

Pedestrian Mobility and Safety Audit **Cambridge, MA, USA**

Executive Summary

AARP and the Institute of Transportation Engineers (ITE) joined together in a pilot project to evaluate the accessibility and safety of five intersections in Cambridge, MA, USA. The audit, which took place on October 10, 2007, brought together traffic engineers, AARP staff and four AARP members, who live in Cambridge and routinely use the city's streets to get to where they need to go.

The primary goal of the AARP/ITE pedestrian mobility and safety audit focuses on elevating the importance of incorporating older driver and pedestrian safety needs into traffic operations and transportation planning work. It also stresses the mobility and safety needs of seniors in their communities. The joint relationship hopes to synergize and elevate specific goals within the respective organizations by:

1. Increasing the level of awareness for transportation planning/engineering professionals in addressing older persons' mobility issues and challenges.
2. Assisting AARP members in making their case to local transportation professionals and policy-makers when identifying their transportation needs through involvement and advocacy.
3. Establishing relationships between AARP volunteers and ITE professionals who can provide technical information needed to make community pedestrian and transportation improvements.

DEMOGRAPHY OF THE UNITED STATES SENIOR POPULATION

In 2005, 12 percent of the U.S. population was 65 or older. The U.S. Census estimates that by 2025 the number of seniors will increase by 79 percent and an estimated 18 percent of the population (62 million people) will be 65 or older. Many of those over age 65 will be very advanced in age—over age 80–85. In 26 states, more than 20 percent—one in five residents—will be over the age of 65. By 2030, one in eight of those over 65 will also be over 85 (NHSTA 2005). The population 65 and over will increase from 35 million in 2000 to 71.5 million in 2030 (an increase to approximately 20 percent of the population) (Administration on Aging 2005).

In total, people aged 65 and older will account for 25 percent of U.S. drivers (AAA Foundation for Traffic Safety, 2008). Older pedestrians also face high risks when navigating streets primarily designed for cars. In 2005, older adults accounted for 15 percent of all traffic fatalities, 14 percent of all vehicle occupant fatalities and 20 percent of all pedestrian fatalities (Traffic Safety Facts 2003, 2004). Because older persons consist of approximately 12 percent of the U.S. population, there is a proportional overrepresentation of older adult traffic, vehicle occupant and pedestrian fatalities.

Having few opportunities to walk on a daily basis can make it more difficult for older adults to remain active, and having to give up driving puts a great strain on their ability to live independently. Consequently, walking safely in a neighborhood and on a local street network is critical to maintaining mobility, livability and independent living.

The goal of this audit was to test a number of factors including pedestrian and vehicle traffic, crosswalk signage and the overall condition of sidewalks and streets, and to identify positive aspects and recommend improvements at each sample intersection. The transportation audit

was initially conceived for older adults; however, the results demonstrate that safe sidewalks and intersections are critical for all community residents.

The city of Cambridge is an excellent example of a proactive and collaborative approach to addressing intersection safety for pedestrians using both tried-and-true and innovative improvements. The city takes a systematic approach to make intersection safety improvements related to pedestrians and bicyclists (in addition to motor vehicles). Pedestrian and bicycle crashes are tracked regularly (dating back to 1990). Lists of improvements are considered by brainstorming monthly with staff and elected officials and feedback is provided by a bicycle and pedestrian advisory committee.

City wide improvements are done through various mechanisms. In some cases, such as a recent conversion to LED traffic signal heads, the city’s capital improvements program is used. However, sometimes budget constraints do not allow for a complete upgrade of all intersections, such as the conversion to countdown pedestrian signal heads or the addition of detectable warning surfaces on sidewalk ramps. In each case, upgrading is achieved through streetscape projects or when equipment is knocked down or damaged. The city of Cambridge has established a healthy working relationship with other departments. When other (non-traffic) improvements are made, such as sewer replacement or park improvements, the traffic engineering department is consulted to see if there are any traffic safety changes needed.

The city of Cambridge is also in the process of upgrading street name signs for improved visibility by using larger text and placing signs on traffic signal mast arms.

It should be noted that the city of Cambridge regularly addresses many of the issues that are highlighted at the various intersections as funding becomes available.

CITY OF CAMBRIDGE POPULATION AND AGE DEMOGRAPHICS

The population of Cambridge is approximately 90,000, with 11.4 percent of the population over age 65 as compared to the U.S. population over age 65, which is 2.4 percent.

	Cambridge, MA 2006 (percentage)	United States 2006 (percentage)
Total Population	89,804 (100)	299,498,385 (100)
AGE 65+	10,238 (11.4)	3,713,780 (12.4)
AGE 75+	5,118 (5.7)	1,826,940 (6.1)

INTERSECTION SELECTION

The following summary outlines the intersections that were chosen, as well as short- and long-term recommendations for improved mobility and safety at each location.

Edward Stollof, ITE safety program senior director and Jeff Parenti, city traffic engineer, city of Cambridge, met for a pre-audit meeting on September 17, 2007, in order to select the intersections and locations for the AARP/ ITE Pedestrian Mobility and Safety Audit.

The following five intersections were selected for the audit:

- Massachusetts Avenue and Beech Street
- Massachusetts Avenue and Somerville Avenue (Porter Square)
- Massachusetts Avenue and Western Avenue/Prospect Street (Central Square)
- Massachusetts Avenue and Inman Street/Pleasant Street
- Broadway Street and Hampshire Street

During the pre-audit meeting field reconnaissance was conducted at the intersection locations listed above. The pre-audit reconnaissance is a critical and necessary step in gaining valuable information to provide to the audit participants. Digital photographs of the intersection locations were taken. In addition, the time it takes to travel from one location to another is estimated, along with other logistical requirements for the audit day. Special situations were noted for discussions that would take place in briefings on the day of the audit.

INTERSECTION ASSESSMENTS

Massachusetts Avenue and Beech Street

In the short-term, the following recommendations should be considered to improve the safety of the intersection:

- **Reduce** pedestrian obstructions by either eliminating some of the signage or combining signs onto fewer posts.
- **Install** pedestrian countdown signals.
- **Improve** signal visibility by replacing missing visors and add backplates (if possible) to the signal indications that do not have them.
- **Install** street name signs to help drivers and pedestrians.
- **Revisit** the signal timing and operations of this intersection to determine if it is operating in the most efficient manner.



Pedestrian obstructions on one side of the intersection. Shown in this photograph are Frank Carroll, AARP (left) and Jeff Parenti, city of Cambridge, traffic engineer (right).

Longer-term solutions may include the following:

- **Remove** crosswalk obstruction that extends significantly into the crosswalk on the southeast side of the intersection.
- **Install** detectable warning surfaces to enhance the safety for visually-impaired pedestrians.

Massachusetts Avenue and Somerville Avenue (Porter Square)

In the short-term, the following recommendations should be considered to improve the safety of the intersection:

- **Remove** obstacles by thoroughly examining all of the signage and other objects that may impede pedestrians without compromising the safety of the intersection users.

Longer-term solutions may include the following:

- **Install** detectable warning surfaces to enhance the safety for visually-impaired pedestrians.
- **Monitor** pedestrian crossing times and make adjustments to the pedestrian phase timing, if needed.



The Porter Square intersection has a complex set of activities simultaneously taking place: left-turning vehicle traffic, transit, retail, pedestrian activity, pedestrian-to-rail and commercial vehicular traffic.

Massachusetts Avenue and Western Avenue/Prospect Street (Central Square)

In the short-term, the following recommendations should be considered to improve the safety of the intersection:

- **Install** a simple connection from the bottom corner of the pole-mounted cabinet (traffic signal mounted on poles placed on street corner) to the sidewalk so it can be detected by a visually-impaired pedestrian using a cane.

Longer-term solutions may include the following:

- **Install** detectable warning surfaces to enhance the safety for visually-impaired pedestrians.



Pole-mounted cabinet on southwest corner that could be a hazard to visually impaired pedestrians.

Massachusetts Avenue and Inman Street/Pleasant Street

In the short-term, the following recommendations should be considered to improve the safety of the intersection:

- **Enhance** the signing for pedestrians crossing Pleasant Street. “Watch for Turning Vehicles” might be an appropriate message to display to alert pedestrians of the potential hazard.

Longer-term solutions may include the following:

- **Redirect** the traffic from Inman and Pleasant Streets to other area roadways to remove much of the traffic making the dog-leg maneuver.
- **Install** detectable warning surfaces to enhance the safety for visually-impaired pedestrians.



A large number of pedestrians use the high-traffic volume Massachusetts Avenue/Pleasant Street “dog-leg” intersection.

Broadway Street and Hampshire Street

In the short-term, the following recommendations should be considered to improve the safety of the intersection:

- **Touch up/repaint** pavement markings.

Longer-term solutions may include the following:

- **Install** detectable warning surfaces to enhance the safety for visually-impaired pedestrians.



Faded bicycle lane markings.

CONCLUSION

The audit involved the following steps:

- Pre-audit reconnaissance and intersection study;
- Identification of audit participants;
- Pre-audit logistics;
- Development of briefing books and briefing materials for audit participants;
- Development of a PowerPoint presentation for a briefing on the day of the audit;
- Conduct of the audit; and
- Audit debriefing.

The day-long audit in Cambridge was extremely successful as a result of the pre-audit reconnaissance, as well as the extremely supportive environment and assistance that the AARP/ITE team received from the city of Cambridge Traffic Engineering Department. The photograph illustrates a discussion taking place at the briefing prior to going out in the field for the day. The group reconvened in the conference room at the end of the day for a debriefing and evaluation—an important step in the overall pedestrian safety and mobility audit process.

The bottom photo shows a Councilwoman that met the audit team at one of the intersection locations. One of the lessons learned for the pedestrian safety and mobility audits is that it is extremely helpful to have political support and attendance by city councilors or elected and appointed officials during the conduct of an audit.

The ITE professionals and AARP volunteers were able to forge relationships that did not previously exist. The ITE transportation professionals learned that many older volunteers were highly educated retirees who lived in their respective communities for many years. Each individual participated in the pedestrian audits as a way to have a greater voice in making their community, neighborhood and local streets more livable and safe for all users of the roadway.

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Jeff Parenti, City of Cambridge, traffic engineer (shown back row, center) explains the city's policies and procedures regarding pedestrian safety planning, engineering, construction and maintenance to the audit participants.



Seen in this photograph (left to right) are Christopher R. Widelo, AARP, Frank Carroll, AARP Massachusetts and Councilwoman Henrietta Davis.