



SIGNAGE



An aerial photograph of a sports complex. The image shows several baseball fields, a tennis court, and a large building with a blue roof. A red dotted line outlines a specific area in the center-right of the image, which includes a large building and an adjacent parking lot. The text "PARKING & TRANSPORTATION" is overlaid in white capital letters across the center of the image.

# PARKING & TRANSPORTATION



**MEMORANDUM**

To: Michael Crowley, National Development      Date: June 12, 2015  
 From: Guy Busa      HSH Project No.: 2010190  
 Elizabeth Peart  
 Subject: 375-399 Chestnut Hill Avenue  
 Summary of Transportation Impacts and Mitigation

As requested, HSH has prepared this technical memo to provide a summary of the transportation issues related to the redevelopment of 375-399 Chestnut Hill Avenue (Project) and to document the evolution of building program changes that have occurred during the Project’s review process. This memo presents a comparison of key transportation metrics for earlier building programs and the most recent program as presented by National Development (ND) in Appeal to the Brookline Zoning Board of Appeals (ZBA), May 26, 2015. The most recent program is herein referred to as the ZBA Program. This memo also documents the Project’s impacts on the local transit system, describes enhancements and safety improvements to the Beacon Street/Chestnut Hill Avenue intersection and the pedestrian/bicycle environment, and presents the detailed travel demand management (TDM) program to be established by ND/BDG.

**Building Program Comparison**

In May 2011, the Town of Brookline created a Cleveland Circle Hotel Overlay District and codified specific features of and limitations to Boston Development Group’s (BDG) then-current proposal for the Project site. Having been approved at Town meeting, the Cleveland Circle Hotel Overlay district is now part of the zoning bylaws. At that time, the Project’s building program included a hotel, medical and general office space, and retail/restaurant space.

By March 2013, when BDG submitted the DPIR to the Boston Redevelopment Authority (BRA), the building program had evolved and included a larger hotel and new residential space along with retention of the medical office space and elimination of the general office space. These changes were made in response to various comments and concerns of the Town of Brookline, City of Boston, and the local neighborhood community.

In February 2014, the continuing review processes in Boston and Brookline guided BDG to propose a Revised Program with an increased number of residential units, a decreased number of hotel rooms, and the elimination of the medical office space.

By May 2015, the ND had teamed with BDG to develop the current ZBA Program that will retain most features of the February 2014 program but will convert the apartment units to an age-restricted, senior housing community and reduce the size of the retail/restaurant spaces. The currently proposed ZBA Program will result in lower transportation impacts than the previous building program as described, analyzed, and mitigated in the DPIR

**HSH Memorandum**  
**375-379 Chestnut Hill Avenue Redevelopment Project**  
**Summary of Transportation Impacts and Mitigation**

Table 1 presents a comparison of the previous building programs with the most recent ZBA Program.

**Table 1. Building Program Comparison**

Land Use	Brookline Zoning Program <sup>1)</sup> May 24, 2011	DPIR Program <sup>2)</sup> March 13, 2013	Revised Program <sup>3)</sup> February 2014	ZBA Program <sup>4)</sup> May 2015
Hotel	180 rooms	196 rooms	162 rooms	162 rooms
Residential	0 units	74 units	92 units	0 units
Senior Housing	0 units	0 units	0 units	92 units
Medical Office	18,000 sf	18,000 sf	0 sf	0 sf
Retail	Combined 18,000 sf	7,300 sf	7,600 sf	2,635 sf
Restaurant		6,900 sf	6,400 sf	3,562 sf
General Office	30,000 sf	0 sf	0 sf	0 sf

- 1) Program as outlined in ARTICLE XII of the May 24, 2011 Annual Town Meeting (Brookline), which created a Cleveland Circle Hotel Overlay District.
- 2) Program as presented by BDG in the Draft Project Impact Report submitted to City of Boston, March 13, 2013.
- 3) Revised program as approved by the by the BRA on June 19, 2014 and presented at the preliminary Brookline Planning Board meeting on June 26, 2014.
- 4) ZBA Program as presented by National Development in Appeal to Brookline Zoning Board of Appeals, May 26, 2015.

**Trip Generation Comparison**

Each successive program change shown in Table 1, resulted in fewer vehicle trips than the previous program. A comparison of vehicle trip estimates between the Brookline Zoning Program (May 24, 2011) and the recent ZBA Program is presented in Table 2.

Under the ZBA Program, daily vehicle trips will be reduced by approximately 42%, and the a.m. peak hour and p.m. peak hour trips will be reduced by 55% and 53%, respectively, indicating that the proposed ZBA Program will have less of an impact on local area traffic operations than the previously proposed plan.

(Note that the number of vehicle trips are calculated using standard traffic engineering methodologies and are derived from the Institute of Transportation Engineers’ (ITE) Trip Generation (9th edition, 2012) trip rates. Assumptions regarding trip generation and the application of travel mode shares and vehicle occupancy rates are the same as documented in the DPIR.)

**Table 2. Vehicle Trip Comparison – Brookline Zoning Program vs. ZBA Program**

Direction	Brookline Zoning Program May 24, 2011	ZBA Program May 2015	Percent Change
<i>Daily</i>			
In	1,093	629	-42%
Out	1,093	629	-42%
Total	2,186	1,258	-42%
<i>a.m. Peak Hour</i>			
In	88	29	-67%
Out	33	25	-24%
Total	121	54	-55%
<i>p.m. Peak Hour</i>			
In	74	46	-38%
Out	106	38	-64%
Total	180	84	-53%

## Parking Demand and Supply

Recommended parking guidelines from the Town of Brookline and the City of Boston are shown in **Table 3** for each of the Project's land use categories. The proposed on-site parking supply of 188 spaces conforms to the recommended parking guidelines and will adequately serve the Project's parking demands. No public parking will be permitted.

As shown, the Brookline and Boston have similar parking ratio guidelines for hotel, retail, and restaurant uses, even though Brookline uses stated minimums and Boston uses stated maximums. Boston's ratios recognize lower maximum guidelines for residential developments within close proximity to transit stations. Current trends in urban parking demand nationally, and especially locally, have been on the decline for residential parking in close proximity to transit – or true transit oriented developments (TOD). Other factors influencing urban residential parking demand include a significant generational shift in attitude towards vehicle ownership both for environmental and financial reasons. The advent and proliferation of both car sharing and bicycle sharing services in the Boston region also contribute to lowering vehicle ownership and thereby parking demand.

The Project will provide 92 residential parking spaces, resulting in a parking ratio (1.0 space/unit) that is reflective of the transit-oriented nature of the Project. It is important to note that senior residents are less likely than the general population to own an automobile. This is evidenced by the Town of Brookline's recommended parking ratio for senior housing units, where the minimum ratio is 0.4 parking spaces/unit. This factor also is reflected in the standard Institute of Transportation Engineers trip generation rates used to estimate vehicle trips shown in Table 2. The daily number of trips per senior housing unit is about half that of a standard residential unit, reflecting a more home-based life-style and lower automobile ownership among seniors.

The 92 reserved parking spaces for senior housing residents will be located within the underground parking garage. Eleven additional spaces for retail/restaurant uses will also be located in the garage. Hotel parking, 81 spaces, will be located in the surface lot on the western side of the Project site. (Access and egress control of these surface spaces is discussed in a later section.) Within the internal piazza, four surface spaces will be designated for senior housing residential visitor use.

**Table 3. Parking Ratio Recommendations and ZBA Program Parking Supply**

Land Use/ Size	Recommended Parking Ratios		Recommended Parking Supply for Revised Program		ZBA Program Proposed Parking Supply
	Brookline (minimums)	Boston (maximums)	Based on Brookline Ratios	Based on BTD Ratios	
Hotel (162 rooms)	0.5 spaces/room <sup>1)</sup>	0.5 spaces/room	81	81	81
Residential/Senior housing (92 units)	2.0 – 2.3 spaces/unit <sup>2)</sup> residential	0.75 - 1.25 spaces/unit <sup>4)</sup>	185 <sup>2)</sup> residential	92 <sup>4)</sup> based on 1.0 spaces/unit	92 residents <sup>7)</sup> + 4 visitors 96
	0.4 spaces/unit <sup>3)</sup> senior housing		37 <sup>3)</sup> senior housing		
Retail (0 sf) <sup>5)</sup>	0.75 spaces/1,000 sf <sup>1)</sup>	0.75 spaces/1,000 sf	0	0	11
Restaurant (6,197 sf) <sup>5)</sup>	1.0 spaces/1,000 sf <sup>1)</sup>	0.75 spaces/1,000 sf	7	5	
Total	-	-	273 With residential ratio 125 With senior housing ratio	178	188 <sup>6)</sup>

- 1) Source: Town of Brookline, Zoning Bylaw, Section 5.06 (Special District Regulations), Cleveland Circle Hotel Overlay District. May 24, 2012.
- 2) The Cleveland Circle Hotel Overlay District regulations do not specifically address residential parking ratios. Therefore, the following source was used: Town of Brookline, Zoning Bylaw, Section 6.02 (Off-Street Parking Regulations), Paragraph 1, Table of Off-Street Parking Space Requirements, page 6-2. May 24, 2012. Note that the 2.0 space/unit guideline applies to units with less than three bedrooms and the 2.3 space/unit guideline applies to units with three or more bedrooms. (In the Project, 90 units will have one or two bedrooms and two units will have three bedrooms.)
- 3) Source: Town of Brookline, Zoning Bylaw, Section 6.02.2.d (Off-Street Parking Regulations), May 24, 2012. "...for housing having age of occupant or maximum rents or maximum sales prices controlled ... shall not reduce the parking requirement below one-fifth of the number of spaces which would otherwise be required by this section."
- 4) The ratios shown are for residential use. While Boston does not have specific ratios for age-restricted/senior housing, the guideline does state: "Lower parking ratios may be appropriate for housing types such as elderly, lodging housed, transitorial housing, and group residences."
- 5) The ZBA Program will have up to 6,197 sf of retail and/or restaurant space. For parking evaluation purposes, all use has been categorized under restaurant, the use with the higher parking ratio under Brookline zoning.
- 6) The ZBA Program includes a total parking supply of 188 spaces plus valet spaces.
- 7) None of the Project's residential units are located Brookline. The parking supply is based on City of Boston's guidelines.

## Site Design and Circulation

Since publication of the DPIR, substantial changes have been made to the site design and internal site circulation. The current plan is shown in **Figure 1**.

### Vehicular Access/Egress and Circulation

The Project site is served by two driveways: 1) the two-way driveway on Chestnut Hill Avenue, which will be the primary vehicle access and egress point for the site, and 2) the one-way exit only driveway connecting the rear hotel parking area to Beacon Street through the Waterworks driveway. Infrastructure and safety improvements are proposed at both site driveways, with the Chestnut Hill Avenue driveway being a part of the Proponent's overall proposed improvements to the Beacon Street/Chestnut Hill Avenue (Cleveland Circle) intersection (as presented in a later section). **Figure 2** and **Figure 3** show the traffic circulation for entering and exiting vehicles, respectively.

The piazza area between the senior housing residential building and hotel building will have contrasting pavement treatments and landscaping to encourage slow travel speeds within the Project site. When entering from Chestnut Hill Avenue, hotel vehicles will proceed through the piazza to the main lobby doors at the western end of the hotel building (signs will direct drivers to the hotel). Near the hotel lobby, a small plaza area will serve short-term parking for guests who are checking in and allow vehicles to circulate through to the surface parking lot.

Residential traffic entering from Chestnut Hill Avenue will immediately turn left to the parking ramp into the underground garage. Exiting residential traffic will proceed up the ramp and turn right onto the driveway to Chestnut Hill Avenue.

The site has been designed to internally accommodate all pick-up/drop-off activities, building loading and servicing, and move-in/move-out activities. None of this activity will occur curbside along any public street.

Residential pick-up/drop-off activity will occur curbside in the piazza near the main residential lobby doors. Hotel pick-up/drop-off activity will occur in the rear plaza near the hotel lobby. Two taxicab stands are provided on-site – one each for Boston and Brookline. A loading area for the hotel and the retail/restaurant deliveries will be located adjacent to the parking ramp. The residential loading area will be located adjacent to the rear plaza at the western end of the residential building.

### Surface Parking Lot

**Figure 4** shows the parking and loading plan for the site. On the western side, a surface parking area with 81 spaces will be used by overnight hotel guests and hotel employees.

Per Brookline Zoning requirements for this site, access to sixty of these spaces will require passage through a control gate, which can only be activated by a hotel-issued keycard. Once passed the control gate, these vehicles cannot exit back through the site to Chestnut Hill Avenue and must exit to Beacon Street through the Waterworks easement. A second control gate will be located at the far end of the lot (at the Waterworks driveway) and can only be activated by exiting vehicles from the lot. Vehicles outside the lot cannot activate the gate, preventing vehicles from entering at this location.

Use of the remaining 21 surface spaces will be unrestricted and vehicles exiting these spaces can only use the Chestnut Hill Avenue driveway.

### Parking Garage

As shown in **Figure 4**, the underground parking garage will have 92 reserved spaces for senior housing residential use and 11 spaces for on-site retail/restaurant activity. No public parking will be permitted. Ninety-two secure bicycle storage spaces will be provided in the garage along with an additional 15 bicycle spaces for employees who commute to work by bicycle.

### Waterworks Driveway

As stated earlier, hotel vehicles parked in the 60 spaces within the controlled parking area must use the Waterworks driveway easement to exit the Project site toward Beacon Street. These vehicles cannot exit back through the site to Chestnut Hill Avenue. A vehicle detection gate located at the far end of the lot will allow Project vehicles to exit to the Waterworks driveway. Vehicles cannot enter the Project site at this gate (because the gate cannot be activated from outside the lot), but the Proponent will install a "Do Not Enter" sign to reinforce this restriction.

The Proponent will place a "No Left Turn" sign at the parking lot exit, indicating that hotel traffic cannot turn left toward the Waterworks garage but must proceed straight toward Beacon Street. The Proponent will work with Waterworks management to install static "Speed Limit 10 mph" signs along the driveway. **Figure 5** identifies the traffic calming improvements that will be made to the Waterworks Driveway.

At the intersection of Beacon Street/Waterworks driveway, the Proponent has recommended to the City of Boston that several on-street parking spaces be removed to improve driver sight distance. On the southern side on Beacon Street, immediately to the east of the Waterworks driveway, approximately five spaces would be eliminated so that drivers exiting the driveway can better see approaching westbound Beacon Street traffic.

## Transit Impacts

Similar to the vehicle trip demand estimate, the Project's transit demand under the ZBA Program will also decrease. As documented in the DPIR, the overall number of transit trips is small and will not adversely affect transit services in the study area. The Proponent is committed to promoting transit use among employees, hotel guests, residents, and visitors, as further discussed under the Transportation Demand Management section below.

## Infrastructure Improvements

### Beacon Street/Chestnut Hill Avenue Intersection Improvements

The Proponent is committed to providing infrastructure improvements at the Beacon Street/Chestnut Hill Avenue (Cleveland Circle) intersection that will reduce vehicle delays, provide pedestrian and bicycle amenities, upgrade accessibility, and enhance safety for all users. For reference, the existing configuration of the intersection is shown in **Figure 6**.

The overall design improvements will include:

**Intersection Geometry**

- Reassign lane use and add vehicle turning lanes
- Shorten pedestrian crossings as possible
- Relocate Chestnut Hill Ave. pedestrian crossing at MBTA Entrance/Site Driveway
- Coordinate with site driveway signal

**Traffic Signal**

- Full upgrade to traffic signal equipment
- Add vehicle and bicycle detection
- Coordinate to MBTA Green Line
- Concurrent pedestrian phase
- Audible pedestrian signal

**Other**

- Add bicycle lanes/accommodation
- Upgrade to ADA/MAAB accessible ramps
- Repave as needed
- New pavement markings
- New signage

A conceptual plan of these improvements is shown in **Figure 7A and Figure 7B**, with a more detailed plan of the new crosswalk across Chestnut Hill Avenue south of the site driveway shown in **Figure 8**.

With these improvements, the a.m. peak and p.m. peak hour intersection operations will improve from level of service F to level of service D.

**Pedestrian Accommodations**

The Proponent will enhance the pedestrian environment and pedestrian safety along the Chestnut Hill Avenue corridor by reducing the number of existing curb cuts at the site from four to one, and installing new accessibility compliant sidewalks adjacent to the Project site. A signalized crosswalk across Chestnut Hill Avenue at the Project site driveway will also be installed. As noted above, the recommended improvements to the Beacon Street/Chestnut Hill Avenue (Cleveland Circle) intersection include changing from an exclusive pedestrian walk phase to concurrent pedestrian walk phases, thereby reducing delay for pedestrians and vehicles.

With the inclusion of the new sidewalks, reduction of curb cuts on Chestnut Hill Avenue, and complete upgrade of crosswalks, traffic signal equipment, traffic signal timing and phasing, and accessibility compliant sidewalks and ramps, the pedestrian convenience, service, and safety will be significantly improved for Cleveland Circle.

**Bicycle Accommodations**

The Proponent will provide bicycle amenities for the Project’s residents, guests, and visitors to encourage bicycle use. BTD has established guidelines<sup>1</sup> requiring projects subject to Article 80 Large Project Review (and the required Transportation Access Plan Agreement (TAPA)) to provide secure bicycle parking for residents and employees and short-term bicycle racks for visitors. Based on BTD guidelines, **Table 4** presents a breakdown of the Project’s proposed on-site bicycle accommodation for the Project.

Bicycle storage will be provided in the underground garage and bicycle racks will be provided near primary entrances. Bicycle racks, signs, and parking areas will conform to BTD standards.

Bicycle accommodations will also be included in the redesign of the Beacon Street/Chestnut Hill Avenue intersection (Cleveland Circle). These accommodations will include bicycle lanes, sharrows, and bicycle boxes as appropriate. To augment these bicycle accommodations being provided by the Project, the Proponent will also sponsor a Hubway bicycle sharing station to be located in Cleveland Circle. There are currently no Hubway bicycle sharing stations in the area.

**Table 4. On-Site Bicycle Accommodations for ZBA Program**

Land Use	Bicycle Storage for employees/residents	Showers <sup>1)</sup>	Bicycle Racks for visitors
Hotel	10	N/A	3
Residential	92	N/A	15
Retail/Restaurant	4	N/A	2
Total	106	0	20

<sup>1)</sup> Shower facilities at the hotel will be made available for Project employees who bicycle to work.

**Deliveries**

All delivery vehicles will enter and exit via the Chestnut Hill Avenue driveway and all service and loading will take place off-street. (Loading areas are shown in **Figure 4**.) Adequate roadway width and clearances will be provided for delivery vehicle access, egress, and circulation within the site. Associated truck movement paths have been developed by Stantec, another consultant on the study team, using AutoTURN, an engineering software program that analyzes and evaluates vehicle maneuvers.

<sup>1</sup> Brookline also has bicycle guidelines for residential spaces requiring one space for every five housing units in a multifamily building. The BTD residential bicycle requirements exceed the Brookline minimums. Brookline does not stipulate guidelines for non-residential uses.

As in the DPIR, delivery trip estimates were based on National Cooperative Highway Research Program<sup>2</sup> (NCHRP) data for Boston. A description of the anticipated loading/ service activity by land use is presented below.

**Table 5. Delivery Activity by Land Use**

Land Use	Daily (Weekday) Deliveries
Hotel	3
Senior Housing Residential	1
Retail/Restaurant	3
Total	7

## Travel Demand Management Measures

The Project will continue to develop specific travel demand management (TDM) measures of relevance to the ZBA Program. These TDM measures will be codified in a Transportation Access Plan Agreement (TAPA) between the Proponent and the Boston Transportation Department (BTD). The TAPA is required prior to issuance of a building permit by the City of Boston. This information will also be submitted to the Brookline Director of Transportation.

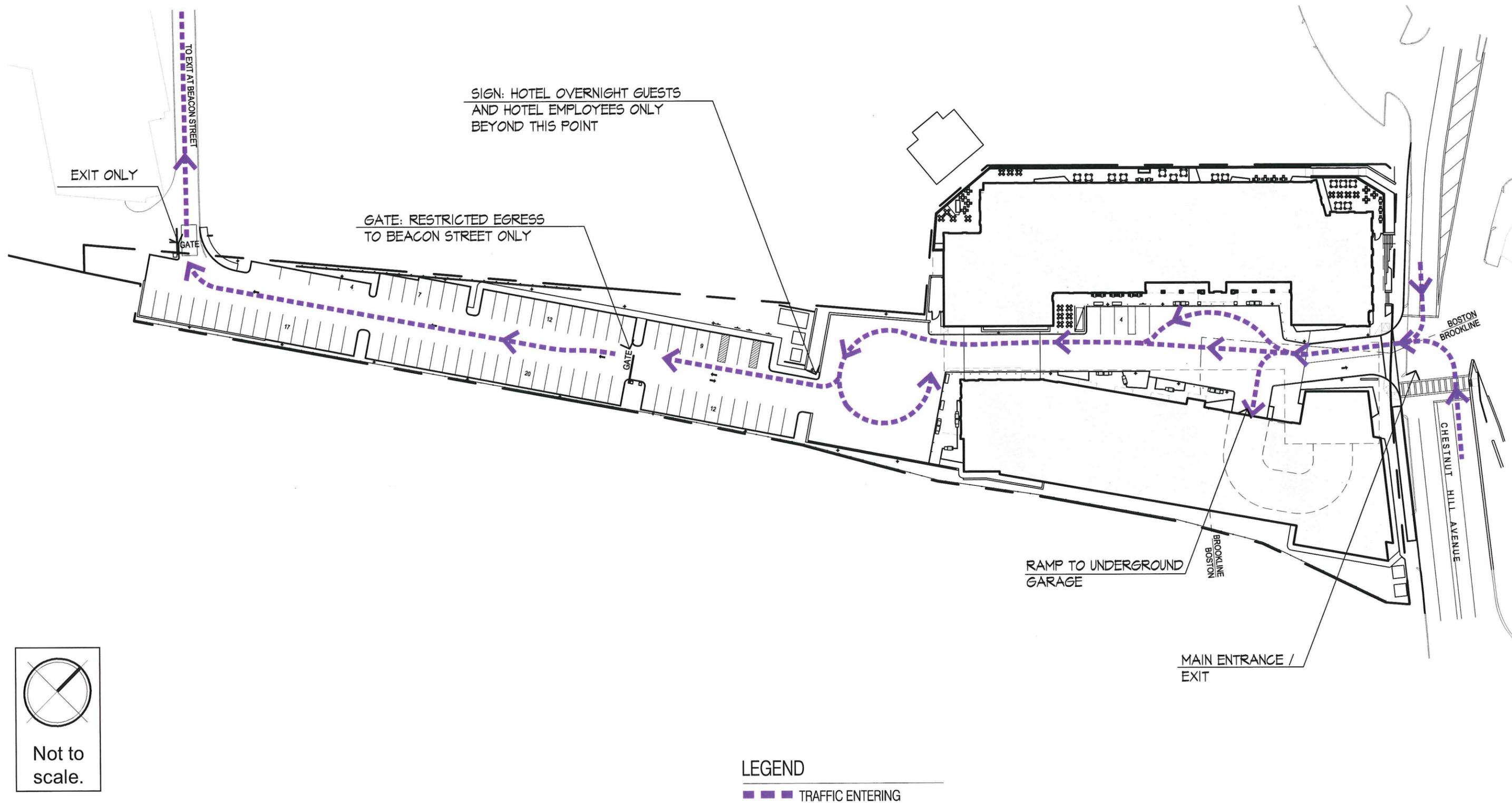
The following are a set of preliminary TDM measures that have been developed for the Project:

- **Transportation Coordinator:** The Proponent will designate a transportation coordinator to manage loading and service activities, move-in/move-out activities, and provide alternative transportation materials to residents and tenants. The Transportation Coordinator will be part of the on-site building management staff.
- **Orientation Packets:** The Proponent will provide orientation packets to new residents and tenants containing information on available transportation choices, including transit routes and schedules. Information on local car sharing and bicycle sharing services and facilities will also be included in the orientation packets.
- **Transit Passes – Hotel:** The Proponent will encourage the hotel operator to provide guests with public transit system maps and schedules, and provide such information in a prominent location within the hotel, as well as on the hotel’s website.

<sup>2</sup> “Truck Trip Generation Data –Synthesis 298”, NCHRP, Transportation Research Board, Washington D.C. 2001. Appendix D.

- **Transit Passes – Commercial Tenants:** Through commercial leases, the Proponent will encourage commercial tenants to subsidize transit passes for their employees.
- **Electric Vehicle Charging Stations:** As demand mandates, the Project will commit to providing up to 5% of total on-site parking supply with electric vehicle charging stations.
- **Low Emission Vehicle Parking:** The Proponent will designate up to 5% of preferred garage spaces for low emission vehicle parking.
- **Long-term Bicycle Parking:** The Proponent will provide on-site covered and secure bicycle storage for residents at one space per residential unit and an additional 15 bicycle spaces for employees who commute to work by bicycle.
- **Short-term Bicycle Parking:** The Proponent will provide bicycle racks for up to 20 bicycles at various on-site locations to accommodate visitors who travel to the site by bicycle.
- **Car-Sharing:** The Proponent will promote the use of nearby Zipcars and work with Zipcar to provide up to two spaces on-site for a Zipcar station.
- **Bicycle Sharing:** The Proponent will sponsor one Hubway bicycle sharing station to be located in Cleveland Circle and coordinated with Boston Bikes.



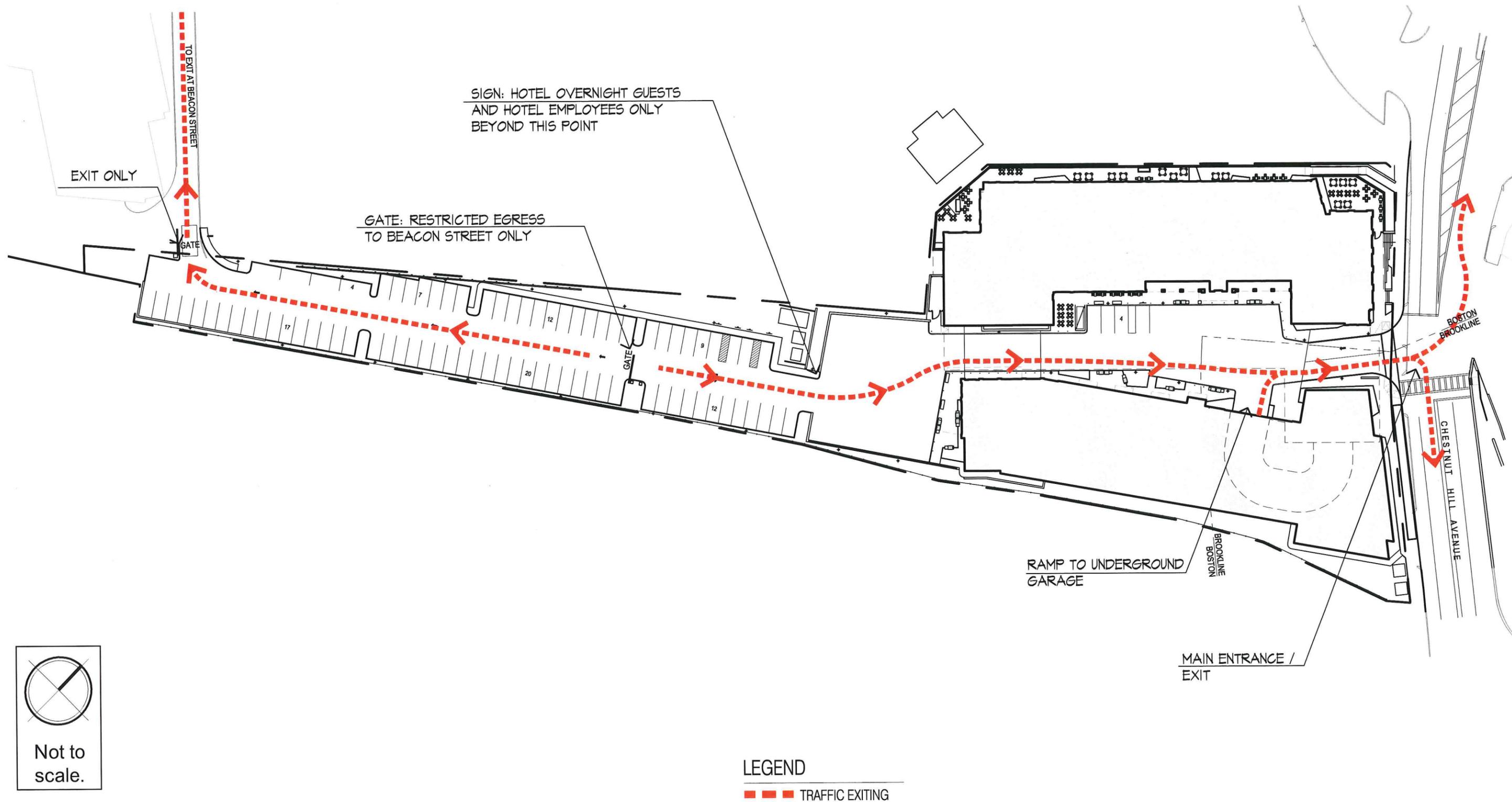


375-399 Chestnut Hill Avenue Boston/Brookline, Massachusetts



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**Figure 2**  
Vehicular Circulation - Entering  
Source: ELKUS | MANFREDI

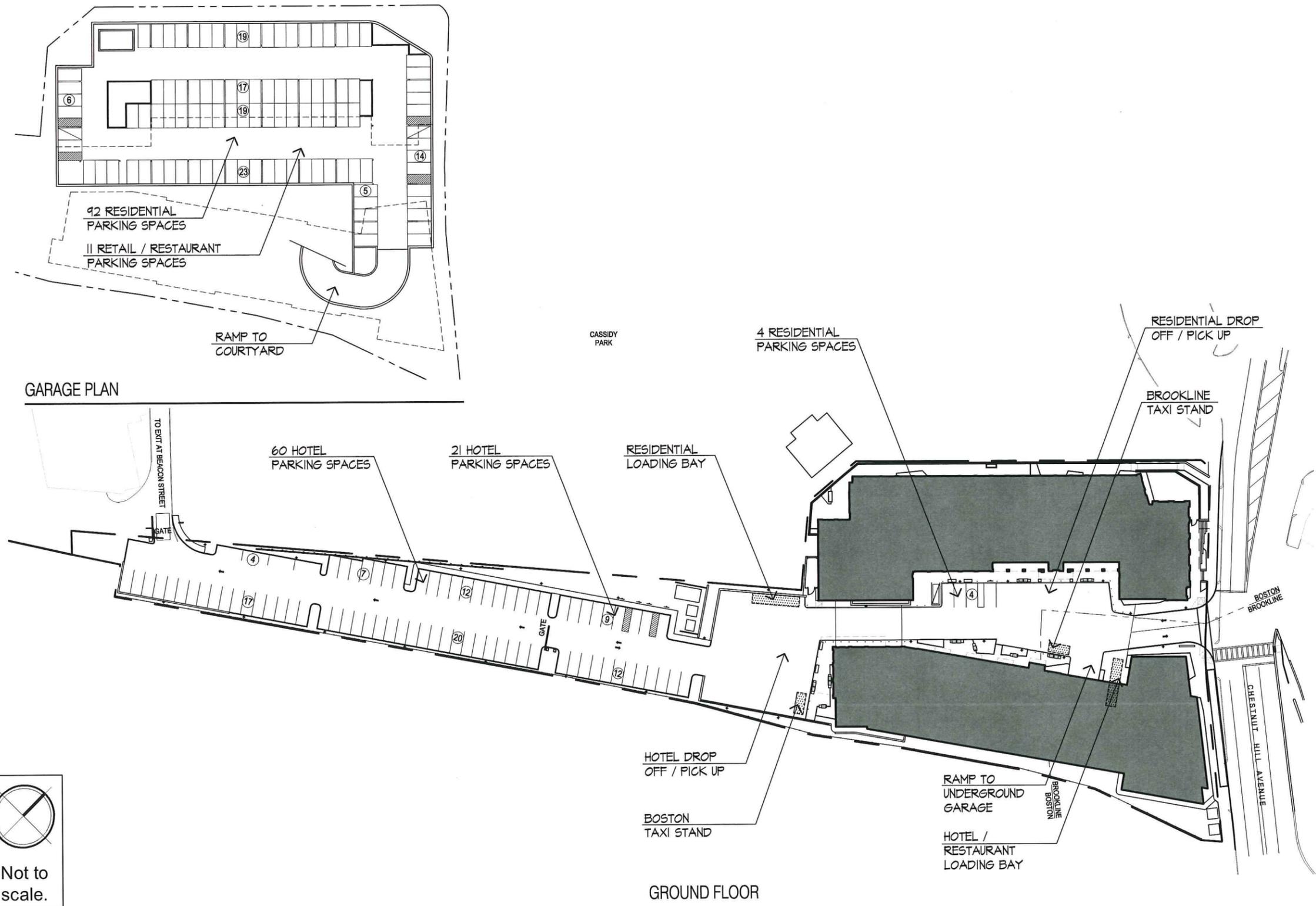


75-399 Chestnut Hill Avenue Boston/Brookline, Massachusetts



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**Figure 3**  
Vehicular Circulation - Exiting  
Source: ELKUS | MANFREDI



Not to scale.

375-399 Chestnut Hill Avenue Boston/Brookline, Massachusetts