Memorandum

To: Brad Rawson, Director, Mobility Division
Greg Hanafin, Transportation Planner
OSPCD
City Hall
93 Highland Avenue, 3rd Floor
Somerville, Massachusetts 02143
Cc: Christine Thomas
Adam Dash

Date: October 1, 2025

Project #: 15748.00

From: Lourenço Dantas, AICP, EIT
Ryan Cullen, EIT

Re: Supplemental TIS Memorandum – Scoping Request
1 McGrath Highway (Somerbridge Hotel)

Somerbridge Hotel, LLC (the "Proponent" or "Applicant") is proposing revisions to its redevelopment project at the property/site at 1 McGrath / 263 Monsignor O'Brien Highway, Somerville, Massachusetts. The Proponent's Plan Revision application will be reviewed as a *Major Amendment*.

In May 2023, Applicant obtained special permits and site plan approval from the Somerville Planning Board, and a variance from the ZBA, for the construction of a 199 room, six-story hotel at the property in cases P&Z 21-028 and P&Z 23-032, respectively. The plan revision calls for a 145-key hotel and changes to its site plan.

In support of the Proponent's new application, we request your approval of the proposed scope of work to provide a Supplemental TIS Technical Memorandum (memo) for review by the City of Somerville's Mobility Division.

Background

Transportation Materials

In September 2022, the Proponent submitted a Transportation Impact Study (TIS) (dated September 14, 2022) to the City of Somerville, as a component of the site plan/development review application. A supplemental TIS memo was submitted to the Mobility Division in December 2022.

On November 29, 2022, the Mobility Division approved (with conditions) the Proponent's Mobility Management Plan (MMP).

The final Transportation Access Plan (TAP) was developed in January 2023.

The certification of required materials was issued by the Mobility Division on January 18, 2023.

Project Overview

The current project proposal consists of a hotel with about 145 rooms/keys, limited surface parking, and driveway and site frontage modifications ("the Project"). The project has 33 motor vehicle parking spaces (20 motor vehicle parking spaces provided on the Somerville portion of the property, plus 13 motor vehicle parking spaces provided on the Cambridge portion of the property). There will be bicycle parking on site that meet local requirements: 5 spaces for short-term bicycle parking and 10 for long-term bicycle parking on the Somerville side of the property, and for 3 short-term bicycles and 1 long-term bicycles on the Cambridge side of the property.

Consistent with the project approved in 2023, the Applicant will continue to provide a 14-foot clear space for a ramp to be built across the Cambridge portion of the property to connect the McGrath/O'Brien Highway bike facilities with the Community Path Extension via a spur to be constructed on MBTA property at the rear of the site.

The Development Site is located within the *High-Rise* zoning district within a half-mile of transit. It is not in a designated *Pedestrian Street District*.

Proposed Scope of Work for a Supplemental TIS Technical Memo

The proposed Supplemental TIS Technical Memo for the Project will include the following components:

- Estimated Project trip generation, using Institute of Transportation Engineers (ITE) *Trip Generation Manual* procedures and trip rate data. The potential vehicular-traffic reductions associated with transit use, bicycling, and walking opportunities will be presented; these will be based on adjustments to ITE trip rates using U.S. Census mode share data. The resulting trip generation will be compared to that estimated to be generated by the previously proposed project.
- Discussion of existing transportation network and transit services in the Project area, noting any expected changes under future conditions (anticipated no-build condition, reflecting programmed projects or those under construction/implementation)
- Site plan and ground floor plan
- General description of access to the site and building, circulation, and parking supply
- Summary of the conclusions from the previously submitted TIS, acknowledging that the previously submitted TIS (and supplemental materials) reflected a larger project (i.e., generated a greater number of net-new trips at the site) than the current Project
- Description of any Project impact mitigation measure or transportation improvements proposed by the Proponent

VHB document the above in a technical memorandum with supporting materials and submit it to the City of Somerville following review and approval of this proposed scope of work.

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To: Brad Rawson
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Somerville, Massachusetts 02143

Cc: Christine Thomas

Date: November 14, 2025

Project #: 15748.00

From: Lourenço Dantas, AICP, EIT
Ryan Cullen, EIT

Re: Supplemental TIS Information
Revised Program and Trip Generation
1 McGrath Highway (Somerbridge Hotel)

Somerbridge Hotel, LLC (the "Proponent" or "Applicant") is proposing revisions to its redevelopment project at the property/site at 1 McGrath / 263 Monsignor O'Brien Highway, Somerville, Massachusetts (Figure 1). The redevelopment project was previously approved by the Planning Board via a decision issued on May 23, 2023 (reference Planning & Zoning review number 21-028). The Proponent plans to submit a Plan Revision application, which will be reviewed as a *Major Amendment*.

On behalf of the Proponent, VHB has prepared this memorandum (memo) based on a scope of work approved by the Mobility Division. In this memo, we summarize the proposed changes to the Project's program, the resulting trip generation, modifications to site access, traffic operations analysis, and mitigation commitments. Based on the character of the changes presented in this document, VHB seeks your approval to rely on the findings of this document, the September 2022 Transportation Impact Study (TIS), and December 2022 Supplemental TIS Memo, which conservatively assess potential impacts and establish commensurate mitigation commitments, without the need for additional study.

The 2022 TIS found that additional new traffic generated by the previously approved project could be accommodated on the surrounding roadway network without any significant changes to the traffic network. It also noted that the Proponent's proposed site amenities, improvements to McGrath Highway streetscape at the project site, and low parking ratios would minimize the Project's vehicle demand and incentivize walk, bike, and transit access to/from the development site. While the revised proposed Project includes changes to site access, the revised project is smaller than the previous project, resulting in a lower trip generation. The proposed Project maintains similar low parking ratios, transportation demand management, and streetscape improvements, thereby suggesting that the resulting impacts would be similar or reduced compared to the previously approved project.

Background

The previously approved project consisted of a 199-room hotel ("previous project").

Several elements of the previous project were contingent on the coordinated development of the adjacent 15 McGrath project. Because the 15 McGrath project is currently not moving forward, the project required modifications of several transportation and site access elements to proceed independently.

The Proponent submitted the following Mobility Division-related materials to the City of Somerville in conjunction with its previous site plan/development review application/approved project:

- Transportation Impact Study (TIS) (dated September 14, 2022)
- A supplemental TIS memo (December 2022)

- Mobility Management Plan (MMP) (approved (with conditions) on November 29, 2022)
- Transportation Access Plan (TAP) (final revision) (January 2023).

The Mobility Division issued its certification of required materials on January 18, 2023.

Revised Development Program and Project Summary

Proposed Development Program

The development project will be located at 1 McGrath Highway[1] in Somerville and 263 Monsignor O'Brien Highway in Cambridge (the "Development Site"), two adjacent lots with frontage/access to the MassDOT roadway, depicted in Figure 2. The Development Site is located within the *High-Rise* zoning district within a half-mile of transit (outside of the ¼ mile transit shed); it is not along a designated *Pedestrian Street District*.

The current project proposal consists of a 6-story hotel, 62,650 square feet (SF) GFA, with 145 keys (rooms), which is a reduction from the approved 199-room project. Of the 145 hotel rooms, 95 rooms would be wholly situated in Somerville, with the remaining 50 rooms being situated in Cambridge. (The floor area SF is approximately split 44,510 SF in Somerville and 18,140 SF in Cambridge.)

The site plan has changed compared to the previous project. It reflects the modified hotel building and changes to the limited surface vehicle parking, external and internal bicycle parking, driveway, circulation, and site frontage. These elements are discussed in greater detail next.

Site Access

The proposed site driveway is at the east end of the site, utilizing an existing curb cut, and will provide two-way access (right-turn in and right-turn out). Two other existing curb cuts will be closed, including the one at the intersection with Rufo Road. (Please refer to Figure 2.) The site driveway leads to the hotel passenger pick-up/drop-off area and the parking lots in the rear of the building. Vehicles destined for the passenger pick-up/drop-off area would enter the driveway and use the rear parking areas to turn around prior to pulling into the pick-up/drop-off area.

This is a notable change from the previous project. The previous project had proposed using the western-most curb cut as an entrance driveway and creating an exit driveway via a parallel driveway on the adjacent 15 McGrath property; the exit driveway would serve as a shared egress for the two projects. This scheme is no longer proposed because the 15 McGrath project is not being advanced at this time.

The modified Project site driveway location creates a right-turn-in/right-turn-out condition due to the presence of an existing concrete median along McGrath Highway. This condition results in changes to the trip distribution patterns of vehicles accessing the site, as will be discussed later in this document.

Further details on the Project site access by various modes and the internal site circulation will be provided in this Project's revised Transportation Access Plan (TAP).

1 The MassDOT Roadway Inventory database formally names these as "Highway". At times in this memo, we use the term "Boulevard" when referring to McGrath Highway, acknowledging that calling this arterial roadway a "highway" is a misnomer relative to its design and function.

Access Permit

The Proponent will seek a Vehicular Access Permit with MassDOT to establish the driveway location and closure of the other existing curb cuts along McGrath/O'Brien Highway. The Proponent has received notice from MassDOT District 6 that the Permit Engineer agrees to the revised driveway location on the eastern/southern end of the project site configured to accommodate right-in and right-out movements, "subject to the execution of a Shared Access Agreement between the properties located at 15 McGrath Highway in Somerville and 263 Monsignor O'Brien Highway in Cambridge." MassDOT has an interest in preserving the option for a future shared-access driveway at the Rufo Road intersection and the 15 McGrath property. To enable this potential future shared driveway, the Proponent's site plan will preserve the space for a vehicular connection between the property and the 15 McGrath site.

Ramp Access

Additionally, while the proposed driveway location is adjacent to the space reserved for a future ramp connection to the Community Path Extension, vehicles that are potentially in conflict with the path of bicyclists are anticipated to be low in volume, with 31 vehicles entering and 29 exiting in the PM peak hour. When the ramp design is underway (by others), the Proponent will work with the designers of the future path connector ramp to mitigate conflicts at the site driveway with appropriate safety measures.

Vehicle Parking Supply

The previous project was granted a special permit to provide a parking supply below that required by zoning. It proposed no on-site parking within the Somerville portion of the site, relying instead on a combination of dedicated and shared parking spaces in the planned 15 McGrath parking garage adjacent to the Site. To accommodate the anticipated parking demand with the loss of the 15 McGrath garage use, the Project now proposes 20 on-site surface parking spaces within the Somerville portion of the site and 13 parking spaces on-site in a surface parking lot situated wholly within Cambridge, totaling 33 spaces on-site. The combined parking supply results in an overall Project parking ratio of 0.23 spaces per guest room.

The current Project remains committed to restricting vehicle trips and parking demand by having a limited parking supply. The vehicle parking supply remains significantly lower than the rate established by zoning: for a project within the *High-Rise* zoning district and outside of a ¼-mile transit station walkshed, the *Hotel (Lodging)* land use calls for a minimum of 48 vehicle parking spaces (based on a rate of 1.0 space per 2 guest rooms, for only the 95 guest rooms that are wholly situated in the city of Somerville (out of 145 total rooms)).

The Project's parking lot will provide 1 preferential carpool/vanpool parking space and 1 electric vehicle charging station to serve 2 EV-ready spaces.

Further details on the Project site access by various modes and the internal site circulation will be provided in this Project's revised Transportation Access Plan (TAP).

Bicycle Parking

To accommodate the bicycle parking needs, the Project will provide 13 long-term, secured bicycle parking spaces and 6 short-term spaces within and around the proposed building, as follows:

- 10 long-term bicycle parking spaces, using pedestal racks located within the covered parking area to the rear of the hotel building (located on the Somerville parcel)

- 3 long-term bicycle spaces in an enclosed bike storage unit east of the hotel (located within the Cambridge parcel)
- 6 short-term bicycle parking spaces on the front façade of the hotel within the public realm near the hotel entrance

These spaces meet the Somerville bicycle storage requirements for the 95 rooms wholly situated in Somerville in the revised program (and they satisfy Cambridge's associated requirements). Figure 2 shows the planned bicycle parking locations on the site plan.

A bike "fix-it" repair station will be provided in a visible area next to/near the long-term bike parking areas under the building.

Existing and No-Build Conditions

This section documents changes to the existing transportation network near the Project site since filing the TIS, as well as changes to the status or design of proposed transit and infrastructure improvements initially documented in the TIS.

Nearby Bikeshare Docks/Stations

Since the previous project's TIS, a handful of new bike share stations have been installed in surrounding neighborhoods, most that are located further than ½ mile from the Project site. The station anticipated to be installed with the adjacent 15 McGrath project is no longer expected to be installed until that project proceeds.

The current Bluebikes station locations near the Project site are depicted in Figure 3. The two closest stations are each about a third mile walk from the Project site.

Area Bicycle Accommodations

Since filing the TIS, the McGrath Highway cross section has been reduced to provide buffer-separated bicycle lanes in both directions along the site frontage and continuing north to Broadway and south to Third Street. This was done as part of the McGrath Highway Resurfacing Project as an interim improvement while the longer-term McGrath Boulevard (Grounding McGrath) Project continues through the design process. These facilities connect to the recently completed separated bicycle lanes provided south of Third Street (as part of the Cambridge Crossing project). The Somerville Community Path Extension which runs to the rear of the site has been completed.

Gore Street was also reconstructed by the City of Cambridge and now includes a shared use path between the Grand Junction right-of-way and 6th Street, and shared lane markings extending to O'Brien Highway, improving connections between (and along) Medford Street in Somerville, Gore Street in Cambridge, Rufo Road, and McGrath Highway.

The Grand Junction Multi-Use Path, planned by the City of Cambridge and its partners to extend from Cambridgeport in the south to Gore Street west of Gold Star Mother's Park, continues to undergo final design coordination. [2]

These changes in existing conditions bicycle facilities are shown in Figure 4.

2 https://www.cambridgema.gov/CDD/Projects/Transportation/GrandJunctionPathway

Car Share (Zipcar)

The Zipcar location closest to the site near the intersection of Third Street and Gore Street has been eliminated. Several other locations remain, as presented in Figure 3.

MBTA Transit Services

Green Line Extension (GLX)

The GLX service and all stations are now fully operational.

Bus Service and Amenities

The Bus Network Redesign (BNRD) effort conducted by the MBTA issued a Final Report in Spring 2023. Current BNRD route maps propose eliminating the Route 80 service from McGrath Highway (Boulevard) and eliminating the Route 88 service. Route 87 would continue to serve McGrath Highway and the Project site and would run between Arlington and Lechmere approximately every 25 minutes during the weekday peak hours and every 50-90 minutes off-peak. This service plan differs from the assumptions at the time of the TIS filing, when draft BNRD recommendations saw all routes being eliminated from McGrath Highway. Route 69 service along Cambridge Street is planned to be maintained, with weekday service every 30 minutes or less between Harvard Square and Lechmere. The MBTA is phasing in these service modifications over the next several years. The existing MBTA transit services near the site and those proposed under BNRD are depicted in Figures 5 and 6.

Recently, as part of the McGrath Highway Resurfacing Project, MassDOT installed far-side floating bus stops along McGrath Boulevard at the intersection with Rufo Rd, near the Project site. These are the two nearest bus stops that serve the Project site.

Roadway Improvements

O'Brien/McGrath Highway (Route 28) Resurfacing Project

Roadway work conducted between O'Brien Highway at Third Street and O'Brien Highway at Land Boulevard as part of the Cambridge Crossing development project has been completed. Travel lanes have been reduced from three lanes to two. The arterial roadway now includes buffer-separated bicycle lanes on each side of McGrath/O'Brien Highway between Third/Winter Street and over the bridge toward Poplar Street and Broadway; the segment also features new sidewalks and enhanced crossings.

Grounding McGrath (aka McGrath Boulevard) Project

This MassDOT project[3] is in the design phase, with design anticipated to be completed in 2028. Although the larger scope improvements of this project are located farther northwest of the Project site, many of the proposed bicycle improvements and key street elements have been installed along McGrath Highway along the Project site in an interim condition as part of the McGrath Highway Resurfacing Project.

3 www.mass.gov/mcgrath-boulevard-project

Memorandum

Vehicle Trip Generation

The trip generation estimates for the proposed 145-room hotel Project are projected using trip generation rates published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th edition[4] for land use code (LUC) 310 (General Hotel). The estimates for the previous 199-room hotel program are presented in the December 2022 Supplemental TIS Memorandum. By using the 11th edition rates we can clearly compare the changes in trip generation resulting from the revised program. Because the 12th edition of the *ITE Trip Generation Manual*[5] was recently released, for reference (as an attachment), VHB also estimated the Project's trip generation using the 12th edition rates. We find that the ITE manual's 12th edition rates rely on fewer studies for LUC 310, resulting in a statistically insignificant daily trip generation rate. Additionally, we find that both the rates for daily trips and trips during peak of adjacent street are significantly lower in the 12th edition than the 11th edition. Therefore, relying on the 11th edition is both the more appropriate and a more conservative approach.

To align with prior filings, the peak hour/peak direction mode share estimates were based on 2015-2019 U.S. Census journey-to-work data for residents of Somerville and Cambridge (as previously detailed in the TIS scoping request letter and the TIS). This approach remains conservative, as vehicle mode shares for both Somerville and Cambridge commuters have decreased for both the American Community Survey (ACS) 2024 1-Year Estimates and 2023 5-Year Estimates compared to the 2015-2019 data used.[6] For the updated trip generation estimate, we apply the same mode share assumptions: 30 percent for transit and 70 percent of person trips were assigned to vehicle trips (for a conservative estimate, recognizing that some trips to the Project site will occur via walking and biking).[7]

The unadjusted and adjusted vehicle trip estimates, for the prior and current development programs, are compared in Table 1.

4 Trip Generation Manual, 11th Edition, Institute of Transportation Engineers (ITE), Washington, DC, 2021.

5 Trip Generation Manual, 12th Edition, Institute of Transportation Engineers (ITE), Washington, DC, 2025.

6 https://data.census.gov/chart/ACSST5Y2023.S0801?q=commute&g=160XX00US2511000,2562535

7 *Transportation Impact and Access Study: Proposed Scope, 1 McGrath Highway, Somerville, Massachusetts*, Allen & Major Associates, Inc., memo to City of Somerville Mobility Division, February 14, 2022, Table 5: Adjusted Mode Split Data; based on 2015-2019 U.S. Census data commuter mode of travel.

Table 1 Project Vehicle Trip Generation Comparison

	Previous Program (199 rooms, 11th edition ITE rates)[1]		Current Program (145 rooms, 11th edition ITE rates)		Difference
	Unadjusted Vehicle Trips[a]	Adjusted Vehicle Trips[b]	Unadjusted Vehicle Trips[a]	Adjusted Vehicle Trips[b]	Adjusted Vehicle Trips
Weekday Daily					
Enter	795	**556**	579	**405**	-174
Exit	795	**556**	579	**405**	-174
Total	1,590	**1,112**	1,159	**811**	-348
Weekday Morning					
Enter	51	**36**	37	**26**	-11
Exit	40	**28**	29	**20**	-9
Total	91	**64**	67	**47**	-20
Weekday Evening					
Enter	60	**42**	44	**31**	-13
Exit	58	**41**	42	**29**	-13
Total	118	**83**	86	**60**	-26

Notes:
1. Reported in *TIS Supplemental Information; Traffic Analysis and Future Transit Capacity Analysis; 1 McGrath Highway (Somerbridge Hotel);* memo to City of Somerville Mobility Division, December 16, 2022.
a Based on ITE LUC 310 (Hotel)
b Unadjusted vehicle trips minus public transit trips

As expected, the trip generation estimate for the proposed Project finds that the program would generate fewer trips than the previously approved development program: approximately 20 fewer vehicles entering and exiting the site driveway during the AM peak hour and approximately 26 fewer vehicles entering and exiting the site driveway during the PM peak hour. Overall, on a weekday basis, the proposed Project would generate 348 fewer vehicle trips than the previously approved program. Fewer trips further reduces the nominal anticipated traffic impacts of the development.

Trip Distribution and Assignment

The directional distribution of the traffic approaching and departing the Development site was established in the TIS and is represented on a neighborhood-scale by the red arrows in Figure 7. The modified Project site driveway, however, no longer allows for left turns into or out of the site because of a concrete median along McGrath Highway. While this does not alter the trip distribution on a neighborhood or regional scale, it does alter the vehicle trip assignment on an intersection movement level. To enter the site, vehicles from the north would now be required to pass the site before making a U-turn at the O'Brien/Third Street intersection to the south, and vehicles from the west will reroute upstream to turn left onto McGrath/O'Brien Highway from Third Street rather than using Rufo Road. Exiting vehicles destined to the west would turn left onto Rufo Road from McGrath Highway northbound, and those destined to the south would make a U-turn at the McGrath/Rufo intersection from its left-turn lane. This modified trip assignment on an intersection movement level is also represented in Figure 7.

The revised Project-generated trips and 2022 Build Condition, volume network diagrams are presented in Figures 8 through 11.

Traffic Operations Analysis

Because of the change to the vehicle trip assignment at the intersection network level, the signalized intersection operations analyses for the 2022 Build Condition were updated for two of the study intersections closest to the site: the McGrath Highway at Rufo Road intersection and McGrath/O'Brien Highway at Third Street intersection. This analysis assesses the potential impacts of the additional left-turn and U-turn volume resulting from the modified trip assignment related to the new site driveway location.

Results of the intersection capacity analysis are presented in Tables 2 and 3, which also include a comparison of the updated 2022 Build Condition results to the 2022 Build Condition results presented in the original TIS. Key findings include:

- McGrath Highway at Rufo Road — Overall intersection operations improve marginally, with 1-2 fewer seconds of intersection delay because of the additional U-turn volume being offset by reduced left-turn volume into the site and the reduced volume entering the intersection from the 15 McGrath driveway.
- McGrath/O'Brien Highway at Third Street — Impacts to operations are negligible, with no additional intersection delay in either the AM or PM peak hours.

While the modified driveway location requires additional left-turn and U-turn movements at the McGrath Highway at Rufo Road and McGrath/O'Brien Highway at Third Street intersections, the revised 2022 Build Condition traffic operations analysis suggests the additional traffic volume will have an imperceptible impact on the operations of those intersections. While not presented in these tables, the incremental change in the 2027 Future Condition traffic operations would be expected to be of a similar negligible magnitude as the change in 2022 Build Conditions discussed above.

Table 2 Signalized Intersection Capacity Analysis (McGrath Highway at Rufo Road)

Location / Movement	2022 Existing Conditions					2022 Build Conditions					2022 Build: Δ from TIS				
	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
McGrath Highway (SEB/NWB) at Rufo Road (NB)/Site Driveway (SB)/Car Wash Driveway (SWB)															
Weekday Morning															
NB L/T	0.52	51	D	34	70	0.52	51	D	34	70	-0.02	-1	-	-2	-3
NB R	0.04	47	D	0	0	0.04	47	D	0	0	+0.01	-	-	-	-
SB L/R	0.01	47	D	0	0	0.01	47	D	0	0	-	-	-	-	-
SEB L/T	0.68	22	C	201	#613	0.69	22	C	204	#621	-0.06	-2	-	-13	-30
SEB R	0.17	15	B	0	60	0.17	15	B	0	60	-	-	-	-	-
NWB L	0.59	52	D	65	107	0.59	52	D	65	107	-	-	-	-	-
NWB T/R	0.15	7	A	16	75	0.14	7	A	10	53	+0.01	-	-	-	+1
Overall	**0.62**	**21**	**C**	-	-	**0.62**	**21**	**C**	-	-	**-0.05**	**-2**	**-**	**-**	**-**
Weekday Evening															
NB L/T	1.18	>120	F	~239	#347	1.12	>120	F	~237	#347	-0.01	-	-	-5	-7
NB R	0.09	35	C	0	0	0.09	34	C	0	0	-	-	-	-	-
SB L/R	0.02	34	C	2	7	0.01	34	C	2	7	-0.04	-	-	+2	+7
SEB L/T	0.66	30	C	149	#387	0.67	31	C	153	#398	-0.11	-3	-	-9	-30
SEB R	0.12	23	C	0	20	0.12	23	C	0	20	-	-	-	-	-
NWB L	0.41	40	D	51	100	0.49	42	D	58	110	+0.05	+1	-	+6	+10
NWB T/R	0.48	14	B	86	260	0.46	14	B	73	230	+0.02	-	-	-1	-1
Overall	**0.73**	**37**	**D**	-	-	**0.73**	**35**	**C**	-	-	**-0.05**	**-1**	**-1**	**-**	**-**

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.
~ Volume exceeds capacity, queue is theoretically infinite.
# 95th percentile volume exceeds capacity; queue may be longer.
m Volume for 95th percentile queue is metered by upstream signal.

Table 3 Signalized Intersection Capacity Analysis (McGrath/O'Brien Highway at Third Street)

Location / Movement	2022 Existing Conditions					2022 Build Conditions					2022 Build: Δ from TIS				
	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
McGrath Highway at Third Street															
Weekday Morning															
NB L	0.30	31	C	42	86	0.30	31	C	42	86	-	-	-	-	-
NB L/T/R	0.24	30	C	26	69	0.24	30	C	26	69	-	-	-	-	-
SB L/T/R	0.36	44	D	10	31	0.36	44	D	10	31	-	-	-	-	-
SEB T	0.68	14	B	240	311	0.70	14	B	243	323	+0.02	-	-	+4	+11
SEB R	0.35	12	B	0	43	0.35	12	B	0	43	-	-	-	-	-
NWB T	0.26	10	A	61	73	0.25	9	A	60	73	-0.02	-1	-	-3	-2
Overall	**0.63**	**14**	**B**	-	-	**0.64**	**14**	**B**	-	-	-0.01	-	-	-	-
Weekday Evening															
NB L	0.90	58	E	170	#338	0.91	61	E	174	#338	+0.01	+3	-	+3	-
NB L/T/R	0.54	31	C	71	171	0.55	31	C	73	171	+0.01	-	-	+2	-
SB L/T/R	0.65	61	E	17	#43	0.65	61	E	17	#43	-	-	-	-	-
SEB T	0.55	15	B	176	206	0.59	15	B	184	223	+0.04	-	-	+5	+11
SEB R	0.23	11	B	0	36	0.23	11	B	0	36	-	-	-	-	-
NWB T	0.45	14	B	144	170	0.46	14	B	142	172	-	-	-	+6	-
Overall	**0.70**	**22**	**C**			**0.74**	**22**	**C**	-	-	+0.03	-	-	-	-

a Volume to capacity ratio. If over 1.0, the lane group is rated as LOS F, per TIS guidelines.
b Average total delay, in seconds per vehicle.
c Level-of-service.
d 50th percentile queue, in feet.
e 95th percentile queue, in feet.
~ Volume exceeds capacity, queue is theoretically infinite.
# 95th percentile volume exceeds capacity; queue may be longer.
m Volume for 95th percentile queue is metered by upstream signal.

Transportation Mitigation and Improvements

While the Proponent remains committed to minimizing Project-related traffic impacts by improving conditions for sustainable transportation modes, mitigation commitments that were contingent on the coordinated development of 15 McGrath now require revisions given that the adjacent project is not advancing at this time. This section provides an updated status for each of the commitments to mitigation and improvements established in the 2022 TIS.

Community Path Connector Ramp

The Proponent remains committed to reserving 14.5' of dedicated space (about 10 percent of the parcel's land area) for a future bike/pedestrian ramp at the east end of the site. This space allocation on the property enables the construction of a planned connection that facilitates travel between two key multi-use paths, the Somerville Community Path Extension and the Grand Junction path, while also connecting to bike lanes on McGrath Highway. Funds for the design and construction of the ramp are not part of this Project's commitments.

McGrath Highway Cycle Track

The Proponent is open to working with stakeholders to install a two-way cycle track along the Project site frontage on McGrath/O'Brien Highway between the site of a future ramp to the Community Path Extension at the intersection with Rufo Road (west end of the Project site). Previously, design concepts for this short connection were developed for discussion as part of previous project filings for 1 McGrath, 15 McGrath, and 35 McGrath; yet these design concepts have not been finalized.

When the design of the ramp and related McGrath/O'Brien Highway bike lane modifications is underway (by others), the Proponent will work with the designers to mitigate conflicts with vehicles at the Project site driveway by incorporating appropriate safety measures.

Intersection Improvements: McGrath Highway at Rufo Road

The adjacent 15 McGrath project proponent committed to implementing various mitigation/improvements to the McGrath Highway/Rufo Road intersection, including installation of a southbound left-turn lane and the addition of new pedestrian and bicycle crosswalks across McGrath Highway. With the stalled 15 McGrath project, these intersection improvements are not advancing at this time. The 15 McGrath project will need to seek an Access Permit with MassDOT for the approval of site access and changes to the intersection.

A related modification to the intersection is the installation of a pedestrian and bicycle crossing on the east side of the McGrath Highway/Rufo Road intersection; this crosswalk would connect to the proposed two-way cycle track along the Project site frontage and offer a connection to bike paths south of McGrath Highway that are planned by Cambridge.

The Proponent understands that MassDOT will work on issuing the appropriate Access Permit(s) for those adjacent properties regarding changes to the McGrath Highway/Rufo Road intersection design and operation. MassDOT District 6 has expressed interest in preserving a shared-driveway configuration at the intersection. The Project's site plan is designed in a manner not to preclude the implementation of a shared driveway with the 15 McGrath property.

Transportation Demand Management

The Proponent and the Project will retain several key commitments to Transportation Demand Management (TDM) measures. The Project does trigger the requirement for a submittal of an MMP based on its program, which will be submitted by the Proponent. Among measures and amenities intended to encourage and support the use of non-vehicular modes of travel to the site are:

- Charge market rates for parking on site. The low parking supply ratio is aligned with the Mobility Division's goal of only providing a minimal amount of vehicle parking.
- Provide long-term, secure, bicycle parking spaces and short-term bike parking spaces (as detailed earlier). The use of bike parking spaces by employees or guests will be allowed at no cost. A bike "fix-it" repair station is provided in a visible area next to/near the long-term bike parking areas under the building.
- Promote sustainable mobility to employees and patrons/guests, by sharing information pertaining to walking, cycling and transit access options for travel to/from the property.

Conclusion

The 2022 TIS found that the additional new traffic generated by proposed previous Project can be accommodated on the surrounding roadway network. It also noted that the Proponent's proposed Project site amenities, improvements to the site frontage streetscape/public realm along McGrath Highway, transportation demand management program, and low parking ratios, have all been developed to minimize the Project's vehicle demand and incentivize walk, bike, and transit access to/from the Project site.

The revised Project is smaller than the previous Project and will generate fewer trips than the previously approved project. The updated intersection operations analysis reflecting the change in driveway access suggests that traffic impacts are functionally identical compared to the previously approved project.

Multimodal improvements recently completed in the surrounding area, including the completion of the Green Line Extension, installation of buffer-separated bicycle lanes and floating bus stops along McGrath Boulevard, installation of additional Bluebikes stations, and the MBTA's decision to maintain Route 87 along McGrath Boulevard under its Bus Network Redesign, further encourage future site users to use non-vehicular modes.

The Proponent will implement various TDM strategies that aim to take full advantage of its proximity to multi-modal mobility options and to reduce vehicles traveling to and from the site:

- Supply vehicle parking at minimum levels needed to satisfy guest needs, while constraining vehicle demand to incentivize travel by biking, walking, or using MBTA transit services (including the nearby Green Line)
- Charge parking fees at market rates (or higher) to manage parking demand
- Provide ample secured bicycle parking at key points near the building entrances, including outdoor covered bicycle racks and bike repair station
- Promote sustainable mobility to employees and patrons/guests, by sharing information pertaining to walking, cycling and transit access options for travel to/from the property.

Furthermore, the Project will provide the following transportation-related benefits:

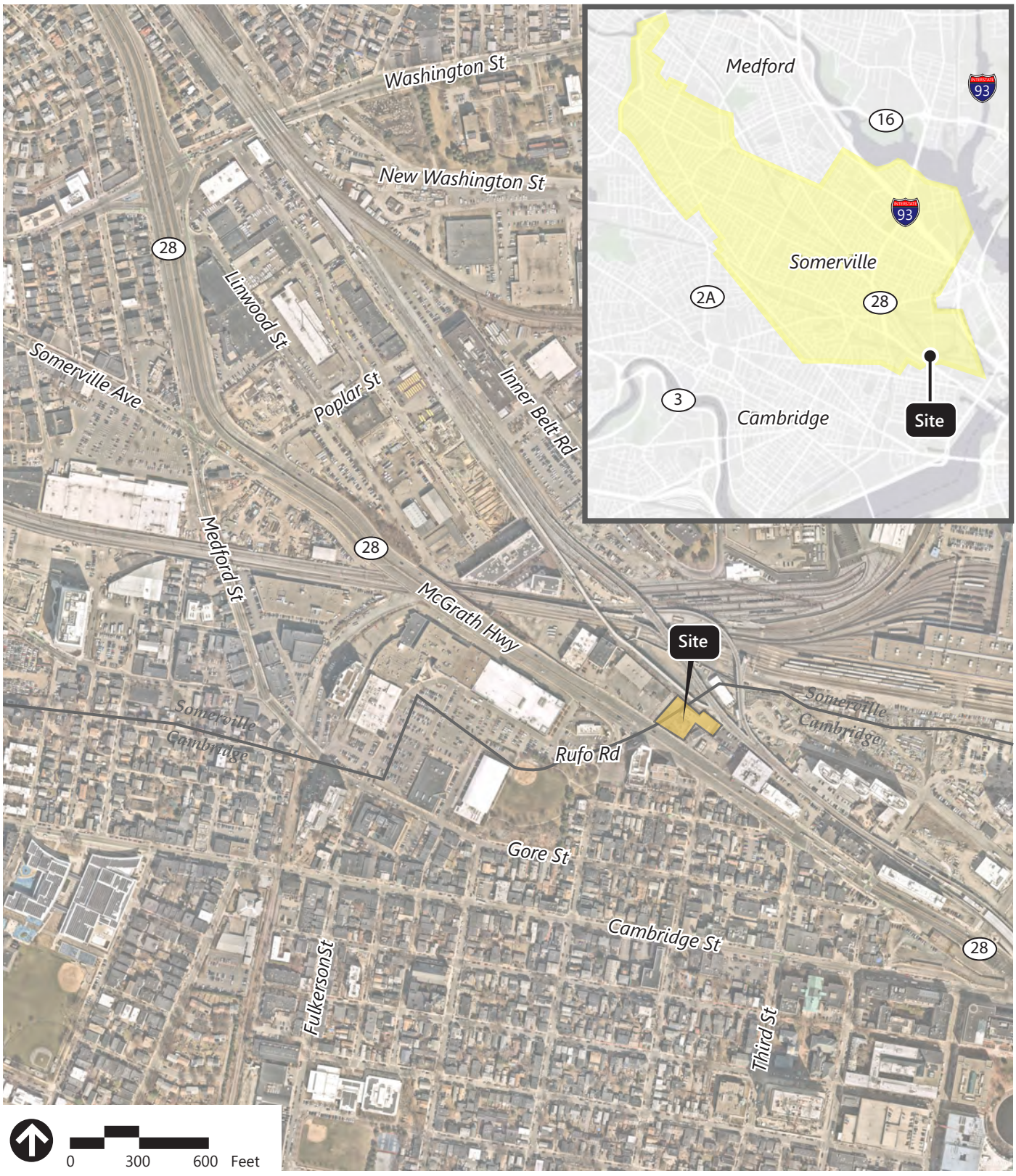
- New and improved sidewalks along the Project's site frontage will improve existing, long-standing deficiencies for pedestrians

- Reserving space within the Project site for the construction of a future public, pedestrian and bicycle connection from McGrath Boulevard to the nearby Somerville Community Path Extension, and work with path proponents to accommodate the connections to the ramp and mitigate driveway conflicts.

The proposed Project remains consistent with promoting the City's mobility-related goals for the area and it complements the surrounding developments in the area.

Appendix (attached)

- Trip Generation (Current Program – ITE 11th Edition)
- Trip Generation (Current Program – ITE 12th Edition)
- Synchro Intersection Operations Results – 2022 Build Condition

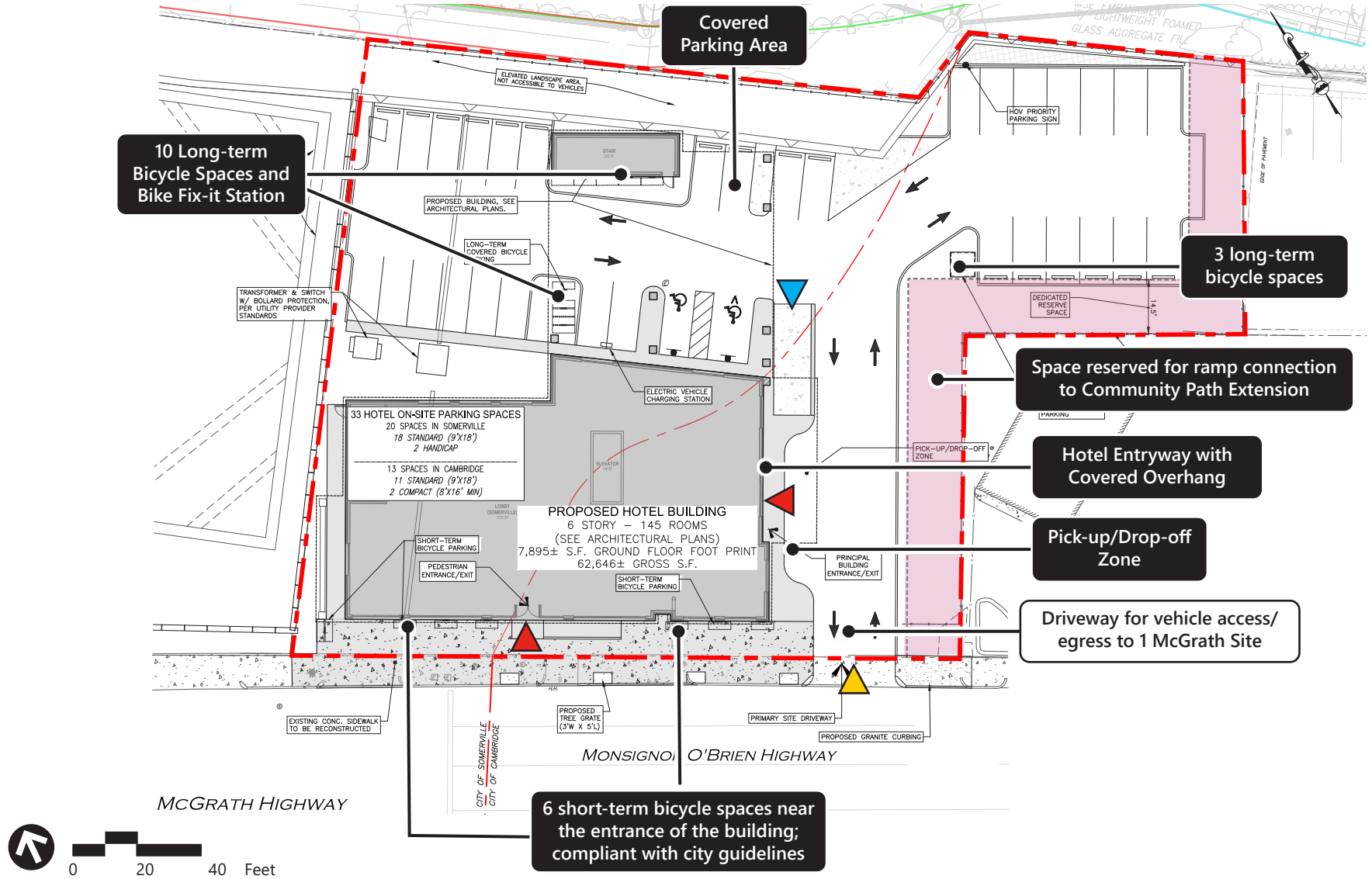


Source: Nearmap Aerial

Figure 1

Site Location Map

1 McGrath Highway
Somerville, Massachusetts



Source: Base Image / Site Plan by Allen & Major Associates, Inc. Transportation Access Plan

Pedestrian Access / Building Lobby Entrance

Vehicle Access

Loading Dock

Figure 2

Conceptual Site Plan

1 McGrath Highway
Somerville, Massachusetts

Source: Nearmap Aerial, BlueBikes System Map, ZipCar

Bluebikes Station

Number of Docks

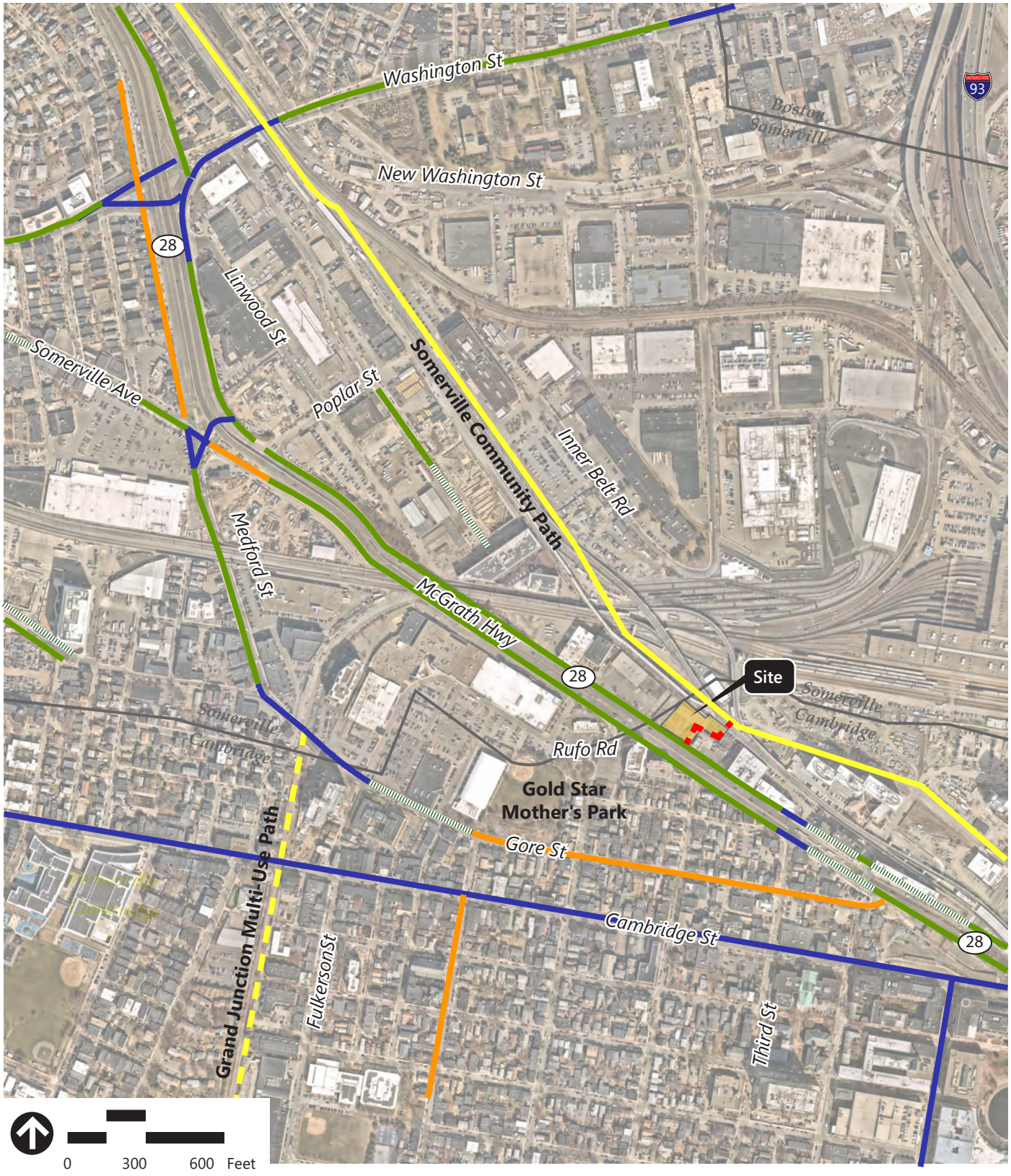
ZipCar Location

Number of Vehicles

Figure 3

Existing Bluebikes and ZipCar Locations

1 McGrath Highway
Somerville, Massachusetts



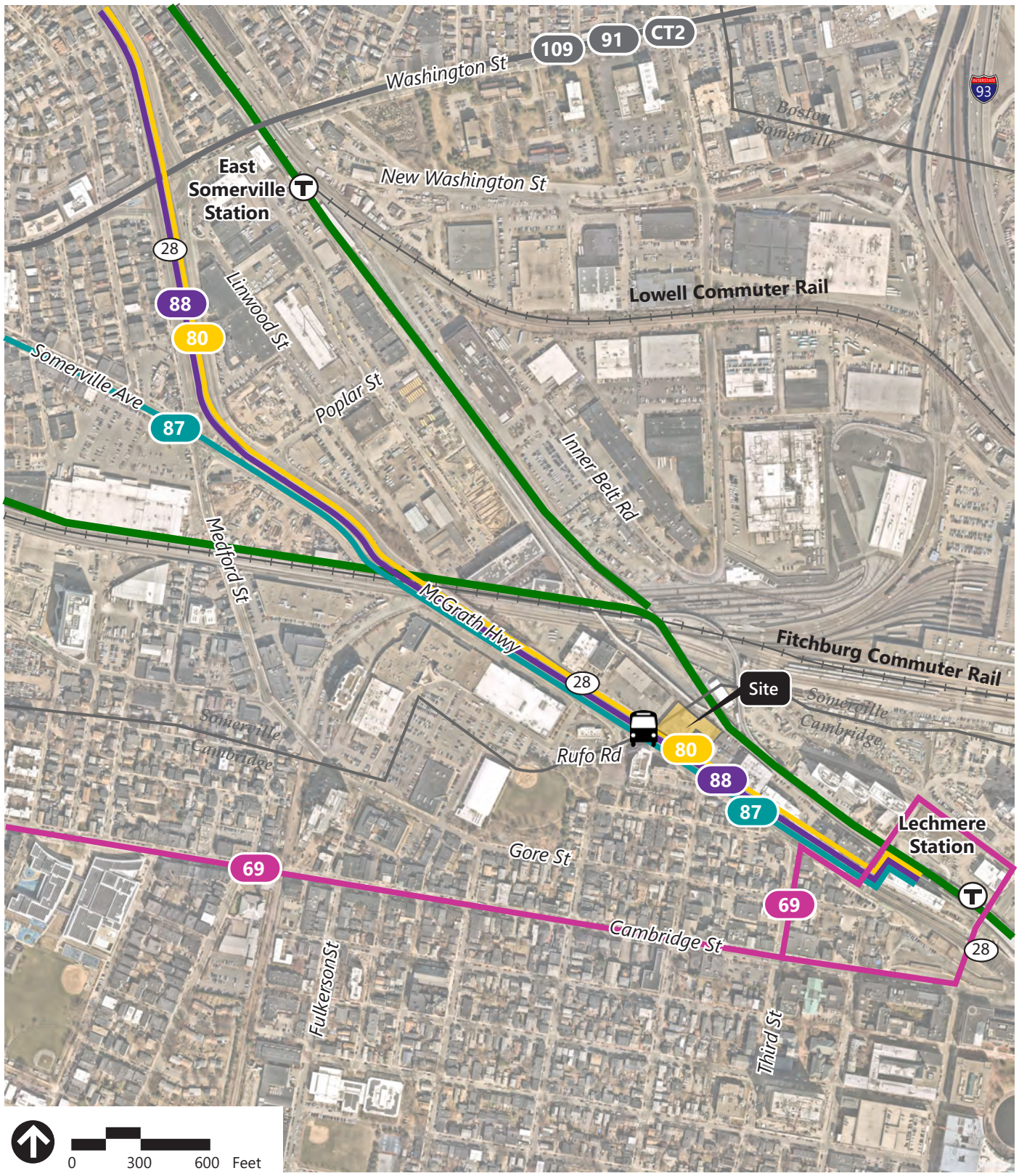
Source: Nearmap Aerial

- Bike Lanes
- Raised Separated Cycle Track
- Buffered Bike Lanes
- Planned Buffered Bike Lanes
- Sharrow Pavement Markings
- Proposed Sharrow Pavement Markings (by Others)
- Multi-Use Path
- Proposed Multi-Use Path (by Others)
- Proposed Ramp

Figure 4

Existing & Planned Bicycle Facilities

1 McGrath Highway
Somerville, Massachusetts



Source: Nearmap Aerial, MBTA

Existing MBTA Bus Route

Existing Green Line

Existing MBTA Bus Stop[1]

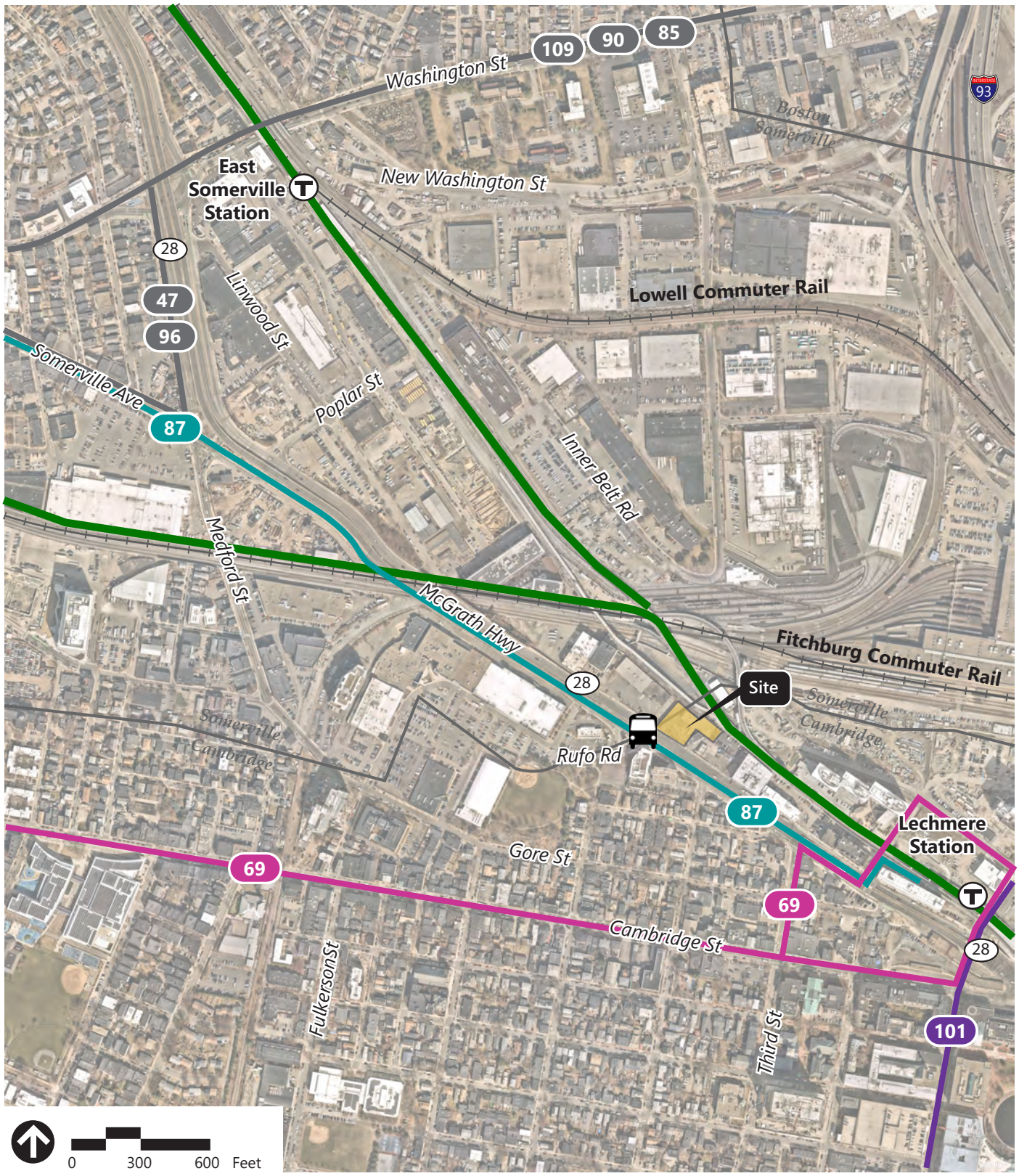
Existing MBTA Station

Figure 5

Public Transportation Services

Existing Condition

1 McGrath Highway
Somerville, Massachusetts



Source: Nearmap Aerial, MBTA

MBTA Bus Route

Existing Green Line

Existing MBTA Bus Stop[1]

Existing MBTA Station

Figure 6

Public Transportation Services

Bus Network Redesign

1 McGrath Highway
Somerville, Massachusetts

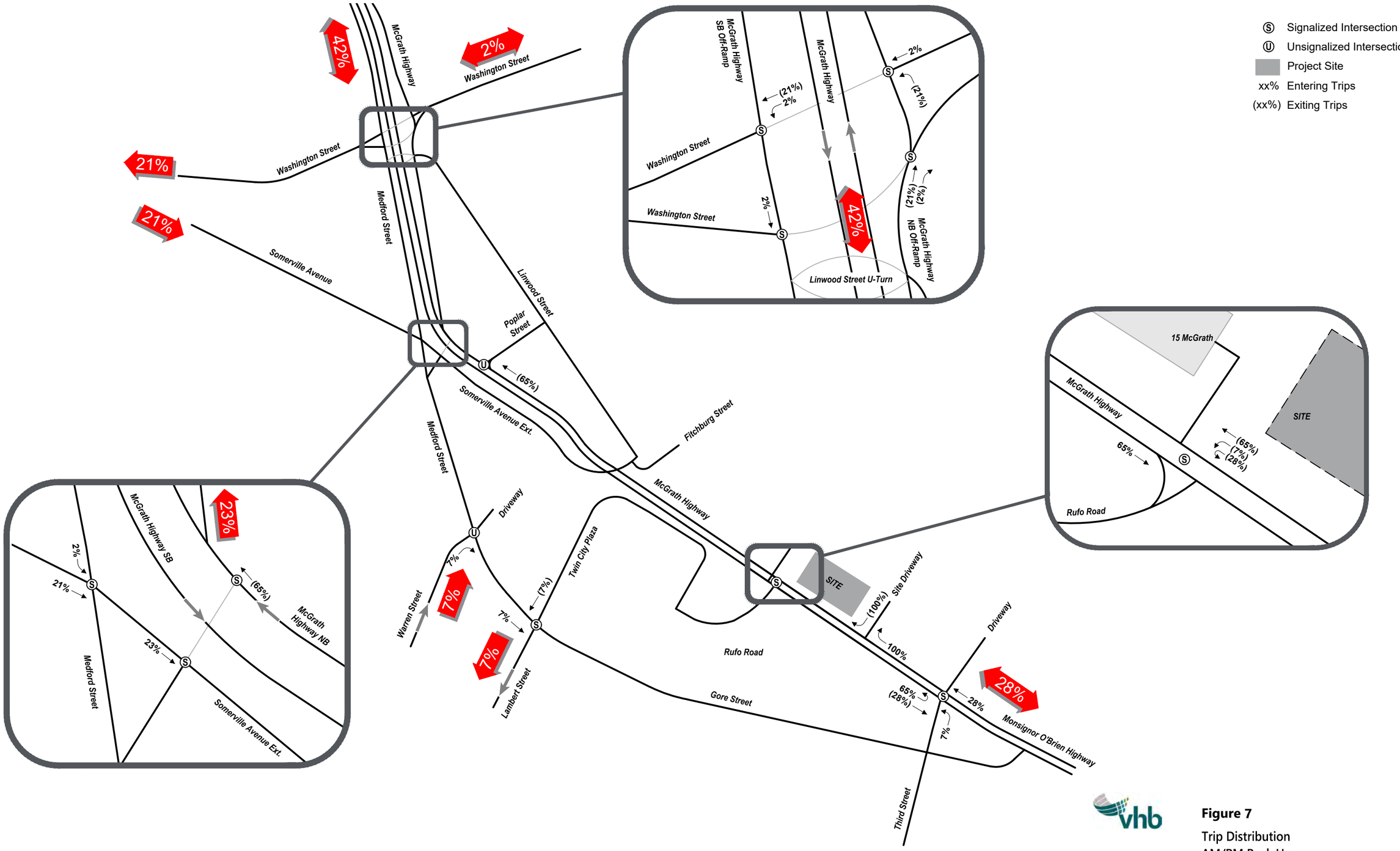
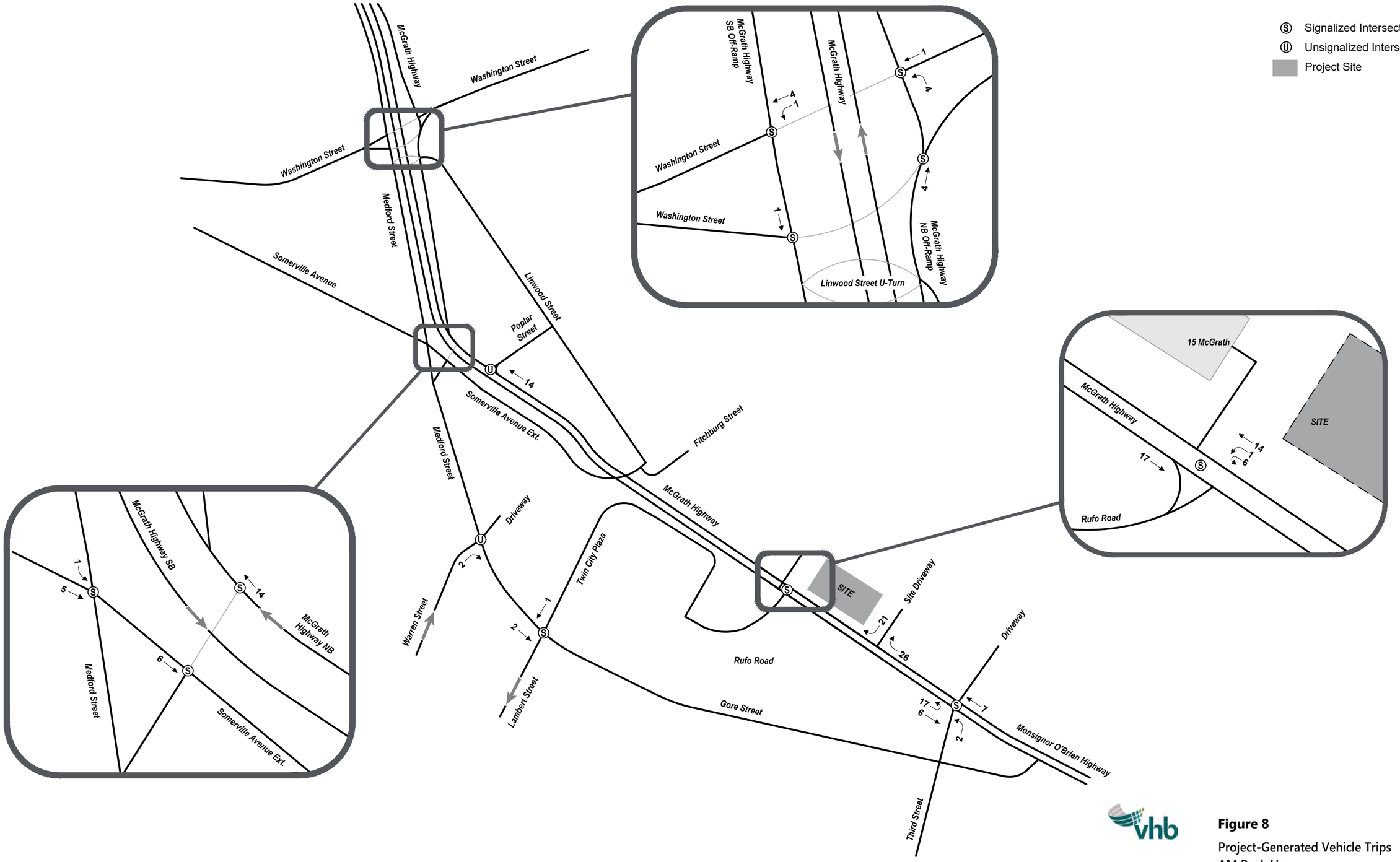


Figure 7

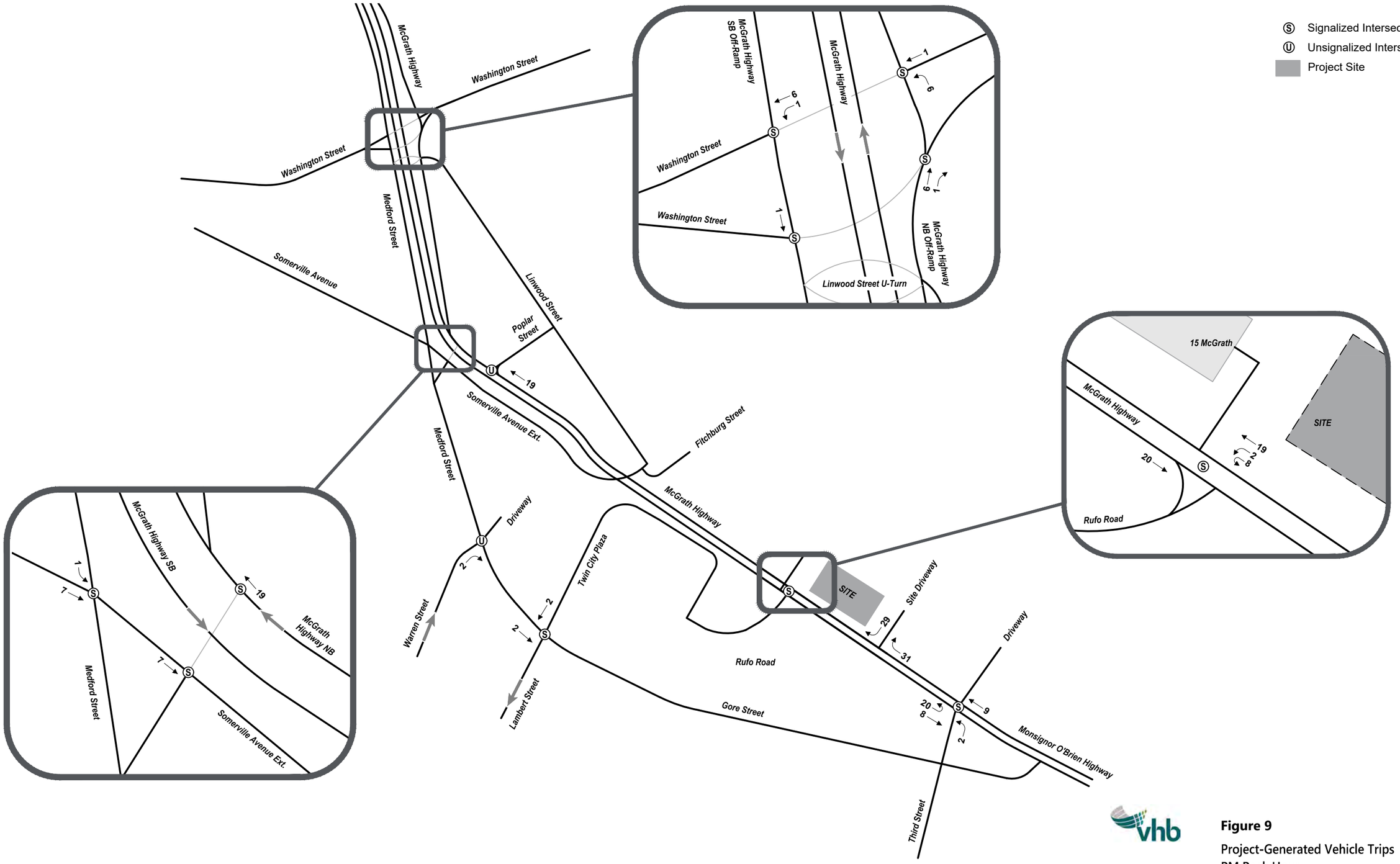
Trip Distribution
AM/PM Peak Hour
1 McGrath Highway
Somerville, MA



Not to Scale

Figure 8

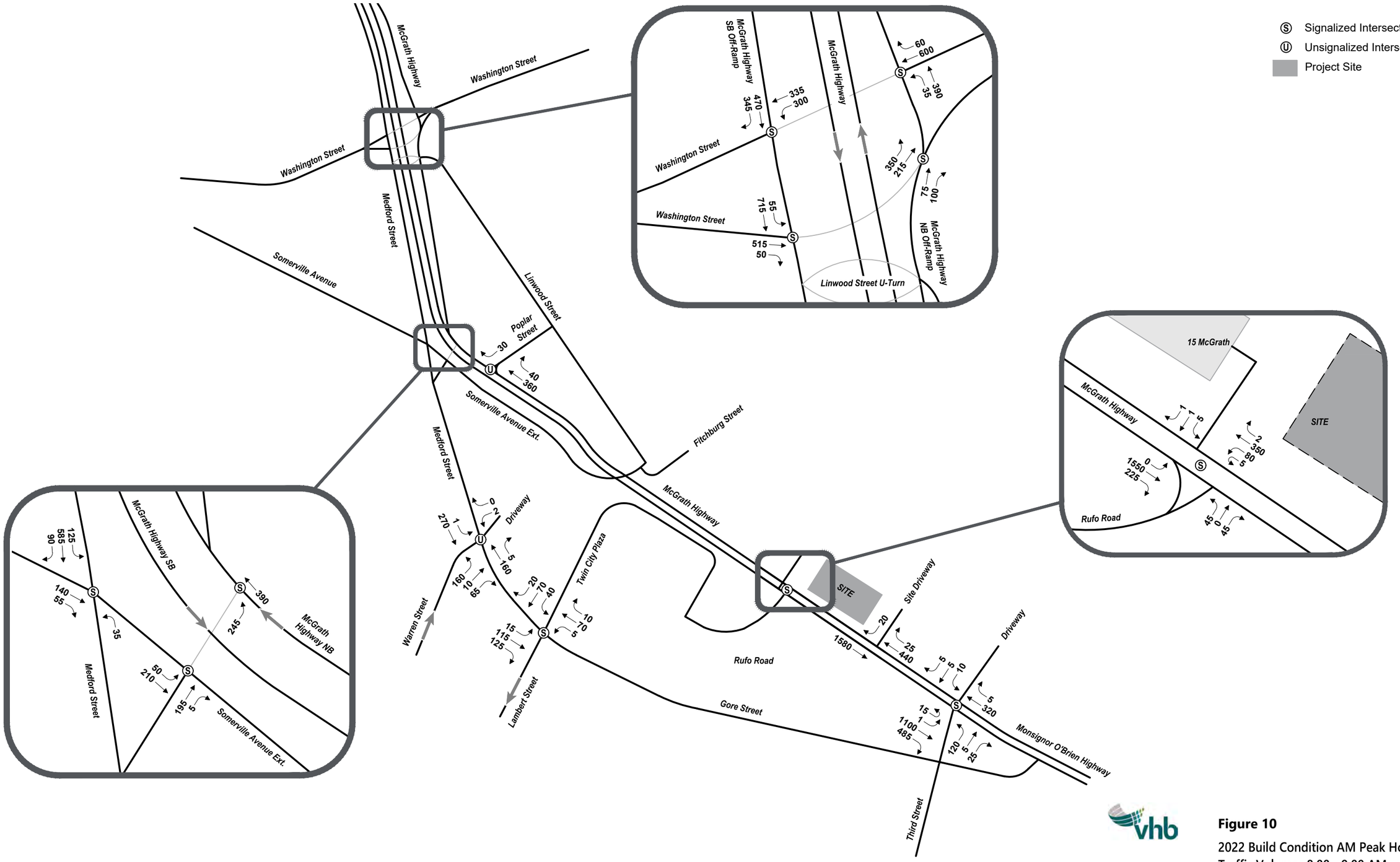
Project-Generated Vehicle Trips
AM Peak Hour
1 McGrath Highway
Somerville, MA



Not to Scale

Figure 9

Project-Generated Vehicle Trips
PM Peak Hour
1 McGrath Highway
Somerville, MA



Not to Scale

Figure 10

2022 Build Condition AM Peak Hour
Traffic Volumes 8:00 - 9:00 AM
1 McGrath Highway
Somerville, MA

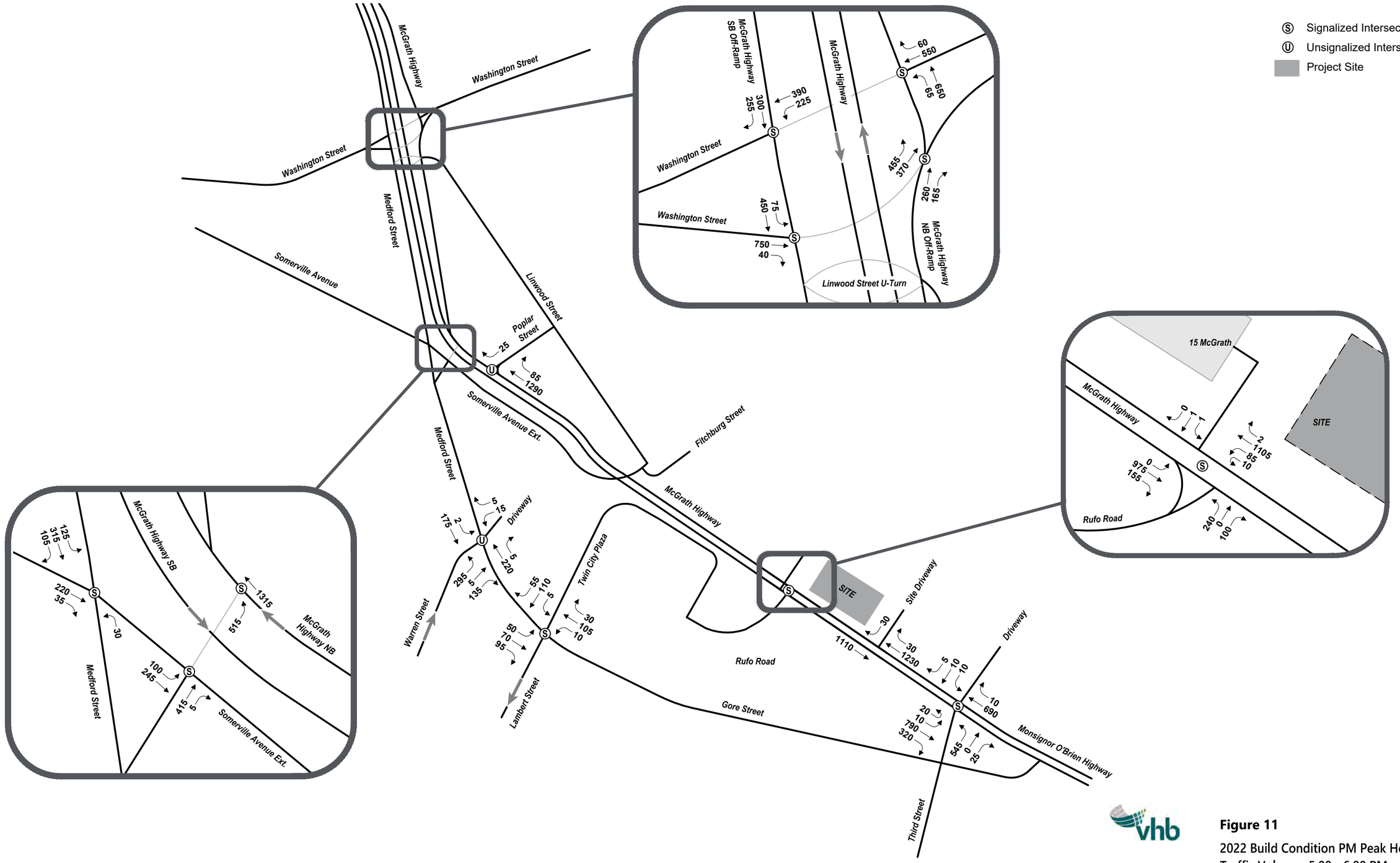


Figure 11

2022 Build Condition PM Peak Hour
Traffic Volumes 5:00 - 6:00 PM
1 McGrath Highway
Somerville, MA

Appendix

- Trip Generation (Current Program – ITE 11TH Edition)
- Trip Generation (Current Program – ITE 12TH Edition)
- Synchro Intersection Operations Results – 2022 Build Condition

ITE TRIP GENERATION WORKSHEET
(11th Edition, Updated 2021)

LANDUSE: Hotel
LANDUSE CODE: 310
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- Number of Rooms

145 rooms

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	7	0.85	7.99	5.31	9.53	148	100	260	50%	50%
AM PEAK OF GENERATOR	33	0.64	0.53	0.25	1.42	282	86	575	53%	47%
PM PEAK OF GENERATOR	32	0.69	0.60	0.22	0.97	285	86	575	58%	42%
AM PEAK (ADJACENT ST)	28	0.84	0.46	0.20	0.84	182	74	426	56%	44%
PM PEAK (ADJACENT ST)	31	0.78	0.59	0.26	1.06	186	74	426	51%	49%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,159	579	579	1,148	574	574
AM PEAK OF GENERATOR	77	41	36	81	43	38
PM PEAK OF GENERATOR	87	50	37	86	50	36
AM PEAK (ADJACENT ST)	67	37	29	65	36	29
PM PEAK (ADJACENT ST)	86	44	42	79	40	39

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	9	0.93	8.07	6.35	9.79	202	100	355	50%	50%
PEAK OF GENERATOR	10	0.80	0.72	0.49	1.23	192	100	355	56%	44%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,170	585	585	1,079	539	539
PEAK OF GENERATOR	104	58	46	106	59	47

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	9	0.90	5.94	4.01	8.48	202	100	355	50%	50%
PEAK OF GENERATOR	9	0.86	0.57	0.39	0.72	202	100	355	48%	52%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	861	431	431	713	356	356
PEAK OF GENERATOR	83	40	43	76	37	40

ITE TRIP GENERATION WORKSHEET
(12th Edition)

LANDUSE: Hotel
LANDUSE CODE: 310
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- Number of Rooms

145 rooms

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Low	High	Independent Variable Range Average	Low	High	Directional Distribution Enter	Exit
DAILY	2	--	5.84	5.58	6.03	143	120	166	50%	50%
AM PEAK OF GENERATOR	5	--	0.47	0.32	0.70	155	86	204	51%	49%
PM PEAK OF GENERATOR	4	--	0.47	0.27	0.72	150	86	204	56%	44%
AM PEAK (ADJACENT ST)	17	0.68	0.34	0.03	0.69	128	74	309	52%	48%
PM PEAK (ADJACENT ST)	20	0.64	0.47	0.11	1.06	142	74	309	51%	49%

TRIPS:

	BY AVERAGE Total	Enter	Exit	BY REGRESSION Total	Enter	Exit
DAILY	847	423	423	--	--	--
AM PEAK OF GENERATOR	68	35	33	--	--	--
PM PEAK OF GENERATOR	68	38	30	--	--	--
AM PEAK (ADJACENT ST)	49	26	24	53	27	25
PM PEAK (ADJACENT ST)	68	35	33	68	35	33

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Low	High	Independent Variable Range Average	Low	High	Directional Distribution Enter	Exit
DAILY	1	--	6.92	6.92	6.92	166	166	166	50%	50%
PEAK OF GENERATOR	3	--	0.47	0.23	0.78	130	85	166	51%	49%

TRIPS:

	BY AVERAGE Total	Enter	Exit	BY REGRESSION Total	Enter	Exit
DAILY	1,003	502	502	--	--	--
PEAK OF GENERATOR	68	35	33	--	--	--

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Low	High	Independent Variable Range Average	Low	High	Directional Distribution Enter	Exit
DAILY	1	--	5.78	5.78	5.78	166	166	166	50%	50%
PEAK OF GENERATOR	1	--	0.70	0.70	0.70	166	166	166	67%	33%

TRIPS:

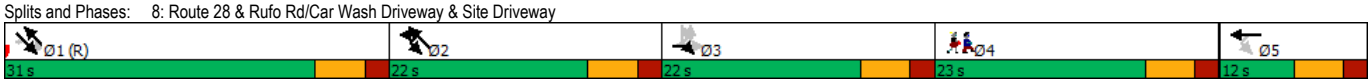
	BY AVERAGE Total	Enter	Exit	BY REGRESSION Total	Enter	Exit
DAILY	838	419	419	--	--	--
PEAK OF GENERATOR	102	68	33	--	--	--

Lane Group	EBL2	EBT	EBR	WBT	SBL	SBR	SBR2	SET	SER	NWL	NWT	NWR2	Ø4
Lane Configurations													
Traffic Volume (vph)	45	0	45	0	5	1	1	1550	225	80	350	2	
Future Volume (vph)	45	0	45	0	5	1	1	1550	225	80	350	2	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	11	11	10	12	12	12	12	12	10	11	11	
Storage Length (ft)			0		0	0			500	500			
Storage Lanes			1		1	0			1	1			
Taper Length (ft)					25					25			
Satd. Flow (prot)	0	1354	1405	1596	1532	0	0	4532	1439	1472	4026	0	
Flt Permitted		*0.950			0.966					0.950			
Satd. Flow (perm)	0	1264	1405	1596	1530	0	0	4532	1380	1469	4026	0	
Right Turn on Red			Yes				Yes		Yes			Yes	
Satd. Flow (RTOR)			208		208				230		149		
Link Speed (mph)		30		30	30			30			30		
Link Distance (ft)		370		168	135			1946			823		
Travel Time (s)		8.4		3.8	3.1			44.2			18.7		
Confl. Peds. (#/hr)	8		1		1	5	8		5	5		11	
Confl. Bikes (#/hr)									2			8	
Peak Hour Factor	0.91	0.91	0.91	0.31	0.50	0.50	0.50	0.98	0.98	0.84	0.84	0.84	
Heavy Vehicles (%)	16%	0%	0%	0%	0%	17%	0%	3%	1%	3%	12%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	49	49	0	14	0	0	1582	230	95	419	0	
Turn Type	custom	NA	custom		D.Pm			NA	Perm	Prot	NA		
Protected Phases			3!	5				1		2	1 2		4
Permitted Phases	3	3!			3!				1				
Detector Phase	3	3	3	5	3			1	1	2	1 2		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	4.0	6.0			6.0	6.0	6.0			6.0
Minimum Split (s)	21.0	21.0	21.0	10.0	21.0			21.0	21.0	21.0			21.0
Total Split (s)	22.0	22.0	22.0	12.0	22.0			31.0	31.0	22.0			23.0
Total Split (%)	20.0%	20.0%	20.0%	10.9%	20.0%			28.2%	28.2%	20.0%			21%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0	2.0			2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0	0.0	0.0			
Total Lost Time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0			
Lead/Lag	Lead	Lead	Lead		Lead			Lead	Lead	Lag			Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	None			C-Min	C-Min	None			None
Act Effct Green (s)		9.4	9.4		9.4			66.6	66.6	12.1	85.9		
Actuated g/C Ratio		0.09	0.09		0.09			0.61	0.61	0.11	0.78		
v/c Ratio		0.46	0.16		0.04			0.58	0.25	0.59	0.13		
Control Delay		60.1	1.1		0.3			19.0	4.1	60.8	4.4		
Queue Delay		0.0	0.0		0.0			0.0	0.0	0.0	0.0		
Total Delay		60.1	1.1		0.3			19.0	4.1	60.8	4.4		
LOS		E	A		A			B	A	E	A		
Approach Delay		30.6			0.3			17.1			14.8		
Approach LOS		C			A			B			B		
Queue Length 50th (ft)		34	0		0			204	0	65	10		
Queue Length 95th (ft)		70	0		0			#621	60	107	53		
Internal Link Dist (ft)		290		88	55			1866			743		
Turn Bay Length (ft)									500	500			
Base Capacity (vph)		183	382		400			2744	926	214	3252		
Starvation Cap Reductn		0	0		0			0	0	0	0		
Spillback Cap Reductn		0	0		0			0	0	0	0		
Storage Cap Reductn		0	0		0			0	0	0	0		
Reduced v/c Ratio		0.27	0.13		0.04			0.58	0.25	0.44	0.13		

Intersection Summary

Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 89 (81%), Referenced to phase 1:NWSE, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 17.1 Intersection LOS: B
Intersection Capacity Utilization 77.8% ICU Level of Service D
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 8: Route 28 & Rufo Rd/Car Wash Driveway & Site Driveway



Movement	EBL2	EBT	EBR	WBT	SBL	SBR	SBR2	SET	SER	NWL	NWT	NWR2
Lane Configurations												
Traffic Volume (vph)	45	0	45	0	5	1	1	1550	225	80	350	2
Future Volume (vph)	45	0	45	0	5	1	1	1550	225	80	350	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	10	12	12	12	12	12	10	11	11
Total Lost time (s)		6.0	6.0		6.0			6.0	6.0	6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00			0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00	1.00		0.99			1.00	0.96	1.00	1.00	
Flpb, ped/bikes		0.93	1.00		1.00			1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.96			1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00		0.97			1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1264	1405		1530			4532	1382	1472	4027	
Flt Permitted		0.95	1.00		0.97			1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1264	1405		1530			4532	1382	1472	4027	
Peak-hour factor, PHF	0.91	0.91	0.91	0.31	0.50	0.50	0.50	0.98	0.98	0.84	0.84	0.84
Adj. Flow (vph)	49	0	49	0	10	2	2	1582	230	95	417	2
RTOR Reduction (vph)	0	0	45	0	13	0	0	0	113	0	49	0
Lane Group Flow (vph)	0	49	4	0	1	0	0	1582	117	95	370	0
Confl. Peds. (#/hr)	8		1		1	5	8		5	5		11
Confl. Bikes (#/hr)									2			8
Heavy Vehicles (%)	16%	0%	0%	0%	0%	17%	0%	3%	1%	3%	12%	0%
Turn Type	custom	NA	custom		D.Pm			NA	Perm	Prot	NA	
Protected Phases			3!	5				1		2	1 2	
Permitted Phases	3	3!			3!				1			
Actuated Green, G (s)		8.2	8.2		8.2			55.8	55.8	12.1	73.9	
Effective Green, g (s)		8.2	8.2		8.2			55.8	55.8	12.1	73.9	
Actuated g/C Ratio		0.07	0.07		0.07			0.51	0.51	0.11	0.67	
Clearance Time (s)		6.0	6.0		6.0			6.0	6.0	6.0		
Vehicle Extension (s)		2.0	2.0		2.0			3.0	3.0	3.0		
Lane Grp Cap (vph)		94	104		114			2298	701	161	2705	
v/s Ratio Prot			0.00					c0.35		c0.06	0.09	
v/s Ratio Perm		c0.04			0.00				0.08			
v/c Ratio		0.52	0.04		0.01			0.69	0.17	0.59	0.14	
Uniform Delay, d1		49.0	47.2		47.1			20.5	14.6	46.6	6.5	
Progression Factor		1.00	1.00		1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.4	0.1		0.0			1.7	0.5	5.7	0.0	
Delay (s)		51.4	47.3		47.1			22.2	15.1	52.3	6.5	
Level of Service		D	D		D			C	B	D	A	
Approach Delay (s)		49.3		0.0	47.1			21.3			15.0	
Approach LOS		D		A	D			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEU	SEL	SET	SER	NWL	NWT	NWR	Ø2	Ø6	Ø9
Lane Configurations																
Traffic Volume (vph)	120	5	25	10	5	5	15	1	1100	485	0	320	5			
Future Volume (vph)	120	5	25	10	5	5	15	1	1100	485	0	320	5			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	10	10	8	12	12	12	12	12	11	12	12	11	11			
Storage Length (ft)	110		0	0		0		0		0	475		0			
Storage Lanes	1		0	0		0		0		1	1		0			
Taper Length (ft)	25			25				25			25					
Satd. Flow (prot)	1346	1200	0	0	1614	0	0	0	3047	1425	0	2848	0			
Flt Permitted	0.950	0.971			0.921				0.946							
Satd. Flow (perm)	1346	1200	0	0	1478	0	0	0	2882	1425	0	2848	0			
Right Turn on Red			Yes			Yes				Yes			Yes			
Satd. Flow (RTOR)		26			6					505		3				
Link Speed (mph)		30			30				30			30				
Link Distance (ft)		475			144				823			272				
Travel Time (s)		10.8			3.3				18.7			6.2				
Confl. Peds. (#/hr)			52	52				37		59	59		37			
Confl. Bikes (#/hr)										5						
Peak Hour Factor	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.96	0.96	0.96	0.78	0.78	0.78			
Heavy Vehicles (%)	7%	0%	25%	0%	0%	0%	2%	0%	3%	2%	0%	10%	0%			
Shared Lane Traffic (%)	36%															
Lane Group Flow (vph)	82	78	0	0	25	0	0	0	1163	505	0	416	0			
Turn Type	Split	NA		Perm	NA			Perm	NA	custom		NA				
Protected Phases	4	4			3				2 9	2 4		6 9		2	6	9
Permitted Phases				3				2 9								
Detector Phase	4	4		3	3			2 9	2 9	2 4		6 9				
Switch Phase																
Minimum Initial (s)	6.0	6.0		5.0	5.0									10.0	17.0	1.0
Minimum Split (s)	24.0	24.0		11.0	11.0									23.0	23.0	23.0
Total Split (s)	24.0	24.0		11.0	11.0									31.0	31.0	24.0
Total Split (%)	26.7%	26.7%		12.2%	12.2%									34%	34%	27%
Yellow Time (s)	3.0	3.0		3.0	3.0									4.0	4.0	4.0
All-Red Time (s)	3.0	3.0		2.5	2.5									1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0											
Total Lost Time (s)	6.0	6.0			5.5											
Lead/Lag	Lag	Lag		Lead	Lead											
Lead-Lag Optimize?																
Recall Mode	Ped	Ped		None	None									C-Min	C-Min	Min
Act Effct Green (s)	18.0	18.0			5.3				54.4	56.9		54.4				
Actuated g/C Ratio	0.20	0.20			0.06				0.60	0.63		0.60				
v/c Ratio	0.30	0.30			0.27				0.67	0.47		0.24				
Control Delay	34.3	25.3			41.0				15.3	2.5		9.5				
Queue Delay	0.0	0.0			0.0				0.0	0.0		0.0				
Total Delay	34.3	25.3			41.0				15.3	2.5		9.5				
LOS	C	C			D				B	A		A				
Approach Delay		30.0			41.0				11.4			9.5				
Approach LOS		C			D				B			A				
Queue Length 50th (ft)	42	26			10				243	0		60				
Queue Length 95th (ft)	86	69			31				323	43		73				
Internal Link Dist (ft)		395			64				743			192				
Turn Bay Length (ft)	110															
Base Capacity (vph)	269	260			95				1821	1086		1800				
Starvation Cap Reductn	0	0			0				0	0		0				
Spillback Cap Reductn	0	0			0				0	0		0				
Storage Cap Reductn	0	0			0				0	0		0				
Reduced v/c Ratio	0.30	0.30			0.26				0.64	0.47		0.23				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 17 (19%), Referenced to phase 2:SETL and 6:NWT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 12.7 Intersection LOS: B
Intersection Capacity Utilization 70.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 9: Third Street/Hotel Driveway & Route 28

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEU	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations													
Traffic Volume (vph)	120	5	25	10	5	5	15	1	1100	485	0	320	5
Future Volume (vph)	120	5	25	10	5	5	15	1	1100	485	0	320	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	8	12	12	12	12	12	11	12	12	11	11
Total Lost time (s)	6.0	6.0			5.5				5.0	5.0		5.0	
Lane Util. Factor	0.95	0.95			1.00				0.95	1.00		0.95	
Frpb, ped/bikes	1.00	0.97			1.00				1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00			0.97				1.00	1.00		1.00	
Frt	1.00	0.95			0.97				1.00	0.85		1.00	
Flt Protected	0.95	0.97			0.97				1.00	1.00		1.00	
Satd. Flow (prot)	1346	1200			1559				3045	1425		2847	
Flt Permitted	0.95	0.97			0.92				0.95	1.00		1.00	
Satd. Flow (perm)	1346	1200			1474				2884	1425		2847	
Peak-hour factor, PHF	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.96	0.96	0.96	0.78	0.78	0.78
Adj. Flow (vph)	128	5	27	13	6	6	16	1	1146	505	0	410	6
RTOR Reduction (vph)	0	21	0	0	6	0	0	0	0	232	0	1	0
Lane Group Flow (vph)	82	57	0	0	19	0	0	0	1163	273	0	415	0
Confl. Peds. (#/hr)			52	52				37		59	59		37
Confl. Bikes (#/hr)										5			
Heavy Vehicles (%)	7%	0%	25%	0%	0%	0%	2%	0%	3%	2%	0%	10%	0%
Turn Type	Split	NA		Perm	NA			Perm	NA	custom		NA	
Protected Phases	4	4			3				2 9	2 4		6 9	
Permitted Phases				3				2 9					
Actuated Green, G (s)	18.0	18.0			3.3				52.2	54.7		52.2	
Effective Green, g (s)	18.0	18.0			3.3				52.2	48.7		52.2	
Actuated g/C Ratio	0.20	0.20			0.04				0.58	0.54		0.58	
Clearance Time (s)	6.0	6.0			5.5								
Vehicle Extension (s)	2.0	2.0			2.0								
Lane Grp Cap (vph)	269	240			54				1672	771		1651	
v/s Ratio Prot	0.06	0.05								c0.19		0.15	
v/s Ratio Perm					c0.01				c0.40				
v/c Ratio	0.30	0.24			0.36				0.70	0.35		0.25	
Uniform Delay, d1	30.7	30.2			42.3				13.3	11.7		9.3	
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00	
Incremental Delay, d2	0.2	0.2			1.5				1.0	0.1		0.0	
Delay (s)	30.9	30.4			43.8				14.3	11.8		9.3	
Level of Service	C	C			D				B	B		A	
Approach Delay (s)		30.7			43.8				13.6			9.3	
Approach LOS		C			D				B			A	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

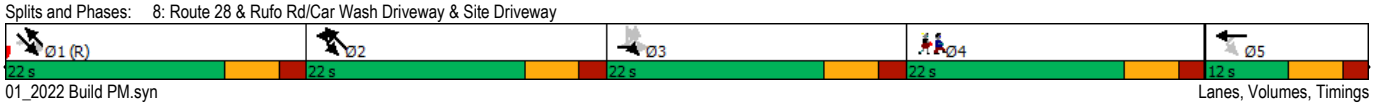
Lane Group	EBL2	EBT	EBR	WBT	SBL	SBR	SET	SER	NWU	NWL	NWT	NWR2	Ø4
Lane Configurations													
Traffic Volume (vph)	240	0	100	0	1	1	975	155	10	85	1105	2	
Future Volume (vph)	240	0	100	0	1	1	975	155	10	85	1105	2	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	11	11	10	12	12	12	12	10	10	11	11	
Storage Length (ft)			0		0	0		500		500			
Storage Lanes			1		1	0		1		1			
Taper Length (ft)					25					25			
Satd. Flow (prot)	0	1540	1391	1565	1509	0	4622	1439	0	1477	4381	0	
Flt Permitted		*0.950			0.976					0.950			
Satd. Flow (perm)	0	1459	1391	1565	1506	0	4622	1351	0	1461	4381	0	
Right Turn on Red			Yes					Yes				Yes	
Satd. Flow (RTOR)			229					229			164		
Link Speed (mph)		30		30	30		30				30		
Link Distance (ft)		370		168	135		1946				823		
Travel Time (s)		8.4		3.8	3.1		44.2				18.7		
Confl. Peds. (#/hr)	7		2		2	12		12	2	12		12	
Confl. Bikes (#/hr)								1				4	
Peak Hour Factor	0.81	0.81	0.81	0.92	0.50	0.50	0.92	0.92	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	2%	2%	1%	2%	0%	0%	1%	1%	0%	3%	3%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	296	123	0	4	0	1060	168	0	100	1165	0	
Turn Type	custom	NA	custom		D.Pm		NA	Perm	Prot	Prot	NA		
Protected Phases			3!	5			1		2	2	1 2		4
Permitted Phases	3	3!			3!			1					
Detector Phase	3	3	3	5	3		1	1	2	2	1 2		
Switch Phase													
Minimum Initial (s)	6.0	6.0	6.0	4.0	6.0		6.0	6.0	6.0	6.0			6.0
Minimum Split (s)	21.0	21.0	21.0	10.0	21.0		21.0	21.0	21.0	21.0			21.0
Total Split (s)	22.0	22.0	22.0	12.0	22.0		22.0	22.0	22.0	22.0			22.0
Total Split (%)	22.0%	22.0%	22.0%	12.0%	22.0%		22.0%	22.0%	22.0%	22.0%			22%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0			2.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0			
Total Lost Time (s)		6.0	6.0	6.0	6.0		6.0	6.0		6.0			
Lead/Lag	Lead	Lead	Lead		Lead		Lead	Lead	Lag	Lag			Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	None	None	None		C-Min	C-Min	None	None			None
Act Effct Green (s)		18.1	18.1		18.1		43.7	43.7		13.9	63.6		
Actuated g/C Ratio		0.18	0.18		0.18		0.44	0.44		0.14	0.64		
v/c Ratio		1.13	0.28		0.01		0.52	0.23		0.49	0.41		
Control Delay		133.0	1.6		35.5		24.8	2.4		47.4	9.7		
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0		
Total Delay		133.0	1.6		35.5		24.8	2.4		47.4	9.7		
LOS		F	A		D		C	A		D	A		
Approach Delay		94.4			35.5		21.7				12.7		
Approach LOS		F			D		C				B		
Queue Length 50th (ft)		~237	0		2		153	0		58	73		
Queue Length 95th (ft)		#347	0		7		#398	20		110	230		
Internal Link Dist (ft)		290		88	55		1866				743		
Turn Bay Length (ft)								500		500			
Base Capacity (vph)		263	438		271		2020	719		236	2934		
Starvation Cap Reductn		0	0		0		0	0		0	0		
Spillback Cap Reductn		0	0		0		0	0		0	0		
Storage Cap Reductn		0	0		0		0	0		0	0		
Reduced v/c Ratio		1.13	0.28		0.01		0.52	0.23		0.42	0.40		

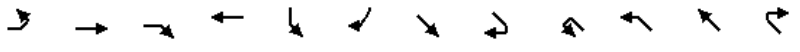
Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 84 (84%), Referenced to phase 1:NWSE, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 28.3 Intersection LOS: C
Intersection Capacity Utilization 93.6% ICU Level of Service F
Analysis Period (min) 15

* User Entered Value
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 8: Route 28 & Rufo Rd/Car Wash Driveway & Site Driveway





Movement	EBL2	EBT	EBR	WBT	SBL	SBR	SET	SER	NWU	NWL	NWT	NWR2
Lane Configurations												
Traffic Volume (vph)	240	0	100	0	1	1	975	155	10	85	1105	2
Future Volume (vph)	240	0	100	0	1	1	975	155	10	85	1105	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	10	12	12	12	12	10	10	11	11
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		0.91	1.00		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		0.97		1.00	0.94		1.00	1.00	
Flpb, ped/bikes		0.95	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.93		1.00	0.85		1.00	1.00	
Flt Protected		0.95	1.00		0.98		1.00	1.00		0.95	1.00	
Satd. Flow (prot)		1459	1391		1507		4622	1352		1477	4380	
Flt Permitted		0.95	1.00		0.98		1.00	1.00		0.95	1.00	
Satd. Flow (perm)		1459	1391		1507		4622	1352		1477	4380	
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.50	0.50	0.92	0.92	0.95	0.95	0.95	0.95
Adj. Flow (vph)	296	0	123	0	2	2	1060	168	11	89	1163	2
RTOR Reduction (vph)	0	0	101	0	0	0	0	111	0	0	75	0
Lane Group Flow (vph)	0	296	22	0	4	0	1060	57	0	100	1090	0
Confl. Peds. (#/hr)	7		2		2	12		12	2	12		12
Confl. Bikes (#/hr)								1				4
Heavy Vehicles (%)	2%	2%	1%	2%	0%	0%	1%	1%	0%	3%	3%	0%
Turn Type	custom	NA	custom		D.Pm		NA	Perm	Prot	Prot	NA	
Protected Phases			3!	5			1		2	2	1 2	
Permitted Phases	3	3!			3!			1				
Actuated Green, G (s)		18.1	18.1		18.1		34.1	34.1		13.9	54.0	
Effective Green, g (s)		18.1	18.1		18.1		34.1	34.1		13.9	54.0	
Actuated g/C Ratio		0.18	0.18		0.18		0.34	0.34		0.14	0.54	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0		
Vehicle Extension (s)		2.0	2.0		2.0		3.0	3.0		3.0		
Lane Grp Cap (vph)		264	251		272		1576	461		205	2365	
v/s Ratio Prot			0.02				c0.23			0.07	c0.25	
v/s Ratio Perm		c0.20			0.00			0.04				
v/c Ratio		1.12	0.09		0.01		0.67	0.12		0.49	0.46	
Uniform Delay, d1		41.0	34.1		33.6		28.2	22.7		39.8	14.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		92.0	0.1		0.0		2.3	0.6		1.8	0.1	
Delay (s)		132.9	34.1		33.6		30.5	23.2		41.6	14.2	
Level of Service		F	C		C		C	C		D	B	
Approach Delay (s)		103.9		0.0	33.6		29.5				16.4	
Approach LOS		F		A	C		C				B	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

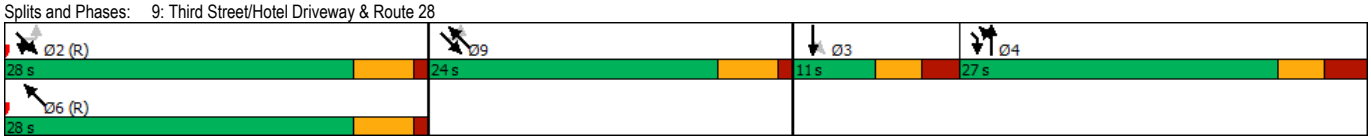
! Phase conflict between lane groups.
c Critical Lane Group

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEU	SEL	SET	SER	NWL	NWT	NWR	Ø2	Ø6	Ø9
Lane Configurations																
Traffic Volume (vph)	545	0	25	10	10	5	20	10	790	320	0	690	10			
Future Volume (vph)	545	0	25	10	10	5	20	10	790	320	0	690	10			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	10	10	11	12	12	12	12	12	11	12	12	11	11			
Storage Length (ft)	110		0	0		0		0		0	475		0			
Storage Lanes	1		0	0		0		0		1	1		0			
Taper Length (ft)	25			25				25			25					
Satd. Flow (prot)	1412	1377	0	0	1631	0	0	0	3045	1439	0	3039	0			
Flt Permitted	0.950	0.956			0.500				0.905							
Satd. Flow (perm)	1412	1377	0	0	816	0	0	0	2758	1439	0	3039	0			
Right Turn on Red			Yes			Yes				Yes			Yes			
Satd. Flow (RTOR)		152			8					330		2				
Link Speed (mph)		30			30				30			30				
Link Distance (ft)		475			132				823			272				
Travel Time (s)		10.8			3.0				18.7			6.2				
Confl. Peds. (#/hr)			58	58				32		92	92		32			
Confl. Bikes (#/hr)										6			12			
Peak Hour Factor	0.96	0.96	0.96	0.64	0.64	0.64	0.92	0.97	0.97	0.97	0.97	0.97	0.97			
Heavy Vehicles (%)	2%	2%	13%	0%	0%	0%	2%	0%	3%	1%	6%	3%	0%			
Shared Lane Traffic (%)	47%															
Lane Group Flow (vph)	301	293	0	0	40	0	0	0	846	330	0	721	0			
Turn Type	Split	NA		Perm	NA			Perm	NA	custom		NA				
Protected Phases	4	4			3				2 9	2 4		6 9		2	6	9
Permitted Phases				3				2 9								
Detector Phase	4	4		3	3			2 9	2 9	2 4		6 9				
Switch Phase																
Minimum Initial (s)	6.0	6.0		5.0	5.0									10.0	17.0	1.0
Minimum Split (s)	24.0	24.0		11.0	11.0									23.0	23.0	23.0
Total Split (s)	27.0	27.0		11.0	11.0									28.0	28.0	24.0
Total Split (%)	30.0%	30.0%		12.2%	12.2%									31%	31%	27%
Yellow Time (s)	3.0	3.0		3.0	3.0									4.0	4.0	4.0
All-Red Time (s)	3.0	3.0		2.5	2.5									1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0			0.0											
Total Lost Time (s)	6.0	6.0			5.5											
Lead/Lag	Lag	Lag		Lead	Lead											
Lead-Lag Optimize?																
Recall Mode	Ped	Ped		None	None									C-Min	C-Min	Min
Act Effct Green (s)	21.1	21.1			6.7				47.9	55.4		47.9				
Actuated g/C Ratio	0.23	0.23			0.07				0.53	0.62		0.53				
v/c Ratio	0.91	0.67			0.59				0.58	0.33		0.45				
Control Delay	66.5	23.0			69.9				17.1	2.1		14.8				
Queue Delay	0.0	0.0			0.0				0.0	0.0		0.0				
Total Delay	66.5	23.0			69.9				17.1	2.1		14.8				
LOS	E	C			E				B	A		B				
Approach Delay		45.0			69.9				12.9			14.8				
Approach LOS		D			E				B			B				
Queue Length 50th (ft)	174	73			17				184	0		142				
Queue Length 95th (ft)	#338	171			#43				223	36		172				
Internal Link Dist (ft)		395			52				743			192				
Turn Bay Length (ft)	110															
Base Capacity (vph)	340	447			68				1601	1007		1765				
Starvation Cap Reductn	0	0			0				0	0		0				
Spillback Cap Reductn	0	0			0				0	0		0				
Storage Cap Reductn	0	0			0				0	0		0				
Reduced v/c Ratio	0.89	0.66			0.59				0.53	0.33		0.41				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 17 (19%), Referenced to phase 2:SETL and 6:NWT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 21.9 Intersection LOS: C
Intersection Capacity Utilization 82.2% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Third Street/Hotel Driveway & Route 28



Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEU	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations													
Traffic Volume (vph)	545	0	25	10	10	5	20	10	790	320	0	690	10
Future Volume (vph)	545	0	25	10	10	5	20	10	790	320	0	690	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	11	12	12	12	12	12	11	12	12	11	11
Total Lost time (s)	6.0	6.0			5.5				5.0	5.0		5.0	
Lane Util. Factor	0.95	0.95			1.00				0.95	1.00		0.95	
Frpb, ped/bikes	1.00	0.99			1.00				1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00			0.98				1.00	1.00		1.00	
Frt	1.00	0.99			0.97				1.00	0.85		1.00	
Flt Protected	0.95	0.96			0.98				1.00	1.00		1.00	
Satd. Flow (prot)	1412	1377			1599				3042	1439		3039	
Flt Permitted	0.95	0.96			0.50				0.91	1.00		1.00	
Satd. Flow (perm)	1412	1377			816				2760	1439		3039	
Peak-hour factor, PHF	0.96	0.96	0.96	0.64	0.64	0.64	0.92	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	568	0	26	16	16	8	22	10	814	330	0	711	10
RTOR Reduction (vph)	0	116	0	0	8	0	0	0	0	153	0	1	0
Lane Group Flow (vph)	301	177	0	0	32	0	0	0	846	177	0	720	0
Confl. Peds. (#/hr)			58	58				32		92	92		32
Confl. Bikes (#/hr)										6			12
Heavy Vehicles (%)	2%	2%	13%	0%	0%	0%	2%	0%	3%	1%	6%	3%	0%
Turn Type	Split	NA		Perm	NA			Perm	NA	custom		NA	
Protected Phases	4	4			3				2 9	2 4		6 9	
Permitted Phases				3				2 9					
Actuated Green, G (s)	21.1	21.1			5.6				46.8	54.3		46.8	
Effective Green, g (s)	21.1	21.1			5.6				46.8	48.3		46.8	
Actuated g/C Ratio	0.23	0.23			0.06				0.52	0.54		0.52	
Clearance Time (s)	6.0	6.0			5.5								
Vehicle Extension (s)	2.0	2.0			2.0								
Lane Grp Cap (vph)	331	322			50				1435	772		1580	
v/s Ratio Prot	c0.21	0.13								0.12		0.24	
v/s Ratio Perm					c0.04				c0.31				
v/c Ratio	0.91	0.55			0.65				0.59	0.23		0.46	
Uniform Delay, d1	33.5	30.3			41.2				15.0	11.0		13.6	
Progression Factor	1.00	1.00			1.00				1.00	1.00		1.00	
Incremental Delay, d2	26.9	1.0			19.7				0.4	0.1		0.1	
Delay (s)	60.5	31.3			61.0				15.4	11.1		13.7	
Level of Service	E	C			E				B	B		B	
Approach Delay (s)		46.1			61.0				14.2			13.7	
Approach LOS		D			E				B			B	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group