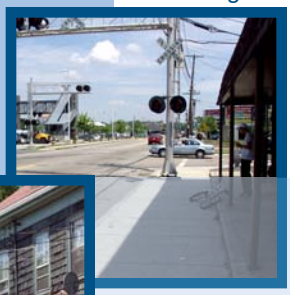
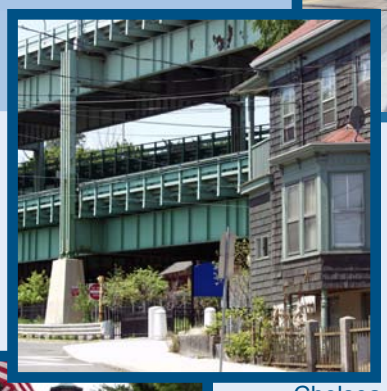
Bicycle and Pedestrian Improvements in Six Urban Centers

Brookline

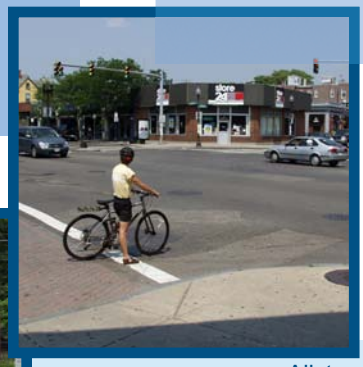
Framingham



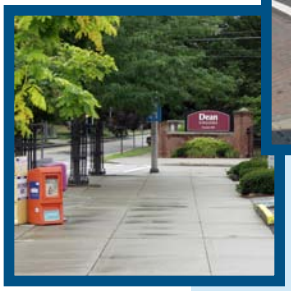


Chelsea

Weymouth



Allston



Franklin

Boston Region Metropolitan Planning Organization

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Project Managers
Cathy Buckley
Ben Rasmussen

Contributors
John Hersey
Kate Parker-O'Toole
Kathy Jacob
Alicia Wilson

Cover Design
Kim Noonan

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Central Transportation Planning Staff of the **Boston Region Metropolitan Planning Organization**. The MPO is composed of state and regional agencies and authorities, and local governments.

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1 Introduction

An urban center is the heart of a community. An urban center that invites walking and bicycling is vital to a healthy community. Pleasant, safe, and convenient access for pedestrians and bicyclists to and within an urban center will attract residents, shoppers, visitors, workers, and transit commuters alike. Pedestrian and bicycle networks connecting surrounding areas to urban centers provide alternatives to the automobile for trips within a community. Improved pedestrian and bicycle access to an urban center supports economic vitality by encouraging more people to stroll and cycle by businesses and storefronts on their way to other destinations. In some cities, business owners have renovated their facades after pedestrian and bicycle improvements have been implemented. Better conditions for walking and bicycling to and within urban centers improve people's quality of life by reducing congestion, improving air quality, reducing carbon dioxide emissions, and encouraging exercise.

Most New England centers were built before the advent of the automobile. Many destinations are within walking distance of each other, including municipal offices, fire and police stations, libraries, churches, schools, health and human services centers, and connections to public transportation. Storefronts are plentiful, and many have offices or residential units above, with nearby multifamily housing that might serve elderly and low-income populations. Many of these residents are less likely to own a car and more likely to walk, bicycle, or use transit to get where they need to go. Transit stations connect many urban centers to destinations throughout the region by bus, light rail, subway, and train.

Motor vehicles have some attributes that have a more negative effect in an urban center than, at the other extreme, on an interstate highway. Cars and trucks take up a lot of space, may be loud, emit pollutants, and are massive compared to people and therefore can do great harm in collisions. On hot days, especially when their air conditioners are running, motor vehicles generate much heat, affecting nearby walkers and bicyclists. Furthermore, fewer motor vehicles in urban centers would result in less congestion and less travel time for drivers.

As urban centers became more auto oriented, investments in the maintenance and construction of pedestrian facilities lost their traditional priority. The compact New England center also has the disadvantage that the automobile has taken much of the space otherwise available to pedestrians and bicyclists. There is no space to widen the road to accommodate bicyclists. Parking lots have replaced some older buildings, requiring more vigilance at driveways from pedestrians and bicyclists, and providing much less interesting streetscapes and vistas. While parking spaces along sidewalks provide a buffer for pedestrians from moving traffic, the parked cars may reduce safety by preventing

motorists from seeing crossing pedestrians. Drivers pulling into or out of parking spaces and opening car doors can endanger bicyclists.

This study includes recommendations in six selected urban centers for relatively low-cost, easy-to-implement improvements for pedestrians and bicyclists. Safer and more enjoyable environs for these modes would encourage more people to walk and bicycle, creating an even more inviting atmosphere and more vibrant, viable urban centers.

The improvements for bicycling and walking are treated separately in this report, as they are very different modes of travel. Bicycles are legal vehicles, allowed to use all roads except where specifically prohibited, such as limited-access highways. Bicyclists must yield to pedestrians. Bicyclists are generally prohibited from traveling on sidewalks, per municipal regulations.

1.1 BACKGROUND

The Boston Region Metropolitan Planning Organization (MPO) is committed to improving the transportation network for pedestrians and bicyclists. The measures for improving the network are found in the MPO's most recent policies, under the categories of system preservation, modernization, and efficiency; mobility; environment; safety and security; and land use and economic development (*Journey to 2030, Transportation Plan of the Boston Region Metropolitan Planning Organization*, June 28, 2007, pp. 4-2–4-6).

This Urban Centers study is a companion to the MPO's May 2007 report *Bicycle and Pedestrian Improvements in Town Centers*. That study focused on municipalities with a population of fewer than 20,000 people. This study includes municipalities with populations of over 30,000. Accordingly, the centers in this study are denser and more active than those in the Town Centers study.

The Town Centers study was recommended by the MPO's 2004 Report of the Congestion Management System (CMS), now known as the Congestion Management Process (CMP). The CMP is an ongoing program that provides the MPO and other parties with timely information about transportation system performance in the region, making recommendations where congestion and other mobility deficiencies are found. The CMP documents how the region's transportation network accommodates bicycling and walking.

The Massachusetts Department of Transportation Highway Division released its *Project Development and Design Guide* (*Design Guide*) in 2006, providing a framework for incorporating context-sensitive design and multimodal elements into transportation improvement projects. Transportation projects developed with the provisions outlined in the *Design Guide* are likely to significantly enhance the bicycle and pedestrian environments.

The concept of improving the bicycle and pedestrian environments in urban centers is also supported by and consistent with regional, state, and federal transportation plans and policies, which include:

- Boston Region MPO policies (referenced above)
- *Massachusetts Pedestrian Transportation Plan,* 1998
- *MetroFuture*, the long-range land use plan for the Boston region, by the Metropolitan Area Planning Council (MAPC), 2008
- MassHighway's Bicycle Route and Share the Road Signing Policy (Policy Directive P-98-003), 1998
- The Executive Office of Transportation and Public Works (now the Massachusetts Department of Transportation), *A Framework for Thinking – A Plan for Action*, the Statewide Transportation Plan, 2005
- *Massachusetts Bicycle Plan,* 2008
- *Regional Bicycle Plan,* prepared by MAPC for the Boston Region MPO, 2007

MAPC's update of the MPO's Regional Pedestrian Plan will be available in 2010.

1.1.1 OBJECTIVES

The MPO articulated three objectives for this study: 1) identify urban centers to include in the study, 2) identify opportunities to improve pedestrian and bicycle access and safety within those urban centers, and 3) recommend measures that would both improve conditions in the urban centers studied and highlight opportunities that could serve as a model for other communities in the region. Throughout this process, MPO staff was to work with municipal officials to ensure that study recommendations would be integrated into current municipal planning processes and implemented in the near future.

1.1.2 SELECTION OF URBAN CENTERS

The criteria for site selection were organized into two tiers. The first tier was based solely on population and population density. Eliminating municipalities with populations of less than 30,000 resulted in a list of 28 municipalities. MPO staff then created a list of 94 urban centers within those municipalities. Thereafter, the following second-tier criteria were applied:

- The number of residents, jobs, and pedestrian and bicycle crashes in and adjacent to the urban center
- The availability of transit services
- The location of services, such as municipal libraries, post offices, town halls, banks, grocery stores, and parks
- The location of obstacles to continuous safe access, such as major roadways or railroad tracks
- The type of urban center, such as an intersection, corridor, or multi-block area
- The geographic location within the region

- Municipalities that had hosted a Walkable Community Workshop or had recently undergone MPO studies

The above criteria yielded 12 urban centers in 9 municipalities as candidates for consideration for this study. Staff contacted officials in each of the municipalities to determine whether there were already plans underway for improving the urban center and whether there was sufficient interest in participating in the study. Staff also visited urban centers with which they were not familiar to observe the current condition of pedestrian and bicycle facilities. The list was narrowed down to six urban centers in six municipalities, and the MPO's Transportation Planning and Programming Committee approved those for inclusion.

The selected urban centers are Union Square in the Boston neighborhood of Allston, Brookline Village in Brookline, Downtown Chelsea, Downtown Framingham, Downtown Franklin, and Jackson Square in Weymouth.

1.2 COMPARATIVE DATA

Crash data and user counts are presented in the chapters devoted to specific municipalities. This section presents and compares the data for the six communities.

1.2.1 BICYCLE AND PEDESTRIAN COUNTS

Counts of bicyclists and pedestrians were done in the six study areas on Thursday, August 28, 2008. Counts were done in the morning, 6:00–10:00 AM, for three of the study areas, and from 2:00–6:00 PM for the other three. The morning counts are shown in Table 1-1.

TABLE 1-1
Counts of Pedestrians and Bicyclists and the Ratio of the Counts:
Allston, Brookline, and Weymouth, Thursday, August 28, 2008, 6:00–10:00 AM

Location	Pedestrians	Bicyclists	Pedestrians/Bicyclists
Allston	304	132	2.3
Brookline	426	121	3.5
Weymouth	57	10	5.7

For the morning counts, Brookline had the highest pedestrian count and Allston the highest volume of bicyclists. The Weymouth counts are about an order of magnitude lower than those high volumes in both categories. For all three communities, there are more pedestrians than bicyclists: from over twice as many in Allston to almost six times as many in Weymouth.

For the afternoon counts (see Table 1-2), Chelsea has by far the most pedestrians, over twice the count in Framingham, which is in turn over three times the count in Franklin. The most bicyclists were found in Framingham—about 50 percent more than in Chelsea, and almost 10 times the volume in Franklin. The ratios of pedestrians to bicyclists in these three areas are higher than in the other three communities, and significantly so in Chelsea and Framingham. There were 25 times as many pedestrians as bicyclists in Chelsea, and over 18 times as many in Framingham.

TABLE 1-2
Counts of Pedestrians and Bicyclists and the Ratio of the Counts
Chelsea, Framingham, and Franklin, Thursday, August 28, 2008, 2:00–6:00 PM

Location	Pedestrians	Bicyclists	Pedestrians/Bicyclists
Chelsea	2, 022	81	25.0
Framingham	934	128	7.3
Franklin	276	15	18.4

While the AM and PM counts cannot be strictly compared because they were taken at different times, it is clear that the highest pedestrian volumes by far are in Chelsea. The 4-hour count there, 2,022, is almost five times the next highest count of 426 in Brookline and 35 times the volume in Weymouth. The differences amongst the communities' bicyclist volumes were less striking. Allston, Framingham, and Brookline had the highest volumes and were somewhat comparable to each other. Compared to these three, the Chelsea volumes were about 50 percent less and those in Franklin and Weymouth were about an order of magnitude lower.

While all six areas in the study are called urban centers, the above data indicate that some have significantly more activity than others.

1.2.2 CRASH DATA

Table 1-3 presents the total number of pedestrian crashes and the total number of bicycle crashes for the six municipalities for two different five-year periods: 1997-2001 and 2002-2006. Data from both of these time periods are presented because a significant change in the reporting requirements took place in December 2001. The Massachusetts Registry of Motor Vehicles lengthened the crash report form, requiring more information. While the increased level of detail would be helpful in determining the causes of crashes and possible trends, the change to the longer form seems to have had the effect of decreasing the number of reported crashes.

For the six municipalities, the average number of reported bicycle crashes in 2002-2006 fell to 57 percent of the 1997-2001 level. The ratio of bicycle crashes in the more recent time period to the 1997-2001 time period fell the least in Framingham, where the rate decreased to 85 percent. The largest decrease was in Allston-Brighton, where there was

TABLE 1-3
Bicycle and Pedestrian Crashes Reported in the Six Urban Center Communities, and the Ratios of the Crashes for the Two Time Periods, 1997-2001 and 2002-2006

	1997-2001		2002-2006		Bicycle	Pedestrian
Community	Bicycle Crash	Pedestrian Crash	Bicycle Crash	Pedestrian Crash	Ratio of 2002-2006 / to 1997-2001	Ratio of 2002-2006 / to 1997-2001
Allston-Brighton	45	122	8	27	0.18	0.22
Brookline	158	321	86	177	0.54	0.55
Chelsea	112	270	59	170	0.53	0.63
Framingham	142	333	121	144	0.85	0.43
Franklin	21	54	7	15	0.33	0.28
Weymouth	95	168	44	109	0.46	0.65
Average	95	211	54	107	0.57	0.51

less than one bicycle crash reported in 2002-2006 for every five reported in the previous five years. The reported number of bicycle crashes in Franklin fell by two-thirds. Reported bicycle crashes filed in Brookline, Chelsea, and Weymouth police fell to approximately half of their previous five-year levels.

The pedestrian crashes reported in 2002-2006 fell to 51 percent of the 1997-2001 level, a slightly larger decline than the corresponding bicycle percentage. The lowest decreases occurred in Chelsea and Weymouth, where about two pedestrian crashes were reported in 2002-2006 for every three reported the previous five-year period. The largest decline was again in Allston-Brighton (22 percent as many reported) followed by Franklin (28 percent as many reported). Falling in the middle were Brookline (55 percent as many reported) and Framingham (43 percent as many reported).

It is not known how much, if any, of these differences between the two time periods may be due to an actual decrease in the number of crashes. Also unknown is the comparative rate at which different police departments reported crashes prior to the 2001 change in the form. For example, during the 1997-2001 period, there were 158 bicycle crashes reported in Brookline and 45 in Allston-Brighton. Were there three times as many bicycle crashes in Brookline during this period, or were crashes there reported more diligently? An analysis of hospital data might help shed light on these questions, but that inquiry is beyond the scope of this study. It should be noted that both police officers and individuals involved in crashes can file these reports. It is generally believed that the police reports are more objective.

In comparing the number of crashes in different municipalities, it is important to consider population and user volumes. That is, one would expect fewer crashes in settings with little or no traffic than in ones where there is more activity. Table 1-4 indicates, for each

municipality, the pedestrian and bicyclist crashes per 10,000 residents, using U.S. Census data from 2000, and the number of crashes compared to the user volumes collected.

TABLE 1-4
Population (2000 U.S. Census); Reported Bicycle and Pedestrian Crashes per 10,000 Residents, 2002-2006; August 2008 Four-Hour Volumes of Pedestrians and Bicyclists; and Crashes per Count Index, for the Six Communities

Community	Population	Bicycle Crashes/ 10,000 Residents	Pedestrian Crashes/ 10,000 Residents	4-Hour Bicycle Count	4-Hour Pedestrian Count	Bicycle Crashes per Count Index*	Pedestrian Crashes per Count Index**
Allston-Brighton	64,961	1	4	132	304	6	9
Brookline	57,107	15	31	121	426	49	42
Chelsea	35,080	17	48	81	2,022	73	8
Framingham	66,910	18	22	128	934	95	15
Franklin	29,560	2	5	15	276	47	5
Weymouth	53,988	8	20	10	57	440	191

*Bicycle Crashes per Count Index: Bicycle Crashes (2002-2006) divided by the 4-hour bicycle count, multiplied by 100.
** Pedestrian Crashes per Count Index: Pedestrian Crashes (2002-2006) divided by the 4-hour pedestrian count, multiplied by 100.

There are problems with almost all the data in the above table. The limitations of the reported crash data were noted above. Also, the user volumes were taken on only one day at one location in each municipality. The population figures, although probably accurate as of 2000, are being used to compare crash data for the years 2001-2006. This would only be an issue if the populations of these six municipalities changed significantly relative to each other. Given the other problems with the data, this one is relatively minor.

Given all these data limitations, detailed comparisons of rates amongst the communities are not warranted. A couple of points are worth noting, however. First, the Allston-Brighton numbers reinforce the conclusion that reported crash data there are low. The Allston-Brighton crashes per capita for bicyclists and for pedestrians are the lowest for all six communities. In terms of crashes per volume of users, Allston-Brighton is the lowest by far for bicycle crashes and amongst the lowest for pedestrian crashes.

Second, the crashes per capita are higher for pedestrians than for bicyclists by a factor of at least two to one for each municipality except Framingham, where the pedestrian rate is only slightly higher. Yet the ratios based on user counts tell a different story. The number of crashes using the count index is higher for bicyclists than for pedestrians in all municipalities except Allston-Brighton. And, except for Brookline, the bicycle ratio is significantly higher than the pedestrian ratio: more than two to one in Weymouth, six to one in Framingham, and nine to one in Chelsea and Franklin. Even taking into account

the limitations of the data, it is fair to say that bicyclists are involved in crashes disproportionately more than pedestrians when considering the relative number of trips these two groups make. Overall there are more pedestrian crashes because there are many more walking than bicycling trips.

A third point is that in Weymouth, for both bicyclists and pedestrians, the number of reported crashes compared to the volumes is significantly higher than in the other five communities.

In summary, high crash numbers may indicate more diligent reporting of crashes or higher levels of activity, or both, rather than less safe conditions. The crash data may help, however, in identifying specific areas that could be improved for bicyclists and walkers.

1.3 OVERVIEW OF REPORT

The next chapter provides information on methods to improve the environment for pedestrians and bicyclists in urban areas. These methods are presented separately for the two modes. While this report focuses on physical improvements, efforts in other areas – such as education and enforcement – are also important. A section on funding then presents information on programs at the federal, state and local levels of government that are potential sources to undertake improvements. Tables in Chapter 2 present cost estimates for various types of construction.

The remaining six chapters are each devoted to one of the urban centers. Each of these chapters begins with an overview of the entire community in which the urban center is located, including a history, and information on land use, population and employment, transportation services, and crash data. Then, the specific study area within each community is described in more detail. The study areas then are broken down into even smaller areas, to describe the existing conditions and recommendations in more detail. These descriptions are presented separately for the two modes.

While the recommendations are specific to the urban areas in this report, they also are intended to convey general concepts applicable to other sites.