



**TRAFFIC
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Transportation Analysis

**Coolidge Corner
Brookline, Massachusetts**

Prepared for:

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EXECUTIVE SUMMARY

Coolidge Corner is a dense yet vibrant commercial centre supporting an array of stores, offices, restaurants, and coffee shops, while numerous banks, churches, temples, schools, a cinema and a post office ensure that there are always people visiting or conducting business in the area. For many, this mix of uses and the dense residential neighborhoods that surround Coolidge Corner typify what is meant by “transit-oriented development,” with Coolidge Corner exemplifying many of the best qualities of urban living.

Located at the intersection of Beacon Street and Harvard Street, Coolidge Corner experiences significant volumes of vehicular traffic, much of which is through traffic. This intersection is also the location of a stop on the MBTA Green Line ‘C’ branch, with the ‘C’ branch running along the middle of Beacon Street. The MBTA’s Route 66 bus also passes through this intersection, connecting Cambridge with the Roxbury neighborhood of Boston. This well established transportation network makes Coolidge Corner easily accessible. However, this ease of access is often viewed as being responsible for some of the area’s greatest problems. Conflicts between the various transportation modes, congestion, a lack of parking, deficiencies in the transit system, along with the perceived burdensome nature of regulatory policies and requirements relating to transportation, are all seen as detracting from the area’s overall vitality and livability.

This study therefore sets out to more closely examine each mode of transportation as well as the relationship between transportation modes. It also seeks to identify the circulation system within the Coolidge Corner District. Since the scope of this transportation analysis was broad, each mode of transportation is examined at various levels of detail, with greater focus given to some areas, such as vehicular parking demand and parking availability. The purpose of the analysis is not only to provide a better understanding of the existing conditions and the pressures already experienced and likely to be experienced on the transportation network, but also to suggest improvements that can be made, both over the short-term and the longer term.

This analysis follows a relatively simple framework that was based upon the original Scope of Work issued by the Town’s Department of Planning and Community Development. The Scope of Work had the analysis divided into five individual tasks. The five tasks are as follows:

Task 1 – Establishment of Baseline and Trends

A detailed examination of all existing reports, studies and data available for the Coolidge Corner area was reviewed at the outset of the Analysis. Not only did this Task allow for a detailed compilation of materials pertaining to Coolidge Corner, but it also allowed for the identification of existing trends as well as the identification of those areas that lacked adequate existing data.

Task 2 – Land Use and Transportation Analysis

This was a continuation of the work already undertaken by the Bluestone Planning Group and involved examining three potential development sites within the Coolidge Corner area. For the various development scenarios advanced for each site by the Bluestone Group, a preliminary analysis of each scenario was undertaken to determine potential parking requirements, trip generation characteristics and potential impacts on the surrounding roadway network.

Task 3 – Circulation Analysis

This task allowed for a general overview of the circulation system within Coolidge Corner. The existing circulation system was reviewed in greater detail by transportation mode, with a number of findings and suggested improvements related to the overall circulation system being made.

Task 4 – Access and Parking Analysis

During the preparation of this Analysis the demand for and availability of parking within the District was by far the most talked about issue. There is a perceived shortage of parking within the District, and for many, this concern could only be solved by either the construction of additional municipal parking or private parking facilities. Task 4 of this analysis therefore involved a much more detailed study of existing parking trends, parking occupancy levels and parking demand, to better determine if a new municipal parking facility should be constructed or if better management of the existing spaces would suffice.

Task 5 – Final Transportation Analysis

This final task was essentially a compilation of Tasks 1 through 4 and involved making a series of recommendations for both the short term and long term. The recommendations are based on transportation mode and were derived from field observations as well as the common transportation themes for Coolidge Corner that had been advanced in the Town's Comprehensive Plan.

The various recommendations set forth in this Analysis will allow the Town to advance a number of simple improvements to the transportation network at relatively little cost. The Analysis will also bring attention to some of the existing policies or regulations that either directly or indirectly impact the transportation network within the District. Finally, it will examine a number of longer term, more expensive improvements that can be undertaken or explored in greater detail as funds permit. It is anticipated that this Analysis will provide the data and insight needed to assist Town officials, the Coolidge Corner District Planning Council, and other interested parties in the decision-making process, especially when it comes to devising planning strategies and implementing policies and regulations for the Coolidge Corner District.

1 Introduction

The Brookline Comprehensive Plan 2005-2015 was prepared to provide a common vision for the future growth of the Town. The Plan recommends various actions that will help the Town achieve its preferred vision for the future and allow it to react to the various changes that will occur as it advances towards that vision. The Plan has the following nine subject areas or elements; Neighborhoods and Districts, Affordable Housing, Route Nine Corridor, Historic Resources, Natural Resources, Land Use and Housing, Economic Development, Transportation and Mobility, and Town, School and Cultural facilities.

Also within the Plan are a series of goals, policies, and strategies intended to provide a framework that will assist and guide local officials and other decision-makers in the implementation of the Plan. One such strategy within the Comprehensive Plan is the preparation of District Plans for those commercial centers and street corridors which experience high concentrations of development and activity, or which are likely to experience more intense development pressures. Coolidge Corner was identified as such a location in the Comprehensive Plan.

To further the development of the Coolidge Corner District Plan the "Coolidge Corner District Plan Overview and Proposed Approach" was prepared by the Town's Planning and Community Development Department in December 2005. Set forth in this document were the following goals which the District Plan hoped to achieve:

- A common vision for the district that resolves conflicting issues as much as possible based on the vision outlined in the Comprehensive Plan;
- Detailed evaluation and a neighborhood vision for sites that might possibly be developed in the commercial core in the next 5-10 years;
- Detailed evaluation of the likely future development of surrounding neighborhoods if no action is taken and alternatives that protect these neighborhoods;
- Regulatory tools such as zoning changes to help conserve neighborhoods and maintain a vibrant commercial core;
- Public actions that should be taken to help protect neighborhoods and encourage investment consistent with this vision; and
- Other potential tools available to the Town, residents and businesses to help achieve this vision.

A new Coolidge Corner District Planning Council was established to assist in the development of the District Plan for Coolidge Corner. The Council consists of Brookline residents and local business representatives working in collaboration with the Town's Planning and Community Development Department. The Council was established primarily to begin the process of developing the new District Plan and to help oversee and advise on the Plan's preparation. Input into the preparation of new permanent zoning for Coolidge Corner was a further purpose in the establishment of the Council.

To assist both the Planning and Community Development Department and the Coolidge Corner District Planning Council in this process, and to provide a better understanding of potential future development within the District, a consulting team was hired. Led by the Bluestone Planning Group, the team examined the development potential of three different sites within Coolidge Corner. The three sites selected were viewed by many as those most likely to be redeveloped in the near future, and as such the study would serve to raise awareness of the issues that may result from each site's redevelopment. This work, which has already been completed by the Bluestone Planning Group, will be

further advanced in this report, with respect to the impacts that each different development scenario will have on the local transportation network.

1.1 Purpose

The purpose of this study is not only to further advance the work undertaken by the Bluestone Planning Group for the three development sites, but it is also to provide a broader understanding of the transportation network and the various transportation modes within the District. The study explores not only the pressures already experienced and likely to be experienced on the transportation network, but it also makes recommendations for short term and longer term improvements to the transportation network. In addition, the study examines other impacts on transportation, such as zoning requirements and existing parking regulations and policies.

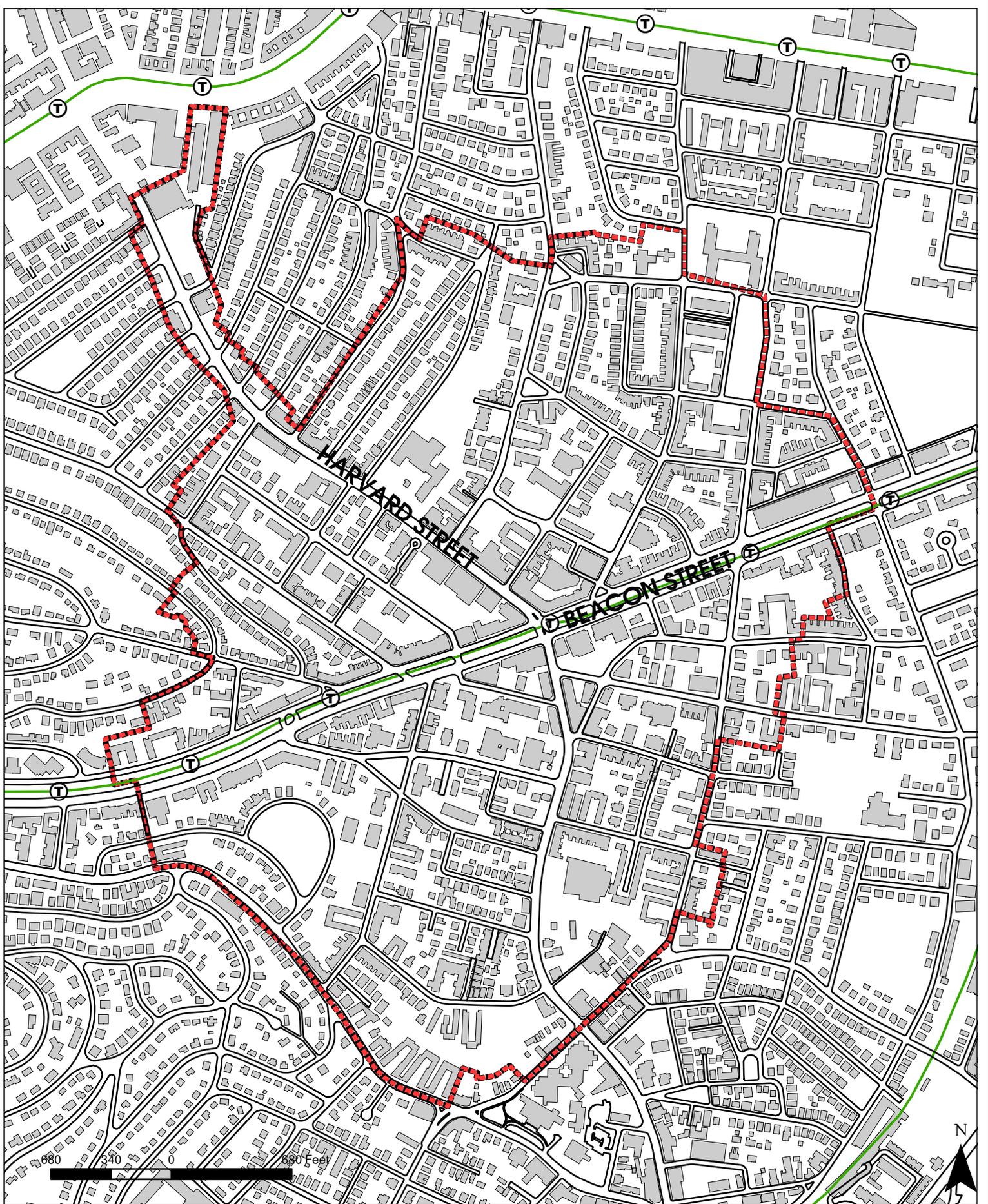
1.2 Coolidge Corner District

Coolidge Corner is considered by many to be the area that immediately surrounds the intersection of Beacon Street and Harvard Street. However, for the purposes of this study the area being examined is significantly larger. As illustrated in Figure 1, the Coolidge Corner District stretches from roughly Verndale Street to the North, School Street and Aspinwall Avenue to the south, by Powell Street and Marshall Street to the east, and to almost Fairbanks Street and Lancaster Terrace to the west.

The heart of the District remains the intersection of Beacon Street and Harvard Street. Historically, commercial uses have tended to concentrate at or near this intersection, taking advantage of the high volumes of vehicular and pedestrian traffic that can be found in the area. Residential uses in the Coolidge Corner District generally tend to be located just off these two main streets, where a mix of single-, two-, three- and multi-family residential developments can be found at various densities and scales. Also to be found in the Coolidge Corner District, but to a lesser extent, are institutional uses; such as churches, temples and schools.

The Coolidge Corner District represents the largest concentration of retail commercial businesses in the Town, with just over 42%* of the total, the majority of which are locally or regionally owned. Overall, Coolidge Corner holds a combination of destination and service businesses, with over 65%* of the businesses in the District service-oriented. A host of shops, banks, and restaurants as well as a supermarket, Post Office, movie theater and hotel can all be found within the District. The District is considered by many to be Brookline's downtown.

* Coolidge Corner District Plan, Overview and Proposed Approach, December 2005



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COOLIDGE CORNER DISTRICT BOUNDARY
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Figure 1

1.3 Consistency With 2005-2015 Comprehensive Plan

As outlined on Page 34 of the Town's Comprehensive Plan, "District and neighborhood plans need to be consistent with the goals and policies outlined in the Comprehensive Plan." Since this Transportation Analysis will guide the creation of the transportation and parking section of the Coolidge Corner District Plan, it is imperative that this Analysis also be consistent with the Comprehensive Plan.

The Town's Comprehensive Plan for 2005–2015 was reviewed to establish all relevant aspects of the Plan in relation to transportation policies both for the Town, and more specifically for Coolidge Corner. This review of the Comprehensive Plan revealed a number of common themes. These themes, in conjunction with the Scope of Work devised by the Town's Office of Planning and Community Development, as well as input from that Department, the Department of Public Works, the Coolidge Corner District Planning Council, Coolidge Corner merchants, residents, the MBTA and others, have all been used in the preparation of this Transportation Analysis.

The themes outlined within the Comprehensive Plan, which helped form the structure of this Transportation Analysis, are as follows:

- Zoning Changes and Development Incentives
- Transportation Demand Management
- Transit Oriented Development
- Transportation Management Associations
- Parking Supply and Demand
- Bicycle and Pedestrian Facilities and Connections
- Massachusetts Bay Transportation Authority (MBTA)

Each of these themes is explored in greater detail throughout this Analysis, and where appropriate, specific recommendations for implementing policies and strategies set forth in the Comprehensive Plan have been made.

1.4 Scope of Work

The Scope of Work for this Transportation Analysis, prepared by the Town's Department of Planning and Community Development, establishes five individual tasks to be completed. These tasks have been developed to be consistent with the Comprehensive Plan and to more fully address the relevant strategies for the Coolidge Corner District as set forth in the Comprehensive Plan.

However, the tasks outlined are not simply restricted to addressing the strategies and policies set forth in the Comprehensive Plan. For example, the Department of Planning and Community Development has identified three potential development sites for a detailed review of parking requirements, the impact such requirements have on development, and the impacts of development on the surrounding transportation network. In addition, the Department also requested a more detailed analysis of the public parking supply within the Coolidge Corner District. Better understanding the current supply and demand for public parking would identify any existing parking management problems and allow for suggested improvements relating to the parking supply.

The format of this Analysis follows the same five tasks outlined in the Scope of Work prepared by the Town's Planning and Community Development Department. Relevant policies and strategies from the Comprehensive Plan are also addressed under the appropriate task, while the Analysis concludes with a series of findings and recommendations, including suggested quick-fix, low-cost improvements that can be

carried out in the short term, as well as more expensive, more desirable improvements that could possibly be carried out over the longer term.

The five Tasks around which this Analysis has been prepared are as follows:

Task 1 – Establishment of Baseline and Trends

Task 2 – Land Use and Transportation Analysis

Task 3 – Circulation Analysis

Task 4 – Access and Parking Analysis

Task 5 – Final Transportation Analysis

2 Establishment of Baseline and Trends

An extensive data collection effort was undertaken to better understand the existing conditions within Coolidge Corner, to ascertain any existing trends, and to be aware of any improvements that are either under construction or proposed within the District. The age and detail of the data varies significantly, with some of the reports reviewed, such as the 1997 Beacon Street Study, undertaken almost ten years ago. Other data are however much more recent, for example, the detailed parking space inventory in this report is based on data collected from September 2006 through January of 2007. All of the reports, studies and data analyzed are referenced in Appendix A of this report.

In reviewing the data collected a number of common categories emerged. This section of the report has been broken into these common categories with the key findings in each presented. The locations and categories reviewed are as follows:

- Beacon Street
- Harvard Street
- MBTA services and facilities
- Bicycle routes, facilities and connections
- Pedestrian facilities and connections
- On-street and off-street parking
- Other transportation modes
- Crash Data

2.1 Beacon Street

Beacon Street in Brookline is 2.7 miles in length and averages approximately 160 feet in width. A portion of Beacon Street runs through the heart of the Coolidge Corner District in an east west direction, connecting downtown Boston with Newton Centre and points beyond. It is the largest and most traveled street within the study area*. Classified as an urban arterial it serves many users, including; automobiles, bicyclists, pedestrians, and both light-rail and buses. Throughout its length Beacon Street is bordered by various commercial, office, institutional and residential uses.

Reconstruction

The street is currently undergoing major reconstruction, with the reconstruction work commencing in April of 2006 and expected to last approximately three years. The reconstruction work includes, but is not limited to; new pavement, pavement markings, signage and street furniture, as well as new street lighting and increased landscaping. Enhancements to pedestrian and bicycle facilities are also proposed, with the various upgrades and design changes to the street layout all geared towards improving the operational efficiency of the street.

Traffic signal improvements are a major component of the reconstruction project. A new interconnected traffic signal system will replace and expand the existing signal system, with the new signal equipment designed to improve operations by coordinating movements between vehicles, the MBTA trolleys, bicyclists and pedestrians.

* The 1997 Beacon Street Corridor Design Report had a weekday Average Daily Traffic (ADT) volume of 35,740 vehicles for Beacon Street E. of Harvard Street. The study also projected an annual 1% increase in traffic over 10 years; the 2006 volumes would therefore be approximately 40,000 vehicles per day.

This new closed-loop traffic signal system allows for better traffic signal coordination and queue length management by having flexible traffic signal timing patterns based on traffic demands. This system will reduce unnecessary wait times for vehicles using Beacon Street, while also providing additional signal timing for the MBTA 'C' line trolleys.

Within the Coolidge Corner District the following intersections are included in the new closed loop traffic signal system, with the existing traffic signal equipment either upgraded or replaced, or new signal equipment installed where none presently exists:

- Beacon Street at Summit Avenue
- Beacon Street at Centre Street
- Beacon Street at Harvard Street
- Beacon Street at St. Paul Street
- Beacon Street at Kent Street/Powell Street.
- Beacon Street at Lancaster Terrace (Pedestrian Signal)
- Beacon Street at Fairbanks Street (Pedestrian Signal)
- Beacon Street at Marion Street
- Beacon Street at Pleasant Street
- Beacon Street at Charles Street
- Beacon Street at Winchester Street

In addition to the signal improvements proposed along Beacon Street, four additional intersections in the Coolidge Corner District, located just off of Beacon Street, are also to be upgraded as required and included in the new closed loop signal system. The four intersections are as follows:

- Longwood Avenue at St. Paul Street
- Carlton Street at Monmouth Street
- Harvard Street at Babcock Street
- Babcock Street at the Fire Station

When complete, the proposed Beacon Street design establishes two delineated vehicular travel lanes and parallel parking at the curb on both sides of Beacon Street, as well as separated angle parking modules in the center median, adjacent to the MBTA reservation area. These parking modules are separated from the two delineated vehicular travel lanes and will provide a safe waiting and maneuvering area for vehicles parking at the median. The proposed layout will also provide a waiting area for those vehicles waiting to park at the curb.

The street will remain at approximately 160 feet in width after the reconstruction, with a typical cross-section of the street having a variable width sidewalk, an eight foot wide parking lane, two 10.6 feet travel lanes, a 30-34 foot reservation area, a 15 foot angle parking area, a 10 foot parking access lane, a three foot rumble strip, a 12 foot travel lane, a 10.6 foot travel lane, a six and one half foot bicycle lane, an eight foot parking lane and a variable width sidewalk.

Parking

The public parking supply along that section of Beacon Street which is located within the Coolidge Corner District will be affected by this reconstruction project. There will be some disruption and loss of parking as construction activities occur in the District, while there will also be a permanent loss of parking as a result of the reconstruction project.

For that portion of Beacon Street located within the Coolidge Corner District (just east of Lancaster Terrace and Fairbanks Street and extending to Powell Street and Kent Street), it is anticipated that 11 spaces will be lost as a result of the reconstruction project. The

existing number of parking spaces along this section of Beacon Street is approximately 419, which includes both metered and un-metered spaces. Once the reconstruction project is complete the number of spaces would be reduced to approximately 408.

2.2 Harvard Street

Harvard Street in Brookline is approximately 1.4 miles in length and averages approximately 52 feet in width. Running through the heart of the Coolidge Corner District, its intersection with Beacon Street is considered by many to be the commercial hub of the District and the Town. Classified as an urban arterial it carries high volumes of traffic* in a north south direction between Allston in Boston and Brookline Village, and connects with points beyond. Throughout its length Harvard Street is bordered by various commercial, office, institutional and residential uses.

Within the Coolidge Corner District Harvard Street has generally one vehicular travel lane in each direction, though at numerous locations it flares in width to provide left turn storage bays. The width of the street also allows for a parking lane on each side of the street, while it is the only street within the District to have a bicycle lane. This bicycle lane runs intermittently from where the Town line meets the Allston neighborhood of Boston to approximately School Street, at the southern boundary of the Coolidge Corner District.

The pavement and pavement markings along Harvard Street are generally in good condition, as are the variable width sidewalks. The signal equipment, street lighting and street furniture along the street are also in good condition, with the Town completing a major reconstruction of the street in 2004.

2.3 Massachusetts Bay Transportation Authority (MBTA)

The MBTA operates both subway and bus service in Coolidge Corner. The Cleveland Circle or 'C' Branch of the Green Line runs east-west along Beacon Street from downtown Boston to Cleveland Circle, while the MBTA's Route 66 bus runs north-south on Harvard Street between Harvard Square and Dudley Station. Both services are extremely popular and are amongst the busiest in the MBTA system. The Coolidge Corner stop on the 'C' Branch ranks second only to the Harvard Avenue stop on the 'B' Branch in terms of total surface passenger boardings on the Green Line, while the Route 66 bus is one of the most utilized bus routes in the MBTA system, ranking #6 in MBTA bus ridership.**

MBTA: Trolley – Light Rail

The most recent ridership data for the Green Line 'C' Branch provided by the Central Transportation Planning Staff (CTPS) dates back to 1995. The MBTA anticipates that once the new automated Charlie Card system becomes fully operational, accurate ridership data will be easier to collect and made available more frequently. Although now over ten years old, the 1995 data indicated that the total inbound and outbound daily passenger boardings on the 'C' Branch of the Green Line were 14,522, with 3,449 of these passenger boardings occurring at Coolidge Corner, making it the busiest stop for boardings on the 'C' Branch. Approximately 3,690 daily alightings occurred at Coolidge Corner, also making it the single busiest stop for alightings on the 'C' Branch.**

* A traffic study for the 164 Harvard Street development conducted in 2000 reported Harvard Street as having an Average Daily Traffic (ADT) volume of almost 18,000 vehicles.

** Based on 1995 Green Line 'C' branch ridership and 2004 Route 66 ridership data provided by Central Transportation Planning Staff.

The Green Line, like the rest of the MBTA system, has also just transitioned to an automated fare collection (Charlie Card and Charlie tickets) system, with passengers encouraged to purchase tickets in advance. For those who do not avail of the new system there is a hefty surcharge on the cash fare over the ticketed fare. Bay State Foods and Johnnie's Foodmaster, both located on Beacon Street, sell the new Charlie Card and Charlie Tickets. There are no plans to have ticket vending machines at the surface Green Line stops on the 'C' Branch.

The MBTA is considering a number of other improvements to the 'C' Branch, though design and operational constraints will first have to be overcome. The possibility of operating three-car trains as opposed to two car trains along Beacon Street is one such improvement, though with each car being approximately 73 feet long, and with a three-car train being approximately 225 feet long, trains of this length when stopped would partially block at least one intersection on the outbound side.

A further improvement being considered by the MBTA is the introduction of mini-high platforms for wheelchair accessibility. These platform modifications are 37 feet long and are required to be positioned alongside the first car of a train set. Although desirable, installation of these mini-high platforms could result in a loss of parking and landscaping, they also raise aesthetic concerns.

Independent of the improvements to be undertaken by the MBTA, other work planned and scheduled for the Beacon Street corridor will lead to improvements in service. For example, the closed-loop traffic signal system being installed as part of the Beacon Street reconstruction project will result in coordinated signal timings, which in turn will result in more efficient trolley movements.

The new closed-loop traffic signal system should also reduce conflicts at grade crossings with the reconstruction only allowing left-turn vehicles on Beacon Street (inbound or outbound) to cross the tracks during a protected phase or under STOP sign control from an exclusive turn lane. Additionally, the new traffic signal system, which is based on traffic demands, will allow unused signal timing to be given to through traffic on Beacon Street, thereby allowing the MBTA trolley to move more frequently.

MBTA: Bus

The only bus service provided by the MBTA through the Coolidge Corner District is the Route #66. Ridership numbers produced by the CTPS where from the spring of 2004. As previously mentioned, this bus route is ranked #6 in ridership in the MBTA system, with a total daily ridership of 11,103 in both the inbound and outbound directions. In Coolidge Corner at the Harvard/Beacon Street intersection on the inbound direction (Cambridge to Roxbury) there were approximately 312 daily boardings and 349 daily alightings. At the same intersection for the outbound direction (Roxbury to Cambridge) the total number of daily boardings and daily alightings was very similar, with approximately 321 boardings and 328 alightings.*

Although the MBTA acknowledges that the Route 66 bus has schedule reliability problems, these problems are attributed to the long length of the route, the high ridership numbers, and its alignment through heavily congested areas. Reliability problems experienced within Coolidge Corner are viewed by the MBTA as the same as those experienced elsewhere on the route. Having recently added compressed natural gas

* Based on 2004 Route 66 ridership data provided by Central Transportation Planning Staff.

(CNG) and environmentally friendly buses to the route, the MBTA has no immediate plans to make any further changes to the route, the fleet or schedule.

2.4 Bicycle Routes, Facilities and Connections

No recent counts of cyclists in the Coolidge Corner area are available, though the CTPS undertook a series of counts of cyclists at the intersection of Beacon Street and Harvard Street during the 1980's and 1990's (Table 1). The available counts were undertaken between the hours of 7:45a.m. and 9:00a.m. and 4:00p.m. and 6:15p.m. sets forth the counts obtained by the CTPS staff.

In terms of bicycle amenities, Harvard Street is currently the only street within the Coolidge Corner District to have a designated bicycle lane. This bicycle lane, which is approximately five feet in width, runs intermittently from where the Town line meets the Allston neighborhood of Boston to approximately School Street, at the southern boundary of the Coolidge Corner District.

As part of the Beacon Street reconstruction project a designated bicycle lane will also be located on Beacon Street. This 6.5 foot wide bicycle lane will be located adjacent to the parallel parking lanes on Beacon Street, where there is sufficient width. Unfortunately this bicycle lane will also not be continuous, and in those sections of Beacon Street which are narrower, bicyclists will continue to share the street with traffic, as is the current practice. Frequent "Share the Road" signage and pavement markings as a result of the reconstruction project will better alert drivers to the presence of cyclists. Although clustered bike racks will be installed as part of the Beacon Street reconstruction, there are other areas within the Coolidge Corner District equally in need of bicycle racks. It is not uncommon within the Coolidge Corner District to see bicycles chained or locked to street lights, trash barrels, benches and parking meters.

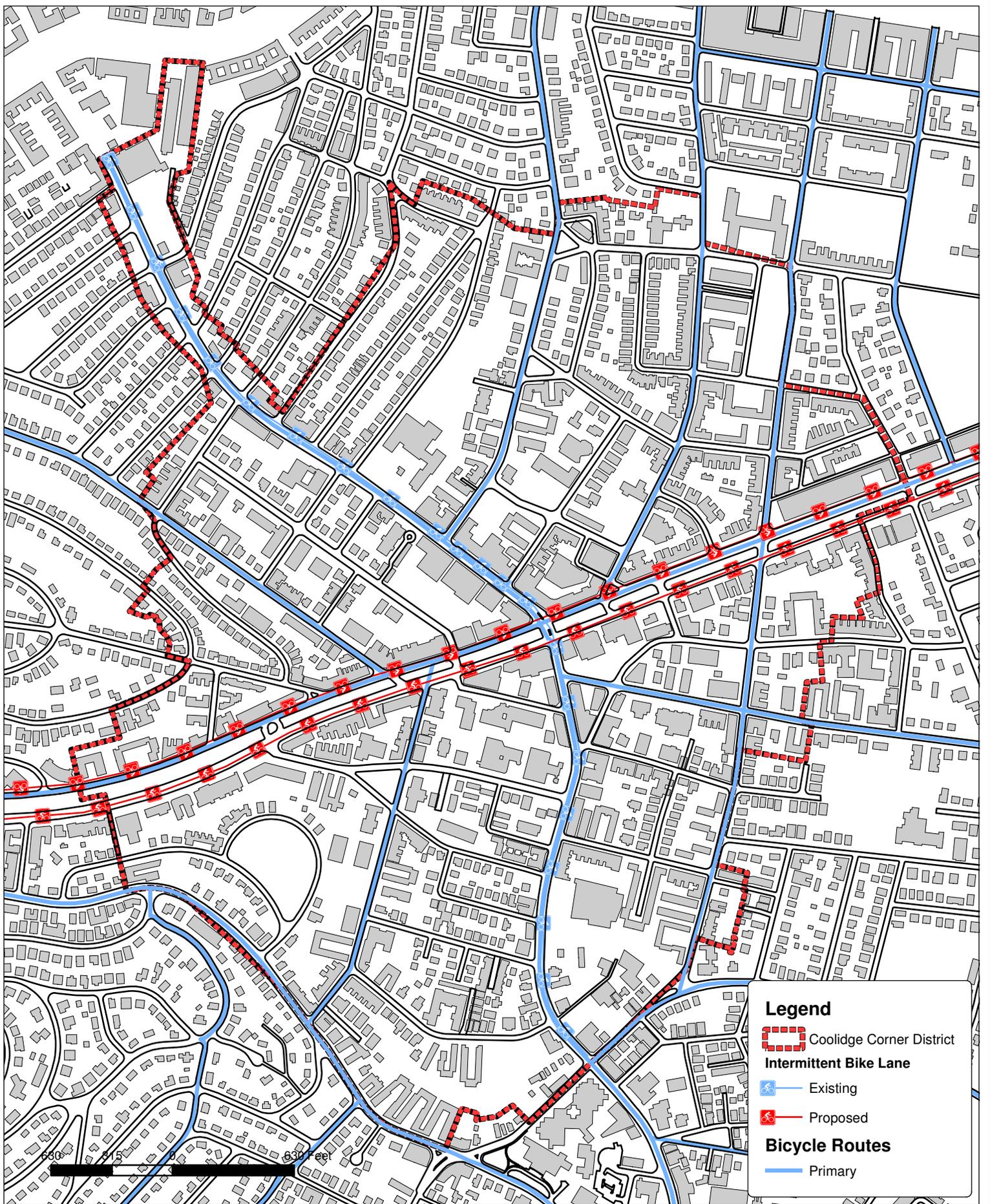
Since an existing Town bylaw prohibits bicyclists from riding on the sidewalks in commercial areas such as Coolidge Corner, it is important that bike routes within the District are easily identifiable and safe. The existing Harvard Street bicycle lanes as well as the proposed Beacon Street bicycle lane, complement multimodal use in the District. A number of recommended routes in concert with those existing or planned are available on the Town website (Figure 2).

Finally, although Section 6.05 of the Town's Zoning Bylaw requires that bicycle parking be provided, the requirement is strictly for residential development and is only applied at the rate of 1 space per 5 residential units. The Board of Appeals has the discretion to require more or less bicycle parking depending on the project. Revisions to the bicycle parking requirements of the zoning bylaw were proposed by the Bicycle Committee in 2002, though these revisions were never officially adopted as part of the bylaw.

Table 1 - Cyclist Counts at Intersection of Beacon Street and Harvard Street (CTPS)

STREETS	TIME AND DATE OF BICYCLE COUNTS					
	7:45-9:00a.m. 09/24/80	7:45-9:00a.m. 09/24/85	7:45-9:00a.m. 09/26/90	7:45-9:00a.m. 05/28/97	4:00-6:15p.m. 10/11/95	4:00-6:15p.m. 05/28/97
Harvard St. NB to Harvard St. NB	13	16	18	16	68	79
Beacon St. WB to Harvard St. NB	1	4	2	3	18	7
Beacon St. EB to Harvard St. NB	11	2	11	6	8	7
Harvard St. SB to Harvard St. SB	43	39	39	48	35	62
Beacon St. WB to Harvard St. SB	4	16	6	5	17	7
Beacon St. EB to Harvard St. SB	53	4	25	34	8	3
Harvard St. SB to Beacon St. EB	3	3	8	8	11	11
Harvard St. NB to Beacon St. EB	1	28	4	1	3	2
Beacon St. EB to Beacon St. EB	109	64	58	75	28	27
Harvard St. SB. to Beacon St. WB	2	3	3	2	4	8
Harvard St. NB to Beacon St. WB	1	7	2	2	33	20
Beacon St. WB to Beacon St. WB	9	13	6	0	68	74
TOTAL	250	199	182	200	301	307

Data provided by CTPS



Legend

-  Coolidge Corner District
-  Intermittent Bike Lane
-  Existing
-  Proposed
- Bicycle Routes**
-  Primary

PREPARED BY
TRAFFIC SOLUTIONS, LLC
 Planning, Permitting, and Design
 TWO CENTER PLAZA, SUITE 700
 BOSTON, MASSACHUSETTS 02108

PREPARED FOR:



BICYCLE MAP
COOLIDGE CORNER
BROOKLINE, MA

Figure 2

2.5 Pedestrian Facilities and Connections

Although no pedestrian counts are available for the District, one only has to visit Coolidge Corner to observe the high levels of pedestrian activity. The majority of this activity is focused around the Beacon and Harvard Street intersection and a few blocks in either direction from the intersection. This area is busy both day and night, with many people arriving and departing by either the MBTA, foot, car or bicycle.

Pedestrian facilities and connections within Coolidge Corner are generally in good condition and were extensively studied in the June 2003, "Commercial Areas Streetscape Master Plan" prepared by CBA Landscape Architects. The Master Plan drew attention to both the positive and negative aspects of pedestrian facilities within Coolidge Corner, and made a number of recommendations as to improvements that could be made, many of which have yet to be implemented.

Two of the key recommendations within the Master Plan were the upgrading of the pedestrian alleys connecting the Centre Street parking lots with Harvard Street, and the creation of a pedestrian-oriented public space within the Centre Street parking area. It should be noted however that these and many of the other improvements recommended within the Master Plan were cosmetic in nature, further suggesting that the underlying infrastructure and facilities were in good condition. That being said, the improvements recommended should in no way be dismissed as they would certainly make for a more pleasant, interesting and secure environment for pedestrians.

Similar to the bicycle facilities in the Coolidge Corner District being improved as a result of the Beacon Street reconstruction project, pedestrian facilities will also be greatly enhanced. The existing pedestrian signals at both Lancaster Terrace and Fairbanks Street will be upgraded while new traffic signals with controlled pedestrian crossings will be installed at Marion Street, Pleasant Street and Charles Street. Concurrent pedestrian phasing at these and other signalized intersection locations will be utilized to minimize disruption to traffic flow in the corridor and to maximize the amount of time provided for pedestrian crossings.

In addition to the improved signalized pedestrian crossings a number of other design changes to Beacon Street will also benefit pedestrians. Code compliant sidewalks with curb-cuts for improved accessibility will be constructed, while neckdowns (extended sidewalks) will be installed at corners to reduce crossing distances and provide better visibility. Greater attention will also be given to the placement of pedestrian amenities such as benches, trash receptacles and newsrack stands, to ensure optimum usage with minimum clutter.

Harvard Street, which is the other major street running through the District underwent similar improvements in 2004. The sidewalks along Harvard Street have decorative brick paving bands, new benches, trash receptacles, light fixtures, planter pots and bike racks. Pavement markings, neckdowns and upgraded signal equipment were also installed, making it easier and safer for pedestrians to negotiate this busy street.

2.6 On-street and Off-street Parking

There are six existing municipally owned parking lots located within the Coolidge Corner District. Within these six municipal parking lots there are approximately 341 parking spaces, with various restrictions limiting the duration and type of parking permitted. For example, during the daytime hours the Centre Street West Lot is designated for use by employees of the Coolidge Corner area who participate in the Town's Commercial Permit Parking Program (except Thursday's when the Farmers Market is in session), while at night the Lot is used for the Resident Overnight Parking Program. Programs such as the

Resident Overnight Parking are enormously popular, especially within the Coolidge Corner District, with 257 or (83%) of the 309 overnight spaces rented in the Town located within the District. Similarly, 56 (74%) of the 76 Guest Overnight Parking spaces in the Town are also located within the Coolidge Corner District.

As well as the municipally owned lots, public parking is also available in the parking garage of the Marriott Hotel located on Webster Street. An agreement with the Town, reached as part of the hotel's approval for development, required that sixty (60) spaces within the hotel's one hundred thirty (130) space garage be made available for public parking during the day at the current public parking rates (\$0.50 per hour) for the first 3 hours. Up to sixty (60) spaces must also be made available for rental for overnight parking.

On-street metered parking is also available in the District. Within the District there are approximately 740 metered on-street spaces, the majority of which are located in either the center median or the parking lanes along either side of Beacon Street, and the parking lanes along either side of Harvard Street (Table 2).

Parking spaces in privately owned lots are also widely utilized by Brookline residents, who avail of such spaces primarily to meet their overnight parking requirements. The rental of these spaces normally occurs on a monthly basis and is privately negotiated with landowners, though the Town assists by disseminating information about available spaces, locations and rental rates through its website. Those property owners renting out parking spaces to anyone other than a tenant under this program are required to obtain an Open Air Parking Space License from the Town. Approximately 338 spaces are available within the Coolidge Corner District through this program.

In addition to the private rental of parking spaces, a private parking facility at 209 Harvard Street makes spaces available at an hourly rate. This facility has approximately 32 parking spaces, with a \$5 fee for the first hour and a \$1 fee for each half hour thereafter, up to a maximum of \$20.

Table 2 - Location and Number of Metered Parking Spaces

Name/Location Parking Lots	No. of Spaces	Name/Location Parking Meters	No. of Spaces
Center Street West	56	Beacon Street	367
Center Street East	143	Harvard Street	255
Fuller Street	50	Pleasant Street	30
Babcock Street	65	Centre Street	21
St. John Street	14	Babcock Street	16
Webster Street	13	John Street	24
Marriott Courtyard Hotel	60	Longwood Avenue	6
		Charles Street	4
		Webster Street	7
		Sewall Avenue	10
Total	401		740

Although there is an overnight on-street parking ban in effect in the Town (except at a small number of permit locations), on-street parking is allowed during the day for both residents and visitors on all metered and un-metered streets. Visitors and town residents can presently park their vehicle for up to two hours on any un-metered street where parking is permitted.

A new resident permit parking program that is being considered by the Town would allow residents who obtain a resident permit to park on a street in their neighborhood for as long as they like between 6AM and 1AM. Visitors who cannot obtain a permit and residents who choose not to obtain a permit would still be limited to the existing two hour on-street maximum. This program would be managed on a neighborhood basis using existing police precincts, i.e., a permit for one precinct could not be used in another precinct.

2.7 Other Transportation Modes

Taxi Cabs

There are currently five taxicab companies licensed to operate a total of 187 taxi cabs in the Town of Brookline. Within the Coolidge Corner District there are five taxi stands (Figure 3).

ZipCar

There are currently 18 Zip cars assigned to eight different locations within the Coolidge Corner District (Figure 3).

Brookline Elder Bus

Sponsored by the Brookline Council on Aging and West Suburban Elder Services, the Brookline Elderbus is a local bus service for senior citizens. The Elder Bus operates on a fixed-route and schedule (Figure 3), Mondays through Fridays, 9:00 a.m. to 3:45 p.m. The bus makes seven runs daily along the route, which includes the Brookline Senior Center, elderly housing sites, shopping areas and the Longwood Medical Area.

MBTA - The RIDE

The MBTA offers a special door-to-door handicapped accessible service for those senior citizens and handicapped passengers unable to ride conventional transit services. This service, known as "The RIDE," provides medical and non-medical transportation on a space available basis to many destinations, including adult day health centers. The program requires an application, which must be approved by a physician, nurse, or licensed social worker. When approved, an identification number is assigned to the client, who can then call and arrange in advance pick-up and drop-off services.

West Suburban Elder Services (WSES)

Special medical transportation services to out-of-town locations are available to Brookline seniors from West Suburban Elder Services (WSES). Residents must be registered with the WSES in order to utilize this service.

Brookline Elder Taxi Service (BETS)

The Brookline Elder Taxi Service (BETS), sponsored by Brookline Council on Aging, CDBG, and all licensed Brookline cab companies, is a coupon discount program (50% discount on cabs for low-to-moderate income Brookline residents) that allows eligible elders to buy coupon books worth \$10 for \$5. An individual must be 60 years of age or older and be a Brookline resident.

Home Escort and Linkage Program (H.E.L.P. Program)

Depending on worker availability, this program can provide limited transportation. Most workers charge \$12-\$13 per hour and must be retained for a minimum of two hours. This service can be arranged through the Brookline Council on Aging.

Springwell - Senior Medical Escort Program

Springwell subsidizes transportation to medical appointments, as well as offering volunteers to provide one-on-one assistance to elders who need someone to accompany them to their appointment. The most common types of available assistance are transportation to medical appointments and grocery shopping.

Springwell's medical program matches frail seniors with volunteers to drive and/or accompany them to medical appointments between 8:00 a.m. and 5:00 p.m. To be eligible, an individual needs to be age 60 or older, unable to get to medical appointments independently, and able to get in and out of the car with minimal assistance.

Brookline Senior Center Van

The Van provides door to door transportation (within the Brookline area) to the Senior Center for educational and social programs and activities. The van's hours of operation are Monday –Thursday, from 10 a.m. to 4 p.m.

2.8 Crash Data

Crash data were obtained from the Massachusetts Highway Department (MHD) for the latest available three year period (2003-2005) (Table 3).

Table 3 Coolidge Corner Crash Totals - 2002-2005

	Beacon St	Harvard St	Beacon & Harvard¹	Other	Total
2002	54	39	9	4	106
2003	59	51	10	5	125
2004	53	48	10	9	120
2005	92	62	11	10	175
Total	258	200	40	28	526
Average	64.5	50	10	7	

¹ The crashes in "Beacon @ Harvard" are the total number of crashes at the intersection. These crash values are not included in the Beacon Street or Harvard Street columns.

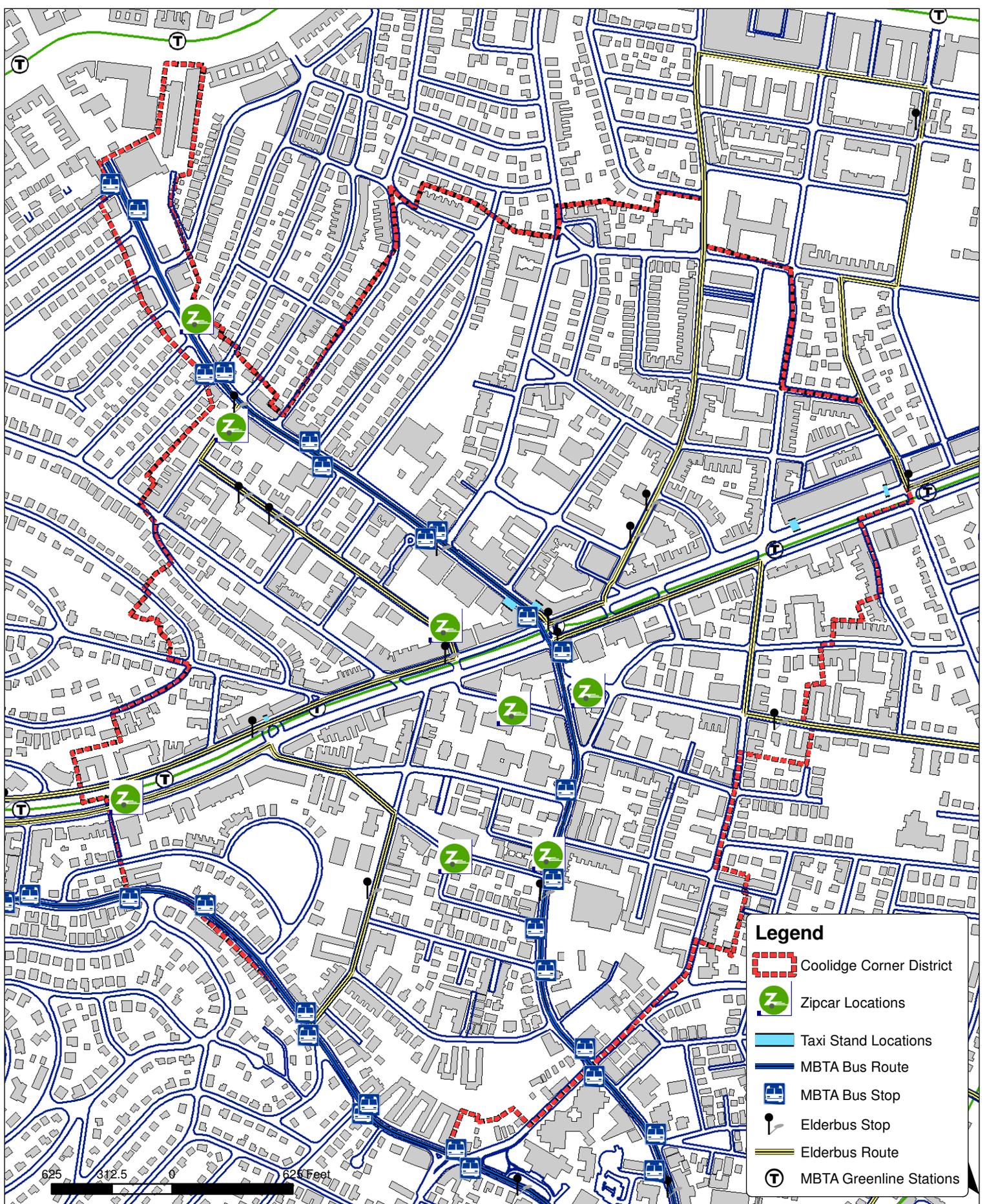
Beacon Street has the highest number of crashes followed by Harvard Street. All other streets in Coolidge Corner have a smaller combined crash total than each one of these streets. There are more crashes per year at the intersection of Beacon and Harvard Street than there are at all other Coolidge Corner Streets combined. It is worth noting that there was a 14% increase in total crashes between 2004 and 2005 recorded in Massachusetts. This can be explained primarily by changes in data entry procedures at the RMV that resulted in a greater number of operator-only reports being entered in CDS, not necessarily an increase in the number of operator-only crashes, or total crashes.

2.9 Summary Findings

- The reconstruction of Beacon Street will result in significant upgrades to the street's infrastructure and layout, and will undoubtedly improve how the street functions. However, the reconstruction will also cause significant disruption during construction, result in a loss of on-street parking, and only a portion of the street will have a designated bicycle lane.
- The pavement, pavement markings and street furniture within the District are generally in good condition. The Commercial Areas Streetscape Master Plan undertaken in 2003 made a number of suggestions for improvements to the Coolidge Corner streetscape. The majority of these suggested improvements have yet to be implemented or advanced beyond their preliminary design.
- Both the Green Line 'C' Branch and the Route 66 bus have extremely high ridership, with Coolidge Corner being an extremely popular stop. Fleet and schedule changes to improve service on both the 'C' Branch and Route 66 do not appear imminent, though a number of capacity and station/stop improvements are being considered.
- There are a limited number of bicycle lanes constructed or planned, while recommended bicycle routes tend to be poorly signed or marked. There is also a lack of bicycle parking facilities, while existing facilities may not be in optimum

locations. Current zoning requirements are limited and even discretionary when it comes to providing bicycle parking requirements and standards.

- Approximately 1,141 metered parking spaces are located within the District, both on-street and off-street (including Centre Street West lot and Marriott garage). Approximately 338 spaces in the District are available through the Town's Open Air Parking Space License Program, while an additional 32 spaces are available at hourly rates through a private parking facility at 209 Harvard Street. On-street parking during the daytime is likely to be more heavily used if the proposed Resident Permit Parking Program is adopted.
- A number of lesser known alternative modes of transportation operating within the District, such as but not limited to; ZipCar, the Elderbus and The RIDE.



3 Land Use and Transportation Analysis

A key component of this Analysis was to focus on three key development sites within the Coolidge Corner District and to identify and assess the potential impacts that different development scenarios for each site might place on the supporting transportation infrastructure. The analysis of these three sites is a continuation of the work already undertaken for the Town by the Bluestone Planning Group. The build-out scenarios for each site are illustrated and described in more detail within the June 2006 Bluestone study, entitled "Coolidge Corner – Alternative Development Scenarios for Three Sites." The three sites (Figure 4) are:

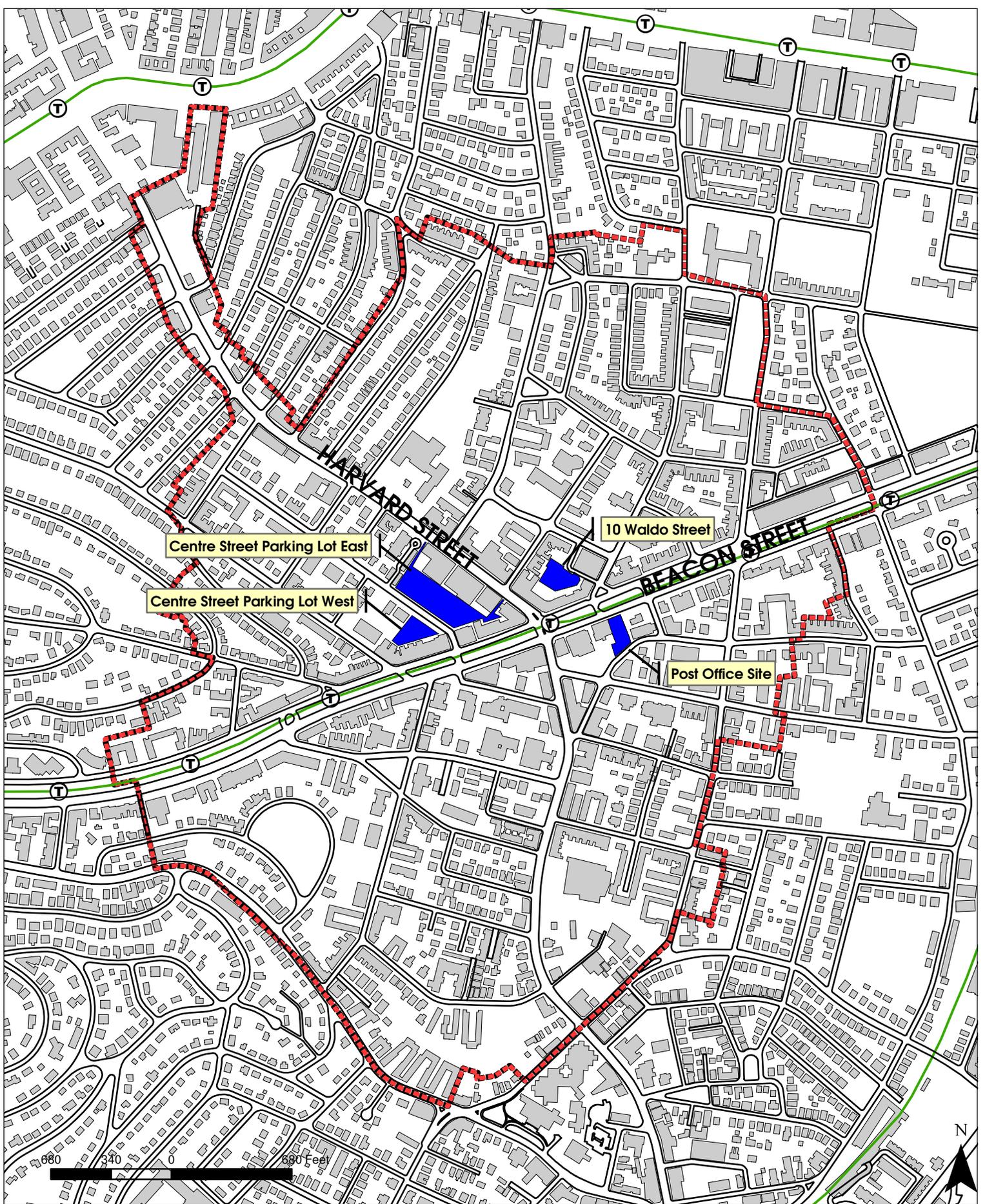
- The Beacon Street Post Office
- 10 Waldo Street, and
- The Centre Street Parking Lots

Zoning

All three of the development sites are currently located within the Coolidge Corner Interim Planning Overlay District (CCIPOD). The CCIPOD was approved at a Town Meeting in November of 2005. According to the Comprehensive Plan, "[t]he interim zoning regulations ... established during the study period will ensure that an area is not subjected to inappropriate development proposals. After ... District Plan is complete, the interim zoning might be replaced with new, permanent zoning consistent with the findings of the planning study."

The underlying zoning for the three sites is G-1.75 (CC) Coolidge Corner General Business, though a smaller portion of the 10 Waldo Street Site is located within the M-2.0 Apartment House district. The G-1.75 (CC) district allows for a wide variety of business and residential uses, though a special permit is generally required from the Town's Board of Appeals. The M-2.0 district is primarily a residential zoning district that allows for higher density residential developments. Based on this underlying zoning, and the probability that a larger or higher density development will be proposed at each of the three sites, zoning relief in the form of a special permit (section 4.01.3 of the Zoning Bylaw) would be required.

With at least one special permit likely to be required for each development scenario, the Board of Appeals in its review of a project would consider, amongst other things; the design and number of on-site parking spaces as well as access to and from those spaces, the adequacy of abutting streets and intersections to accommodate additional traffic, measures to promote alternative means of transport such as cycling and walking, the proximity of transit, the location and number of loading facilities, and the parking supply and demand in the immediate neighborhood. This report addresses these and other factors related to the two development scenarios proposed by the Bluestone Planning Group for each of the three development sites. The report also draws attention to other transportation related issues that may arise, regardless of what final development scenario may be advanced for any of the three sites.



3.1 Beacon Street Post Office Site

Background

The United States Postal Service (USPS) building located on the south side of Beacon Street is Brookline's main Post Office. Owned and operated by the USPS, the front portion of the single-story building operates as a retail post office outlet, while the rear portion is a supporting mail distribution/sorting/delivery facility. The rear of the site, which backs onto Sewall Avenue, is where truck loading docks associated with the distribution/sorting/delivery facility are located. The site does not provide off-street parking for either patrons or employees. The USPS has already indicated that the site and building are too small to provide adequate service and as such they are seeking a larger alternative location.

The Post Office site is approximately 17,946 square feet. In their assessment of the redevelopment potential of the site the Bluestone Planning Group determined that any successful redevelopment would in all likelihood require that the site be combined with adjacent property(ies). The creation of a larger land parcel would not only support new development, but it would also allow for the associated on-site parking that would be required. Bluestone also determined that any parking provided on-site would have to be placed underground. Because of the combination of underground parking and the costs associated with acquiring the properties located adjacent to the Post Office, higher development densities would be required on the site to offset these higher costs.

In their final assessment of the Post Office site the Bluestone Planning Group developed two alternative development scenarios for the site. Each scenario envisioned an expanded site that included both the Post Office site as well as the two parcels located to the immediate west of the Post Office, for a total parcel size of approximately 40,809 square feet. The Post Office site as a stand alone project was not examined, as a preliminary assessment by the Bluestone Group determined it was unlikely to be a viable development project.

Surrounding Roadway Network

The Post Office site is immediately abutted to the north by Beacon Street, by Sewall Avenue to the south and by abutting properties to the east and west, with Charles Street being only one lot removed to the east and Harvard Street only four lots removed to the west. At present vehicular access to the site can only be gained via Sewall Avenue.

Classified as an urban arterial, Beacon Street runs in a west to east direction immediately in front of the site, towards downtown Boston. After reconstruction Beacon Street will have two through travel lanes in this direction, though the roadway will also flare to provide an exclusive left turn storage lane for vehicles doing a U-turn on Beacon Street. A parking lane will remain in front of the site while new push button activated pedestrian traffic signal equipment will be installed to facilitate pedestrian crossings from both Pleasant Street and Charles Street. This new signal equipment will be part of the closed-loop signal system previously described.

Classified as a local street, Sewall Avenue connects Harvard Street with Kent Street. From Harvard Street to Longwood Avenue, Sewall Avenue has one travel lane in each direction, while from Longwood Avenue to Charles Street, Sewall Avenue becomes a one-lane, one-way street. It is along this section of Sewall Avenue that the Post Office site directly abuts. It is at the intersection of Sewall Avenue with Charles Street where Sewall Avenue once again becomes a two-way street. Charles Street is a short one-way

street that connects with an unsignalized intersection at Beacon Street, under "STOP" sign control.

Sewall Avenue is approximately 28 feet in width, with on-street parking permitted on the northerly side of the street only, the side closest to the Post Office site. Access to the site is presently gained via an oversized curb cut on Sewall Avenue. This curb-cut is necessary to accommodate the loading and unloading of mail trucks using the mail sorting facility located to the rear of the Post Office building.

Alternative Development Scenarios

Two similar mixed-use development options were explored for the expanded Post Office site. Both scenarios included one or more uses (housing, offices or hotel) on the upper floors, with one or two levels of retail space along Beacon Street on the lower floors. Both options also had a pedestrian passageway connecting Beacon Street to Sewall Avenue, as well as a civic plaza fronting on to Beacon Street and a courtyard backing on to Sewall Avenue.

For each development option the footprint of the building is essentially the same. The only difference between the two Options is that in Option 1 only one level of underground parking is provided, while in Option 2 two levels of underground parking are provided. The second level of underground parking in Option 2 allows for a more intense level of development, with the building height going from 5 stories (Option1) to 7½ stories, and the square footage increasing from 48,000 SF (Option1) to 93,750 SF.

Although the Bluestone Planning Group found that Option 2 was probably more financially viable than Option 1, both Options have been reviewed to determine their potential impacts on the local transportation network.

Option 1

Option 1 involves the construction of a mixed-use building of approximately 48,000 SF (Figure 5). The building would have 20,000 SF of retail space and 28,000 SF of residential space, or approximately 22 residential units (Table 4). The parking required for such a build-out according to the Bluestone Planning Group is 72 spaces, while it is estimated that 71 spaces could be provided in the single level of underground parking proposed as part of this scheme. Access to and from the proposed underground parking structure in this Option would be gained via Sewall Street.



**Figure 5 Post Office Development - Option 1 –
Plan View (top), from the south (bottom left), from the north (bottom right)**

Table 4 Post Office Site Development Program - Option 1

USES	Sf/fl	Unit Count		# Stories	Total SF	Assumed Required Parking	Parking Provided
		Units/FL	Total Units				
HOUSING	11,200	9	22	2.5	28,000	32	
RETAIL 1	8,000	N.A.	N.A.	1.5	12,000	24	
RETAIL 2	8,000	N.A.	N.A.	1	8,000	16	
1 LEVEL UNDERGROUND PARKING							71
TOTAL				N.A.	48,000	72	71

Option 1 - Transportation Analysis

Although the analysis prepared by Bluestone Planning Group included an estimation of the parking supply required for each scenario, an independent analysis was performed

to identify the number of drivers that would be attracted to the facility. The trip generation values are based on the Institute of Transportation Engineer's (ITE) Trip Generation Manual. The analysis was performed for two reasons, first and foremost, it provides a basis to identify the impact on the transportation network that each scenario may have on a peak hour and daily basis. Second, it provides another metric for the Town to identify the daily demand with regard to the parking facilities required to satisfy the demands of each option.

In this scenario, 22 residential units are proposed, which results in approximately 16 "trips" during the weekday AM peak hour. It is important to note that the traditional trip is made up of the "trip to" and "trip from" a location (e.g., a driver pulling into a restaurant is one trip, leaving the restaurant is another trip; even though there was only one car on the roadway, two trips were made). Therefore, according to the ITE's trip generation, 16 trips are expected during the weekday AM peak hour, 18 trips during the weekday PM peak hour, and 19 trips during the Saturday peak hour (Table 5).

Two retail options are also considered in the analysis, with the only difference being the size of the use. In Retail 1, 12,000 square feet (SF) of retail is analyzed, while Retail 2 includes 8,000 SF of retail space. For the 8,000 square foot retail option during the weekday AM peak hour, up to 34 trips are expected, which equates to 17 people visiting the site (Table 5). During the weekday PM peak hour 118 trips are expected and 168 trips during a Saturday peak hour. Since the site is located in an "urban center," Coolidge Corner, and with its proximity to pedestrian amenities, these "visitors" may drive vehicles, walk, or take transit; therefore, it is difficult to estimate the number of "new" vehicles on the roadway. Conservatively, and for an objective comparison, the trips generated can be used as the number of new vehicle trips, with the aforementioned caveats considered. The larger retail program, 12,000 square feet, creates a larger demand. During the weekday AM peak hour 44 trips are expected, 154 during the weekday PM peak hour, and 218 trips during the Saturday peak hour (Table 5).

Using the ITE Trip Generation Manual, and assuming that the trips generated are all vehicle trips, on an average weekday, Retail 1 will attract 1,712 trips during the day. The smaller retail footprint will attract 1,315 trips throughout the day.

Table 5 Trip Generation – Post Office Development Program - Option 1

USES	Square Footage or # of Units	AM Peak Hour	PM Peak Hour	SAT Peak Hour
HOUSING	22	16	18	19
RETAIL 1	12,000	44	154	218
RETAIL 2	8,000	34	118	168

Option 1 - Abutting Streets and Nearby Intersections

Vehicular access to the development should be from Sewall Avenue. Providing direct access to and from Beacon Street would impact throughput along this busy corridor. The vehicular volume from this development will use the following intersections in the immediate area:

- Harvard Street at Beacon Street;
- Sewall Avenue at Longwood Avenue;
- Sewall Avenue at Harvard Street;
- Charles Street at Sewall Avenue; and
- Charles Street at Beacon Street.

Many of these intersections experience high volumes throughout the day based on their close proximity to Coolidge Corner. Coolidge Corner is a dense urban center, and as such potential mitigation is immediately limited, since building locations restrict the expansion of intersections and roadways. Mitigating the impact of a project like this will require creative solutions including pavement markings, signal timings, and one-way pairs of streets. Quantifying and qualifying the impacts on these various intersections as a result of a project such as the one contemplated in this Option is recommended, with any appropriate adjustments made for the final use composition and project size.

Option 1 - On-site Parking and Circulation

Based on the existing zoning it is estimated that approximately 97 on-site parking spaces would be required for this development option, 44 spaces for the residential component (two spaces per unit) and 53 spaces for the retail component (16,000 s.f. ground floor 4,000 second floor space). The Bluestone Report assumed lower than this, with 72 required parking spaces calculated and 71 parking spaces to be provided in one level of underground parking.

No parking plan was provided in the Bluestone report, though the site plan shows a ramped entrance and exit to the underground parking garage via Sewall Avenue, at the eastern boundary of the site. With the site almost 41,000 square feet in size and with a shape that makes it conducive to having an efficient parking layout, it is not unrealistic to believe that at a minimum of 71 spaces could be provided in one level of underground parking. In fact, it may even be possible to provide the higher parking requirement of 97 spaces that was calculated for this development scenario with one level of underground parking.

The preferred access to and from the underground garage would be from Sewall Avenue, to minimize the impact of the development on the major corridor, Beacon Street. Shifting the entrance/exit of the underground parking to the western boundary of the site on Sewall Avenue would probably allow for a more efficient parking layout, since the depth of the lot increases along this boundary and appears to be better suited to accommodate the ramped entrance/exit.

Since the parking requirement for the development estimated by the Bluestone Group is significantly lower than what was calculated by using the underlying zoning for the area, Table 6 was prepared to better compare and understand parking requirements. Table 6 shows the calculated parking requirement for development Option 1 using Brookline's underlying zoning for the area and compares it against the parking estimates of the ITE for this development Option, as well as the parking requirements for two other local communities, Cambridge and Somerville. The zoning for Central Square in Cambridge (Business B) and the zoning for Davis Square in Somerville (Central Business District) were selected and applied to development Option 1, since both these areas share similar characteristics to Coolidge Corner, being dense urban centers well served by public transportation and with limited public and private parking available.

Table 6 Comparison of Parking Demands – Post Office – Option 1

OPTION 1 USES	Square Footage or # of Units	Bluestone Planning Group	Brookline (Parking Required)	ITE (Parking Required)	Cambridge (Parking Required)**	Somerville (Parking Required)***
HOUSING	22*	32	44	22	22	37
RETAIL 1	12,000	24	30	36	20	16
RETAIL 2	8,000	16	23	24	13	13
TOTAL	N/A	72	97	82	55	62

*Calculation assumed all two-bedroom units. Although Brookline, Cambridge and Somerville allow through special permit a reduction in parking for qualifying affordable housing units, no deductions were calculated since special permits are discretionary.

** Parking maximums rather than minimums were used for the retail component under the Cambridge zoning bylaw.

*** 20% reduction applied for proximity to T for non-residential uses under the Somerville zoning bylaw.

Option 1 - Neighborhood Parking Supply (Public and Private)

A number of municipally owned parking lots are located within walking distance of the Post Office site; these include John Street, Babcock Street, Webster Street, the Marriott Hotel garage, and Centre Street. The privately owned parking facility at 209 Harvard Street is also just a short walk away. In addition, metered curb side parking is available along both sides of Beacon Street, as well as in the center median of Beacon Street. Also within walking distance are a significant number of privately rented spaces for overnight parking, available directly through those property owners who have obtained an Open Air Parking Space License.

On-street parking is available along Sewall Avenue, as well as a number of other residential streets in the immediate neighborhood. The removal of the Post Office and its associated sorting facility will result in the elimination of the existing oversized curbcut and the constant loading and unloading activities experienced on Sewall Avenue. This should make parking and traveling on the street easier.

Option 1 - Loading Facilities

Because of the preliminary nature of the Bluestone site plan, loading facilities were not shown. The design of the building, with the first floor retail extending from Beacon Street to Sewall Street, would suggest that loading and unloading is likely to occur from both these streets.

Having those on-street parking spaces on Beacon Street immediately in front of the site restricted during certain hours for loading activities would be one alternative, and could keep larger trucks from using Sewall Avenue and the surrounding streets. This shared approach would also eliminate the need for trucks to try and maneuver into loading bays from Beacon Street, which would no doubt be disruptive to Beacon Street traffic flows.

Loading could occur via Sewall Avenue since it is a practice that already occurs daily with the existing sorting facility. However, loading and unloading via Sewall Avenue under the current design would in all likelihood require trucks to back into the site,

causing disruption to traffic flows along this street and possibly the loss of on-street parking.

Option 2

Option 2 involves the construction of a mixed-use building of approximately 93,750 SF on the Post Office Site (Figure 6). The building would have 24,000 SF of retail space and 69,750 SF of residential space, or approximately 54 residential units (Table 7). According to the Bluestone Planning Group the parking required for such a build-out is 128 spaces, and it is estimated that 123 spaces could be provided in two levels of underground parking. Access to and from the proposed underground parking structure in this Option would be gained via Sewall Avenue.



**Figure 6 Post Office Development - Option 2 –
Plan View (top), from the south (bottom left), from the north (bottom right)**

Table 7 Post Office Site Development Program - Option 2

USES	Sf/fl	Unit Count		# Stories	Total SF	Assumed Required Parking	Parking Provided
		Units/FL	Total Units				
HOUSING	15,500	12	54	4.5	69,750	80	
RETAIL 1	8,000	N.A.	N.A.	1.5	12,000	24	
RETAIL 2	8,000	N.A.	N.A.	1.5	12,000	24	
2 LEVELS UNDERGROUND PARKING							123
TOTAL				N.A.	93,750	128	123

Option 2 - Transportation Analysis

The same trip generation process was used for Option 2 as was used for Option 1, with the trip generation being adjusted proportionally to the different project size. In this scenario, 54 residential units are proposed, which results in approximately 9 “trips” during the AM peak hour. This trip generation is lower than the 22 units that are proposed under Option 1. One of the primary reasons for this difference can be attributed to the mid-rise structure (e.g., greater than three stories) when compared to the low-rise structure that is used in Option 1. Trip-making characteristics according to ITE are different for those that live in a mid-rise structure compared to those living in a low-rise structure, with fewer trips made by those in the mid-rise structure. As a result, the demand for parking spaces would be expected to be less in a mid-rise structure. Also, since there is a discrepancy between what the Bluestone Group projects for parking requirements and the projections made based on the zoning, an alternative parking requirement calculation for comparison purposes could be done by evaluating a local mid-rise structure with similar composition to that proposed.

The size of the retail component in Retail 2 is the same as Retail 1, namely 12,000 square feet. Similar to Retail 1, during the weekday AM peak hour up to 44 trips are expected, which equates to 22 people visiting the site (Table 8). During the weekday PM peak hour up to 154 trips are expected for the retail use, while 218 are projected to occur during the Saturday peak hour. Using the trip generation rates, and assuming that the trips generated are all vehicle trips, on an average weekday, each retail Option has the potential to attract 1,712 vehicles during the day.

Table 8 Trip Generation - Post Office Development Program - Option 2

USES	Square Footage or # of Units	AM Peak Hour	PM Peak Hour	SAT Peak Hour
HOUSING	54	9	15	N.A.
RETAIL 1/2	12,000	44	154	218

Option 2 - Abutting Streets and Nearby Intersections

Similar to Option 1, and as shown in the plan, access to the development should be from Sewall Avenue. Providing direct access to Beacon Street would impact throughput along this busy corridor. The vehicular volume from this development will use the following intersections in the immediate area:

- Harvard Street at Beacon Street;
- Sewall Avenue at Longwood Avenue;
- Sewall Avenue at Harvard Street;
- Charles Street at Sewall Avenue; and
- Charles Street at Beacon Street.

Many of these intersections experience high volumes throughout the day based on their proximity to Coolidge Corner. Based on the trip generation of the mid-rise structure, the overall residential trip generation has a high probability of being less than the low-rise structure in Option 1, resulting in less volume on the roadways surrounding the project. As with Option 1, quantifying and qualifying the impacts on these various intersections as a result of a project such as the one contemplated is recommended, with any appropriate adjustments made for the final use composition and project size.

Option 2 - On-site Parking and Circulation

Based on the existing zoning it is estimated that approximately 168 on-site parking spaces would be required for this development option, 108 spaces for the residential component (two spaces per unit) and 60 spaces for the retail component (12,000 s.f. ground floor 8,000 second floor space). The Bluestone Report again assumed lower than this, with 128 required parking spaces calculated and 123 parking spaces to be provided in two levels of underground parking.

No parking plan was provided in the Bluestone report, though the site plan shows the same ramped entrance and exit to the underground parking garage via Sewall Avenue as was shown in Option 1. The preferred access to and from the underground garage would be from Sewall Avenue, to minimize the impact of the development on the major corridor, Beacon Street. Shifting the entrance/exit of the underground parking to the western boundary of the site on Sewall Avenue would probably allow for a more efficient parking layout, since the depth of the lot increases along this boundary and is more easily able to accommodate the ramped entrance/exit.

Again, since the parking requirement for the development estimated by the Bluestone Group is significantly lower than what was calculated by using the underlying zoning for the area, Table 9 was prepared to better compare and understand parking requirements for this Option. Table 9 shows the calculated parking requirement for development Option 2 using Brookline's underlying zoning for the area and compares it against the parking estimates of the ITE for this development Option, as well as the parking requirements for two other local communities, Cambridge and Somerville. The zoning for Central Square in Cambridge and the zoning for Davis Square in Somerville were again selected and applied to development Option 2.

Table 9 Comparison of Parking Demands – Post Office – Option 2

OPTION 1 USES	Square Footage or # of Units	Bluestone Planning Group	Brookline (Parking Required)	ITE (Parking Required)	Cambridge (Parking Required)**	Somerville (Parking Required)***
HOUSING*	54	80	108	54	54	90
RETAIL 1	12,000	24	30	36	20	16
RETAIL 2	12,000	24	30	36	20	16
TOTAL	N/A	128	168	126	94	122

*Calculation assumed all two-bedroom units. Although Brookline, Cambridge and Somerville allow through special permit a reduction in parking for qualifying affordable housing units, no deductions were calculated since special permits are discretionary.

** Parking maximums rather than minimums were used for the retail component under the Cambridge zoning bylaw.

*** 20% reduction applied for proximity to T for non-residential uses under the Somerville zoning bylaw.

Option 2 - Neighborhood Parking Supply (Public and Private)

Option 2 has the same access to public and private parking spaces as those described for Option 1. There are a number of municipally owned parking lots within easy walking distance, as well as a privately owned parking facility. Metered and unmetered curbside parking spaces are also available on a host of streets that are in close proximity to the site; while also within walking distance are a significant number of privately rented spaces for overnight parking, available directly through those property owners who have obtained an Open Air Parking Space License.

Option 2 - Loading Facilities

Because of the preliminary nature of the Bluestone site plan, loading facilities were not shown. Again, similar to Option 1, the preference would be to have limited loading and unloading facilities directly off of Beacon Street, so as to have minimal disruption along this corridor. Again, a shared parking/loading zone immediately in front of the site could be utilized, while a loading bay could also be located at the rear of the building and accessed via Sewall Avenue. However, similar to Option 1, loading and unloading via Sewall Avenue under the current design would in all likelihood require trucks to back into the site, causing disruption to traffic flows along Sewall Avenue, as well as the possible loss of on-street parking.

3.2 10 Waldo Street

Background

The 10 Waldo Street site is bounded by Harvard Street, Beacon Street, Pleasant Street, John Street and Green Street. A vacant single-story building occupies the majority of the site, while a portion of the site is leased for parking to nearby residents. The site is 31,600 square feet or approximately 0.73 acres in size. The parcel is adjoined on both Beacon Street and Harvard Street by one- and two-story commercial properties. A vehicular easement from Waldo Street across the site provides service and parking access for those abutting commercial buildings on Beacon Street and Harvard Street.

Similar to the Post Office site on Beacon Street, the Bluestone Planning Group determined that accumulating or merging one or more adjacent properties with the site would result in a more functional and pleasing redevelopment opportunity. In their final assessment the Bluestone Planning Group developed two alternative development scenarios for the Waldo Street site.

Surrounding Roadway Network

Being an interior lot, the 10 Waldo Street site is only one lot removed from Harvard Street, Beacon Street, Pleasant Street, John Street and Green Street. Vehicular access to the 10 Waldo Street site can presently only be gained via Waldo Street, with the purpose of Waldo Street essentially being to serve the subject property and other interior lots. However, the opportunity also exists to access the site via John Street, with a connection to Waldo Street already existing but fenced off to restrict vehicular access.

As identified in the Bluestone report, not only does Waldo Street provide direct access to the development site, but it also provides a means of service to the rear of all the other properties that surround this interior parcel. Preserving the access easement that leads from Waldo Street to these other properties is essential and requires careful consideration for any future development scenario at the site.

Alternative Development Scenarios

The first scenario envisioned a public parking deck built entirely within the existing 10 Waldo Street property, in the interior of the block; while the second scenario envisioned a privately-developed mixed use project that incorporates an adjacent parcel of land on Pleasant and Beacon Street to provide street frontage and visibility. Common to each scenario was the retention of the service alley and access easement, while each scenario also has the intersection of Waldo/Pleasant/Beacon Streets realigned to eliminate the triangular traffic island that now exists. In addition, both options include above-ground structured parking rather than underground parking.

The Bluestone Planning Group found that both options were probably financially feasible, though if similar schemes were to be advanced they would require greater refinement to ensure an adequate return on costs.

Option 1

Option 1 involves the Town acquiring the property from its present owner and constructing a public parking facility (Figure 7 and Table 10). A total of 100 parking spaces would be provided in the facility, which would have one level of decked parking above surface parking. Existing surface parking located immediately to the northeast of the proposed parking deck would also be retained under this Option.



Figure 7 - 10 Waldo Street Development - Option 1 -

Plan View (top), from the south (bottom left), from the west (bottom right)

Table 10 10 Waldo Street Site Development Program - Option 1

USES	SF/FL	Unit Count		# Stories	Total SF	Assumed Required Parking	Decked Parking Provided
		Units/FL	Total Units				
PARKING DECK	19,500	N.A.	N.A.	2.0	39,000	N.A.	100
TOTAL				2	39,000	N.A.	100

Option 1 - Transportation Analysis

As designed, the entrance and exit to the parking deck would be directly from Waldo Street, near the major intersection of Pleasant Street and Beacon Street. Although the proposed location does offer a certain level of convenience to users by being located near a major route, it raises concerns as well. Queuing and operations at the intersection of Waldo Street and Pleasant Street may impact the major intersection of Beacon Street and Pleasant Street and would require additional analysis, especially to ensure that operations along Beacon Street would not be impacted. Since the proposed design eliminates any potential access to and from John Street, this is a further concern. John Street has the potential to better distribute traffic to and from the site and reduce any potential conflicts at the Waldo Street and Pleasant Street intersection. Incorporating into the design of the parking deck either an entrance, exit, or both an entrance and exit from John Street needs to be fully explored.

Given the large number of people who would be entering and exiting this proposed public parking facility pedestrian access also needs to be easily incorporated into the overall design. Directly connecting any new pedestrian walkways with existing pedestrian amenities in the immediate area is crucial. Especially desirable would be direct pedestrian access to Harvard Street. It would also be beneficial to include bicycle lockers in the parking structure as well. These lockers would allow the Town, in conjunction with local business owners, the opportunity to promote and possibly even offer incentives for employees and customers who cycle.

Option 2

Option 2 requires the acquisition of an adjacent parcel located directly on Pleasant/Beacon Street (Figure 8). This option involves the construction of a 50,100 square foot mixed use building with associated surface parking and a parking deck (Table 11). The Bluestone Planning Group calculated that only 72 of the 100 parking spaces provided in this scheme would be needed to support the new development. The remaining 28 parking spaces could be either dedicated to public parking or sold or rented to nearby residents or commercial building owners.



**Figure 8 10 Waldo Street Development - Option 2 –
Plan View (top), from the south (bottom left), from the west (bottom right)**

Table 11 10 Waldo Street Development Program- Option 2

USES	Sf/fl	Unit Count		# Stories	Total SF	Assumed Required Parking	Parking Provided
		Units/FL	Total Units				
HOUSING	11,200	9	26	3	33,600	39	
RETAIL	11,000	N.A.	N.A.	1.5	16,500	33	
PARKING DECK	19,500	N.A.	N.A.	2	39,000		100
TOTAL				N.A.	89,100	72	100

Option 2 - Transportation Analysis

A trip generation analysis was performed for this option also. In this scenario, 26 residential units are proposed, which results in approximately 18 “trips” during the weekday AM peak hour, 21 trips during the weekday PM peak hour and 22 trips during the Saturday peak hour (Table 12). The retail program was also analyzed. The retail program has the potential to generate up to 34 trips during the weekday AM peak hour, 118 trips during the weekday PM peak hour, and 168 trips during the Saturday peak hour. On an average weekday the retail use will generate approximately 2,105 trips.

Table 12 Trip Generation – 10 Waldo Street Development Program - Option 2

USES	Square Footage or # of Units	AM Peak Hour	PM Peak Hour	SAT Peak Hour
HOUSING	26	18	21	22
RETAIL 1	16,500	34	118	168

Option 2 - On-site Parking and Circulation

Based on the existing zoning it is estimated that approximately 93 on-site parking spaces would be required for the mixed use development component of this option, 52 spaces for the residential component (two spaces per unit) and 41 spaces for the retail and office component (11,000 s.f. ground floor 5,500 second floor space). The Bluestone Group had assumed a lower parking requirement than this, with 72 required parking spaces calculated and 100 parking spaces to be provided on the surface of the lot and one deck above.

Again, since the parking requirement for the development estimated by the Bluestone Group is significantly lower than what was calculated by using the underlying zoning for the area, Table 13 was prepared to better compare and understand parking requirements for this Option. Table 13 shows the calculated parking requirement for development Option 2 using Brookline’s underlying zoning for the area, and compares it against the parking estimates of the ITE for this development Option, as well as the parking requirements for two other local communities, Cambridge and Somerville. The zoning for Central Square in Cambridge and the zoning for Davis Square in Somerville were again selected and applied to development Option 2.

Table 13 Comparison of Parking Demands – 10 Waldo Street – Option 2

OPTION 1 USES	Square Footage or # of Units	Bluestone Planning Group	Brookline (Parking Required)	ITE (Parking Required)	Cambridge (Parking Required)**	Somerville (Parking Required)***
HOUSING*	26	39	52	26	26	43
RETAIL 1	16,500	33	41	50	28	22
TOTAL	N/A	72	93	76	54	65

*Calculation assumed all two-bedroom units. Although Brookline, Cambridge and Somerville allow through special permit a reduction in parking for qualifying affordable housing units, no deductions were calculated since special permits are discretionary.

** Parking maximums rather than minimums were used for the retail component under the Cambridge zoning bylaw.

*** 20% reduction applied for proximity to T for non-residential uses under the Somerville zoning bylaw.

Option 2 - Neighborhood Parking Supply (Public and Private)

A number of municipally owned parking lots are located within easy walking distance, with John Street and Babcock Street particularly convenient to the site. Metered and unmetered curbside parking spaces are also available on a host of streets that are in close proximity to the site; with Pleasant, John, Green, Harvard and Beacon Streets all surrounding the site and all providing on-street metered parking. Also within walking distance are a significant number of privately rented spaces for overnight parking, available directly through those property owners who have obtained an Open Air Parking Space License.

Option 2 - Loading Facilities

Because of the preliminary nature of the Bluestone site plan, loading facilities were not shown. Since the site design preserves the existing vehicular access easement from Waldo Street to the rear of the buildings along Beacon Street and Harvard Street, limited loading and unloading could continue in this area. This area is however congested and not particularly suited to the maneuverability requirements of larger vehicles. Although loading and unloading along Beacon Street is not desirable, it appears unavoidable at this location. Having either a dedicated loading zone or a shared parking/loading zone, located between Pleasant and Harvard Street would seem necessary.

3.3 Centre Street Public Parking Lots (East & West Lots)

Background

The Town of Brookline owns two public parking lots located either side of Centre Street, referred to as the Centre Street East parking lot and the Centre Street West parking lot. The Centre Street East lot, which is the larger of the two lots and the largest public parking lot in the CCD, is approximately 82,000 square feet (1.88 acres) in size, and contains 143 public parking spaces. 10 spaces within the lot are made available to residents through the Town’s Resident Overnight Parking program.

The Centre Street East lot is accessible from both Centre Street and Harvard Street. Five outdoor public pedestrian passageways connect the parking lot to storefronts along both Harvard and Beacon Streets, while a sixth indoor public passageway provides

access through the Arcade Building to Harvard Street. A vehicular service lane runs the length of the rear of storefronts to provide trash collection and deliveries.

The Centre Street West lot, which is approximately 23,300 square feet (0.65 acres) in size, contains 56 parking spaces and a small public seating area. The 56 parking spaces within this lot are made available during the day to employees in Coolidge Corner through the Town's Commercial Permit Program (only exception to this is every Thursday from June through October, when the Brookline Farmers Market occupies the lot). Overnight the 56 parking spaces within the lot are made available to residents through the Town's Resident Overnight Parking program.

Surrounding Roadway Network

Centre Street bisects both the Centre East lot and the smaller Centre Street West lot. Running in roughly a north south direction, Centre Street is classified as a collector street and connects Fuller Street with the signalized intersection at Beacon Street. The intersection with Beacon Street allows for vehicles to go in either the northbound or southbound direction along Beacon Street. Similarly, vehicles traveling along Beacon Street in either the northbound or southbound direction can turn on to Centre Street.

Centre Street has one travel lane in each direction. On-street metered parking is permitted along the east side of Centre Street, while parking is not permitted on the west side of the street. Two curb cuts on Centre Street provide access to the Centre Street East lot, while an additional two curb cuts provide access to the Centre Street West lot, which is located opposite. All of these curb cuts are wide enough to allow for vehicles to enter and exit simultaneously. In the northeast corner of the Centre Street East lot is a one-way exit that leads directly to Harvard Street, while in the northwest corner vehicular access can be gained via an alleyway from Harvard Street.

Alternative Development Scenarios

In the first scenario the Centre Street East parking lot would be redeveloped as a Town-funded capital improvement project, comprised public civic space over one level of underground public parking. The second scenario envisions a public/private partnership for a mixed-use development project, which includes both the Centre Street East and West parking lots as well as an adjoining privately-owned parcel of land on Harvard Street. The Harvard Street parcel would provide the required street frontage and visibility.

In both scenarios major new public civic spaces would be provided, with the existing Center Street East surface parking lot being replaced by an underground public parking level. The Centre Street West lot is seen as an independent site in both scenarios, that either could be redeveloped or left to operate as it now does. Complicating the redevelopment of the Centre Street West lot is relocating the loss of public parking spaces on the site to the Centre Street East lot, and providing adequate on-site parking for any new development.

The financial feasibility of both Options is a challenge, due to the financial investment required by the Town, by a private developer, or by both the Town and a private developer. Option 1 in particular only results in a net gain of 26 parking spaces, the bulk of the costs associated with this option are therefore directly attributable to providing the new civic space. Nevertheless, both Options have been reviewed to determine their potential impacts on the local transportation network.

Option 1

Option 1 involves the construction of a public park/plaza along Centre Street over a new underground public parking garage of 140 spaces (which replaces the existing surface parking lot) (Figure 9). The new civic space includes landscaped lawns as well as paved areas to support such activities as the Farmers Market, which is now held on the West Lot. This development would be a municipally-sponsored and funded initiative.



**Figure 9 Centre Street East Lot – Option 1 –
Plan view (left), from the northwest (right)**

Similar to the first Waldo Street Option, this first Centre Street Option does not include any retail or housing component (Table 14), with solely parking and civic space being provided. The parking lot would increase the existing parking supply by 26 spaces. No changes to the Centre Street West parking lot configuration are anticipated under this option.

Table 14 Centre Street East Lot Development Program - Option 1

USES	Sf/fl	Unit Count		# Stories	Total SF	Assumed Required Parking	Parking Provided
		Units/FL	Total Units				
UNDERGROUND PARKING				1.0	48,000		140
CIVIC SPACE					48,000		
SURFACE PARKING							29
PARKING ON EAST LOT (EXISTING)						143	
PARKING ON WEST LOT (EXISTING)						56	56
TOTAL				N.A.	96,000	199	225

Option 1 - Transportation Analysis

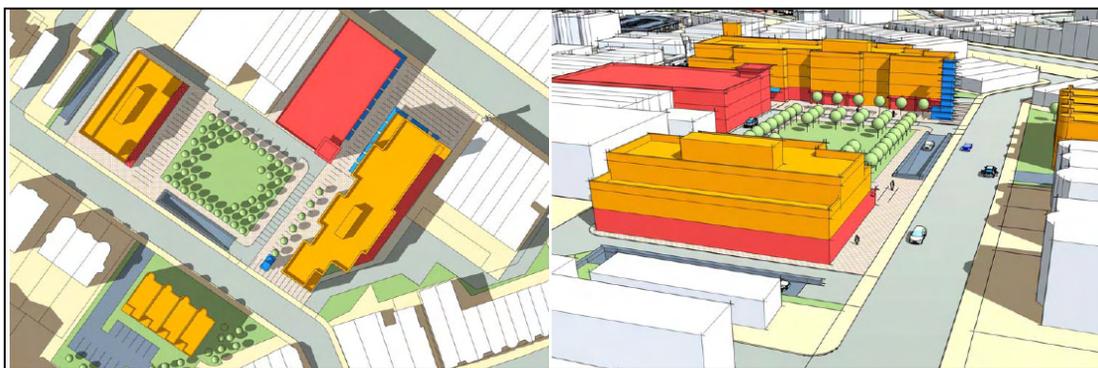
Although a level of service analysis was not performed, a number of field visits were conducted to the existing parking lot, as well as to the abutting streets. Currently, operations near and in the existing parking lot are relatively efficient. Since the

underground parking lot in this development option is expected to offer a very similar number of parking spaces it is expected that the new parking structure and the adjacent roadways will operate similar to existing conditions. Further study will however be required to determine if a second entrance/exit or exit only ramp would be desirable to ensure optimum circulation patterns within the garage and on Centre Street. As with the other proposals, if the Town chooses to move ahead with this option, then a comprehensive study is recommended to determine exact impacts on the surrounding roadway network and the level of mitigation required.

Given the large number of people who would be entering and exiting this proposed public parking facility pedestrian access needs to be easily incorporated into the overall site design and must directly connect with existing pedestrian amenities in the immediate area. The existing surface parking facility offers unparalleled ease of access to the stores on Harvard Street. If the proposed underground structure cannot provide similar direct and easy access to Harvard Street people may choose to park elsewhere in the District. Within the design it would also be beneficial to include bicycle lockers in the parking structure. These lockers would allow the Town, in conjunction with local business owners, the opportunity to promote and possibly even offer incentives for employees and customers who cycle.

Option 2

Option 2 is a mixed-use development with associated civic space over 1½ levels of underground parking (Figure 10). This option envisions approximately 144,000 square foot of new mixed use development located in three new buildings on both the Centre Street East Lot and on an adjoining parcel of privately-owned land along Harvard Street (Table 15). It is estimated that the 1½ levels of underground parking would accommodate 350 parking spaces, which would be built below the Centre Street East Lot and the acquired parcel of land along Harvard Street. Of the 350 new underground spaces, 143 spaces would be dedicated to replacement of the existing surface public parking lot and the remainder would be available to support the new mixed use development. On the Centre Street West lot 8 residential units and 4,300 SF of medical office space are proposed in a three story building. To meet the parking demand generated by this building, 13 parking spaces would be provided on the lot.



**Figure 10 Centre Street East Lot –Development Program Option 2 –
Plan view (left), from the north (right)**

Table 15 Centre Street East Lot Development Program - Option 2

USES	Sf/fl	Unit Count		# Stories	Total SF	Assumed Required Parking	Parking Provided
		Units/FL	Total Units				
BUILDING 1							
RETAIL	17,000	N.A.	N.A.	1.0	17,000	34	
HOUSING	18,500	14	43	3.0	55,500	64	
BUILDING 2							
RETAIL	10,000			1.0	10,000	20	225
OFFICE	12,000			2.0	24,000	48	
EXISTING RETAIL TO BE REPLACED	-26,000			1.0	-26,000	-52	
BUILDING 3							
RETAIL	9,000			1.0	9,000	18	
HOUSING	7,800	6	12	2.0	15,600	18	
UNDERGROUND PARKING		N.A.	N.A.	1.5	128,000		350
CIVIC SPACE					37,000		
PARKING ON EAST LOT (EXISTING)						143	
WEST LOT DEVELOPMENT							
MED OFFICES		N.A.	N.A.	1.0	4,300	16	
HOUSING		3	8	2.0	8,600	12	
PARKING ON WEST LOT						56	13
TOTAL				N.A.	266,000	365	363

Option 2 - Transportation Analysis

A trip generation analysis was performed for this development program. Similar to the other Options, the retail and housing uses exhibit similar trip patterns, the difference with this Option is the introduction of office. With office space, distinct trip patterns can be observed – during the AM peak hour, employees show up to work, while at lunch time they may stay in the office, or run errands if desired services are nearby. In the evening, the employee leaves the office and heads for home. The resulting trip pattern is two distinct peaks, one during the AM and one during the PM peak hour. Some areas experience a slightly smaller peak during the lunch hour. In summary, the office trip generation pattern is different from the retail peak – it typically does not last throughout the day, and should be considered in the decision making process.

Based on the low-rise residential housing proposed, 38 trips are expected during the weekday AM peak hour, 45 during the weekday PM peak, and 45 during the Saturday peak hour (Table 16). On an average weekday, the retail option (based on a net gain of 10,000 sf over existing conditions) will generate approximately 39 trips during the weekday AM peak hour, 137 trips during the weekday PM peak hour, and 194 trips during the Saturday peak. During an average weekday 1,520 additional trips may be generated as a result of the retail component.

The office component is expected to generate approximately 60 trips during the weekday AM peak hour, 106 trips during the weekday PM peak hour, and 36 trips during the Saturday peak hour. During an average weekday, 445 additional trips may be generated as a result of the office component. For the smaller medical office building (4,300sf) which would be located on the Centre Street West lot, 11 trips are expected during the weekday AM peak hour, 17 trips during the weekday PM peak hour, and 16 trips during the Saturday peak hour. During an average weekday, 155 additional trips may be generated as a result of the medical office component.

Table 16 Trip Generation – Centre Street Development Program-Option 2

USES	Square Footage or # of Units	AM Peak Hour	PM Peak Hour	SAT Peak Hour
HOUSING	63	38	45	45
RETAIL	10,000	39	137	194
OFFICE	24,000	60	106	36
MEDICAL OFFICE	4,300	11	17	16

Option 2 - On-site Parking and Circulation

Current access and egress to the Centre Street East lot is provided from Centre Street and Harvard Street. This current configuration “spreads” the traffic volume thereby not overly burdening one entrance, resulting in relatively efficient operations. A similar circulation pattern is anticipated under this development option, with the access points to and from Harvard Street preserved. Since both these access points are close to signalized intersections on Harvard Street and have the potential to impact operations at the intersections, both should be carefully assessed to determine if they are warranted.

Again, since the parking requirement for the development estimated by the Bluestone Group is significantly lower than what was calculated by using the underlying zoning for the area, Table 17 was prepared to better compare and understand parking requirements for this Option. Table 17 shows the calculated parking requirement for development Option 2 using Brookline’s underlying zoning for the area and compares it against the parking estimates of the ITE, as well as the parking requirements for two other local communities, Cambridge and Somerville. The zoning for Central Square in Cambridge and the zoning for Davis Square in Somerville were again selected and applied to development Option 2.

Table 17 Comparison of Parking Demands – Centre Street East – Option 2

OPTION 1 USES	Square Footage or # of Units	Bluestone Planning Group	Brookline (Parking Required)	ITE (Parking Required)	Cambridge (Parking Required)**	Somerville (Parking Required)***
HOUSING*	63	94	126	63	63	105
RETAIL 1	10,000	20	29	30	17	16
OFFICE	24,000	48	40	58	48	34
OFFICE (MEDICAL)	4,300	16	17	15	13	7
TOTAL	N/A	178	212	166	141	162

*Calculation assumed all two-bedroom units. Although Brookline, Cambridge and Somerville allow through special permit a reduction in parking for qualifying affordable housing units, no deductions were calculated since special permits are discretionary.

** Parking maximums rather than minimums were used for the retail and office component under the Cambridge zoning bylaw.

*** 20% reduction applied for proximity to T for non-residential uses under the Somerville zoning bylaw.

Option 2 - Neighborhood Parking Supply (Public and Private)

As well as the redeveloped public parking that will be available under this option, there are a number of other municipally owned parking lots within easy walking distance, with Webster Street and the Marriott hotel parking particularly convenient. Metered and un-metered curbside parking spaces are also available on a number of streets that are in close proximity to the site; with Harvard, Centre and Beacon Streets all having metered parking spaces. Also within walking distance are a significant number of privately rented spaces for overnight parking, available directly through those property owners who have obtained an Open Air Parking Space License.

Option 2 - Loading Facilities

Because of the preliminary nature of the Bluestone site plan, loading facilities were not shown. Since the site design preserves the vehicular access that runs along the rear of those properties fronting on to Harvard Street, the opportunity exists to provide loading zones along this service road. Providing adequate loading via this service road should be a greater priority than attempting to provide additional parking along the road. Loading and unloading via this service road, with suitably designed loading bays, should meet the needs of all the existing buildings and proposed buildings set forth in this Option.

3.4 Summary Findings

- For each of the development Options examined, the Town's parking requirements under the existing Zoning Bylaw are significantly higher than projected in the Bluestone land use study, as well as those projected by the Institute Traffic Engineers (ITE) and those of nearby communities with similar dense urban areas near transit lines.
- With a Town preference for structured or underground parking and with each of the development scenarios examined also having structured or underground parking, construction costs are increased significantly. A parking space within an

above ground structure generally ranges from \$15,000 to \$25,000, while for a below ground structure they are generally cited as being in the range of \$25,000 to \$35,000 per parking space. The greater the number of spaces, the greater the construction costs and the greater the rents and sales prices of the final building. Often this means that local merchants and residents cannot afford to buy or rent in the area. Ensuring adequate parking provision and not over provision of parking is therefore critical.

- Unlike some other communities, no reduction in parking requirements is given in the Zoning Bylaw for proximity to transit. Somerville for example gives a 20% reduction for non-residential uses located within 1000 ft of a transit stop; new zoning in downtown Quincy has parking requirements of 1 space per residential unit in order to promote development and because of the availability of transit; the Medford MUZ zone, which abuts Wellington station, also has reduced parking (1.5 spaces per residential unit) because of the availability of transit. In Boston, like Brookline, where parking requirements are based on the Floor Area Ratio of the zoning district (as opposed to the square footage of the proposed building), the parking requirements for retail and office uses, particularly those on the upper floors, are significantly lower in Boston than the requirements in Brookline.
- All the development programs envisioned, particularly the municipal lot scenarios, would be extremely expensive to construct. The benefits to the Central Street scenarios are that the Town already owns the lot. Although not Town owned, the Waldo Street Option 1 has advantages in that it is decked parking (less expensive to construct), it would be screened from view being an internal lot, and it has potential for an efficient circulation pattern. It may also lead to a better distribution of the parking demand within the District.
- Mitigation for any development scenario will be limited due to the existing density within the District. Mitigation for development will in all likelihood require more creative solutions, such as signal timing changes, one-way street pairings and so forth.

4 Circulation Analysis

Ways in which the existing multimodal environment within the CCD can be enhanced to improve circulation are explored in this section. Areas where improvements can be made have been identified while recommendations to improve the existing circulation system have been prepared. Recommendations have been made for all travel modes in a manner which strikes the appropriate balance between each, and which preserves the character and vitality of the District. These recommendations should not however be carried out/implemented without a thorough analysis, performed by a registered professional engineer.

4.1 Wayfinding

Providing a roadway network that visitors and citizens can efficiently use is critical for the economic vitality of the Town. Once in the Town, it is imperative that the visitors can travel to areas efficiently and safely. Cities and Towns have taken different approaches to accomplishing this – in some Towns, information has been provided on the sidewalk or roadway, in the form of horizontal pavement markings, while vertically mounted banners or signs have been provided above the roadway. Spanning the multi-modal environment, billboards and advertisements on subways have been used successfully. Regardless of approach, the objective is the same – direct visitors to a certain destination.

One way of disseminating information to the T population is through maps and sidewalk treatments. The shelters at the T stops are ideal locations to mount maps of the district, highlighting the services and uses that the District offers (Figure 11). This space could be updated frequently, featuring different merchants in the area. Another option is to provide sidewalk treatments, in a manner similar to the Freedom Trail in downtown Boston, which would guide the visitors to certain district destinations, whether new or historical. Horizontal pavement markings, similar to those used on the roadway, yet smaller-scaled, are also another option to guide visitors into the District.



Figure 11 Potential Map Space – T Shelter

Once the visitors are in the area, it is just as critical to direct them to services that they will need/use. In an urban core, like the CCD, one of the most widely used services by drivers is the public parking. Drivers visiting the district now are faced with a number of different signs that all promote the same service – parking. In the district, there are many signs that are used to direct visitors to the public parking facilities, and they all vary in appearance (Figure 12). Providing uniform signs, both in appearance and size, would make getting to the parking facilities easier, which in turn could have a beneficial impact on the circulation pattern in the district.



Figure 12 Signs Used in Coolidge Corner to Direct Drivers to Public Parking Facilities

One of the parking lots in the District that is not readily identifiable is the parking facility located beneath the Marriott Hotel. Smaller blue signs, with the letter “P” and an arrow are used to direct drivers to the parking lot driveway. However, once the driver takes the right onto the driveway, he/she is facing what appears to be a loading dock for a hotel (Figure 13). Compounding the problem is the frequency of delivery and heavy vehicles in the driveway. Drivers unfamiliar with the area may be confused, and not realize that the parking lot is under the hotel. One solution is to increase the quality of the sign (larger), making it uniform, as well as adding signs along the driveway and near the entrance of the parking facility so that drivers are confident traveling from Webster Street, down the driveway, and into the facility.



Figure 13 Entrance to Parking Lot under the Marriott Hotel – Coolidge Corner

4.2 Parking

Once the driver is in a parking lot, parking regulations should be presented in a concise, understandable manner. Recognizing that policies change throughout the day and year, as well as each parking lot having its own use policies, the Town should attempt to encourage parking in the lots. Signs that are verbose may discourage users from parking; therefore, the Town should revise their signs to present the information in a precise yet consistent manner.



Figure 14 Samples of Parking Signs – Coolidge Corner

4.3 Signal Coordination

One of the challenges in the District, as with many urban cores, is providing a facility where the pedestrians can cross the road safely without impacting vehicular flow. One area that faces such a challenge is the intersection of Beacon Street and Harvard Street. The intersection is signalized and pedestrian flow and vehicular flow on both streets is relatively high.

Pedestrians cross at this major location without significant impact on the Beacon and Harvard Street intersection operations; however, just north of the intersection, at the crosswalk near the movie theatre, vehicle operations are impacted when pedestrians cross the street. Near the movie theatre, on Harvard Street, less than 300 feet from the intersection of Beacon and Harvard, a pedestrian activated signal is provided that creates gaps in the traffic so that pedestrians may cross the street. When a pedestrian pushes the button, the signal goes from green to red, stops traffic, and the pedestrian crosses the road.

While the pedestrian is crossing the road, either Beacon Street or Harvard Street may have the green light (at Beacon and Harvard). If Beacon Street has the green light, then the right turning traffic is relatively light and the pedestrian crossing Harvard Street does

not impact operations at the major intersection; however, if a pedestrian crosses when Harvard Street has the green, queues frequently extend from the pedestrian crossing back through the major intersection of Beacon and Harvard, ultimately impacting operations at the major intersection. If the pedestrian signal turns red near the end of Harvard's green, then the residual queues impact operations along Beacon Street – when the light turns green on Beacon Street, some drivers have to wait until the Harvard Street queue clears.

A recommendation is to explore coordinating the signals so that pedestrians may cross the road when Beacon Street has the green light, and the flow from Beacon to Harvard Street is relatively light, thereby improving efficiency along Harvard Street and ultimately Beacon Street.

4.4 Multi-Modalism

It is critical that the Town continues to integrate multi-modalism in the overall planning process. Multi-modal connectivity allows all users (including potential users) to benefit from an accessible, affordable transportation system. A number of challenges exist for the current T boarding and alighting process, most importantly, platform access.

Current access to any subway car is provided via the front doors of the subway car. If the potential passenger queue is extended, then additional delay on the green line occurs. Additionally, headways between successive trains varies and can cause bunching along the corridor. Working directly with the MBTA on these and other issues may increase ridership and provide for a more efficient and dependable service.

A number of bus stops are provided within the district along Harvard Street, one of the busiest corridors in the area. The Town must continue to work to create a system for buses that is efficient and safe. With regard to location, bus stops should be located on the downstream side of a signalized intersection. This configuration allows the bus driver to be processed by the green signal, then pull over, pick-up or discharge passengers, wait for the signal to turn red, thereby creating a gap in traffic that allows the bus to accelerate and rejoin the traffic stream without impacting efficiency. Active parking enforcement should also occur frequently to ensure that vehicles do not block bus stops (Figure 15). The MBTA Bus Route 66 Arterial Improvement Study conducted by CTPS staff in December, 2001 should also be re-examined by the Town to ensure that all the recommendations of that study that apply to the Town, that can or should be carried out, have been.



Figure 15 Blocked Bus Stop – Harvard Street

4.5 Pedestrian

The Town has been quite successful in maintaining a vehicular and pedestrian network. As the District moves forward, it is critical that Town Officials continue to prioritize pedestrian integration, in recognition of the added value to the network when a safe and efficient pedestrian environment is provided.

Overall, the pedestrian network in the District is in good condition. As with any older well established community, there are some areas on the network that present a challenge for pedestrians, with building placement and roadway layouts often restricting desired improvements. The Town should pay special attention to areas that have restricted sidewalk width and the placement of sidewalk furniture; these areas make efficient operations challenging during periods of high pedestrian volume (Figure 16).



Figure 16 Example of Constraint Points on the Pedestrian Network

4.6 Bicycle

Many communities, like Brookline, are working toward a comprehensive bicycle plan. It is critical that as the Town moves forward with improvements, both from a maintenance perspective (annual line marking plan) as well as during major infrastructure improvements, that bicycle accommodations are properly planned for. Any comprehensive bicycle plan should consider and ultimately plan to accommodate cyclists of all abilities. Accommodating cyclists with different abilities is in general, challenging. In some instances, existing and planned, bicycle lanes are provided on some of the heavily-traveled streets, yet they end abruptly, leaving the cyclist to "share the road". Depending on the ability of the cyclist, this may be sufficient; however, the rider who is not comfortable riding in traffic may find this approach daunting.

A number of roadways in the District may be able to accommodate bicyclists by reducing the vehicle's traveled way width and leaving the remaining pavement demarcated for cyclists. Rather than allocating financial resources to expand existing cross-sections to effectively include a dedicated bike lane on a roadway, other alternatives to consider include; decreasing the vehicular travel lane width, removal of on-street parking spaces and providing a delineated four foot shoulder.

The Town should begin to look at their network and determine the roadways that would provide the greatest utility for users (e.g., network connectivity). Once the network has been established, it is recommended that the Town create a system for implementation. The overall plan should be reviewed and updated annually. Annual pavement marking programs typically address some of the more heavily traveled roadways, making them ideal candidates for upgraded treatments. Installation of pavement markings may have to be staggered to allow for the "old" markings to wear off so that the "new" traveled way may be defined. This approach allows the Town to absorb in the annual pavement marking budget relatively easily.

One service that is noticeably absent to the bicycling community in the District is an area to safely store bicycles (Figure 17). This lack of bicycle amenities may discourage cyclists from riding to the District. One recommendation is to create bicycle friendly accommodations that may be on/near the sidewalk, or provide bicycle lockers.



Figure 17 Bicycle Amenities – Coolidge Corner District

4.7 Summary Findings

- **Wayfinding:** Providing an efficient and effective wayfinding system is critical in the CCD. Incorporating simplified and uniform wayfinding signs into pedestrian and vehicular traffic flow will allow people to get to the district, park, and find their way around quickly and effectively.
- **Parking:** Parking regulatory signs should be concise and should avoid unnecessary length. Signs with too much text are unlikely to be read and adhered to.
- **Signal Coordination:** For Harvard Street, explore coordinating signals so that pedestrians may cross the road when Beacon Street has the green light and the flow of traffic from Beacon to Harvard is relatively light. This would improve vehicular efficiency near the intersection of Harvard and Beacon Streets.
- **Multi-Modalism:** Explore working with the T to reduce variability in headways and to having multiple door loading at the platform to increase speed and capacity. Bus stops should be located on the near side of the intersection whenever possible. Consistent parking enforcement may help improve the efficiency of the Route 66 through the CCD.
- **Pedestrian:** The Town should continue to prioritize pedestrian integration and to maintain the pedestrian network in good condition. Pavement markings and signal equipment should be maintained and upgraded on a regular basis.

- Bicycle: Bicycle accommodations need to be more fully explored and encouraged, and should be included in any major infrastructure improvement project. Bicycle infrastructure should be maintained in good condition including an annual line marking plan. Given the limited right of way, innovative approaches to creating bicycle right of way should be explored (e.g. reduce vehicular lane width, removal of parking spaces).

5 Access and Parking Analysis

A parking supply shortage and the limited availability of parking spaces have long been considered issues in Coolidge Corner, yet these concerns appear to be anecdotal, with few detailed and in-depth parking studies having been undertaken. Of those studies undertaken, the focus tends to have been on the demand for parking rather than a more detailed study of the parking supply and parking utilization rates.

A 1999 Brookline Business Parking Survey stopped short of making recommendations regarding the supply and demand for parking within commercial areas. The survey did indicate that the business community believed there was a need for additional parking as well as better parking space management, especially in terms of the employee sticker program and the duration of parking meters. The "State of Brookline Businesses 2002" also referred to inadequate parking supply as affecting the continued viability of commercial areas such as Coolidge Corner, while the shortage of commercial parking areas has also been documented in the 2001 Commercial Areas Parking Study, which found the municipal parking lots to be well used with limited space availability.

An employee parking survey was conducted as recently as December 2006 by the Coolidge Corner Merchants Association in cooperation with the Coolidge Corner Hub. Responses to the survey were received from 111 companies, representing a total of 1,248 employees, of which seven 744 were found to arrive to work by car. Only 17 of these car trips were shared by fellow employees, meaning seven 727 employees required parking in the area at various times of the day and week. The survey also found that 77 of the employees used privately owned parking facilities, while a further 41 employees used the Town's Commercial Permit Parking Program. Employees also indicated that they frequently used residential streets in the Coolidge Corner area for parking, as well as the 10 hour meters located on Beacon Street.

5.1 Parking and the Comprehensive Plan

The Town's Comprehensive Plan refers to the need to explore opportunities to improve parking conditions in existing commercial areas and to examine options for expanding parking in Coolidge Corner. The Plan states, "The shortage of commercial area parking, especially in Coolidge Corner, has been identified in numerous studies as a barrier to enhancing the vitality of Brookline's commercial areas (Page 136)."

Within the Comprehensive Plan a number of strategies have been suggested as to how the accessibility and availability of parking within commercial areas such as Coolidge Corner need to be improved. Establishing a Parking District in Coolidge Corner is one such strategy. "Parking Districts would be zoning overlays in primarily commercial districts in which required parking could be reduced or waived in exchange for payment-in-lieu-of parking provision. Payments would be placed in a fund and used to fund parking improvements. In order for such a Parking District to work, a viable location and plan for such parking improvements must already be in place (Page 139)." Other strategies put forth in the Comprehensive Plan include:

- Adjust parking resources and policies in commercial areas to support both business and residential needs.
- Review parking standards for commercial areas to evaluate possible changes for mixed-use buildings, shared parking arrangements, and transit-oriented development.
- Seek opportunities for additional off-street parking and shared parking, primarily in Coolidge Corner, Brookline Village/Route Nine, and Washington Square.

- Design and implement a consistent town-wide signage program for parking in conjunction with streetscape improvements.
- Continue providing public parking spaces for car-share companies (such as Zipcar) and encourage the same in private parking lots.
- As part of district and neighborhood plans, evaluate the need for and seek appropriate opportunities for additional off-street parking and shared parking in Coolidge Corner, Brookline Village/Route Nine, Washington Square, and Chestnut Hill. (Page 37, 38 & 131)

Although increasing and/or relocating the parking supply within Coolidge Corner is referenced within the Comprehensive Plan, the Plan also points out that the potential impacts of additional parking must also be explored, especially as to how parking patterns might impact residential neighborhoods (Page 137).

5.2 Parking Space Inventory and Survey

An inventory of all metered on-street and off-street parking spaces in the Coolidge Corner District was undertaken, as was a survey of parking occupancy levels for all these metered spaces. Park Street and Naples Road were also inventoried for parking demand, with these two streets essentially serving as a sample of un-metered residential streets close to the heart of the District. All of this inventory and survey work was undertaken between the beginning of September 2006 and the beginning of January 2007. In addition, for the Centre Street East lot, which was deemed to require a greater level of study, a license plate survey was also undertaken over the period of a day.

On-Street Metered Parking

A parking occupancy survey of all on-street metered parking spaces in the District was undertaken on eight different days, with different times of the day selected. Thursday, Friday and Saturday were the days when the survey work was primarily undertaken, with the assumption being that these were the days when the demand for on-street parking would be the greatest. For ease of use, all of the data collected has been broken down into a series of graphs and figures to more clearly represent the findings.

On-Street Metered Parking - Harvard Street

The average percentage of occupied on-street parking spaces within the District as one travels north to south along Harvard Street (approximately Verndale Street to School Street) was calculated (Figure 18). As would be expected, the closer to the intersection of Beacon Street, the greater the average occupancy rate of on-street parking spaces. For that section of Harvard Street between Babcock Street and Marion Street, average occupancy levels were consistently above 90%.

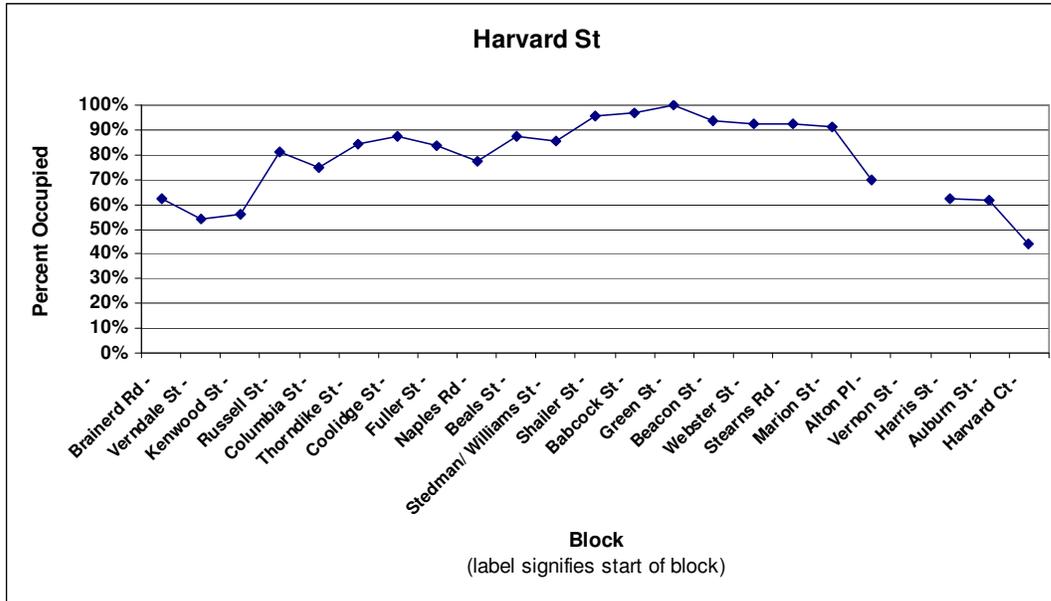


Figure 18 – Harvard Street - Average Percentage of Occupied Metered Spaces

On-Street Metered Parking - Beacon Street

A similar scenario to Harvard Street plays out along Beacon Street. The average percentage of occupied metered on-street parking spaces within the District as one travels west to east along Beacon Street (approximately Lancaster Terrace/Fairbanks Street to Powell Street/Marshall Street) was calculated (Figure 19). Again, the closer to the intersection of Harvard Street and the core of the District, the greater the average occupancy rate of the on-street parking spaces. For that section of Beacon Street between Marion Street and Pleasant Street, average occupancy levels were above 90%.

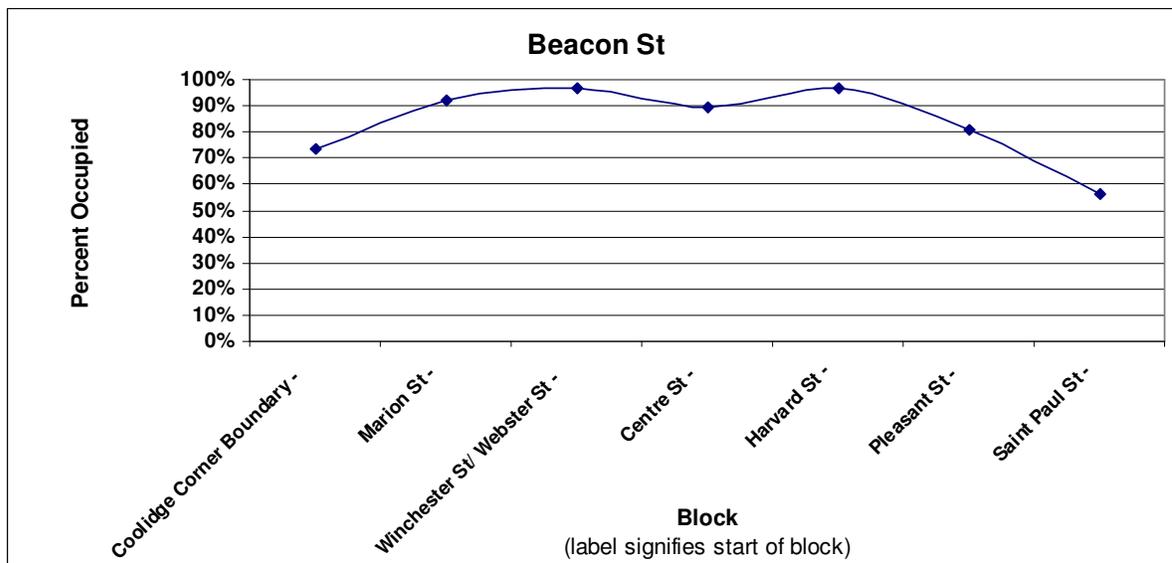


Figure 19 – Beacon Street – Average Percentage of Occupied Metered Spaces

Metered Street Parking

In addition to Harvard Street and Beacon Street there are a significant number of other streets within the District which also have metered parking. Each of these streets with metered parking were also surveyed to determine parking space occupancy rates (Figure 20). As can be seen, average occupancy rates were consistently high, ranging from seventy three percent (73%) on Pleasant Street to ninety six percent (96%) on Longwood Avenue.

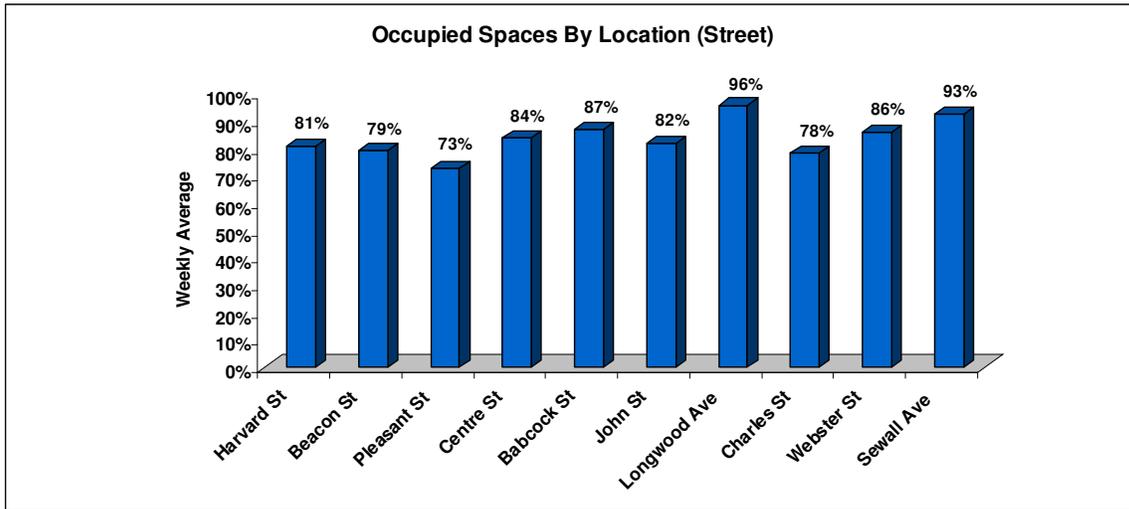


Figure 20– Average Occupancy of On-Street Spaces by Street

To further illustrate the high levels of on-street parking experienced within the District, the average occupancy of metered on-street spaces for each of the days that counts were taken in the District were calculated (Figure 21). As would be expected occupancy rates are consistently high, ranging from seventy three (73%) to eighty five (85%). It should be noted however that the seventy three (73%) occupancy rate for the second Saturday of the survey was collected on an extremely wet and windy day. This may explain why at 73% the parking occupancy levels are lower than would otherwise be expected for a Saturday.

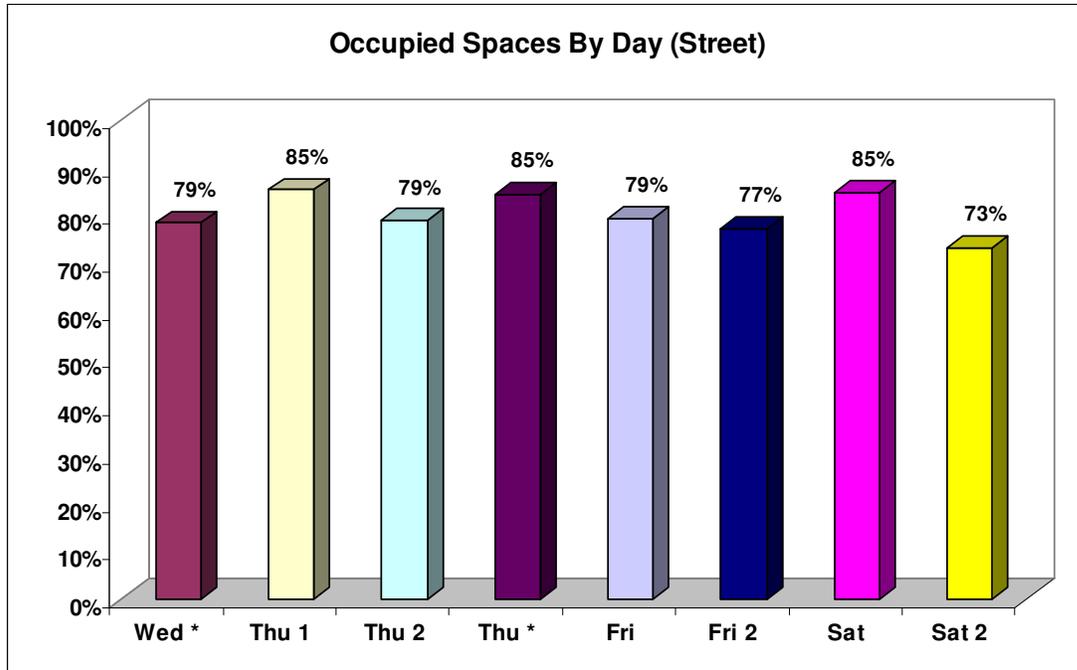


Figure 21 – Average Occupancy of On-Street Spaces by Day

Municipal Parking Lots

Similar to the data collected for metered on-street parking spaces, the data collected for occupancy levels within the municipal parking lots has also been broken down into a series of graphs and figures for ease of use. Surveying for the occupancy rates of the municipal off-street parking facilities was also undertaken on different days at different times, though the tendency again was to do most of the survey work on either a Thursday, Friday, or Saturday, the days assumed to be busiest and with the greatest occupancy rates.

The average occupancy based on the occupancy counts that were taken for each of the municipal lots was calculated (Figure 22). A few of the overall percentages shown in Figure 22 appear low, such as for the Centre Street West lot and the John Street lot. However, the Centre Street West lot is used exclusively for commercial parking and varies dramatically by time of day and shift schedules, while with the John Street lot, which only has 14 spaces, as little as three or four more vehicles using this lot would result in a significant increase in the overall occupancy percentage.

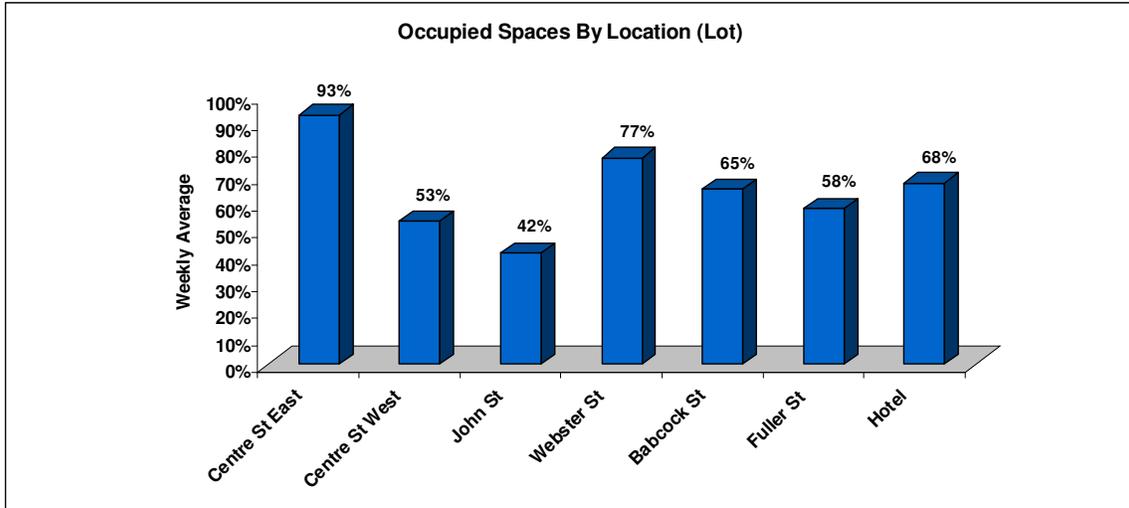


Figure 22 – Average Occupancy Within Municipal Lots

To further illustrate the high levels of parking occupancy experienced within all the municipal lots, the average occupancy for each of the days that counts were taken in the District were calculated (Figure 23). Occupancy rates are generally high, ranging from fifty three percent (53%) to ninety percent (90%). Again, it should be noted that the occupancy rate data for the second Saturday of the survey were collected on an extremely wet and windy day. This may explain why, at 72%, the parking occupancy levels are lower than would otherwise be expected for a Saturday.

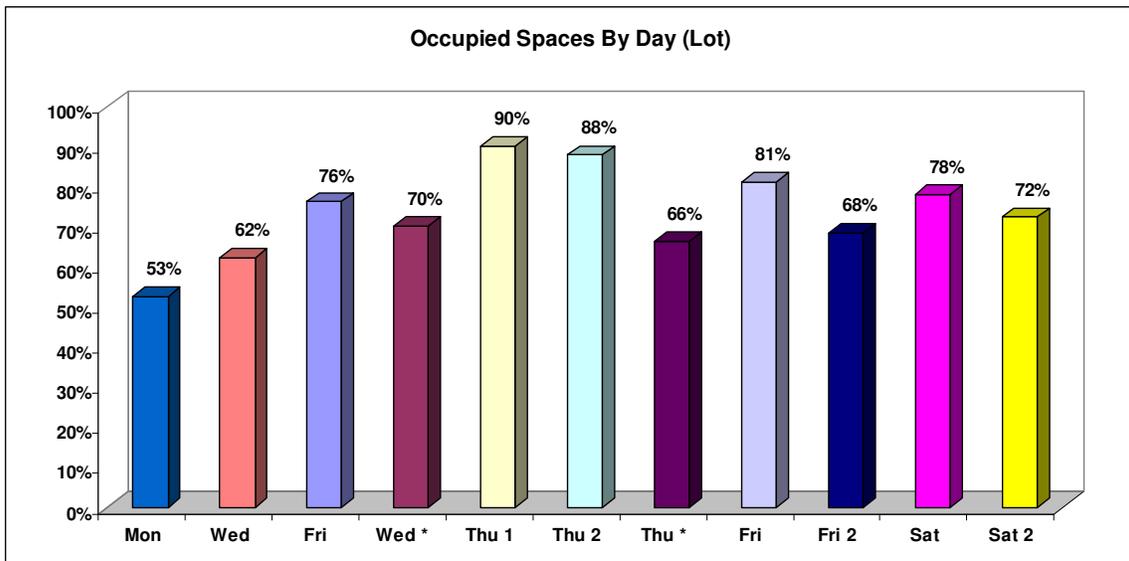


Figure 23 – Average Occupancy Within Municipal Lots by Day

Metered Parking

Combining both on-street and off-street parking occupancy levels for those days when both were surveyed shows average parking occupancy levels within the heart of the Coolidge Corner District to be well over 70% (Figure 24).

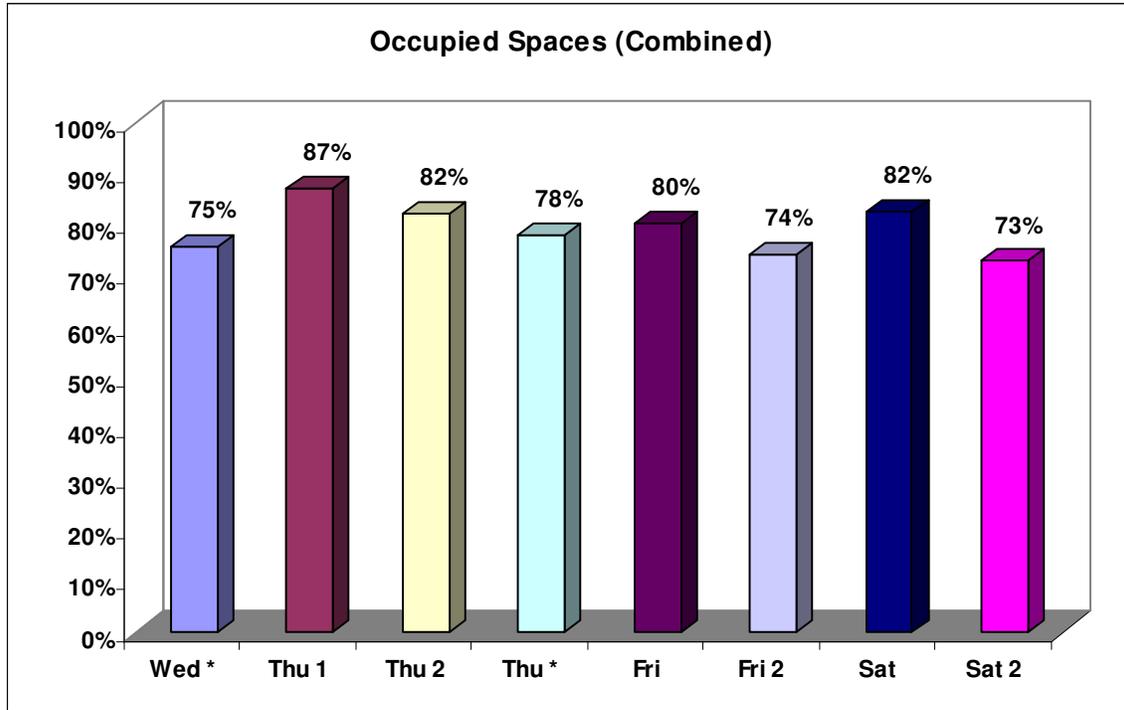


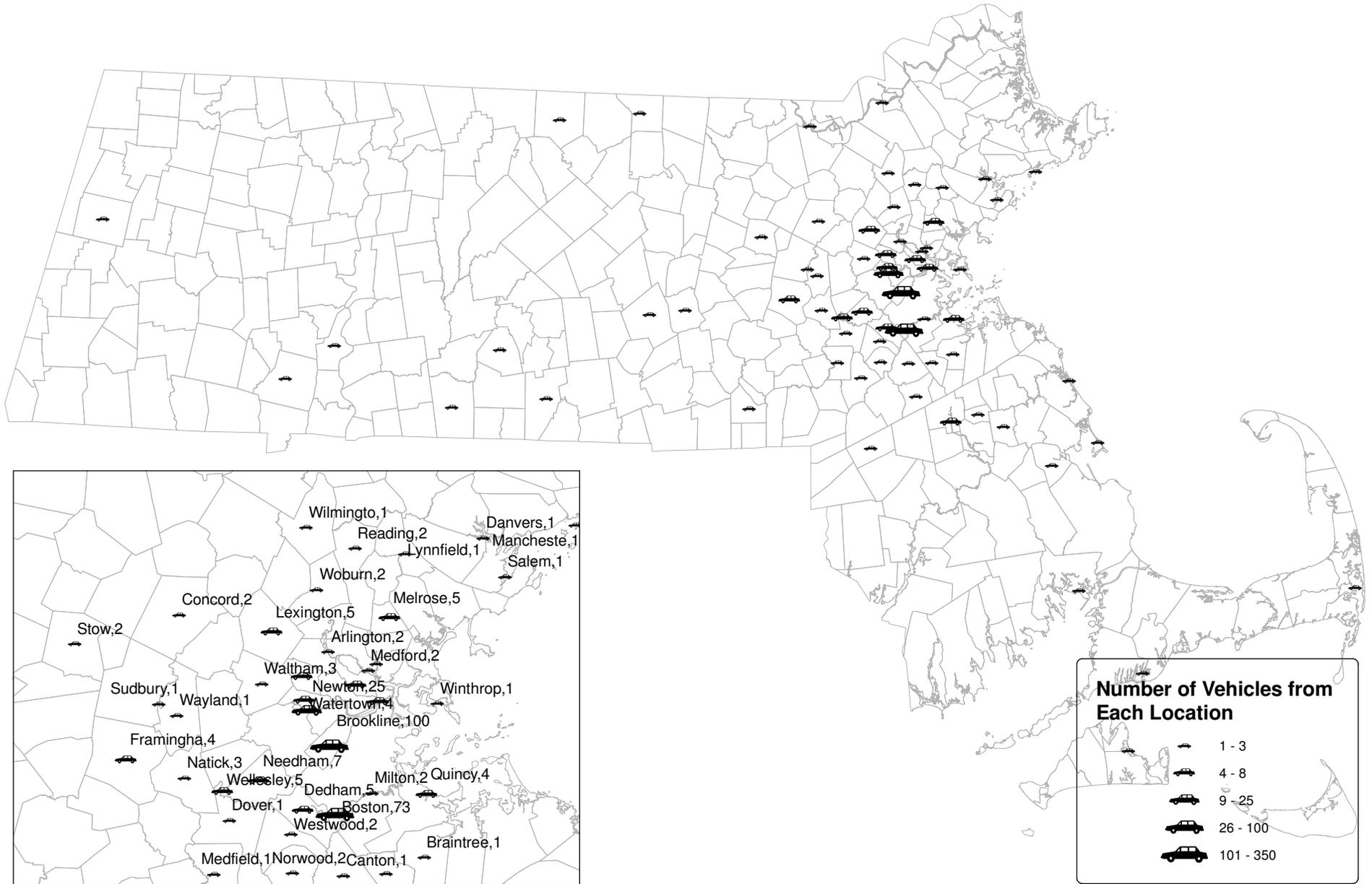
Figure 24 – Average of On-Street and Off-Street Parking Occupancy Levels

Centre Street East Lot

An additional level of review was performed for the Centre Street East lot. The Centre Street East municipal parking lot is the largest and busiest lot within the District. This parking lot, including the out cove to the rear of Walgreens, has 143 parking spaces. The lot is a three hour lot – vehicles cannot occupy a metered space for longer than three hours. In addition to the manual counts that were undertaken for this lot, a license plate survey was undertaken on Thursday, December 7, 2006.

The license plates collected during the survey of the Centre Street East Lot were geo-coded to find the vehicles place of origin. Data was limited to vehicles originating in Massachusetts state borders. Vehicles originated from the far reaches of the state including Cape Cod and the far West. Most vehicles, however, originated in either Brookline or Boston (Figure 25).

A parking utilization study was also performed at the Center Street East lot on Thursday, December 7, 2006 from 11 am until 7 pm. Every hour, on the hour, the license plate of each vehicle was recorded as well as the space that the vehicle was parked in. The purpose of the survey was to identify parking turnover rates. Throughout the eight hour survey period, a total of only 79 spaces were available on the hour. The largest number of spaces was available at 6 pm, seventeen 17 spaces (Figure 26).



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COOLIDGE CORNER
 BROOKLINE, MA

ORIGIN OF PARKERS IN THE
 CENTRE STREET EAST LOT

Figure 25

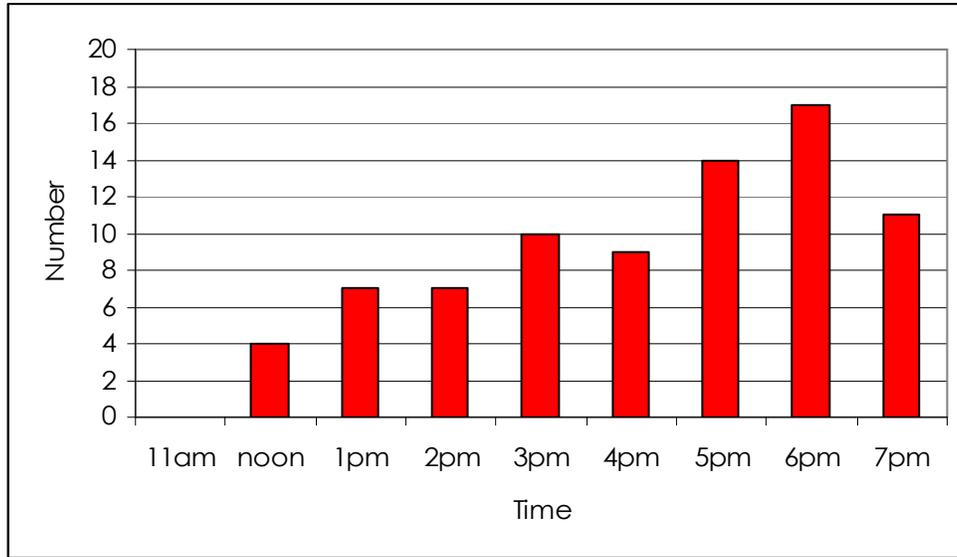


Figure 26 - Number of Parking Spaces Available - Center Street East Parking Lot - Thursday, December 7, 2006

During the day, the average occupancy in the parking lot was 94 percent; at 11 am, the parking lot was completely full (Figure 27).

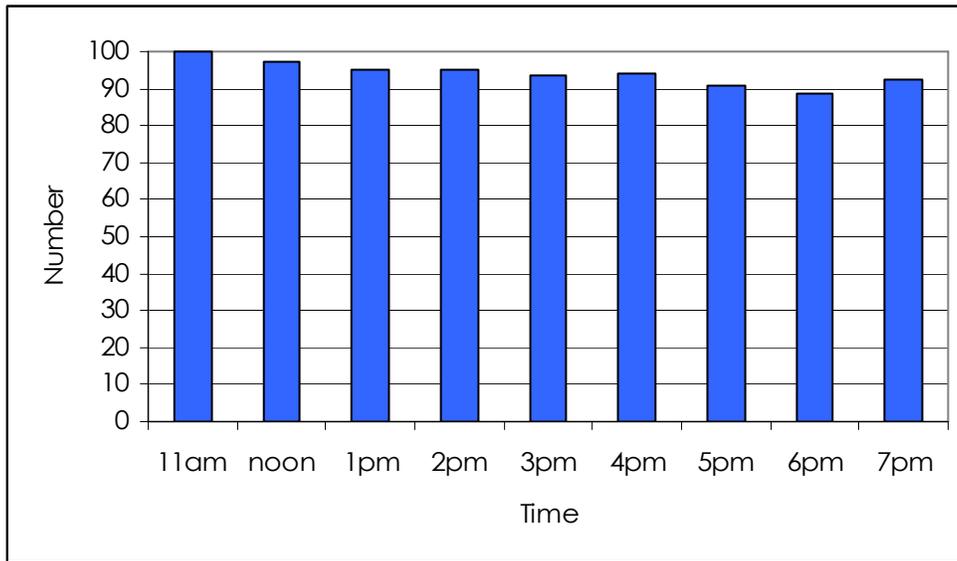


Figure 27 - Duration of Parked Vehicles - Center Street East Parking Lot - Thursday, December 7, 2006

On Thursday, December 7, 2006 it was found that 280 different vehicles were parked for at least an hour or more (Figure 28). Of these 280 vehicles, 25 vehicles, or close to nine percent (8.93%) of the spaces were illegally parked. Illegally parked can be defined as those vehicles that are left in the same space for at least 3 hours. Of the 280 vehicles which parked for an hour or more, five vehicles (1.79%) were parked in the parking space during the entire eight hour study period, six vehicles (2.14%) were parked for five or more hours, 14 vehicles (5%) were parked for four or more hours. Based on the data collection technique, namely collecting the data on the hour every hour, the vehicles that were

parked for three hours were in all likelihood going to be illegally parked also, which represents approximately 30 additional vehicles (10.71%).

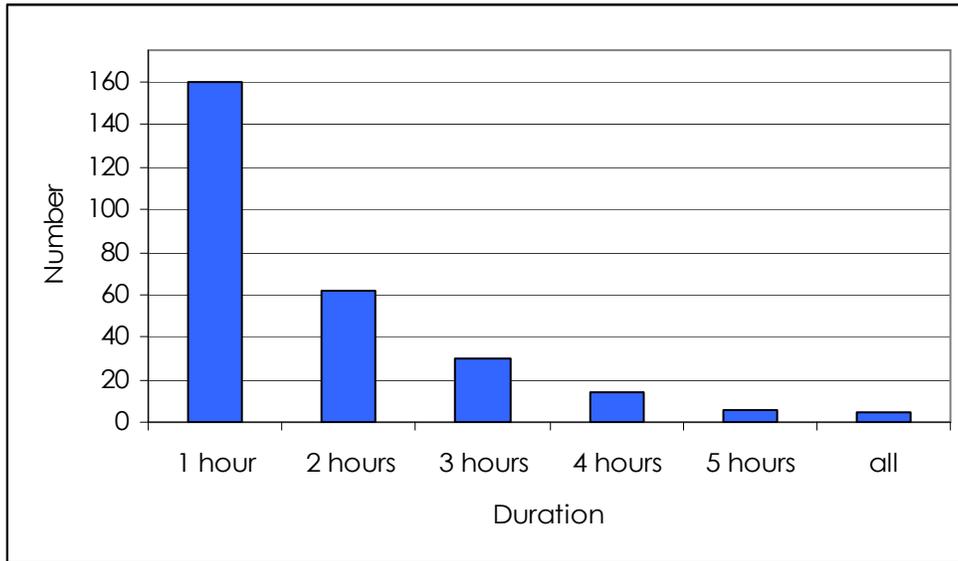


Figure 28 – Duration of Parked Vehicles - Center Street East Parking Lot – Thursday, December 7, 2006

Park Street and Naples Road

In an attempt to determine the effects of spillover parking on residential streets surrounding the heart of the Coolidge Corner District, two residential streets, Park Street and Naples Road, were selected by the Planning and Community Development Department for a closer observation of on-street parking practices. Both streets are only a short walk from the intersection of Beacon Street and Harvard Street.

Naples Road

Naples Road runs from Harvard Street in Brookline to Commonwealth Avenue in Boston. The street is exclusively residential and is comprised primarily of one-, two- and three-family homes. Naples Road is a two lane roadway and has a posted speed limit of 25mph. Parking, which is presently permitted for up to two hours, is allowed on one side of Naples Road only, with approximately 83 on-street parking spaces available. On the approach to Commonwealth Avenue no parking is permitted between 8:00a.m. and 10:00a.m.

A license plate survey for Naples Road was undertaken on both Wednesday, January 3rd and Thursday, January 4th 2007, between the hours of 8:30a.m. and 4:30p.m. It was found that a total of 82 different vehicles parked on Naples Road at various times on Wednesday, January 3rd. Of these 82 vehicles at least 33 were found to be parked in excess of the two hour maximum. No tickets were observed issued for these violations. On Thursday January 4th 2007 88 different vehicles were observed parked on Naples Road at various times of the day. 39 of these vehicles were found to be parked in excess of the two hour maximum. Again, no tickets were observed issued for these violations.

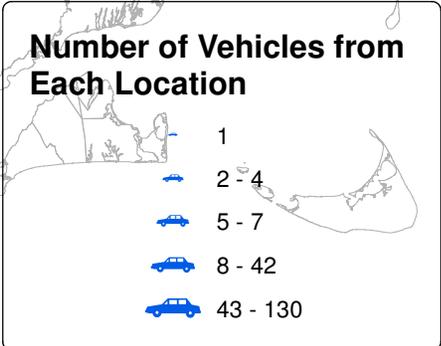
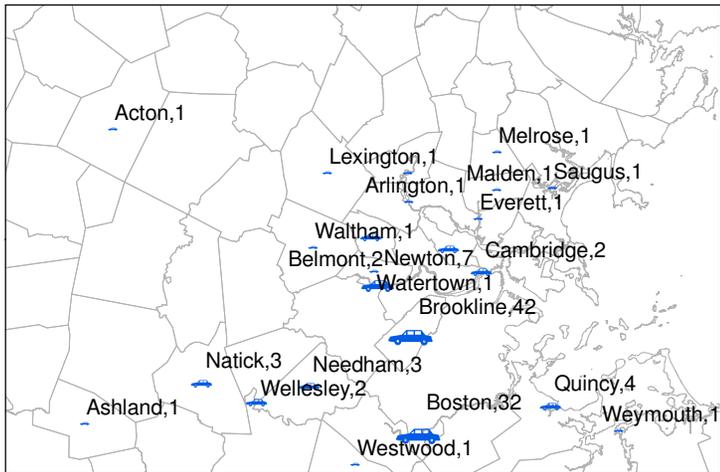
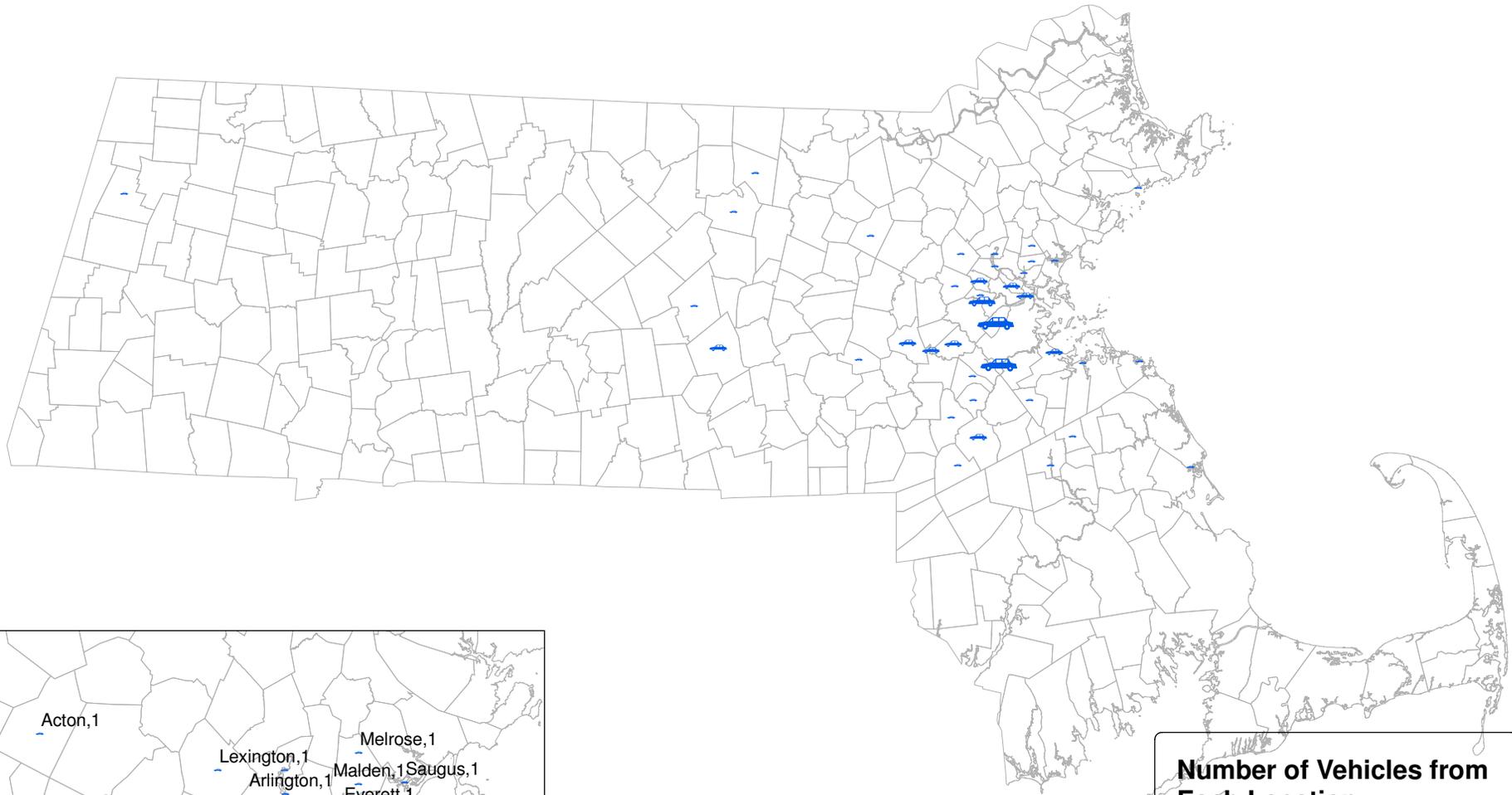
Park Street

Park Street runs from Washington Street to Beacon Street in Brookline. The street is exclusively residential and is comprised primarily of apartment and condominium

buildings, many of which have their own on-site parking. Park Street has a posted speed limit of 25mph and is a two-lane roadway between Marion Street and Washington Street, while between Marion Street and Beacon Street the street becomes a single lane, one-way roadway towards Beacon Street. Parking on the street is confined to one side only, though on certain sections, such as between Marion Street and Vernon Street, parking is not permitted on either side of the street. There are approximately 54 on-street parking spaces available on Park Street.

The license plate survey for Park Street was also undertaken on both Wednesday, January 3rd and Thursday, January 4th 2007, between the hours of 8:30a.m. and 4:30p.m. On Wednesday, January 3rd 78 different vehicles were recorded as being parked on Park Street at various times of the day. Of these 78 vehicles at least 29 were found to be parked in excess of the two hour maximum. No tickets were observed issued for these violations. On Thursday January 4th 2007 86 vehicles were recorded as being parked on Park Street. 26 of these vehicles were found to be parked in excess of the two hour maximum. Tickets were observed issued for five of these vehicles in violation.

The license plates collected during the survey of Naples Road and Park Street were geo-coded to find the vehicles place of origin. It was found that people parking on Park Street or Naples Road originated mostly from the Boston Metro area with the large majority of parkers originating in either Brookline or Boston (Figure 29)



PREPARED BY



PREPARED FOR:



COOLIDGE CORNER
BROOKLINE, MA

ORIGIN OF PARKERS ON
PARK STREET AND NAPLES ROAD

Figure 29

Commercial Permit Parking Program

To assist business owners and their employees located in the Coolidge Corner area, the Town makes available for purchase a limited number of employee parking permits. Corresponding with the 56 un-metered parking spaces within the Centre Street West parking lot, 56 permits are currently issued for this program. Employees who obtain a permit may park in this lot 9:00am to 8:00pm weekdays, and 12:00pm to 8:00am on weekends and holidays, though the lot is not available on those Thursday's that the Farmer's Market is in session. The current cost for participating in the program is \$65 per month (this fee is scheduled to increase to \$78 per month in April), there is also a one time administrative fee of \$25. Permits are limited to two per business and are issued to new applicants only when an existing participant drops out of the program.

In December of 2006 the Town's Transportation Board voted to approve a number of changes to the commercial permit parking program, with these changes anticipated to go into effect in April 2007. These changes were primarily in response to the area's business community, who had been requesting additional commercial permits along with a number of other relief measures from parking and traffic enforcement regulations. Currently there is a waiting list of 24 companies/individuals waiting for commercial permits, with the next eligible company/individual having been on the list for over a year.

Among the changes to the Commercial Permit Program voted on by the Transportation Board was an increase in the number of permits issued for the Centre Street West lot, from 56 permits to 66 permits. As shown in Figure 22 the average occupancy for this parking lot when surveyed was 53%. Similar occupancy levels were observed by the DPW staff in windshield surveys. Increasing the number of permits to 66 does not guarantee participants in the program a space in the lot, though with the different days and hours of employment for participants it is not expected that there will be a shortage of spaces.

Other changes approved by the Transportation Board included the conversion of the John Street Parking lot to commercial permit parking only. Adding these 14 spaces to the program, as well as 13 current 10 hour meter spaces on the east side of Harvard Street near TJ Maxx to commercial parking, would increase the overall number of commercial permits in the program to 93. With an increase in the fees for parking violations also approved by the Transportation Board it is hoped that this increase in the number of permits will help meet the demand for permits and reduce the number of employees parking on residential streets.

In addition to the Commercial Permit Parking program the Marriott Hotel on Webster Street also makes parking available at a discounted rate to area employees. The hotel's manager indicated that it is a rare occurrence for the parking garage to be fully occupied, by either hotel guests or by the public. In fact, because the garage operates well below capacity the hotel's manager allows members of the Coolidge Corner Merchants Association and their employees to now park in the garage at a discounted rate of \$5.00 per day, a rate that is consistent with the designated "commercial" parking lots and the 10 hour meters. These spaces for employees are available on an as-needed, day-to-day, pay-as-you-use basis.

5.3 Summary Findings

- Although only two residential streets, Park Street and Naples Road, were observed and monitored, enforcement of parking violations on these streets appears to be lacking. Over a two day period, at least 72 vehicles on Naples

Road were found to have exceeded the maximum two hour parking permitted, while on Park Street at least 55 vehicles were found to have exceeded the maximum two hour parking permitted. Only five of these 127 vehicles were observed as having tickets issued for this violation. While people drove from all over the state to the CCD, in general, parkers originated in Boston and Brookline.

- There appears to be a shortage of available and convenient parking for employees in the Coolidge Corner area. Employees parking on residential streets, the "feeding" of parking meters and the waiting list for the commercial parking program seem to validate this perception.
- Results of a December 2006 survey by the Coolidge Corner Merchants Association in cooperation with the Coolidge Corner Hub showed that of the 111 companies who responded to the survey, 744 of their employees were found to arrive to work by car. Only 17 of these car trips were shared by fellow employees, meaning 727 employees required parking in the area at various times of the day and week. The survey also found that only 77 of the employees used privately owned parking facilities, while only a further forty one 41 employees used the Town's Commercial Permit Parking Program.
- Amongst other things the Comprehensive Plan called for the establishment of a Parking District in Coolidge Corner. A Parking District would be a zoning overlay in which required parking could be reduced or waived in exchange for payment-in-lieu-of parking provision. Payments would be placed in a fund and used to fund parking improvements (Page 139). The Plan also calls for a review in parking standards for commercial areas to evaluate possible changes for mixed-use buildings, shared parking arrangements, and transit-oriented development.
- Occupancy levels for metered on-street parking along Harvard Street and Beacon Street are significantly higher closer to the Harvard Street and Beacon Street intersection, with occupancy levels over 90% observed.
- Occupancy levels for metered on-street spaces in the District were found to be consistently high, ranging from 73% to 96% for the streets surveyed.
- Occupancy levels within the municipal parking lots varied significantly when surveyed, ranging from an average occupancy for the John Street lot of 42% to an average occupancy of 93%.
- A parking utilization study was performed for the Centre Street East to identify parking turnover rates. Throughout the eight hour survey period, available parking spaces were counted every hour. A total of only 79 spaces were counted over the eight hour period. The largest number of spaces was available at 6 pm, 17 spaces.
- The number of commercial permits available through the Commercial Permit Parking Program is proposed to be increased from 56 to 93. An informal arrangement with the Marriott Hotel will also make parking spaces available at a discounted rate to area employees.

6 Final Transportation Analysis

This final task of the Analysis has been broken into a number of individual categories, so as to better relate any suggested improvements or changes to the specific transportation mode or infrastructure requiring change, or policy or regulation that would be subject to change. Another important reason for this approach is to more clearly show that the changes recommended are consistent with the Town's Comprehensive Plan. Where there are recommendations within the Comprehensive Plan relating to transportation which cannot be implemented in the near future, or which would be difficult to implement at anytime within the District, they too are addressed in this section.

This report is specific to changes relating to transportation within Coolidge Corner. The zoning amendments suggested within this section are specifically related to parking requirements. The amendments suggested have been used in other communities within Massachusetts and should assist with supporting modest growth within the Coolidge Corner District, without placing further stress on the area's parking supply and roadway network.

6.1 Comprehensive Plan

In an already densely populated urban environment such as Coolidge Corner, the promotion of even modest development growth, through zoning or by other means, can only successfully occur if strategies are in place to ensure that any such growth does not overburden the existing transportation network. Numerous strategies and policies are set forth within the Comprehensive Plan for exploration into how the negative impacts of development growth on the transportation network might be mitigated, as well as to how the existing transportation network and infrastructure might be improved upon. As outlined in the Introduction of this Analysis, the following broad themes were identified in the Comprehensive Plan:

- Zoning Changes and Development Incentives
- Transportation Demand Management
- Transit Oriented Development
- Transportation Management Associations
- Parking Supply and Demand
- Bicycle and Pedestrian Facilities and Connections
- Massachusetts Bay Transportation Authority (MBTA)

Each theme has been addressed to some extent within earlier sections of this Analysis, but each is now addressed in greater detail within this final section. Specific recommendations under each theme for the Town to consider have also been made in this section.

Zoning Changes and Development Incentives

An underlying theme of the Comprehensive Plan is that development within the Town is encouraged and supportable, especially within the Town's existing commercial areas, where appropriate and well considered infill development is particularly welcome. It is made clear that in such instances and locations where development is to occur, the existing urban fabric needs to be respected and the proposed use or uses needs to be suitable for the location. The development also needs to contribute to the neighborhood; in terms of aesthetics, area vitality (social and economic), and neighborhood character.

There are numerous strategies within the Comprehensive Plan supporting such growth. Specifically, for those areas where District Plans will be developed, the Comprehensive Plan states, "As part of district plans, examine incentives for office development in Brookline Village/Route Nine and Coolidge Corner, including mixed-use development, and evaluate zoning changes suitable to attract this development" (Page 128). The Comprehensive Plan also states, "Explore the feasibility of creating additional office space through redevelopment of existing buildings as well as new construction" (Page 130).

In tandem with supporting modest and appropriate development growth, the Comprehensive Plan also envisions potential zoning amendments to help facilitate such growth. Amendments described in the Plan are not focused solely on incentives to increase the size, density, and types of uses permitted, but also for the zoning to be relaxed or more flexible when it comes to meeting the transportation requirements of new development. The Comprehensive Plan set forth the following strategies relating to zoning and transportation:

"Revise the Transportation Studies section (Section 5.09) of the Zoning By-law and the related Transportation Access Plan Guidelines (Page 138);"

"Review and revise parking standards for commercial areas to evaluate possible changes for mixed-use buildings, shared parking arrangements, and transit oriented development (Page 139);" and

"Establish specific standards and criteria for shared parking in mixed-use buildings (Page 139)."

There are numerous examples of communities throughout Massachusetts that allow for shared parking standards and for reduced parking requirements for those projects that are in close proximity to rapid transit. Shared parking has become a basic component of smart growth strategies and "is the use of a parking space to serve two or more individual land uses without conflict or encroachment."^{*} The goal of shared parking is to balance providing adequate parking to support uses without overbuilding. Reductions for shared parking are typically around 15% of the total capacity, and are typically applied to larger projects with a mix of uses and with suitable operational conditions. Section 6.02.1.b.c of the Town's Zoning By-Law already allows for a reduction in required parking through a special permit from the Board of Appeals. This section does not however specify the maximum deduction that will be considered and under what circumstances shared parking will be considered.

For the development scenarios examined in Section 2 of this Analysis, parking requirements were often the impediment to development rather than Floor Area Ratio, height, setbacks, or other dimensional standards. Offsetting the costs of providing parking also made some of the potential build-out scenarios greater in square footage than otherwise might be needed in order to realize profits. Increased construction costs associated with increased parking, primarily in underground structures, would also be passed on to owners and tenants of buildings, whether these be residents, office or retail tenants, making it harder for people to buy in the community and for smaller retail and office tenants to compete with larger national chains. Providing an appropriate level of parking is therefore of utmost importance.

The current parking requirements within the Zoning Bylaw are applied throughout the Town, and do not take into consideration the special circumstances of the Coolidge

^{*} Mary S. Smith, *Shared Parking: Second Edition, Urban Land Institute: Washington DC: 2005*

Corner District, with almost the entire District located with ¼ mile of some form of public transportation. Parking requirements within the Town are high, when compared to other inner core communities, which experience similar parking pressures and which also seek to avail of Transit Oriented Development opportunities. What the parking analysis of the various development scenarios in Section 2 showed was that the current parking requirements for the District are significantly higher than those set forth by the ITE, and by nearby, similarly situated communities such as Cambridge and Somerville.

Recommendations

- The Town may wish to consider up to a 20% reduction in parking requirements for uses located within 1000 feet of the Green Line 'C' Branch.
- Section 6.02.1.b.c of the Town's Zoning By-Law already allows for a reduction in required parking through a special permit from the Board of Appeals. This section does not however specify the maximum deduction that will be considered. The Town may wish to consider allowing up to a 15% reduction in parking requirements to avail of shared parking arrangements in mixed use developments.
- Reduction of existing on-site parking requirements for both residential and non-residential uses permitted within the existing G-1.75 (CC) district.
- Underground parking is always preferable within urban settings and is almost a necessity within the Coolidge Corner District when attempting to meet the parking requirements of the Bylaw. The floor area of underground or above ground parking structures and the floor area of the portion of either structure devoted in whole or in part to parking automobiles, should not be counted as Gross Floor Area and should be exempt from the requirements as to floor area.
- The Town may wish to consider establishing parking minimums and maximums within the G-1.75 (CC) district.
- As outlined within the Comprehensive Plan, Section 5.09 of the Zoning By-Law should be revised. This section of the By-Law is very prescriptive, lacking adequate detail or standards as to the minimum standards and scope for a transportation study and potential mitigation requirements.
- The establishment of a Parking District in Coolidge Corner needs greater exploration and should be tied into any potential zoning changes that allow for a reduction in parking. Any reduction or waiver from parking requirements granted by the Board of Appeals would require the applicant for such relief to pay into a fund for parking improvements, with the amount paid based on a per space formula. Any funds generated could be used towards the design, maintenance and construction of parking facilities in the District. The G-1.75 (CC) district seems appropriate for such an overlay, and the Town may wish to explore the viability and feasibility of this and other similar overlays that have already been established elsewhere. For example, Plymouth, Massachusetts, has such an Overlay District already operating within its downtown.

6.2 Transportation Demand Management (TDM)

TDM programs are designed to maximize the people-moving capability of the existing transportation infrastructure by reducing Single Occupancy Vehicle (SOV) trips, increasing the number of persons in a vehicle, providing alternate modes of travel, or influencing the time of travel or need to travel. TDM measures are most often directed at

commuter travel. The day-to-day regularity of this type of trip and conditions at the workplace; in terms of employer practices and on-site services, bicycle storage and showers, and shuttle services, directly impact employees commuting choices and make this population the most suitable for identifying travel alternatives.

The term TDM includes both alternatives to driving alone as well as the strategies that encourage the use of alternatives. TDM alternatives to driving alone include carpools and vanpools, public and private transit, and non-motorized travel, including bicycling and walking. TDM alternatives can also influence when trips are made. TDM strategies are the supporting measures that encourage the use of alternatives to driving alone. TDM strategies include financial incentives, trip-time improvements, provision of new or enhanced commuter services, socio-economic incentives, dissemination of information, and marketing alternative services. TDM strategies include all the incentives and disincentives that increase the likelihood for people to change their existing travel behavior.

Brookline's Comprehensive Plan references TDM measures on several occasions as a means to limiting impacts on the roadway network. The Plan makes reference to a "Town-administered outreach program for transportation demand management to serve small-scale businesses in commercial districts" (Page 141). The plan also makes reference to requiring through the permitting process "Transportation Demand Management (TDM) programs as part of mitigation for new commercial development projects of more than 25,000 square feet" (Page 139).

Recommendation

- In any update of Section 5.09 of the Zoning Bylaw there should be a requirement that for any project within the CCD that exceeds certain square footage thresholds and for any project requiring relief from constructing a certain number of parking spaces, a detailed TDM plan must be submitted. Minimum submission requirements for a TDM plan should also be set forth in Section 5.09. At a minimum, any TDM plan submitted should outline the steps to be taken to reduce single occupant vehicle trips, measurable goals, and monitoring strategies for the plan.
- The City of Cambridge has a full time planner for TDM planning and ensuring developers meet obligations set forth within a TDM plan. Although it would not make fiscal sense to have a full time planner in Brookline to review, formulate and enforce TDM strategies in the District, as the workload would not sustain such a position, it would make sense to add these responsibilities to an appropriate staff position. TDM strategies often lose their effectiveness if they are not regularly monitored and enforced to ensure their long term success.

6.3 Transit Oriented Development

Transit Oriented Development, according to the Massachusetts Office Commonwealth Development, "is compact, walkable development centered around transit stations. Generally including a mix of uses such as housing, shopping, employment, and recreational facilities TOD is designed with transit and pedestrians as high priorities, making it possible for visitors and residents to move around without complete dependence on a car." Development features often associated with TOD projects are; a mix of uses, moderate to high densities, pedestrian orientation/connectivity, transportation choice, reduced parking and high quality design.

Since reference is made to supporting TOD within the Comprehensive Plan (Page 5 & Page 137) and for consideration to be given to the creation of a TOD Overlay District

(Page 117 & 139) which would provide a variety of measures and incentives to encourage and take advantage of transit access and use, the question becomes what are the advantages and disadvantages of creating such an overlay district and what zoning incentives would such an overlay district offer?

Many, if not all of the features commonly associated with TOD are already instantly recognizable within the District. The area already experiences high densities, and it is outside the scope of this analysis to determine if density should be increased further. This analysis also outlined the wide range of transportation options that are available within the District. Where the District seems to be lacking is that the existing parking requirements are high, while no reductions or incentives are given for proximity to transit.

Recommendation

- Coolidge Corner typifies what is meant by TOD, with the exception of parking standards for new development. As outlined earlier in this section, zoning amendments to reduce parking requirements for new development, a reduction in parking requirements for proximity to transit, and shared parking arrangements should be considered as revisions to the Zoning Bylaw.

6.4 Transportation Management Associations (TMAs)

Often created as part of a TDM strategy or policy, Transportation Management Associations (TMAs) are private, non-profit coalitions of local businesses and/or public agencies that provide transportation services in a particular area, such as a commercial district, mall, medical center or industrial park. TMA's work to strengthen partnerships with businesses to reduce traffic congestion and pollution by improving commuting options for their employees. Although TMA services vary, most include carpool, vanpool, transit, bike, shuttle and infrastructure planning.

A TMA is already successfully operating on the fringe of the CCD. MASCO - Medical Academic and Scientific Community Organization, Inc. - is a non-profit organization established in 1972 by its member institutions to plan, develop and enhance the Longwood Medical and Academic Area (LMA). To improve accessibility within the LMA, MASCO provides various transportation and parking services to its various user groups.

The Comprehensive Plan proposes that the potential for the Town to take a leadership role in forming a TMA be evaluated and that the potential for the expansion of the existing MASCO TMA and associated shuttle service also be evaluated (Pages 130 & 141).

Recommendations

- Since the MASCO TMA is dedicated towards serving the LMA and is financed by a small number of larger institutions within the LMA, it is unlikely to be receptive to expanding its services to include individual small businesses outside the LMA. The ability of the Town to act on behalf of the businesses to provide funding and support services to the MASCO TMA would have to be determined by the Town, though significant time and resources should not be spent on this effort unless MASCO first expresses an interest in expanding its TMA.
- As to the establishment of a self supporting TMA, the Town and businesses within the District would have to explore this in more detail. With no easily identifiable large employer/employers within the District, the establishment of a TMA is made all the more difficult, particularly from a motivational view point and from a financial perspective. A model of a TMA which may be more appropriate for Coolidge Corner than the MASCO TMA is the Charles River TMA,

<http://www.masscommute.com/tmas/crtma/>, which runs a private shuttle service supported by area businesses. The Town and the local business community may wish to conduct some preliminary research into the costs involved in the establishment, management and operational considerations of running a TMA such as the Charles River TMA. The Charles River TMA and MassCommute should be able to provide the Town with this information, allowing it to make a decision as to whether pursuing the establishment of a TMA is even a viable option in the District.

6.5 Parking Supply and Demand

A primary focus of this report was to undertake a preliminary assessment of the parking supply and demand within the Coolidge Corner District and its utilization. The management of the parking supply, opportunities to increase the supply, and existing policies and regulations were also examined. Section 4 of this Analysis outlines in detail the data collection effort that was undertaken in order to arrive at the various findings.

Section 4 of the Analysis clearly illustrated the existing public parking supply is often at or near capacity, with some parking lots more popular than others. However, full and optimal use of the public parking supply can only be achieved if users are aware of the location of all public parking within the District and the regulations governing that parking.

Signage and Parking Space Reservations

The signage currently being used for public parking facilities is small, often missing from key locations or poorly located, and it fails to give drivers unfamiliar with the area sufficient advance warning. It would be easy for drivers unfamiliar with the area to not know how to get to a number of the municipal lots or where exactly they are located. The Marriott Hotel parking facility in particular is very poorly signed. There is no advance warning of this parking facility, the driveway to the garage parking is poorly signed, and the driveway has the appearance of a dead-end street. Further, the regulations are not clearly posted and even contradictory on occasion, while spaces within the garage for public parking are not clearly delineated.

A longer-term, though more expensive signage package for the District, would be the utilization of an Advanced Parking System (APS) in conjunction with variable message signs. Advanced Parking Systems obtain information about available parking spaces, process it and then present it to drivers by means of variable message signs (variable message signs are used to give travelers information while they are en route). APS is used in two ways: to guide drivers in congested areas to the nearest parking facility with empty parking spaces and to guide drivers within parking facilities to empty spaces. Within Coolidge Corner, alerting and guiding drivers to the nearest public parking facility would be the desired goal.

Although APS and variable message signs have been successfully used in Europe for decades, they are only beginning to gain popularity in the United States. An independent study of such a system would be required to determine its potential effectiveness and feasibility within Coolidge Corner. These systems can be expensive to install, especially when permanent fixtures are necessary.

A further technology which is gaining in popularity and which might be suitable for Coolidge Corner is e-PARKING. e-PARKING is a parking management system that relies upon cell phone technology. It enables drivers to obtain early information on available parking spaces so that they can reserve spots at desired times. Related to this is "Park-

By-Phone," a system that allows members to pay for parking at meters and lots by using their cell phone. A 10% convenience fee is added to the parking charge by the company administering the program and all other revenues are then returned to the municipality. Coral Gables, FL and Denver, CO, are already operating such a system.



Figure 30 Variable Message Sign

Commercial Parking Permits

As outlined in detail in Section 4 of this Analysis, the Town's Transportation Board recently voted on a number of major changes to the Town's Commercial Permit Parking Program. This program, which currently makes 56 parking commercial permits available in the Centre Street West lot, would be expanded upon. An additional 10 permits would be issued for the Centre Street West lot, while the 14 parking spaces in the John Street lot would also be included in the program, as would 13, 10 hour meter spaces near JFK Crossing. This would raise the total number of commercial parking permits to 93. In addition, as a result of negotiations with the manager of the Marriott Hotel, members of the Coolidge Corner Merchants Association and their employees can now park in the hotel garage at a discounted rate of \$5.00 per day, a rate that is consistent with the designated "commercial" parking lots and the 10 hour meters. These spaces for employees are available on an as-needed, day-to-day, pay-as-you-use basis.

These changes should improve the existing situation and help meet the demand for additional commercial parking as expressed by area merchants. If the employee parking survey conducted in December 2006 by the Coolidge Corner Merchants Association in cooperation with the Coolidge Corner Hub is accurate, then there may still

be a shortfall of designated commercial parking spaces. This survey indicated that 727 employees require parking in the area at various times of the day and week. Although the survey did not take into account shift operations and the employee parking demand at any given period, it still provided a useful insight into employee driving and parking patterns.

Residential Street Parking

Parking on the un-metered residential streets within the District is generally permitted for up to two hours during the day, yet most of these streets experience only moderate levels of parking activity. As outlined in Section 4 of this Analysis, the survey of parking habits on residential streets suggests that the ticketing of vehicles that exceeded the two hour parking maximum was not being strictly enforced and the majority of violators did not receive tickets. With the new residential parking program slated for introduction and implemented at the precinct level, enforcement efforts may improve.

Metered Parking

A parking occupancy survey for all on-street metered parking spaces and all metered parking spaces within municipal lots was undertaken and is described in detail in Section 4. The average occupancy of on-street spaces for each of the days that counts were taken in the District was consistently high, with overall rates ranging from 73% to 85%. As would be expected, the closer to the intersection of Harvard Street and Beacon Street and the core of the District, the greater the average occupancy rate of the on-street metered parking spaces. Similarly, parking rates within the municipal lots were consistently high, with rates as high as 90% occupancy experienced when daily averages were considered. Combined daily rates for both on-street metered parking and municipal lot metered parking were consistently over 70%.

These high occupancy levels were not unexpected and few will find them surprising. Also, few will find surprising that “feeding” the meters commonly occurs, with this practice monitored at the Centre Street lot and observed at numerous other locations. Again, similar to the two hour violations on residential streets, violations of the parking maximums at meters occurs regularly, which in turn reduces parking turnover rates. If customer parking is to be provided for in an efficient manner then parking turnover rates need to be maximized and the practice of “feeding” the meters needs to be discouraged and should be more strictly enforced. Close monitoring of the Commercial Permit Parking program is also needed going forward to ensure adequate employee parking, especially if enforcement efforts are stepped up. What also might be considered is an increase in meter fees. An increase in meter fees would not only discourage “feeding” of meters, but it might also assist with funding expanded parking facilities, which is discussed later in this section.

Parking Structures and Systems

The idea of adding additional parking to the District, and in particular to the Centre Street East lot, is viewed by many to be the solution to the perceived shortage of parking within Coolidge Corner, though the exact number of spaces required and how they would be located on the lot has never been fully determined. As outlined in Section 2, the option of providing additional underground parking is attractive. This approach would allow the existing surface lot to be redeveloped and a significant civic space to be created. However, the major drawback is that underground parking is significantly more expensive than providing parking within an above ground garage structure.

Although there are no tried and tested formulas with costs continuously fluctuating and site specific, figures often cited for the cost of a parking space within an above ground structure generally range from \$15,000 to \$25,000, while for a below ground structure they are generally cited as being in the range of \$25,000 to \$35,000 per parking space. When structures capable of accommodating 150 to 200 cars are envisioned costs can be astronomical. Funding for a garage therefore becomes of the utmost importance. At the current parking fee levels levied by the Town it would be unrealistic to assume a private developer would construct a garage and charge rates that can compete with the current rates offered by the Town. If the idea of a privately managed and constructed parking facility is ever to be advanced then an increase in parking fees will have to be explored. Other funding options will also have to be explored, as will the role of the Town in providing any parking facility.

Robotic parking was also mentioned as an alternative to be considered in providing any new parking structure in the District. Robotic parking is gaining in popularity within the United States, with companies such as Robotic Parking, APT, SpaceSaver Parking and AutoMotion each having installed robotic parking facilities in the northeast. As yet, there are no fully automated robotic parking facilities operating within the Boston area, though the Lovejoy Wharf development is considering the installation of such a facility. Costs per space for robotic parking are not as easily attainable, though savings can be realized with underground facilities since less excavation is needed, while for all robotic facilities, more parking spaces can be placed in the same square footage of a robotic garage than in a conventional garage. Whether these benefits offset other costs is not obvious, and discussions with a robotic provider would have to occur with the Town, if and when a detailed parking program is developed.

One of the more publicized robotic parking garages¹ is the Garden Street Garage in Hoboken, NJ which opened in October 2002. This garage, designed for local residents, is seven stories high and accommodates 312 cars. When a driver enters the garage, a sensor detects their access card and signals to the computer that a driver is approaching. The driver proceeds into the open bay, gets out of their car, and pushes a button to activate the automated parking process. Once the driver has left their vehicle, an integrated motion control system takes over, managing numerous independently operating robots that transport the vehicle from the entrance bay into an open parking space.

Parking structures, decks and garages need not have poor aesthetic design (Figure 31). Figure 31 shows the robotic parking garage at Garden Street in Hoboken, NJ., a well designed and attractive parking structure that has been designed to at least partially mimic surrounding properties.



Figure 31 Robotic Parking Structure in Hoboken, NJ

Since this study was not focused solely on parking supply and demand within the District, it would be prudent not to make any estimate on the exact number of spaces required or the type of parking facility that could best accommodate any additional spaces that may or may not be needed. The data collected as part of this analysis suggests that parking at the Centre Street East lot is close to capacity throughout the day, and for most days of the week. However, there are other parts of the District where parking occupancy levels do not reach capacity.

Although there is clear demand for the existing parking within the District, a number of questions need to be answered prior to increasing the parking supply. These include:

- Would adding more parking simply be for the convenience of those drivers who like to use the Centre Street East lot?
- Does the current supply cater to the demand?
- Do people avoid Coolidge Corner because of a lack of parking or leave frustrated because they cannot find parking? How many additional spaces are needed?
- Could the existing on-street spaces be more fully utilized?

The answer to these and other questions must first be determined before any decision on the location and type of structure to provide additional parking is made. If it is determined that additional parking is required then a subsequent study should be made into the feasibility of providing those spaces, optimum locations, cost estimates for alternative parking structures, and financing and management options.

Recommendations

- A comprehensive way finding signage package that clearly directs drivers to the various parking lots within the District is urgently needed. This is a relatively low cost, simple project that could be implemented almost immediately.

- Regulatory signage within parking lots is often confusing and poorly located. Any review of way finding signage should also include a review of regulatory signage within municipal lots and on public streets.
- The Town may wish to explore options such as APS and variable message signs, though as mentioned the installation of such a system can be expensive. Improving the existing signage within the District and monitoring the results may show that a more expensive system is not warranted or would have only marginal benefits.
- The opportunity exists for “e-parking” and “pay-by-phone” with what should be relatively little expense to the Town. These programs are managed independently and the Town may wish to further explore these options, which would add to the convenience of parking in the District.
- Since the occupancy rates for both on-street and off-street metered parking are consistently high the Town needs to be creative in how it manages the existing parking supply. This Analysis has identified a number of steps that can be taken that allows for the existing supply to be more fully utilized and better managed. However, if occupancy rates continue to remain high and the Town chooses not to allow for more flexible parking arrangements on residential streets, then increasing the parking supply will in all likelihood be necessary at some point in the near future. As previously mentioned within this Analysis, any contemplated increase in supply would first require a detailed study to be undertaken to establish the demand for such additional parking and how best to provide it.
- If it still determined that additional commercial parking spaces are needed (once the recent changes to the program proposed by the Transportation Board have been enacted) then the Town may wish to consider offering a very limited number of commercial permits to each business allowing employees to park on residential streets for greater than two hours. However, this option should only be examined after the existing changes to the Commercial Parking Program have been fully vetted and it has been determined that additional permits are still required.
- Enforcement of parking violations in the District needs to improve, especially with the introduction of the new residential on-street parking program. Ticketing for meter “feeding” and parking in excess of parking maximums needs to improve to encourage parking turnover rates.
- The Town should examine all existing meter fees and fines for violations to determine if fee increases are warranted. Increased fees may assist with parking turnover rates, reduce parking violations, and potentially be used towards providing additional parking within the District.
- Pavement markings within the municipal lots need to be maintained on a regular basis. Markings within the Centre Street West lot do not appear to correspond with the 56 spaces that are supposed to be available within this lot.
- The Town should actively work with ZipCar and similar providers to make access to their fleets easier and available within municipal lots. The promotion of shared vehicle programs should also be considered in private developments and considered by the Board of Appeals when zoning relief from parking requirements is being sought. The Zoning Bylaw should also have specific language that permits shared cars on private property. An April paper published by UC Berkeley's Partnership for Advanced Transit and Highways, suggested that every car sharing vehicle on the road accounts for six to 23 cars taken off the personally owned vehicle roster in this country and Canada. The zoning code should be amended to more easily accommodate Zip Car.

6.6 Bicycle and Pedestrian facilities and connections

As outlined within the Coolidge Corner District Plan White Paper, at over 42%*, the CCD represents the largest concentration of retail commercial businesses in the Town. Overall, Coolidge Corner holds a combination of destination and service businesses, with over 65%* service-oriented. In addition, the CCD is a high density residential neighborhood, with not only one-, two- and three-family homes, but also many large apartment and condominium buildings. The mix of commercial, retail, restaurant, residential and institutional uses in the District coupled with the easy roadway and public transit access makes the area not only an attractive place to live, but also an attractive employment center and destination for shoppers, diners and visitors.

With so much activity in the district it is vital that the needs of pedestrians and cyclists are properly provided for and that the appropriate facilities, strategies and mechanisms to promote pedestrians and cyclists are put in place. The Comprehensive Plan calls for identifying pedestrian and bicycle priority routes and the preparation of a bicycle and pedestrian master plan that outlines a system of connections between neighborhoods, activity centers and public open spaces (Pages 5 & 140). The Plan also emphasizes the need to follow through on recommendations of existing plans and programs, such as the Commercial Areas Streetscape Master Plan and the Sidewalk Rehabilitation program (Page 38 & 142). Finally, the Plan recommends that the Planning Board establish bicycle parking guidelines for incorporation into the Zoning By-law and that bike facilities be provided in new private development projects, while the Town's Transportation Board and DPW should develop a plan for improved bike parking in commercial areas and as part of public improvement projects.

Recommendations

- A comprehensive study of existing bicycle rack locations, circulation patterns and routes, directional and routes signage, as well as pavement markings needs to be undertaken. Recent upgrades to Harvard Street have improved conditions and facilities for cyclists, as will the reconstruction of Beacon Street. However, further improvements are needed along these streets and elsewhere within the District. Improved way finding signage, share the road signage, pavement markings, and better as well as more strategically placed bicycle parking facilities and shelters, could all enhance the overall experience of cycling within the District.
- Bicycle parking requirements within the current Zoning Bylaw are minimal and discretionary, as such new bicycle parking requirements and standards need to be incorporated into the Bylaw. Proposed Bylaw amendments drafted in 2002, and which progressed to Town Meeting warrant, were never enacted. These amendments should be re-examined by the newly formed Bicycle Committee and the Town's Planning and Community Development Department to determine if they are still suitable (with or without amendment) for inclusion within the Bylaw. If they are deemed unsuitable new bicycle parking requirements and standards should be drafted for inclusion into the Bylaw.
- Existing facilities and amenities need repair or upkeep. Faded crosswalk paint, uneven and broken pavement surfaces on sidewalks and roadways, malfunctioning pedestrian signals are examples of facilities and amenities in need of attention.

* Coolidge Corner District Plan, Overview and Proposed Approach, December 2005

- Sidewalks should be level, smooth and without obstructions in the pathway of pedestrians (Figure 32).



Figure 32 - Sidewalks with Obstructions and Uneven Path

- Crosswalks should be well marked and accentuated by curb extensions (Figure 33). At a minimum, crosswalks should be marked with ladder striping. Treatments for multilane roadways should include a 10- to 30-foot distance between the stop line and the crosswalk. Appropriate advance signage should also be in place to warn motorists of pedestrian crossing activity.



Figure 33 - Poorly Marked Crosswalks

- To improve sight lines between motorists and crossing pedestrians, on-street parking should be spaced at least 30 feet back from crosswalks. Furthermore, other options for enhancing sidewalks should be considered, including the use of reflective paint or thermoplastic striping, pavement texturing, in-pavement lights, crosswalk cones and barrels and overhead signs.
- All existing signals should have functioning buttons and walk signals, while modern signal technology should be utilized where possible. Signals should be equipped with pedestrian activation buttons that light up when pushed, as an indication of having been successfully activated. Also, countdown-style pedestrian crossing signals should be used in locations with a sufficient amount of pedestrian activity.
- The opportunity to add additional bike lane lanes within the study area is limited, due to on-street parking, high traffic volumes, and street width. Certainly, streets such as Longwood Avenue would benefit from a bike lane, but without further studies and the elimination of parking, such lanes are unlikely to be constructed. Alternative improvements such as discussed in this analysis should be examined.

- The relocation of some existing bicycle racks is needed to improve visibility, provide shelter and promote use. Also, the installation of new racks is needed at various locations. These racks should be sited so that they offer enough space not only for storing bicycles, but also for maneuvering them.
- As important as the location of bicycle racks is the type of racks being used. Racks should be designed to support the bicycle upright by its frame in two places, enabling the frame and one or both wheels to be secured. Racks should also allow for front-in or back-in parking and should be compatible with modern bicycle frames and with U-locks. Commonly used racks that meet these requirements are the inverted -U or hoop style rack, the "A" rack, which is a hoop with a horizontal bar, and the post-and-loop rack. If racks are to be arranged in a row they should ideally be spaced approximately 36 to 42 inches apart.
- Bike lockers and showers should be considered at new office developments for employees.
- In a few locations street furniture impedes passage along the sidewalk (Figure 34). Sidewalks should have all street furniture placed next to the curb to ensure adequate clearance.



Figure 34 - Street Furniture Impeding Pedestrian Passage

6.7 Massachusetts Bay Transportation Authority (MBTA)

A high level of public transportation puts most of the CCD within ¼ mile of some form of public transportation. The MBTA Green Line "C" Branch runs along the center of Beacon Street and through the heart of the CCD, while the Green Line "B" Branch can be found just outside the northern perimeter of the CCD. The District is also well served by bus transit, with the Route 66 bus going through the District, and the Route 65 bus running just south of the District. These bus routes, in addition to serving neighboring communities, also provide service to the MBTA's Green, Orange, Red, and Silver "T" lines.

The Town's Comprehensive Plan notes that transit ridership on all MBTA lines serving Brookline has continued to grow and exceeds peak-period capacity. The need to cooperate and work with the MBTA to successfully address peak period capacity demands and improve service are outlined as strategies within the Plan (Pages 136 & 140). Also outlined within the Plan is the need to work cooperatively with the MBTA to advance the Urban Ring project, particularly Phase III of the project (Pages 136, 137 & 140), which is viewed as being essential to improving transit service both within the Town and for neighboring communities.

Recommendations

- The MBTA has an ongoing bus shelter and bicycle rack installation and maintenance program. A staff member in the Planning and Community Development Department should be assigned to work with the MBTA and the Town's Bicycle Committee to determine where bus shelters and bicycle racks would be most beneficially located along Harvard Street. The appointment of a staff member to work directly within the MBTA may also help the transition and dissemination of information surrounding the transition to the automated fare collection (Charlie Ticket) system.
- The MBTA is considering a number of other improvements to the 'C' Branch, though design and operational constraints will first have to be overcome. The possibility of operating three-car trains along Beacon Street is one such improvement, though with each car being approximately 73 feet long, and with a three-car train being approximately 225 feet long, trains of this length would partially block at least one intersection on the outbound side. A further improvement being considered by the MBTA is the introduction of mini-high platforms for wheelchair accessibility. These platform modifications are 37 feet long and are required to be positioned alongside the first car of a train set. Although desirable, installation of these mini-high platforms can result in a loss of parking and landscaping, they also raise aesthetic concerns. Again, the appointment of a staff member to work directly within the MBTA may help advance these projects.

TRAFFIC

SOLUTIONS, LLC

Planning, Permitting and Design



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