

### 3. Walking in the Boston Region

The following chapter describes the current state of walking and pedestrian accommodation in the Boston Region through use of available data. According to U.S. Census Bureau data, 25 percent of workers in the Boston Region walked, biked, or took public transportation to get to work in 2000, almost 40 percent higher than the state's mode share, which was 18 percent.

#### a. Boston Region Commuting Patterns

According to Figure 1, 'Municipalities with the Highest and Lowest Walk to Work Rates,' an estimated 5.7 percent of commuters walked to work in the Boston Region in 2000, over 40 percent higher compared to the Massachusetts rate of 4 percent. The percent of those who walked to work ranged from as high as 24 percent in Cambridge to as low as 0 percent in Middleton.

Communities with high percentages of commuters who walked to work were Cambridge (24%), Boston (13%), Wellesley (12%), Brookline (10%), and Somerville (9%). Ashland, Hanover, Middleton, Sherborn and Walpole were the lowest, all less than .05 percent of walking commuters.

In general, communities with higher population densities and easier access to public transportation have a greater percentage of commuters walking to work. Overall, communities that have lower numbers of vehicles by occupied housing units are the same communities that have a high percentage of commuters who walk to work. Appendix A, 'Boston Region Commuting Patterns and Vehicle Ownership,' contains further information.

Figure 1 Municipalities with the Highest and Lowest Walk to Work Rates

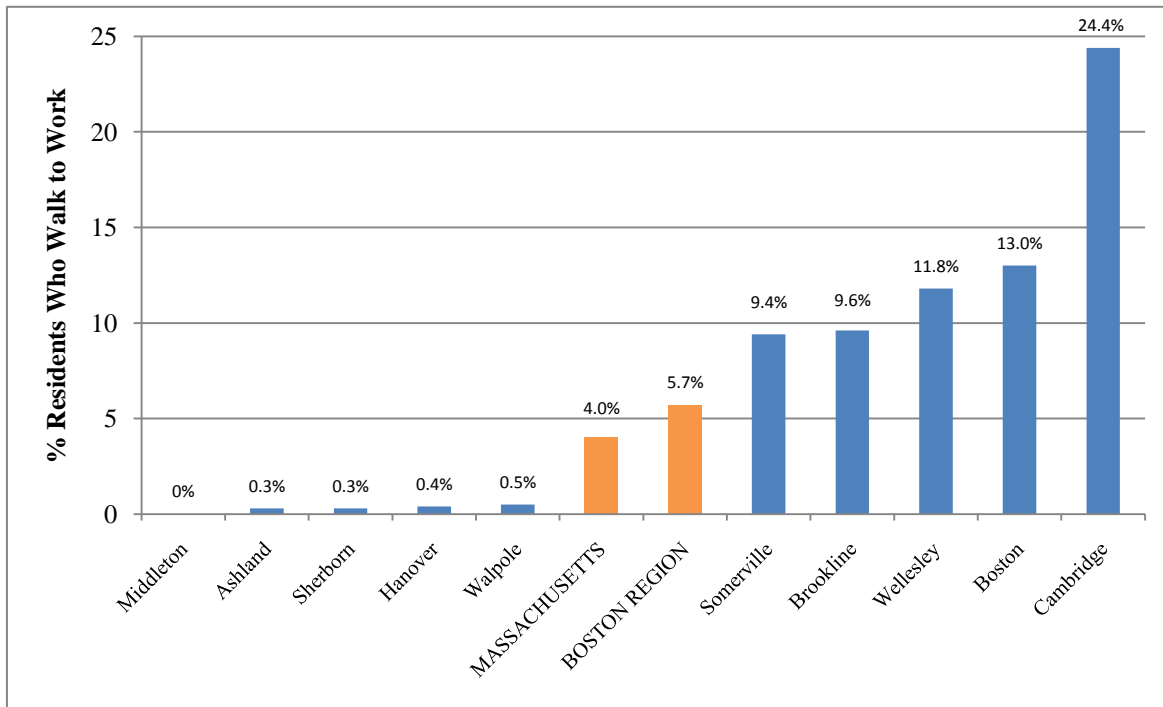
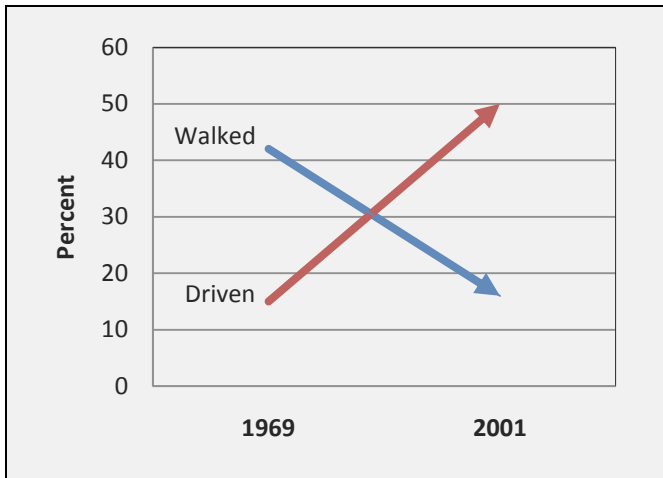


Figure 2 Student Access to School



Source: Federal Highway Administration, NHTS Brief on Travel to School, 2008.

Travel to school has changed dramatically over the past four decades. As depicted in Figure 2, 'Student Access to School', the number of students aged 5 to 18 who walked to school declined by more than half (42% to 16%) while the percent of those who were driven to school more than tripled (15% to 50%) between 1969 and 2001 nationwide. Policies and programs that encourage walking to school need to be implemented to reverse this trend. For example, Massachusetts' Safe Routes to School program reaches 20 percent of the eligible aged school children compared with 9 percent nationwide.

## b. Pedestrian Surveys

Three completed surveys, two administered by MAPC and one by the City of Newton, give a picture of pedestrian conditions in the Boston Region. The Pedestrian Facility Planning Survey addressed how municipalities manage and inventory their pedestrian network. The On-Line Pedestrian Plan Survey was conducted to better understand residential pedestrian issues. Information about student access to school was obtained from the City of Newton's Walk to School Assessment Survey.

### *Pedestrian Facility Planning Survey*

One of the key goals of the plan is to provide a continuous and complete pedestrian network. With 101 cities and towns in the region, there are many ways sidewalk and pedestrian facility projects can be programmed and funded.

To better understand how the 101 communities are managing and inventorying their pedestrian network, MAPC sent out the following survey questions in June 2009 to each of the town planners:

- 1) Does your community have an inventory of its existing walkways (sidewalks, paths, and other pedestrian facilities)?*
- 2) Does your community have a master plan for construction and/or upgrading of walkways (including repainting of crosswalks)?*
- 3) Does your community have a policy for snow removal? If so, are abutters primarily responsible or is the community?*
- 4) Is there a board or committee that has primary responsibility for planning and/or recommending pedestrian facilities? If so, please identify the name of the board or committee.*

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The responses received from 32 communities are outlined in Table 1, ‘Pedestrian Planning Survey Summary.’

Sixty-five percent of the communities that responded have an inventory of their sidewalk and path system. Forty-five percent of the communities have an implementation plan in place for construction or repair of the sidewalk system. Most communities have a sidewalk snow removal policy. For the most part, abutters are responsible for snow removal on sidewalks in predominantly urban communities. Communities have responsibility primarily in developing communities where the density is low and sidewalks are infrequent. Removal of snow on sidewalks by the communities is often focused on the areas near schools. About half of the responding communities have some sort of independent board or committee that evaluates pedestrian programs and policies.

**Table 1 Pedestrian Planning Survey Summary**

Community	Sidewalk Inventory	Sidewalk Master Plan	Snow Removal Policy	Pedestrian Board
1 Acton	Yes	Yes	Yes - Municipality	Sidewalk Committee
2 Arlington	No	No	Yes - Abutters	Transportation Advisory Committee
3 Bedford	Yes	Yes	Yes - Abutters	Transportation Advisory Committee
4 Beverly	Yes - GIS	No	Yes - Abutters	No
5 Boxborough	No	No	No	Planning Board
6 Braintree	In Progress	In Progress	No - except special permits	No
7 Brookline	Yes - GIS	Yes	Yes - Abutters	Transportation Board
8 Cambridge	Yes	Yes	Yes - Abutters	Pedestrian Committee
9 Chelsea	No	No	Yes - Abutters	No
10 Cohasset	Yes	Yes	Yes - Municipality	No
11 Concord	Yes - GIS	No	Yes - Municipality	PW Comm & Natural Resources Comm
12 Dedham	Yes	No	Yes - Municipality	Board of Selectmen as Street Commissioners
13 Duxbury	No	No	Yes - Municipality	Sidewalk Bikepath Committee
14 Essex	No	No	Yes - Municipality	Essex Board of Public Works
15 Franklin	Yes	No	Yes - Municipality	No
16 Holliston	Yes	In Progress	Yes - Abutters (town near schools)	Board of Selectmen
17 Lexington	Unknown	Unknown	Unknown	Sidewalk Committee
18 Marlborough	Yes	Yes	Yes - Abutters	City Council
19 Marshfield	Yes	No	Yes - Municipality	Board of Public Works
20 Medford	No	No	No	No
21 Natick	Yes	No	Yes - Abutters	Bicycle & Pedestrian Advisory Committee
22 Newton	Yes - GIS	Yes - limited	Yes - commercial, No - residential	No
23 North Reading	No	No	Yes - Commercial	Unknown
24 Norwell	No	No	Yes - Municipality	Norwell Pathway Committee
25 Quincy	Yes - GIS	Yes - DPW	Yes - Abutters	No
26 Stow	No - planned	No - planned	No	Pedestrian Walkway Committee
27 Sudbury	Yes	Yes	Yes - Municipality	Planning Board
28 Topsfield	Yes	Yes	Yes - Municipality	No
29 Watertown	Yes	Yes - DPW	Yes - Abutters	Bicycle Pedestrian Committee
30 Westwood	Yes - GIS	No	Yes - Abutters	Pedestrian and Bike Safety
31 Woburn	Yes - partial	No	Yes - Abutters	No
32 Wrentham	No	No	Yes - Municipality	Board of Selectmen

Municipality – The municipality is responsible for snow removal.

Abutters – Private owners are responsible for removing snow abutting their property.

### *On-Line MAPC Pedestrian Plan Survey*

To obtain a better understanding of pedestrian issues for residents in the Boston Region, an on-line Pedestrian Plan Survey was conducted. Initiated in 2007 and lasting for a period of two years, over 1,600 respondents completed the survey.

Although the survey is intended to represent the Boston Region, approximately 70 percent of the respondents reported having a home zip code in Arlington, Boston, Cambridge, Medford or Somerville. These communities represent 28 percent of the region's population. The majority (66%) of the respondents were women. Forty-three percent of the women were between the ages of 31 to 50 and 73 percent did not have children under the age of 16 living in their households.

Respondents were asked to estimate what percent of trips they take by each mode of transportation for all trip types, not just commuting. Survey respondents relied heavily on driving (50%); however walking was a significant trip type (28%). A variety of reasons ranging from bad weather (56%), sidewalks or paths not cleared from snow or ice (43%), and lack of time (38%) were given when asked what prevents them from walking.

Having both pedestrian-friendly infrastructure and multiple destinations to walk to are considered good features for a walking environment by survey respondents. The presence of sidewalks (87%) and crosswalks (58%) were considered components of a good walking environment. Walking access to multiple destinations was also given a high criterion for a good walking environment (64%).

Half of the survey respondents clearly indicated a desire to walk to work and about two-thirds would walk to work more often if they lived closer. About two-thirds of the survey respondents indicated they would walk more often if they were closer to shopping areas and friends and one-third if their schedules were more flexible. The decision of whether to walk is more heavily weighted on the distance of destination points rather than conditions of the walking environment. Smart growth, in addition to walking conditions, is essential to encouraging walking as a mode of transportation.

### *Walk to School Assessment Survey*

In the fall of 2008, Newton conducted a Walk to School Assessment Survey. The survey had over 1,000 responses representing 13 schools. The vast majority (80%) of the respondents lived within one mile of a school and over 75 percent reported that they want to live in a community where students walk to school. Eighty-three percent of arterial streets in Newton have sidewalks on at least one side of the street so it can be assumed that walkways are available for most or the entire trip.

Weather, scheduling, convenience and safety (child cannot walk without an adult) are the primary factors that make parents or guardians decide to drive. The majority of the respondents did not find sidewalks to be a specific reason to drive instead of walking. If sidewalks were identified as a problem, the intermittent lack of sidewalks and broken or cracked sidewalks were cited. With the exception of wintertime, 40 percent of respondents walked to school 4-5 days per week. A significantly lower percentage (27%) reported walking home 4-5 days per week. Weather or climate was the leading decision for a parent or guardian to drive instead of letting their child walk either to or from school.

However, respondents reported issues pertaining to snow removal with approximately 45 percent stating that failure of residents to clear snow causes them to drive. Over 50 percent of respondents said that snow piles at corners and sidewalk entrances or that having to step into the street due to snow

causes them to drive to school. Over 40 percent said failure to clear entrances to crosswalks causes them to drive to school.

### c. Sidewalk Inventory

Eight maps with a tandem table comprise Appendix B, 'Sidewalk Coverage by Municipality.' The maps comprise the entire Boston Region and identify whether sidewalks exist, on one side, or both sides, or neither side for the "Main Roads" and the "Local Roads." "Main Roads" carry through traffic and generally have limited access points. "Local Roads" have more frequent access points and serve adjacent residential and business land uses. "Local Roads" distribute traffic between neighborhoods and "Main Roads." The companion table indicates the percent lacking sidewalk coverage by street type for each MAPC community. The sidewalk inventory is based on road data from MassDOT. In addition, primary schools and rail transit stations are identified on the maps.

The sidewalk inventory data show that 54 percent of roadway miles in the region that allow pedestrians lack sidewalks.

### d. Public Health

Studies have found that there is a direct relation between the built environment in vehicular-oriented communities and physical inactivity.<sup>4</sup> The availability of parks, walking trails, and the walkability of communities all have a direct impact on the transportation choices people make. Having advantageous transportation and community design does have an important role in improving health.

The Centers for Disease Control and Prevention (CDC) has identified physical inactivity (and related chronic health conditions of obesity, diabetes, high blood pressure and stroke) as a major underlying cause of premature mortality in the United States. According to the Centers for Disease Control, the obesity rate among Massachusetts adults increased from 10-14 percent of the population in 1998 to 20-24 percent in 2008. Almost 25 percent of Massachusetts high school students are overweight or are at-risk of becoming overweight.

### e. Pedestrian Crash Data

The need to reduce pedestrian injuries and fatalities while promoting increased walking is an important objective. Currently, data on pedestrian crashes and injuries is recorded differently in each community. Specifically, the numbers and locations of the crash data need to be more accurate. For example, many crashes are not reported, and others do not include correct information on the location. The map in Appendix C, 'Pedestrian Fatalities within the Boston Region,' depicts the locations of pedestrian fatalities recorded between 2002-2006.

According to information from MassGIS, there were 149 pedestrian fatalities between 2002 and 2006. The number of fatalities is consistent annually. As shown in Appendix C, the number of pedestrian fatalities is concentrated among municipalities with the greatest population densities. During the same time frame, pedestrian fatalities were reported in about half of the 101 municipalities comprising the Boston Region. Most accidents involving pedestrian fatalities in the Boston Region took place from September to December and between the hours of 5pm and 7pm.

Pedestrian crashes and the resulting injuries and fatalities are a serious problem. In June 2008, a National Pedestrian Crash Report by the US DOT, National Highway Traffic Safety Administration was

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<sup>4</sup> Lee V, Mikkelsen L, Srikantharajah J, Cohen L., Strategies for Enhancing the Built Environment to Support Healthy Eating and Active Living. Oakland, CA: Prevention Institute, 2008, page 8.

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released. This technical report analyzed trends in pedestrian fatalities and police-reported motor vehicle crashes involving pedestrians in the United States since 1997.

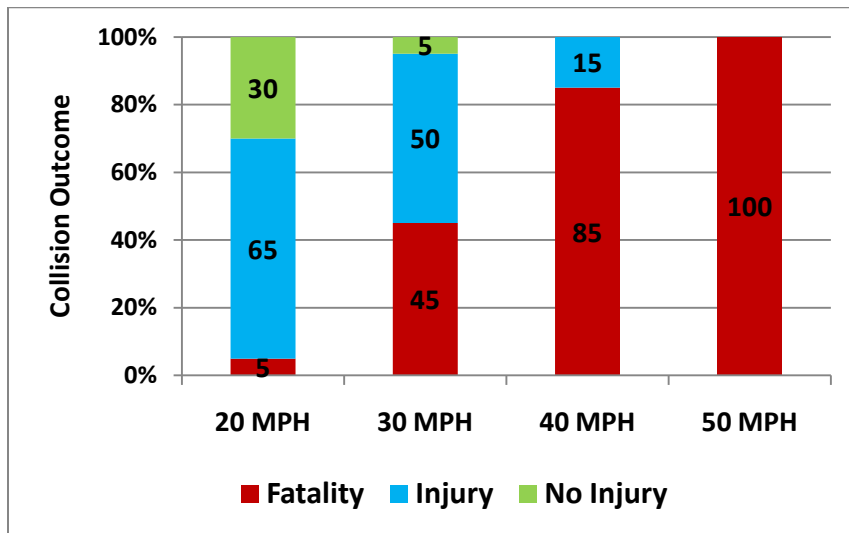
Key findings in the report were:

- *The number of pedestrian fatalities gradually declined between 1997 and 2006.*
- *More than two-thirds of pedestrian crash fatalities took place on urban roads.*
- *Older individuals (over 64) are more likely to become pedestrian fatalities.*

In the Boston Region MPO area, pedestrians were involved in only 1.8 percent of all traffic-related crashes between 1995 and 2001, yet accounted for 25.4 percent of all traffic-related fatalities.<sup>5</sup> This statistic is a strong indicator of pedestrians' vulnerability to vehicular traffic and that safety is critical to improving pedestrian access and networks.

In many communities, the failure of motorists to obey posted speed limits is a major concern for pedestrian safety. The faster a motor vehicle is traveling when it hits a pedestrian, the greater the likelihood of a pedestrian fatality. Lower speeds give drivers and pedestrians more time to react and drivers to slow down. Figure 3, 'Impact Speeds, Pedestrian Fatality and Injury,' depicts this relationship.

Figure 3 Impact Speeds, Pedestrian Fatality and Injury



Source: *Effect of Impact Speed on Pedestrian Fatality and Injury* (U.S. DOT, Leaf WA, Preusser DF, 1999).

Many pedestrian crashes are the result of unsafe motorist and pedestrian behaviors. A study conducted by the NHTSA's National Center for Statistics and Analysis based on national accident data between 1997 and 2006, found that nearly 46 percent of pedestrian fatalities are alcohol-involved. The proportion of alcohol involvement for drivers in fatal pedestrian crashes is less than half that of pedestrians. Nationwide, the peak timeframe when pedestrian fatalities occur is between 5 and 11 pm, when both darkness and alcohol use are factors.

<sup>5</sup> CTPS. Bicycle and Pedestrian Improvements in Town Centers, May 2007, page 3.

Prioritizing programs that are designed to reduce alcohol-related pedestrian fatalities and increasing the availability of buses, taxis, and other forms of public transportation are strategies that may contribute to lowering alcohol-related pedestrian fatalities. Specific roadway design features can contribute to unsafe behaviors by pedestrians and motorists. For example, excessively wide streets encourage higher motorist speeds. High-volume multilane roads that lack safe crossings at regular intervals can encourage pedestrians to cross streets at unsafe locations. Land use decisions such as separating residential areas from shopping areas with high-volume multilane roads can force pedestrians to cross streets in places that may not be safe. These types of design issues are most effectively addressed during preliminary design.

### ***Street Speed Limits***

Traffic engineers maintain that speed limits should be established according to the 85<sup>th</sup> percentile of free flowing traffic. This means the limit should be set at a level at or under which 85 percent of people are driving. Currently, Mass DOT sets the speed limit on all roads and streets, and follows the practice of setting it at 85 percent of the prevailing speed, however fast. In Massachusetts, the posted speed limits represent the maximum safe speed under ideal driving conditions.

However, adherence to the 85<sup>th</sup> percentile speed standard makes it very difficult for communities to obtain permission to reduce speeds on a particular street without making geometric changes. Although the 85<sup>th</sup> percentile may be the safest speed for drivers, this does not take into account the safety of pedestrians on the same corridor. As noted in Figure 3, a pedestrian is more likely to be killed than to survive if hit by a vehicle traveling at greater than 30 mph.

Communities can focus on reducing speeds on roadways by employing geometric changes such as traffic calming, narrowing lanes, and adding street trees and other vertical amenities that appear to narrow the street.

According to current state legislation (M.G.L. Chapter 90, Section 17), if there is no posted speed limit in a thickly settled area or business district, the 'default' speed limit is 30 miles per hour. If the rate of speed were changed from 30 miles per hour to 25 miles per hour, a pedestrian's chances of survival would significantly increase if struck by a motor vehicle. There is pending legislation to change the law from 30 to 25 miles per hour (see Chapter 6, section e.).