Memorandum

To: Jennifer Caira
Planning & Development Department,
City of Newton

Date: May 11, 2021

Project #: 10865.03

From: Randall Hart, Principal
Matthew Duranleau, Project Consultant

Re: Riverside Station Redevelopment
Transportation Peer Review
Response to Comments

Vanasse Hangen Brustlin, Inc. (VHB) has prepared the following responses to comments received through the peer review of the Riverside Station redevelopment application package. Comments were received from Green International Affiliates, Inc. in a memorandum dated April 23, 2021, and were generally discussed during a call between the Proponent, the City of Newton, and the Peer Consultant on Tuesday April 27, 2021. For ease of review, the comments that were received are outlined below along with the responses.

Transportation Impact and Access Study

Comment 1: *Ten (10) specific development projects were identified as projects that are expected to add site generated vehicle trips to the study area roadway network. The TIAS states that the ITE trip generation calcs were used as well as existing traffic patterns to add the site generated vehicle trips to the study area intersections. However, no ITE trip generation calcs were provided in the Appendix. ITE Trip Generation calcs should be provided for these developments. In addition, clarification should be provided as to which trip distribution (Office/Retail or Residential) was used for each development project. It is preferred that site generated trips from these developments and the trip distribution be taken directly from the traffic studies that were completed (if a traffic study was completed for the project).*

Response 1: For projects where a traffic study was completed, the trip generation estimates were taken directly from the submitted studies. However, many of the background projects identified are small and did not require the preparation of a traffic study. For those that didn't require a study, VHB made projections for trip generation assumptions based on ITE trip generation data and existing traffic patterns. Since the site-generated trips are generally fairly low for each of the small projects that did not require a traffic study, the trip distribution for each project was based on existing traffic patterns as opposed to applying specific residential or office/retail distribution patterns with generally a 50/50 split assumed on the major roadway going into and coming out of each driveway. Detailed backup regarding the background project trip generation calculations are included as an attachment to this document, as are pages from traffic studies for the projects where that work was completed.

Comment 2: *The TIAS references the Allston Multimodal Project (Allston Viaduct) as a regional transportation project that may have an impact on the Project site but notes it is included for informational purposes only as construction is expected to extend past 2031. The current MassDOT project website for this project*

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states that construction is expected to begin in late 2023 or early 2024. The construction timeline of the Allston Multimodal Project should be verified to identify potential overlaps in construction with the Riverside Station Redevelopment and the associated impacts to regional traffic patterns through the study area. If construction for the two projects is expected to occur simultaneously, coordination between the projects will be needed during construction to minimize impacts to regional traffic.

Response 2: VHB has verified that the I-90 Allston Viaduct project is currently moving forward with a Notice of Project Change which is expected to be filed by the end of the year. The project shows that construction could begin as early as 2023/2024. The current Riverside project schedule anticipates that the garage will be completed in 2024, prior to the completion of the remainder of the development. Until the development is fully built and leased, the MBTA will have the option of leasing any spaces that are not dedicated to the project or construction vehicle parking. This give the MBTA the option to expand beyond 1,000 parking spaces on an interim basis, should parking demand or traffic and transit patterns dictate the need for more parking during the construction of the Viaduct Project. The proponent will continue to monitor activities on the Allston project.

Comment 3: *Transit Mode Splits (7% Office/R&D and 15% Residential) are below what are to be expected at a transit-oriented development (TOD) such as this due to the convenience and ease of access of several public transit options located within the project site. While this method may provide a conservative analysis relative to vehicular traffic impacts, it underestimates the number of people who are expected to use public transit services; thus, understanding the potential impacts to the capacity of these public transit services. The December 2019 TIAS prepared for the previous building program provided a separate transit capacity analysis using a more robust transit mode split that more accurately represents the impact of the Project on the MBTA in addition to traffic analysis using a low-transit mode split. The mode splits used for the transit capacity analysis were 15% and 35% for office and residential uses, respectively. The 7% office/R&D and 15% residential transit mode splits used for this TIAS are significantly lower than the previous transit capacity analysis. Transit trip generation calculations should be provided using the December 2019 TIAS transit mode split of 15% and 35% for office and residential uses, respectively. The new transit trip generation should then be compared to the previous transit trip generation to confirm there are no issues related to the expected transit capacity and the previous transit capacity levels are equal to or greater than the current transit capacity levels.*

Response 3: During a conference call to discuss the initial comments between the proponent, the City of Newton, and the peer consultant (Green International), the peer consultant clarified that they are requesting that VHB provide projections for public transportation passenger activities based on more realistic mode shares, such as those included in the December 2019 TIAS. VHB has prepared a supplemental projection of traffic generation assuming transit mode shares of 15% for R&D uses and 35% for residential uses. The daily Site-generated transit trips are provided below in Table 1 and the full trip generation calculations are included as an attachment to this document.

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Table 1 Transit Passenger Estimates based on "Realistic" Transit Mode Shares

	Total Site-Generated Transit Trips [a]					
	Proposed Building Program			December 2019 TIAS Building Program		
	Residential Trips	R&D Trips	Total Transit Trips	Residential Trips	Office Trips	Total Transit Trips
Weekday Daily						
Enter	526	338	**864**	527	248	**775**
Exit	556	328	**864**	564	232	**796**
Total	1,082	666	**1,748**	1,091	480	**1,571**

a Total site-generated transit trips based on higher transit mode shares of 15% for R&D and 35% for residential uses.
Note: Retail land use under "Realistic" mode share used in December 2019 TIAS assumed not to generate any transit trips.

As shown in Table 1, based on the "Realistic" mode shares used in the December 2019 TIAS, the new building program is expected to generate approximately 1,748 daily transit trips while the building program used in the December 2019 TIAS was expected to generate approximately 1,571 daily transit trips. While the new building program is expected to generate more transit trips with these mode shares than the previous building program, we expected that the transit analyses presented in the December 2019 TIAS would still be applicable and that there are no issues related to the expected transit capacities with the proposed building program.

The reason for this is that the December 2019 building program included a 150-room hotel that was expected to replace the existing hotel on-site. Transit trips generated by the proposed hotel were not included in the December 2019 transit capacity analyses, as they were expected to replace the existing hotel trips that utilize public transit today. The current building program proposes to replace the hotel square footage with additional R&D space, which means that the existing hotel transit trips will no longer be replaced with equivalent new hotel transit trips. If we remove the existing and proposed hotel transit trips from both sets of transit numbers, it is expected that the current building program would generate daily transit trips at a rate similar to the previous building program.

In addition, the realistic mode shares assumed in the December 2019 TIAS represented an "upper bound" of transit trip generation and it was expected that the actual transit capacity impacts would be somewhere between the conservative and the realistic capacity analyses presented. For the updated TIAS, only one set of transit shares mirroring existing census data for the City of Newton was used for simplicity and based on comments by MassDOT. While the transit mode shares for the land uses at the Site may be slightly higher than the census data for the City of Newton overall, it is expected to still be below the upper bound presented in the December 2019 TIAS. Therefore, the capacity impacts on the transit network with the new building program are still expected to be below the upper bound analyses presented in the December 2019 TIAS.

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Comment 4: *There is a typo in Table 3-5 Project Trip Generation – New Unadjusted Vehicle Trips. The total unadjusted vehicle trips during the Saturday Midday Peak Hour should read 237 for the residential use, not 137. We reviewed the calculations for the Future Build traffic volume projections and verified the correct number of 237 unadjusted vehicle trips for the residential use was used in the calculations.*

Response 4: We agree that there is a typo, but the analyses were conducted using the correct numbers.

Comment 5: *There is a typo in Table 3-8 Project-Generated Peak – hour Vehicle Trips by Use. The total net vehicle trips during the Saturday Midday Peak Hour should read 304, not 204. We reviewed the calculations for the Future Build traffic volume projections and verified the correct number of 304 net vehicle trips was used in the calculations.*

Response 5: We agree that there is a typo, but the analyses were conducted using the correct numbers.

Site Plans

Comment 1: *Table 3-28 of March 2021 TIAS lists the Site Main Street at Grove Street Driveway / Garage Driveway as operating under All-Way Stop control. However, the March 2021 Site Plans show the interaction operating under 3-Way Stop control with no Stop line or Stop sign provided along the Road B approach. The Designer should clarify the proposed intersection operations at the Main Street / Grove Street Driveway / Garage Driveway intersection and revise the project documents as needed for consistency.*

Response 1: Synchro, the traffic program that was utilized for the traffic analyses, cannot model a 3-way stop control at a 4-way intersection. As a result, to be conservative, VHB analyzed the undersection under 4-way stop condition. The peer consultant feels that implementation of a 3-ways stop condition could be confusing and therefore we will adjust the plans to incorporate a 4-way stop condition to match the analyses that are provided in the TIA.

Comment 2: *Designer should add stop line along the Riverside MBTA Driveway southbound approach to the signalized intersection with Grove Street. The stop line should be set back a minimum of four feet from the proposed crosswalk.*

Response 2: A stop line will be added on Road B's eastbound lane approaching the Grove Street intersection. The stop line will be set four feet behind the proposed crosswalk.

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Comment 3: *We have concerns with the proposed traffic operations at the Grove Street / MBTA Site Driveway signalized intersection and the internal intersection at Main Street / Road B / Building 9/10 parking Garage entrance. The 95th percentile queues along the MBTA Site Driveway (Road B) approach to the signalized intersection with Grove Street are expected to spill back into and block the internal intersection at Main Street / Road B / Building 9/10 Parking Garage entrance during the weekday AM and PM peak hours (only approximately 10 feet between end of average vehicle queues and intersection during PM peak hour). The proponent should consider implementing measures to hold traffic in the garage during the peak hours when the queues may block the intersection to maintain MBTA bus access to the transit plaza.*

Response 3: As discussed in the TIA, if needed during the evening peak hour period, traffic attendants will be stationed within the parking garage and direct exiting motorist to the most appropriate egress during any given period to avoid or minimize any potential back-ups that may exist.

Comment 4: *There are no loading zones provided on-street or in the garage adjacent to Buildings 9/10. The proponent should clarify how deliveries will be made to Buildings 9/10 and consider providing loading zones adjacent to the buildings either on-street or in the garage.*

Response 4: The loading zones servicing Buildings 9 and 10 will be located internal to the garage. Labels of their locations will be added to the plans.

Comment 5: *There are no loading zones provided for Buildings 7/8. The proponent should clarify how deliveries will be made to Building 7/8. If the intent is for deliveries to use the designated bus stop and accessible drop off area delivery scheduling will need to be coordinated with the MBTA and any transit/drop-off services who will be using these areas.*

Response 5: The loading zones servicing Buildings 7 and 8 will be labeled on the plans. Buildings 7's loading area is on eastern façade adjacent to Grove Street and Building 8 has an internal lading bay on the southern edge.

Comment 6: *The proposed accessible drop off area is located in the middle of the MBTA bus maneuvering area and conflicts with the turning movement for a MBTA bus pulling into the designated bus stop area proposed in front of Building 7. The proponent should evaluate reconfiguring the proposed bus stop and accessible drop off areas in front of Buildings 7 and 8 eliminate conflicts between the MBTA bus maneuvering area and the accessible drop off area.*

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Response 6: The location of the short-term accessible parking space in front of building 7 and associated truck turns will be further explored and relocated if necessary.

Comment 7: *There are no turning movements provided for trash vehicles accessing the designated trash rooms located in the proposed garage for Buildings 9/10. Figures showing the turning movements for trash pick-up should be provided at the designated trash areas within the garage for Buildings 9/10.*

Response 7: A figure showing the trash vehicle turning movements is provided as an attachment to this document.

Comment 8: *There are no turning movements provided for a City Bus exiting the designated bus area adjacent to the trash/utility room, MBTA Bike Storage and GO BUS Station in the garage for Buildings 9/10 turning right onto Road C. A figure should be provided showing the turning movements for a City Bus can make the right-turn maneuver from the Designated bus area out of the garage and onto Road C.*

Response 8: A figure showing the turning movement for a city bus exiting the garage onto Road C is provided as an attachment to this document.

Comment 9: *No detectable warning panel is provided at the end of the crossing across Road C at the corner adjacent to Building 8. The proponent should provide a detectable warning panel at this location to indicate a transition from the sidewalk to vehicle travel way.*

Response 9: A detectable warning panel will be added to the plans for the Road C crossing at the corner of Building 8.

Comment 10: *The TDM includes directional signage for locating transportation services (transit stop/shuttle stop) and amenities (bicycle parking, regional bicycle routes, and pedestrian walkways). The site plan only shows proposed regulatory and warning signage. All proposed wayfinding and directional signage (including locations and sign details) should be included in a comprehensive signage package and submitted to the City of Newton for review when the documents are available.*

Response 10: An initial comprehensive signage package was submitted to the City of Newton as part of the Revised Special Permit submission in March 2021. The signage package requires further coordination with the UDC, the City of Newton and the MBTA and will be updated to include wayfinding signage as the design of the project is further developed. The proponent will provide the City and the peer consultant the update when it is finalized.

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Comment 11: *The March 2021 Site Plans show various locations where a 30" x 30" Stop sign (R1-1) is mounted back-to-back with a 30" x 30" Do Not Enter sign (R5-1). Per the 2009 MUTCD, a sign that is mounted with a STOP or YIELD sign should stay within the edge of the STOP or YIELD sign. The designer should either propose larger Stop signs (36" x 36") at these locations such that the Do Not Enter signs stay within the edges of the Stop signs or mount the signs on separate posts.*

Response 11: The signs will be updated accordingly.

Comment 12: *The March 2021 Site Plans propose standard crosswalk markings (parallel lines) at all crosswalks within the project site. We recommend using high-visibility crosswalk marking types such as ladder or continental for all crosswalks within the project site.*

Response 12: The proposed crosswalks will be updated to be the continental style.

Comment 13: *The proposed pedestrian crossing warning sign assembly (W11-2 and W16-7P) on the west side of Main Street at the proposed mid-block crosswalk across Main street between Road A and Road B is located directly behind a proposed tree that could block visibility for southbound vehicles along Main Street. The designer should consider relocating the pedestrian crossing warning sign assembly and/or revising the proposed landscape in this area to provide sufficient visibility of the pedestrian crossing warning sign assembly and pedestrians waiting to cross at this location.*

Response 13: The signs will be relocated accordingly.

Comment 14: *Layout and Materials Plan C-8.2 of the March 20201 Site Plans shows standard W11-2 and W16-7P being proposed at the proposed crosswalk across Grove Street south of the signalized intersection with MBTA Site Driveway (Road B). The Site Plan should be revised to include a RRFB at this location consistent with the Off-Site Mitigation Concept Plans.*

Response 14: The signs will be updated to include the proposed Rapid Reflectorized Flashing Beacon (RRFB).

Comment 15: *The proponent should clarify whether the proposed exit from the garage for Buildings 9/10 onto Road C is one-way traffic flow for vehicles exiting the garage onto Road C. If this is the case, Do Not Enter signs (R5-1) should be provided at this location facing Road C. In addition, a Stop line and Stop sign (R1-1) should be added along this approach to Road C.*

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Response 15: The garage exit onto Road C is intended to be one-way. Do Not Enter signed and stop signs will be added along the approach to Road C. In addition, a Stop line and Stop sign (R1-1) will be added along this approach to Road C.

Comment 16: *There is no detail provided in the Site Details for the proposed chevron pavement markings to be installed along the ramp transitions to the raised section of Main Street between the "horseshoe loop" for Buildings 2-4. The proponent should include a pavement marking detail in the Site Details for the proposed chevron pavement markings to be installed along the ramp transitions to the raised section of roadway.*

Response 16: Chevron pavement markings will be added to the plan.

Riverside Masterplan Revised Parking Analysis

Comment 1: *The areas used in the peak parking demand calculations included in the March 2021 Revised Parking Analysis for the proposed Retail & R&D uses do not match the latest areas included in the current proposal. The current project narrative proposes 21,981 square feet of retail and 362,235 square feet of R&D. However, the Revised Parking Analysis uses 22,442 square feet of retail and 363,401 square feet of R&D to calculate the peak parking demand for the respective uses. The total areas used in the peak parking demand calculations for each of the proposed land uses should match the current building program. However, it is noted that the current differences in the areas used for proposed Retail & R&D are low enough where it is not expected to change the overall results of the Parking Analysis.*

Response 1: We agree that the total areas used in the peak parking demand calculations for each of the proposed land uses should match the current building program and that the current differences in the areas used for proposed Retail & R&D are low enough where it is not expected to change the overall results of the Parking Analysis.

Riverside Parking Calculation

Comment 1: *The parking requirement calculation for the Laboratory/Research use assumes 1 parking space is required for every three (3) employees. However, as stated in the Parking Calculation document Section 5.1.4. A of the City of Newton's Zoning Bylaw and General Bylaw requires 1 parking stall per 1,000 square feet and 1 parking stall for every 4 employees for Laboratory/Research use. As a result, the Total Laboratory/Research Parking Requirement calculation should read: (362,235 / 1,000) + (966 /4) =363 + 242=605 parking stalls. The 605 parking stalls is 80 spaces fewer than the 685 parking stalls stated in*

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the Parking Calculation document. This reduces the total commercial parking requirement with reduction by special permit from 624 parking stalls to 570 parking stalls (reduction of 54 parking stalls) and the total residential and commercial parking requirement (after reductions pursuant to Sections 5.1.4.A and 5.1.4.C) from 1,312 parking stalls to 1,258 parking stalls. Thus, the total waiver required pursuant to Section 5.1.13 is 1,258 parking stalls (required) – 1,171 parking stalls (provided) = 87 parking stalls.

Response 1: The peer reviewers' calculation is correct. The 87 parking stalls fall within the waiver that was previously granted on the project. Thus, no new additional parking waiver is required.

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Attachments

- Background Project Trip Generation Calculations
- Trip Generation Calculations – "Realistic" Transit Mode Shares
- Turning Movement Diagrams

BACKGROUND PROJECT-GENERATED TRIPS

			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on Published TIA			
			BACKGROUND DEVELOPMENTS																													
	INTERSECTION	MOVEMENT	160 Stanton Ave			143 Rumford Ave			429 Cherry Street			1314 Washington St			1089 Washington Street (Marijuana Disp.)			131 Rumford Street (Marijuana Disp.)			15-21 Lexington Street			20 Kinmonth Road			283 Melrose Street			Dunstan East			TOTAL BACKGROUND		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
1	**GROVE STREET AT ROUTE 128 SB RAMPS / ASHEVILLE ROAD**																																	
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		EB R																																
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2	**GROVE STREET AT ROUTE 128 NB RAMPS**																																	
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	Hotel Indigo Driveway	SB L																																
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4	**GROVE STREET AT RIVERSIDE MBTA PARKING LOT DRIVEWAY**																																	
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5	**GROVE STREET AT RIVERSIDE OFFICE BUILDING (SOUTH) / APARTMENT DWY**																																	
	Office Building South	EB L																																
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	Condo Driveway	WB L																																
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6	**GROVE STREET AT RIVERSIDE OFFICE BUILDING (CENTER) / APARTMENT DWY**																																	
	Office Building Center	EB L																																
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7	**GROVE STREET AT RIVERSIDE OFFICE BUILDING (NORTH) / SEMINARY AVENUE**																																	
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8	**WASHINGTON STREET AT CONCORD STREET**																																	
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			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
10	**CONCORD STREET AT HAGAR ROAD**																																	
	Hagar Road	WB L				1	1	1										3	6	10	1	1	1				3	3	6				**8**	**11**	**18**
		WB R																																
	Concord Street	NB U																																
		NB T																																
		NB R				1	1	2										3	6	10	1	1	1				3	4	7				**8**	**12**	**20**
	Concord Street	SB L																																
		SB T																																
11	**GROVE STREET AT HAGAR ROAD / COLGATE ROAD**																																	
	Hagar Road	EB U																																
		EB L				1	1	2										3	6	10	1	1	1				3	4	7				**8**	**12**	**20**
		EB T																																
		EB R																																
	Colgate Road	WB L																																
		WB T																																
		WB R																																
	Grove Street	NB L																																
		NB T																																
		NB R																																
	Grove Street	SB L																																
		SB T																																
		SB R				1	1	1										3	6	10	1	1	1				3	3	6				**8**	**11**	**18**
12	**RT 128 EXIT 21B C-D ROAD AT RT 128 SB ON-RAMP**																																	
	C-D Road	NB R	3	3	4				1	1	1	5	5	5										1	1	2				9	5	6	**19**	**15**	**18**
	C-D Road	SB L					1	1										3	6	10	1		1										**4**	**7**	**12**
		SB T																																
13	**WASHINGTON STREET AT QUINOBEQUIN ROAD / WALES STREET / RT 128 SB RAMPS**																																	
	Route 16	EB L																																
		EB T	2	4	4						1	4	2	2	3	5	8								1	1				4	3	3	**13**	**15**	**19**
		EB R																																
		EB HR																																
	Route 16	WB U																																
		WB L																																
		WB BL																																
		WB T	3	3	4						1	2	2	2	2	5	8							1		1				4	3	3	**12**	**13**	**19**
		WB R	3	3	4				1	1	1	5	5	5										1	1	2				9	5	6	**19**	**15**	**18**
	Quinobequin Road	NB U																																
		NB HL																																
		NB L																																
		NB T																																
		NB R	1	4	4																				1	2							**1**	**5**	**6**
	Quinobequin Road	SB L																																
		SB T																																
		SB BR																																
		SB R																																
	Wales Street	NEB HL																																
		NEB BL																																
		NEB BR																																
		NEB HR																																

BACKGROUND PROJECT-GENERATED TRIPS

			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on Published TIA			
			BACKGROUND DEVELOPMENTS																													
	INTERSECTION	MOVEMENT	160 Stanton Ave			143 Rumford Ave			429 Cherry Street			1314 Washington St			1089 Washington Street (Marijuana Disp.)			131 Rumford Street (Marijuana Disp.)			15-21 Lexington Street			20 Kinmonth Road			283 Melrose Street			Dunstan East			TOTAL BACKGROUND		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
14	**WASHINGTON STREET AT ROUTE 128 NB RAMPS**																																	
	Route 16	EB U																																
		EB L																																
		EB T	3	8	8						1	4	2	2	3	5	8								2	3					4	3	3	**14**	**20**	**25**
		EB R																																
	Route 16	WB L																																
		WB T	6	6	8				1	1	2	7	7	7	2	5	8							2	1	3				13	8	9	**31**	**28**	**37**
		WB R	3	3	4																			1	1	2							**4**	**4**	**6**
	Route 128 NB Ramps from South	NB L																																
		NB T																																
		NB R	1	4	4				1	1	1	9	4	6										1	1	2				9	6	7	**21**	**16**	**20**
	Route 128 NB On Ramp	SB L																																
		SB T																																
		SB R																																
15	**WASHINGTON STREET AT BEACON STREET**																																	
	Washington Street	EB U																																
		EB L																																
		EB T	4	12	12				1	1	2	13	6	8	3	5	8													13	9	10	**34**	**33**	**40**
		EB R																						1	3	5							**1**	**3**	**5**
	Washington Street	WB L	1	1	1																				1	1							**1**	**2**	**2**
		WB T	9	9	12				1	1	2	7	7	7	2	5	8													13	8	9	**32**	**30**	**38**
		WB R																																
	Beacon Street	NB L																						3	2	5							**3**	**2**	**5**
		NB T																																
		NB R		1	1																			1		1							**1**	**1**	**2**
	Beacon Street Extension	SB L																																
		SB T																																
		SB R																																
16	**GROVE STREET AT HANCOCK STREET**																																	
	Grove Street	SB U																																
		SB T				1	2	2										6	12	20	2	1	2				3	3	6				**12**	**18**	**30**
		SB R																																
	Grove Street	NB U																																
		NB L																																
		NB T				2	2	4										6	12	20	1	2	2				3	4	7				**12**	**20**	**33**
	Hancock Street	SEB L																																
		SEB R																																
17	**GROVE STREET AT WOODLAND ROAD**																																	
	Woodland Road	EB L																																
		EB T																																
		EB R																																
	Woodland Road	WB L																																
		WB T																																
		WB R																																
	Grove Street	NB L																																
		NB T				2	2	4										6	12	20	1	2	2				3	4	7				**12**	**20**	**33**
		NB R																																
	Grove Street	SB L																																
		SB T				1	2	2										6	12	20	2	1	2				3	3	6				**12**	**18**	**30**
		SB R																																

BACKGROUND PROJECT-GENERATED TRIPS

			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on Published TIA			
			BACKGROUND DEVELOPMENTS																														
	INTERSECTION	MOVEMENT	160 Stanton Ave			143 Rumford Ave			429 Cherry Street			1314 Washington St			1089 Washington Street (Marijuana Disp.)			131 Rumford Street (Marijuana Disp.)			15-21 Lexington Street			20 Kinmonth Road			283 Melrose Street			Dunstan East			TOTAL BACKGROUND		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
18	**HANCOCK STREET AT WOODLAND ROAD**																																
	Woodland Road	EB L																															
		EB T																															
		EB R																															
	Woodland Road	WB L																															
		WB T																															
		WB R																															
	Hancock Street	NB L																															
		NB T																															
		NB R																															
	Hancock Street	SB L																															
		SB T																															
		SB R																															
19	**WOODLAND ROAD AT CENTRAL STREET**																																
	Woodland Road	EB U																															
		EB L																															
		EB T																															
		EB R																															
	Woodland Road	WB L																															
		WB T																															
		WB R																															
	Central Street	NB L																															
		NB T																															
		NB R																															
	Central Street	SB L																															
		SB T																															
		SB R																															
20	**GROVE STREET AT CENTRAL STREET / AUBURN STREET**																																
	Central Street	EB L																															
		EB T																															
		EB R																															
	Auburn Street	WB U																															
		WB L																															
		WB T																															
		WB R																									1	5	6	4	2	3	**5**	**7**	**9**
	Grove Street	NB L																															
		NB T				2	2	4										6	12	20	1	2	2				3	4	7				**12**	**20**	**33**
		NB R																															
	Auburn Street	SB U																															
		SB L																									6	3	4	4	3	3	**10**	**6**	**7**
		SB T				1	2	2										6	12	20	2	1	2				3	3	6				**12**	**18**	**30**
		SB R																															
21	**LEXINGTON STREET AT AUBURN STREET**																																
	Auburn Street	EB U																															
		EB L																															
		EB T																															
		EB R																									9	6	10	4	3	3	**13**	**9**	**13**
	Driveway	WB L																															
		WB T																															
		WB R																															
	Auburn Street	NB L																									4	9	13	4	2	3	**8**	**11**	**16**
		NB T				2	2	4										6	12	20	1	2	2										**9**	**16**	**26**
		NB R																															
	Lexington Street	SB L																															
		SB T				1	2	2										6	12	20	2	1	2										**9**	**15**	**24**
		SB R																															

BACKGROUND PROJECT-GENERATED TRIPS

	INTERSECTION	MOVEMENT	Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on Published TIA			
			BACKGROUND DEVELOPMENTS																													
			160 Stanton Ave			143 Rumford Ave			429 Cherry Street			1314 Washington St			1089 Washington Street (Marijuana Disp.)			131 Rumford Street (Marijuana Disp.)			15-21 Lexington Street			20 Kinmonth Road			283 Melrose Street			Dunstan East			TOTAL BACKGROUND		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
22	**COMMONWEALTH AVENUE AT LEXINGTON STREET**																																	
	Commonwealth Avenue	EB L				2	2	4										6	12	20		2	2				3	6	14	4	4	3	**15**	**26**	**43**
		EB T								1	1	13	6	8	3	5	8										2	3	8	4	3	3	**22**	**18**	**28**
		EB R																																
	Commonwealth Avenue	WB U																																
		WB L																																
		WB T							1		1	7	7	7	2	5	8										3	4	12	4	3	3	**17**	**19**	**31**
		WB R	1	1	1	1	1	2										3	6	10		1	1	1		1						**6**	**9**	**15**
	Lexington Street	NB L																																
		NB T				2	2	4										6	12	20	1	2	2										**9**	**16**	**26**
		NB R																																
	Lexington Street	SB L		1	1		1	1										3	6	10	1		1		1	1						**4**	**9**	**14**
		SB T				1	2	2										6	12	20	2	1	2										**9**	**15**	**24**
		SB R				1	2	2										6	12	20	2	1	2				6	6	23	5	4	4	**20**	**25**	**51**
23	**LEXINGTON STREET AT WOLCOTT STREET**																																	
	Starbucks Driveway	EB L																																
		EB T																																
		EB R																																
	Wolocott Street	WB L																									3	3	12	5	4	4	**8**	**7**	**16**
		WB T																																
		WB R																																
	Lexington Street	NB U																																
		NB L																																
		NB T	1	1	1	5	5	10										15	30	50	1	5	5	1		1	1	3	7				**24**	**44**	**74**
		NB R																									2	3	7	4	4	3	**6**	**7**	**10**
	Lexington Street	SB L																																
		SB T		1	1	2	5	5										15	30	50	5	2	5		1	1	3	3	11				**25**	**42**	**73**
		SB R																																
24	**COMMONWEALTH AVENUE AT MELROSE STREET**																																	
	Commonwealth Avenue	EB L																																
		EB T				2	2	4		1	1	13	6	8	3	5	8	6	12	20		2	2							8	7	6	**32**	**35**	**49**
		EB R																																
	Commonwealth Avenue	WB L																									9	10	35				**9**	**10**	**35**
		WB T				1	2	2	1		1	7	7	7	2	5	8	6	12	20	2	1	2							9	7	7	**28**	**34**	**47**
		WB R																																
	Melrose Street	NB L																																
		NB T																																
		NB R																									5	9	22				**5**	**9**	**22**
	Melrose Street	SB L																																
		SB T																																
		SB R																																

BACKGROUND PROJECT-GENERATED TRIPS

			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on Published TIA			
			BACKGROUND DEVELOPMENTS																													
	INTERSECTION	MOVEMENT	160 Stanton Ave			143 Rumford Ave			429 Cherry Street			1314 Washington St			1089 Washington Street (Marijuana Disp.)			131 Rumford Street (Marijuana Disp.)			15-21 Lexington Street			20 Kinmonth Road			283 Melrose Street			Dunstan East			TOTAL BACKGROUND		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
25	**COMMONWEALTH AVENUE AT AUBURN STREET (EAST)**																																	
	Auburn Street	EB L																																
		EB BL																																
		EB T																									6	3	4	4	3	3	**10**	**6**	**7**
		EB BR																																
		EB R																																
	Auburn Street	WB HL																																
		WB L																																
		WB T																									1	5	6	4	2	3	**5**	**7**	**9**
		WB R							1		1	7	7	7	2	5	8													4	3	3	**14**	**15**	**19**
		WB HR																																
	Commonwealth Avenue	NB L																																
		NB T	1	1	1	1	1	2										3	6	10		1	1	1		1	3	4	12				**9**	**13**	**27**
		NB BR																																
		NB R																																
		NB HR																																
	Commonwealth Avenue	SB HL																																
		SB L								1	1	13	6	8	3	5	8													4	3	3	**20**	**15**	**20**
		SB BL																																
		SB T		1	1		1	1										3	6	10	1		1		1	1	3	3	8				**7**	**12**	**22**
		SB R																																
	Commonwealth Avenue Carriage Rd	NWB HL																																
		NWB L																																
		NWB BL																																
		NWB T																																
		NWB R																																
	Commonwealth Avenue Carriage Rd	SWB L																																
		SWB T																																
		SWB BR																																
		SWB R																																
		SWB HR																																
26	**WASHINGTON STREET WOODLAND STREET**																																	
	Woodland Street	EB L																																
		EB R																																
	Washington Street	NB L																																
		NB T	9	9	13				1	1	2	13	6	8	3	5	8							1		1				13	9	10	**40**	**30**	**42**
	Washington Street	SB T	4	12	13				1	1	2	7	7	7	2	5	8								1	1				13	8	9	**27**	**34**	**40**
		SB R																																
27	**WASHINGTON STREET AT COMMONWEALTH AVENUE**																																	
	Commonwealth Avenue	EB U																																
		EB L																																
		EB T					1	1										3	6	10	1		1				3	3	8				**7**	**10**	**20**
		EB R		1	1																				1	1							**2**	**2**
	Commonwealth Avenue	WB U																																
		WB L	1	3	4																												**1**	**3**	**4**
		WB T				1	1	2										3	6	10		1	1				3	4	12				**7**	**12**	**25**
		WB R																																
	Washington Street	NB L	1	1	1																			1		1							**2**	**1**	**2**
		NB T	6	6	8				1	1	2	13	6	8	3	5	8													13	9	10	**36**	**27**	**36**
		NB R	2	2	4																												**2**	**2**	**4**
	Washington Street	SB L																																
		SB T	3	8	8				1	1	2	7	7	7	2	5	8													13	8	9	**26**	**29**	**34**
		SB R																																
28	**WASHINGTON STREET AT AUBURN STREET**																																	
	Auburn Street	EB L								1	1	13	6	8	3	5	8										6	3	4	8	6	6	**30**	**21**	**27**
		EB R																																
	Washington Street	NB L																																
		NB T	6	6	8				1	1	2	13	6	8	3	5	8													13	9	10	**36**	**27**	**36**
	Washington Street	SB T	3	8	8				1	1	2	7	7	7	2	5	8													13	8	9	**26**	**29**	**34**
		SB R							1		1	7	7	7	2	5	8										1	5	6	8	5	6	**19**	**22**	**28**

BACKGROUND PROJECT-GENERATED TRIPS

	INTERSECTION	MOVEMENT	Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on ITE Estimates			Based on ITE Estimates			Based on ITE Estimates			Based on Published TIA			Based on Published TIA			
			BACKGROUND DEVELOPMENTS																														
			160 Stanton Ave			143 Rumford Ave			429 Cherry Street			1314 Washington St			1089 Washington Street (Marijuana Disp.)			131 Rumford Street (Marijuana Disp.)			15-21 Lexington Street			20 Kinmonth Road			283 Melrose Street			Dunstan East			TOTAL BACKGROUND		
			AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT	AM	PM	SAT
29	**WASHINGTON STREET AT PERKINS STREET / MASS PIKE EB ON-RAMP**																																
	Washington Street	EB T (to Pike)	3	3	4																						3	2	2				**6**	**5**	**6**
		EB T (to Rt. 16)	3	3	4				1	2	3	26	12	16	6	10	16										3	1	2	22	15	16	**61**	**43**	**57**
		EB R																																	
	Perkins Street	NB L																																	
		NB T																																	
		NB R																																	
	Pike Overpass	SB L (to Pike)							1	1	1	7	7	7	2	5	8													8	5	6	**18**	**18**	**22**
		SB L (to Rt. 16)							1	1	1	13	6	7	3	5	8													3	5	4	**20**	**17**	**20**
		SB L (U-Turn at Perk)																																	
		SB T																																	
		SB R	3	8	8				2	1	3	14	14	14	4	10	16										1	5	6	20	13	15	**44**	**51**	**62**
30	**WASHINGTON STREET AT MASS PIKE WB OFF-RAMP**																																
	Washington Street	WB L	1	4	4				3	2	4	21	21	21	6	15	24											2	3	28	18	21	**59**	**62**	**77**
	I-90 Off Ramp	EB R	2	4	4				1	1	1	13	6	7	3	5	8										1	3	3	3	5	4	**23**	**24**	**27**
31	**SOUTH AVENUE AT RIVER ROAD / ROUTE 128 SB RAMPS**																																
	South Avenue	EB L																																	
		EB T				1	1	2				4	2	2	3	5	8	3	6	10		1	1				2	3	6	4	3	3	**17**	**21**	**32**
		EB R																																	
	South Avenue	WB U																																	
		WB L																									4	6	15				**4**	**6**	**15**
		WB T				1	1	1				2	2	2	2	5	8	3	6	10	1	1	1				2	2	6	4	3	3	**15**	**20**	**31**
		WB R																																	
	I-95 SB Ramps	NB U																																	
		NB L																																	
		NB T																																	
		NB R				1	1	2		1	1	9	4	6				3	6	10		1	1				3	4	14	8	7	6	**24**	**24**	**40**
	River Road	SB L																																	
		SB T																																	
		SB R																																	
32	**SOUTH AVENUE / COMMONWEALTH AVENUE AT ROUTE 128 NB RAMPS**																																
	South Avenue	EB U																																	
		EB T				2	2	4		1	1	13	6	8	3	5	8	6	12	20		2	2				5	7	20	12	10	9	**41**	**45**	**72**
		EB R																																	
	Commonwealth Avenue	WB T				1	1	1				2	2	2	2	5	8	3	6	10	1	1	1				6	8	21	4	3	3	**19**	**26**	**46**
		WB R					1	1	1		1	5	5	5				3	6	10	1		1				4	6	15	9	6	7	**23**	**24**	**40**
	I-95 NB Ramps	NB L																																	
		NB R																									3	4	14				**3**	**4**	**14**
33	**COMMONWEALTH AVENUE AT AUBURN STREET (WEST)**																																
	Commonwealth Avenue	EB T				2	2	4		1	1	13	6	8	3	5	8	6	12	20		2	2							8	7	6	**32**	**35**	**49**
		EB R																									8	11	34	4	3	3	**12**	**14**	**37**
	Commonwealth Avenue	WB U																																	
		WB L																																	
		WB T				1	2	2	1		1	7	7	7	2	5	8	6	12	20	2	1	2				4	5	15	9	7	7	**32**	**39**	**62**
	Auburn Street	NB L																									6	9	21	4	2	3	**10**	**11**	**24**
		NB R																																	

Riverside

10865.03

Background Generated Trips

Based on ITE Trip Generation Manual, 10th Edition

Gold Meir - 160 Stanton Avenue

Land Use	Residential [a]	Retail [b]	Total
Size	69 units	3.5 ksf	
Weekday Daily			
Enter	187	66	253
Exit	187	66	253
Total	374	132	506
Weekday Morning			
Enter	6	2	8
Exit	18	1	19
Total	24	3	27
Weekday Evening			
Enter	19	6	25
Exit	12	7	19
Total	31	13	44
Saturday Daily			
Enter	313	81	394
Exit	313	81	394
Total	627	161	788
Saturday Midday			
Enter	17	8	26
Exit	18	8	26
Total	36	16	51

a - Based on ITE LUC 221 (Mid-Rise Residential) for 69 units

b - Based on ITE LUC 820 (Shopping Center) for 3.5 ksf

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevlopment - Background Project
160 Stanton Avenue

LANDUSE: Mid-Rise Residential
LANDUSE CODE: 221
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- Number of Units

69 units

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	27	0.77	5.44	1.27	12.50	205	21	494	50%	50%
AM PEAK OF GENERATOR	48	0.69	0.32	0.06	0.77	225	21	1,168	27%	73%
PM PEAK OF GENERATOR	47	0.66	0.41	0.09	1.26	211	21	1,168	60%	40%
AM PEAK (ADJACENT ST)	53	0.67	0.36	0.06	1.61	207	26	703	26%	74%
PM PEAK (ADJACENT ST)	60	0.72	0.44	0.15	1.11	208	26	703	61%	39%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	375	188	188	374	187	187
AM PEAK (ADJACENT ST)	25	6	18	24	6	18
PM PEAK (ADJACENT ST)	30	19	12	31	19	12

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	0.73	4.91	4.03	8.51	224	111	336	50%	50%
PEAK OF GENERATOR	8	0.89	0.44	0.34	0.73	264	111	462	49%	51%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	339	169	169	627	313	313
PEAK OF GENERATOR	30	15	15	36	17	18

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	--	4.09	3.06	8.41	224	111	336	50%	50%
PEAK OF GENERATOR	6	--	0.39	0.26	1.07	224	111	336	62%	38%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	282	141	141	N/A	N/A	N/A
PEAK OF GENERATOR	27	17	10	N/A	N/A	N/A

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevlopment - Background Project
160 Stanton Avenue

LANDUSE: Shopping Center
LANDUSE CODE: 820
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- 1,000 Sq. Feet Gross Floor Area

FLOOR AREA (KSF): 3.50

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Low	High	Independent Variable Range Average	Low	High	Directional Distribution Enter	Exit
DAILY	147	0.76	37.75	7.42	207.98	453	9	1,510	50%	50%
AM PEAK OF GENERATOR	47	0.71	3.00	0.70	23.74	323	8	1,320	54%	46%
PM PEAK OF GENERATOR	53	0.76	4.21	0.78	27.27	298	7	1,320	50%	50%
AM PEAK (ADJACENT ST)	84	0.90	0.94	0.18	23.74	351	9	1,510	62%	38%
PM PEAK (ADJACENT ST)	261	0.82	3.81	0.74	18.69	327	2	2,200	48%	52%

TRIPS:

	BY AVERAGE Total	Enter	Exit	BY REGRESSION Total	Enter	Exit
DAILY	132	66	66	615	308	308
AM PEAK (ADJACENT ST)	3	2	1	154	95	58
PM PEAK (ADJACENT ST)	13	6	7	45	22	24

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Low	High	Independent Variable Range Average	Low	High	Directional Distribution Enter	Exit
DAILY	58	0.71	46.12	13.07	167.89	602	56	1,510	50%	50%
PEAK OF GENERATOR	119	0.87	4.50	1.42	15.10	416	4	1,510	52%	48%

TRIPS:

	BY AVERAGE Total	Enter	Exit	BY REGRESSION Total	Enter	Exit
DAILY	161	81	81	1,115	558	558
PEAK OF GENERATOR	16	8	8	44	23	21

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Low	High	Independent Variable Range Average	Low	High	Directional Distribution Enter	Exit
DAILY	30	--	21.10	4.15	148.15	509	47	1,510	50%	50%
PEAK OF GENERATOR	24	--	2.79	0.39	12.40	382	47	1,268	49%	51%

TRIPS:

	BY AVERAGE Total	Enter	Exit	BY REGRESSION Total	Enter	Exit
DAILY	74	37	37	N/A	N/A	N/A
PEAK OF GENERATOR	10	5	5	N/A	N/A	N/A

Riverside
10865.03
Background Generated Trips
Based on ITE Trip Generation Manual, 10th Edition

143 Rumford Avenue

Land Use	Self-Storage [a]
Size	107.4 ksf
Weekday Daily	
Enter	81
Exit	81
Total	162
Weekday Morning	
Enter	6
Exit	4
Total	11
Weekday Evening	
Enter	9
Exit	10
Total	18
Saturday Daily	
Enter	105
Exit	105
Total	209
Saturday Midday	
Enter	20
Exit	14
Total	33

a - Based on ITE LUC 151 (Mini Warehouse) for 107.4 ksf

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevlopment - Background Project
143 Rumford Street

LANDUSE: Mini Warehouse
LANDUSE CODE: 151
LOCATION: General Urban / Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- 1,000 Sq. Feet Gross Floor Area

FLOOR AREA (KSF): 107.4

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	15	--	1.51	0.38	3.25	52	5	100	50%	50%
AM PEAK OF GENERATOR	10	--	0.20	0.07	0.79	62	5	100	50%	50%
PM PEAK OF GENERATOR	15	--	0.20	0.06	1.05	52	5	100	51%	49%
AM PEAK (ADJACENT ST)	11	--	0.10	0.04	0.17	65	25	100	60%	40%
PM PEAK (ADJACENT ST)	16	--	0.17	0.04	0.64	54	5	100	47%	53%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	162	81	81	N/A	N/A	N/A
AM PEAK (ADJACENT ST)	11	6	4	N/A	N/A	N/A
PM PEAK (ADJACENT ST)	18	9	10	N/A	N/A	N/A

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	5	--	1.95	1.21	3.29	34	20	60	50%	50%
PEAK OF GENERATOR	1	--	0.31	0.31	0.31	71	71	71	59%	41%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	209	105	105	N/A	N/A	N/A
PEAK OF GENERATOR	33	20	14	N/A	N/A	N/A

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	4	--	1.89	0.69	3.70	28	20	30	50%	50%
PEAK OF GENERATOR	1	--	0.16	0.16	0.16	71	71	71	45%	55%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	203	101	101	N/A	N/A	N/A
PEAK OF GENERATOR	17	8	9	N/A	N/A	N/A

Riverside

10865.03

Background Generated Trips

Based on ITE Trip Generation Manual, 10th Edition

429 Cherry Street

Land Use	Residential [a]	Office [b]	Total
Size	13	904 sf	
Weekday Daily			
Enter	35	4	39
Exit	35	4	39
Total	69	9	78
Weekday Morning			
Enter	1	1	2
Exit	3	0	4
Total	5	1	6
Weekday Evening			
Enter	4	0	4
Exit	2	1	3
Total	6	1	7
Saturday Daily			
Enter	32	1	33
Exit	32	1	33
Total	64	2	66
Saturday Midday			
Enter	6	0	6
Exit	6	0	6
Total	12	0	13

a - Based on ITE LUC 221 (Mid-Rise Residential) for 13 units

b - Based on ITE LUC 710 (Office) for 0.9 ksf

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevelopment - Background Projects
429 Cherry Street

LANDUSE: Mid-Rise Residential
LANDUSE CODE: 221
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- Number of Units

13 units

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	27	0.77	5.44	1.27	12.50	205	21	494	50%	50%
AM PEAK OF GENERATOR	48	0.69	0.32	0.06	0.77	225	21	1,168	27%	73%
PM PEAK OF GENERATOR	47	0.66	0.41	0.09	1.26	211	21	1,168	60%	40%
AM PEAK (ADJACENT ST)	53	0.67	0.36	0.06	1.61	207	26	703	26%	74%
PM PEAK (ADJACENT ST)	60	0.72	0.44	0.15	1.11	208	26	703	61%	39%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	71	35	35	69	35	35
AM PEAK (ADJACENT ST)	5	1	3	5	1	3
PM PEAK (ADJACENT ST)	6	3	2	6	4	2

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	0.73	4.91	4.03	8.51	224	111	336	50%	50%
PEAK OF GENERATOR	8	0.89	0.44	0.34	0.73	264	111	462	49%	51%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	64	32	32	457	228	228
PEAK OF GENERATOR	6	3	3	12	6	6

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	--	4.09	3.06	8.41	224	111	336	50%	50%
PEAK OF GENERATOR	6	--	0.39	0.26	1.07	224	111	336	62%	38%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	53	27	27	N/A	N/A	N/A
PEAK OF GENERATOR	5	3	2	N/A	N/A	N/A

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevelopment - Background Projects
429 Cherry Street

LANDUSE: General Office Building
LANDUSE CODE: 710
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- 1,000 Sq. Feet Gross Floor Area

FLOOR AREA (KSF): 0.9

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	66	0.83	9.74	2.71	27.56	171	6	1,300	50%	50%
AM PEAK OF GENERATOR	228	0.84	1.47	0.57	4.93	209	6	2,408	88%	12%
PM PEAK OF GENERATOR	243	0.82	1.42	0.49	6.20	205	6	2,408	18%	82%
AM PEAK (ADJACENT ST)	35	0.85	1.16	0.37	4.23	117	5	511	86%	14%
PM PEAK (ADJACENT ST)	32	0.88	1.15	0.47	3.23	114	6	511	16%	84%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	9	4	4	11	6	6
AM PEAK (ADJACENT ST)	1	1	0	27	24	4
PM PEAK (ADJACENT ST)	1	0	1	1	0	1

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	5	--	2.21	1.24	7.46	94	28	183	50%	50%
PEAK OF GENERATOR	3	--	0.53	0.30	1.57	82	28	183	54%	46%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	2	1	1	N/A	N/A	N/A
PEAK OF GENERATOR	0	0	0	N/A	N/A	N/A

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	5	--	0.70	0.19	3.05	94	28	183	50%	50%
PEAK OF GENERATOR	3	--	0.21	0.11	0.68	82	28	183	58%	42%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1	0	0	N/A	N/A	N/A
PEAK OF GENERATOR	0	0	0	N/A	N/A	N/A

Riverside

10865.03

Background Generated Trips

Based on ITE Trip Generation Manual, 10th Edition

1314 Washington Street

Land Use	Restaurant [a]	Office [b]	Total
Size	120 seats	13.2 ksf	
Weekday Daily			
Enter	262	75	337
Exit	262	75	337
Total	524	149	673
Weekday Morning			
Enter	30	33	63
Exit	28	5	33
Total	58	39	97
Weekday Evening			
Enter	29	3	31
Exit	22	14	36
Total	50	17	67
Saturday Daily			
Enter	336	15	351
Exit	336	15	351
Total	672	29	701
Saturday Midday			
Enter	34	4	37
Exit	30	3	33
Total	64	7	71

a - Based on ITE LUC 932 (High-Turnover Sit-Down Restaurant) for 120 seats.

b - Based on ITE LUC 710 (Office) for 13.2 ksf

*Project consists of a three-story addition to the existing two-story bank at 1314 Washington Street

*Proposed building will consist of a bank (2,456 sf), office space (13,219 sf), and a restaurant (120 seats, 4,000 sf)

*Proposed bank assumed to generate same rates as exisiting bank. No additional TG added for bank or removed for reduction in bank sf from existing to proposed.

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevelopment - Background Project
1314 Washington Street

LANDUSE: High-Turnover (Sit-Down) Restaurant
LANDUSE CODE: 932 Independent Variable --- Seats
SETTING/LOCATION: General Urban/Suburban
JOB NAME: **NUMBER OF SEATS:** 120

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	1	--	4.37	4.37	4.37	148	148	148	50%	50%
AM PEAK OF GENERATOR	7	--	0.59	0.18	1.70	167	65	250	60%	40%
PM PEAK OF GENERATOR	12	--	0.73	0.37	2.09	144	65	250	52%	48%
AM PEAK (ADJACENT ST)	9	--	0.48	0.30	0.76	155	110	195	52%	48%
PM PEAK (ADJACENT ST)	16	--	0.42	0.16	1.73	142	60	250	57%	43%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	524	262	262	N/A	N/A	N/A
AM PEAK (ADJACENT ST)	58	30	28	N/A	N/A	N/A
PM PEAK (ADJACENT ST)	50	29	22	N/A	N/A	N/A

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	1	--	5.60	5.60	5.60	148	148	148	50%	50%
PEAK OF GENERATOR	8	--	0.53	0.16	1.88	112	60	150	53%	47%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	672	336	336	N/A	N/A	N/A
PEAK OF GENERATOR	64	34	30	N/A	N/A	N/A

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	1	--	3.87	3.87	3.87	148	148	148	50%	50%
PEAK OF GENERATOR	2	--	0.63	0.32	1.08	124	100	150	55%	45%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	464	232	232	N/A	N/A	N/A
PEAK OF GENERATOR	76	42	34	N/A	N/A	N/A

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevelopment - Background Project
1314 Washington Street

LANDUSE: General Office Building
LANDUSE CODE: 710
SETTING/LOCATION: General Urban/Suburban
JOB NAME:

Independent Variable --- 1,000 Sq. Feet Gross Floor Area

FLOOR AREA (KSF): 13.2

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Low	High	Independent Variable Range Average	Low	High	Directional Distribution Enter	Exit
DAILY	66	0.83	9.74	2.71	27.56	171	6	1,300	50%	50%
AM PEAK OF GENERATOR	228	0.84	1.47	0.57	4.93	209	6	2,408	88%	12%
PM PEAK OF GENERATOR	243	0.82	1.42	0.49	6.20	205	6	2,408	18%	82%
AM PEAK (ADJACENT ST)	35	0.85	1.16	0.37	4.23	117	5	511	86%	14%
PM PEAK (ADJACENT ST)	32	0.88	1.15	0.47	3.23	114	6	511	16%	84%

TRIPS:

	BY AVERAGE Total	Enter	Exit	BY REGRESSION Total	Enter	Exit
DAILY	129	64	64	149	75	75
AM PEAK (ADJACENT ST)	15	13	2	39	33	5
PM PEAK (ADJACENT ST)	15	2	13	17	3	14

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Low	High	Independent Variable Range Average	Low	High	Directional Distribution Enter	Exit
DAILY	5	--	2.21	1.24	7.46	94	28	183	50%	50%
PEAK OF GENERATOR	3	--	0.53	0.30	1.57	82	28	183	54%	46%

TRIPS:

	BY AVERAGE Total	Enter	Exit	BY REGRESSION Total	Enter	Exit
DAILY	29	15	15	N/A	N/A	N/A
PEAK OF GENERATOR	7	4	3	N/A	N/A	N/A

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends Average	Low	High	Independent Variable Range Average	Low	High	Directional Distribution Enter	Exit
DAILY	5	--	0.70	0.19	3.05	94	28	183	50%	50%
PEAK OF GENERATOR	3	--	0.21	0.11	0.68	82	28	183	58%	42%

TRIPS:

	BY AVERAGE Total	Enter	Exit	BY REGRESSION Total	Enter	Exit
DAILY	9	5	5	N/A	N/A	N/A
PEAK OF GENERATOR	3	2	1	N/A	N/A	N/A

Riverside
10865.03
Background Generated Trips
Based on ITE Trip Generation Manual, 10th Edition

131 Rumford Avenue

Land Use	Marijuana Dispensary [a]
Size	5.5 ksf [b]
Weekday Daily	
Enter	695
Exit	695
Total	1,390
Weekday Morning	
Enter	32
Exit	25
Total	57
Weekday Evening	
Enter	60
Exit	60
Total	120
Saturday Daily	
Enter	713
Exit	713
Total	1,426
Saturday Midday	
Enter	100
Exit	100
Total	200

Note: special permit not filed as of January 2021, ITE rates used instead to be conservative

a - Based on ITE LUC 882 (Marijuana DIspensary) for 5.5 ksf

b - Square footage based on allowable proposed retail building size for the site

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevlopment - Background Project
131 Rumford Street

LANDUSE: Marijuana Dispensary
LANDUSE CODE: 882
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- 1,000 Sq. Feet Gross Floor Area

FLOOR AREA (KSF): 5.5

WEEKDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	4	--	252.70	79.74	791.22	2	0	4	50%	50%
AM PEAK (ADJACENT ST)	4	--	10.44	1.17	31.08	2	0	4	56%	44%
PM PEAK (ADJACENT ST)	12	--	21.83	2.94	98.65	2	0	4	50%	50%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,390	695	695	N/A	N/A	N/A
AM PEAK (ADJACENT ST)	57	32	25	N/A	N/A	N/A
PM PEAK (ADJACENT ST)	120	60	60	N/A	N/A	N/A

SATURDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
b - Square footage DAILY	4	--	259.31	75.34	852.03	2	0	4	50%	50%
PEAK OF GENERATOR	4	--	36.43	10.85	118.92	2	0	4	50%	50%

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	1,426	713	713	N/A	N/A	N/A
PEAK OF GENERATOR	200	100	100	N/A	N/A	N/A

SUNDAY

RATES:	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	--	--	--	--	--	--	--	--	--	--
PEAK OF GENERATOR	--	--	--	--	--	--	--	--	--	--

TRIPS:	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	N/A	N/A	N/A	N/A	N/A	N/A
PEAK OF GENERATOR	N/A	N/A	N/A	N/A	N/A	N/A

Riverside
10865.03
Background Generated Trips
Based on ITE Trip Generation Manual, 10th Edition

15-21 Lexington Street

Land Use	Residential [a]
Size	24 units
Weekday Daily	
Enter	65
Exit	65
Total	129
Weekday Morning	
Enter	2
Exit	6
Total	8
Weekday Evening	
Enter	7
Exit	4
Total	11
Saturday Daily	
Enter	245
Exit	245
Total	490
Saturday Midday	
Enter	8
Exit	9
Total	17

a - Based on ITE LUC 221 (Mid-Rise Residential) for 24 units

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevlopment - Background Project
15-21 Lexington Street

LANDUSE: Mid-Rise Residential
LANDUSE CODE: 221
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- Number of Units

24 units

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	27	0.77	5.44	1.27	12.50	205	21	494	50%	50%
AM PEAK OF GENERATOR	48	0.69	0.32	0.06	0.77	225	21	1,168	27%	73%
PM PEAK OF GENERATOR	47	0.66	0.41	0.09	1.26	211	21	1,168	60%	40%
AM PEAK (ADJACENT ST)	53	0.67	0.36	0.06	1.61	207	26	703	26%	74%
PM PEAK (ADJACENT ST)	60	0.72	0.44	0.15	1.11	208	26	703	61%	39%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	131	65	65	129	65	65
AM PEAK (ADJACENT ST)	9	2	6	8	2	6
PM PEAK (ADJACENT ST)	11	6	4	11	7	4

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	0.73	4.91	4.03	8.51	224	111	336	50%	50%
PEAK OF GENERATOR	8	0.89	0.44	0.34	0.73	264	111	462	49%	51%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	118	59	59	490	245	245
PEAK OF GENERATOR	11	5	5	17	8	9

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	--	4.09	3.06	8.41	224	111	336	50%	50%
PEAK OF GENERATOR	6	--	0.39	0.26	1.07	224	111	336	62%	38%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	98	49	49	N/A	N/A	N/A
PEAK OF GENERATOR	9	6	4	N/A	N/A	N/A

Riverside
10865.03
Background Generated Trips
Based on ITE Trip Generation Manual, 10th Edition

20 Kinmonth Road

Land Use	Residential [a]
Size	24 units
Weekday Daily	
Enter	65
Exit	65
Total	129
Weekday Morning	
Enter	2
Exit	6
Total	8
Weekday Evening	
Enter	7
Exit	4
Total	11
Saturday Daily	
Enter	245
Exit	245
Total	490
Saturday Midday	
Enter	8
Exit	9
Total	17

a - Based on ITE LUC 221 (Mid-Rise Residential) for 24 units

ITE TRIP GENERATION WORKSHEET
(10th Edition, Updated 2017)

Riverside Redevlopment - Background Project
20 Kinmonth Road

LANDUSE: Mid-Rise Residential
LANDUSE CODE: 221
SETTING/LOCATION: General Urban/Suburban
JOB NAME:
JOB NUMBER:

Independent Variable --- Number of Units

24 units

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	27	0.77	5.44	1.27	12.50	205	21	494	50%	50%
AM PEAK OF GENERATOR	48	0.69	0.32	0.06	0.77	225	21	1,168	27%	73%
PM PEAK OF GENERATOR	47	0.66	0.41	0.09	1.26	211	21	1,168	60%	40%
AM PEAK (ADJACENT ST)	53	0.67	0.36	0.06	1.61	207	26	703	26%	74%
PM PEAK (ADJACENT ST)	60	0.72	0.44	0.15	1.11	208	26	703	61%	39%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	131	65	65	129	65	65
AM PEAK (ADJACENT ST)	9	2	6	8	2	6
PM PEAK (ADJACENT ST)	11	6	4	11	7	4

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	0.73	4.91	4.03	8.51	224	111	336	50%	50%
PEAK OF GENERATOR	8	0.89	0.44	0.34	0.73	264	111	462	49%	51%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	118	59	59	490	245	245
PEAK OF GENERATOR	11	5	5	17	8	9

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	6	--	4.09	3.06	8.41	224	111	336	50%	50%
PEAK OF GENERATOR	6	--	0.39	0.26	1.07	224	111	336	62%	38%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	98	49	49	N/A	N/A	N/A
PEAK OF GENERATOR	9	6	4	N/A	N/A	N/A

Riverside Redevelopment
Background Project Calculations
1089 Washington Street

Pages from 1089 Washington Street TIAS

SITE GENERATED TRAFFIC VOLUMES			
	ENTER	EXIT	TOTAL
MORNING	29	23	52
AFTERNOON	54	55	109
SATURDAY	91	91	182

Assume of trips to/from the west:
- 20% to/from south via local streets
- 20% to/from north via local streets
- 20% to/from I-90 via W Newton exit
- 20% to/from Wellesley via Route 16
- 20% to/from Weston via Auburn Street and Comm Ave

20% of trips to/from west:
Enter (eastbound) = 3 (5) [8]
Exit (westbound) = 2 (5) [8]

XXX(XXX)[XXX] = WEEKDAY MORNING PEAK HOUR (WEEKDAY PM PEAK HOUR) [SATURDAY PEAK HOUR]
8:00 AM - 9:00 AM (5:30 PM - 6:30 PM) [12:00 PM - 1:00 PM]

FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

FIGURE 2: TRIP GENERATION
PROJ. NO: 20190241.A20
1089 WASHINGTON STREET
NEWTON, MA
AUGUST 1, 2019

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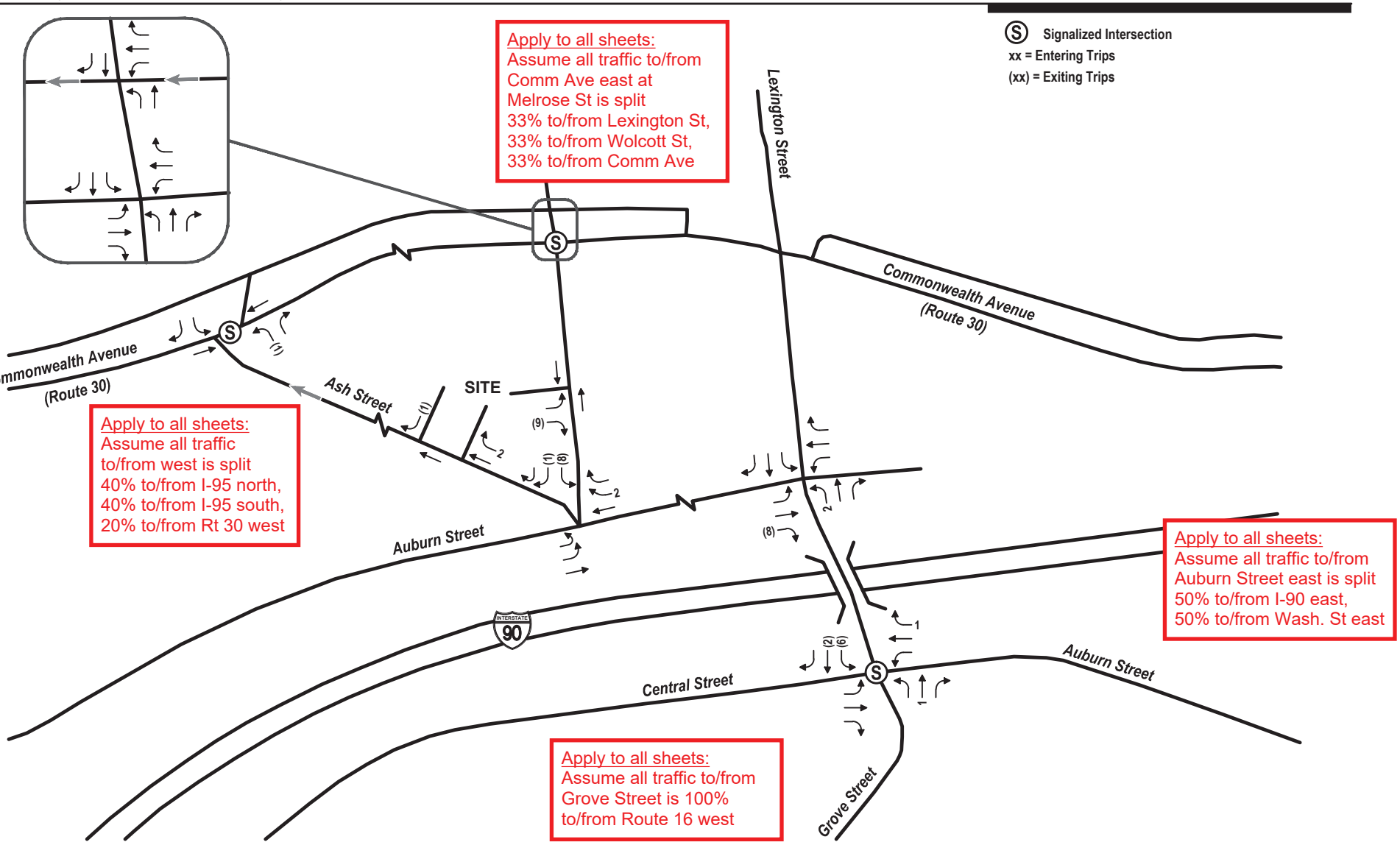

Vanasse Hangen Brustlin, Inc.

Not to Scale

Riverside Redevelopment
Background Project Calculations
283 Melrose Street

Pages from 283 Melrose Street TIAS Appendix
(filed by VHB in January 2015)

Residential Site Generated Trips
Weekday Morning Peak Hour
Turtle Lane
Newton, Massachusetts

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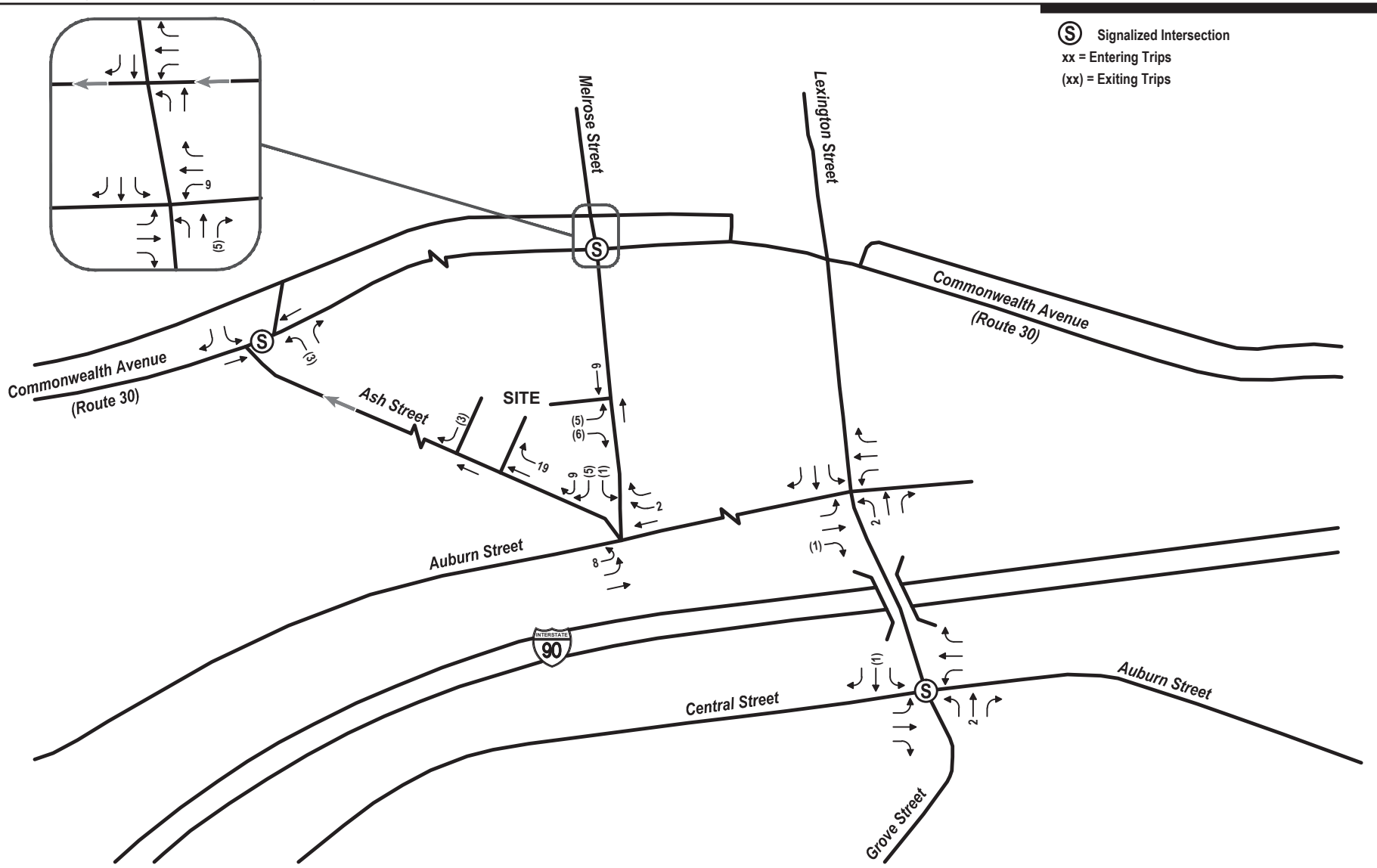


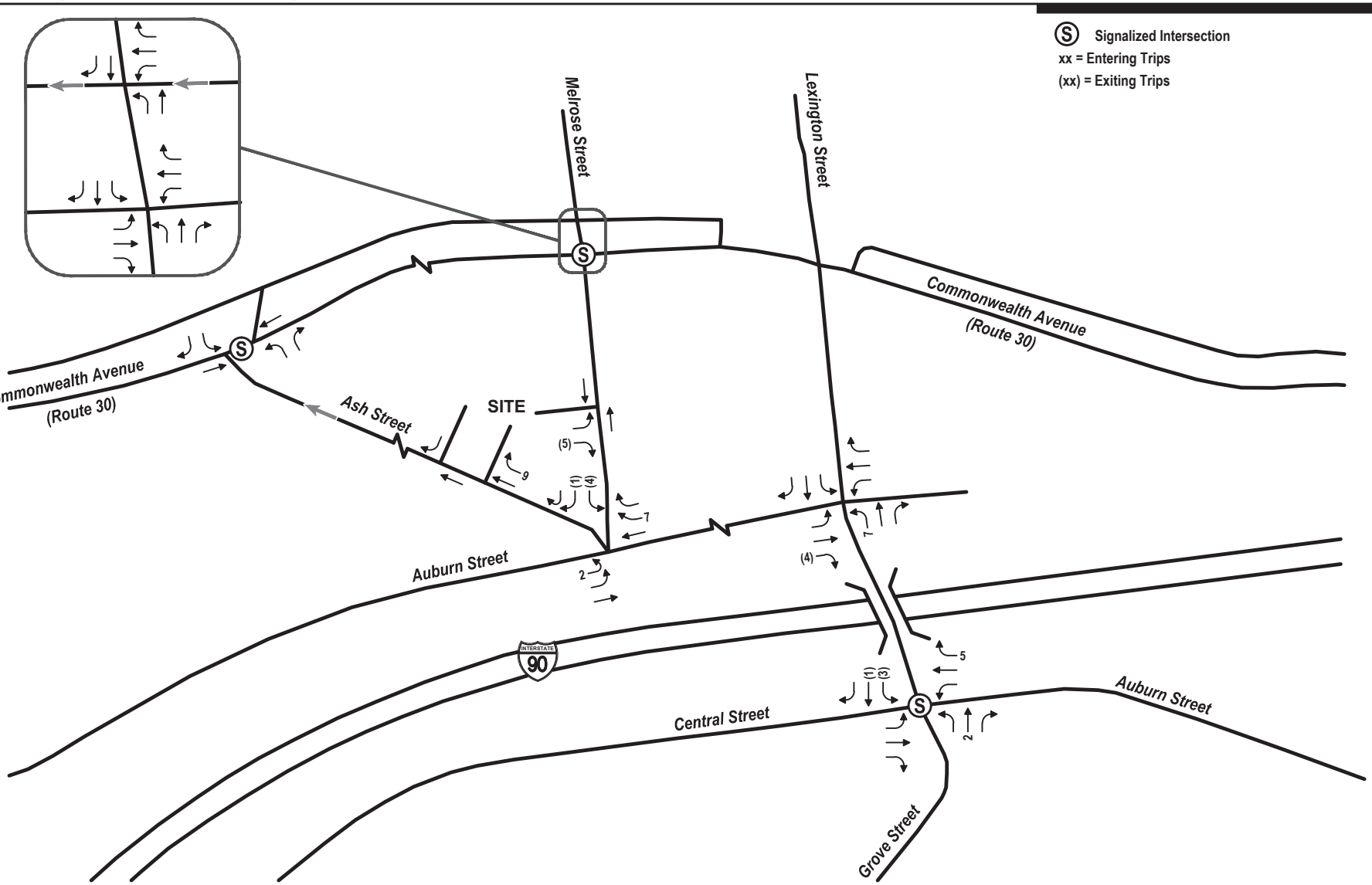
Vanasse Hangen Brustlin, Inc.

Not to Scale

Riverside Redevelopment
Background Project Calculations
283 Melrose Street

Pages from 283 Melrose Street TIAS Appendix
(filed by VHB in January 2015)

Restaurant/Theater/Office Site Generated Trips
Weekday Morning Peak Hour
Turtle Lane
Newton, Massachusetts



Vanasse Hangen Brustlin, Inc.

Not to Scale

Riverside Redevelopment
Background Project Calculations
283 Melrose Street

Pages from 283 Melrose Street TIAS Appendix
(filed by VHB in January 2015)

Residential Site Generated Trips
Weekday Evening Peak Hour
Turtle Lane
Newton, Massachusetts

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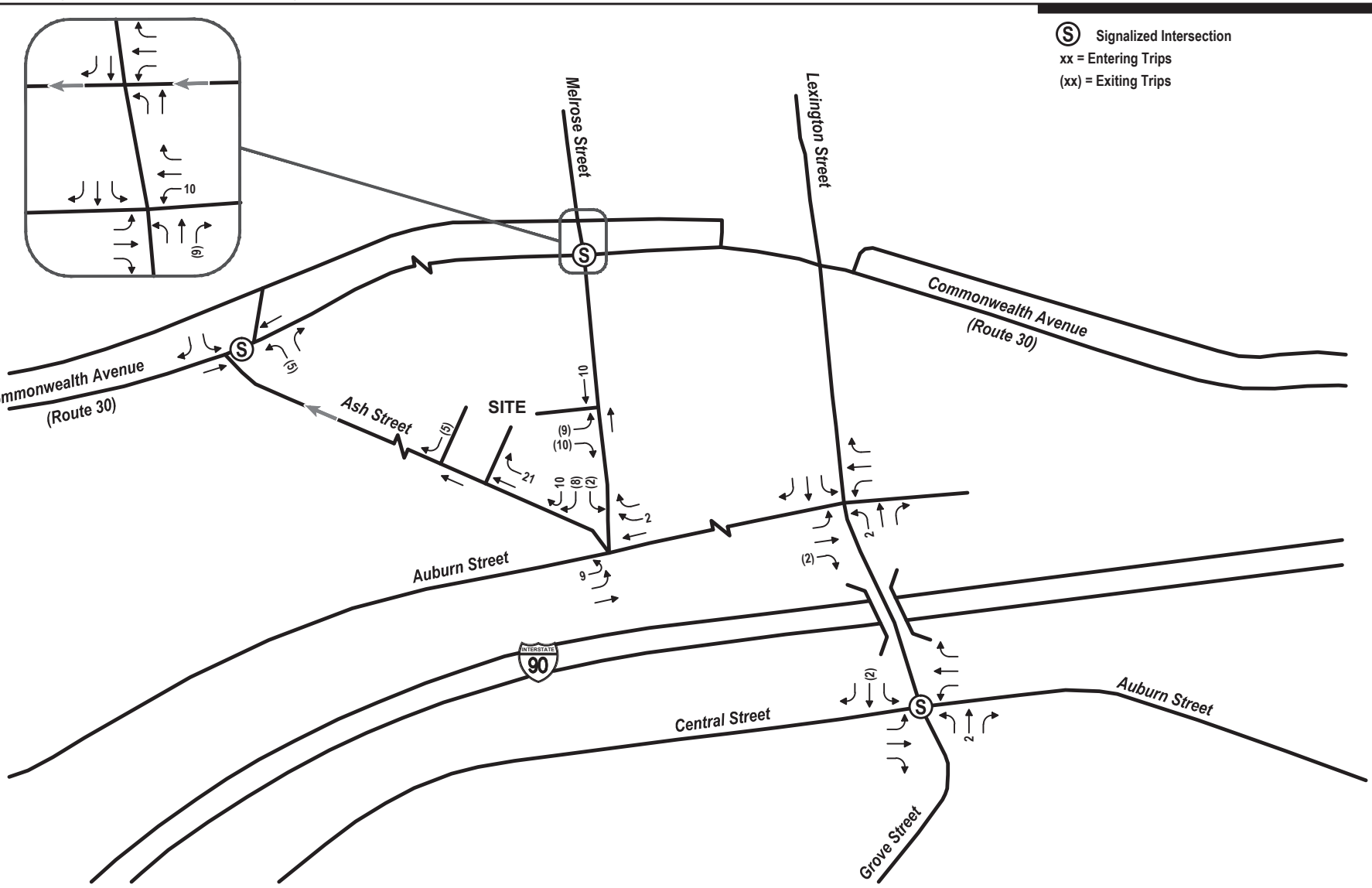

Vanasse Hangen Brustlin, Inc.

Not to Scale

Riverside Redevelopment
Background Project Calculations
283 Melrose Street

Pages from 283 Melrose Street TIAS Appendix
(filed by VHB in January 2015)

Restaurant/Theater/Office Site Generated Trips
Weekday Evening Peak Hour
Turtle Lane
Newton, Massachusetts

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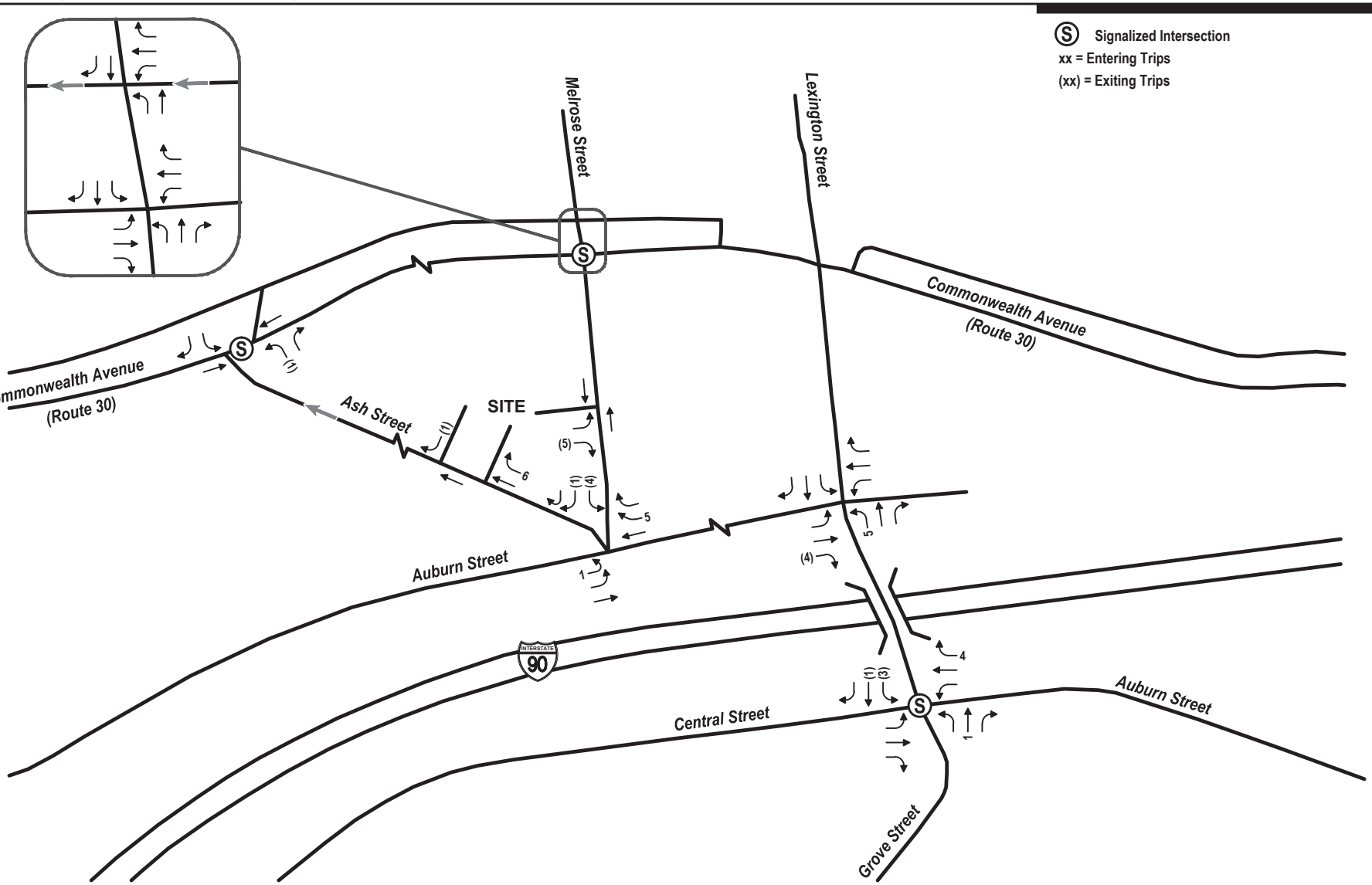

Vanasse Hangen Brustlin, Inc.

Not to Scale

Riverside Redevelopment
Background Project Calculations
283 Melrose Street

Pages from 283 Melrose Street TIAS Appendix
(filed by VHB in January 2015)

Residential Site Generated Trips
Saturday Midday Peak Hour
Turtle Lane
Newton, Massachusetts

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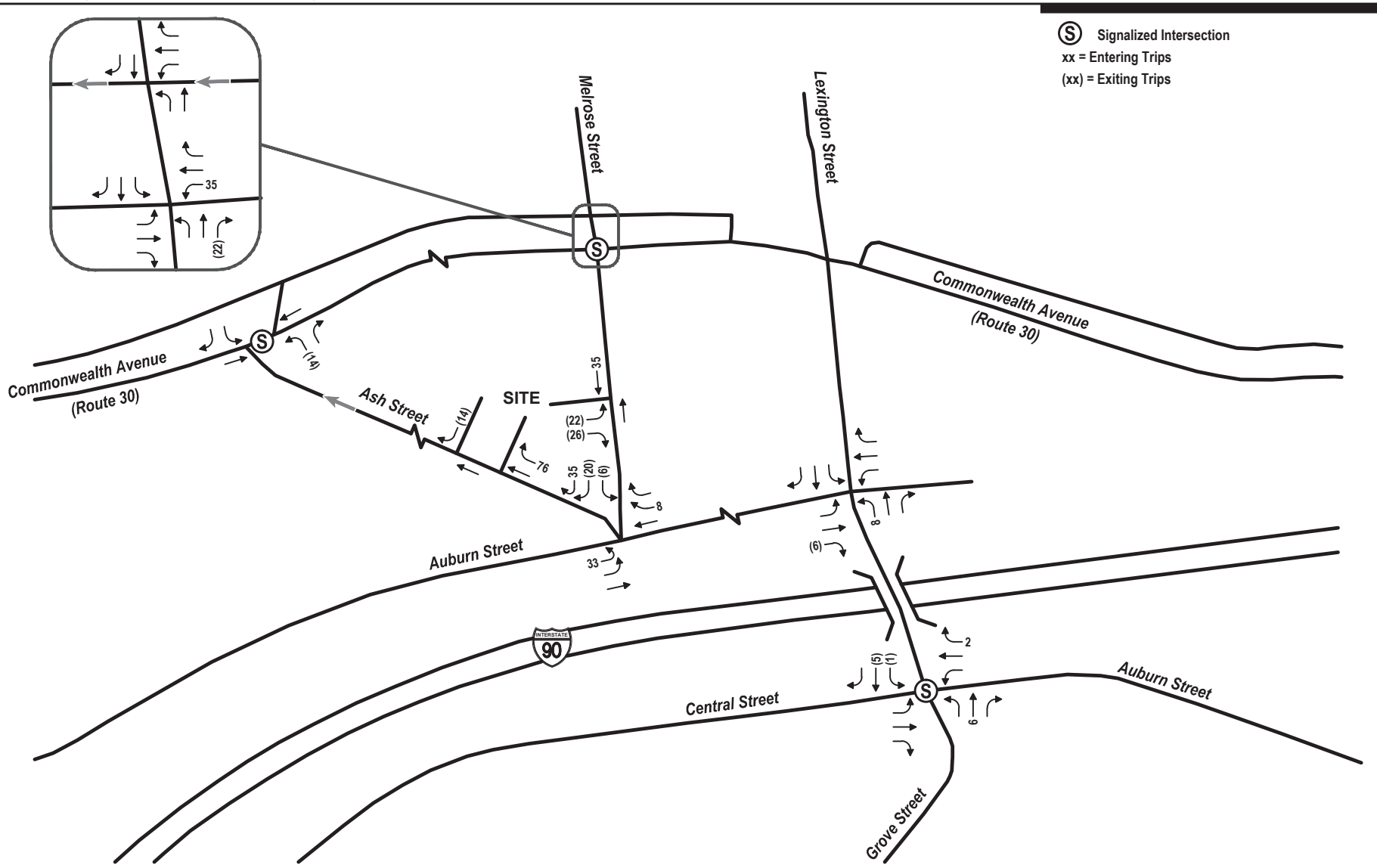

Vanasse Hangen Brustlin, Inc.

Not to Scale

Riverside Redevelopment
Background Project Calculations
283 Melrose Street

Pages from 283 Melrose Street TIAS Appendix
(filed by VHB in January 2015)

Restaurant/Theater/Office Site Generated Trips
Saturday Midday Peak Hour
Turtle Lane
Newton, Massachusetts

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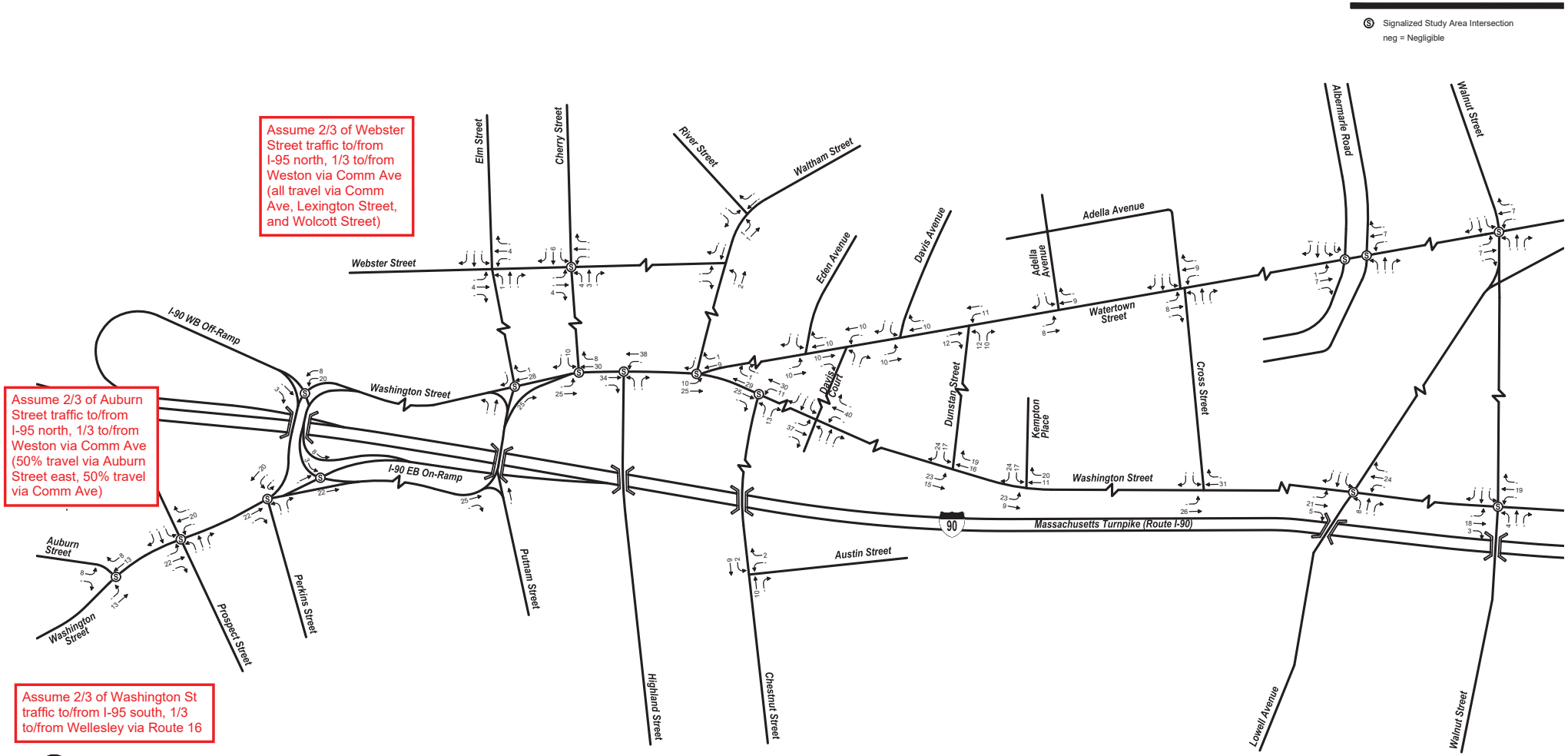

Riverside Redevelopment
Background Project Calculations
Dunstan East

Pages from Dunstan East TIAS Appendix
(filed by VHB in November 2019)

vhb

Site-Generated Trips
Weekday Morning Peak Hour Traffic Volumes

West Newton Redevelopment
Newton, Massachusetts

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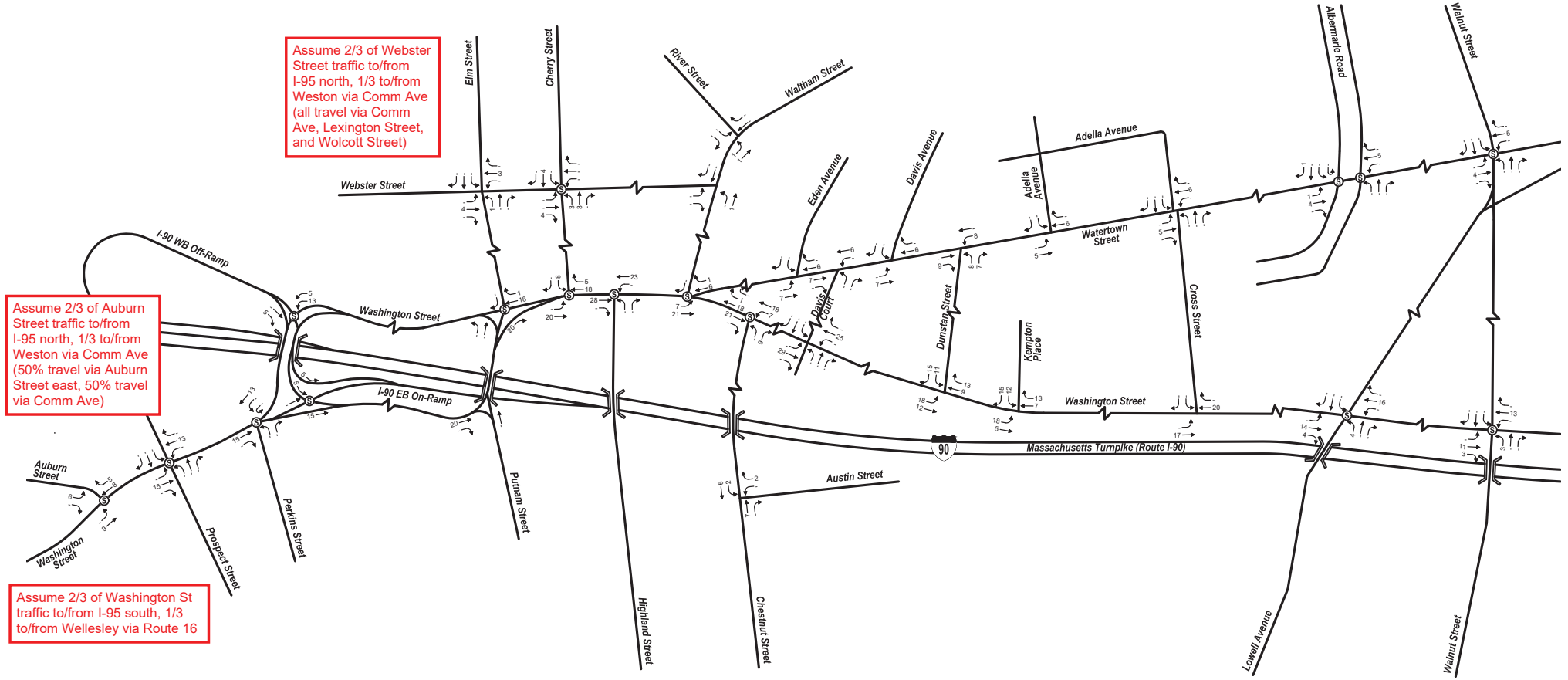
Signalized Study Area Intersection
neg = Negligible



Not to Scale

Riverside Redevelopment
Background Project Calculations
Dunstan East

Pages from Dunstan East TIAS Appendix
(filed by VHB in November 2019)

vhb

Site-Generated Trips
Weekday Evening Peak Hour Traffic Volumes

West Newton Redevelopment
Newton, Massachusetts

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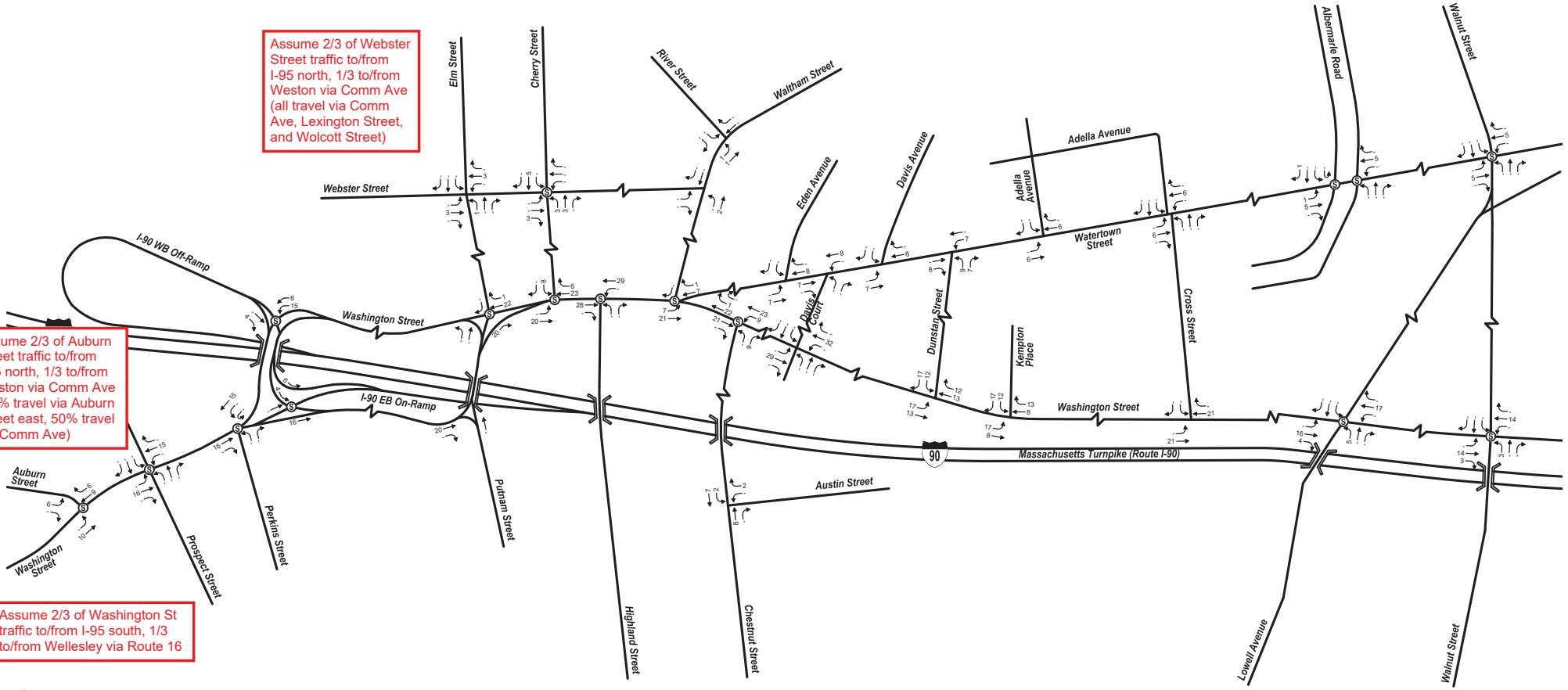
Signalized Study Area Intersection
neg = Negligible



Not to Scale

Riverside Redevelopment
Background Project Calculations
Dunstan East

Pages from Dunstan East TIAS Appendix
(filed by VHB in November 2019)

Site-Generated Trips
Saturday Midday Peak Hour Traffic Volumes

West Newton Redevelopment
Newton, Massachusetts

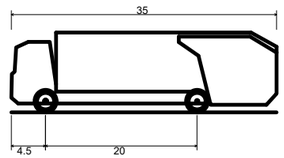
TRIP GENERATION SUMMARY - MAY 2021 RESPONSE TO COMMENTS

Revised Mode Splits

	Full Build																				Net New				
	Residential [1]						Research and Development [2]						Retail [3]												
	Gross Trips	Gross Person Trips [4]	Internal Capture [5]	Net Person Trips	Vehicle Trips [6]	Transit Trips [7]	Gross Trips	Gross Person Trips [4]	Internal Capture [5]	Net Person Trips	Vehicle Trips [6]	Transit Trips [7]	Gross Trips	Gross Person Trips [4]	Internal Capture [5]	Net Person Trips	Vehicle Trips [6]	Pass-By Trips [8]	Net Vehicle Trips	Transit Trips [7]	Total Net Vehicle Trips	EX Hotel Vehicle Trips [9]	**New New Vehicle Trips**	Pass-By	Transit Trips
					65%	35%					85%	15%					100%			0%					
Weekday Daily																		25%							
Enter	1,498	1,767	264	1,503	857	526	1,961	2,314	59	2,255	1,711	338	1,088	1,981	257	1,724	947	235	712	-	3,280	443	**2,837**	**235**	**864**
Exit	1,498	1,767	178	1,589	906	556	1,961	2,314	125	2,189	1,661	328	1,088	1,981	277	1,704	936	235	701	-	3,268	491	**2,777**	**235**	**884**
Total	2,996	3,534	442	3,092	1,763	1,082	3,922	4,628	184	4,444	3,372	666	2,176	3,962	534	3,428	1,883	470	1,413	-	6,548	934	**5,614**	**470**	**1,748**
Weekday Morning Peak Hour																		25%							
Enter	47	56	1	55	31	19	114	135	8	127	96	19	101	184	15	169	93	19	74	-	201	45	**156**	**19**	**38**
Exit	135	159	5	154	88	54	38	45	13	32	24	5	62	113	6	107	59	19	40	-	152	45	**107**	**19**	**59**
Total	182	215	6	209	119	73	153	180	21	159	120	24	163	297	21	276	152	38	114	-	353	90	**263**	**38**	**97**
Weekday Evening Peak Hour																		34%							
Enter	139	164	48	116	66	41	27	32	7	25	19	4	86	157	29	128	70	23	47	-	132	50	**82**	**23**	**45**
Exit	89	105	20	85	48	30	151	179	17	162	123	24	94	170	47	123	68	23	45	-	216	35	**181**	**23**	**54**
Total	228	269	68	201	114	71	178	211	24	187	142	28	180	327	76	251	138	46	92	-	348	85	**263**	**46**	**99**
Saturday Daily																		25%							
Enter	1,045	1,233	360	873	498	306	283	334	50	284	216	43	1,765	3,211	362	2,849	1,565	389	1,176	-	1,890	381	**1,509**	**389**	**349**
Exit	1,045	1,233	289	944	538	330	283	334	80	254	193	38	1,765	3,211	403	2,808	1,543	389	1,154	-	1,885	356	**1,529**	**389**	**368**
Total	2,089	2,466	649	1,817	1,036	636	566	668	130	538	409	81	3,529	6,422	765	5,657	3,108	778	2,330	-	3,775	737	**3,038**	**778**	**717**
Saturday Midday Peak Hour																		26%							
Enter	116	137	44	93	53	33	44	51	9	42	32	6	99	180	28	152	84	20	64	-	149	30	**119**	**20**	**39**
Exit	121	143	24	119	68	42	44	51	11	40	30	6	91	166	46	120	66	20	46	-	144	25	**119**	**20**	**48**
Total	238	280	68	212	121	75	87	102	20	82	62	12	190	346	74	272	150	40	110	-	293	55	**238**	**40**	**87**

1 Trip generation estimate based on ITE LUC 221 (Mid-Rise Residential), using regression equations for 550 units.
2 Trip generation estimate based on ITE LUC 760 (Research and Development Center), using regression equations for daily and average rates for peak hours for 363,401 sf.
3 Trip generation estimate based on ITE LUC 820 (Shopping Center), using regression equations for 22,442 sf.
4 Gross Person Trips developed based on national VOR data from the 2017 National Household Travel Survey (USDOT FHWA) (1.18 for residents and workers, 1.82 for retail).
5 Internal capture rates based on NCHRP Report 684, Saturday midday rates assumed to be the same was weekday evening rates.
6 Converted back into vehicle trips based on the most recent local VOR data from the City of Newton Census data (1.12 for residents, 1.14 for workers, and 1.82 for retail) and mode shares from the most recent census data.
7 Vehicle and Transit mode shares based on "realistic" transit shares used in the December 2019 TIAS of 15% transit share for office/R&D uses and 35% transit share for residential uses.
8 Pass-by Credit applied based on ITE Trip Generation Handbook data for LUC 820 (34% for weekday evening peak hour, 26% for Saturday midday peak hour, and 25% for all other time periods).
9 Existing hotel trips subtracted out based on peak hour data from Empirical counts. Daily projected data used to subtract out existing hotel trips to provide a conservative analysis.

\\vhb\gbl\proj\Wat-TS\10865.03 Mark Inv Riverside Newto\cad\ld\Eng\Autoturn\BLGD 9-10 Garage (Go bus, Newton Fire, Passenger)\Building 9-10 Garbage Truck Turns.dwg



Rear-Load Garbage Truck	
Overall Length	35.000ft
Overall Width	8.375ft
Overall Body Height	10.546ft
Min Body Ground Clearance	1.000ft
Track Width	8.375ft
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	29.300ft

MBTA GARAGE

99 SPACES

MISC. ROOMS

ELEC. ROOM

COM. ROOM

BUILDING 10
TRASH ROOM

Main Trash Room

Garage Stair

Fresh

Elevator

Stair

Unit B1

Unit S1

Unit B1

Unit B2

AMENITY SPACE BLDG 10

AMENITY SPACE UPPER

BUILDING 9
TRASH ROOM

Elevator Lobby

BUILDING 9
RETAIL

Trash/Utility

MBTA Bike Storage

GO BUS Station

BUILDI
RETAIL/ RES

DROP OFF

SHUTTLE

BUS STOP

DROP OFF

BUS STOP

Main Street

LOADING

BUILDING 6

EN

LD

STOP

Truck Turning Movement

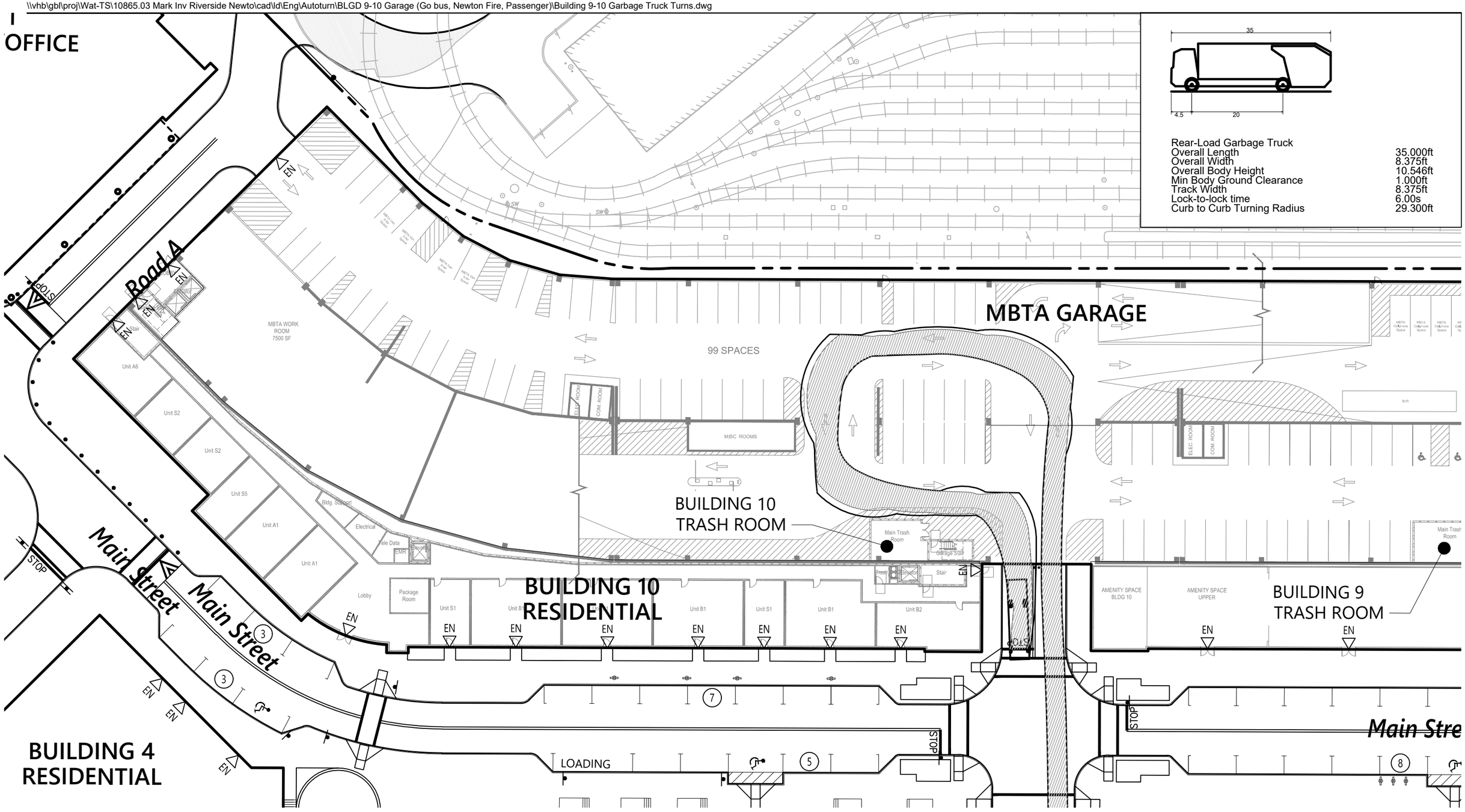
0 20 40 80 Feet

Figure 1

Building 9 Trash Pickup
Truck Turning Movement

Riverside Station Redevelopment
Newton, Massachusetts

\\vhb\gbl\proj\Wat-TS\10865.03 Mark Inv Riverside Newto\cad\ld\Eng\Autoturn\BLGD 9-10 Garage (Go bus, Newton Fire, Passenger)\Building 9-10 Garbage Truck Turns.dwg



Rear-Load Garbage Truck	
Overall Length	35.000ft
Overall Width	8.375ft
Overall Body Height	10.546ft
Min Body Ground Clearance	1.000ft
Track Width	8.375ft
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	29.300ft

Truck Turning Movement

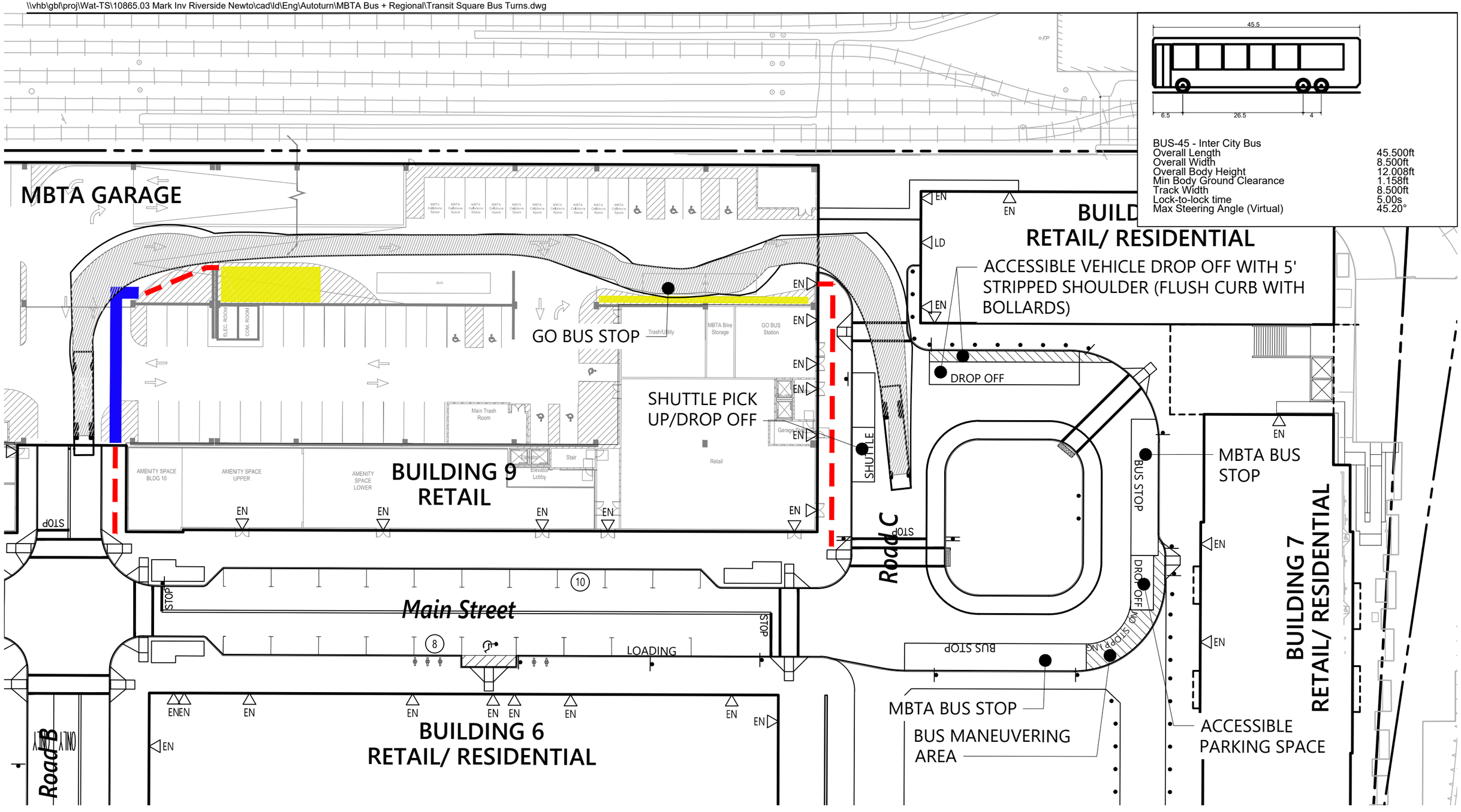
0 20 40 80 Feet

Figure 2

Building 10 Trash Pickup
Truck Turning Movement

Riverside Station Redevelopment
Newton, Massachusetts

\\vhb\gbl\proj\Wat-TS\10865.03 Mark Inv Riverside Newto\cad\ld\Eng\Autoturn\MBTA Bus + Regional\Transit Square Bus Turns.dwg



Proposed Accessible Sidewalk

Proposed Accessible Crosswalk

Proposed Passenger Zone

Truck Turning Movement

NO STOPPING MBTA Bus Maneuvering Area

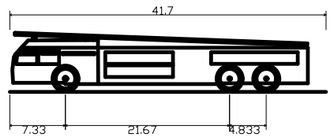
Accessible Vehicle Drop Off Shoulder

0 20 40 80 Feet

Figure 3

Go Bus Exit onto Road C
Truck Turning Movement

Riverside Station Redevelopment
Newton, Massachusetts



Newton Fire	
Overall Length	41.700ft
Overall Width	9.810ft
Overall Body Height	7.788ft
Min Body Ground Clearance	1.038ft
Track Width	9.810ft
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	37.000ft

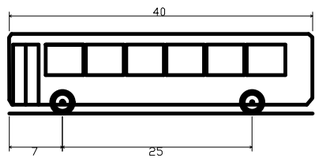
0 30 60 120 Feet

vhb

Newton Fire
Building 9 & 10 Garage
Riverside
Newton, MA

Figure 1

12/11/2020



CITY-BUS - City Transit Bus

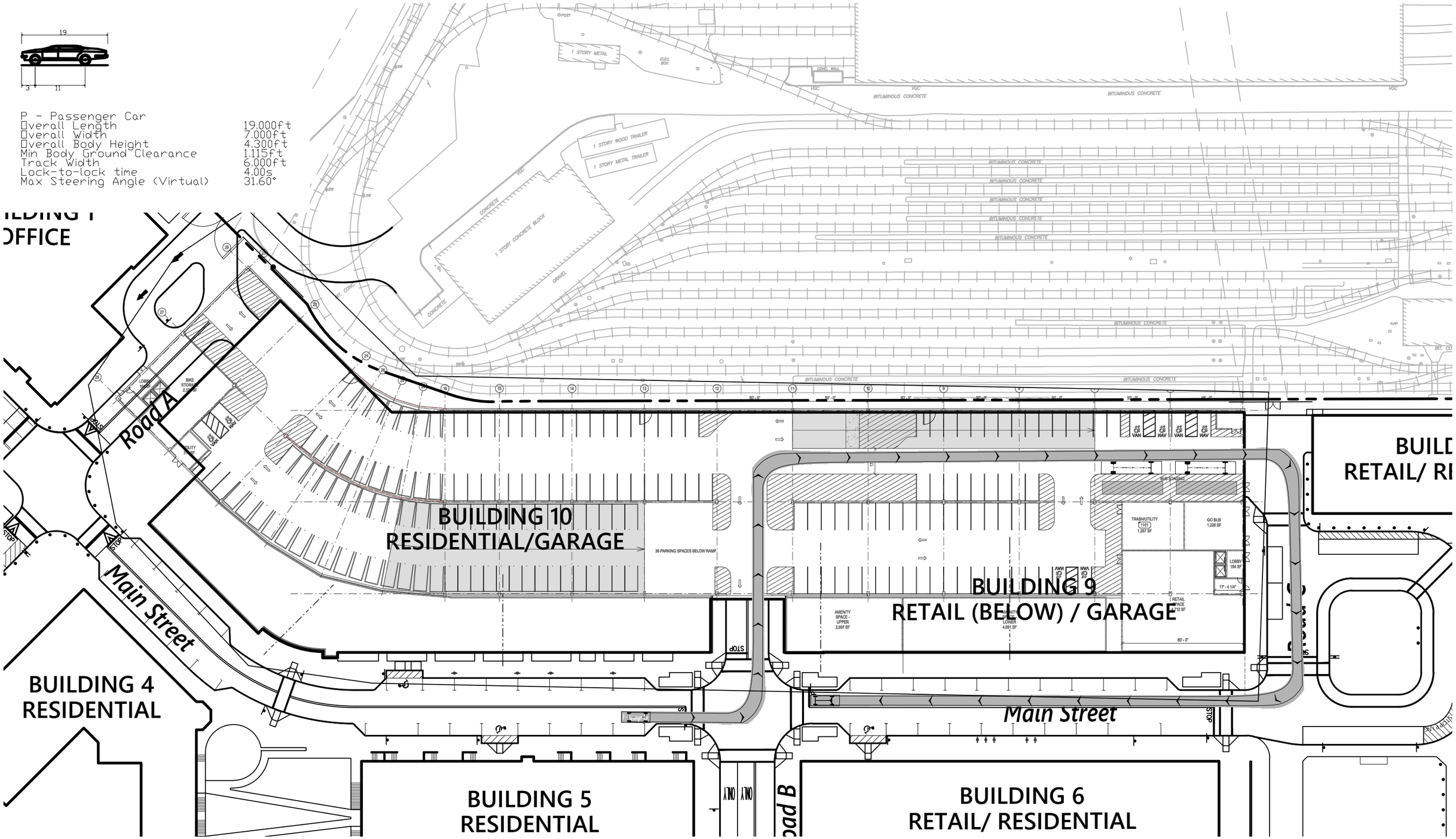
Overall Length	40.000ft
Overall Width	8.500ft
Overall Body Height	10.500ft
Min Body Ground Clearance	1.158ft
Track Width	8.500ft
Lock-to-lock time	5.00s
Max Steering Angle (Virtual)	41.40°

0 30 60 120 Feet

Go Bus
Building 9 & 10 Garage
Riverside
Newton, MA

Figure 2

12/11/2020



Passenger Car
Building 9 & 10 Garage
Riverside
Newton, MA

Figure 3

12/11/2020