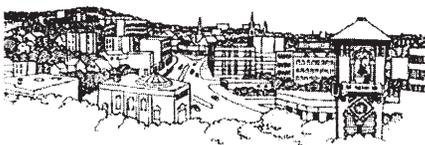


focus area 3 TRAVEL & MOBILITY

TRAVEL & MOBILITY



BROOKLINE COMPRHENSIVE PLAN 2005-2015

issues & opportunities report

INTRODUCTION

Transportation has a powerful effect on Brookline's quality of life. The elements that make up Brookline's transportation system, automobiles, trolleys, buses, bicycles, and walking, provide diverse mobility choices for Brookline residents, visitors, and employees, as well as people traveling through Town. The diversity of transportation modes serving Brookline allows for preservation of the historic pattern of land development, found particularly in north Brookline, which has a diverse mixture of uses and densities, and close proximity of residential neighborhoods to commercial centers, characteristics not found in automobile-reliant suburban communities. Brookline's unique and special character and its high quality of life are greatly affected and enhanced by the diversity of transportation choices.

Transportation systems and the issues that are derived from them are not confined to city or town boundaries. Because we are surrounded by cities on all sides, and is so close to downtown Boston, Brookline is particularly impacted by regional issues. Local transportation impacts are often the consequence of regional transportation patterns or trends and it is important to keep this analysis of the Brookline transportation system in context with that of the region.

This report briefly describes the role transportation has played in the development of Brookline and the elements that make up the existing transportation system, and explores key issues and opportunities regarding transportation today and tomorrow in Brookline.

Background of Early Transportation in Brookline

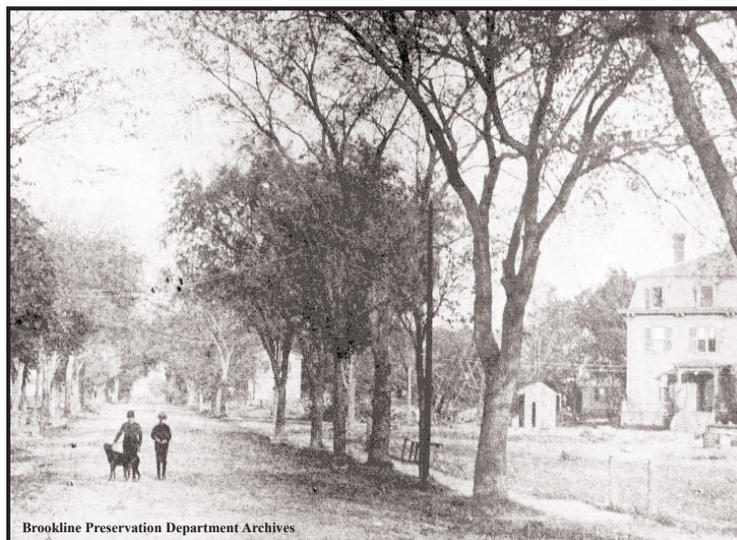
Seventeenth century Brookline, then called Muddy River, was a farming community with a transportation system consisting of a handful of roads and a cart bridge over the Muddy River. The cart bridge was built in 1634 to improve access to and from Boston. There were at least nine main roads laid out in the 17th century, that included all or portions of the following roads, as we call them today: Heath Street and Walnut Street (part of the historic Sherburne Road), Newton Street, Reservoir Road, Chestnut Hill Road, Warren Street, Washington Street, Harvard Street, and Sewall Avenue.

During the 18th century, a few more roads were developed including Goddard Avenue, Clyde Street, and portions of Cypress Street. In 1806, the Worcester Turnpike (Boylston Street/Route 9) was privately constructed, greatly enhancing access to Boston and western communities. In the early years of the Turnpike, the primary means of transportation, aside from individual horses and carriages, was the omnibus, an urban form of the stagecoach. This type of transportation carried a small number of passengers and was generally regarded as expensive.

In the early 18th century, wealthy Bostonians built summer homes in Brookline, primarily in the Heath/Warren/Cottage Street area. Partially as a result of the Mill Dam Road (Brookline Avenue) opening in 1821, the Longwood area was developed as a residential neighborhood by David Sears.

In 1847, the Brookline branch of the Boston and Worcester Railroad opened with a station near the present Brookline Village MBTA stop. This steam railroad was fast but had limited stops: the four stations in Brookline were at Chapel in the Longwood area, Longwood, Brookline Village, and Reservoir (near the current Cleveland Circle). The primary purpose of the railroad was not for commuters, but to accelerate industrialization by linking the port of Boston with manufacturing and farming towns of New England.

The Boston and Albany railroad company, chartered in 1867, succeeded the Boston and Worcester and operated an additional line that ran through a small portion of north Brookline with a station called Cottage, near the Cottage Farm neighborhood.



Brookline Preservation Department Archives

Beacon Street, ca 1885



Coolidge Corner, ca 1930

Starting in the early 1850s, the horsecars, an early horse-drawn form of trolley on tracks in the roadway, provided a convenient means of mass transportation in Boston with lines extending about 2.5 miles from Boston City Hall. The first line of horsecars in Brookline was established in 1859 and ran from Brookline Village over Tremont Street and into Boston. A second horsecar line opened on Boylston Street down Cypress to Chestnut Street.

In addition to the rail and horse-drawn travel modes of this time, pedestrian travel continued to be important. As early as 1849, the Town began to officially accept public footpaths. All of Brookline's 17 footpaths were accepted by the Town between 1849 and 1926 (the Town currently maintains 11 of these). In general, the paths were created concurrently with the subdivision and development of Brookline's neighborhoods, and continue to be an important element of Brookline's pedestrian infrastructure.

Beacon Street in Brookline was originally laid out in 1850 as a narrow county road designed to open up North Brookline to development and to provide better access to Boston. In 1885, Henry M. Whitney, a Brookline citizen living in Coolidge Corner, commissioned Frederick Law Olmsted and John C. Olmsted to develop plans to convert Beacon Street into a model French boulevard. The initial design was a wide avenue of 200 feet consisting of two bridle paths, one commercial lane, one pleasure drive, one lane for cycling, and streetcar tracks, all separated by rows of elm and maple trees. The final design was reduced to 160 feet wide, eliminating one of the bridle paths and the cycling lane.

Simultaneous with the redevelopment of Beacon Street, Whitney established the West End Street Railway to promote his Beacon Street development.

Sources:

Brookline Preservation Commission. *Beacon Street Historic Neighborhood Brochure: Coolidge Corner/ Lower Beacon*, 1996.

Brookline Preservation Commission. *Beacon Street Historic Neighborhood Brochure: Washington Square/Upper Beacon*, 1996.

Hardwicke, Greer. *Boylston Street*. Brookline Preservation Commission Archives, 1992.

Krim, Arthur. *Brookline Preservation Commission: Carriage Barn and Auto Garage Survey Project*, July 2000.

National Register of Historic Places Inventory - Nomination Form: Brookline Multiple Resource Area, Town of Brookline, Massachusetts, 1985.

Pehlke, Linda Olson. *Exploring the Paths of Brookline*. 2001.

Town of Brookline 1632-1976: *Bicentennial Commemorative Map & Guide to Local History*, 1976.

Warner, Sam Bass, Jr. *Streetcar Suburbs: The Process of Growth in Boston (1870-1900)*. 2nd edition, 1962.

This company was formed through the merger of the six private trolley companies that were serving the Boston area at that time. By January 1889, electric trolley operation on the entire Beacon Street line was opened. While Beacon Street was not the first electric trolley in the United States (Richmond, VA had the first, opening in February 1888), it was the first in the Boston metropolitan area and is the longest continually operating electric trolley in the United States.

By 1900, Brookline had four trolley lines serving the town: Beacon Street, Boylston Street, Washington Street, and Harvard Street. In the late 1930's the electric trolleys on Boylston, Washington, and Harvard were replaced by bus routes that continue today. In 1942, a Works Progress Administration project was undertaken to remove the rails along these streets for scrap steel for the war effort.

Brookline began seeing the effects of automobile transportation as early as 1901 with the construction and conversion of private outbuildings to house the new vehicles. Some of these auto houses are extant, as documented in the *Carriage Barn and Auto Garage Survey Project* (Krim, 2000).

Major improvements to roads for use by automobiles were typical in the late 1920s and 1930s, with Boylston Street being graded, widened, and renamed Route 9, and the construction of the Veterans of Foreign Wars, West Roxbury, and Hammond Pond parkways. The road constructions and improvements made throughout the 20th century reflected the growing importance of the automobile, as well as the continuing emphasis on transportation and access to and from Boston which has been a consistent theme in Brookline's transportation system since the construction of the first cart bridge in 1634.

EXISTING TRANSPORTATION

This section describes various regional and local transportation projects, the general structure of the Transportation Board, as well as the physical components of Brookline's transportation system including transit, automobiles, parking, vehicles for hire, pedestrians, and bicycles.

The Regional Planning Context

Regional transportation planning efforts, as well as planning and projects in surrounding municipalities, are important factors to consider when reviewing the Town's existing transportation system. The following are brief descriptions of planning studies that may have impacts on Brookline including the Boston MPO Transportation Plan, Access Boston, Route 9 Study, Fenway Improvement Plan, Turnpike Air Rights Study, and the Urban Ring Project.

BOSTON MPO TRANSPORTATION PLAN

The Boston MPO Transportation Plan is scheduled for release later this summer, and will comprise policies, strategies, and priorities for the region's transportation system for the next 25 years.

The underlying philosophy of the plan will be to strive to deliver a high level of transportation service to all stakeholders, within the constraints of total available resources. The intent of the plan is to guide decisions about transportation investments. The Boston MPO jurisdiction is divided into eight subregions of which Brookline is a member of the inner core region. The Town of Brookline participates in the Inner Core Committee that meets periodically at CTPS (see definitions below) to review plan progress and is involved in reviewing drafts of the plan and related documents prior to release of the final plan.

ACCESS BOSTON

Access Boston 2000-2010 is a citywide strategic transportation plan for Boston. Access Boston will be the first citywide comprehensive transportation planning effort since the 1960s. Access Boston will formulate transportation policies for the next generation with a prioritized list of programs and projects. It will focus on the use of all modes of travel – walking, vehicles, transit, air, water transportation, and bicycles.

The Access Boston Plan is being released in topical sections. The Bicycle Plan has been completed; The other remaining sections are scheduled for completion this summer, including the pedestrian safety guidelines, parking, and public transit and regional connections.

ROUTE 9 STUDY

The purpose of this proposed study is to examine pedestrian and traffic flow along the Route 9 corridor from Hammond Street in Brookline to Elliot Street in Newton. From this examination, it is expected that recommendations for improvements will emanate. This effort is a result of the 2000 Transportation Bond Bill. In December 2000, a scoping meeting was held, that included representatives from Brookline, Newton, CTPS, and MassHighway. As a result of this meeting, participants learned of the 1996 Route 9 Traffic Study and decided to update this study rather than develop a new study.

The 1996 CTPS traffic study noted intersections along Route 9 where demand exceeded capacity, inadequate sight distances existed, and left-turn lane storage areas were deficient. The study determined that only short-term improvements could be achieved without major reconstruction of intersections and this could be accomplished via changes of signal timing and other minor improvements. A separate pedestrian analysis looked at several mile-long stretches of Route 9 in Newton for potential limitations.

Since the 1996 study, a number of developments have been developed or proposed that could have a major impact on mobility in this corridor. The current set of recommendations in this updated study are still apropos and are called for to make improvements to traffic flow, movement, and safety. Brookline will continue to monitor the progress.

Boston Metropolitan Planning Organization (MPO)	One of the 13 Massachusetts regions established to carry out federally funded transportation plans and programs. Home to nearly three million people, it is made up of 101 cities and towns, including Brookline.
Central Transportation Planning Staff (CTPS)	Provides technical and policy-analysis support to Boston Metropolitan Planning Organization (MPO) and other members of the region's transportation community.
Metropolitan Area Planning Council (MAPC)	A regional planning agency representing 101 cities and towns in the metropolitan Boston area, including Brookline. As one of fourteen members of the MPO, MAPC has oversight responsibility for the region's federally funded transportation program.
Massachusetts Bay Transportation Authority (MBTA)	The nation's oldest and 4th largest transportation system. The MBTA service district includes seventy-eight communities in eastern Massachusetts, including Brookline. In addition, the MBTA provides commuter rail and interdistrict bus service to sixty-four.
Massachusetts Port Authority (MassPort)	A world-class independent public authority that develops, promotes and manages airports (including Logan), the seaport, and transportation infrastructure.
Mass Highway	Is responsible for the design, construction and maintenance of 12,600 lane miles of state highway, including Route 9.
Massachusetts Turnpike Authority	Created by an act of Legislature in 1952, is responsible to manage and maintain the Massachusetts Turnpike (Route 90), a small portion of which runs north Brookline near Commonwealth Avenue.
Metropolitan District Commission	Manages the Metropolitan Park System encompassing open space within 34 municipalities in metropolitan Boston. The MDC also manages 162 miles of parkways, including Hammond Pond, West Roxbury, and VFW parkways, linking MDC parks and reservations.

TABLE 1 Regional Transportation Agencies

FENWAY PUBLIC IMPROVEMENT PLAN

The Fenway Plan is a specific plan for \$100 million of various infrastructure improvements in the area around Fenway Park. The Plan is an extension of a comprehensive planning effort for the Fenway area in which the City, the Red Sox, and the Fenway neighborhood have been engaged in since May 1998. The Fenway Public Improvement Plan has four key elements: transit enhancements; pedestrian and landscape improvements; roadway and traffic improvements; and utility upgrades.

The Plan includes transit enhancements to the Yawkey, Fenway, and Kenmore stations. Roadway and traffic improvements will consist of construction of new roads, alleys and loading areas; reconstruction of existing streets; installation of upgraded traffic signals at 14 intersections as well as a state-of-the-art communication system to manage event traffic. The plan represents the first of many legislative requirements that must be satisfied before any public expenditure can be made.

TURNPIKE AIR RIGHTS

This project involves the proposed development of six parcels which are air rights over the Massachusetts Turnpike in Boston and Brookline. Brookline's two parcels consist of a 3.3 acre site and a 1.8 acre site both on the western edge of the project area adjacent to the Cottage Farm neighborhood. Part of the project area is seen as potential Boston University facility expansion while the remainder for commercial investment designed to benefit the university. Other benefits claimed include tying the fabric of the area together in a more pedestrian oriented streetscape. Given the proposed scale of development coupled with the concerns of the neighborhood and incompatibility of the proposed scale of development with the current zoning requirements, any air-

rights development on the Brookline portion needs careful consideration.

URBAN RING PROJECT

Since 1995, the Town of Brookline has served as a member of The Urban Ring Compact which also includes the municipalities of Boston, Cambridge, Somerville, Everett, and Chelsea. This compact was designed to promote improved transit and to coordinate transportation planning activities in the Urban Ring corridor.

A Major Investment Study (MIS) is being developed by the MBTA working in close consultation with the Compact and its member communities. The MIS is scheduled for completion by July 31, 2001 and includes three phases of implementation: **Phase 1** (5 year horizon) will modify existing bus routes, add new express routes, add and extend crosstown bus routes, and support the purchase of low floor and low emission transit vehicles; **Phase 2** (10 year horizon) would introduce bus rapid transit vehicles and supporting services. **Phase 3** (15 year horizon) would add either light rail or rail rapid transit in the most heavily traveled section of the corridor between Assembly Square in Somerville and Dudley Square in Boston. Phase three presents two alternative routes near the Brookline boarder (a crossing at St. Mary's or Kenmore).

Over the next year, the MIS will further refine the alternatives and identify incremental phases through which it can be implemented. At the conclusion of the MIS, the MBTA will file an Environmental Notification Form for the preferred alternative and a first increment of the project.

Capital Improvements Program

The FY 2002 Capital Improvements Program schedules over \$2.5 million in transportation improvements. This figure includes traffic improvements such as new traffic signals at certain intersections, street and sidewalk resurfacing, traffic calming projects, and handicapped access improvements.

The Beacon Street Reconstruction project consists of roadway infrastructure improvements to the Beacon Street corridor in Brookline. The project includes five primary components: 1) rebuilding of the traffic signal system and addition of new pedestrian signals; 2) MBTA station enhancements addressing accessibility issues, new or restored shelters, and trolley prioritization in signalization (underway); 3) pedestrian amenities including landscaping, street furniture and access lighting; 4) designated bike lanes where feasible; 5) resurfacing and remarking the entire street, rebuilding deteriorated sidewalks and new accessible ramps, and construction of neck-downs at crossings. Five million dollars of state funds are scheduled for FY 2003. This spring, the Town submitted a pre-application for an enhancement grant of \$2 million of TEA-21 funds for pedestrian enhancements.

One of the larger transportation capital improvements is the street rehabilitation program. The Town is scheduled to spend over \$1 million in FY2001 on street rehabilitation, in addition to the over \$500,000 of state funds and over \$50,000 in Federal Community Development Block Grant funds. The FY2002-2007 CIP schedules over \$1.5 million

for traffic calming projects. Requests to the Town for traffic calming studies have become more prevalent. In fact, the demand for studies has exceeded the funding. The upcoming appropriations will fund both studies and implementation.

Over the next three fiscal years, the Town is scheduled to spend \$300,000 on footpath reconstruction. The Town maintains 11 public footpaths that receive heavy use. During winter months, the paths require the application of de-icing materials which result in deterioration of the concrete stairs and metal handrails. Recently, several paths have been reconstructed. However, particular paths are in need of reconstruction including Addington, Colbourne, Winthrop, and University paths. Likewise, since many Town sidewalks are in need of repair, \$1 million are scheduled for sidewalk reconstructions over the next six fiscal years.

Installation of a traffic control signal at the intersection of Hammond and Heath streets in Chestnut Hill is scheduled for FY2002 at an estimated cost of \$208,000. This intersection is currently controlled by a stop sign on Heath Street, and a police officer is needed for the evening peak hours. In addition to long delays, this intersection has a high rate of accidents.

Brookline Transportation Board

The Brookline Transportation Board was formed in 1974 by an act of the State Legislature to administer all matters relating to parking and transportation in the Town. These duties were previously held by the Board of Selectmen. The six Members of the Transportation Board must be Brookline residents and are appointed by the Board of Selectmen to staggered three-year terms. Any action taken by the Transportation Board may be appealed to the Board of Selectmen within 21 days.

The Transportation Board has authority over the *Traffic Rules and Regulations*, including issues such

as handicapped parking, one-way streets, truck exclusions, parking meters, permit parking, turn restrictions, bus stops, stop and yield signs, traffic calming projects, taxi cab service, tow zones, and general parking prohibitions. In addition to these duties, the Transportation Board takes a proactive role in addressing potential and existing transportation problems that affect both neighborhoods and the Town as a whole through the powers listed above as well as recommending capital projects. The Transportation Board establishes subcommittees from time to time, including the Bicycle Advisory Committee.

Transit

The mass transit system, including trolleys and buses, is a tremendous asset to Brookline, and the trolley in particular is a major contributing factor to the Town's historic and existing development pattern. In fact, the transit system is one of the primary factors that

enabled Brookline to develop with a special and distinctive character, a character not found in outlying suburbs that were more heavily influenced by the demands of the automobile. The mass transit system not only provides an alternative to automobile travel, it is also a means for citizens to be more environmentally responsible in terms of air and water quality. Mass transit can also provide a viable transportation alternative for the elderly, children, other non-drivers, and those who cannot afford to operate or garage an automobile.

Brookline is connected to an intricate metropolitan transportation network that was primarily intended to connect Boston with surrounding communities: That is why the MBTA rail lines are on a radial system, like spokes of a wheel. The bus lines are intended to supplement rail service by connecting various origins and destinations that are underserved by the existing metropolitan rail system. As Figures 1-4 show, the MBTA rail and bus lines are quite extensive, serving a broad population. Figures 1 and 2 map the rail and bus lines in relation to 1996 population figures and shows the high correlation between population density and existing rail service. Figures 3 and 4 show a similar correlation between rail and employment density. Employment density, however, is greater in the center of Boston than population density is, meaning more people work in the city than live there. Brookline shows similar patterns of population density as it does employment density. It is also important to notice the high correlation between density in Brookline and the

existence of light rail lines: North Brookline has greater density than South Brookline and is served by rail lines. These figures graphically show the very basic principle that rail supports density and density supports rail.

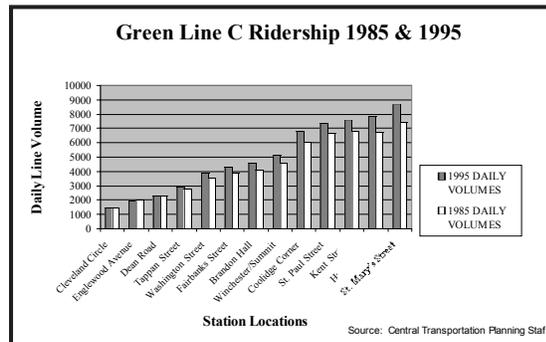


CHART 1

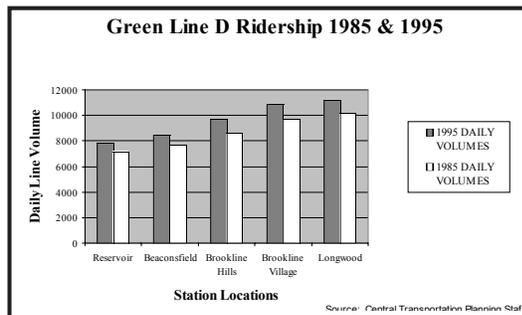


CHART 2

LIGHT RAIL SYSTEM

Light rail serves the Town of Brookline via the C and D lines of the Green Line, and, indirectly, the B line along Commonwealth Avenue in Boston. As shown in Figure 5, the C Line traverses Brookline along Beacon Street from Cleveland Circle to St. Mary's Street and includes 12 stations within Town limits. The D Line traverses Brookline from the Reservoir stop near Cleveland Circle to the Longwood stop on Chapel Street and includes five stations within Town limits.

Charts 1 and 2 display the increase in volume of ridership at each of the C and D Line stations in Brookline. Overall, ridership at Brookline stations has increased by 21% on the C line and almost 24% on the D line over the ten years between 1985 and 1995. Data beyond 1995 is not yet available. According to the CTPS report *Mobility in the Boston Region, Volume I: Inner Core*, 35% of the peak period trips on the C Line are overcrowded (technically meaning more than 2.2 persons per seat) and 24% on the D Line. In addition, the *Mobility Report* also indicates that 18% of the peak period trips on the C Line are excessively early or late and 20% on the D Line. The C and D lines are the most overcrowded of all four Green Line services. The MBTA is conducting studies to determine feasible ways to increase capacity on the Green Lines. There are extensive accessibility improvements currently being made to Green Line stations.

Regional Transit & Population Density

FIGURE 1

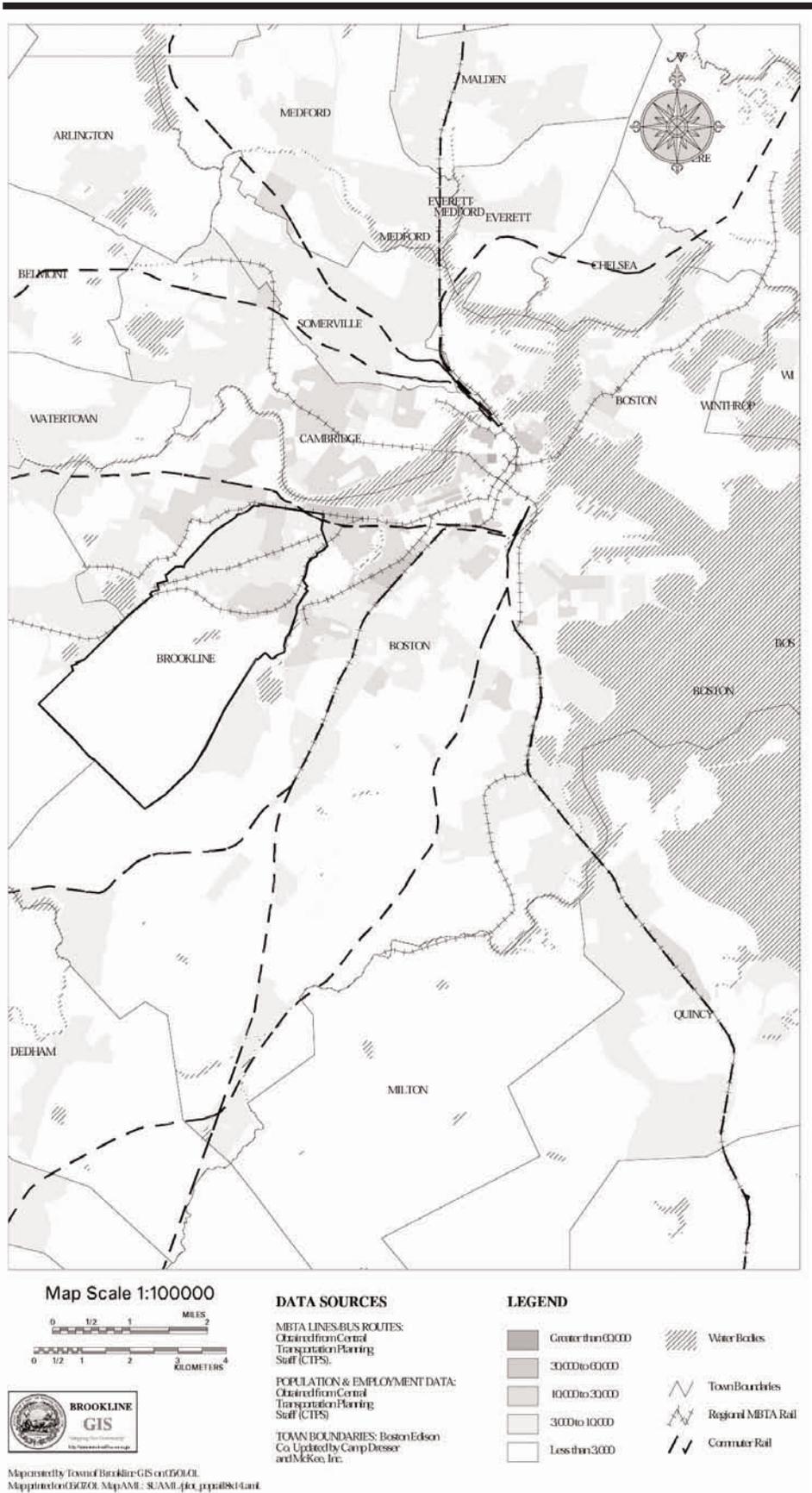
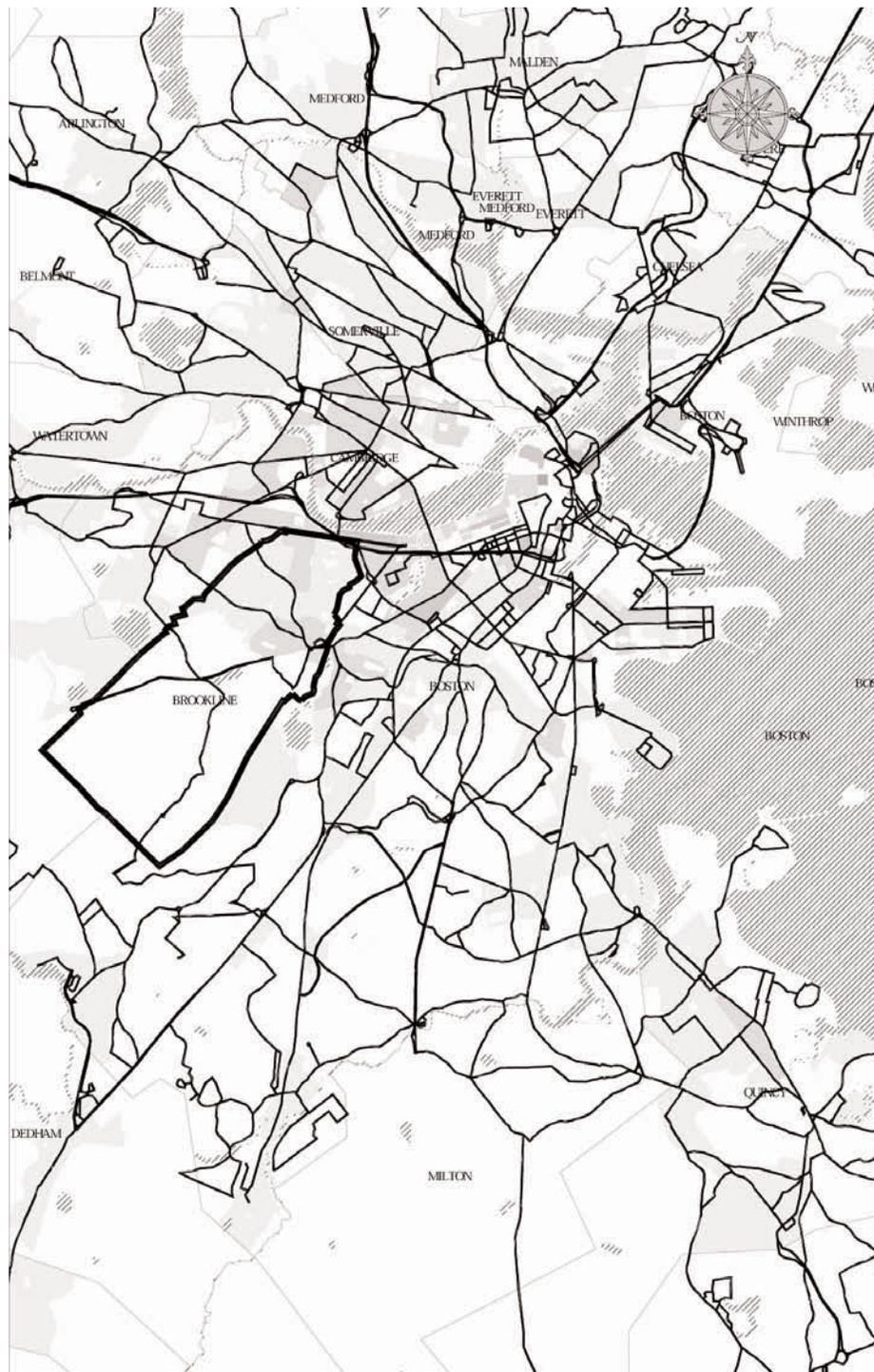
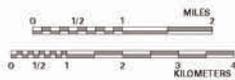


FIGURE 2

Regional Bus & Population Density



Map Scale 1:100000



Map prepared by Town of Brookline GIS on 04/25/01
 Printed on 06/20/01, 8.5x11, 400, pp, plus 8x11 in L

DATA SOURCES

MBTA LINES-BUS ROUTES:
 Obtained from Central
 Transportation Planning
 Staff (CTPS).

POPULATION & EMPLOYMENT DATA:
 Obtained from Central
 Transportation Planning
 Staff (CTPS).

TOWN BOUNDARIES: Boston Edison
 Co. Updated by Corp. Dresser
 and McKee, Inc.

LEGEND

- Greater than 6000
- 3000 to 6000
- 1000 to 3000
- 300 to 1000
- Less than 300
- Water Bodies
- Town Boundaries
- Regional Bus Routes
- Brookline Town Boundary



Map Scale 1:100000



Map created by Town of Brookline GIS on 05/01/04.
 Mapping tool: G7070/SU/AM/40x_employ/sk1.txd

DATA SOURCES

MBTA LINES, BUS ROUTES:
 Obtained from Central
 Transportation Planning
 Staff (CTPS).

POPULATION & EMPLOYMENT DATA:
 Obtained from Central
 Transportation Planning
 Staff (CTPS).

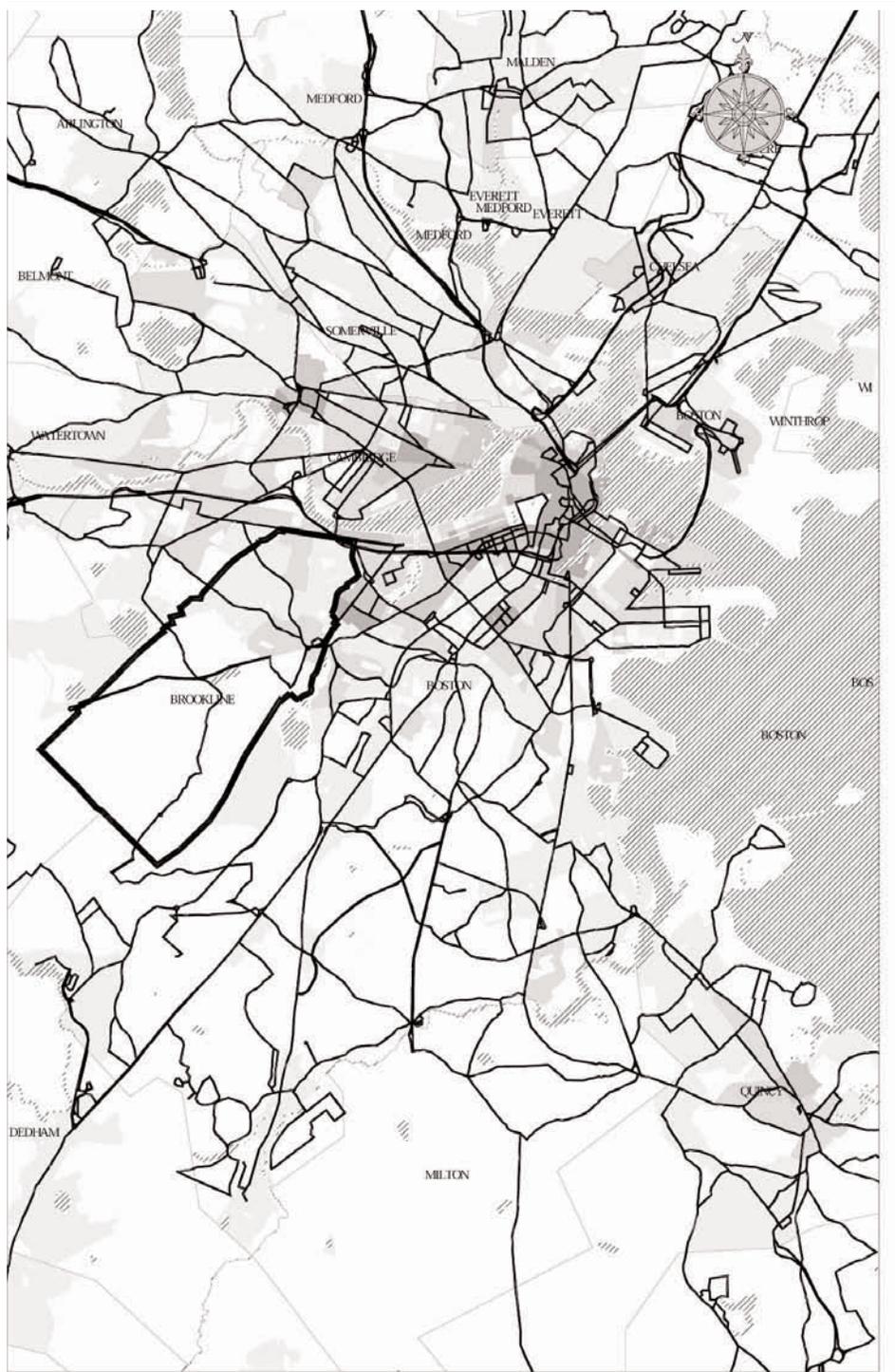
TOWN BOUNDARIES: Boston Edson
 Co. Updated by Camp Dresser
 and McKee, Inc.

LEGEND

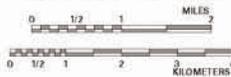
- | | | | |
|--|-------------------|--|--------------------|
| | Greater than 6000 | | Water Bodies |
| | 3000 to 6000 | | Town Boundaries |
| | 1000 to 3000 | | Regional MBTA Rail |
| | 300 to 1000 | | Commuter Rail |
| | Less than 300 | | |

FIGURE 4

Regional Bus & Employment Density



Map Scale 1:100000



Map provided by Town of Brookline GIS on 04/25/01.
 Printed on GEOLOG SUAMI for employment8414.tam.

DATA SOURCES

MBTA LINES BUS ROUTES:
 Olin and firm Central
 Transportation Planning
 Staff (CTPS).

POPULATION & EMPLOYMENT DATA:
 Olin and firm Central
 Transportation Planning
 Staff (CTPS).

TOWN BOUNDARIES: Boston/Edison
 Co. Updated by Camp Dresser
 and McKee, Inc.

LEGEND

- Greater than 6000
- 3000 to 6000
- 1000 to 3000
- 300 to 1000
- Less than 300
- Water Bodies
- Town Boundaries
- Regional Bus Routes
- Brookline Town Boundary

MBTA Trolley & Bus Routes

FIGURE 5

LEGEND

-  Main Streets
-  Bus Routes
-  MBTA Rail Lines
-  Bus Stops
-  MBTA Rail Stops

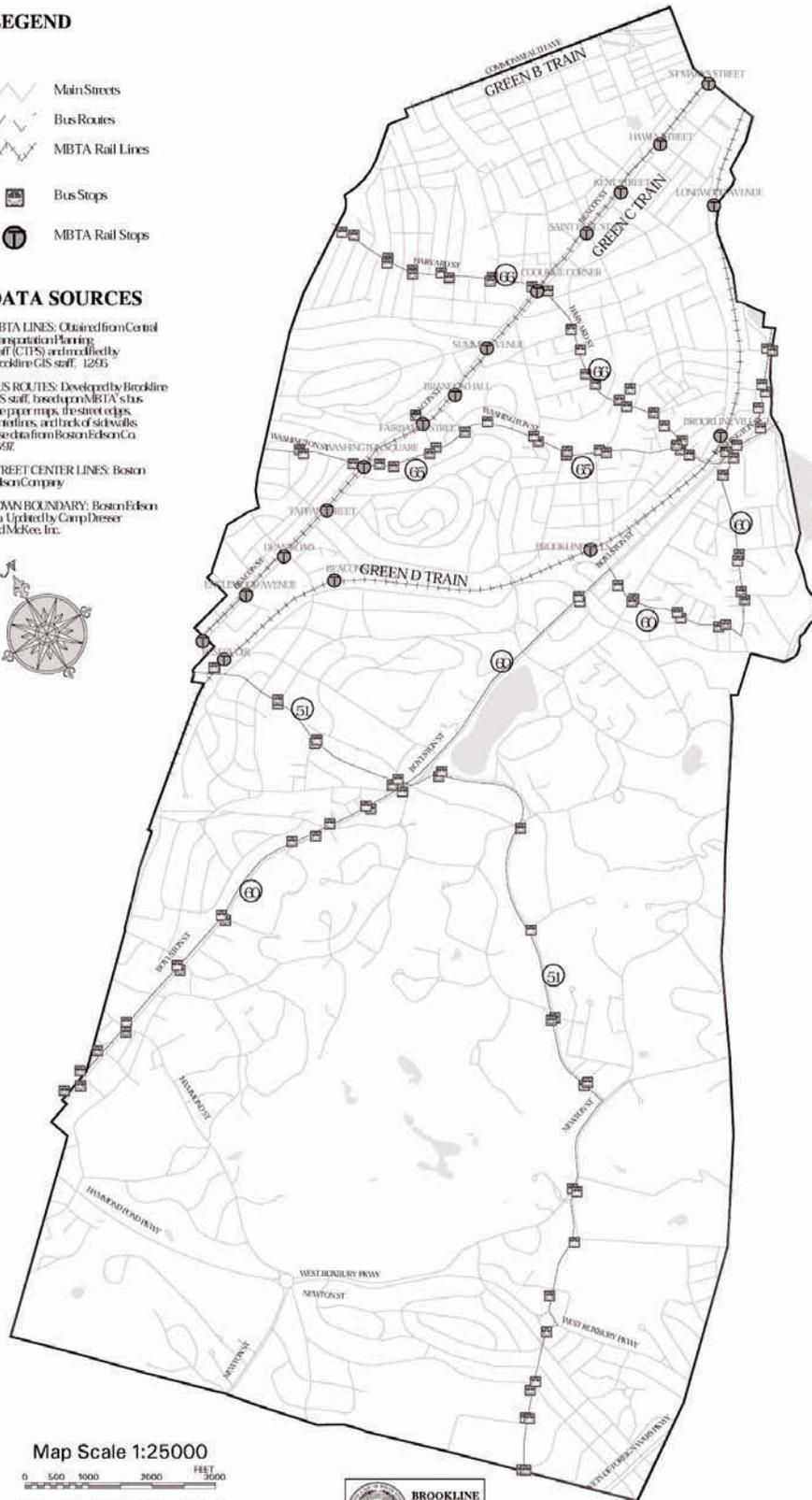
DATA SOURCES

MBTA LINES: Obtained from Central Transportation Planning Staff (CTPS) and modified by Brookline GIS staff, 12/05

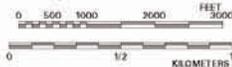
BUS ROUTES: Developed by Brookline GIS staff, based upon MBTA's bus line paper maps, the street edges, centerlines, and block of street IDs; base data from Boston Edison Co. 08/07.

STREET CENTER LINES: Boston Edison Company

TOWN BOUNDARY: Boston Edison Co. Updated by Camp Dresser and McKee Inc.



Map Scale 1:25000



Map prepared by Town of Brookline GIS on 5/7/2011.
Map prepared on 03/01/2011. JLM/1048/14/11

FIGURE 6

Brookline Elderbus Route

LEGEND

-  Elderbus Route
-  Street Centerlines
-  Bus Stops

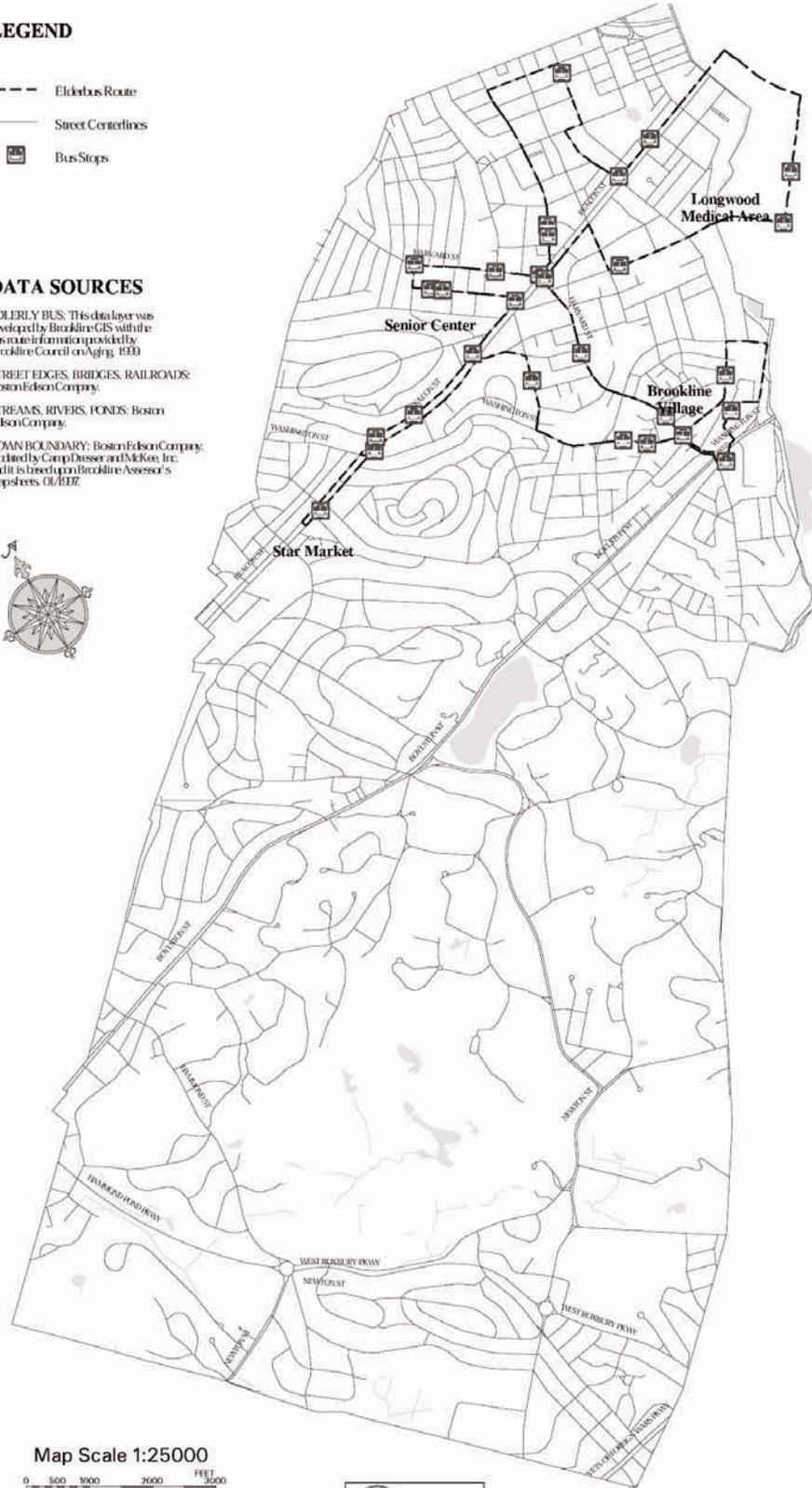
DATA SOURCES

EDLERLY BUS: This data layer was developed by Brookline GIS with the base data information provided by Brookline Council on Aging, 1999.

STREET EDGES, BRIDGES, RAILROADS: Boston Edison Company.

STREAMS, RIVERS, PONDS: Boston Edison Company.

TOWN BOUNDARY: Boston Edison Company. Updated by Camp Dresser and McKee, Inc. and is based upon Brookline Assessor's mapsheets, 01/1997.



Map Scale 1:25000

0 500 1000 2000 FEET 3000

0 1/2 1 KILOMETERS

Map created by Town of Brookline GIS on 4/10/2001.
Map printed on 05/07/01. SUAM.L\pic\elderbus&14.aml.



BUS ROUTES AND SERVICE

A total of four primary bus lines traverse Brookline. These lines are the 51, 60, 65, and 66. The origin and destination of these lines are displayed in Table 2. Brookline's bus lines run most days of the week: the 51 and 65 run everyday but Sunday. According to data from CTPS, the cumulative roundtrips on a weekday are over 200, with the 66 bus running the most at 94 trips per day. The cumulative Saturday service drops to 181 trips with the 66 bus still taking the highest share at 70 trips. On Sundays, the cumulative roundtrips are 103 per day.

According to data from CTPS for 1997, the 66 bus is the most heavily patronized bus line in Brookline.

This route also has the most round trips through Brookline on a daily basis. The 66 bus has more boardings bound for Harvard Square, whereas in the direction to Dudley Square, in Roxbury, there are more alightings. Many more 60 bus users travel to Kenmore than towards Chestnut Hill. The 65 bus has lowest ridership in Brookline.

COMMUTER RAIL

Although not located in Brookline, the MBTA commuter rail service, particularly the Needham Heights Line that runs through Roslindale and West Roxbury, provides transportation to downtown Boston for many South Brookline residents.

BROOKLINE ELDERBUS

The Brookline Elderbus is a locally-run transportation service for seniors that began in the mid-1970s in response to service changes on the MBTA system.

The service runs one bus on weekdays for 8.5 roundtrips per day and operates from 9am to almost 4pm. There is a suggested donation of 50 cents. The vehicle is funded by the Town and the driver is funded through Federal grant money (Title 3 - Older Americans Grant Act).

Route #	Origin & Desintation
51	Reservoir and Forest Hills MBTA stations
60	Kenmore and Chestnut Hill
65	Kenmore and Brighton Center
66	Harvard Square and Dudley Station, Roxbury

TABLE 2 - Bus Routes

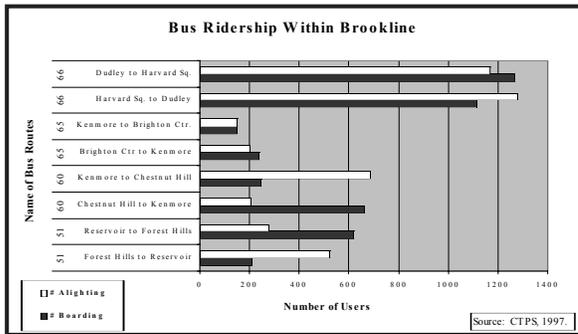


CHART 3

BROOKLINE ELDER TAXI SYSTEM (BETS)

The BETS program provides a 50% discount on Brookline taxicab fares for seniors with low to moderate incomes. Half of the remaining fare is covered by federal Community Development Block Grant funding. The other half of the fare is a discount provided by the taxi companies.

THE RIDE (MBTA)

The Ride is a service offered by the

MBTA for handicap and disabled patrons who are not able to use conventional forms of public transportation. This service has been offered since 1992 and provides door to door service. Reservations must be made one day in advance and the standard cost is \$1.25.

WEST SUBURBAN ELDER SERVICES (WSES)

The WSES is an area agency on aging that, among other services, provides medical transportation services to Brookline seniors with medical appointments out of town. Patrons must be registered with the organization to use this service.

Automobiles

ROAD AND STREET SYSTEM

Brookline has just over 176 miles of roads (not including private ways). All streets in Brookline are classified on the basis of their functional use. A street can serve two basic functions: it can provide access to individual parcels of land, or it can facilitate movements between various origins and destinations. These distinctions are sometimes blurred, especially in Brookline where streets often serve both functions of access and mobility.

The functional classification identifies the degree to which the street provides access to individual parcels

of land or the degree to which it discourages local access in favor of efficient movement. Figure 7 displays the functional classification of Brookline roads as determined by standards from the U.S. Department of Transportation, Federal Highway Administration.

These classifications are used when federal or state funds are involved in road improvement projects to determine eligibility for funding and the types of improvements allowed. For example, if a road is classified as a principle arterial, funded improvements include those intended to provide a higher

Interstate	Offers motorists the highest degree of mobility by providing very limited access, eliminating all grade intersections, and providing wide cross-sections and horizontal/vertical alignments that are conducive to high speeds.
Principal Arterial	Intended to provide a high degree of mobility and a low degree of land access to interconnect major residential communities and other large activity centers within urbanized areas. High capacity is obtained by providing wide cross-sections and/or by elim
Minor Arterial	Provide high levels of mobility and low degrees of land access and may carry local bus routes and provide intra-community continuity, but ideally should not penetrate identifiable neighborhoods. Most minor arterials are at-grade and may intersect with a
Collectors	Penetrate residential neighborhoods, commercial and industrial areas, collecting traffic from local streets and channeling it into the arterial systems. A fair amount of through traffic and/or local bus routes may be carried on major collector streets.
Local Streets	Primarily provide direct access to abutting land and access to the higher road systems. They offer a low level of mobility and usually carry no bus routes. Service to through traffic is discouraged.

TABLE 5 - Functional Classifications

degree of automobile mobility. Table 3 defines each major type of functional classification, based on the USDOT, *Highway Functional Classification: Concepts, Criteria, and Procedures*, March 1989.

JURISDICTIONAL CONTROL

Out of Brookline's 176.25 miles of roads, almost 150 miles are under Town jurisdiction. The remaining 26.5 miles are under the jurisdiction of either the Massachusetts Highway Department (e.g., Route 9), Metropolitan District Commission (e.g., Hammond Pond, West Roxbury, and VFW parkways), the MTA (Interstate 90), and some areas are considered unaccepted (private ways). The Town is responsible to maintain roads under its jurisdiction, including street sweep-

ing, repair, and resurfacing. The Town has an ongoing pavement management system that is allocated funds annually.

AUTOMOBILE OWNERSHIP

Data from the Town automobile excise tax bills from 1988 through 2000 show a substantial decline (almost 11%) in automobile ownership from 1988 to 1992 (Chart 4). After 1992, annual figures increase to the present 39,676 automobiles, which is slightly higher than the 1988 figure by 40 vehicles.

Note in Chart 5 that the number of cars per household has closely followed the pattern of gross number of automobiles, but the current estimated figure is slightly lower than the 1988 figure.

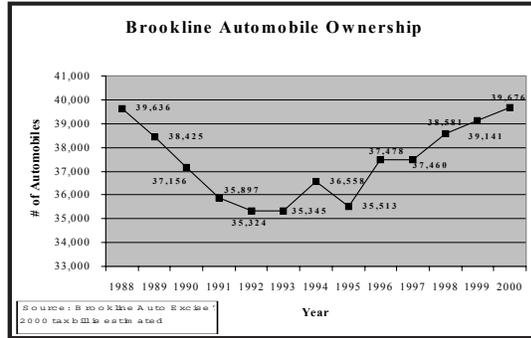


CHART 4

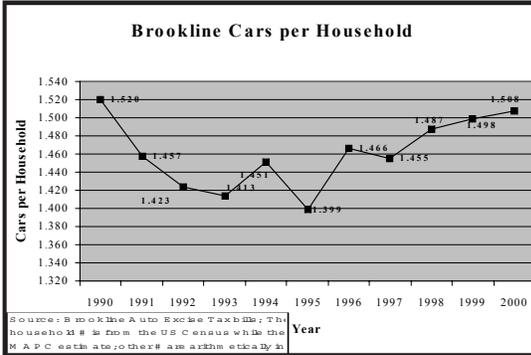


CHART 5

INTERSECTION	TO TAL.	PED	BIKE	SAFETY IMPROVEMENT SCHEDULED
Boylston @ Lee	320	0	3	Complete
Harvard @ Beacon	298	24	4	Beacon Street Improvements Project
Beacon @ Washington	254	9	6	Beacon Street Improvements Project
Horace James Circle	250	2	2	2004
Boylston @ Cypress	173	2	2	(Mhd)
Boylston @ Hammond	178	2	0	Complete
St. Paul @ Beacon	187	8	5	Beacon Street Improvements Project
St. Paul @ Longwood	123	8	4	
Newton @ Grove	120	0	6	Complete
Beacon @ Dean/Corey	127	8	4	Beacon Street Improvements Project
Brookline @ Washington	105	3	3	
Harvard @ Aspinwall/School	100	4	1	Complete
Beacon @ Marion	99	2	4	Beacon Street Improvements Project
Newton @ Clyde	109	1	1	Complete
Cypress/School @ Washington	93	3	1	2004
Harvard @ Fuller	88	3	3	Complete
Beacon @ Carlton	99	5	1	Beacon Street Improvements Project
Hammond Pond Parkway @ Heath	104	0	0	(Mdc)
Boylston @ Warren/Summer	88	0	2	(Mhd)
Kent @ Longwood	82	7	4	2002
Boylston @ Reservoir	110	1	0	(Mhd)
Heath @ Hammond	76	0	0	Under Design
St. Paul @ Dummer	71	1	0	
Boylston @ Washington	105	3	3	
Amory @ Dummer	64	1	1	Complete
Beacon @ Kent	64	5	1	Beacon Street Improvements Project
Beacon @ Webster/Centre	98	4	2	Beacon Street Improvements Project
Brookline @ Pearl	58	0	2	
Harvard @ Longwood	58	3	0	
Beacon @ Pleasant	53	2	1	Beacon Street Improvements Project
Allandale @ Grove	50	0	0	2004
Harvard @ Babcock	57	6	2	2005
Beacon @ Winchester	53	2	5	Beacon Street Improvements Project
Beacon @ Charles	51	1	0	Beacon Street Improvements Project
Longwood @ Sewall	46	1	3	
Chestnut Hill Ave. @ Dean	47	1	0	
Harvard @ Thorndike	43	2	1	Complete
Hammond @ Woodland	43	0	1	Complete
Putterham Circle	44	0	3	
Cypress @ Davis	38	1	2	Under Construction
St. Paul @ Sewall	35	3	0	

(mhd) -- intersection belongs to the Massachusetts Highway Department
(mdc) -- intersection belongs to the Metropolitan District Commission
Source: Town of Brookline Engineering Department, Transportation Division (2000)

TABLE 4 - Accident Data

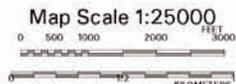
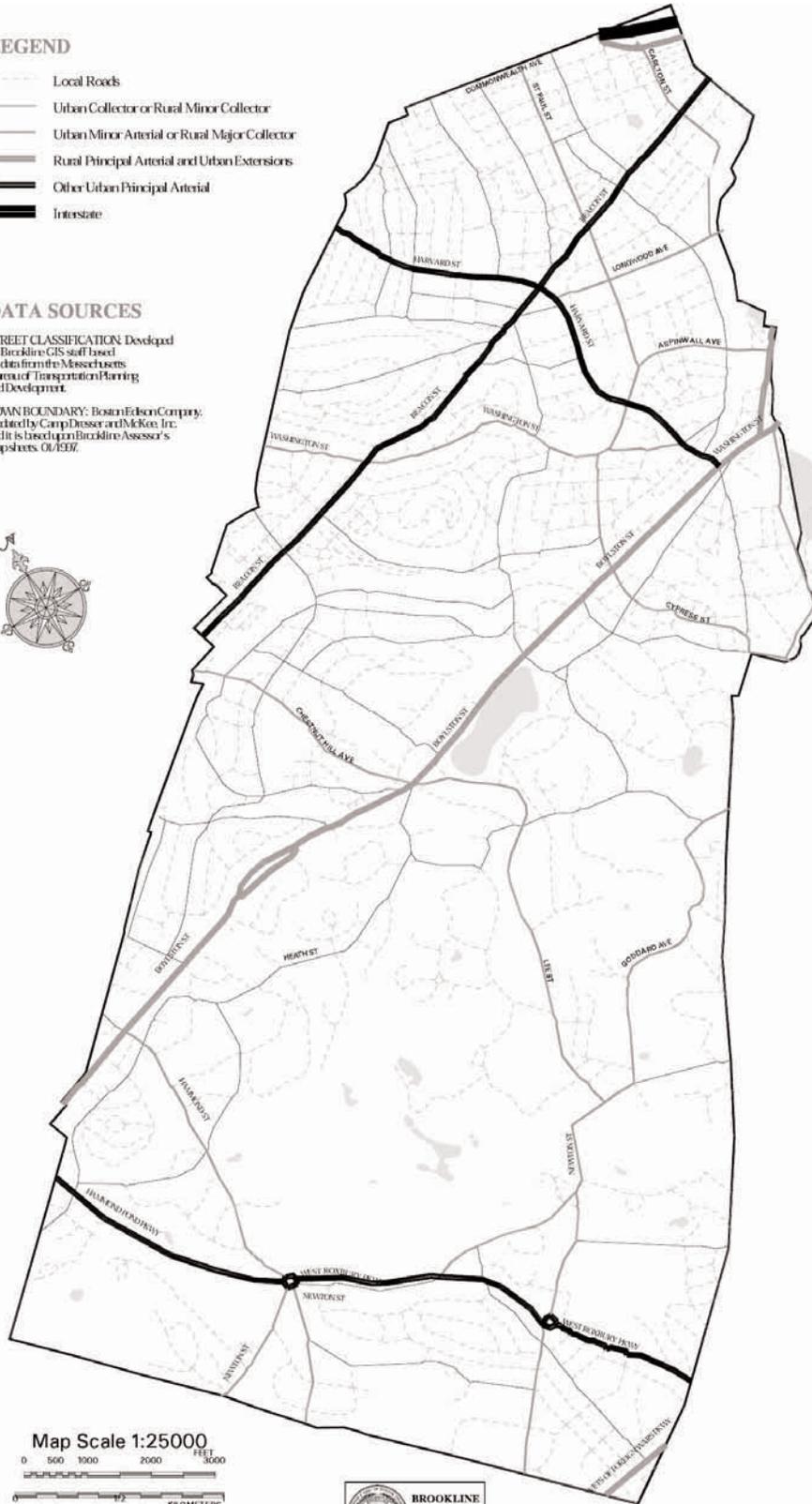
LEGEND

-  Local Roads
-  Urban Collector or Rural Minor Collector
-  Urban Minor Arterial or Rural Major Collector
-  Rural Principal Arterial and Urban Extensiors
-  Other Urban Principal Arterial
-  Interstate

DATA SOURCES

STREET CLASSIFICATION: Developed by Brookline GIS staff based on data from the Massachusetts Bureau of Transportation Planning and Development.

TOWN BOUNDARY: Boston Edison Company. Updated by Camp Dresser and McKee, Inc. and it is based on Brookline Assessor's mapsheets. 01/03/07.



Map created by Town of Brookline GIS on 5/22/01.
Map printed on 03/07/01. SUAML\plotrood\function\8\14.mxd

VEHICLE MILES OF TRAVEL

CTPS compiled the results of modeling to estimate the total number of vehicle miles traveled (VMT) within Brookline by number of registered vehicles. Modeling by CTPS takes into account population, employment, number of households, auto ownership, highway and transit levels of service, downtown parking costs, auto operating costs, and transit fares to apply the model. The estimated vehicle miles traveled in Brookline in 1990 was 763,824 miles with an average speed of 26.26 miles per hour. The 2000 estimate shows an increase in vehicle miles traveled to 809,700 miles and a decrease in average speed to 25.73 miles per hour.

TRAFFIC ACCIDENTS

A review of town intersections which have experienced approximately 50 or more incidents over the past nine years is the basis of Figure 8. Due to the comprehensiveness of the data, the methodology used was to query data for known problematic intersections throughout Town and compile results for these only. Table 4 lists the amount and type of accident for each intersection and indicates any safety improvements recently completed or scheduled for each intersection.

JOURNEY TO WORK

According to data from the 1990 Census, there is a significant preference for Brookline residents to drive alone to work. There is a noticeable difference in mode choice between North Brookline residents and South Brookline: Not surprisingly, about 60-68% of South Brookline residents choose to drive alone to commute to work, whereas between 36% and 52% of North Brookline residents drive alone (Figure 9). Transit, biking, walking, and carpooling are used by more than half of North Brookline residents. Transit is relied on for commuting trips for between 25% and 36% of North Brookline residents. There is logically a strong correlation between availability of and proximity to public rail lines and use of public transportation.

It is speculated that the phenomenon of reverse commuting (commuting to a job outside of downtown Boston, like the 128 or 495 corridors) is increasing. The 2000 Census will provide data to clarify the extent of this phenomenon.

COMMUTING PATTERNS

Many of Brookline's primary streets are used by commuters from southern and western communities to travel to destinations in Boston and Cambridge. The functional classification map (Figure 7) can be used to indicate logical through-traffic routes. Route 9, Beacon Street, Lee Street, Hammond Pond and West Roxbury parkways, Cypress Street, and Harvard Street are some of the streets attractive to through-traffic.

TRAFFIC CALMING POLICY

In the past five years, the Town has begun to initiate traffic calming at various locations throughout town. Traffic calming measures can be used to address the problem of vehicle speeding by narrowing the street or changing its vertical or horizontal alignment. They may also be used to address the problem of cut-through traffic by blocking certain movements and diverting traffic to other streets where it can be handled more safely. The mechanisms used can include textured pavement, one-way street designation, forced turn islands, speed tables, lane/pavement narrowing, neckdowns, chicanes, raised crosswalks, and roundabouts, among others. Some examples of recent traffic calming projects are Greenough Street in front of the High School, and Harvard Street (north of Beacon Street).

In April 2001, the Brookline Transportation Board in coordination with DPW staff developed *Traffic Calming Policy and Procedures* which will be reviewed by the Board of Selectmen during Summer 2001. The primary objective of this policy is to improve the livability and safety of Brookline neighborhoods by mitigating the impacts of traffic and promoting safer conditions for residents, motorists, bicyclists, and pedestrians. The document also sets out procedures for proposing traffic calming projects, guidelines to assist the Transportation Board in determining need and prioritization criteria. High priority is given to projects in areas with high pedestrian activities, particularly schools, high traffic accidents, and inadequate pedestrian infrastructure.

As Figure 10 depicts, traffic calming projects planned and under construction include Winchester Street, Walnut Street, Reservoir Road, and the Driscoll School area.

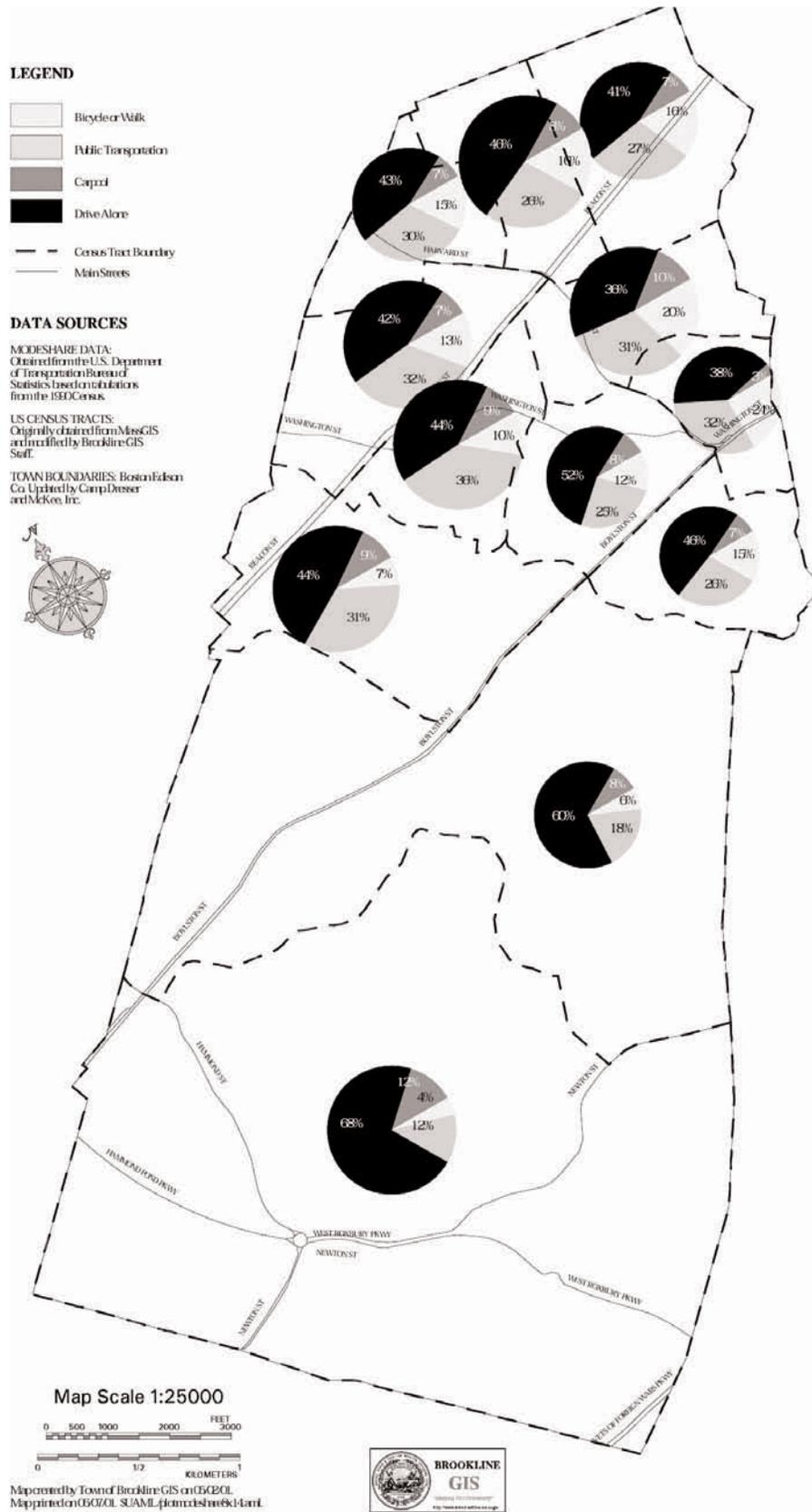


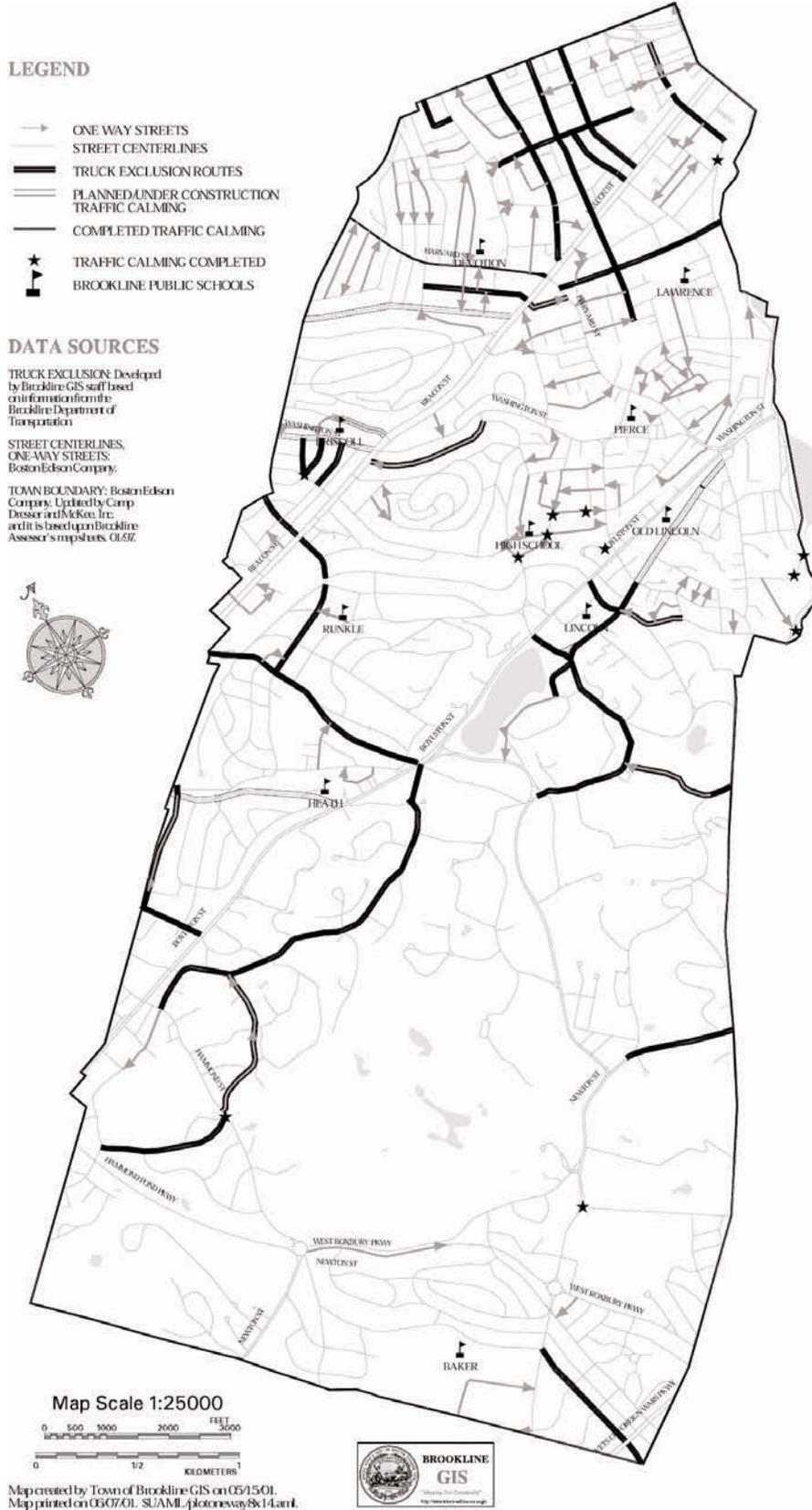
Credit: Jennifer Goldson, 2001

Hammond/Rt.9 Intersection

FIGURE 9

1990 Journey To Work





Parking

Brookline's public parking supply includes non-metered on-street spaces plus 1,825 metered spaces on-street, in Town lots, and in the Beacon Street Reservation. Approximately 80% of the Town's metered public parking supply is located in the three major commercial areas: Coolidge Corner, Brookline Village, and Washington Square. (Commercial Area Parking Recommendations, 2000)

TIME LIMIT (HOURS)	ON STREET	PERCENT	OFF STREET	PERCENT	GRAND TOTAL	PERCENT
2	812	60.46%	35	7.26%	847	46.42%
3	267	19.88%	319	66.18%	586	32.11%
5	55	4.09%	115	23.86%	170	9.32%
10	209	15.56%	13	2.70%	222	12.16%
ALL	1343	100.00%	482	0.00%	1825	100.00%

Source: Town of Brookline Office of the Town Clerk and Engineering Division, Fall 1999

TABLE 5 Parking Meter Time Limits and Locations

METERED SPACES
Brookline's metered spaces have various time limits from two to ten hours. As displayed in Table 5, the majority of the meters have two-hour limits (over 46%), and 32% have three-hour limits. Only 9% meters have five-hour limits. All ten-hour meters are located on-street and these make up about 12% of the total meters.

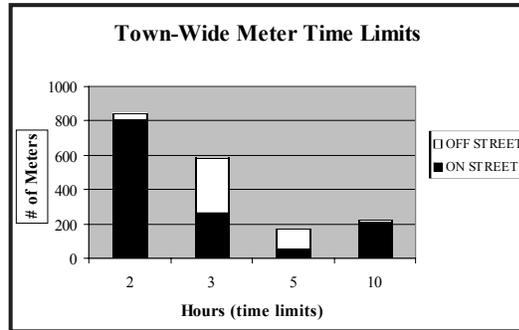


CHART 6

The Transportation Board, in accordance with the Commercial Areas Parking Committee Recommendations of June 2000, is in the process of strategically reassigning meter time limits to encourage short-term use of parking spaces in close proximity to commercial uses while providing longer-term parking in nearby areas that are not prime customer parking areas.

The Board has expanded the Brookline Village Employee Parking program to include 25 spaces in the Kent/Station Street lot (Lot 7) in addition to the existing 20 metered spaces on Kent and Station streets. Another employee parking program has been established in Coolidge Corner at the Center Street West lot that provides 57 off-street spaces. The Board also plans to strategically adjust meter rates to further encourage short-term parking in the heart of the commercial areas. The current meter rates vary between 25 cents and 50 cents per hour.

OVERNIGHT PARKING BAN

Brookline has forbidden overnight parking of vehicles on its streets and regulated daytime parking since 1896. The overnight or all night parking ban in the Town of Brookline is governed by Article V, Section 11 of the Town of Brookline Traffic Rules and Regulations and prohibits parking on streets for more than one hour during 2a.m. and 6a.m.

The restriction on all night parking is enforceable throughout the year. Violators of the overnight ban are currently subject to a parking fine of \$15 per violation. The Spring 2001 Town Meeting approved a home rule petition which, if approved by the State, would allow Brookline to increase parking fine rates. The objective of such an increase would be to institute parking rates that are comparable to Boston, thus discouraging overnight spillover.

The overnight parking ban serves several important public objectives:

- It is an important public safety tool. A line of parked cars is an easy hiding place for a potential attacker, and the additional visibility provided by open spaces makes Brookline safe for people to walk at night.
- Facilitates snow plowing in the winter and street cleaning in other seasons, and ensures safe and quick access to any life-threatening events is available for ambulance, police, and fire personnel.

- May influence landlords to limit the number of unrelated persons with more vehicles than available off-street parking can accommodate. This may keep prices lower than they otherwise might be if parking were not an issue.

Likewise, the ban may have an effect on car ownership rates - if it is more difficult or costly to park a car, then it is more difficult to own one.

To ease the burden on Town residents created by enforcement of the overnight ban, the Town authorizes eligible residents to park overnight at a number of its municipal off-street surface lots. There are presently 267 parking spaces in municipal lots allocated for resident overnight parking and rented on a monthly basis.

PERMIT PARKING

As displayed in Figure 11, certain Brookline streets allow daytime residential permit parking. All streets in Brookline, unless otherwise posted, allow a maximum of 2 hour parking. The residential permit parking program allows cars equipped with a resident sticker to park on designated streets for an unlimited period of time from 6 a.m. of one day to 2 a.m. of the following day. The purpose of this program is to protect neighborhoods where commuter or other intrusive parkers frequently park. Residents in neighborhoods designated by the Transportation Board may petition the Transportation Board for their street to be designated as a resident permit parking street. Permit stickers are available for a fee of \$15 through the Transportation Department. Approximately 23 streets, or portions of streets, are currently designated for resident permit parking.

PARKING REQUIREMENTS IN THE ZONING BYLAW

The Brookline Zoning By-law establishes requirements for amount, location, and design of private off-street parking. Every new development, whether residential, commercial, or institutional, is required to provide a specified minimum of off-street parking spaces on site. The amounts vary depending on the type of use and what zoning district the use is located in.

For example, a ground-floor retail use in a General Business district like Coolidge Corner requires one off-street parking space per 350 square feet (s.f.) of gross floor area, whereas a ground-floor retail use in a Limited Business district would require one space per 200 s.f. For residential uses in a single-family district, two parking spaces per unit are required, regardless of number of bedrooms, and for all other zoning districts (like two-family, multi-family, and business districts) 2.3 spaces are required for units with three or more bedrooms. Figure 12 maps this residential parking regulation, which is a result of a recent zoning amendment that raised the parking requirement for non-single family districts from 1.5/1.6 spaces for one and two bedroom units and 1.7/1.8 spaces for three plus bedroom units to 2.0 and 2.3, respectively. Figure 12 shows that, paradoxically, there is a close geographical relationship between availability of mass transit (Green Line trolleys) and the higher off-street parking requirements.

COMMERCIAL AREAS PARKING COMMITTEE

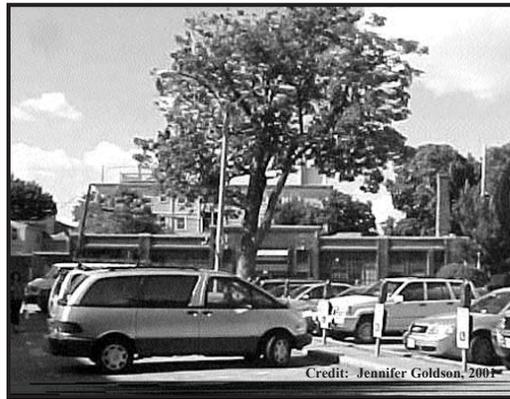
The Commercial Areas Parking Committee was appointed by the Board of Selectmen, in collabora-

tion with the Transportation Board, in February 1999. The charge of the Committee was to identify and assess the Town's commercial parking needs and to recommend short and long term solutions to better fulfill those needs.

Based on various data the Committee gathered and analyzed, a commercial areas survey of needs, and three public forums, the Committee created a substantial list of recommendations.

The recommendations fall under 11 general subject categories: promote alternatives to single-occupancy vehicles, discourage long-term parking on commercial streets, improve signage, create parking districts, improve enforcement, improve management of existing supply, increase convenience of parking, ensure comprehensive plan linkage, explore public/private financing, and evaluate need for and feasibility of parking structures.

Shortly after the Committee's report was issued in June 2000, the Selectmen formed an implementation team that has been meeting regularly to monitor the progress of implementation.



Lot 6, Brookline Village

Vehicles for Hire

TAXI & LIMOUSINE SERVICE

Taxis and limousines provide an important door-to-door service to supplement other modes of transportation. There is currently one taxi company, Bay State Taxi, licensed to operate in Brookline with up to 175 taxicabs, and three independent operators of limousines with one car each.

Brookline has a ratio of 3.1 taxis per 1,000 people, which, in comparison to other communities, such as Cambridge (2.7 per 1,000), is relatively high. However, this indicator gives no consideration for the actual demand of taxi services which can be affected by costs of car ownership, parking availability, and changes in certain populations (e.g., amount of seniors).

Taxicabs and limousines in Brookline must be licensed and operated (and may be inspected, as well) in accordance with the *Rules and Orders for the Regulation of Carriages or Vehicles for Hire* issued by the Transportation Board and revised in 1996. These regulations, however, give no specific guidance to the Board for determining the appropriate number of licenses to issue.

The Transportation Board also has the authority to influence the design of vehicles and determines the location of taxi stand locations. Brookline has taxi stands at 24 locations, with a total of 39 spaces (see Figure 14). Most stands have space for one or two taxicabs, however a few locations have three spaces.

ZIP CARS

Zipcar is a private subscription car-sharing company based in the Boston metropolitan area. To use one of the company's four cars in Brookline, a patron must become a zipcar member with a one-time \$25 fee, a \$300 refundable security deposit, and a \$75 annual fee. Car rentals are \$4.50 per hour and are taken out of your annual fee. This rate, which is lower than zipcars in other locations, is a result of the Transportation Board granting the Company four free

parking spaces in Brookline. Brookline car locations are indicated on Figure 14. The program was initiated over a year ago and is marketed to people who want to "experience the freedom of a car without the hassles of owning one". Car sharing has the potential to help those who do not need cars for regular commuting to avoid owning a car.



A Taxi in Brookline Village

FIGURE 11

Residential Parking Permit Areas & Town Lots

LEGEND

-  TOWN PARKING LOTS
-  STREET CENTER LINES
-  RESIDENTIAL PERMIT PARKING
-  TOWN BOUNDARY

DATA SOURCES

TOWN PARKING LOTS:
Developed by Brookline GIS based on parcel data and information from the Brookline Parking Inventory.

STREET CENTER LINES, BRIDGES, RAILROADS, RIVERS, PONDS:
Boston Edison Company.

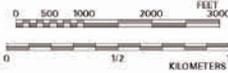
TOWN BOUNDARY: Boston Edison Company. Updated by Camp Dresser and McKee, Inc. and it is based upon Brookline Assessor's map sheets 01/37.

LOT NUMBERS & NAMES

- 1 Webster St. West
- 2 Centre St. West
- 3 Babcock St.
- 4 John St.
- 5 School St.
- 6 Kent Webster St.
- 7 Kent Station
- 8 Fuller St.
- 9 No longer in Existence
- 10 No longer in Existence
- 11 Centre St. East
- 12 Webster St. East



Map Scale 1:25000



Map created by Town of Brookline GIS on 05/14/01.
Map printed on 05/20/01. SLUAM.L4.com.mtasSk4.Lam.

Residential Parking Requirement of Zoning By-law FIGURE 12

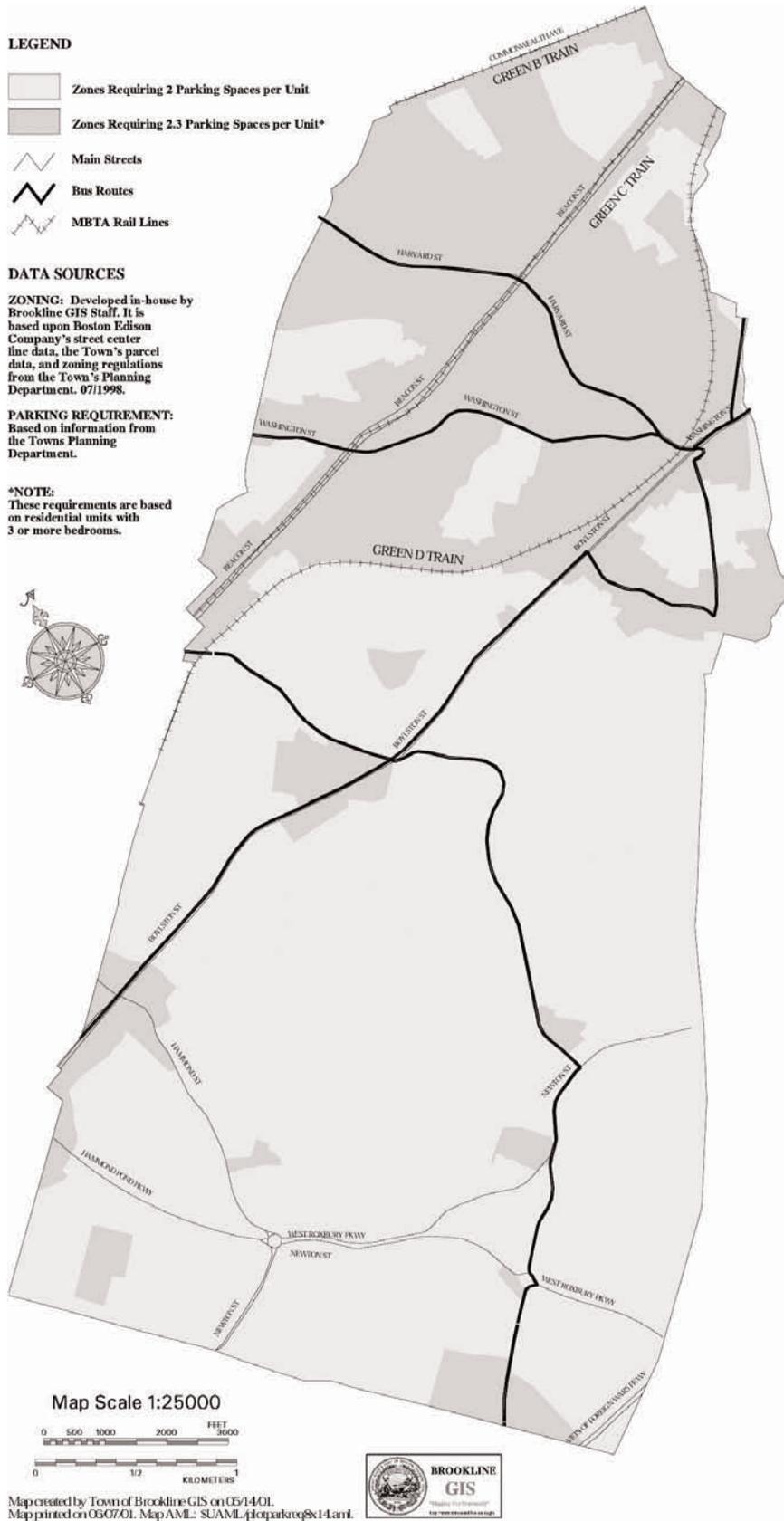


FIGURE 13

Sidewalks & Pedestrian Traffic Lights



Pedestrian

Pedestrian transportation is a critical piece of the overall transportation system: walking is an important way to get places

like shops, work, school, and T or bus stops. Brookline's built environment is strongly pedestrian oriented due to its land use patterns, density of development, and the pedestrian network. The Town's land use patterns strengthen the pedestrian environment through its mixed-use commercial areas that combine retail, services, entertainment, offices, and residences in one area and the close, walkable proximity of residential neighborhoods to commercial areas, particularly in North Brookline. Both of these aspects of the Town's land use patterns create convenient destinations to access on foot.

The density of development is also a contributing factor to the overall pedestrian environment in terms of the distances between land uses and the visual interest and activity of streetscapes en route to a destination. People are more likely to walk if the experience is pleasant. Brookline's general density of development in most areas of Town adds to this positive pedestrian experience.

Lastly, the design and safety of the pedestrian network, including sidewalks, crosswalks, pedestrian paths, and pedestrian traffic signals and phases, is a critical element in linking places to each other to cre-

ate a walkable environment. Brookline's pedestrian network includes over 150 miles of sidewalks as displayed in Figure 13.

Due to the physical developmental differences between North and South Brookline, in terms of density, mixture of uses, and transit availability, the majority of North Brookline streets are lined on two sides with sidewalks, while a number of South Brookline streets have sidewalks on only one side or none at all. Approximately 90 miles of Town sidewalks are made of portland cement concrete and almost 57 miles are bituminous concrete (asphalt). The remaining sidewalks are brick or gravel (see Chart 7).

In 1998, VHB conducted a study for the Brookline Department of Public Works to evaluate the condition of

Town sidewalks. The study determined that the majority (95.4 miles) of Town sidewalks are in fair condition, while 30 miles are poor and almost 11 miles are in immediate need of replacement. The study estimates that it will cost over \$1.7 million to replace the sidewalks designated as poor and replacement. The Town policy is to replace materials in kind (i.e., asphalt for asphalt and brick for brick). Replacement schedules are prioritized by sidewalk condition and proximity to schools, parks, commercial areas, public buildings, and places of worship, due to their potential to generate pedestrian traffic. There is a proposed eight-year repair program requiring \$300,000 per year to implement.

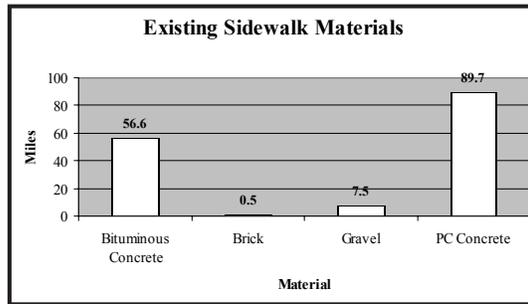


CHART 7

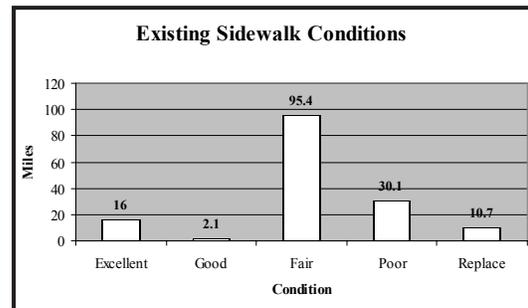


CHART 8



Credit: Jennifer Goldson, 2001

Audible Pedestrian Traffic Signal in Coolidge Corner

FIGURE 14

Zip Car Locations, Taxi Stands, and Bike Lanes

LEGEND

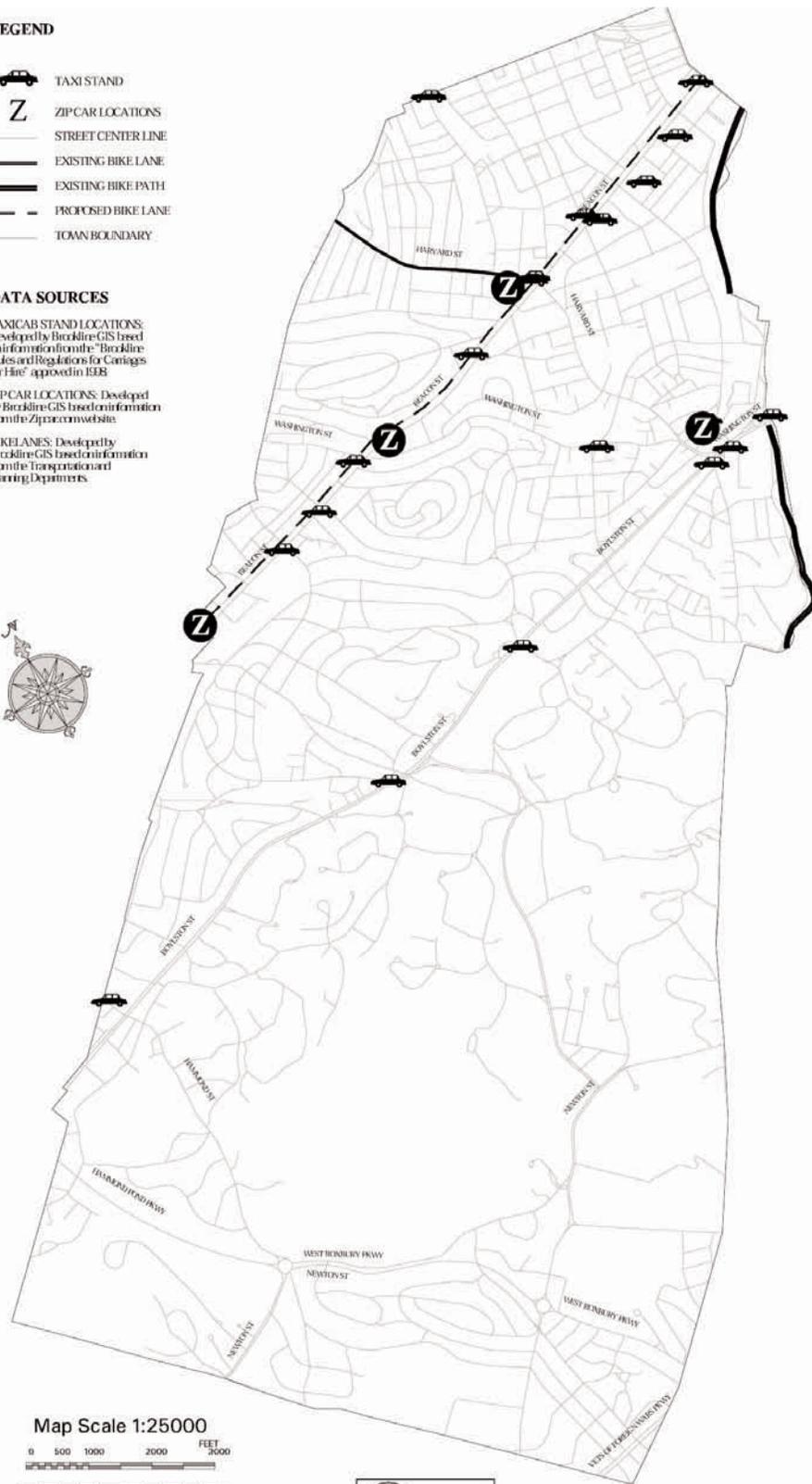
-  TAXI STAND
-  ZIP CAR LOCATIONS
-  STREET CENTER LINE
-  EXISTING BIKE LANE
-  EXISTING BIKE PATH
-  PROPOSED BIKE LANE
-  TOWN BOUNDARY

DATA SOURCES

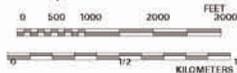
TAXICAB STAND LOCATIONS: Developed by Brookline GIS based on information from the "Brookline Rules and Regulations for Cabs for Hire" approved in 1988.

ZIP CAR LOCATIONS: Developed by Brookline GIS based on information from the zipcar.com website.

BIKE LANES: Developed by Brookline GIS based on information from the Transportation and Planning Departments.



Map Scale 1:25000



Map created by Town of Brookline GIS on 05/21/01.
Map printed on 06/07/01. SUANL/ptotzptaxi&cl4.amf.



Bicycles

Bicycling, although commonly perceived as a recreational activity, is a viable means of transportation. According to the Boston MPO *Transportation Plan 2000-2025: Existing Conditions* and the 1990 U.S. Census, only about 1% of commuters in the Boston region bicycle to work and about 1.8% of Brookline commuters. In other metropolitan areas, particularly in Europe, bicycling is more substantially used for transportation. For example, in Holland, bicycle travel accounts for 29% of total trips (City of Austin, Technical Report, *Innovative Ideas in Bicycle Transportation in U.S. Cities* . . . , 1993).

Not only can bicycling be an important mode for commuting, it can also be a viable alternative to short automobile trips. The 1990 Nationwide Personal Transportation Survey (NPTS) found that only one out of five trips of all kinds (bike, car, train) involve travel to or from work. In terms of bicycle trips, the survey found that 9.9% were work-related, 19.7% were for personal or family business, 55.4% were social or recreational, 14.1% were for school, church, or civic purposes. The average trip length for bicycle trips was two miles. The survey also found that 39.6% of all auto trips are two miles or less. Based on trip distance alone, it appears that many more trips could be made by bicycle if other factors of safety and comfort-level on roadways are addressed. (MAPC, *Regional Bicycle & Pedestrian Plan*, 1997)

Reliance on bicycling is primarily affected by weather and physical conditions, particularly the design of streets and availability of bicycle parking facilities (bike racks). Many studies have been conducted to develop standards for various levels of on-road and off-road bicycle facilities. These levels include designated bike paths, such as the Minute Man Path in Lexington and Arlington, painted bike lanes within the roadway, and bike-friendly roads with sufficient painted shoulder lanes to enhance shared use.

Brookline currently has one bike path, the Riverway, and one existing painted bike lane, on Harvard Street. A second painted bike lane is proposed for sections of Beacon Street as part of the Beacon Street improvement project. There will be a westbound lane from St. Mary's to Coolidge Corner and an eastbound lane from Coolidge Corner to Cleveland Circle. Bike-friendly streets can also be created through traffic calming projects. In fact, one of the objectives of the Town's draft Traffic Calming Policy is to promote safer conditions for all users of the street, including bicyclists.

Bike suitability maps and guides exist for Massachusetts and the Boston Metropolitan area. The Boston MPO plans to compare one of these maps, the Metro West Bicycle Map, with the FHWA (Federal Highway Administration) index of bicycle compatibil-

ity. In addition to the MPO's efforts, the state Transportation Committee is currently considering the Bicyclists' Bill of Rights, a bill that gives bikers the same rights as other drivers, but also allows them to be ticketed like motorists.

In 1997, MAPC produced the *Regional Bicycle and Pedestrian Plan* that was designed to provide a regional context for all bicycle and pedestrian planning efforts in the 101 cities and towns of the MAPC region. The plan sets forth and elaborates on the bicycle and pedestrian goals and policies of the Metropolitan Area Planning Council and provides basic technical information to communities undertaking bicycle and pedestrian planning projects.

The goal of the Town's bicycle network and the various regional and state initiatives is to increase bicycle safety. The number of accidents involving bicyclists

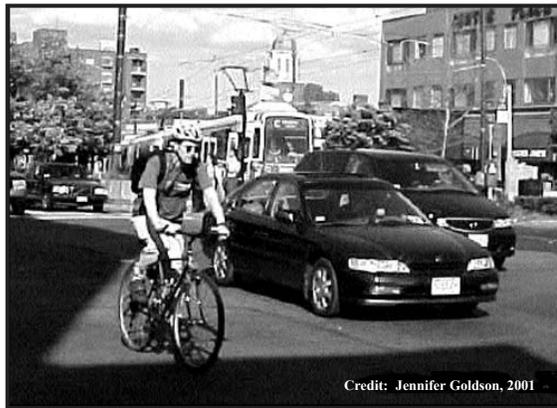
in Brookline over that past decade (1990-1999) was 306. Although Town records show no fatalities reported with any of the 306 accidents involving bicyclists, anecdotally there is one known bicycle fatality in 2000 on Winchester Street.

The second element making up the physical bicycle network, as mentioned above, is bicycle parking facilities. The Town

has installed a few bike racks throughout Town as certain projects are undertaken, such as in JFK crossing on Harvard Street and in the Town Hall plaza. However, there is currently no dedicated funding or program to ensure consistent installation of bike racks in commercial areas or at Town buildings.

Some of the MBTA stations have bike racks that are installed by and maintained by the MBTA. It should be noted that the MBTA does not allow bikes to be taken on Green Line trolleys, but bikes are allowed during non-peak times on other lines. Bikes are not allowed on most MBTA buses, except the crosstown (CT) bus routes that have trial bus bike racks

The Zoning By-law requires that new developments of five or more units of multi-family housing provide a minimum of one bike parking space for every five units with no ground floor entrance. However, there are no requirements for commercial or institutional uses to provide bicycle parking. In 1999, the Brookline Bicycle Advisory Committee gathered existing zoning regulations and bicycle master plans for 13 communities around the country, including four Massachusetts communities, and found useful standards for the design and amount of bicycle parking facilities required for residential, commercial, and institutional developments.



Credit: Jennifer Goldson, 2001

Coolidge Corner

ISSUES & OPPORTUNITIES

This section describes 20 key issues and opportunities related to Transportation, including transportation coordination and management, congestion, street classification, traffic calming, existing transit, expansion of transit, local transit, taxi service, parking supply and enforcement, zoning requirements, shared parking, transit-oriented development, pedestrian and bicycle improvements, urban design, and the Route 9 corridor.

1

Regional & Local Planning Coordination

As Brookline develops a local transportation strategy it will be critical to coordinate the community's goals and vision with regional transportation trends and planning efforts. The Town should continue to be involved with and closely follow planning efforts such as the MPO's Regional Transportation Plan, Access Boston, the Route 9 Study, Fenway Improvement Plan, the Urban Ring, and the Turnpike

Air Rights Study (as described in the Existing System section of this report). Strong ongoing and regular communication and coordination with surrounding communities and regional and state planning agencies will be essential to ensure that Brookline develops realistic and informed transportation policies.

2

Transportation Management

To ensure that the Town continues to make good transportation decisions and manage our transportation infrastructure effectively, it is essential that we continue to develop a system that helps to support transportation management. In order to go beyond our present capabilities, we need to effectively analyze transportation patterns and trends to determine Brookline's future transportation needs. It is integral to generate primary transportation data that is regularly updated indicating how, where, and when the various modes of transportation in Brookline are used.

Reliance on regional and state agencies to provide local data does not often produce the detailed local indicators that are necessary to determine local trends

and needs. Local data that are particularly inadequate or nonexistent are level of service (LOS) indicators and traffic volumes for specific corridors or specific transportation management areas. For example, traffic counts are a problematic data set to compile. Very little historic data exists for even major arterial streets in the Town of Brookline. The primary sources of traffic counts for the Town are temporally scattered single-day counts for specific locations corresponding to project impact assessments.

Reliable and regular data, like traffic volume counts, can indicate traffic patterns and trends, which can inform and affect how we manage transportation and make decisions in the short and long term.

3

Traffic Congestion & Safety

Brookline's major corridors, particularly Route 9, Harvard Street, and Beacon Street, are prime commuting corridors and are, therefore, congested during peak travel times. If alleviating congestion is an objective, then there are a fixed number of solutions: (1) either increase the capacity of transportation infrastructure, (2) shift trips to existing modes with greater capacity, or (3) reduce overall trips by eliminating the need for trips.

The first option, in terms of increasing capacity of roadway infrastructure, is a traditional method for reducing congestion; projects like the Central Artery Project are based on this method. Many intersection improvements throughout Brookline are also based on this method of increasing roadway and intersection capacity and increasing levels of service for automobile traffic. Roadway and intersection expansions are finite and require careful planning and consideration due to potentially negative effects on surrounding land uses, neighborhoods, and other travel modes, such as walking and biking.

Increasing the capacity of non-automobile modes, particularly transit, could have a substantial effect on

commuting choices by shifting some trips from automobile to transit, allowing implementation of the second option listed above. The MBTA has long-range plans to increase capacity on the Green Lines by increasing the length of platforms to accommodate additional cars during peak hours. Expanding bicycle accommodations on roadways to create bicycle-friendly roads could also have an effect of reducing commuting trips by shifting some drivers to bicycles (this mode is, of course, limited due to its weather-dependent nature).

The third congestion management option of reducing overall trips, is based on a larger land-use concept: By creating strong mixed-use neighborhoods with walkable home-to-job proximity and by creating more opportunities for home offices and telecommuting, overall automobile trips could be reduced, thereby easing congestion.

New developments typically generate increased traffic. The significance of this increase varies as a result of the size, type, and location of the development. Section 5.09 of the Zoning By-law requires community and environmental impact and design

review for projects that meet certain thresholds or are in specific locations. Projects that may have significant impact on traffic are required to prepare a transportation study that must be in accordance with the *Brookline Transportation Access Plan Guidelines* issued by the Transportation Department.

During the development review process, traffic mitigation measures can often be negotiated by the Town to be included as part of the project. However, there is no specific language in the Zoning By-law that gives authority to the Town to require or calibrate mitigation measures. This creates an unpredictable situation for both the Town and developer in terms of the types and degree of mitigation measures that may be warranted. The Town could improve this situation by creating specific



Traffic on Route 9 during Rush Hour

Credit: Jennifer Goldson, 2001

standards or guidelines that would clarify the Town's role and authority, as well as provide greater predictability. For example, the standards could set forth an objective to maintain the existing level of service in areas directly affected by the new development. The Town could define specific Transportation

Management Areas to link land use decisions with capacity of transportation infrastructure.

Figure 8 identifies intersections with high incidents of accidents. Many of these intersections have already been identified by the Department of Public Works and are either scheduled for improvements or have had recent improvements to facilitate greater safety (specific improvements are listed in the Existing System section). It is critical to continually monitor traffic accident patterns throughout Town to identify priorities for safety improvements.

4 Local Street Classification System

The functional classifications established by the USDOT are not always indicative of the real use of roads and, therefore, federal and state funded improvements may not always be the most appropriate improvement to enhance the actual use of the street. It is critical to recognize specific land use, design, and neighborhood characteristics that are unique or unifying when planning and implementing roadway improvement projects. Because streets are also public civic places, it is also important to coordinate street improvement projects with community-defined transportation and urban design goals.

To further this aim, the Town could consider establishing a local street classification system to augment the existing federal system. The functional classification established by USDOT would continue as it relates to the availability and use of federal and state funding, but having a parallel classification system could mean the Town would have more basis for using federal and state funds for more appropriate improvements. A local classification system could also affect and guide traffic calming projects, specific capital expenditure, parking regulations or programs, and perhaps aspects the Zoning By-law.

5 Traffic Calming & Community Streets

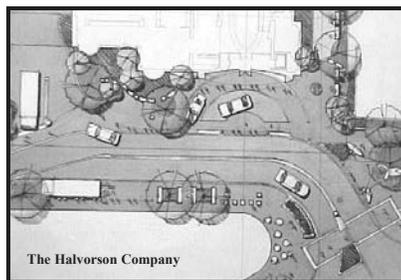
Local streets, which are primarily residential in nature, are designed to provide access to individual parcels of land on those streets. It is important to ensure safe speeds and appropriate traffic volumes on residential streets to increase safety, decrease noise pollution, and generally enhance the neighborhood quality of life.

This issue has led to the creation of the *Traffic Calming Policy and Procedures*, as described in the Existing System section. It will be important for the Town to support and encourage traffic calming initiatives, particularly in high pedestrian areas, such as near schools, and in high traffic accident areas and intersections. Traffic calming can increase safety and greatly enhance streetscape aesthetics. Since traffic calming projects can be expensive, it will also be important to consider and build traffic calming when roads are being worked on for other purposes.

COMMUNITY STREETS

Brookline's first community street will be constructed on Webster Street in Coolidge Corner, as part of the Webster Street Hotel project. The concept of a com-

munity street is to create a street where drivers, pedestrians, and bicyclists share the street. Although various traffic calming mechanisms are used to create a community street, the design is taken beyond a typical traffic calming project to create a community place that can be a destination in and of itself.



Design for Webster Street Community Street

The Halvorson Company

Community streets often incorporate extensive landscaping, benches, fountains or sculptural objects, pedestrian-scale lighting, and nearby land uses that generate pedestrian activity. Community streets are often designed to eliminate the traditional separation of pedestrian, bicycles, and automobiles to create an atmosphere of shared

space, to dramatically slow traffic speeds, and practically eliminate through-traffic.

The community street concept is typically applied to residential streets, but can also be used to transform a commercial or mixed-use street into a community space, such as the Webster Street project. Opportunities for further creation of community streets should be considered as a mechanism to create new public spaces, as well as to strengthen and protect existing neighborhoods.

6

Improve Existing Transit Services & Facilities

IMPROVE EXISTING TRANSIT SERVICE

The existing transit service presents several critical issues including frequency, capacity, consistency, and quality. While these issues are important to riders whose origin or destination is Brookline, the Town is not directly involved in decision making related to the MBTA system. However, concerns related to these issues can be assembled and conveyed to the MBTA by the Town. In addition, the issue described below regarding the development of a stronger working relationship with the MBTA would assist in strengthening dialogue between the Town and MBTA.

EXPAND CAPACITY

The Town should consider making inquiries to the MBTA for the potential of establishing new bus connections or redundant bus lines along corridors where light rail capacity has been met and/or exceeded and where no system improvements are planned or viable. One possibility related to this could be the Beacon Street corridor.

IMPROVE STATION FACILITIES

The issue of improvements to transit station facilities is important from both a functional and passenger amenity perspective. The Town should develop a set of criteria for station functionality and comfort, regularly evaluate stations within Brookline, and develop a set of recommendations that could make each station more functional (platform length, pedestrian access, and bicycle access and storage, etc.) and comfortable and user-friendly for passengers (enclosed or adequately sized, fully-covered shelters; token

machines, handicap accessibility, safe pedestrian facility surfaces, etc.). Such recommendations would be passed along to the MBTA and progress on implementation monitored.

TOWN RELATIONSHIP WITH MBTA

Brookline currently has a positive working relationship with the MBTA, and should continue to develop a strong and close working relationship with the Authority in system planning and financial service planning. A close working relationship can lead to

policies and administrative practices that could give the Town of Brookline a stronger voice in influencing MBTA decision making. Close scrutiny of system planning can provide Brookline with timely information regarding proposed system improvements, system extensions, system contraction, and changes in system operations.

Access to financial service planning may provide

timely information related to financial decision making that could influence service or facility decisions. Brookline currently has a seat on the MBTA Advisory Board which was formed to allow each city and town in the various MBTA service districts to review and approve the Authority's annual operating budget and long-term capital program. In addition, there may be other MBTA boards and committees which allow community participation and input into regular planning and decision making. The Town should review these boards and committees and consider appointing staff to regularly attend those most applicable to Town goals and objectives.



Brookline Village MBTA Station

7

Transit Service Expansion & The Urban Ring

The issue of new transit service and whether it should be circumferential or radial affects Brookline. Each option could provide potential benefits to the Town in that circumferential service can provide connections that are not presently available and provide access to and from Brookline to currently under-served locations. For radial service, the current radial lines are at or near capacity and new or expanded east-west radial service may provide some relief for existing Green Line service depending on where such a service would be situated. The Town should continue to monitor regional planning efforts and studies related to new transit service and keep abreast as to how proposal may affect Brookline.

Related to new transit service is the Urban Ring Project. This project, which is described in the Existing System section of this report, is an important issue that could have indirect influence on access to and from Brookline from communities that do not currently have direct transit connections and/or frequent transit service to the Town such as Somerville, Cambridge, and Dorchester. As a member of the Urban Ring Compact, Brookline should continue to be involved in the Compact and monitor the progress of the project.

8

Local Transit Services

LOCAL BUS

Brookline should study the feasibility and merit of a local transit service similar to the Newton Nexus. Such a service, which would utilize a minibus, would not be designed to compete with MBTA service but to supplement it by providing coverage in areas of Brookline that are currently not served or areas where MBTA service is insufficient to meet the demand. In addition, such a system should provide logical links

to MBTA termini or major stops within Brookline.

This concept presents complex funding, operating, and management issues. Feasibility would primarily focus on financial considerations. Funding must be considered in two parts, startup and system maintenance. Funding for startup could be provided by federal sources such as Congestion Management and Air Quality (CMAQ) which is the source of funding for Nexus startup. An additional consideration could be

the utilization of progressive and innovative technologies to reduce air pollution that would strengthen any CMAQ application. System merit would relate to identifying one or more target populations in which to serve. For example, the Nexus is designed to serve seniors, the disabled, and students and had hoped to attract commuters as well (which has been unsuccessful to date).

In addition to feasibility and merit, policies based on service goals and objectives would be necessary to determine issues such as levels of deficit, if any, that such a system could be permitted to run in order to adequately serve the target populations.

As an alternative to the above described Nexus-like bus, Brookline could consider establishment of a local

circulator bus or van that would provide a loop service between key destinations such as the major commercial areas of the town, similar to the holiday trolley that has been organized by Brookline merchants for the holiday season.



Brookline Village, Elderbus Sign

Such a service would have a specific single purpose and could be funded in full or in part through contributions from the business community. Rolling stock could be as small as a commuter van or as large as a minibus.

ELDER BUS SERVICE

Brookline should regularly review and monitor Elder Bus service including routes and frequency, to determine optimization of current routes and frequency of service, as well as assess whether routes should be altered or new routes should be established.

9

Taxi Service

TAXI LICENSES

The amount of taxis operating in Brookline directly affects service levels, but also adds to traffic volume on streets and could cause garaging difficulties if there is an oversupply. To determine the appropriate number of taxi licenses to issue, a certain amount of baseline information is needed to estimate current taxi demand. An independent study could be conducted on a regular basis to analyze various indicators of demand, such as population changes and projections, changes in elderly and adolescent populations, local transit ridership, airport passenger counts, and convention activity data. It would also be critical to measure current taxicab utilization patterns by using ridership information obtained directly from the taxi companies.

As an alternative to conducting an independent study, the Town could require new applicants for taxi licenses to substantiate their need as a submission requirement by amending the existing regulations, *Rules and Orders for the Regulation of Carriages or Vehicles for Hire*. DPW, in conjunction with Town Council and the Transportation Board, is in the process rewriting the regulations to shift the proof of demand to the taxi companies.

STAND LOCATIONS

Taxi stand locations are determined by the Transportation Board on case by case basis. There are no Town guidelines or criteria used to determine where and how many taxi stands should be designated. Evaluating the current practice and comparing it with the practices of nearby communities could better inform the Town to determine if or where additional stand locations are needed.

VEHICLE DESIGN

The Transportation Board has the authority to influence design of taxi vehicles. Taxi vehicles can be designed to be handicap accessible with wide doors and an integral ramp that can carry a passenger in a full-sized wheelchair. The Town could consider the implications of requiring or encouraging operators to purchase handicap-accessible vehicles.

It is also important to identify opportunities for joint public/private development of parking improvements and explore options for developing mixed-use structures that incorporate public parking with offices, housing, or retail. This type of mixed-use development could present number of design benefits, particularly by enabling the creating of liner buildings to establish ground-level uses in keeping with the surrounding design and land use context.



Taxi Stand in Coolidge Corner

Expansion of the parking supply, whether a public venture or a public/private partnership, could be assisted through innovative zoning mechanisms that would allow business owners or developers to make a payment to a dedicated parking fund in lieu of providing on-site parking. Because many sites in Brookline's commercial areas have no land to create on-site parking and some sites present opportunities for infill or intensification through additional stories, this practice could eventually increase the public parking supply while maintaining and enhancing the vibrancy and historic character of Brookline's commercial areas. This type of zoning mechanism could be targeted to transit-oriented areas where on-site parking is not as critical as nearby parking.

As detailed in the Existing Conditions section of this report, the Town has been adjusting the management and use of the existing on-street and off-street public parking supply to create more efficient use of the facilities, particularly in commercial areas. As recommended by the Commercial Areas Parking Committee, described in the Existing Systems section of this report, the Town should continue to maintain the existing on and off-street public parking spaces and efficiently manage their use through time limitations, rational rate adjustments, and continuance and expansion of the employee parking program now instituted in Brookline Village and Coolidge Corner.

In addition to managing the current parking supply more effectively, the Town has the opportunity to evaluate if any expansion of parking is needed. The most recent parking demand study was prepared by Vanesse Hangen Brustlin, Inc. in 1987. This study, the *Beacon Street Corridor Parking Study*, determined the existing parking supply and analyzed the theoretical demand for parking spaces in Washington Square and Coolidge Corner. The Town has heard clearly that it is important to balance demands for parking. The Town should move forward to consider how to appropriately increase public supply of parking in the short and long term, particularly in our key commercial areas like Coolidge Corner, Brookline Village, and possibly Washington Square. In Coolidge Corner, the Center Street West lot should be looked at as one important potential opportunity to increase public parking supply. The Town should conduct a detailed feasibility study to analyze overall costs and benefits of building additional parking. The

study should include analysis of locations, financing, design context, and economic impacts. The analysis could also include potential effects of an increased parking supply on businesses, value of commercial space, traffic generation, car ownership rates, use of non-automobile transportation modes, and land use patterns.

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As the Commercial Areas Parking Committee recognized, parking enforcement is a key element of effective parking policies and regulations. Parking issues include double parking, long-term parking in short-term spaces (feeding meters), parking in loading zones or taxi stands, and violation of the overnight parking ban. In terms of parking in commercial areas, there is a natural tendency for spillover of employee and sometimes customer parking into nearby residential neighborhoods. One concept that should be explored is increasing enforcement in these impacted residential neighborhoods by creating parking overlay districts that could allow parking enforcement staff (as opposed to police officers) to enforce parking regulations in these areas. This method could increase the frequency and regularity of enforcement.

Enforcement of the overnight parking ban is also an important concern. The Brookline Police Department conducted a study over the course of three nights in November 2000 to determine the extent of vehicles parked on each street in Town during the ban hours (2 a.m. to 6 a. m.). The study assumed that the vehicles counted were in violation of the ban (i.e., were

parked on-street longer than the one hour allowed). The study concluded that roughly 1,100 vehicles were in violation of the ban on a typical weekday, and many of the high incident streets were near adjacent Boston neighborhoods. However, the high numbers of overnight parkers on other streets in Brookline cannot be attributed to spillover. The Police Department issues between 200 and 230 parking tickets for on-street overnight violations on an average night, representing only about 20% of the total overnight violators counted by the study.

Since the ban actually allows overnight parking for up to one hour between the ban hours, it is difficult to consistently enforce - the officer would need to record the presence of the car then return at least an hour later to ticket. To improve the consistency and, thus, the fairness of enforcement, it may be warranted to reconsider the wording of the ban (Article V, Section 11, Town of Brookline Traffic Rules and Regulations) to eliminate the allowance of one hour. It will be important to work closely with neighborhoods to create alternative ways to deal with visitor and overnight residential parking.

The Brookline Zoning By-law requires off-street parking for new development. The amount of parking required varies for different uses (commercial, institutional, residential) and different zoning districts. The performance of these requirements have not been recently been systematically analyzed for their effectiveness at furthering community goals. A comprehensive analysis of off-street parking

requirements would give guidance and insight into specific changes or modifications that should be made to take into account long-term trends facing Brookline and to more effectively achieve community goals. Numerous issues are directly interwoven and related to parking, including car ownership rates, traffic generation, open space, affordable housing, development costs, and transit ridership.

Shared Parking

13

Shared parking is a particularly useful concept in mixed-use neighborhoods where there are day-time uses and night-time uses. For example, offices generally generate parking demand during the traditional 9-5 business hours on weekdays and have little or no generation of parking demand evenings or weekends. On the other hand, residences typically generate higher parking demands in the evenings and on weekends. Since these two uses, residential and office, have different peak times of parking demand, they are natural candidates for successful use of shared parking. This concept is especially helpful in maintaining attractive streetscape design by minimizing the amount of parking lots, as well as alleviating environmental issues

caused by excessive asphalt-pavement. However, conflicts between users of shared parking also occur and should be planned for and evaluated.

Currently, the Brookline Zoning By-law allows shared parking through a special permit (Section 6.11(a)(3)), which requires approval from the Board of Appeals. Any type of governmental review process is generally perceived as a discouragement. Therefore, consideration should be given to amending the Zoning By-law to allow use of shared parking by right, under certain circumstances that would need to be specifically and clearly defined and laid out as part of any amendment.

Transit-Oriented Development

14

The concept of transit-oriented development is also an important concept to consider when analyzing the effects of parking requirements. As described in the Issues and Opportunity report on Housing, the phrase "transit-oriented development" describes a type of development that has a reciprocal relationship: it is development that both supports and is supported by mass transit. Although this is a fairly new term, promoted by architect Peter Calthorpe to describe the development of newly planned communities, it is based on the traditional concept of streetcar suburbs.

Brookline was one of the Boston area's first streetcar suburbs. The density of development that occurred here in the mid to late 19th century and throughout the 20th century would not have been possible without reliance on mass transit. In fact, the most dense development patterns in Brookline have occurred in North Brookline where three of the MBTA's Green Lines provide direct connections to downtown Boston.

With the prevalence of automobiles in our lives, these transit connections to Boston are no longer as strongly relied upon, particularly with reverse commutes becoming more common than in the past. However, Brookline is one of six inner core communities considered part of the urban ring corridor. According to the Urban Ring Major Investment Study, March 2000, this corridor is growing faster than the regional average, and will contain over 250,000 residents and over

240,000 jobs by the year 2020. Therefore, it is clear that mass transit availability in Brookline will continue to have a strong reciprocal relationship with development.

Encouraging the continuance of transit-oriented development is an important opportunity for Brookline to preserve its historic patterns of development, enhance the diversity of housing and lifestyle choices, as well as to lessen reliance on automobiles, thereby reducing traffic congestion and environmental pollution, and increasing our sustainability.

According to *Creating Transit Supportive Land-Use Regulations, PAS Report #468*, the maintenance and creation of transit-oriented development relies on four basic concepts:

1. ensuring pedestrian and bicycle-friendly site and streetscape design
2. balancing the need to accommodate automobile parking with the needs of pedestrians, bicyclists, and transit users
3. encouraging mixed-use development
4. fostering appropriate development densities

Brookline has the opportunity to review its development policies and land use regulations, including parking requirements, to encourage the continuance of our historic patterns of development by fostering transit-oriented development.

It is critical to continually maintain and improve Brookline's pedestrian network of sidewalks, crosswalks, pedestrian paths, and signalized crosswalks to enhance safety and overall quality of life. To ensure timely identification of priority maintenance needs, regular and thorough analysis of conditions will be required. In addition to resurfacing and construction-oriented maintenance needs, snow and ice are serious impediments to winter walking and should be addressed through consistent and timely snow removal. The Town's snow removal policy and procedures should be reevaluated to seek ways to mitigate this issue.

In addition, any deficiencies in pedestrian connections need to be identified to improve and build on



Pedestrians in Coolidge Corner

the existing pedestrian network. For example, all Town crosswalks and signalized crosswalks could be inventoried, mapped, and analyzed in correlation with the entire existing pedestrian network to locate deficient connections. Likewise, roadsides with no sidewalks could also be analyzed to locate deficient connections. Intersection crossings should be assessed to determine pedestrian wait times. These types of analysis could be coordinated through a Pedestrian Master Plan that could prioritize needs to integrate into Town road improvement projects.

The *Open Space Plan 2000* recommends protecting and enhancing various types of greenways, including access greenways, which incorporate networks of landscaped streets, small parks and paths used for walking or biking. These greenways provide important links to pedestrian destinations and should be protected and enhanced.

Parents have justifiably grown more hesitant in today's society to allow children to walk to school. For numerous reasons, such as easing traffic conflicts and congestion, integrating more exercise into daily life, and gaining more personal independence and responsibility, children and parents need to feel that streets are safe for children to walk. Traffic calming measures, which are prioritized for public school areas, can greatly increase both real and perceived safety of a street by reducing traffic speeds, creating substantial landscaped buffers between sidewalks and roadways, and creating safer crossings by physically requiring vehicles to slow speeds and by creating shorter crossing distances through physical devices such as neckdowns (a narrowing of the roadway at intersections).

In addition to physical solutions, various programs can be used to encourage a safe mode transition to

walking, such as the walking bus concept. This type of program would organize parent volunteers to lead a walking bus by establishing routes with pick-ups at each student participant's house. The walking bus would pick up all participants on the route and proceed to walk to school as an organized group. This program has been successfully operated in Arlington and a trial run was successfully conducted at Brookline's Runkle School in May.

There is also a National Walk Our Children to School Day coming up on October 2, 2001. This event started in 1997 by the Partnership for a Walkable America. Last year communities in 47 states participated in the event. It is important for Brookline to find ways to make walking a more attractive option by improving the physical aspects of our pedestrian network and by forming walk-to-school initiatives throughout Town.

Brookline, with only one designated bike lane and one path, has tremendous room for improvement in creating safer bicycle routes and better connections. Every street and intersection in Brookline may not be physically able to accommodate bike lanes or be transformed into a bike-friendly street or intersection (typically through provision of a painted shoulder or curb extensions), but some streets can.

As a first step, a bicycle road capacity analysis should be conducted throughout Town to determine which streets can physically accommodate these types of facilities. When this data set is complete, principle destinations and routes should be identified as criteria for investment prioritization for the creation of bike-friendly streets, designated bike lanes, and "share the road" awareness signs or other forms of education and publicity.

This type of analysis and prioritization could be organized and coordinated in a Brookline Bicycle Master Plan that could guide and inform future investments and improvements. The Plan should also coordinate priorities and route improvements with the MAPC Regional Bicycle and Pedestrian Plan, briefly described in the Existing System section of this report, and any other plans for surrounding municipalities or regional plans that may apply. Designated staff to coordinate both the bicycle and pedestrian master plans would help to ensure implementation and ongoing analysis. A locally-produced and updated map of bicycle routes would encourage the use of bicycle investments.

Creating safer bike routes will logically need to be accompanied by providing convenient and safe bicycle parking facilities in predictable locations, such as throughout commercial areas and for Town and other public facilities. As part of a potential Bicycle Master Plan, mentioned above, the Town should develop a policy to guide the consistent installation of bike racks at principle destinations throughout Town. This would require the determination of where these types of facilities can be physically accommodated, such as on sidewalks, neckdowns, or in parking lots. This would also require determination of a consistent design and logical placement locations. The Transportation Board and DPW are planning to install bike racks in existing Town parking lots. The Town is currently investigating funding methods.



Bike Parked at Meter on Harvard Street

cle parking facilities, developers of commercial and institutional uses could also be required to provide on-site bicycle parking facilities, just as new development is required to provide off-street automobile parking. Racks could be required in various locations, such as in visible locations, serving short-term users, and in protected locations like underground garages, serving long-term users such as employees. In order to implement this type of requirement through the Zoning By-law, reasonable thresholds and criteria for the types of developments that would trigger this requirement would be needed.

Also, reasonable requirements for amount, design, and placement of bike parking facilities would be needed. Our current requirement for multifamily residential development should be re-evaluated for its consistency with the intent of these possible amendments.

To supplement the Town's efforts at improving bicy-

Urban Design & Streetscapes

Streets are not only places to move traffic, but function as public civic places too. Certain streets also act as gateways or front doors into Brookline, like Beacon Street, Harvard Street, and Route 9. Good urban design and streetscape enhancements can not only create a desirable image of Brookline, but can also create pleasant and attractive places for residents and visitors to enjoy. Commercial area streetscapes can have a large effect on the perception of economic success, and therefore, it is critical to continue to encourage facade and signage enhancements on private properties, as well as public streetscape enhancements.

Creating design or corridor overlay districts through the Zoning By-law could further tailor development regulations to community goals for particular target areas, such as the Route 9 corridor. An overlay district is a zoning mechanism that provides an additional layer of zoning regulations designed to promote or protect particular physical characteristics of an area. For example, Brookline could create a Route 9 Corridor Overlay district with regulations or design criteria tailored to defined development goals for Route 9, or particular target areas along the Route 9 corridor.

Route 9 Corridor

The Route 9 corridor through Brookline presents a substantial opportunity for improvements in terms of streetscape aesthetics, development, and the pedestrian network. Route 9 is and will remain a major corridor providing connections to Boston, Interstate 95, and to western communities. Route 9 is under State jurisdiction (Massachusetts Highway Department) and acts as an important gateway into and through Brookline, providing an image of Brookline for many drivers.



Route 9 in Chestnut Hill

Brookline has a critical opportunity to work closely with the State as it prepares a Route 9 Corridor Study, described in more detail in the Existing Systems section of this report, to improve the image and functionality of

Route 9. Improvement efforts could focus on creating better pedestrian and bicycle crossings, improved sidewalk conditions and maintenance, landscaped buffers between the roadway and sidewalks, bus shelters, and an aesthetic theme providing a positive image of Brookline.

To effectively establish and communicate community policies, goals, and objectives for the Route 9 corridor, a Corridor Master Plan should be created. A master plan could be used to inform state improvement projects and investments, as well as provide a basis for possible zoning amendments that could affect the type, design, and location of development along the corridor.

