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TRAFFIC IMPACT AND ACCESS STUDY

# Proposed Hotel & Residential Development

## Somerville, Massachusetts

PREPARED FOR

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October 2018





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# 1

## Introduction

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### Introduction

VHB, on behalf of CPC Land Acquisition Co, LLC and Distinctive Hospitality Group (together as the "Proponent"), has conducted a traffic impact and access study for a proposed residential and hotel development (the "Project"). The Project is proposed to be located at 0-20 Inner Belt Road in Somerville, Massachusetts (the "Site"). This study quantifies existing and projected future traffic conditions, with and without the Project. Based on the analysis of the future traffic conditions, the proposed Project is not expected to have a significant impact on the study area locations.

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### Project Description

The Project Site is bounded by Washington Street to the north, Inner Belt Road to the west, state-owned land to the south, and Crescent Street to the east. The northerly end of the Site is currently occupied by an approximately 139-space parking lot. Access to the lot is limited to a single full-access driveway located on Crescent Street at its intersection with Roland Street. The southerly portion of the Site is occupied by the approximately 5,400 square foot (sf) Somerville City Club building. An approximately 61-space surface parking lot is located to the south of that building, with access to the lot provided by two full-access driveways on Inner Belt Road. The first curb cut is located just north of New Washington Street, and the second driveway is located 60 feet further to the north. There also is a small unstriped parking area (roughly 5 to 10 spaces) located to the north of the City Club building, with a single full-access driveway provided on Inner Belt Road.



The proposed Project involves the construction of a new residential building containing 205 units (37 studio, 162 one- or two-bedroom, and 6 three-bedroom units). The residential portion of the Project will be located at the southerly end of the Site. The hotel component of the Project will consist of a new 120-room hotel to be constructed at the northerly end of the Site adjacent to Washington Street. The existing City Club use will continue to operate on the Site, but within a new and improved building.

As part of the Project a new "Roland Street Extension" circulation roadway will be constructed running parallel to Washington Street between the two uses and connecting Inner Belt Road to Crescent Street. Access to the residential portion of the Site will be provided by way of two full-access driveways to the 427-space parking garage within the seven-story residential building. The westerly garage driveway will be located on Inner Belt Road opposite New Washington Street. A driveway also will be provided on the Roland Street Extension running between the two uses, with that curb cut being located at the easterly end of the residential building. A full-access driveway will be located on the northerly side of the new circulation road opposite the residential garage driveway. The hotel driveway will provide access to a six-space surface parking lot and hotel pick-up/drop-off area next to the main building entrance.

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## Study Methodology

This traffic assessment has been conducted in three stages. The first stage involved an assessment of existing traffic conditions within the project area including an inventory of existing roadway geometry; observations of traffic flow, including daily and peak period traffic counts; and a review of vehicular crash data.

The second stage of the study established the framework for evaluating the transportation impacts of the proposed project. Specific travel demand forecasts for the Project were assessed along with future traffic demands on the study area roadways due to projected background traffic growth and other proposed area development that will occur, independent of the proposed development. The year 2025, a seven-year time horizon, was selected as the design year for analysis for the preparation of this traffic impact and access assessment to satisfy the Executive Office of Environmental Affairs/Executive Office of Transportation (EOEA/EOT) guidelines.

The third and final stage involved conducting traffic analyses to identify both existing and projected future roadway capacities and demands. This analysis was used as the basis for determining potential project impacts and potential mitigation measures.

# 2

## Existing Conditions

Evaluation of the transportation impacts associated with the proposed mixed-use redevelopment requires a thorough understanding of the existing transportation system in the project study area. The existing conditions evaluation consisted of an inventory of the traffic control, roadway, driveway, and intersection geometry in the study area; the collection of peak period traffic volumes; an overview of existing public transit options; and a review of recent vehicular crash history. Each of these elements is described in detail below.

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### Study Area

Based on an understanding of the current traffic operations in the region, a study area comprised of the following intersections and their approach roadways were selected for the review:

- Washington Street at Inner Belt Road/Mt. Vernon Street (*signalized*)
- Washington Street at Crescent Street
- Washington Street at New Washington Street
- Inner Belt Road at New Washington Street
- Crescent Street at Roland Street/Site parking lot driveways
- Inner Belt Road/Holiday Inn driveways (2)
- Existing City Club driveways (2)



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## Roadway Geometry

Descriptions of the study area roadways and intersections are provided below, including descriptions of the existing lane configurations, traffic control at the study area intersections, the roadway jurisdiction in this area, and existing pedestrian and bicycle infrastructure.

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## Roadways

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### Washington Street

Washington Street is functionally classified as an urban principal arterial and is under the jurisdiction of the City of Somerville adjacent to the Site. Washington Street runs in an east-west direction through Somerville and the City of Boston just east of the Site. Within the study area, Washington Street provides one travel lane in each direction with exclusive turn lanes at prominent intersections. Sidewalks are provided on both sides of the roadway. Dedicated bicycle lanes are provided in both directions on Washington Street within the study area. On-street parking is allowed on both sides of the roadway and 30 miles-per-hour (mph) speed limit signs are posted on Washington Street between New Washington Street and Inner Belt Road. Land use along Washington Street primarily consists of a mixture of residential and commercial uses.

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### Inner Belt Road

Inner Belt Road is a minor local roadway extending approximately two-thirds of a mile to the south of Washington Street to where it terminates at a cul-de-sac adjacent to a commercial building. This roadway is under City of Somerville jurisdiction and provides access to multiple commercial properties. Sidewalks are provided along both sides of the roadway in the vicinity of the Site, and on-street parking is allowed along the easterly side of the street adjacent to the Site. VHB did not observe any posted speed limit signs on this roadway.





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## Intersections

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### Washington Street at Inner Belt Road/ Mt. Vernon Street

Washington Street is intersected by Inner Belt Road from the south to form a three-way signalized intersection at the northwest corner of the Project Site. Washington Street also is intersected from the north by Mt. Vernon Street approximately 30 feet to the west of Inner Belt Road. Due to the offset alignment, the southbound one-way Mt. Vernon Street approach is not part of the signalized operation. Instead, that approach operates under Stop-control. Similarly, a driveway to a 12-space surface parking lot is located opposite Inner Belt Road but operates under Stop-control instead of being included in the signal operation. The Washington Street eastbound approach consists of a single through-lane and an exclusive right-turn lane onto Inner Belt Road. The westbound Washington Street approach features a single through-lane and an exclusive left-turn lane. The northbound Inner Belt Road approach consist of a shared through-/left-turn lane and an exclusive right-turn lane. Sidewalks are provided along both sides of all approaches and the westerly Washington Street and Inner Belt Road approaches feature crosswalks with signalized pedestrian crossings. Land use around the intersection is a mixture of residential and commercial, including the Project Site at the southeast corner of the intersection and the Holiday Inn hotel located at the southwest corner.

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## Traffic Volumes

To identify current traffic flow characteristics along the primary roadways serving the Project study area, peak-hour turning movement counts (TMCs) and daily traffic volumes were collected within the study area in August 2018.

Weekday and Saturday daily volumes along Washington Street and Inner Belt Road were collected using automated traffic recorders (ATRs) on Tuesday, August 21, 2018 and Saturday, August 21, 2018. Table 1 summarizes the observed weekday daily volumes and Saturday daily along the study area roadways.



**Table 1 Observed Traffic Volume Summary**

Location	Weekday							Saturday			
	Daily <sup>a</sup>	Morning Peak Hour			Evening Peak Hour			Daily	Midday Peak Hour		
	Vol.	Vol. <sup>b</sup>	K Factor <sup>c</sup>	Dir. Dist. <sup>d</sup>	Vol.	K Factor	Dir. Dist.	Vol.	Vol.	K Factor	Dir. Dist.
<b>Washington Street:</b> (west of Inner Belt Road)	13,750	840	6.1%	68% WB	880	6.4%	67% WB	14,150	830	5.9%	69% WB
<b>Inner Belt Road:</b> (south of Washington Street)	6,950	525	7.6%	80% SB	540	7.8%	59% NB	2,580	210	8.1%	77% SB

Source: VHB; based on automatic recorder counts conducted in August 2018.

a average daily traffic volume expressed in vehicles per day.

b peak hour volume expressed in vehicles per hour.

c percent of traffic occurs during the peak hour.

d directional distribution of peak hour traffic.

Note: Peak hours do not necessarily coincide with the peak hours of turning movement counts.

As shown in Table 1, Washington Street carries approximately 13,750 vehicles on a typical weekday with the peak hours accounting for roughly six-percent of the daily traffic flow. Volumes on Saturday were slightly higher at 14,150 vehicles per day, with peak hour traffic also making up approximately six-percent of the daily volume. Inner Belt Road volumes were observed to be 6,950 and 2,580 vehicles per day on the respective weekday and Saturday studied.

VHB also conducted manual turning movement/classification counts during the weekday morning (7 AM to 9 AM) and weekday evening (4 PM to 6 PM) peak periods on Thursday, August 9, 2018, and on Saturday August 11, 2018 between 11 AM and 2 PM. These time periods were considered following the standard practice of evaluating the combined peak period for roadway and development traffic. Based on a review of the count data, the weekday morning and evening peak hours of vehicular activity were determined to be 7:45 AM to 8:45 AM and 4:30 PM to 5:30 PM, respectively, while the Saturday peak hour occurred between 1:00 PM and 2:00 PM. The daily ATR data and peak-period TMC data are included in the Appendix to this document.

## Seasonal Adjustment

The traffic data collected for the study area was obtained during the month of August. To evaluate the potential of seasonal fluctuation of traffic volumes on roadways near the project Site, a review of MassDOT seasonal adjustment factors was conducted.



Based on this information, the traffic volumes collected in August 2018 are higher than the yearly average conditions. As such, to provide a conservative analysis, the existing traffic counts were not seasonally adjusted downward.

## Public Transportation

Ample public transportation services by the Massachusetts Bay Transportation Authority (MBTA) currently are provided with in the study area, with significant enhancements also planned. A summary of existing public transportation amenities in the area is provided below, followed by a discussion of the planned MBTA Green Line Extension project.

## Existing Conditions

The Project Site is located roughly 0.36 miles to the west of the MBTA Sullivan Square Orange Line Station. The Project study area also is currently served by three MBTA bus routes passing by the Project Site. Peak period frequencies/headways for MBTA bus services are summarized in Table 3.

**Table 3 Project Area MBTA Service**

Service	Origin / Destination	Peak-Hour Frequency (minutes)
Route 86	Sullivan Square – Reservoir	10-18
Route 91	Sullivan Square – Central Square	25-30
Route CT2	Sullivan Square – Ruggles Station	15-25

## MBTA Green Line Extension Project

Planning is currently underway for a 4.3-mile extension of the MBTA Green Line light rail from its current terminus at Lechmere Station in Cambridge into Somerville and Medford. The extension will have two branches: a 0.9-mile southerly branch that will terminate near Somerville’s Union Square, and a 3.4-mile northerly branch that will parallel the Lowell Line of the commuter rail through Somerville and will terminate at College Avenue in Medford. The new Washington Street station will be located just west of the Washington Street/New Washington Street intersection, which is an approximately 0.39 mile walking distance. The Green Line extension is expected to be completed in 2021, which is prior to the analysis horizon year for this study.



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## Vehicular Crash History

To identify potential vehicle crash trends and/or roadway deficiencies within the project's study area, VHB conducted a review of the MassDOT Crash Database to document the number of vehicular collisions that have taken place over the most recent five-year period (2011-2015). In addition to that review, study area intersections should also be reviewed in the MassDOT's Highway Safety Improvement Program (HSIP) database. An HSIP-eligible cluster is one in which the total number of "equivalent property damage only"<sup>1</sup> crashes in the area is within the top 5% of all clusters in that region. Being HSIP-eligible makes the location eligible for FHWA and MassDOT funds to address the identified safety issues at these locations.

As part of this effort, VHB reviewed this database and found that only the Washington Street/New Washington Street intersection was listed as being within an HSIP-eligible cluster. Specifically, this intersection falls within a segment of Washington Street that is under the 2006-2015 HSIP bicycle cluster listing. Within these years there was a total crash count of 18, with 12 crashes involving injury.

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

# 3

## Future Conditions

Traffic assessments for future conditions were conducted in two steps. First, the baseline traffic volumes in the study area were projected to year 2025, reflecting a typical seven-year traffic planning horizon. Any anticipated roadway improvements that may affect the flow of traffic within the study area and background traffic growth based on known development projects are included in the traffic volumes on the roadway network under year 2025 No-Build Condition. Anticipated Project-generated traffic volumes were then added to the year 2025 No-Build traffic volumes to reflect the year 2025 Build Condition in the study area.

This section describes the process used to arrive at these development conditions.

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### Background Traffic Growth

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in local and regional demographics. A frequently used procedure is to estimate the historical annual percentage increase in traffic volumes and apply that increase to the study-area traffic volumes. An alternative procedure involves the estimation of traffic generated by specific planned major developments that would be expected to affect traffic volumes on the study area roadways. For the purpose of this assessment, *both* methods were utilized to present a conservative assessment.

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### Historic Traffic Growth

Historic traffic data in the vicinity of the project Site was reviewed to determine an appropriate growth rate. Traffic studies conducted in the Cities of Somerville and Boston were reviewed. Based on this research, an annual growth rate of 1.0-percent was determined to be appropriate for this study.



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## Site-Specific Growth

In addition to accounting for background growth, the traffic associated with other planned/approved developments near the Site was also considered. Based on a review of recent traffic studies conducted in the area one planned/approved development in the vicinity of the study area were considered as part of the background development:

- **32 Cambridge Street, Charlestown** – The project involves the construction of 52 residential units with 2,500 sf of supporting street-level retail space, with 16 total surface parking spaces being provided.

Projected traffic volumes expected to be generated by this were obtained from the traffic study submitted as part of that project's permitting process. The projected background development trip assignment is included in the Appendix to this document.

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## No-Build Traffic Volumes

The 2025 No-Build traffic volumes were developed by applying the 1.0-percent annual growth rate over the seven-year study horizon to the 2018 Existing Conditions traffic volumes and adding the traffic volumes associated with the site-specific background project noted previously.

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## Trip Generation

The rate at which any development generates traffic is dependent upon a number of factors such as size, location, and concentration of surrounding developments. The number of vehicle-trips to be generated by the proposed project was estimated based on trip generation rates provided in the [Trip Generation Manual](#)<sup>2</sup>, published by the Institute of Transportation Engineers (ITE). The Project involves the construction of 205 residential units within the proposed seven-story building, and a new 120-room hotel. As noted earlier, the City Club will continue to function on the Site but within a new and improved building. However, there is not expected to be any notable difference in the traffic generation associated with that use. ITE land use codes 221 (Mid-Rise Residential) and 312 (Business Hotel) were determined to be the most appropriate land use codes for estimating the traffic generation associated with this development. While the ITE "Business Hotel" database was utilized for the hotel component of the Site, this was only done as the ITE description for this use has several of the same

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<sup>2</sup> [Trip Generation Manual \(10<sup>th</sup> Edition\)](#), Institute of Transportation Engineers, Washington D.C., 2017.



characteristics of the proposed hotel. The hotel is expected to serve a range of visitors, including business travelers as well as recreational visitors.

Table 3 summarizes the base Project-related vehicle trip projections, prior to any adjustment for expected mode splits (transit, biking, walking, etc.). The trip generation calculations are provided in the Appendix to this document.

**Table 2 Unadjusted Vehicle Trip Generation Summary**

	Residential <sup>a</sup>	Hotel <sup>b</sup>	Total Unadjusted Vehicle Trips
<b>Weekday Daily</b>			
Enter	558	250	808
Exit	<u>558</u>	<u>250</u>	<u>808</u>
Total	1,616	500	2,116
<b>Weekday Morning Peak Hour</b>			
Enter	18	23	41
Exit	<u>51</u>	<u>32</u>	<u>83</u>
Total	69	55	124
<b>Weekday Morning Peak Hour</b>			
Enter	54	21	75
Exit	<u>34</u>	<u>17</u>	<u>51</u>
Total	88	38	126
<b>Saturday Daily</b>			
Enter	520	347	867
Exit	<u>520</u>	<u>347</u>	<u>867</u>
Total	1,040	694	1,734
<b>Saturday Midday Peak Hour</b>			
Enter	45	26	71
Exit	<u>47</u>	<u>28</u>	<u>75</u>
Total	92	54	146

<sup>a</sup> Trip generation estimate based on ITE LUC 221 (Mid-Rise Residential) for 205.  
<sup>b</sup> Trip generation estimate based on ITE LUC 312 (Business Hotel) for 120 rooms.

As shown in Table 3, the project is expected to generate between 124 and 146 unadjusted vehicle trips. However, with its setting in close proximity to MBTA existing



and future transit service, and the travel characteristics of the surrounding area, adjustments for these estimates are appropriate. Specifically, VHB reviewed 2010 U.S. census data for the surrounding census tracts. This review revealed that only 51-percent of residents travel to and from this area by automobile. Currently, 32-percent of trips occur by transit, with the remaining trips being made by biking, walking, or considering those that work from home. Following construction of the MBTA Washington Street Station to the west of the Site transit ridership likely will increase. Projections by the Central Transportation Planning Staff indicate that transit ridership in this area could increase to 41- to 57-percent. However, to provide for a conservative analysis it was assumed that the current 32-percent transit ridership level will be maintained. While the hotel use is residential in nature, the same level of transit ridership is not expected due to visitors not being as familiar with the area. Accordingly, hotel transit use was only expected to be one-quarter of that found for the residential units – 8-percent. Similarly, to provide for a conservative analysis, it was assumed that there would be negligible biking or walking associated with the hotel use. Therefore, 92-percent of the hotel visitors are expected to travel to and from the site by automobile. This approach was undertaken strictly to conservatively estimate potential off-site traffic impacts. In fact, hotel visitors should benefit from the same pedestrian and bicyclist amenities that are in place for Site residents. The resulting net new vehicle trips that will be added to the surrounding roadway network are shown in Table 4.





**Table 4 Adjusted Vehicle Trip Generation Summary**

	<b>Total Unadjusted Vehicle Trips</b>	<b>Total Adjusted Vehicle Trips</b>
<b>Weekday Daily</b>		
Enter	808	412
<u>Exit</u>	<u>808</u>	<u>412</u>
Total	2,116	824
<b>Weekday Morning Peak Hour</b>		
Enter	41	24
<u>Exit</u>	<u>83</u>	<u>44</u>
Total	124	68
<b>Weekday Morning Peak Hour</b>		
Enter	75	38
<u>Exit</u>	<u>51</u>	<u>27</u>
Total	126	65
<b>Saturday Daily</b>		
Enter	867	469
<u>Exit</u>	<u>867</u>	<u>469</u>
Total	1,734	938
<b>Saturday Midday Peak Hour</b>		
Enter	71	38
<u>Exit</u>	<u>75</u>	<u>40</u>
Total	146	78

a Trip generation estimate based on ITE LUC 221 (Mid-Rise Residential) for 125 units.

b Trip generation estimate based on ITE LUC 820 (Shopping Center) for 2.1 ksf.

As shown in Table 4, following the application of appropriate mode splits, the Project is expected to generate between 65 and 78 total vehicle trips. The directional distribution of the vehicular traffic approaching and departing the Site is a function of population densities, the location of employment, existing travel patterns, and the efficiency of the existing roadway system. The trip distribution for the proposed residential portion of the development has been derived based on Journey-to-Work data for the City of Somerville updated with 2010 U.S. Census data. The new trips shown in Table 4 were added to the roadway network following these patterns to create the 2025 Build condition traffic volume networks.



# 4

## Site Access and Circulation

Under existing conditions, the Site has three full-access curb cuts on Inner Belt Road serving the City Club portion of the Site. An approximately 61-space surface parking lot is located to the south of the building, with access to the lot provided by two full-access driveways on Inner Belt Road. The first curb cut is located just north of New Washington Street, and the second driveway is located 60 feet further to the north. The northerly portion of the Site, which currently is occupied by an approximately 139-space parking lot, has a single full-access driveway located on Crescent Street at its intersection with Roland Street.

In conjunction with the Project, the existing City Club driveways on Inner Belt Road will be closed and replaced by a new full-access driveway at the southerly end of the Site to the proposed 427-space parking garage. As noted earlier, a new Roland Street Extension also will be constructed between the two uses connecting Inner Belt Road to Crescent Street. A full-access driveway also will be provided on this roadway, with that curb cut being located at the easterly end of the residential building. A full-access driveway to the hotel will be located on the northerly side of the new circulation road opposite the residential garage driveway. This hotel driveway will provide access to a six-space surface parking lot and hotel pick-up/drop-off area next to the main building entrance.

As part of this effort, VHB reviewed the adequacy of the proposed parking supply. In addition to evaluating on-Site operations, VHB also reviewed the available sight distance at the newly created Inner Belt Road curb cuts. These analyses are discussed in detail in the following sections.

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### Parking Demand

Estimating the anticipated parking demand on-site is critical in determining an appropriate parking supply for the Project. A new 427-space parking garage will be constructed within the residential building at the south end of the Site, and an



additional 6 surface spaces will be constructed in front of the hotel. The potential parking demand expected for the Project has been estimated based on the Parking Generation Manual<sup>3</sup>, published by ITE. Parking generation rates were estimated based on ITE land use codes 222 (High-Rise Apartment) and 310 (Hotel), which were determined to be the most appropriate land use codes for this development. Due to the unique nature of the use, ITE does not have an appropriate land use code for the City Club. Accordingly, the 85<sup>th</sup> percentile parking demand (the demand that would only be exceeded 15 percent of the time) for that use was assumed to match the City of Somerville Zoning Bylaws requirement of 80 spaces. Finally, the Proponent also will continue an existing agreement with the nearby Paradigm-operated “RS56” building on Roland Street to the east of the Site in Boston. Under this arrangement, some parking spaces in the existing front parking lot currently are allocated for use by that development. This same arrangement will continue, with parking provided in the new garage at a ratio allowing for the planned expansion of that office-oriented facility.

As with the trip generation evaluation, the ITE-based parking demand estimates were adjusted using the same census-based mode splits discussed earlier. The analysis focusses on critical weekday conditions when the combination of parking demand for the residential, hotel, City Club, and office (Paradigm) uses would be the greatest. The resulting estimated weekday parking demand is summarized below in Table 5.

**Table 5 Parking Generation Summary**

<b>Weekday</b>	<b>Residential <sup>a</sup></b>	<b>Hotel <sup>b</sup></b>	<b>City Club</b>	<b>Paradigm</b>	<b>Total Demand</b>	<b>Supply</b>
Average demand	281	107	<b>80</b>			
85 <sup>th</sup> percentile demand	312	130	<b>80</b>			
85 <sup>th</sup> percentile demand - adjusted <sup>d</sup>	159	99	<b>80</b>	<b>125</b>	<b>463</b>	<b>433</b>

a Parking demand estimate based on ITE LUC 222 (High-Rise Apartment) for 205 units.

b Parking demand estimate based on ITE LUC 310 (Hotel) for 120 rooms.

c City Club parking demand assumed to match the 8-space City of Somerville Zoning Bylaws requirement.

d Base parking demand estimates adjusted to reflect 51-percent residential auto use reported by 2010 U.S. census data, and the 92-percent auto use assumed for hotel visitors.

As shown in Table 5, the calculated peak parking demand exceeds the available 433-space parking supply by 30 spaces. However, the analysis assumes that almost half of the garage spaces will be used by the combination of the City Club and the Paradigm

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<sup>3</sup> Parking Generation Manual (4<sup>th</sup> Edition), Institute of Transportation Engineers, Washington D.C., 2010.



remote parking. While the calculated peak demand exceeds the supply, the analysis is highly conservative in that it was conducted without any time of day considerations. The proposed Project uses, including the City Club, likely will experience their peak parking demand during the evening hours. However, the Paradigm parking is associated with office-related uses which experience their peak demand during daytime hours. Accordingly, if there is an actual shortfall the on-site parking plan can be adjusted to allow for the shared use of certain spaces. With few office workers cars being in the garage into the evening hours, the lack of corresponding residential and office peak times should readily allow for the effective sharing of parking.

The parking demand for residential uses readily can be controlled through the managed allocation of parking spaces per unit as part of the individual leasing of units. Also, with the nearby transit options available as noted earlier, the development may appeal to one-vehicle households, which would help to lower the projected parking demand further below the ITE 85<sup>th</sup> percentile estimate. The residential parking demand can be reduced further by limiting the number of parking spaces available per unit. This common practice is done by restricting in each tenant's lease how many spaces they are allowed to use on a regular basis.

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## Sight Distance

VHB conducted a sight distance analysis, conforming to guidelines of the American Association of State Highway and Transportation Officials (AASHTO)<sup>4</sup>, at the proposed Site driveway location Inner Belt Road, and the newly created intersection of Inner Belt Road with the proposed connecting circulation roadway. Sight distance considerations are generally divided into two categories: Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD).

SSD is the distance required for a vehicle approaching an intersection to perceive, react, and come to a complete stop before colliding with an object in the road, in this case an exiting vehicle. In this respect, SSD can be considered as the minimum visibility criterion for the safe operation of an unsignalized intersection.

ISD is based on the time required for perception, reaction, and completion of the desired critical exiting maneuver once the driver on a minor street approach decided to execute the maneuver. Calculation for the critical ISD includes the time to (1) turn left, and to clear the half of the intersection without conflicting with the vehicles approaching from the left; and (2) accelerate to the operating speed of the roadway



<sup>4</sup> A Policy on the Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, 2011.



without causing approaching vehicles to unduly reduce their speed. In this context, ISD can be considered as a desirable visibility criterion for the safe operation of an unsignalized intersection. Essentially, while SSD is the minimum distance needed to avoid collisions, ISD is the minimum distance needed so that mainline motorists will not have to substantially reduce their speed due to turning vehicles.

To calculate the required sight distances at the proposed Site driveway observed travel speeds were recorded on Inner Belt Road in conjunction with the traffic data collection. The 85<sup>th</sup> percentile speed on Inner Belt Road was observed to be 30 miles per hour (mph), and this design speed was used for the analysis. Table 6 summarizes the sight distance analyses for the proposed Site driveway on Inner Belt Road, and the new Roland Street Extension intersection with Inner Belt Road. The analysis was conducted using a more realistic 10-foot setback for urban conditions instead of the 14.5-foot AASHTO standard. Sight distance calculations are provided in the Appendix to this document.

**Table 6 Sight Distance Analysis Summary**

Location	Traveling	Stopping Sight Distance		Intersection Sight Distance		
		Required (ft)	Measured (ft)	Looking	Desired (ft)	Measured (ft)
Proposed Inner Belt Road/Roland Street Extension <sup>a</sup>	Northbound	200	500+	Left	335	450
	Southbound	200	190 <sup>b</sup>	Right	335	190 <sup>b</sup>
Proposed Inner Belt Road southerly Site driveway <sup>a</sup>	Northbound	200	500+	Left	335	500+
	Southbound	200	550	Right	335	550

Source: Based on guidelines established in A Policy on the Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials [AASHTO], 2011.

a Design speeds are based on observed 30 mph travel speeds for Inner Belt Road.

b Clear sight lines are available to and from the Washington Street/Inner Belt Road intersection.

As shown in Table 6, both the critical stopping sight distance and desirable intersection sight distance levels are satisfied for the proposed southerly Site driveway on Inner Belt Road. While the southbound stopping sight distance and intersection sight distance looking to and from Roland Street Extension fall below the AASHTO-specified levels, that is not due to any obstructions. Instead, the 190-foot sight line reported is the distance between Washington Street and Roland Street Extension. As vehicles turning from Washington Street will be doing so at speeds well below the 30 mph speeds measured further to the south, motorists will have time to adjust their speeds accordingly for vehicles turning to or from Roland Street Extension.

# 5

## Conclusion

VHB has conducted a detailed traffic evaluation to assess the potential impacts associated with the proposed residential and hotel development at 0-20 Inner Belt Road in Somerville. The proposed Project involves the construction of a 205-unit residential building and a 120-room hotel to be constructed at the northerly end of the Site. The existing City Club will continue to operate at this Site, but in a new and improved facility.

The traffic analysis presented in this evaluation shows that the Project will generate between 65 and 78 new vehicle trips during the weekday morning, weekday evening, and Saturday midday peak hours. These estimates were developed considering existing mode shares (automobile, transit, and biking/walking) in the immediate area. With the upcoming construction of the new MBTA Green Line Washington Street Station to the west, Site residents will have a new MBTA train option in addition to the existing MBTA Orange Line Sullivan Square Station to the east. Regardless, the future conditions analysis conservatively assumed the same transit ridership percentage would be maintained. Even so, when distributed onto the local roadway network, these Project-generated trips are expected to have a negligible impact on the operations of the study area intersections.

The parking needs for the Site will be accommodated by a new 427-space parking garage to be constructed within the residential building at the south end of the Site, and an additional 6 surface spaces will be constructed in front of the hotel. The Project is estimated to generate a calculated peak parking demand of 463 spaces, which exceeds to total 433-space Project supply. However, this demand assumes 125 spaces being allocated for the nearby Paradigm-operated "RS56" building on Roland Street to the east of the Site in Boston. That parking will be allowed under an existing agreement that will occur with the new Project. The actual peak times for the various uses utilizing this garage should not overlap, which is not reflected by the analysis. Specifically, the Paradigm parking is associated with office-related uses which experience their peak demand during daytime hours. If there is an actual shortfall, the



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on-site parking plan can be adjusted to allow for the shared use of certain spaces. With few office workers cars being in the car into the evening hours, the lack of corresponding residential and office peak times should readily allow for the effective sharing of parking. The parking demand for residential uses also can be controlled through the managed allocation of spaces as part of the individual leasing of units. Considering these factors, and the enhanced transit service that will be available, the parking supply is appropriate for the Project, and is not excessive, which would reduce incentives for utilizing public transportation.