avenue
Newton, MA 02459-1449

Re: Comprehensive Permit Application Under M.G.L. Chapter 40B, Sections 20-23
CPC Land Acquisition Company, LLC/15 Riverdale Avenue

Dear Jen,

I am enclosing herewith an initial traffic impact assessment dated December 17, 2019 by MDM Transportation Consultants, Inc. I have also enclosed a CD containing an electronic copy of the same. By a copy of this letter I am also forwarding an electronic copy of this report to Adrianna Henriquez.

Sincerely,

Stephen J. Buchbinder

Stephen J. Buchbinder

SJB/mer
Enclosure

cc: (By Email, w/enclosure)
Ms. Adrianna Henriquez

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Daniel J. Mills, P.E., PTOE

MEMORANDUM

DATE: December 17, 2019

TO: Mr. Jack Englert
Criterion Development Partners
1601 Trapelo Road, Suite 280
Waltham, MA 02451

FROM: Robert J. Michaud, P.E. – Managing Principal
Daniel A. Dumais, P.E. – Senior Project Manager

RE: **Proposed Mixed-Use Development**
15 Riverdale Avenue – Newton, MA

MDM Transportation Consultants, Inc. (MDM) has prepared this initial traffic impact assessment (TIA) for the proposed mixed-use re-development at 15 Riverdale Avenue in Newton, Massachusetts. The location of the site relative to adjacent roadways is shown in **Figure 1**. As currently proposed, the Site uses will include 204 residential apartments in multiple buildings plus commercial space that includes a limited amount of ancillary retail programming. This memorandum describes existing (baseline) traffic conditions for adjacent roadways, outlines trip generation characteristics of the existing use/proposed development, quantifies incremental traffic impacts of the Site development on area roadways, outlines the shared parking programming, and evaluates safety-related conditions at key study locations that provide access to the Site.

Key findings of the traffic assessment are as follows:

- *Traffic Generation*. Projected trip generation for the Site is approximately 112 vehicle trips (44 entering and 68 exiting) during the weekday morning peak hour and 111 vehicle trips (59 entering and 52 exiting) during the weekday evening peak hour. Compared to the existing use of the Site the project will generate 89 additional trips during the weekday morning peak hour and 94 additional trips during the weekday evening peak hour. The projected trip activity is comparable to prior occupancy of the site; only modest additional trips are anticipated from the residential use of the property.

- *Below Average Crash Rates*. All study intersections exhibit crash rates that are well below state averages and no immediate safety countermeasures are warranted based on the crash history at study intersections. None of the study intersections are listed by MassDOT as Highway Safety Improvement Project (HSIP) high crash locations.

Figure 1

Study Locations

MDM TRANSPORTATION CONSULTANTS, INC.
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Date: November 2019
Dwg No. 1014 MR01.dwg

- *Adequate Roadway Capacity & Operations*. Under future Build conditions, site trip increases will represent a small percentage change (approximately 2 percent) at primary area signalized intersections compared to No Build conditions. These trip increases fall within normal daily traffic fluctuations and do not present a material change in volume or operational impacts at study intersections. The principal access points (Los Angeles Street and Riverdale Avenue will continue to operate below capacity (LOS D or better) during peak travel periods. The Proponent notes that the signalized intersection of California Street at Bridge Street (the higher volume/primary area intersection west of the Site) currently experiences longer delays associated with vehicle queuing/backups on Bridge Street. While the project impacts are not expected to materially impact this location, ongoing initiatives for improved signal coordination between the communities of Newton and Watertown are expected to enhance operations and reduce delays associated with Bridge Street.

- *Adequate Shared Parking.* The parking activity at the Site is projected to range from 167 shared spaces during the workday period (8:00 am to 6:00 pm) and 209 parked vehicles during the overnight period (12:00 am to 4:00 am). The shared peak demand of 209 parked vehicles is a reduction in the non-shared demand by 20% and provides parking for the office component during the daytime period when the residential use is 30-50% lower than critical overnight period. The proposed parking supply of 227 spaces will provide adequate on-site parking to accommodate the mixed-used development (employees, customers, and residents). The Proponent should monitor the parking needs of the Site as tenant's are selected and change over time to ensure adequate parking through its management practices.

In summary, MDM finds that modest traffic increases associated with the proposed mixed-use development is not expected to materially impact operating conditions at the study intersections and that ample roadway capacity will be available to support the project. The Proponent will engage with the City in its ongoing efforts to improve traffic operations at the Bridge Street signalized intersection and will offer proportional funding assistance to advance these improvements, subject to further review. The Proponent is also developing a comprehensive Transportation Demand Management (TDM) program to take full advantage of the Site proximity to the Charles River multi-use path and area public transportation and proposes membership in the Watertown Transportation Management Association (TMA) to facilitate and encourage alternatives to automobile use. These TDM actions will establish a framework for minimizing Site traffic impacts by encouraging non-motorized travel modes and pedestrian/bicycle accommodation that is comparable with other area residential and mixed-use projects in Watertown that have demonstrated a measurable benefit in reducing parking needs and reliance on auto mode travel.

PROJECT DESCRIPTION

The project Site is located at 15 Riverdale Avenue in Newton, Massachusetts. The site consists of an industrial building (51,650± sf) which was most recently occupied by Boston Globe and C&K Components for office and warehouse/distribution activities. Three access driveways along Riverdale Avenue provide access to the Site's parking lots which provide a total of 136± marked spaces.

Under proposed conditions, the Site uses will include 204 residential apartments in multiple buildings plus commercial space that includes a limited amount of ancillary retail programming. A total of approximately 22,000 sf of commercial use is planned, principally as office space in a separate building along Los Angeles Street with apartments above; a limited amount of ancillary retail space (less than 5,000 sf) will be provided at ground level within the Site. Access/egress to the Site is proposed via Los Angeles Street, Riverdale Avenue and Midland Avenue – private ways over which the Proponent has easement rights. On-site parking is proposed to support the mixed-use residential/commercial buildings totaling approximately 227 shared parking spaces. The project will also include outdoor bicycle racks and indoor secure bike parking spaces to support the residential and commercial uses. The preliminary site layout/rendering is presented in **Figure 2.**

STUDY AREA

This TIA evaluates transportation characteristics of roadways and intersections that provide a primary means of access to the site, and that are likely to sustain a measurable level of traffic impact from the development. The study area includes the following intersections and identified in **Figure 1**:

- California Street at Bridge Street (Signalized)
- California Street at Los Angeles Street (Unsignalized)
- California Street at Riverdale Avenue (Unsignalized)
- California Street at 5th Avenue (Unsignalized)
- Watertown Street (Route 16) at California Street (Signalized)

North
Scale: Not to Scale

Site Plan Source: Icon Architecture

Figure 2

Preliminary Site Plan

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Date: November 2019
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EXISTING TRAFFIC & SAFETY CHARATERISTICS

An overview of roadway traffic volumes, travel speeds and intersection crash history are provided below.

Baseline Traffic Data

Peak Hour Traffic

Traffic volume data was collected in December 2018 and January 2019 during the weekday morning (7:00 AM–9:00 AM) and weekday evening (4:00 PM-6:00 PM) peak periods; these data are being updated in November 2019 and will be used to amend/augment this study at a later date. Review of MassDOT permanent count station data indicates that December and January are below average traffic months (approximately 3 percent and 9 percent below average month conditions, respectively). Thus, the traffic counts were adjusted to represent average conditions. The 2018 count data was then adjusted by ½ percent to reflect 2019 conditions. The resulting Baseline weekday morning and weekday evening peak-hour traffic volumes for the study intersections are depicted in **Figure 3** and **Figure 4**. Turning movement counts and permanent count station data are provided in the **Attachments**.

Daily Traffic Counts

Daily traffic volumes along California Street to the east of Riverdale Avenue in January 2019 using an automatic traffic recorder (ATR) device with results summarized in **Table 1**.

TABLE 1
ROADWAY TRAFFIC-VOLUME SUMMARY – CALIFORNIA STREET

Time Period	Daily Volume (vpd)[1]	Percent Daily Traffic[2]	Peak Hour Volume (vph)[3]	Peak Flow Direction[4]	Peak Hour Directional Volume (vph)
Weekday Morning Peak Hour	13,525	8%	1,035	52% EB	539
Weekday Evening Peak Hour	13,525	8%	1,140	57% WB	648

[1]Two-way daily traffic expressed in vehicles per day without seasonal adjustment.
[2]Two-way peak-hour volume expressed in vehicles per hour.
[3]The percent of daily traffic that occurs during the peak hour.
[4]EB = Eastbound, WB = Westbound

As summarized in **Table 1**, California Avenue to the east of Riverdale Avenue carries approximately 13,525 vehicles per day (vpd) on weekdays. Peak hour traffic flow on California Street is approximately 8 percent of the daily flow with directional flow slightly skewed eastbound during the weekday morning peak traffic hour and slightly skewed westbound during the weekday evening peak hour.

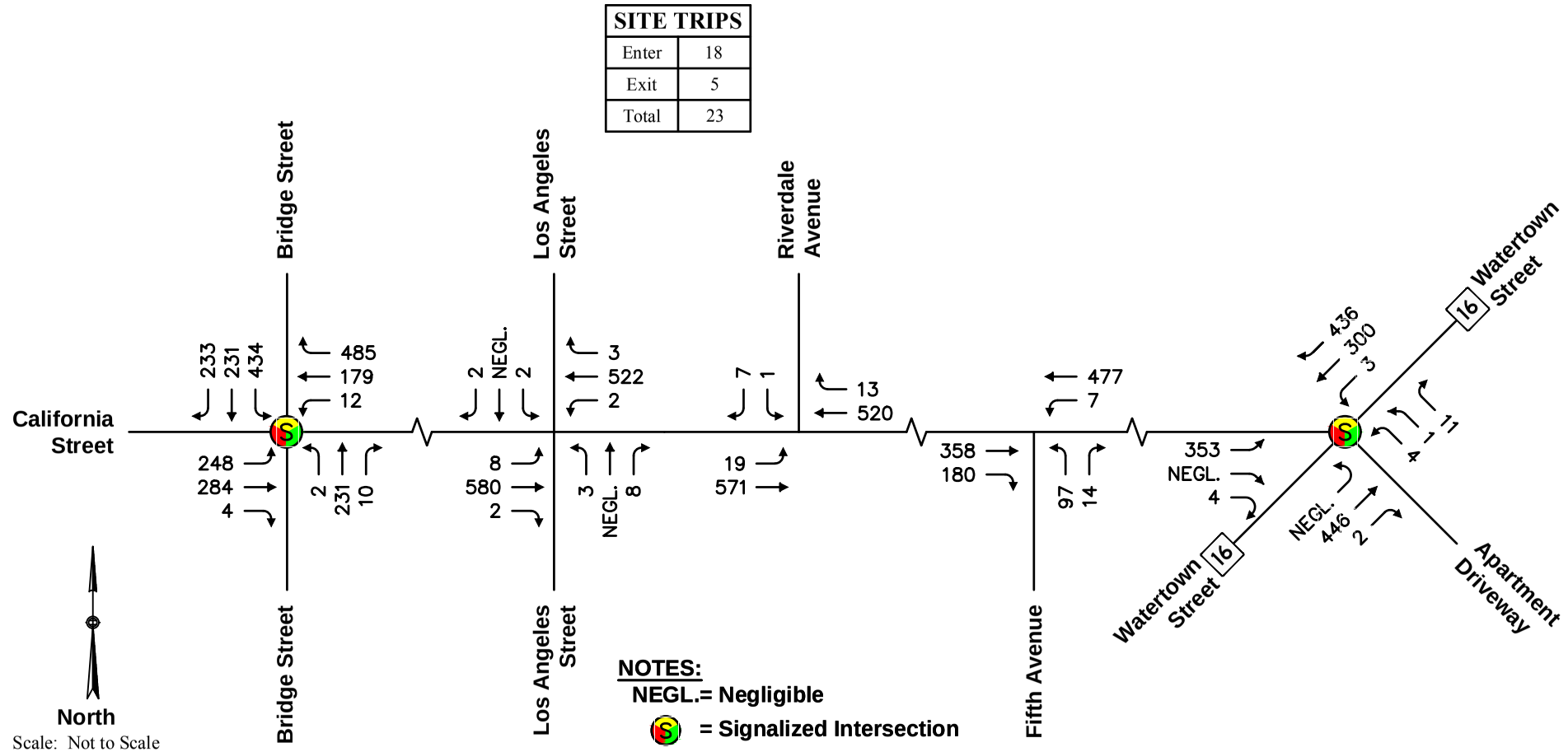

Figure 3

MDM TRANSPORTATION CONSULTANTS, INC.
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2019 Baseline Conditions
Weekday Morning Peak Hour Traffic Volumes

Date: November 2019
Dwg No. 1014 MR01.dwg

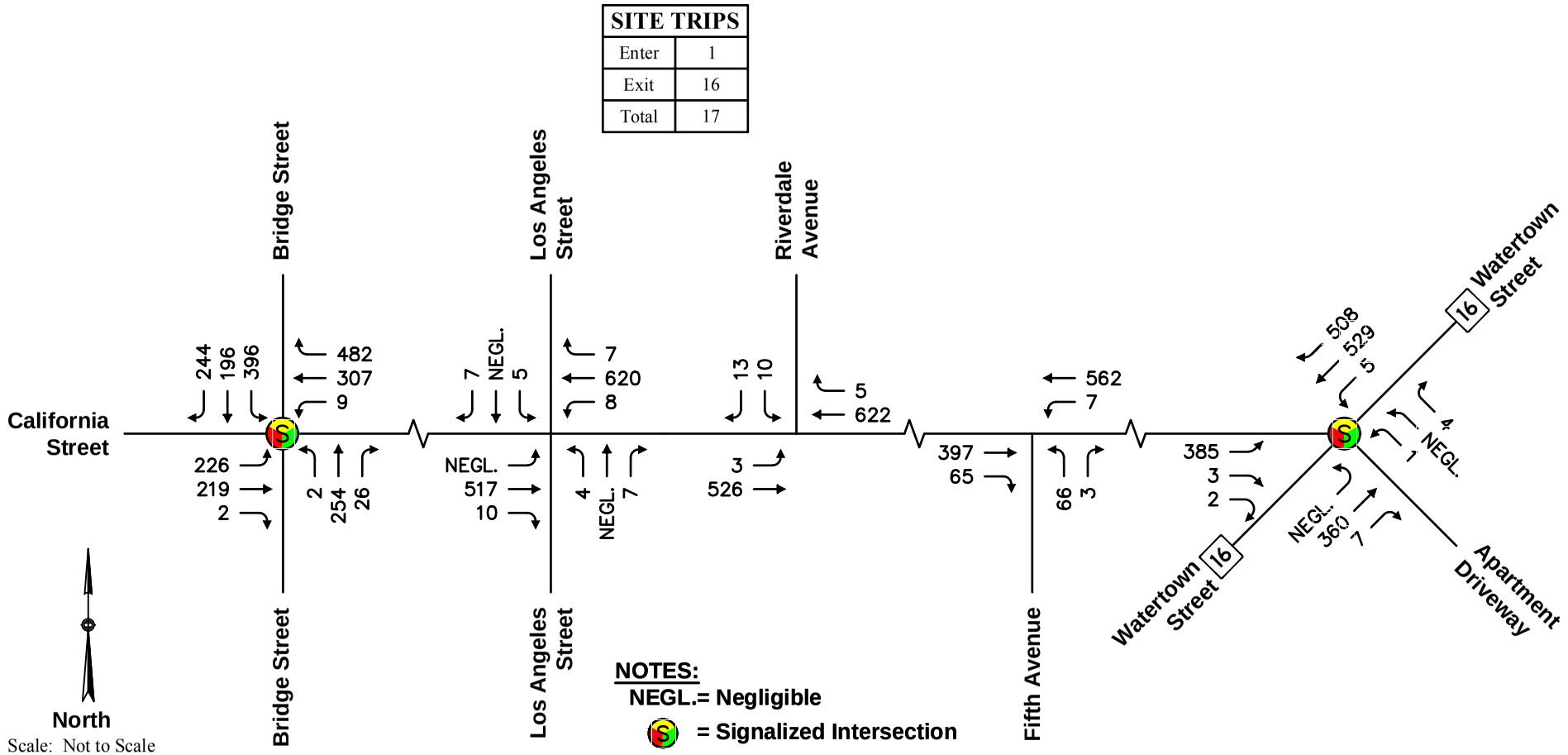

Figure 4

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

2019 Baseline Conditions
Weekday Evening Peak Hour Traffic Volumes

Date: January 2019
Dwg No. 1014 MR01.dwg

Observed Travel Speeds

Vehicle speeds were obtained for the eastbound and westbound travel directions on California Street in January 2019 by timing vehicles over a known distance and then converting the travel times to speeds. **Table 2** summarizes the average and 85th percentile speeds for the location and time period studied. Speed data is provided in the **Attachments**.

TABLE 2
SPEED STUDY RESULTS – CALIFORNIA STREET

Travel Direction	Posted Speed Limit (mph)[1]	Observed Travel Speed (mph)	
		Mean[2]	85th Percentile[3]
Eastbound	30	30	34
Westbound	30	30	33

[1]Regulatory (posted) speed limit.
[2]Arithmetic mean.
[3]The speed at or below which 85 percent of the vehicles are traveling.

As summarized in **Table 2**, the mean (average) travel speed on California Street traveling eastbound is 30 mph and the 85th percentile travel speed is 34 mph. In the westbound direction, the mean travel speed is 30 mph and the 85th percentile travel speed is 33 mph. The speed study results indicate that the observed travel speeds are generally highly consistent with the regulatory speed limit of 30 mph along California Street. The speed data will be used for the sight distance evaluation in the subsequent section of this report.

Intersection Crash History

In order to identify crash trends and safety characteristics for study area intersections, crash data were obtained from MassDOT for the City of Newton for the three-year period 2014 through 2016. Crash data for the study intersections is summarized in **Table 3** with detailed data provided in the **Attachments.**

Crash rates were calculated for the study area intersections as reported in **Table 3**. This rate quantifies the number of crashes per million entering vehicles. MassDOT has determined the official District 6 (which includes the City of Newton) crash rate to be 0.52 for unsignalized intersections and 0.71 for signalized intersections. This rate represents MassDOT's "average" crash experience for District 6 communities and serves as a basis for comparing reported crash rates for the study intersections. Where calculated crash rates notably exceed the district average, some form of safety countermeasures may be warranted. A review of Highway Safety Improvement Project (HSIP) locations was also conducted.

TABLE 3
INTERSECTION CRASH SUMMARY – 2014 THROUGH 2016[1]

	INTERSECTIONS				
Data Category	**California St at Bridge St**	**California St at Los Angeles St**	**California St at Riverdale Ave**	**California St at 5th Ave**	**California St at Watertown St (Route 16)**
Traffic Control	Signalized	Unsignalized	Unsignalized	Unsignalized	Signalized
Crash Rate[2]	**0.55**	**0.20**	**0.20**	**0.28**	**0.13**
MHD Dist. 3 Avg[3]	0.71	0.52	0.52	0.52	0.71
Year:					
2014	5	1	1	1	1
2015	7	1	2	1	2
2016	5	1	0	2	0
Total	**17**	**3**	**3**	**4**	**3**
Type:					
Angle	7	1	1	2	1
Rear-End	2	0	1	2	1
Head-On	1	1	0	0	0
Sideswipe	2	1	1	0	1
Single Vehicle	4	0	0	0	0
Unknown/Other	0	0	0	0	0
Severity:					
P. Damage Only	8	1	2	1	1
Personal Injury	9	1	1	3	2
Fatality	0	0	0	0	0
Not Reported	0	1	0	0	0
Conditions:					
Dry	12	2	2	4	2
Wet	3	1	1	0	1
Snow	0	0	0	0	0
Unknown	2	0	0	0	0
Time:					
7:00 to 9:00 AM	3	0	0	0	1
4:00 to 6:00 PM	2	1	0	1	0
Rest of Day	12	2	3	3	2

[1]Source: MassDOT Crash Database
[2]Crashes per million entering vehicles (MEV)
[3]District 6 Average Crash Rate

As summarized in **Table 3**:

- *California Street at Bridge Street.* There are a total of seventeen (17) crashes reported at the intersection during the three-year study period resulting crash rate of 0.55. The crashes included nine (9) angle/sideswipe type collisions, four (4) single vehicle collisions, two (2) rear-end type collisions, and one head-on type collision. The majority resulted in a non-fatal injury type crash (53%) under dry roadway conditions (71%). Thirty-percent of the crashes occur during peak commuter travel times. No fatalities or pedestrian related crashes were reported.

- *California Street at Los Angeles Street.* There are a total of three (3) crashes reported at the intersection during the three-year study period resulting crash rate of 0.20. The crashes included two (2) angle/sideswipe type collisions and one (1) head-on type collision. The majority resulted in property damage type crashes (67%) under dry roadway conditions (67%). One of the crashes occurred during the weekday evening commuter travel times. No fatalities or pedestrian related crashes were reported.

- *California Street at Riverdale Avenue.* There are a total of three (3) crashes reported at the intersection during the three-year study period resulting crash rate of 0.20. The crashes included two (2) angle/sideswipe type collisions and one (1) rear-end type collision. The majority resulted in property damage type crashes (67%) under dry roadway conditions (67%). None of the crashes occurred during the weekday evening commuter travel times. No fatalities or pedestrian related crashes were reported.

- *California Street at 5th Avenue.* There are a total of four (4) crashes reported at the intersection during the three-year study period resulting crash rate of 0.28. The crashes included two (2) angle type collisions and two (2) rear-end type collisions. The majority resulted in non-fatal injury type crashes (75%) under dry roadway conditions (100%). One of the crashes occurred during the weekday evening commuter travel times. No fatalities or pedestrian related crashes were reported.

- *Watertown Street (Route 16) at California Street.* There are a total of three (3) crashes reported at the intersection during the three-year study period resulting crash rate of 0.13. The crashes included two (2) angle/sideswipe type collisions and one (1) rear-end type collision. The majority resulted in non-fatal injury type crashes (67%) under dry roadway conditions (67%). One of the crashes occurred during the weekday morning commuter travel times. No fatalities or pedestrian related crashes were reported.

In summary, the study intersections all experienced crash rates well below the District 6 average and none of the intersection are listed as HSIP locations. Therefore, no immediate safety countermeasures are warranted based on the crash history at the study intersections.

SIGHT LINE EVALUATION

The evaluation documents existing sight distances for vehicles exiting the defacto site driveways (Los Angeles Street and Riverdale Avenue) along California Street with comparison to American Association of State Highway and Transportation Officials' (AASHTO)[1] recommended guidelines for the regulatory (posted) speed limit and observed travel speeds.

The AASHTO standards reference two types of sight distance which are relevant at the intersections with California Street: stopping sight distance (SSD) and intersection sight distance (ISD). Sight lines for critical vehicle movements were compared to minimum SSD and ISD recommended for the posted and observed travel speeds along California Street.

Stopping Sight Distance

Sight distance is the length of roadway visible to the motorist to a fixed object. The minimum sight distance available on a roadway should be sufficiently long enough to enable a below-average operator, traveling at or near a regulatory speed limit, to stop safely before reaching a stationary object in its path, in this case, a vehicle exiting from Los Angeles Street or Riverdale Avenue onto California Avenue or a vehicle traveling along California Street slowing to turn into either Los Angeles Street or Riverdale Avenue. The SSD criteria are defined by AASHTO based on design and operating speeds, anticipated driver behavior and vehicle performance, as well as physical roadway conditions. SSD includes the length of roadway traveled during the perception and reaction time of a driver to an object, and the distance traveled during brake application on wet, level pavements. Adjustment factors are applied to account for roadway grades.

SSD was estimated in the field using AASHTO standards for driver's eye (3.5 feet) and object height equivalent to the taillight height of a passenger car (2.0 feet) for the eastbound and westbound California Street approaches to Los Angeles Street or Riverdale Avenue. **Table 4** presents a summary of the available SSD and AASHTO's recommended SSD for the regulatory (posted) speed limit and observed travel speeds.

[1] *A policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO), 2011.

TABLE 4
STOPPING SIGHT DISTANCE SUMMARY
CALIFORNIA STREET APPROACHES

Approach/ Travel Direction	Available SSD	AASHTO Recommended[1]	
		Regulatory Speed[2]	85th Percentile Travel Speed[3]
California Street at Los Angeles Street			
Eastbound	>500 Feet	200 Feet	240 Feet
Westbound	>500 Feet	200 Feet	230 Feet
California Street at Riverdale Avenue			
Eastbound	>500 Feet	200 Feet	240 Feet
Westbound	>500 Feet	200 Feet	230 Feet

[1] Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet to object height of 2.0 feet and adjustments for roadway grade were applicable.
[2] Regulatory Speed Limit is 30 mph EB and WB.
[3] 85th Percentile travel speed is 34 mph EB and 33 mph WB.

As summarized in **Table 4,** analysis results indicate that the existing available sight lines exceed AASHTO's recommended SSD criteria for the eastbound and westbound travel directions along California Street based on the regulatory (posted) speed limit and observed travel speeds.

Intersection Sight Distance

Clear sight lines provide sufficient sight distance for a stopped driver on a minor-road approach to depart from the intersection and enter or cross the major road. As stated under AASHTO's Intersection Sight Distance (ISD) considerations, "…*If the available sight distance for an entering …vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to avoid collisions…To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road*." AASHTO's ISD criteria are defined into several "cases". Each case depends on the type of traffic control at the intersection (e.g. no control, *Yield* sign, *Stop* sign, and signal control), and the specific vehicle maneuver in question (crossing, right- or left-turn). AASHTO Case B1 (left turn from stop) and B2/B3 (right turn from stop and crossing maneuver) from Los Angeles Street and Riverdale Avenue were utilized in determining the recommended intersection sight distance summarized in **Table 5** below.

Available ISD was estimated in the field using AASHTO standards for driver's eye (3.5 feet), object height (3.5 feet) and decision point (8 feet from edge of travel way) looking east and west from Los Angeles Street and Riverdale Avenue onto California Street. **Table 5** presents a summary of the available ISD and AASHTO's recommended ISD.

TABLE 5
INTERSECTION SIGHT DISTANCE SUMMARY
DEPARTURES TO CALIFORNIA STREET

Approach/ Travel Direction	Available ISD	AASHTO Minimum[1]		AASHTO Ideal[1]
		Regulatory Speed[2]	85th Percentile Observed Speed[3]	Regulatory Speed[2]
California Street at Los Angeles Street				
Looking East	>500 Feet	200 Feet	230 Feet	290 Feet
Looking West	>500 Feet	200 Feet	240 Feet	335 Feet
California Street at Riverdale Avenue				
Looking East	>500 Feet	200 Feet	230 Feet	290 Feet
Looking West	>500 Feet	200 Feet	240 Feet	335 Feet

[1] Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet and an object height of 3.5 feet and adjustments for roadway grade if required. Minimum value as noted represents SSD per AASHTO guidance.
[2] Regulatory Speed Limit is 30 mph EB and WB.
[3] 85th Percentile travel speed is 34 mph EB and 33 mph WB.

The results of the ISD analysis presented in **Table 5** indicate that the available sight lines on the Los Angeles Street and Riverdale Avenue satisfy the recommended sight line requirements from AASHTO. MDM recommends that the existing and/or new plantings (shrubs, bushes) or physical landscape features located within sight lines should be maintained at a height of 2 feet above the adjacent roadway grade or less to ensure unobstructed lines of sight.

PUBLIC TRANSPORTATION

The Massachusetts Bay Transit Authority (MBTA) operates the following bus routes in the study area which are within ½ mile of the Site and could be used as an alternative mode of travel. A review of census data for Watertown indicates a public transit use of 10% for residents of the immediate study area (Census tract 3732) and 12% for the City of Newton. To remain conservative no credit (trip reduction) was taken for the use of nearby public transportation. Specific route and schedule information is provided in the **Attachments**.

- Route 558: This route provides service between the Riverside "T" Station and Downtown Boston with express service via the Massachusetts Turnpike (Route 90). In the immediate project area, a bus stop located near the intersection of California Street Street and Bridge Street. Service is provided on weekdays and operates between 6:25 am and 7:50 pm.

- Route 70/70A: This route provides service between Cedarwood (Main Street) and the University Park via Arsenal Street, Main Street (Route 20), Western Avenue and Lexington Street. Service is provided along Main Street in Watertown with a bus stop located approximately ½ mile from Site at Watertown Yard. Service is generally provided seven (7) days a week and operates between 4:50 am and 1:20 am on weekdays, between 5:00 am and 1:30 am on Saturdays and between 6:00 am and 1:30 am on Sundays.

- Route 59/71: These routes provide service in the area with a bus stop located approximately ½ mile from Site at Watertown Square. Several connections to other bus routes in the service area are available as is a direct connection to the Needham Commuter Rail. Service is generally provided seven (7) days a week.

- Route 52/57/502/504: These routes provide service in the area with a bus stop located approximately ½ mile from Site at Watertown Yard. Service is generally provided seven (7) days a week.

PEDESTRIAN/ BICYCLE FACILITIES

The immediate study area is served by an existing sidewalk system that connects the Site to public transportation, neighborhood businesses, the adjacent park and the adjacent Charles River Greenway mixed-used path. Direct connections between the Site and the Greenway will be provided as part of the project. LimeBike currently provides a bicycle sharing service within the City of Newton.

CAR SHARING SERVICES

Car sharing services provide access to short-term vehicle transportation. Vehicles can be rented by the hour or day and all standard vehicle costs (gas, maintenance, insurance, etc.) are included in the rental fee. Vehicles are checked out for a period and returned to their designated location. There is currently one Zipcar car-sharing locations in the vicinity of the Site located at the Watertown Square Apartments rear-lot along Aldrich Road.

PROJECTED FUTURE TRAFFIC CONDITIONS

Evaluation of the proposed development impacts requires the establishment of a future baseline analysis condition. This section estimates future roadway and traffic conditions with and without the proposed development. A seven-year planning horizon (year 2026) was selected consistent with standard industry practice and recent area traffic studies.

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

The following sections provide an overview of future No-Build and Build traffic volumes.

Background Growth

Background traffic includes demand generated by other planned developments in the area as well as demand increases caused by external factors. External factors are general increases in traffic not attributable to a specific development and are determined using historical data.

Nearby permanent count station data published by MassDOT indicates a 0.1 percent per year growth rate. For purposes of this evaluation, a 0.5 percent growth rate was used (3.6 percent increase over a 7-year horizon). This growth rate is higher than historic rates, and, as such, is also expected to account for any small fluctuation in hourly traffic that may occur from time to time in the study area and traffic associated with other potential small developments in the area. MassDOT permanent count station data and background growth calculations are provided in the **Attachments.**

A discussion with the City of Newton planning staff indicates that there are also two (2) site-specific projects that are permitted or in the permitting process in the study area that may also modestly increase traffic at the study intersections that are included in background growth. The projects include a 20-unit multi-family building proposed at 184 California Street and a 6-unit residential building under construction on Dalby Street. Given the size of the projects, it is assumed that traffic associated with these two projects can be reasonably accounted for in the general background growth rate.

2026 No-Build Traffic Volume Networks

In summary, to account for future traffic growth in the study area future No-Build traffic volumes are developed by increasing the Baseline volumes by approximately 3.6 percent (0.5 percent compounded annually over 7 years). The resulting 2026 No-Build traffic volumes are displayed in **Figure 5** and **Figure 6**.

Trip Generation

The proposed development includes 204 residential units as well as commercial space. The commercial space will include 22,000± gross square feet (gsf) of commercial space, assumed for analysis purposes to include office use with ancillary programming for a limited amount of retail space (less than 5,000 sf). As such, traffic generated by the Site is estimated using trip rates published in ITE's *Trip Generation*[2] for the Land Use Code (LUC) 710 – General Office Building and LUC 221 – Multi-Family Housing (Mid-Rise) for the weekday morning and weekday evening periods, which correspond to the critical analysis periods for the proposed uses and adjacent street traffic flow. As a conservative measure, no credit or trip reduction is taken for use of the nearby public transportation system, pedestrian trips to/from the surrounding neighborhood or adjoining land uses, or "internal" trip reduction for shared trips between the on-site uses.

Table 6 presents the trip-generation estimate for the proposed development based on ITE methodology. Detailed trip generation worksheets are provided in the **Attachments**.

TABLE 6
TRIP-GENERATION – ITE RATES

	Proposed Site Trips			Existing	
Period/Direction	**Apartments[1]**	**Office[2]**	**Total**	**Site Uses[3]**	**Δ**
Weekday Morning Peak Hour					
Entering	22	22	44	18	+26
Exiting	64	4	68	5	+63
Total	86	26	112	23	+89
Weekday Evening Peak Hour					
Entering	55	4	59	1	+58
Exiting	31	21	52	16	+36
Total	86	25	111	17	+94

Source: ITE *Trip Generation*, 10th Edition; 2017.
[1]Based on ITE LUC 221 applied to 200 apartment units.
[2]Based on ITE LUC 710 applied to 22,000 sf.
[2]Based on traffic counts at the Site in January 2019.

[2]*Trip Generation, 10th Edition*, Institute of Transportation Engineers, Washington, D.C. (2017).

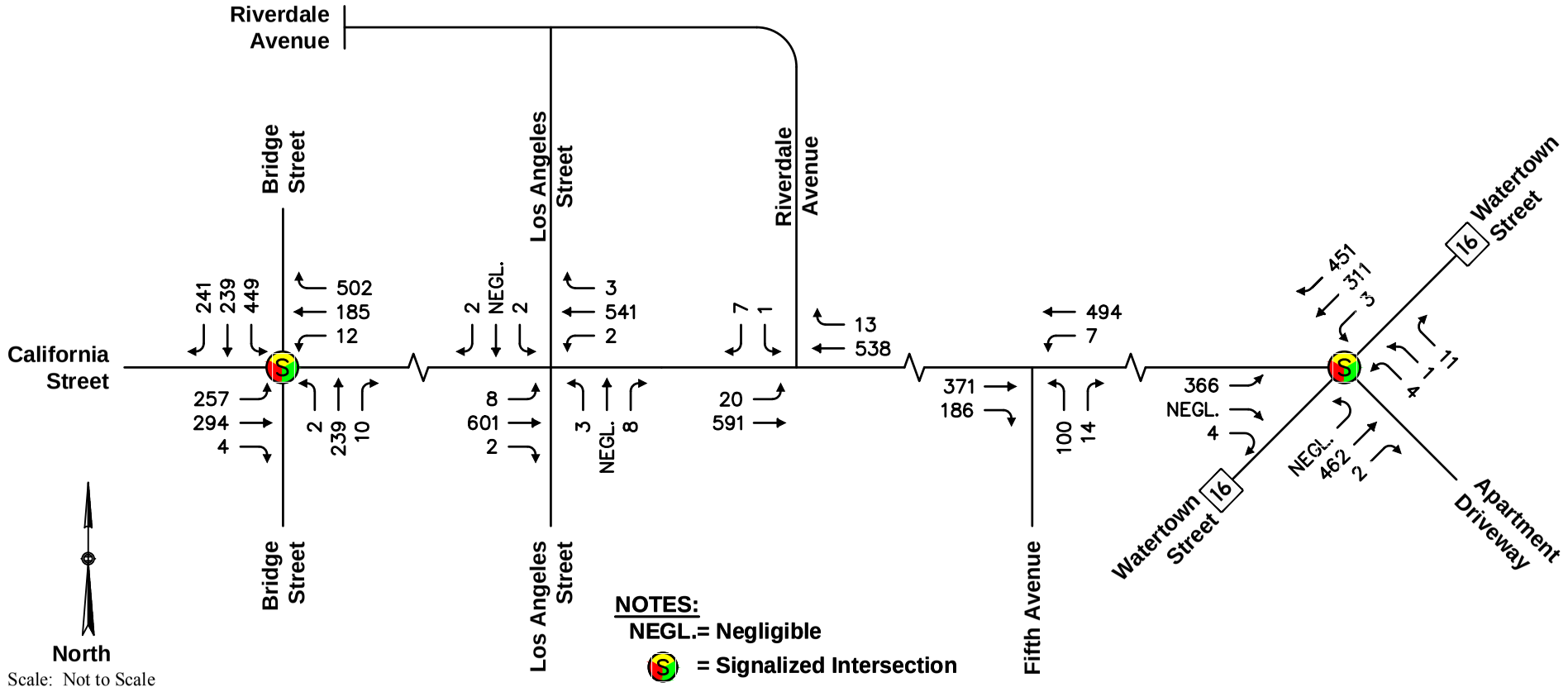

Figure 5

MDM TRANSPORTATION CONSULTANTS, INC.
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2026 No-Build Conditions
Weekday Morning Peak Hour Traffic Volumes

Date: November 2019
Dwg No. 1014 MR01.dwg

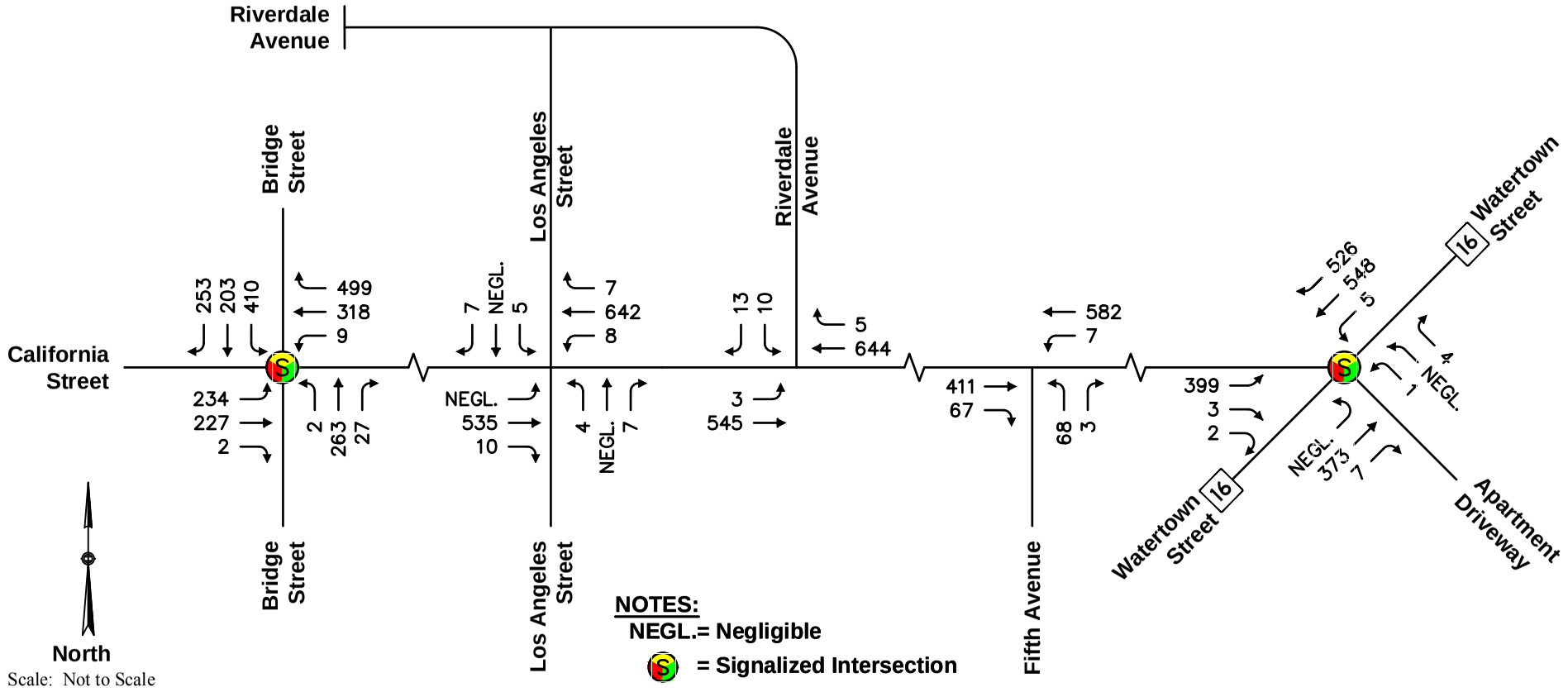

Figure 6

MDM TRANSPORTATION CONSULTANTS, INC.
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2026 No-Build Conditions
Weekday Evening Peak Hour Traffic Volumes

Date: November 2019
Dwg No. 1014 MR01.dwg

As summarized in **Table 6**, projected trip generation for the Site is approximately 112 vehicle trips (44 entering and 68 exiting) during the weekday morning peak hour and 111 vehicle trips (59 entering and 52 exiting) during the weekday evening peak hour. Compared to the existing use of the Site the project will generate 89 additional trips during the weekday morning peak hour and 94 additional trips during the weekday evening peak hour. As shown the proposed office trips are highly comparable to the existing site use trips with the additional trips from the property primarily due to the proposed apartment units. Trip generation calculations are provided in the **Attachments**.

Trip Distribution

The distribution for projected traffic for the residential component is based on Census Journey to Work data statistics for Newton while distribution for the commercial use (office) are based existing travel patterns in the area. The resulting trip distribution patterns are presented in **Figure 7**. Trip distribution calculations are provided in the **Attachments.**

Development-related trips for the proposed development are assigned to the roadway network using the ITE trip-generation estimates shown in **Table 6** and the distribution patterns presented in **Figure 7**. Development-related trips at each intersection approach for the weekday morning and weekday evening peak hours are quantified in **Figure 8** and **Figure 9**.

2026 Build Traffic Conditions

2026 Build condition traffic volumes are derived by first removing trips associated with the existing Site uses and then adding incremental traffic increases for the proposed development uses of the Site to the 2026 No-Build conditions. **Figure 10** and **Figure 11** present the 2026 Build condition traffic-volume networks for the weekday morning and weekday evening peak hours. Trip tracings for the removal of the existing Site trips are provided in the **Attachments.**

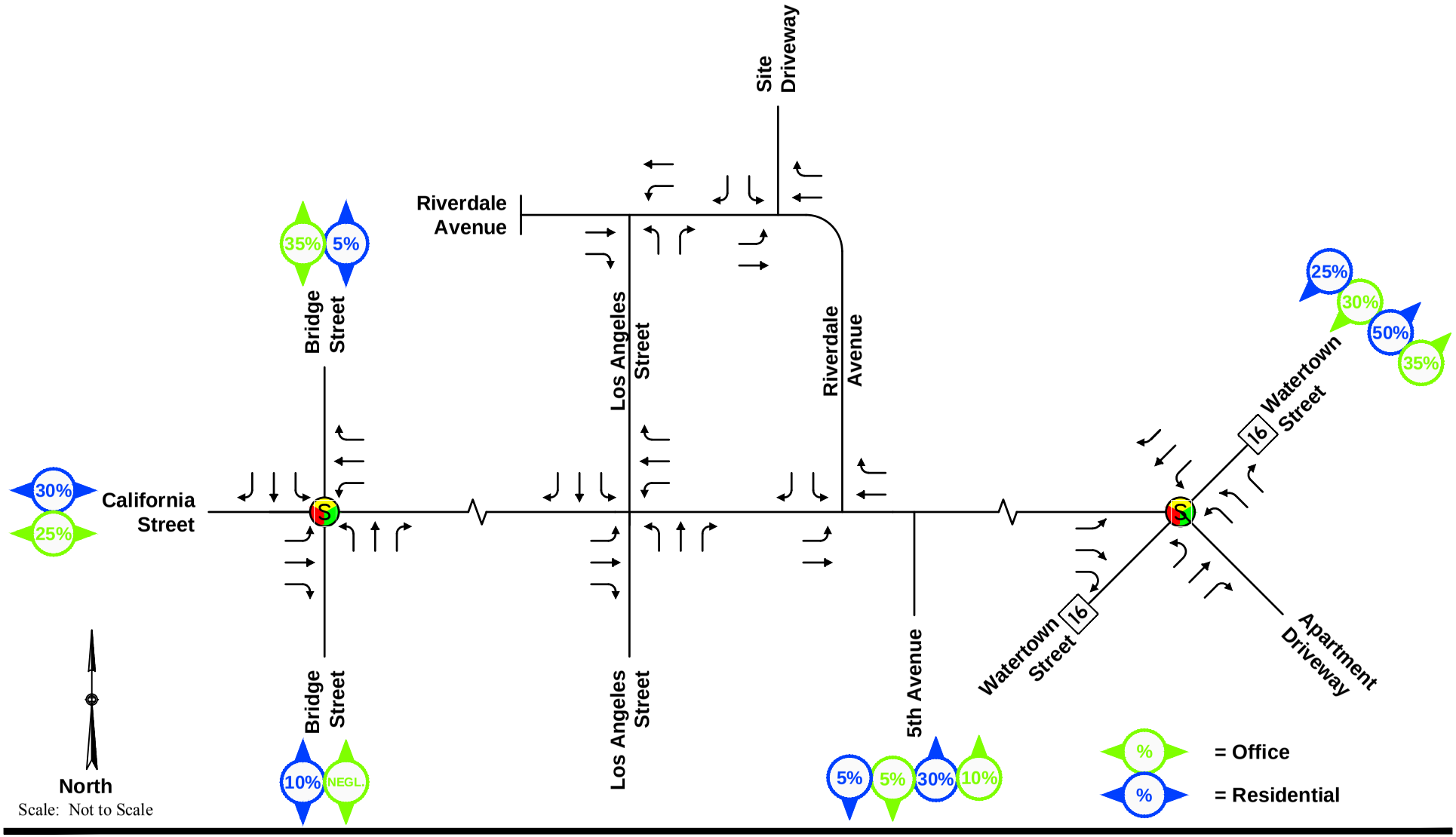

Figure 7

Trip Distribution

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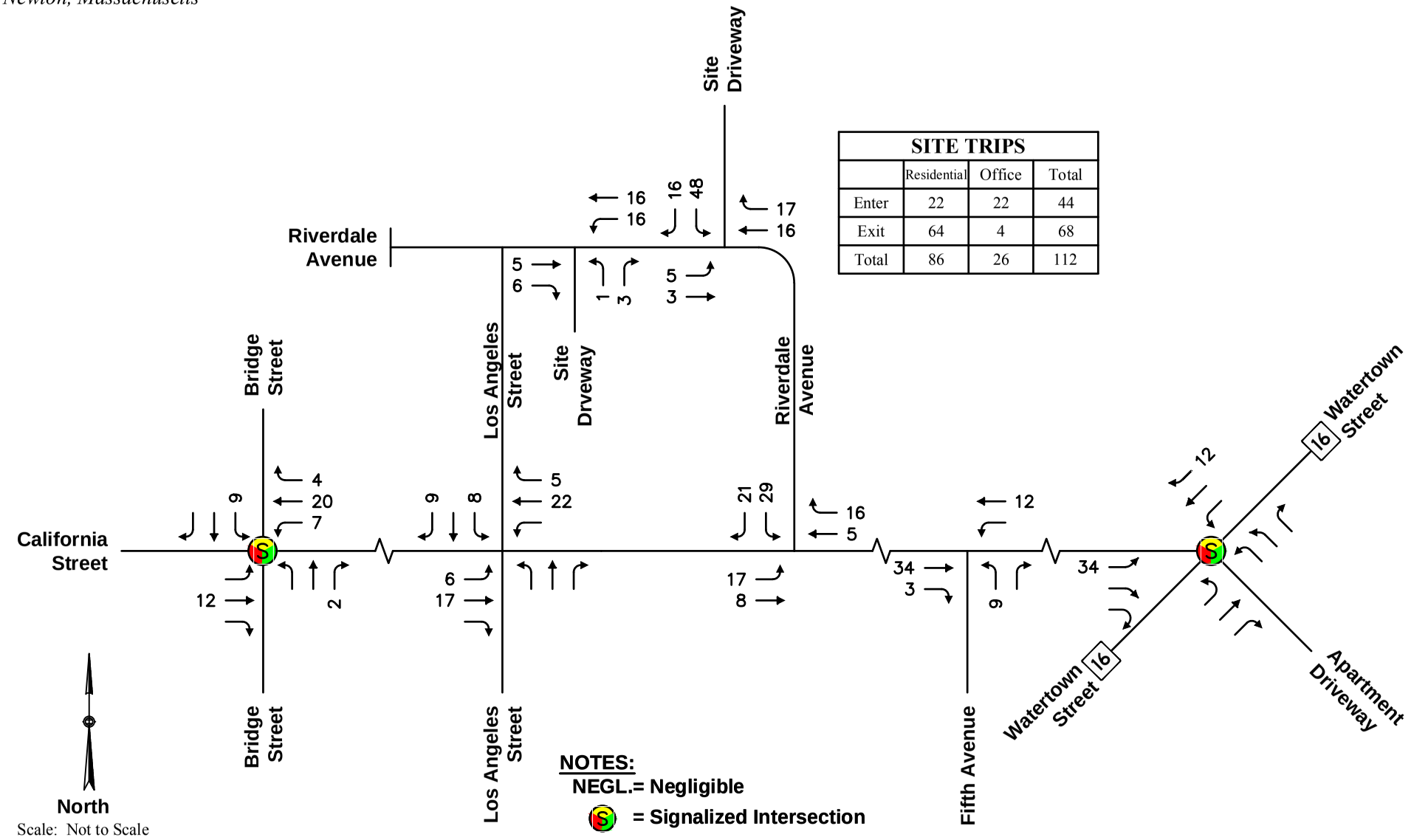

SITE TRIPS			
	Residential	Office	Total
Enter	22	22	44
Exit	64	4	68
Total	86	26	112

Figure 8

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

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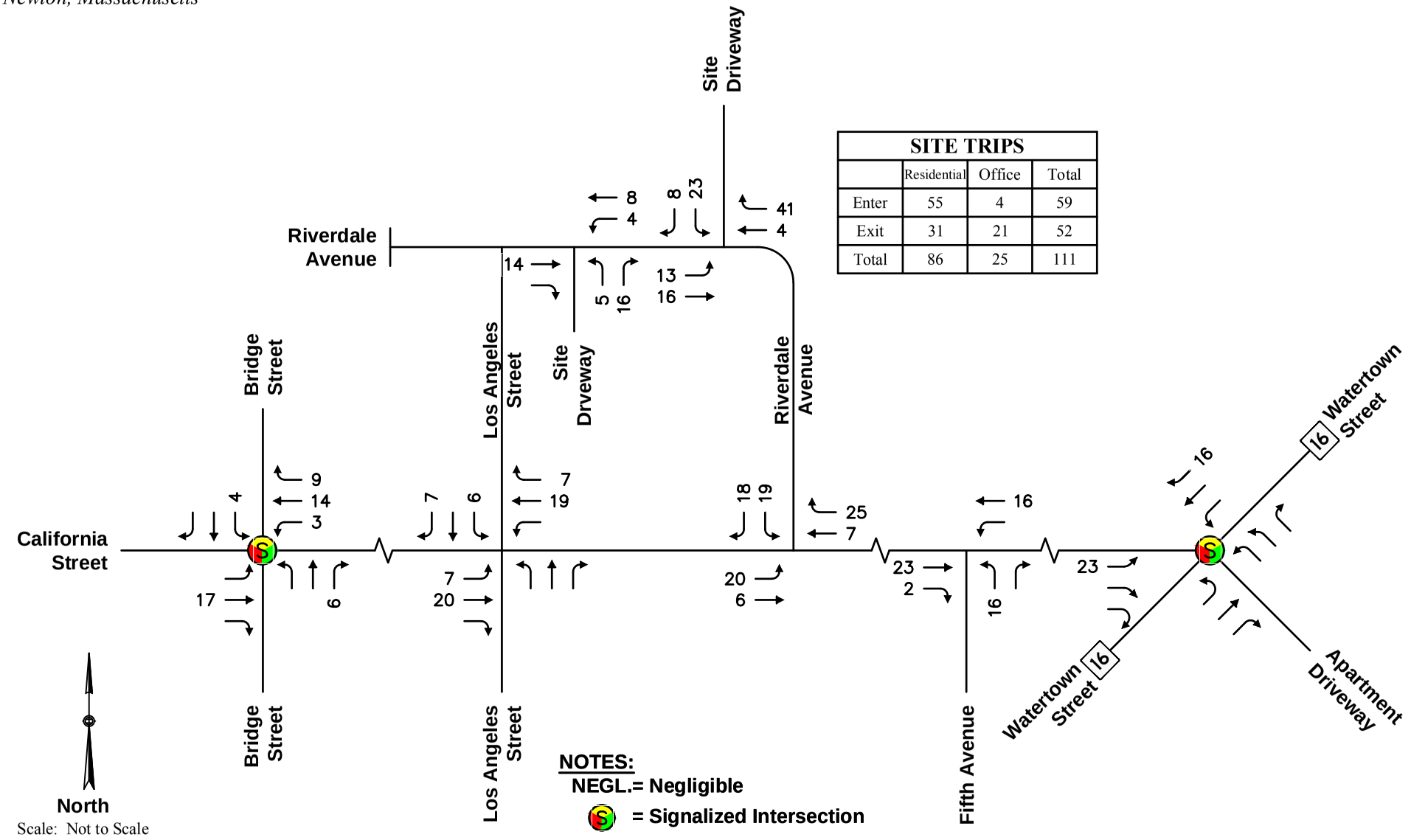

SITE TRIPS			
	Residential	Office	Total
Enter	55	4	59
Exit	31	21	52
Total	86	25	111

Figure 9

Site Generated Trips
Weekday Evening Peak Hour Traffic Volumes

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Date: November 2019
Dwg No. 1014 MR01.dwg

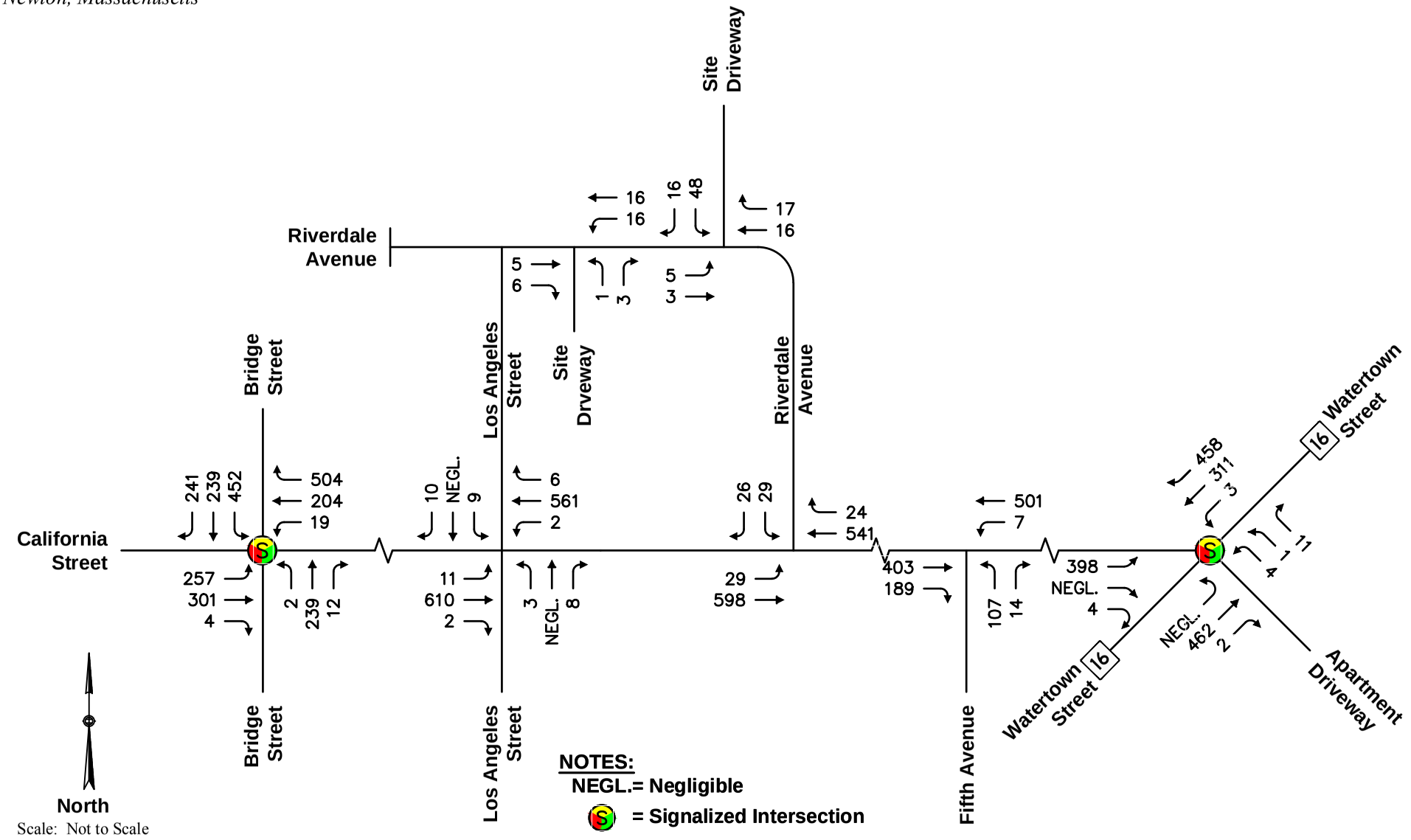

Figure 10

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

Date: November 2019
Dwg No. 1014 MR01.dwg

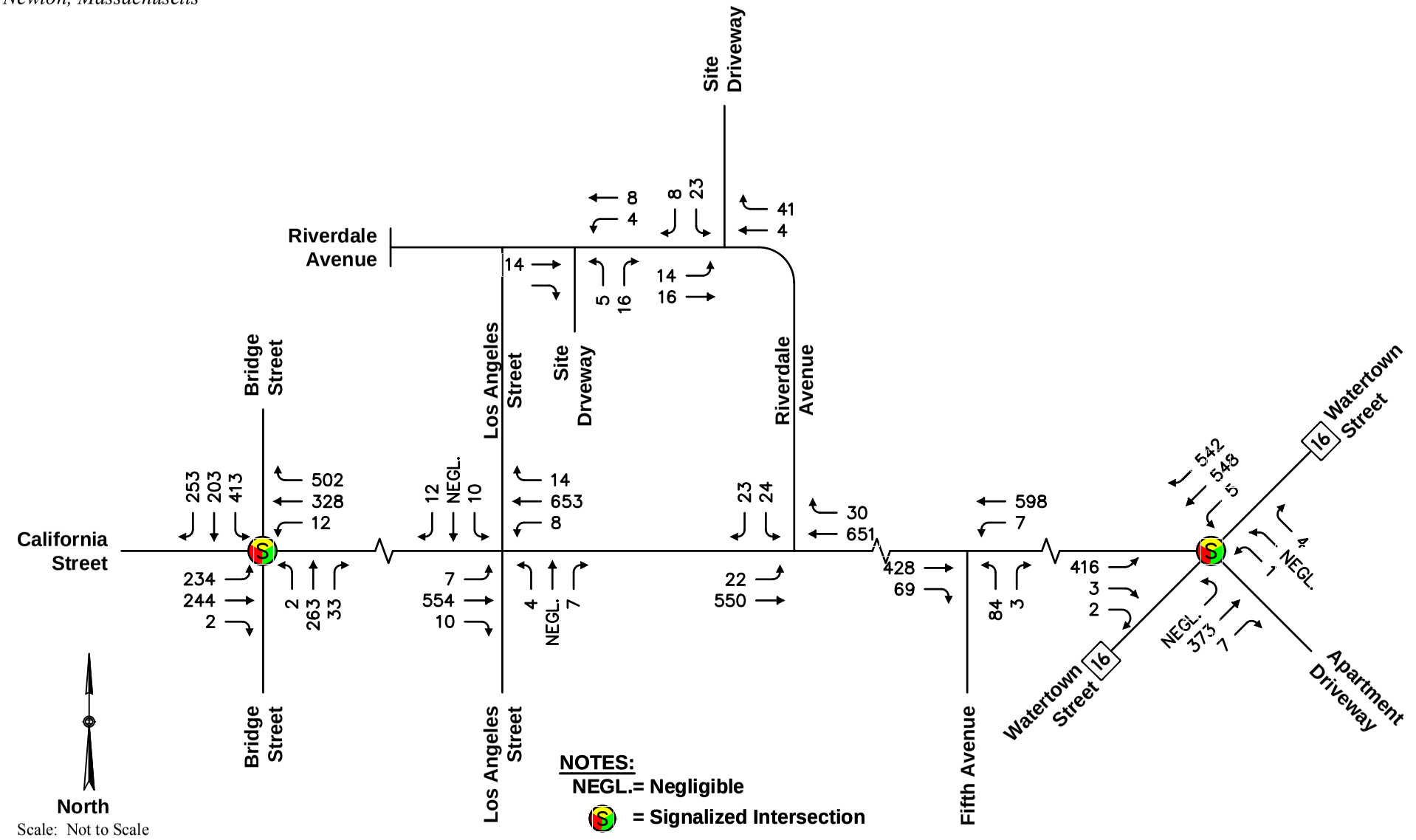

Figure 11

2026 Build Conditions
Weekday Evening Peak Hour Traffic Volumes

MDM TRANSPORTATION CONSULTANTS, INC.
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Date: November 2019
Dwg No. 1014 MR01.dwg

OPERATIONS ANALYSIS

This section provides an overview of operational analysis methodology, and an assessment of intersection operations under Baseline and projected future No-Build and Build conditions.

Analysis Methodology

Intersection capacity analyses are presented in this section for the Baseline, No-Build, and Build traffic-volume conditions. Capacity analyses, conducted in accordance with EEA/MassDOT guidelines, provide an index of how well the roadway facilities serve the traffic demands placed upon them. The operational results provide the basis for recommended access and roadway improvements in the following section.

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the 2010 Highway Capacity Manual (HCM). The resulting analysis presents a level-of-service (LOS) designation for individual intersection movements. The LOS is a letter designation that provides a qualitative measure of operating conditions based on several factors including roadway geometry, speeds, ambient traffic volumes, traffic controls, and driver characteristics. Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of LOS, depending on the time of day, day of week, or period of year. A range of six levels of service are defined on the basis of average delay, ranging from LOS A (the least delay) to LOS F (delays greater than 50 seconds for unsignalized movements and delays greater than 80 seconds for signalized movements). The specific control delays and associated LOS designations are presented in the **Attachments**.

Intersection Capacity Analysis Results

Level-of-Service (LOS) analyses were conducted for the Baseline, No-Build, and Build conditions for the study intersections. The results of the intersection capacity are summarized below in **Table 7** and **Table 8**. Detailed analysis results are presented in the **Attachments**.

TABLE 7
INTERSECTION CAPACITY ANALYSIS RESULTS
WEEKDAY MORNING PEAK HOUR

		2019 Baseline			2026 No-Build			2026 Build		
Period	Approach	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
Bridge Street at	Eastbound	0.71	37	D	0.73	38	D	0.75	37	D
California Street	Westbound	0.73	21	C	0.74	21	C	0.78	24	C
	Northbound	0.93	>80	F	0.96	>80	F	0.97	>80	F
	Southbound	0.81	37	D	0.86	39	D	0.89	42	D
	Overall	**0.93**	**38**	**D**	**0.96**	**40**	**D**	**0.97**	**42**	**D**
Los Angeles Street at	Eastbound	0.00	<5	A	0.01	<5	A	0.01	<5	A
California Street	Westbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	NB Exit	0.04	18	C	0.04	18	C	0.04	19	C
	SB Exit	0.02	20	C	0.02	21	C	0.09	22	C
California Street at	Eastbound	0.02	<5	A	0.02	<5	A	0.03	<5	A
Riverdale Avenue	Westbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	SB Exit	0.02	14	B	0.02	14	B	0.25	25	C
Fifth Avenue at	Eastbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
California Street	Westbound	0.01	<5	A	0.01	<5	A	0.01	<5	A
	NB Exit	0.43	27	D	0.46	30	D	0.53	34	D
Watertown Street at	Eastbound	0.56	14	B	0.58	14	B	0.62	15	B
California Street	Westbound	0.07	14	B	0.07	14	B	0.07	14	B
	Northbound	0.38	10	B	0.38	10	B	0.39	11	B
	Southbound	0.49	6	A	0.49	6	A	0.49	6	A
	Overall	**0.56**	**9**	**A**	**0.58**	**9**	**A**	**0.62**	**10**	**A**

[1]Volume-to-capacity ratio
[2]Average control delay per vehicle (in seconds)
[3]Level of service
[4]n/a = not applicable

TABLE 8
INTERSECTION CAPACITY ANALYSIS RESULTS
WEEKDAY EVENING PEAK HOUR

		2019 Baseline			2026 No-Build			2026 Build		
Period	Approach	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
Bridge Street at	Eastbound	0.87	44	D	0.90	47	D	0.92	48	D
California Street	Westbound	0.83	27	C	0.84	27	C	0.86	28	C
	Northbound	0.90	78	E	0.93	>80	F	0.95	>80	F
	Southbound	0.83	37	D	0.88	40	D	0.91	42	D
	Overall	**0.90**	**40**	**D**	**0.93**	**43**	**D**	**0.95**	**44**	**D**
Los Angeles Street at	Eastbound	0.00	<5	A	0.00	<5	A	0.01	<5	A
California Street	Westbound	0.01	<5	A	0.01	<5	A	0.01	<5	A
	NB Exit	0.05	20	C	0.05	21	C	0.06	23	C
	SB Exit	0.06	22	C	0.07	24	C	0.14	28	D
California Street at	Eastbound	0.00	<5	A	0.00	<5	A	0.03	<5	A
Riverdale Avenue	Westbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	SB Exit	0.11	21	C	0.11	22	C	0.28	31	D
Fifth Avenue at	Eastbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
California Street	Westbound	0.01	<5	A	0.01	<5	A	0.01	<5	A
	NB Exit	0.31	26	D	0.34	28	D	0.43	34	D
Watertown Street at	Eastbound	0.72	27	C	0.75	28	C	0.77	30	C
California Street	Westbound	0.02	>5	A	0.02	<5	A	0.02	>5	A
	Northbound	0.24	8	A	0.24	8	A	0.24	8	A
	Southbound	0.66	8	A	0.67	8	A	0.67	8	A
	Overall	**0.72**	**12**	**B**	**0.75**	**13**	**B**	**0.77**	**13**	**B**

[1]Volume-to-capacity ratio
[2]Average control delay per vehicle (in seconds)
[3]Level of service
[4]n/a = not applicable

As summarized in **Table 7** and **Table 8**:

- *Bridge Street at California Street.* Under future No-Build conditions, the signalized intersection will operate at an overall LOS D or better during the peak hours. The overall increase in delay with the project in place under Build conditions will be nominal and the intersection will continue to operate at an overall LOS D or better with only minor changes between No-Build and Build conditions. The Bridge Street northbound approach to California Street will continue to operate with long delays.

  This signalized intersection is the higher volume/primary area intersection west of the Site and as noted currently experiences longer delays associated with vehicle queuing/backups on Bridge Street. While the project impacts are not expected to materially impact this location, ongoing initiatives for improved signal coordination between the communities of Newton and Watertown are expected to enhance operations and reduce delays associated with Bridge Street.

- *Los Angeles Street at California Street.* Under Build conditions the Los Angeles Street approach to California Street will operate below capacity at LOS D or better during the peak hours. Mainline operation along California Street will continue to operate unimpeded at LOS A.

- *Riverdale Avenue at California Street.* Under future Build conditions, the mainline operation along California Street will continue to operate unimpeded at LOS A. The Riverdale Avenue approach to California Street will operate below capacity with moderate delays at LOS D or better peak hours

- *Fifth Avenue at California Street.* Under future Build conditions, the Fifth Avenue approach to California Street will continue to operate below capacity at LOS D or better during the peak hours.

- *California Street at Watertown Street.* The overall increase in delay with the project in place under Build conditions will be nominal and the intersection will continue to operate at an overall LOS B or better with only minor changes between No-Build and Build conditions. The Bridge Street northbound approach to California Street will continue to operate with long delays.

In summary modest Site trip increases fall within normal daily traffic fluctuations on area roadways and do not present a material change in volume or operational impacts at study intersections. The principal access points (Los Angeles Street and Riversdale Street) will continue to operate below capacity (LOS D or better) during peak travel periods. The Proponent notes that the signalized intersection of California Street at Bridge Street (the higher volume/primary area intersection west of the Site) currently experiences longer delays associated with vehicle queuing/backups on Bridge Street.

Signal Queue Impacts

Vehicle queue results are presented for the two signalized intersections within the study area. These vehicle queues are compared to available storage lengths, which are defined as lengths of exclusive turn lanes or the distance to the nearest major intersection for through lanes. Vehicle queue results from the capacity analysis are summarized in **Table 9** and **Table 10**. The estimated queue lengths are based on the capacity analysis results provided using Synchro computer software. Detailed worksheets of the queuing analysis are provided in the Attachments.

TABLE 9
VEHICLE QUEUE ANALYSIS SUMMARY
BRIDGE STREET AT CALIFORNIA STREET

		Baseline		2026 No-Build		2026 Build	
Approach	Available Queue Storage Length (feet)	Average Queue Length[1]	Maximum Queue Length[1]	Average Queue Length[1]	Maximum Queue Length[1]	Average Queue Length[1]	Maximum Queue Length[1]
Weekday Morning Peak Hour							
Eastbound L	135±	153	209	158	216	155	216
Eastbound T/R	>1000	180	239	185	248	187	254
Westbound L/T	>1000	151	223	156	231	176	259
Westbound R	130±	<25	50	<25	51	<25	52
Northbound L/T/R	>1000	198	360	205	375	206	377
Southbound L	250±	240	709	258	738	268	743
Southbound T/R	435±	202	510	215	539	222	539
Weekday Evening Peak Hour							
Eastbound L	135±	124	232	128	254	126	263
Eastbound T/R	>1000	120	179	124	185	132	200
Westbound L/T	>1000	230	327	237	342	246	377
Westbound R	130±	<25	44	<25	45	<25	45
Northbound L/T/R	>1000	210	371	219	387	223	400
Southbound L	250±	198	606	219	641	225	646
Southbound T/R	435±	173	397	186	426	190	426

[1]Average and 95th percentile queue lengths are reported in feet per lane.

TABLE 10
VEHICLE QUEUE ANALYSIS SUMMARY
WASHINGTON STREET AT CALIFORNIA STREET

Approach	Available Queue Storage Length (feet)	Baseline		2026 No-Build		2026 Build	
		Average Queue Length[1]	Maximum Queue Length[1]	Average Queue Length[1]	Maximum Queue Length[1]	Average Queue Length[1]	Maximum Queue Length[1]
Weekday Morning Peak Hour							
Eastbound L/T/R	>1000	49	141	53	154	60	173
Westbound L/T/R	>100	<25	<25	<25	<25	<25	<25
Northbound L/T/R	>1000	34	72	36	74	40	74
Southbound L/T	375±	47	112	49	114	55	114
Southbound R	350±	<25	<25	<25	<25	<25	<25
Weekday Evening Peak Hour							
Eastbound L/T/R	>1000	104	294	112	308	122	326
Westbound L/T/R	>100	<25	<25	<25	<25	<25	<25
Northbound L/T/R	>1000	36	57	38	58	38	58
Southbound L/T	375±	132	214	139	224	139	224
Southbound R	350±	<25	<25	<25	<25	<25	<25

[1]Average and 95th percentile queue lengths are reported in feet per lane.

As summarized in **Table 9** and **Table 10**, under Build conditions the average and 95th percentile queue lengths will generally remain within the available storage lengths. The exception is the southbound and eastbound left turn lanes at the California Street intersection with Bridge Street which have maximum (95th percentile) queues that continues to extend beyond the storage area during the weekday morning peak hour. The project will result in a change in queue lengths of 1 vehicle or less during peak hours.

PROJECTED PEAK PARKING DEMAND

Peak parking generation rates for multi-family residential complexes and office space, are published by the Institute of Transportation Engineers (ITE) in *Parking Generation*[3] which provides a basis for identifying parking demand characteristics for developments. These parking rates represent peak characteristics for each land use type as "stand-alone" uses that have differing peak parking periods. **Table 11** provides a summary of unadjusted peak parking demands for the mixed-use development inclusive of employees, visitors, and residents. The ratios for the residential parking demand have been adjusted to reflect a 10% reduction for area transit use per Census data. This parking analysis generally follows guidelines set forth for mixed-use shared parking within the Newton Zoning Ordinance (Chapter 30) Section 5.1.4(E) and Section 7.3.5 with detailed data sheets provided in the **Attachments**.

[3] *Parking Generation, 5th Edition*, Institute of Transportation Engineers, Washington D.C. 2019

TABLE 11
WEEKDAY PEAK PARKING DEMAND – ITE BASIS

Land Use	Average Peak Parking Rate	Average Peak Demand	Adjusted Average Peak Demand[3]
Residential[1]	0.75/ bedroom	232	209
Office[2]	2.39/ 1,000 sf	53	53
	Total (Non-Shared)	**285**	**262**

[1]ITE LUC 221 applied to 309 bedrooms.
[2]ITE LUC 710 applied to 22,000 sf.
[3]Peak parking rates adjusted for Transit use based on Census Data (10% reduction).

As summarized in **Table 11**, the non-shared average peak parking demand for the proposed mixed-use development is estimated at 285 parked vehicles on a weekday based on ITE parking rates prior to any shared parking or reduction for transit mode share use. When the 10% reduction for transit use is applied to the residential use, the non-shared average peak parking demand for the proposed mixed-use development is estimated at 262 parked vehicles.

Time-of-day factors published by ITE were then used to model hourly the parking demands at the proposed mixed-use development. The graphical summary of projected hourly parking demands at the site based on the published ITE time-of-day factors and use of the ITE peak parking rates for the project uses are shown in **Figure 12** with the mode share adjustment for the residential apartments. For reference, the unadjusted hourly shared parking graphic is included in the **Attachments**.

As shown in **Figure 12**, the parking activity at the Site is projected to range from 167 shared spaces during the workday period (8:00 am to 6:00 pm) and 209 parked vehicles during the overnight period (12:00 am to 4:00 am). The shared peak demand of 209 parked vehicles is a reduction in the non-shared demand by 20% and provides parking for the office component during the daytime period when the residential use is 30-50% lower than the critical overnight period.

In summary, the proposed parking supply of 227 spaces will provide adequate on-site parking to accommodate the mixed-used development (employees, customers, and residents). The Proponent should monitor the parking needs of the Site as tenant's are selected and change over time to ensure adequate parking through its management practices.

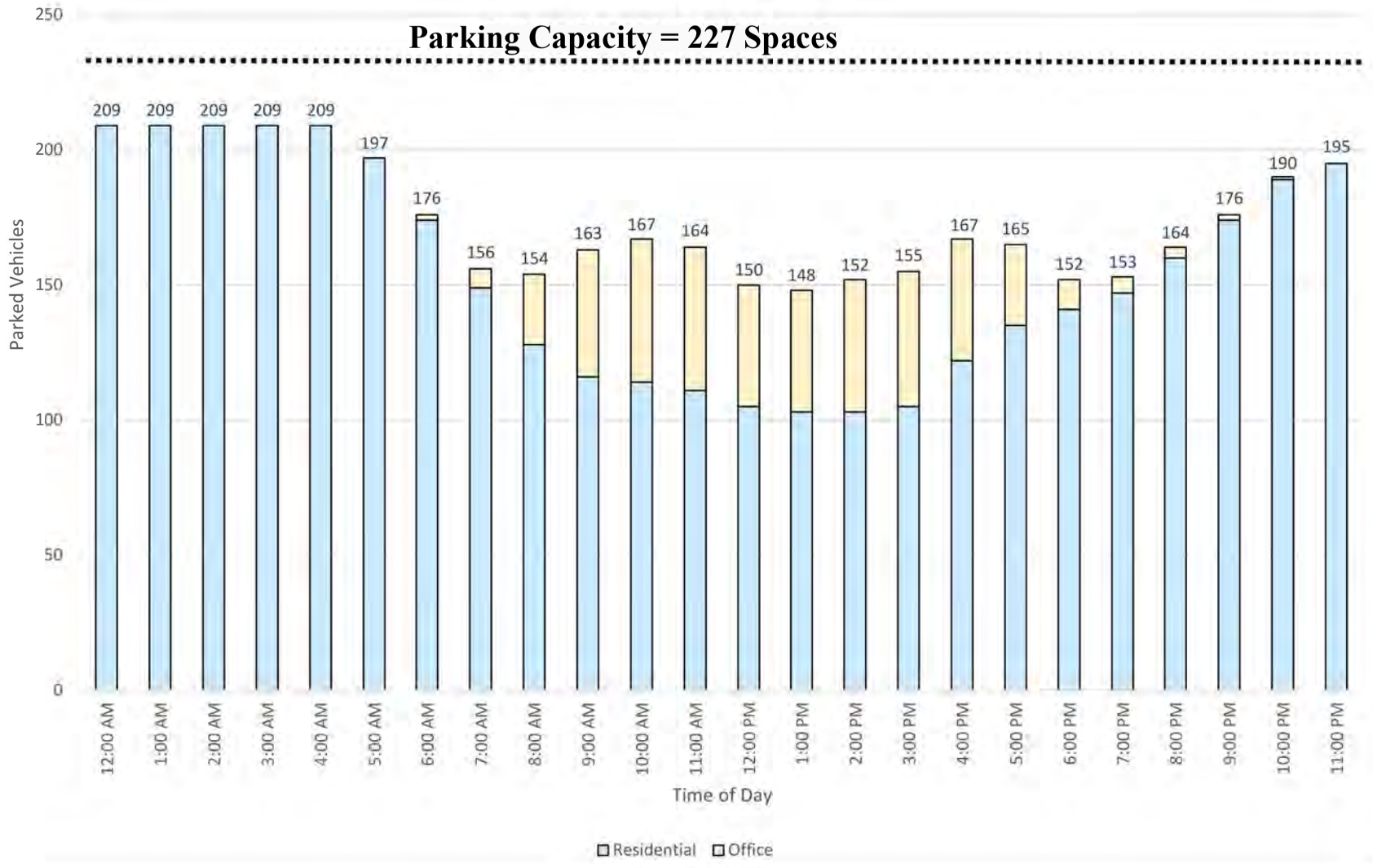

Figure 12

Hourly Shared Parking Demand (Adjusted)

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Planners & Engineers

Date: December 2019
Dwg No. 1014 MR02.dwg

CONCLUSIONS AND RECOMMENDATIONS

Under future Build conditions, site trip increases will represent a small percentage change (approximately 2 percent) at primary area signalized intersections compared to No-Build conditions. These trip increases fall within normal daily traffic fluctuations and do not present a material change in volume or operational impacts at study intersections. Likewise, study intersections exhibit below-average crash rates based on historic crash data; consequently, safety countermeasures are not warranted.

The Proponent notes that the signalized intersection of California Street at Bridge Street (the higher volume/primary area intersection west of the Site) currently experiences longer delays associated with vehicle queuing/backups on Bridge Street. While the project impacts are not expected to materially impact this location, ongoing initiatives for improved signal coordination between the communities of Newton and Watertown are expected to enhance operations and reduce delays associated with Bridge Street.

MDM recommends the following improvements to enhance vehicular operations and to encourage non-motorized trip activity:

Access/Egress Improvements

- "STOP" signs (R1-1) and "STOP" line pavement markings should be installed on the site driveway approaches to Riverdale Avenue. The signs and pavement markings shall be compliant with the Manual on Uniform Traffic Control Devices (MUTCD).
- *Sight Line triangles.* Existing and new plantings (shrubs, bushes) or physical landscape features (walls, fences, signs) to be located within the driveway sight triangle should be maintained at a height of 2 feet or less above the adjacent existing roadway grade to ensure unobstructed lines of sight.

Pedestrian and Bicycle Accommodation

- *Pedestrian Connections*. The development has incorporated sidewalks that connect the proposed buildings to the existing Charles River Greenway and the adjoining municipal park. The Proponent will work collaboratively with the City of Newton and/or abutters, if feasible, to implement a sidewalk connection along Riverdale Avenue to California Street to supplement the proposed connections via the adjacent Forte Park and the Greenway.
- *Bicycle and Pedestrian Amenities*. The development will incorporate bicycle storage racks in the buildings for the residential units. Bicycle racks will also be located proximate to commercial use within the project with specific locations to be identified in the final approved Site Plan.

Off-site Signal Improvements

Bridge Street/California Street (Newton) & Pleasant Street (Watertown). A field inventory indicated that the traffic signal equipment within the traffic signal cabinets are in good operating condition. The traffic signal controllers at both intersections are currently operating using GPS time clock synchronization to enable time-based traffic signal coordination on weekdays. Signal timing plans indicate that coordinated operation is currently in effect on weekdays during the AM and PM peak periods (6:00 AM to 9:00 AM and 3:00 PM to 7:00 PM). Although the traffic signals are operating in a coordinated fashion, field observations indicate that timing and phasing enhancements may be possible to better manage vehicle queues on Bridge Street to improve traffic flow. The Proponent understands that the City of Newton and Town of Watertown are engaged in discussions on possible signal improvements to optimize operations and that funding is available for these improvements via earmarked developer contributions from Watertown-based projects. The Proponent will engage in discussions with the City of Newton to determine a proportional funding contribution to facilitate near-term implementation of an optimized traffic signal plan for the Bridge Street intersections, subject to further review.

Transportation Demand Management (TDM)

TDM programs include a series of measures that are designed to encourage the use of alternative modes of travel to single-occupant vehicles (SOVs) through influencing the choice of travel modes by residents, commercial tenant employees, and patrons. The benefits that are derived from an effective TDM program include less congestion on the roadway network; improved air quality; reduced parking demands and the need for construction of new parking spaces; and health benefits through walking and bicycling. The Proponent is committed to reduce auto dependency by residents, commercial tenant employees and patrons by implementing a robust TDM program. These elements are also consistent with the Massachusetts Department of Environmental Protection (MADEP) directive to use all reasonable and feasible mitigation actions to reduce auto emissions. A preliminary list of potential TDM program elements may include the following which are currently under consideration by the Proponent:

- *Watertown TMA Membership*. The Proponent will become a member of the recently formed Watertown TMA, consistent with recent membership by the City of Newton. The TMA membership offers a host of TDM programs and incentives available to the Proponent and residents and commercial employees of the development that include carpool/ride matching services; marketing/promotional events to inform members of available TMA programs and incentives; assistance with developing a pre-tax transit benefit program; up to 2-month free transit pass program; emergency ride home program (free uber/lyft for transit users); and route/trip matching programs for members who chose to walk/bike to work.

- *Shuttle Program*. The Watertown TMA is exploring the possibility of providing shuttle services in the area. The Proponent has been engaged in ongoing discussions with the Watertown TMA on possible expansion of the TMA-administered Watertown Shuttle service to include California Street in Newton. This planned shuttle would facilitate connecting residential and mixed-use properties along California Street and the Pleasant Street corridor in Watertown to Watertown Square, the Watertown Yard MBTA bus hub, commercial destinations along Arsenal Street, and possibly Harvard Square. Feasibility of this service and Proponent and City participation is currently under evaluation.

- *Bicycle Facilities and Promotion*. Provide bicycle parking, including weather protected racks for residents and visible accessible racks for commercial employees and patrons proximate to the building entrances, including accommodation for Bicycle Sharing Service (LimeBike) bicycle parking. Dissemination of area bicycle route maps as may be available will be postings in the building lobbies.

- *Bike Share Program*. The Proponent will develop and administer a robust bike share program under which bicycles will be available for sign-out by residents and commercial employees.

- *Preferential Parking for Carpools, Vanpools, and Car Sharing.* Preferential parking locations for commercial employees who use carpools and vanpools. The Proponent will also work with the City to consider designating parking spaces on-site for use by a car sharing services such as Zipcar.

- *Preferential Parking for Low-Emission Vehicles.* Preferential parking locations for residents, commercial employees, and patrons who use low-emission vehicles will be considered. Charging stations for electric vehicles will be provided.

- *Unbundled Parking.* The Proponent will unbundle residential parking to provide an option for residents to rent fewer or no parking spaces with their unit.

- *Transit Pass Subsidy.* The Proponent will provide a 100% fare subsidy for MBTA bus pass for the first two months of the lease term. This subsidy is augmented by the Proponent's membership in the Watertown TMA which entitles members an additional 2-month T pass subsidy, for a total of 4 full months of 100% subsidized MBTA T passes.

Conclusions

In summary, MDM finds that modest traffic increases associated with the proposed mixed-use development is not expected to materially impact operating conditions at the study intersections and that ample roadway capacity will be available to support the project. The Proponent will engage with the City in its ongoing efforts to improve traffic operations at the Bridge Street signalized intersection and will offer proportional funding assistance to advance these improvements, subject to further review. The Proponent is also developing a comprehensive Transportation Demand Management (TDM) program to take full advantage of the Site proximity to the Charles River multi-use path and area public transportation and proposes membership in the Watertown Transportation Management Association (TMA) to facilitate and encourage alternatives to automobile use. These TDM actions will establish a framework for minimizing Site traffic impacts by encouraging non-motorized travel modes and pedestrian/bicycle accommodation that is comparable with other area residential and mixed-use projects in Watertown that have demonstrated a measurable benefit in reducing parking needs and reliance on auto mode travel.