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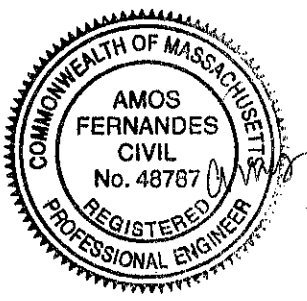
MEMORANDUM

DCI JOB NO. 2014-058

TO: Terence Smith, Traffic & Parking
City of Somerville, MA

FROM: Amos Fernandes, P.E., PTOE, AICP
Transportation Manager



SUBJECT: Trip Generation Study
163 Glen Street, Somerville, MA

DATE: June 11, 2014

The purpose of this memorandum is to examine the trip generation impacts from the proposed adaptive reuse that will convert the former East Somerville America Legion Post into eleven (11) residential condominiums in Somerville, Massachusetts.

The site is the former East Somerville America Legion Post on land zoned both Residence RB and Residence RC. The existing 1 story building structure is on a 16,930 square feet lot and there is a shed on the northern end of the site. The site currently has fifteen (15) parking spaces, including one (1) handicap space. These parking spaces are accessible from a curb cut on Tufts Street, approximately 160 feet from Glen Street. Additionally, there is a loading space off Glen Street on the northeast side of the building.

The proposed project will add eleven (11) condominium residential units and also provide sixteen (16) parking spaces, including one (1) handicap space. Two (2) bike racks are proposed on site and satisfies Article 9 of the Zoning Ordinance.

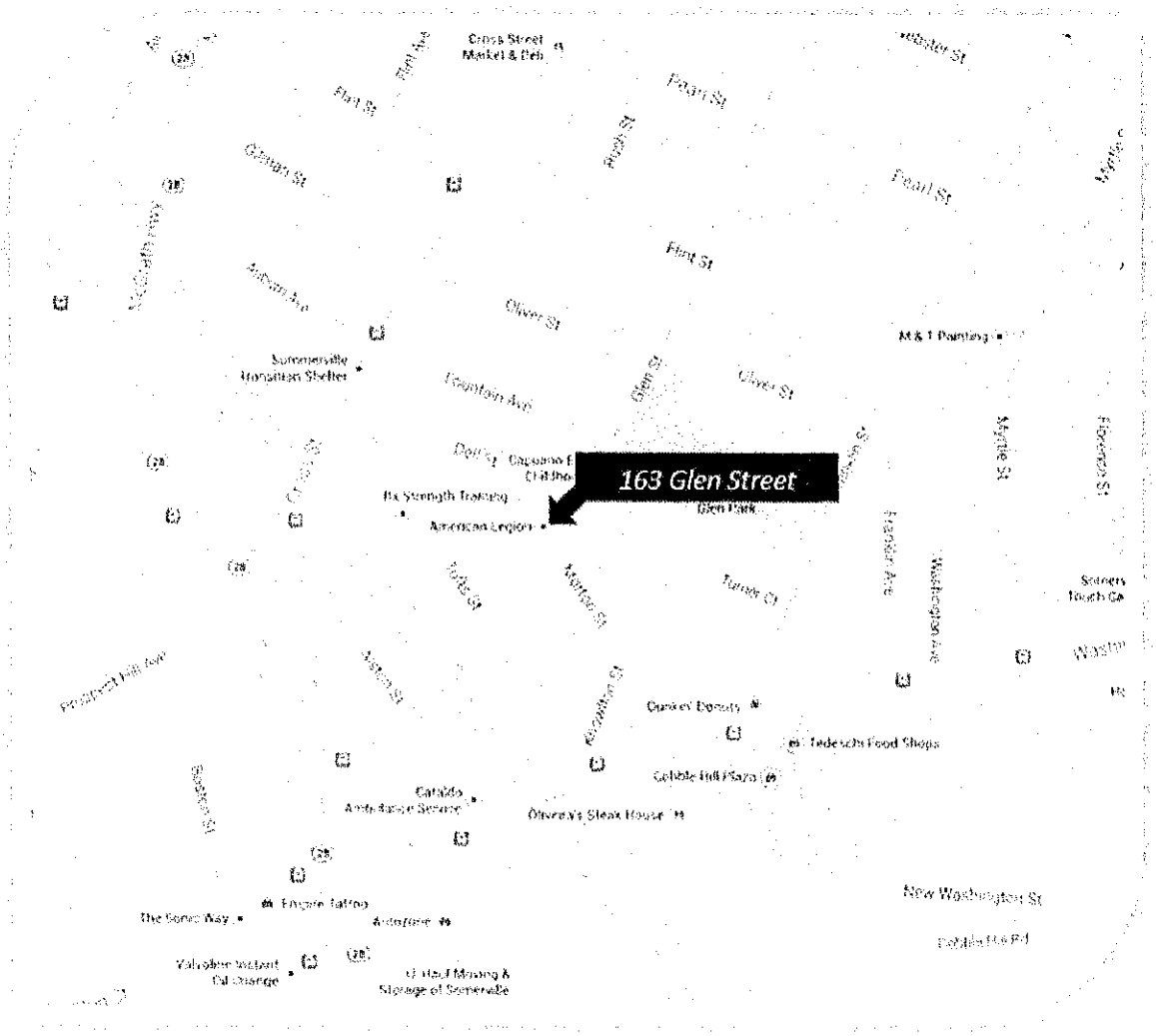
The proposed building structure will be three stories. Of the eleven (11) residential units, one (1) unit is a 3-bedroom unit and ten (10) units are 2-bedroom units. Of the eleven (11) units, the four (4) units on the first floor will be *Accessible*. A total of eight (8) units will be *Affordable* (i.e, seven 2-bedroom and one 3-bedroom). The proposed residential building will have vehicular access via the same curb cut on Tufts Street, approximately 160 feet from Glen Street.

Since eight (8) affordable units are proposed, the parking requirement is 16 off-street parking spaces per City of Somerville Zoning Ordinance (SZO) Article 9. The proposed site will have 16 off-street parking spaces.

This memorandum serves to investigate the transportation impacts of 163 Glen Street. The following scope of traffic elements was examined:

- Trip Generation;
- Mode Choice;
- Proximity to Public Transit; and,
- On-Street Parking Utilization.

Figure 1: Project Location



Map Source: Google Maps

Trip Generation

The industry standard used for estimating trip generation for new developments or redevelopments is the Institute of Transportation Engineers (ITE) *Trip Generation Manual.* ITE is an international education and scientific association of transportation professionals that facilitates the application of technology and scientific principles to research, planning, functional design, operations and services for all modes of ground transportation. The most current Trip Generation Manual was used in this analysis – *9th Edition.*

The trip rates from Land Use Code (LUC) 230 Residential Condominium/Townhouse was used to estimate traffic for the new residential units proposed at 163 Glen Street. The ITE LUC describes residential condominiums/townhouses as ownership units that have at least one other owned unit within the same building structure.

The results from the trip generation analysis is shown in Table 1.

Table 1. Trip Generation Analysis

	AM Peak	PM Peak	Weekday Daily
Average Rate (per num. of dwelling units)	0.44	0.52	5.81
Percent Entering	17%	67%	50%
Percent Exiting	83%	33%	50%
Total Trips	5	6	64
Entering Trips	1	4	32
Exiting Trips	4	2	32

As shown in Table 1, using standard ITE Trip Generation Rates, the proposed eleven (11) new residential units are expected to generate 1 entering trip and 4 exiting trips in the weekday AM peak hour. In the weekday PM peak hour, the site is expected to generate 4 entering trips and 2 exiting trips. The total weekday daily traffic expected is 32 entering and 32 exiting trips. Based on these low trip generation numbers, this adaptive re-use site is expected to have no significant impact on the peak hour intersection operations in the local and regional area. It should be noted that these vehicle trips are conservative values since no reductions were taken due to the expected transit, bike, walk, and telecommute travel. US Census Tract Data for the area including 163 Glen Street indicates that 37.9% of the working population doesn't use an automobile. US Census data findings and analysis is subsequently discussed.

Transportation Mode Choice

Local transportation data for the area encompassing 163 Glen Street was obtained and analyzed using information from the US Census Bureau and the latest American Community Survey (ACS) 5-Year Estimate (2008-2012).

The ACS is a nationwide survey that collects and produces information on demographic, social, economic, and housing characteristics about the US population every year. With respect to local transportation and the subject site, this information provides an important

tool to identify unique community characteristics and allows decision makers to obtain a clear picture of their population so that scarce transportation infrastructure can be allocated efficiently and effectively.

163 Glen Street is located in Census Tract 3514.04. The Site within the Census Tract is shown in Figure 2. Census Tracts are small, relatively permanent statistical subdivisions of a county or equivalent entity that are updated by local participants prior to each decennial census as part of the Census Bureau's Participant Statistical Areas Program. Census tracts generally have a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people.

According the 2008-2012 ACS data for Census Tract 3514.04, approximately 22.4% of the local population have no automobile. The vehicle ownership data for Census Tract 3514.04 is summarized in Table 1 and Figure 3.

Figure 2: 163 Glen Street in US Census Tract 3514.04

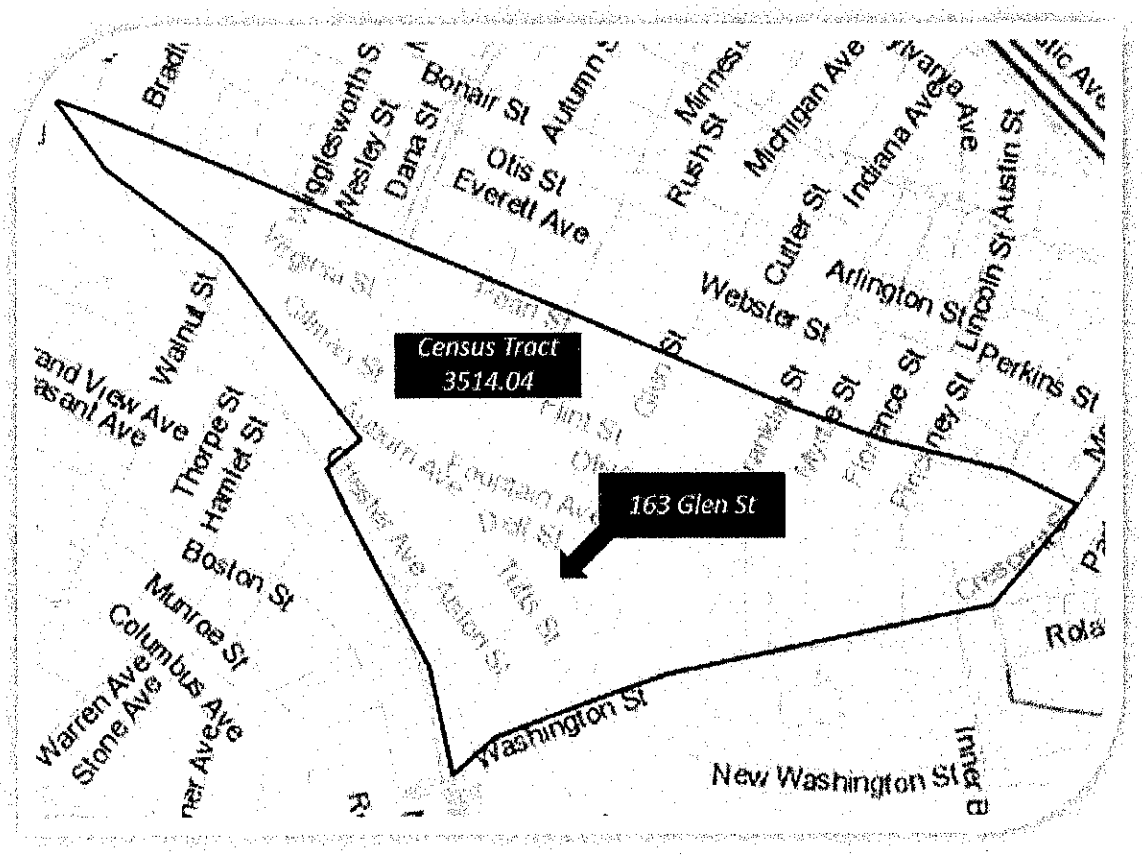
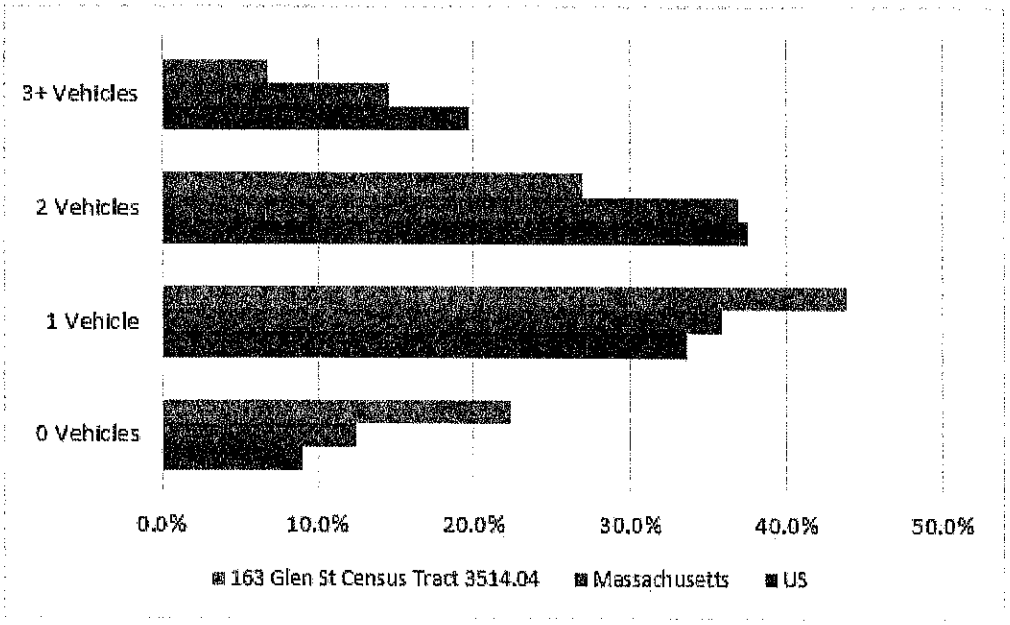


Table 2: Vehicle Ownership Summary (2008-2012 ASC Data)

Automobile Ownership	US	Massachusetts	163 Glen St Census Tract 3514.04
0 Vehicles	9.0%	12.5%	22.4%
1 Vehicle	33.7%	35.9%	43.9%
2 Vehicles	37.6%	37.0%	26.9%
3+ Vehicles	19.7%	14.6%	6.8%
Total	100.0%	100.0%	100.0%

Figure 3: Vehicle Ownership Summary (2008-2012 ASC Data)



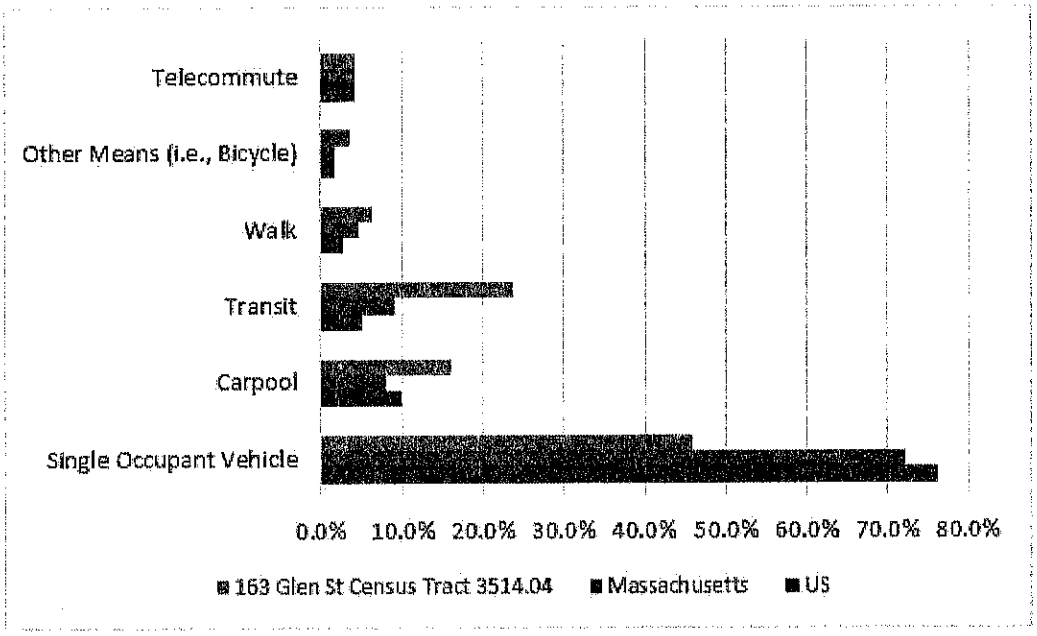
As summarized in Table 2 and illustrated in Figure 3, 163 Glen Street is located in an area where vehicle ownership for occupied housing units is not as prevalent compared to the State and the Nation. For the entire nation and the State of Massachusetts, 91% and 87.5% of occupied housing units have access to at least 1 automobile, respectively. For the local community that encompasses 163 Glen Street, 22.4% of the occupied housing units has no automobile.

In terms of mode split for the commute to work, approximately 37.9% of the local working community find transportation to work without use of an automobile. Approximately 23.6% of the local working population use transit and 10% of the local working population walk or bicycle to work. Approximately 4% of the local working population in the area of 163 Glen Street work from home. The mode split data for Census Tract 3514.04 is summarized in Table 3 and Figure 4.

Table 3: Mode Split for the Commute to Work (2008-2012 ASC Data)

Commuting to Work	US	Massachusetts	163 Glen St Census Tract 3514.04
Single Occupant Vehicle	76.1%	72.2%	46.0%
Carpool	10.0%	8.1%	16.1%
Transit	5.0%	9.2%	23.6%
Walk	2.8%	4.7%	6.3%
Other Means (i.e., Bicycle)	1.8%	1.6%	3.7%
Telecommute	4.3%	4.2%	4.3%
Total	100.0%	100.0%	100.0%

Figure 4: Mode Split for the Commute to Work (2008-2012 ASC Data)



As summarized in Table 3 and illustrated in Figure 4, 163 Glen Street is located in an area where the automobile as a means of transportation to work is relatively obsolete compared to the State and the Nation. For the entire nation and the State of Massachusetts, 86.1% and 80.3% of the population use the automobile for the work commute, respectively. For the local community at 163 Glen Street, only 62.1% use the automobile for the work commute (16.1% are carpools and 46% are SOVs).

Transit Supply

The Site is conveniently situated close to public transportation. As indicated in mode split data for the area, 23.6% of the residents in the direct vicinity of the Site use Transit to commute to work. The Site is approximately 3,900 feet from the Sullivan MBTA Transit Station with connections to Boston via subway or bus.

The Green Line Extension (GLX) project will have a proposed transit station at Washington Station – less than 800 feet away from the subject site. The anticipated completion date for the Washington Station is 2016 (Phase 2). This project will extend the existing MBTA Green Line service from a relocated Lechmere Station in East Cambridge to Union Square in Somerville and College Avenue in Medford. The new transit station will meet or exceed the Americans with Disabilities Act (ADA) standards. Once completed, trains will operate every five to six minutes in the peak periods, providing fast and efficient service to downtown Boston.

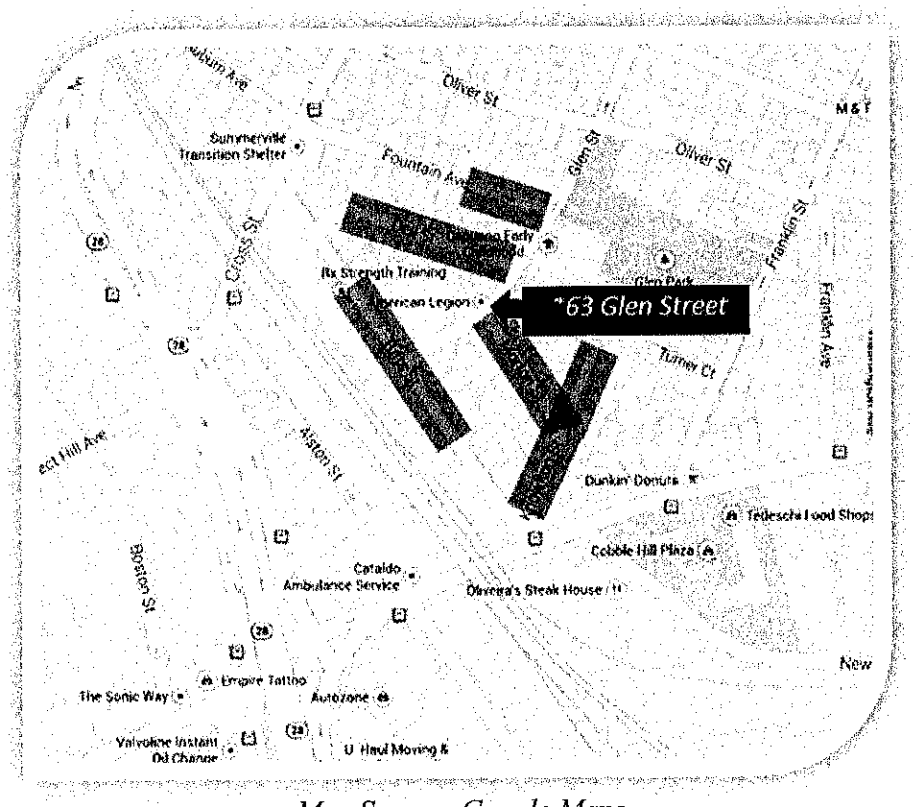
Existing On-Street Parking Utilization

While this project does not require parking relief from the SZO, a parking study of on-street spaces in the area was evaluated. The study area included on-street parking in the vicinity of 163 Glen Street within 500 linear feet. Per discussions with the City and to be sensitive to the Capuano Early Childhood Learning Center school staff, Glen Street parking was not counted towards on-street parking availability. DCI performed a parking survey of all other on-street parking areas (excluding Glen Street) to determine the existing parking utilization. The study area included the following roadways:

- Knowlton St: Between Tufts St and the end of the street;
- Tufts St: Between 11 Tufts St and 50 Tufts St;
- Morton St: Between Glen St and Knowlton St;
- Dell St: Between Glen St and 23 Dell St;
- Fountain Ave: Between Glen St and 21 Fountain Ave;

This study area is shown in Figure 5.

Figure 5: Parking Utilization Study Area



Map Source: Google Maps

On-Street Parking Inventory

DCI recorded the number of available parking spaces in the study area streets during a typical weekday and during a typical Saturday. The parking data were collected during the following time periods:

- Saturday, June 7, 2014 (11:00AM – 2:00 PM)
- Thursday, June 5, 2014 (5:00PM – 7:00 PM)
- Wednesday, June 11, 2014 (12:00PM – 2:00 PM)

The results of the parking surveys are summarized in Table 4. The findings only relate to the on-street permit parking spaces. Detailed tables with the complete parking survey data are contained in the attached Appendix.

As indicated by the parking survey summary, an average total of 78 permit parking spaces were available during the weekday mid-day period. An average of 99 of permit parking spaces were available during the weekday evening period. On Saturday, during the mid-day observation period, an average of 82 permit parking spaces were available. The results of this parking survey indicate that there is currently existing under-utilized permit parking spaces spread amongst the study area streets.

Table 4: Parking Utilization Survey Summary

Street	Section		Subsection	Weekend	Weekday	
	From	to		Afternoon Average	Afternoon Average	Evening Average
Knowlton St	Tufts St	end of Knowlton street	East Side	5	8	6
			(capacity)	*(21)*	*(21)*	*(21)*
				1	0	1
			(capacity)	*(1)*	*(1)*	*(1)*
			West Side	6	6	3
			(capacity)	*(20)*	*(20)*	*(20)*
Tufts St	#11 Tufts St	#50 Tufts St	North Side	7	6	7
			(capacity)	*(24)*	*(24)*	*24)*
			South Side	0	0	0
			(capacity)	*0*	*0*	*0*
Morton St	Glen St	Knowlton St	North Side	5	2	5
			(capacity)	*(12)*	*(12)*	*(12)*
			South Side	4	0	6
			(capacity)	*(15)*	*(15)*	*(15)*
Dell St	Glen St	# 23 Dell St	North Side	11	6	10
			(capacity)	*(16)*	*(16)*	*(16)*
			South Side	8	4	8
			(capacity)	*(12)*	*(12)*	*(12)*
Fountain Ave	Glen St	#21 Fountain Ave	North Side	7	4	8
			(capacity)	*(14)*	*(14)*	*(14)*
			South Side	0	0	0
			(capacity)	*0*	*0*	*0*
			Total Parking Capacity	134	134	134
	Handicap Parking		**Total Parking Occupied**	56	36	52
			Total Parking Available	**78**	**99**	**82**

Conclusions

This memorandum examined the traffic impacts from the proposed adaptive reuse that will convert the former East Somerville America Legion Post into eleven (11) residential condominiums in Somerville, Massachusetts. The site is on land zoned both Residence RB and Residence RC.

The proposed project will add eleven (11) condominium residential units and provide sixteen (16) parking spaces, including one (1) handicap space. Two (2) bike racks are proposed on site and satisfies Article 9 of the Zoning Ordinance. The proposed building structure will be three stories. Of the eleven (11) residential units, one (1) unit is a 3-bedroom unit and ten (10) units are 2-bedroom units. Since eight (8) affordable units are proposed, the parking requirement is 16 off-street parking spaces per City of Somerville Zoning Ordinance (SZO) Article 9. The proposed site will have 16 off-street parking spaces.

Using standard ITE Trip Generation Rates, the proposed eleven (11) new residential units are expected to generate 1 entering trip and 4 exiting trips in the weekday AM peak hour. In the weekday PM peak hour, the site is expected to generate 4 entering trips and 2 exiting

trips. The total weekday daily traffic expected is 32 entering and 32 exiting trips. Based on these low trip generation numbers, this adaptive re-use site is expected to have no significant impact on the peak hour intersection operations in the local and regional area. It should be noted that these vehicle trips are conservative values since no reductions were taken due to the expected transit, bike, walk, and telecommute travel. US Census Tract Data for the area including 163 Glen Street indicates that 37.9% of the working population doesn't use an automobile.

The Site is located in an area that has a relatively high portion of non-vehicular travel to and from employment. The latest data (2008-2012) associated for US Census Tract 3514.04 shows that 37.9% of the residents travel to work via modes other than by a single occupant vehicle (SOV). Moreover, almost 1 in 4 residents do not own a vehicle.

While this project does not require parking relief from the SZO, a parking study of on-street spaces in the area was evaluated. The results of this parking survey indicate that there is currently existing under-utilized permit parking spaces spread amongst the study area streets.

Approximately 1 in 4 residents in the direct vicinity of the Site use Transit to commute to work. The Site is approximately 3,900 feet from the Sullivan MBTA Transit Statin. The Green Line Extension (GLX) project will have a proposed transit station at Washington Station – less than 800 feet away from the subject site. The anticipated completion date for the Washington Station is 2016 (Phase 2).

Synthesizing the characteristics of this adaptive re-use, transit opportunities and local travel behavior characteristics, the proposed site will not negatively impact transportation facilities locally or regionally and is expected to fit the local community texture and the City of Somerville.

Appendix

Parking Survey Data Sheets & Calculations

Parking Survey

City: Somerville, MA
Street: 163 Glen St
Date: 6/5/2014
Weather: Overcast: 50's

Proj. No.: 2014-058
Sheet No.: 1
Field by: Frantz
Notes:

Total Available Parking Spaces

Street	Section		Subsection	Total Available Spaces
	From	to		
Glen St	Tufts St	Oliver St	East Side	17 9 [redacted]
			West Side	29
Knowlton St	Tufts St	end of Knowlton street	East Side	21 1
			West Side	20
Tufts St	#11 Tufts St	#50 Tufts St	North Side	24
			South Side	0
Morton St	Glen St	Knowlton St	North Side	12
			South Side	15
Dell St	Glen St	# 23 Dell St	North Side	16
			South Side	12
Fountain Ave	Glen St	#21 Fountain Ave	North Side	14
			South Side	0
			TOTAL:	196

Permit Parking, Street Cleaning
No Parking, School Bus Stop 7am-3pm, Monday-Friday, September-June
School Drop Off Zone, Monday-Friday, 7am-430pm, Resident Parking Only All Other Times
Handicap Parking

Parking Survey

City: Somerville, MA
Street: 163 Glen St
Date: 6/5/2014 & 6/11/2014
Weather: Overcast: 50's & 80's

Proj. No.: 2014-058
Sheet No.: 2
Field by: Steve & Frantz
Notes:

Weekday Occupied Parking Spaces

Street	Section		Subsection	12:00 PM to 1:00 PM	1:00 PM to 2:00 PM	5:00 PM to 6:00 PM	6:00 PM to 7:00 PM
	From	to					
Glen St	Tufts St	Oliver St	East Side	1 0	1 0	2 5	3 1
			West Side	7	8	6	7
Knowlton St	Tufts St	end of Knowlton street	East Side	8 0	7 0	7 1	5 1
			West Side	6	6	3	2
Tufts St	#11 Tufts St	#50 Tufts St	North Side	6	6	6	7
			South Side	0	0	0	0
Morton St	Glen St	Knowlton St	North Side	2	2	5	5
			South Side	0	0	5	6
Dell St	Glen St	# 23 Dell St	North Side	6	6	10	9
			South Side	4	4	8	8
Fountain Ave	Glen St	#21 Fountain Ave	North Side	4	4	8	8
			South Side	0	0	0	0
			TOTAL:	45	44	69	64

Permit Parking, Street Cleaning
No Parking, School Bus Stop 7am-3pm, Monday-Friday, September-June
School Drop Off Zone, Monday-Friday, 7am-430pm, Resident Parking Only All Other Times
Handicap Parking

Parking Survey

City: Somerville, MA
Street: 163 Glen St
Date: 6/7/2014
Weather: Overcast: 80's

Proj. No.: 2014-058
Sheet No.: 3
Field by: Frantz
Notes:

Saturday Occupied Parking Spaces

Street	Section From	Section to	Subsection	11:00 AM to 12:00 PM	12:00 AM to 1:00 PM	1:00 PM to 2:00 PM
Glen St	Tufts St	Oliver St	East Side	0 3	1 2	2 3
			West Side	6	6	5
Knowlton St	Tufts St	end of Knowlton street	East Side	6 1	6 1	3 1
			West Side	7	7	5
Tufts St	#11 Tufts St	#50 Tufts St	North Side	8	7	7
			South Side	0	0	0
Morton St	Glen St	Knowlton St	North Side	5	5	6
			South Side	5	4	4
Dell St	Glen St	# 23 Dell St	North Side	11	11	10
			South Side	9	9	7
Fountain Ave	Glen St	#21 Fountain Ave	North Side	9	8	5
			South Side	0	0	0
			TOTAL:	76	73	65

Permit Parking, Street Cleaning
No Parking, School Bus Stop 7am-3pm, Monday-Friday, September-June
School Drop Off Zone, Monday-Friday, 7am-430pm, Resident Parking Only All Other Times
Handicap Parking