walkBoston™

High Street Walk Assessment
Lowell, MA

September 19 , 2017

Sponsored by the Massachusetts Executive Office of Public Safety and Security
Planning Initiative for High-Fatality Communities

MAKING MASSACHUSETTS MORE WALKABLE
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Walk Assessment Overview

On Tuesday, September 19, 2017, WalkBoston conducted a walk audit on High Street with support from the Massachusetts Executive Office of Public Safety and Security (EOPSS) Pedestrian Safety Planning Initiative for High-Fatality Communities. The goal of the walk assessment was to recommend improvements to the local built environment that improve pedestrian safety. The City Engineer, as well as staff from the Police Department, Planning Department, Pedestrian and Bicycle Committee/Mass in Motion, and Economic Development Department attended the audit. A list of attendees is included in Appendix A.

On the basis of the walk audit and police crash data, WalkBoston has prepared the following report and recommendations on improving the walking environment in Lowell.

Background

Lowell is the fourth largest city in Massachusetts with a population of 110,000. The City's street pattern is primarily based upon its origins in the 1820's as a planned mill town. Many historic city streets are narrow and residential with more recently designed arterial streets bisecting the urban neighborhoods.

Lowell is very fortunate to have funding for safety improvements from the City's Community Development Block Grant (CDBG) program. The Lowell Planning Department has agreed to dedicate some of this funding to pedestrian and bicycle improvements in the neighborhood, specifically on High Street.

Summary of Crash Data Analysis

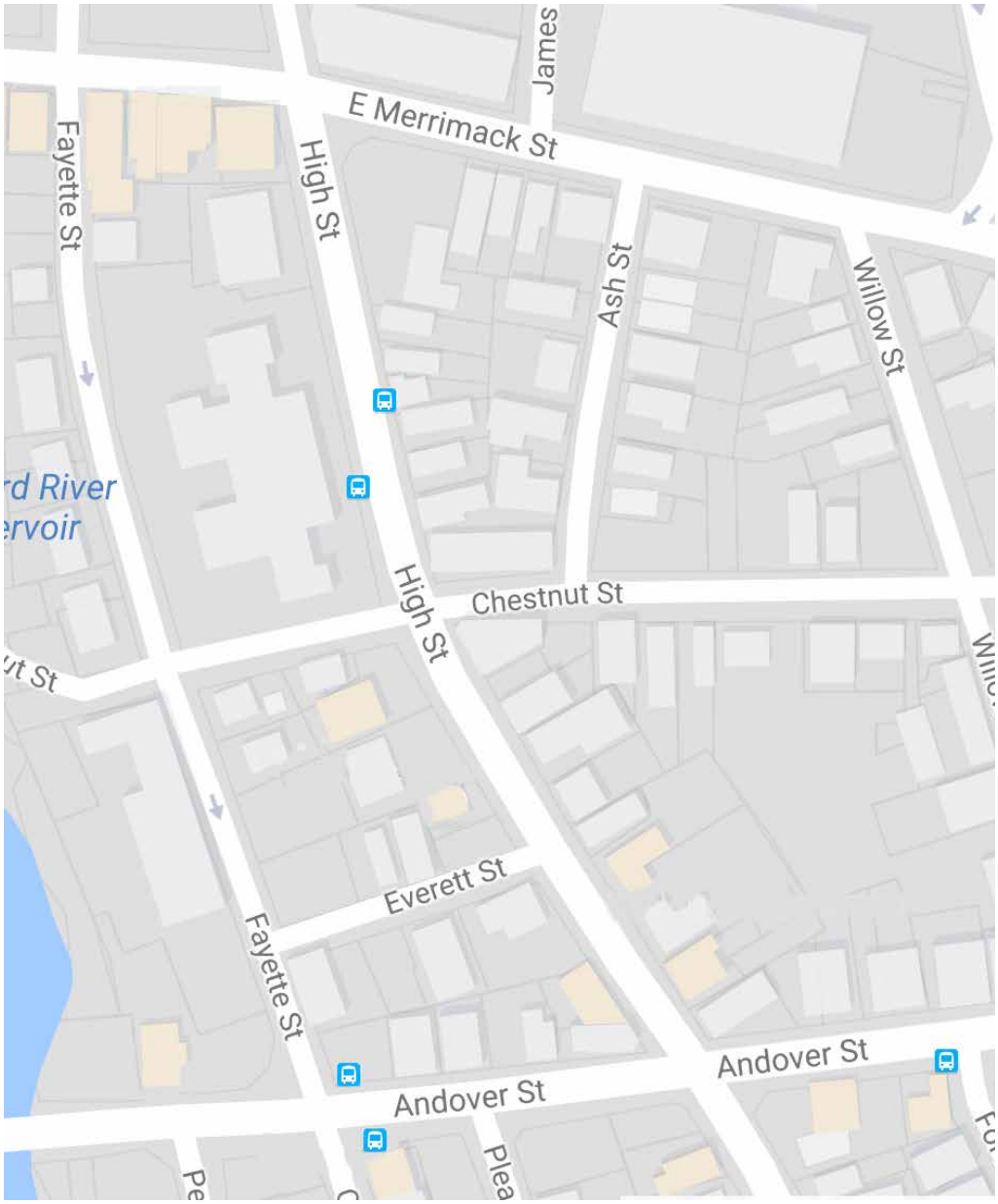
WalkBoston was provided with the crash data for the three intersections in the study area by the Lowell Police Department. We reviewed each report and presented our findings before beginning the walk audit. Between 2012 and 2016, there were 94 crashes along this two-block section of High Street, of which 11 were pedestrian-vehicle crashes. Thankfully, none of the crashes were fatal. More crashes occurred at High/Andover than at the other two intersections in the corridor. The complete crash data analysis can be found in Appendix B.

Summary of Lowell Crash Data

2012 thru 2016 data	**Crashes**			**Manner of Collision**				
	Total	Veh/Ped	Injury (all parties)	Single Vehicle	Rear-end	Angle	Sideswipe	Head on
High Street/Andover Street	54	7	7	2	17	12	11	1
High Street/Chestnut Street	10	0	1	2	0	9	0	0
High Street/E Merrimac	30	4	5	0	1	13	9	1
Total	**94**	**11**	**13**	**4**	**18**	**34**	**20**	**2**

Walk Audit Route

The walking route included two blocks of High Street between Andover Street and E Merrimack Street. Walk audit participants began at the E Merrimack intersection and then proceeded south to Andover Street before returning to Lowell General Hospital – Saints Campus to discuss observations and make preliminary recommendations.



High Street Corridor Walk Assessment
September 19, 2017

COMMONWEALTH OF MASSACHUSETTS
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The High Street corridor has a mix of land uses including single, multi-family and apartment housing, retail and small businesses, and institutions. Norton Family Manor is an apartment building run by the Lowell Housing Authority for seniors located near the Chestnut Street intersection. The Immaculate Conception School and Church, as well as Lowell General Hospital – Saints Campus, anchor High Street on E Merrimack Street.

When visiting High Street in preparation for the walk audit, WalkBoston staff talked with both the crossing guard at the Immaculate Conception School and a staff member at Norton Family

Manor about the safety of the walking environment. The crossing guard stated that she felt the E Merrimack crossing is unsafe and that many drivers do not stop for her even when she is in the crosswalk with her stop sign. She said that many high school students ask for her help to cross the street because they have trouble getting drivers to yield to them in the crosswalk. The crossing conditions are more dangerous at the school's start time (8:55 am) than at dismissal.

A staff member of the Norton Family Manor stated that it is difficult for residents to cross High Street at the mid-block crossing in front of the building to reach the #2 bus stop. Although there is a crosswalk to the bus stop, cars park too close to the crosswalk which limits pedestrian visibility and drivers do not often yield to people in the crosswalk.

Key Recommendations

- Improve the safety of E Merrimack and High Street intersection. Short term: Install STOP signs at all approaches. Long term: Install traffic signal with pedestrian countdown signals
- Repair and replace sidewalks on High Street to correct heaving concrete panels, raise curbs, narrow curb cuts, and define parking areas near neighborhood businesses.
- Daylight existing crosswalks through parking enforcement, installation of curb bump-outs and installation of appropriate crosswalk signage
- Adjust phasing of High Street/Andover Street traffic signal and upgrade signal heads to improve visibility

Improve the safety of E Merrimack and High Street intersection. Short term: Install STOP signs at all approaches. Long term: Install traffic signal with pedestrian countdown signals

The E Merrimack/High Street intersection is confusing for all users – drivers, walkers, transit riders, and cyclists. Currently, only the High Street northbound approach is controlled with a stop sign. The STOP sign is obstructed by a tree limb and is posted tens of feet before the stop line painted on the street.

Traffic flows freely on E Merrimack where visibility of pedestrians and other vehicles is compromised by changes in elevation, parked cars, and a cluttered, busy landscape. A traffic study conducted in July, 2016 by the Lowell City Engineer found that the volume of vehicles and pedestrians at this intersection met the warrant of the Manual for Uniform Traffic Control Devices (MUCTD) for an all-way STOP as well as a signal system. City Council did not approve the installation of stop signs at this location.

Stop sign is blocked by tree branches and located over 10 feet behind the painted stop line on High Street

View from southwestern corner of E Merrimack and High Street intersection

Short-term recommendations:

- Install highly visible STOP signs on all approaches. Move or replace STOP sign on northbound High Street approach
- Paint STOP lines to indicate the location where drivers are required to stop
- Install school zone flashing beacons along E Merrimack Street and High Street

Long-term recommendations:

- Install traffic signals equipped with accessible pedestrian countdown signals. As discussed above, the pedestrian and vehicle volumes as well as the crash data meet the MUCTD warrant for a traffic signal at this intersection.

Repair and replace sidewalks on High Street to correct heaving concrete panels, raise curbs, narrow curb cuts, and define parking areas near neighborhood businesses.

In general, the sidewalk widths along High Street are adequate. The walking surface is generally even with the exception of the upended panels near the mature trees on the east side of the street. The concrete sections of sidewalk are in much better condition than those sections paved in asphalt.

There are long stretches of curb cuts and some depressed curbs particularly on the west side of High Street. Cars park in these areas interrupting the pedestrian pathway and forcing people to walk in the street. The entry and egress from the parking areas is also confusing. The Lowell Planning Department has been working with the Asados Dona Flor restaurant at 175 High Street to redesign their parking lot and seating areas.

Trees along this sidewalk have made this section impassable for those with limited mobility or strollers

Businesses along the western side of High Street between Andover and Chestnut have allowed parking and wide curb cuts to take over the sidewalk

Short-term recommendations

- Repair/replace sidewalk panels in dire need of repair, such as near the mature trees

Long-term recommendations

- Replace all sidewalk panels in need with concrete sidewalks
- Ensure that all ramps are compliant with ADA standards and add detectable warnings and level landings
- Raise curbs to provide 6" reveal between the roadway and the sidewalk
- Reduce the extensive curb cuts leading to businesses and surface parking along the west side of High Street
- Paint the "Ls and Ts" to delineate parking spaces and bus stops on the roadway

Daylight existing crosswalks through parking enforcement, installation of curb bump-outs and installation of appropriate crosswalk signage

Parked cars can present a challenge for people trying to cross a street safely. Cars parked too close to an intersection, or to close to a mid-block crossing, prevent pedestrians from seeing oncoming traffic and drivers from seeing pedestrians who want to cross. High Street has examples of both of these conditions – at the E Merrimack Street, Chestnut Street and Andover Street intersections, and at the mid-block crossing in front of Norton Family Manor. Cars are not legally parked if they are within 25 feet of an intersection or crosswalk. Furthermore, cars are parked on the sidewalk on the north side of Chestnut Street between High and Fayette Streets significantly reduce the width of the sidewalk making it difficult for those in wheelchairs or using strollers.

Cars parked too close to crosswalks and intersections block visibility for both pedestrians and drivers

Short-term recommendations

- Enforce parking regulations – issue tickets to those in violation
- Paint diagonal lines indicating no parking zones at intersections and near mid-block crossing
- Install No Parking signs
- Install curb ramps to access mid-block crossing in front of the Norton Family Manor
- Consider installing flex posts to delineate no parking zone near mid-block crossing

Long-term recommendations

- Install curb bump outs at the mid-block crossing in front of the Norton Family Manor
- Consider installing a Rectangular Rapid Flashing Beacon (RRFB) in front of the Norton Family Manor

Adjust phasing of High Street/Andover Street traffic signal and upgrade signal heads to improve visibility.

The traffic signal at the High Street/Andover Street intersection has an exclusive pedestrian phase, which gives pedestrians adequate time to cross one leg of the intersection, and almost enough time to cross diagonally. Given the length of time it takes for the signal complete its full phase before the WALK light is illuminated, it is worth considering extending the WALK time to accommodate diagonal crossing. It may also be prudent to add a couple seconds to the all RED phase to ensure the intersection clears. This may reduce the number of left-hand turn crashes in the intersection.

View of the Andover/High Street intersection traffic signals and crosswalks

One theory that may be a contributing factor in the number of rear-end crashes at the High Street/Andover crossing is that eastbound traffic on Andover Street can not see the traffic signal. Upgrades to the signal itself and warning signage could improve visibility.

Short-term recommendations:

- Extend the pedestrian phase so pedestrians can cross the intersection diagonally
- Consider adding additional time to the all RED phase to allow cars to clear the intersection
- Install signage or flashing red beacon on Andover Street as the road inclines up from the Concord River to alert drivers that there is a red traffic signal ahead.
- Place a back plate on the traffic signals to make them more visible
- Consider instituting No Right Turn on Red at the intersection to reduce crash rates and protect pedestrians in the crosswalk from right turning vehicles.

Fayette/Andover

Although this intersection was not on the walking route, the audit participants reviewed it because one of the attendees pointed out the lack of crosswalks to the bus stops on Andover. This is of concern to the residents of the Mazur Park Apartments who are predominantly elderly and live near the bus stops. If a crosswalk is installed at this intersection where Andover is four lanes wide, then it will need to be highly visible to drivers and alert them to its presence with signage and perhaps flashing lights or Rectangular Rapid Flashing Beacon (RRFB). We would not recommend installing a crosswalk at this location until sightlines, traffic speeds and visibility are studied thoroughly.

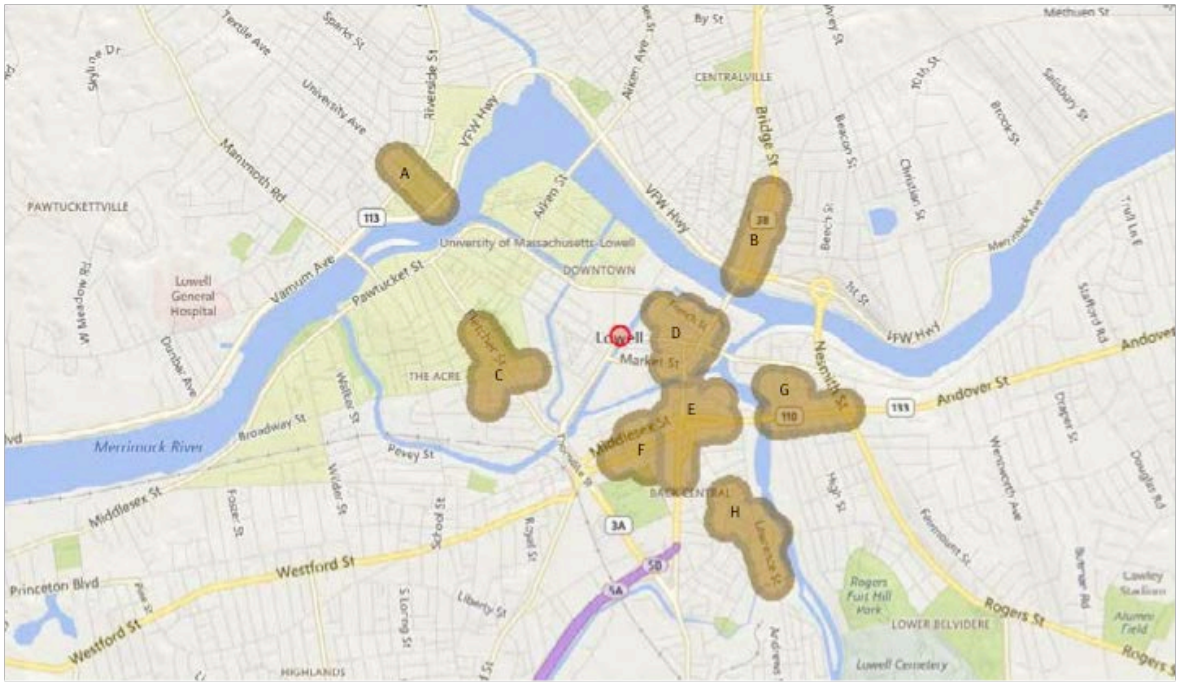
Appendix A. Walk Audit Attendees

Stephen Gendreau, Lowell Police Department
Francisco Maldonnado, Lowell Police Department
Nicholas Bosonetto, Interim City Engineer, Transportation Engineer, City of Lowell
Sidney Liang, Lowell Bike/Ped Committee, Mass in Motion Coordinator
Yovani Baez-Rose, Lowell Department of Planning and Development
Maria Dickinson, Lowell Department of Planning and Development
Tom Lamond, Lowell Planning and Development
Sandra Swaile, Lowell Planning and Development

John Fabiano, Executive Office of Public Safety and Security
Stacey Beuttell, WalkBoston
Dorothea Hass, WalkBoston

Appendix B. Crash Data Analysis

WalkBoston consulted MassDOT's Highway Safety Improvement Program (HSIP) crash portal to determine potential locations for the walk audit. As shown below, the data show that Lowell has multiple pedestrian crash clusters that indicate potentially dangerous locations for people walking. After consulting with City staff and Lowell police, High Street (within crash cluster G) was chosen as the walk audit location.



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Manner of Collision

As shown in the table, most vehicle-vehicle crashes are angle crashes, primarily when drivers are turning left. Sideswipe crashes and rear-end crashes were also prevalent, particularly at the Andover Street/High Street intersection. Although some crashes occurred during periods of dense fog or snow, most occurred during daylight hours. Several drivers and at least one pedestrian said they were distracted by cell phone usage.

Drivers often stated that they did not see pedestrians due to poor sight lines. For example, drivers indicated that it was difficult to see the traffic signal when headed out of downtown Lowell on Andover Street. The number of rear-end crashes at this location support this claim. Drivers are traveling uphill from the river and may not have enough warning of the upcoming traffic signal.

Crash Characteristics by Intersection

1. **High/Andover**
   This intersection is characterized by many left turn crashes, primarily cars turning left from Andover Street onto High Street, and rear-ending on Andover Street as cars come up from the river, headed outbound. Pedestrian crashes at this intersection include a driver who was on a cell phone, drivers turning right on red and striking a pedestrian, a young girl running between cars, and a pedestrian on a cell phone who walked into traffic.

2. **Chestnut/High**
   There were no pedestrian crashes at this intersection. However, there were 10 vehicle crashes primarily of cars taking a left from Chestnut onto High Street. Visibility was most likely a factor in these crashes.

3. **E. Merrimac/High**

   This is a very confusing intersection for all users. Drivers are unsure of who has the right of way. Sight lights here are also difficult with one driver reporting that "the intersection is blind." Many of the sideswipes occur at the southwestern corner of the intersection where a convenience store is located. Drivers reported coming out of the convenience store only to see their cars clipped or their side mirror knocked off. Drivers on High headed north do not always stop at E. Merrimack because they do not see the STOP sign.