walkBoston®

Pearl Street Walk Assessment

Somerville, MA

November 7, 2014

Massachusetts Department of Transportation
Bicycle and Pedestrian Safety Program

in partnership with Massachusetts Department of Public Health

MAKING MASSACHUSETTS MORE WALKABLE
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Report Scope and Purpose

WalkBoston conducted this walk assessment as part of the Massachusetts Department of Transportation Bicycle and Pedestrian Safety Program, in association with the Massachusetts Department of Public Health. WalkBoston is a pedestrian advocacy organization whose mission is to make walking safer and easier in Massachusetts to encourage better health, a cleaner environment and vibrant communities. The purpose of the walk assessment is to develop knowledge and awareness of the pedestrian environment at the state and municipal level.

This walk assessment report summarizes the observations made along the walk route and makes recommendations for improvements to the built environment. The observations vary from specific infrastructure deficits (e.g., faded crosswalk, uneven sidewalk) to general comments on traffic speeds or land use patterns (e.g., vacant storefronts). Likewise, the recommendations range from individual fixes (e.g., paint the crosswalk) to suggestions for further study (e.g., evaluate the feasibility of installing raised crosswalks). The assessment is not meant to be a complete inventory of infrastructure deficiencies, nor is it meant to provide specific designs for improvement.

WalkBoston leads these assessments as a means to build local capacity for improving the built environment for walking and not as a complete inventory of walking conditions. WalkBoston staff members are not licensed design or engineering professionals. This report may be used as a resource for municipal staff and for design professionals who may be engaged by municipalities to program and design infrastructure improvements.

Somerville Walk Assessment

The City of Somerville is one of twelve communities participating in the Massachusetts Department of Transportation's (MassDOT's) multi-disciplined program to improve bicycle and pedestrian safety in Massachusetts. One component of the MassDOT program is to conduct walk assessments. The assessments have three goals:

1. Foster an awareness of the infrastructure elements which contribute to the walking environment
2. Evaluate the safety and quality of the walking environment along the route
3. Recommend infrastructure improvements

The City of Somerville has made great progress in both installing new bicycle and pedestrian facilities in the City, as well as instituting more active transportation friendly policies. However, there are many intersections and road corridors that continue to be hazardous for pedestrians and cyclists. The Somerville police department identified several high-priority intersections that are particularly dangerous for pedestrians and cyclists to implement the bike/ped enforcement and awareness program. Many of the identified intersections are in the process of being redesigned.

Rather than conduct the assessment at these known locations, Somerville suggested conducting the assessment along the Pearl Street corridor which connects two elementary schools, the newly opened East Somerville Community School (ESCS) and the Winter Hill Community School. While there are few documented crashes involving pedestrians along this corridor, the new ESCS arrival and dismissal traffic patterns are a major concern. Furthermore, Pearl Street has not had significant road improvements in many years.

The walk assessment was conducted in Somerville on November 7, 2014, from 8:00 to 10:30 am. Many participants gathered at ESCS at 7:30 am to observe school arrival traffic patterns. The weather was cloudy and cold with temperatures in the high 30s to low 40s.

ESCS dismissal at the Cross/Pearl Street intersection

Vehicles waiting to turn left block this crosswalk

Study Area

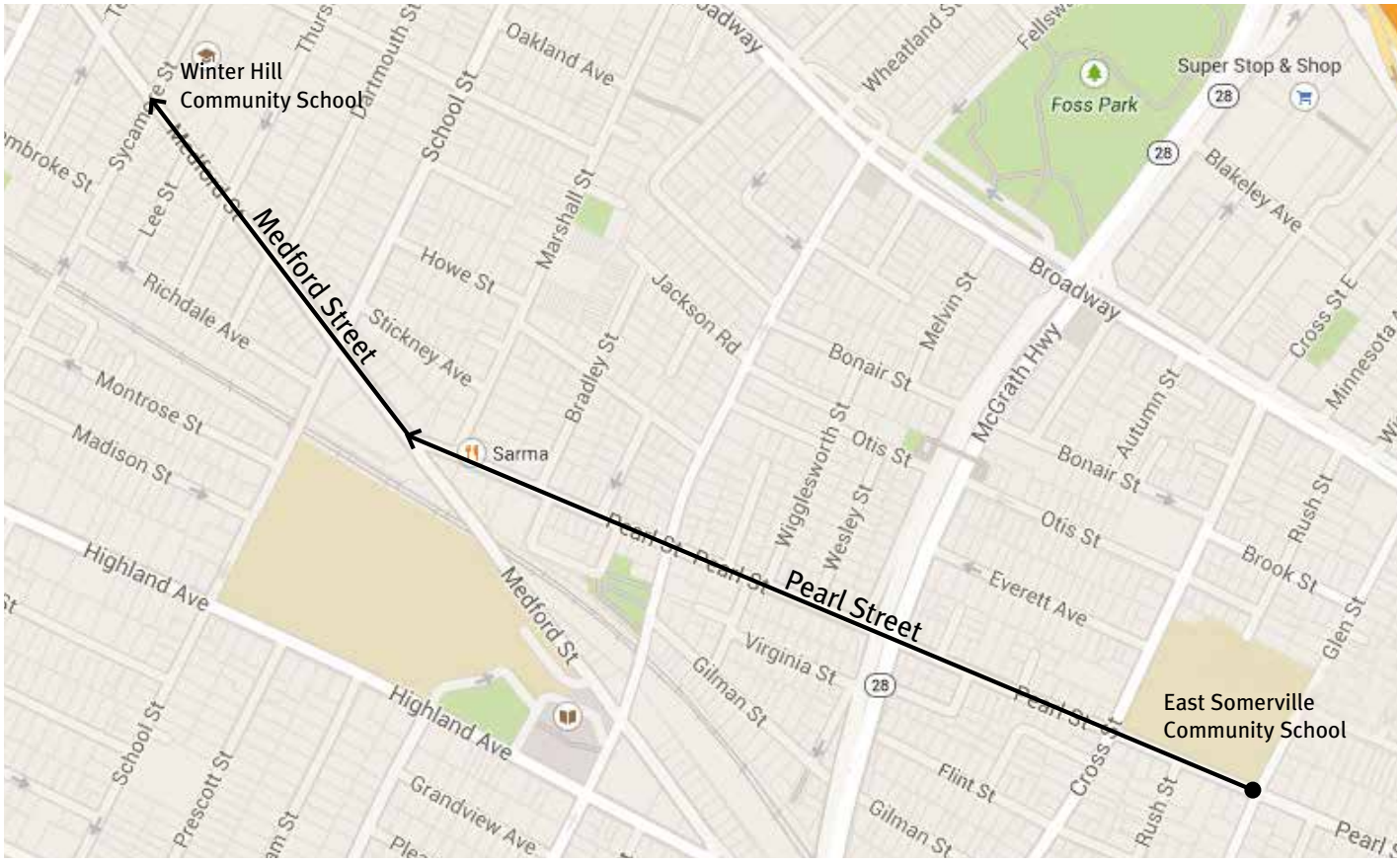
The assessment focused on Pearl Street between Glen Street and Medford Street, and Medford Street between Pearl Street and Sycamore Street. The East Somerville Community School was at one end of the walking route and the Winter Hill Community School was at the other end. The Somerville High School campus is located nearby between Medford Street, School Street, and Highland Avenue, and many students use Pearl Street and Medford Street to walk to school. While the impetus for evaluating this area was improving student safety, the pedestrian infrastructure improvements will benefit all road users and invest in an area that has been historically underserved.

This area of Somerville is primarily residential with other uses such as neighborhood retail, office/business uses, restaurants, and the schools. The Green Line Extension and Gilman Square T Stop will serve this area and will trigger major road improvements and park development along Medford Street near the intersection of Pearl and Medford. When completed, the Green Line will likely increase the volumes of pedestrian traffic along the Pearl Street and Medford Street corridors.

General Observations of Conditions along the Walk Assessment Route

Participants made the following observations about the overall conditions along the walking route:

- Traffic signals have an exclusive pedestrian phase; no intersections along route have a concurrent phase with a leading pedestrian indicator
- Limited visibility from driveways and at intersections along Pearl Street compromises pedestrian safety
- Crosswalks are faded and not perpendicular to the curb line; "piano key" design, but paths are often skewed to reach curb ramps or accommodate other road conditions
- Sidewalks are not uniformly accessible



Map of Pearl Street walk assessment route

Pearl Street Corridor

Pearl Street is a neighborhood arterial with one travel lane in each direction and parking along both sides of the street. It is a crowded corridor with MBTA bus service, two travel lanes, sharrows and sidewalks in a dense residential district. Lane widths seem adequate, although neither the travel lanes nor the parking lanes were marked. Much of the corridor has sharrow markings to elevate awareness of bicycles. Concrete sidewalks line both sides of the street and vary in width. Trees narrow the sidewalk, but provide needed shade and green in the residential neighborhood. Traffic speed can be an issue on Pearl Street as drivers race to get to McGrath Highway.

All traffic signals in the corridor have an exclusive pedestrian phase which can increase wait times and reduce pedestrian compliance with the WALK signal.

Current infrastructure deficiencies:

- Sidewalks are not uniformly accessible; missing curb ramps and detectable warning strips (some curb ramps have been upgraded on the south side of Pearl between Walnut and Medford); narrow openings between trees and edge of sidewalks; heaving concrete panels
- Limited visibility from driveways and at intersections along Pearl Street compromises pedestrian safety
- Crosswalks are faded and not perpendicular to curb line; "piano key" design but skewed to reach curb ramps or accommodate other road conditions

Recommendations:

- Repair curb ramps and install detectable warning strips to meet ADA accessibility requirements
- Widen sidewalks through selective tree removal; preserve trees where possible; replace or repair concrete panels to eliminate tripping hazards
- Study location of on-street parking as it relates to driveways and intersections; consider prohibiting parking in those locations where visibility is compromised
- Evaluate location of crosswalks and repaint those that are faded
- Evaluate signal phasing to determine if a concurrent phase is possible. Before switching to a concurrent phase, evaluate the red light compliance and crash data. Add leading pedestrian interval (LPI) with concurrent phase, if appropriate.

Heaving concrete panels around trees are tripping hazards.

East Somerville Community School Arrival Traffic Patterns

The new East Somerville Community School (ESCS) opened in September 2013 after a devastating fire took the original school building in December 2007. ESCS is a K-8 school with approximately 645 students enrolled. Given its location in a dense residential neighborhood, traffic flow at arrival and dismissal was considered in the new site plan. Car drop-off and pick-up lanes are provided on Glen Street and bus drop-off and pick-up occurs in the half circle along Cross Street. As observed at the assessment, vehicular drop-off occurs haphazardly on all sides of the school building, primarily along Cross Street.

Assessment participants observed the following issues during school arrival on Cross Street:

- Double parking along Cross Street
- Parking in the MBTA bus stop preventing the bus from pulling over and causing traffic to back-up
- U-turns on Cross Street either before or after students were dropped off
- Students crossing (primarily with their parents) between parked cars and mid-block rather than using the signalized intersection staffed with a crossing guard
- Posted ESCS staff member in the school bus lane to prevent cars from entering the exclusive lane; if he left his post to manage other traffic infractions on Cross Street, cars would drive into bus lane almost immediately (according to staff member)

On Glen Street, where there are dedicated car drop-off lanes and a crossing guard, there were very few children. It appears that the majority of students are coming from the opposite side of the school. Glen Street is one way from Broadway to Pearl Street which may make travel distances longer for some families already pressed for time in the morning.

An ESCS student darts across the street

A fence separates this sidewalk from the car drop-off lane on Glen Street

Well-marked crosswalk and a separated drop-off lane increase the safety of this dangerous zone. However, most students are dropped off on the Cross Street side of the school.

Recommendations:

The assessment team recommends that a comprehensive study of the arrival and dismissal patterns and policies be reviewed to determine the best course of action to improve pedestrian safety around ESCS. The study should include interviews with the school principal, crossing guards, and other staff members assisting in arrival and dismissal. Transportation surveys should be administered to all families and mapped to better understand where students are coming from, and how they are reaching the school campus.

Some additional recommendations to consider include:

- Determine if there are drawbacks to using the Glen Street drop off zone and work with the City of Somerville Traffic and Parking Offices to alter traffic patterns, if needed
- Work with the Somerville Police Department to periodically enforce parking restrictions and other traffic laws during arrival/dismissal times
- Flip the vehicle drop-off zone on Glen Street with the bus drop-off zone on Cross Street, if possible

It is important to balance increasing pedestrian safety with facilitating travel by car. Arrival/dismissal policies should prioritize and promote walking and biking to school over driving, when possible.

Specific Observations and Recommendations at Major Intersections

Pearl Street and Cross Street intersection

Cross Street is a two-way neighborhood street that begins at McGrath Highway and connects north to Broadway. Resident parking is allowed on both sides of the street. Concrete sidewalks line both sides of the street and are in relatively good condition. The Pearl/ Cross Street intersection is the center of pedestrian activity near the East Somerville Community School. The pedestrian zone at this intersection is incredibly tight due to traffic signal equipment, narrow sidewalks, building edges, and bus stops.

The intersection of Pearl and Cross Streets is the center of pedestrian activity near the East Somerville Community School

Current infrastructure deficiencies:

- No lane markings on Cross Street: double yellow or parking lanes
- Flashing school zone beacon is not functioning
- Missing curb ramps
- Pedestrian traffic signal is misaligned and is not facing pedestrians in crosswalk
- MBTA bus stops on the north side of Pearl Street on both sides of Cross Street pinch the intersection (northbound bus on the far side of the intersection; southbound bus on the near side of the intersection)

The pedestrian crossing signal is facing the wrong direction at the Cross/Pearl intersection

The school zone beacon at the intersection of Pearl and Cross Streets is not functioning

Recommendations:

- Repair or replace flashing school zone beacon; evaluate other approaches to school for adequate school zone signage and pavement markings
- Install accessible curb ramps and detectable warning strips on all corners
- Realign pedestrian traffic signal head so that it faces oncoming pedestrians
- Work with MBTA to determine if southbound bus stop could be moved to the far side of the Pearl/ Cross intersection to provide more right-of-way for other travel modes

Pearl Street and McGrath Highway

McGrath Highway is a six-lane major arterial that runs roughly north/south through East Somerville. The road carries high volumes of traffic at relatively fast speeds. Despite its width and high traffic volumes, residences line both sides of this section of McGrath. Pedestrian crossing points are distant from one another along McGrath. There is a pedestrian bridge over the highway north of the intersection and the Gilman underpass is to the south of the intersection (closed due to construction).

McGrath Highway, looking south

McGrath Highway, looking north

Crosswalk at Pearl Street and McGrath Highway

Crossing guard helps students and families cross McGrath Highway during school dismissal

At the Pearl Street intersection, Dana Street runs parallel to McGrath on its west side serving as a neighborhood collector for the residences along it. The crosswalk on Pearl Street on the west side of McGrath connects from the southwest corner of Pearl/McGrath to a median separating Dana Street from McGrath. Another crosswalk marked with zebra striping runs across Dana Street connecting to the northwest corner of the Pearl/McGrath intersection. This crossing pattern requires pedestrians to traverse two crossing points to cross Pearl Street on the west side of the intersection; however, it does facilitate crossing for those at the northeast corner of the intersection who wish to reach the southwest corner.

Current infrastructure deficiencies:

- Auto repair shop on SW corner of intersection has extensive curb cuts and minimal separation between driveways and sidewalks
- Pedestrian phase of traffic signal seems short considering pedestrians are crossing six lanes of traffic (timed at 22 secs)
- Long crossing distance across McGrath Highway; no pedestrian refuge island
- Pedestrian traffic signals are not countdown signals
- Crosswalk pavement markings are minimal; two parallel lines
- No Right Turn on Red Signs (RTOR) are easily missed; may not be posted for traffic traveling westbound on Pearl Street at the McGrath intersection or for traffic on McGrath Highway turning onto Pearl Street
- Missing detectable warning strips on all curb ramps

The parking lot of the auto repair shop on the southwest corner of McGrath Highway/Pearl Street intersection blends with the sidewalk compromising the pedestrian zone

Recommendations:

- Work with auto repair shop owner to delineate pedestrian zone from parking and driveway areas
- Evaluate pedestrian phase of traffic signal to ensure that there is adequate time for pedestrians to cross and clear the intersection
- Consider installing pedestrian refuge island in the center of McGrath intersection; could be an extension of the median if wide enough and made accessible
- Install pedestrian countdown signals
- Enhance crosswalk pavement markings to zebra, ladder or continental design to raise awareness of crossing point and discourage drivers from stopping beyond the stop line
- Evaluate safety of allowing right turn on red (RTOR) at all intersection points; if no RTOR is preferred, place no RTOR signs in highly visible locations, such as hanging on traffic signal wires near the traffic signals
- Install detectable warning strips and evaluate all curb ramps to ensure they meet ADA accessibility standards

Pearl Street and Walnut

Walnut Street is a one-lane, one way street carrying northbound traffic through the residential district to Broadway. Walnut Street is a heavily traveled street because it is one of few roads directly connecting Union Square to East Somerville. Traffic from Walnut Street travels downhill and often picks up speed through the intersection. Resident permit parking is allowed on both sides of the street near the Pearl/ Walnut intersection. The intersection is signalized with pedestrian traffic signals on an exclusive phase. Crosswalks are painted across all four approaches.

Current infrastructure deficiencies

- Exclusive pedestrian phase on traffic signal; wait time seems long given one-way traffic pattern; not a countdown signal
- Crosswalks are not parallel to the curb lines; connect to curb ramps while avoiding traffic signal equipment and control boxes
- Crosswalks are faded
- Curb ramps are missing detectable warning strips
- Traffic moves quickly down Walnut Street sometimes speeding through Pearl/Walnut intersection

Crosswalk at Pearl and Walnut Streets

Recommendations

- Evaluate signal phasing to determine if a concurrent phase is possible. Before switching to a concurrent phase, evaluate the red light compliance and crash data to be sure motorists typically comply with existing signal. Add leading pedestrian interval (LPI) with concurrent phase, if appropriate.
- Evaluate crosswalk locations on all approaches; determine if they can be regularized to improve experience for visually impaired and increase proper use of crosswalks
- Repaint faded crosswalks
- Install detectable warning strips and evaluate all curb ramps to ensure they meet ADA accessibility standards
- Consider installing curb bump-outs on Walnut Street to slow traffic speeds and increase visibility of pedestrians and shorten crossing distances

Pearl Street and Medford Street (Gilman Square)

This intersection will be upgraded as part of the Green Line Extension and Gilman Square station construction. Medford Street carries traffic in one lane in both directions and connects north to Broadway at Magoun Square and south to McGrath Highway (Rt 28). There is parking on both sides of Medford Street. Northbound traffic on Medford Street moves quickly downhill past Somerville High School. The sightlines at this unsignalized intersection are compromised by irregular geometries and grade changes on Medford Street. The geometries make the crossing distance across Pearl Street excessively long. There is no marked crossing on Medford Street. The planned improvements to this intersection should address the issues listed below.

Current infrastructure deficiencies:

- Crossing distance on Pearl Street is long; curb radius at the northeast corner is wide
- Traffic moves quickly northbound on Medford Street
- Few marked crossings on Medford Street; only at signalized intersections
- Pavement markings are minimal and worn; no consistent road centerline on Medford Street, faded crosswalks and stop line
- Curb ramps are new, but curbs and traffic control equipment crowd the ramps

Medford Street looking toward Pearl Street Intersection

Recommendations:

- Consider installing curb bump-outs on Pearl Street to shorten crossing distances and tighten curb radii
- Implement traffic calming strategies on Medford Street
- Evaluate number of crossings on Medford Street and determine if additional crossing points are needed; proposed Gilman Square green line station will likely generate more pedestrian traffic and may require a marked crossing at this intersection
- Repaint pavement markings: centerline on Medford Street, parking lane or edge lines on Pearl Street, crosswalk on Pearl Street, and stop line
- Evaluate curb ramps to determine if they meet ADA accessibility standards

Medford Street and School Street

School Street is a neighborhood arterial carrying traffic in one lane in both directions connecting north to Broadway, and a one-way, one-lane street connecting south to Somerville Avenue. Parking is allowed on both sides of the School Street. There are crosswalks painted across all approaches, however they are faded. Sidewalks and curb ramps have been recently upgraded on all corners of the intersection. The signalized intersection has pedestrian traffic signals and an exclusive pedestrian phase.

The assessment team evaluates Gilman Square

Current infrastructure deficiencies

- Exclusive pedestrian phase on traffic signal; wait time seems long given one-way traffic pattern; not a countdown signal
- Worn pavement markings – crosswalks and centerlines
- Nearside bus stop on Medford Street before Medford/School intersection

Recommendations

- Evaluate signal phasing to determine if a concurrent phase is possible. Before switching to a concurrent phase, evaluate the red light compliance and crash data to be sure motorists typically comply with existing signal. Add leading pedestrian interval (LPI) with concurrent phase, if appropriate
- Install countdown signals
- Repaint pavement markings – crosswalks, centerlines, parking lanes, edge lines
- Evaluate location of bus stop at the Medford Street/School Street intersection and move to the farside, if appropriate

Medford Street and Sycamore Street

Sycamore Street is a narrow, one-way northbound street with parking on both sides of the street. Parking on the school side of the street is signed as a school drop off/pick-up zone. Sycamore is incredibly busy at school dismissal. Sidewalks on the school side of the intersection were recently replaced. Curb ramps on all corners of the intersection have been upgraded. Ramp slopes to the street are patched with asphalt (temporary?) and do not meet accessibility requirements. The signalized intersection has pedestrian countdown traffic signals and an exclusive pedestrian phase.

Current infrastructure deficiencies

- Curb ramps do not meet the street along a consistent, smooth surface of adequate slope; asphalt patches connect concrete sidewalk to the street
- Exclusive pedestrian phase on traffic signal; may be desirable given proximity to school
- Crosswalks are faded
- School zone signs and pavement markings present on some approaches, but not all

Recommendations

- Evaluate curb ramp connections to the roadways; complete if temporary and repair if this is intended as its permanent state
- Evaluate signal phasing to determine if a concurrent phase is possible. Before switching to a concurrent phase, evaluate the red light compliance and crash data to be sure motorists typically comply with existing signal. Add leading pedestrian interval (LPI) with concurrent phase, if appropriate
- Repaint crosswalks
- Evaluate presence of school zone signs and pavement markings. Install new ones, where appropriate

Winter Hill Community School Dismissal

According to the Winter Hill Community School's principal, school dismissal is the biggest safety issue for children and walkers. The principal often monitors traffic along Sycamore Street, helping to remind parents not to park near curb ramps or the intersection and block traffic. Curb radii are tight and parked cars near the intersection prevent other cars from turning right onto Sycamore. The principal stated that he had not heard of any specific issues concerning walking safety around the school either at arrival or dismissal times.

Appendix A. Summary of Issues and Recommendations

Pearl Street Corridor

ISSUE	RECOMMENDATION	TIMEFRAME	RESPONSIBLE PARTY
Sidewalks are not uniformly accessible; missing curb ramps and detectable warning strips (some curb ramps have been upgraded on the south side of Pearl between Walnut and Medford); narrow openings between trees and edge of sidewalks; heaving concrete panels	Repair curb ramps and install detectable warning strips to meet ADA accessibility requirements. Widen sidewalks through selective tree removal; preserve trees where possible; replace or repair concrete panels to eliminate tripping hazards	Long-term	City of Somerville
Traffic signals have exclusive pedestrian phase; no intersections have concurrent phase	Evaluate intersections to determine if concurrent phase with a leading pedestrian interval is appropriate	Long-term	City of Somerville
Limited visibility from driveways and at intersections along Pearl Street	Study location of on-street parking as it relates to driveways and intersections; consider prohibiting parking in those locations where visibility is compromised	Short-term	City of Somerville
Crosswalks are faded and not perpendicular to curb line; "piano key" design but skewed to reach curb ramps or accommodate other road conditions	Evaluate location of crosswalks and repaint those that are faded	Short-term	City of Somerville

Pearl Street and Cross Street Intersection

ISSUE	RECOMMENDATION	TIMEFRAME	RESPONSIBLE PARTY
No lane markings on Cross Street: double yellow or parking lanes	Install pavement markings to better delineate street for all users	Short-term	City of Somerville
Flashing school zone beacon is not functioning	Repair or replace flashing school zone beacon; evaluate other approaches to school for adequate school zone signage and pavement markings	Short-term (evaluation) Long-term (replacement)	City of Somerville
Missing curb ramps	Install accessible curb ramps and detectable warning strips on all corners	Long-term	City of Somerville
Pedestrian traffic signal is misaligned and is not facing pedestrians in crosswalk	Realign pedestrian traffic signal head so that it faces oncoming pedestrians	Short-term	City of Somerville
MBTA bus stops on the north side of Pearl Street on both sides of Cross Street pinch the intersection	Work with MBTA to determine if southbound bus stop could be moved to the far side of the Pearl/Cross intersection to provide more space for other travel modes	Long-term	MBTA and City of Somerville

Pearl Street and McGrath Highway

ISSUE	RECOMMENDATION	TIMEFRAME	RESPONSIBLE PARTY
Auto repair shop on SW corner of intersection has extensive curb cuts and minimal separation between driveways and sidewalks	Work with auto repair shop owner to delineate pedestrian zone from parking and driveway areas	Long-term	City of Somerville
Pedestrian phase of traffic signal seems short considering pedestrians are crossing six lanes of traffic (timed at 22 secs)	Evaluate pedestrian phase of traffic signal to ensure that there is adequate time for pedestrians to cross and clear the intersection	Evaluation (short-term) Replace equipment (long-term)	City of Somerville
Long crossing distance across McGrath Highway; no pedestrian refuge island	Consider installing pedestrian refuge island in the center of McGrath intersection. Could be an extension of the median if wide enough and made accessible	Long-term	City of Somerville and MassDOT
Pedestrian traffic signals are not countdown signals	Install pedestrian countdown signals	Long-term	City of Somerville and MassDOT
Crosswalk pavement markings are minimal; two parallel lines	Enhance crosswalk pavement markings to zebra, ladder or continental design	Short-term	City of Somerville
Right Turn on Red Signs are easily missed; may not be posted for traffic traveling westbound on Pearl Street at the McGrath intersection or for traffic on McGrath Highway turning onto Pearl Street	Evaluate safety of allowing right turn on red at all intersection points; if no RTOR is preferred, place no RTOR signs in highly visible locations, such as on hanging on traffic signal wires near the traffic signals	Short-term	City of Somerville and MassDOT
Missing detectable warning strips on all curb ramps	Install detectable warning strips and evaluate all curb ramps to ensure they meet ADA accessibility standards	Long-term	City of Somerville and MassDOT

Pearl Street and Walnut Street

ISSUE	RECOMMENDATION	TIMEFRAME	RESPONSIBLE PARTY
Exclusive pedestrian phase on traffic signal; wait time seems long given one-way traffic pattern; not a countdown signal	Evaluate signal phasing to determine if a concurrent phase is possible. Install countdown signals	Long-term	City of Somerville
Crosswalks are not parallel to the curb lines; connect to curb ramps while avoiding traffic signal equipment and control boxes	Evaluate crosswalk locations on all approaches; determine if they can be regularized to improve experience for visually impaired and increase proper use of crosswalks	Short-term	City of Somerville
Crosswalks are faded	Repaint faded crosswalks	Short-term	City of Somerville
Curb ramps are missing detectable warning strips	Install detectable warning strips and evaluate all curb ramps to ensure they meet ADA accessibility standards	Long-term	City of Somerville
Traffic moves quickly down Walnut Street sometimes speeding through Pearl/Walnut intersection	Consider installing curb bump-outs on Walnut Street to slow traffic speeds and increase visibility of pedestrians and shorten crossing distances	Long-term	City of Somerville

Pearl Street and Medford Street (Gilman Square)

ISSUE	RECOMMENDATION	TIMEFRAME	RESPONSIBLE PARTY
Crossing distance on Pearl Street is long; curb radius at the northeast corner is wide	Consider installing curb bump-outs on Pearl Street to shorten crossing distances and tighten curb radii	Long-term	City of Somerville
Traffic moves quickly northbound on Medford Street	Implement traffic calming strategies on Medford Street	Long-term	City of Somerville
Few marked crossings on Medford Street; only at signalized intersections	Evaluate number of crossings on Medford Street and determine if additional crossing points are needed	Evaluation (short-term) Installation (long-term)	City of Somerville and MBTA (Green Line Extension Project)
Pavement markings are minimal and worn; no consistent road centerline on Medford Street, faded crosswalks and stop line	Repaint pavement markings: centerline on Medford Street, parking lane or edge lines on Pearl Street, crosswalk on Pearl Street, and stop line	Short-term	City of Somerville
Curb ramps are new, but curbs and traffic control equipment crowd the ramps	Evaluate curb ramps to determine if they meet ADA accessibility standards	Long-term	City of Somerville

Medford Street and School Street

ISSUE	RECOMMENDATION	TIMEFRAME	RESPONSIBLE PARTY
Exclusive pedestrian phase on traffic signal; wait time seems long given one-way traffic pattern; not a countdown signal	Evaluate signal phasing to determine if a concurrent phase is possible. Install countdown signals	Short-term (evaluation) Long-term (installation)	City of Somerville
Worn pavement markings – crosswalks and centerlines	Repaint pavement markings – crosswalks, centerlines, parking lanes, edge lines	Short-term	City of Somerville
Nearside bus stop on Medford Street before Medford/School intersection	Evaluate location of bus stop at the Medford Street/School Street intersection and move to the farside, if appropriate	Long-term	MBTA and City of Somerville

Medford and Sycamore Street

ISSUE	RECOMMENDATION	TIMEFRAME	RESPONSIBLE PARTY
Curb ramps do not meet the street along a consistent, smooth surface of adequate slope; asphalt patches connect concrete sidewalk to the street	Evaluate curb ramp connections to the roadways; complete if temporary and repair if this is intended as its permanent state	Short-term (evaluation) Long-term (repair)	City of Somerville
Exclusive pedestrian phase on traffic signal; may be desirable given proximity to school	Evaluate signal phasing to determine if a concurrent phase with a leading pedestrian interval is recommended	Short-term	City of Somerville
Crosswalks are faded	Repaint crosswalks	Short-term	City of Somerville
School zone signs and pavement markings present on some approaches, but not all	Evaluate presence of school zone signs and pavement markings. Install new ones where appropriate	Short-term	City of Somerville

Appendix B. Participant List

NAME	ORGANIZATION
Stacey Beuttell	WalkBoston
Jim Danila	MassDOT
Alycia Goodwin	SRTS
Melissa Green	SRTS
Kasia Hart	WalkBoston
Brendan Kearney	WalkBoston
Matt Lawlor	Robinson & Cole, WalkBoston
Tom Lin	MassDOT*
Erin Reed	SRTS
Erica Satin-Hernandez	Shape Up Somerville
Sarah Spicer	City of Somerville
Misrak Sultan	MassDOT
Sara Timoner	MassDOT D4*
Chris Wendt	Somerville PD

*attended introduction, but did not participate in the walking portion of the assessment

Appendix C. Terminology

Below are images and definitions of the terms used to describe the walking environment in this report.

Crosswalk and stop line

Crosswalks can be painted in a variety of ways, some of which are more effective in warning drivers of pedestrians. Crosswalks are usually accompanied with stop lines. These lines act as the legally mandated stopping point for vehicles, and discourage drivers from stopping in the middle of the crosswalk.

Crosswalk patterns
Source: USFHA

Crosswalk and stop line
Source: http://safety.fhwa.dot.gov/ped_bike/tools_solve/ped_scdproj/sys_impact_rpt/images/fig16.jpg

Curb ramp and detectable warning strip

Curb ramps provide access from the sidewalk to the street for people using wheel chairs and strollers. They are most commonly found at intersections. While curb ramps have improved access for wheelchair-bound people, they are problematic for visually impaired people who use the curb as an indication of the side of the street. Detectable warning strips, a distinctive surface pattern of domes detectable by cane or underfoot, are now used to alert people with vision impairments of their approach to streets and hazardous drop-offs.

Curb ramp and detectable warning strip in Woburn, MA

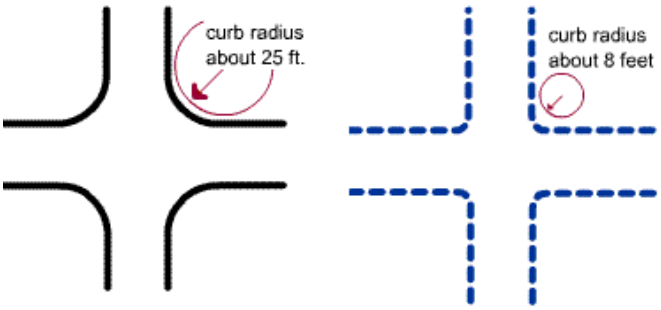
Curb extension/curb bulb-out

A sidewalk extension into the street (into the parking lane) shortens crossing distance, increases visibility for walkers and encourages eye contact between drivers and walkers.

Curb extensions are often associated with mid-block crossings

Curb radius

A longer curb radius (on the left in figure below) allows vehicles to turn more quickly and creates longer crossing distance for pedestrians. A shorter curb radius (on the right in the figure below) slows turning speeds and provides pedestrians shorter crossing distances.



There are two excellent examples of the shortening of curb radii in Woburn, MA. The first (A) is a low- cost solution using a gravel-filled zone between the original curb line and the newly established road edge. The second is a higher-cost solution using grass and trees and extending the sidewalks to the new curb. Both work to slow traffic.

Edge line

An edge line is a solid white line painted along the roadside curb that defines the driving lane and narrows the driver's perspective. Edges lines are most often used in suburban and rural locations, but may be appropriate in some urban conditions.

Edge lines delineate the vehicular driving zone on wide roadways.

(A) Gravel-filled curb extension

(B) Grass, trees and extended sidewalk in curb extension

In-street pedestrian crossing sign

In-street pedestrian crossing signs are used at the road centerline within crosswalks to increase driver awareness of pedestrians in the area. These signs are a relatively low-cost, highly effective tool in slowing traffic by the narrowing travel lanes. They are popular with road maintenance departments since they can be easily moved for snow removal.

Leading Pedestrian Interval (LPI)

A leading pedestrian interval gives pedestrians an advance walk signal before motorists get a green signal, giving the pedestrian several seconds to start walking in the crosswalk before a concurrent signal is provided to vehicles. This makes pedestrians more visible to motorists and motorists more likely to yield to them. Typical LPI settings provide 3 to 6 seconds of advance walk time.

Walker taking advantage of leading pedestrian interval
Source: http://safety.fhwa.dot.gov/ped_bike/tools_solve/ped_scdproj/sys_impact_rpt/images/fig34.jpg

High-Intensity Activated crossWalk (HAWK)

A HAWK beacon (High-Intensity Activated crossWalK beacon) is a traffic signal used to stop road traffic and allow pedestrians to cross safely. It is officially known as a Pedestrian Hybrid Beacon (PHB). The purpose of a HAWK beacon is to allow protected pedestrian crossings, stopping road traffic only as needed. Where standard traffic signal 'warrants' prevent the installation of standard three-color traffic signals, the HAWK beacon provides an alternative.

Walker crosses roadway after activating the HAWK beacon
Source: http://www.achdidaho.org/Projects/Images/NewHawkSignal092209% 20014.jpg

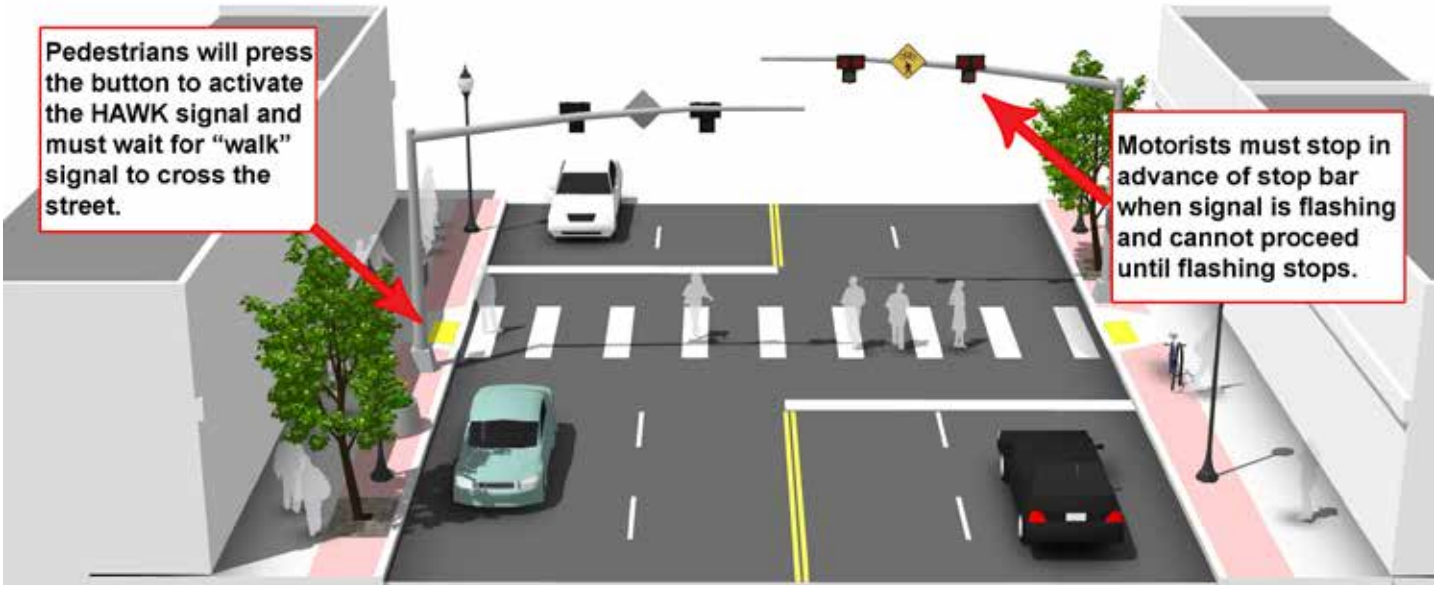


Diagram showing step-by-step operation of a HAWK signal. .Source: http://bloomington.in.gov/media/media/image/jpeg/13144.jpg

Pedestrian Refuge Island

Pedestrian refuge islands are protected areas where people may safely pause or wait while crossing a street. Pedestrian refuge islands are particularly helpful as resting areas for seniors, persons with disabilities, children, and others who may be less able to cross the street in one stage. At signalized intersections, they allow slow moving pedestrians to cross in two phases. At unsignalized locations, they simplify the act of finding a gap in traffic to cross since vehicles from only one direction must be reckoned with at a time.

http://www.sfbetterstreets.org/find-project-types/pedestrian-safety-and-traffic-calming/traffic-calming-overview/medians-and-islands/

Pedestrian refuge island at a signalized crossing
Source:http://safety.fhwa.dot.gov/intersection/resources/fhwasa06016/images/fig95.jpg

Appendix D. Walk Assessment Tool

walkBoston

Street Name/Intersection	
Date/Time	
Weather Conditions	
Neighborhood Character	
❍ Land use: residential, commercial, industrial or mixed use?	
❍ Community facilities: schools, parks, libraries?	
❍ Surface parking lots?	
❍ Buildings occupied?	
❍ Building facades – blank walls, engaging storefronts, sidewalk cafes?	
❍ Is there street activity?	
Street Description	
❍ Arterial or local	
❍ Number and estimated width of travel lanes – narrow, adequate, wide?	
❍ Parking – none, one or both sides?	
❍ Sidewalks – none, one or both sides?	
Vehicular Traffic	
❍ Posted speed limit signs	
❍ Estimated vehicle speeds	
❍ Volume	
Sidewalks	
❍ On both sides of the street?	
❍ Wide? Continuous? Smooth surface?	
❍ Curb ramps/detectable warning strips?	
❍ Buffered from traffic with landscape strips (verge)?	
❍ Minimal number of interrupting driveways? Narrow or wide driveways?	
❍ Are newspaper racks, outdoor seating organized?	

Street furnishings	
❍ Trees?	
❍ Benches?	
❍ Trash receptacles?	
❍ Bicycle accommodations?	
❍ Lighting?	
Crosswalks	
❍ Condition?	
❍ Design: 2 lines, zebra/ladder, stamped, pavers? Raised?	
❍ Marked and signed?	
Traffic signals	
❍ Pedestrian-activated? Countdown signals?	
❍ Timing – enough time to cross? Traffic stops in all directions? Traffic stops only in lanes pedestrian is crossing?	
❍ Right turn on red prohibited?	
Sight lines/Visibility	
❍ Obstacles – vegetation, light poles, parked cars?	
❍ Road design – curves, elevation change?	
Pedestrian Safety Countermeasures	
❍ Curb extensions?	
❍ Pedestrian refuge islands or medians?	
❍ In-street pedestrian signs?	
❍ Speed tables?	
Accessibility	
❍ Curb ramps?	
❍ Detectable warning strips?	
❍ Slopes/cross-slopes?	