massDOT
Massachusetts Department of Transportation
Highway Division

Route 117 Review of Ownership Transfer

October 2014

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I. INTRODUCTION

MassDOT and the Towns of Lancaster and Bolton have been in discussions regarding transferring a section of Rte. 117 from municipal control to state control. This report outlines the existing conditions of the Rte. 117 corridor and likely actions that MassDOT would pursue if ownership was indeed transferred. The following documents were referenced in the production of this report:

- Montachusett Regional Planning Commission Traffic Study of Selected Intersections for the Town of Lancaster, Massachusetts
- September 2013 MRPC Route 117 Corridor Profile Town of Lancaster, Massachusetts
- MassDOT Traffic Volume Analysis Reports S13-068, S13-069, and S13-070.
- Lancaster Historical Commission letter to District Highway Director dated 5/6/14.
- Town of Bolton Non-motorized Transportation Recommendations dated July 2014
- Various roadway layouts, construction plans and traffic count data

The Rte. 117 section in discussion is located between the I-190 and I-495 interchanges, spanning approximately 8 miles. MassDOT recognizes that the Rte. 117 corridor is not used solely by local traffic, but acts as a route for regional traffic as well. One of the more heavily traveled areas is located at the Rte. 117/70 overlap in Lancaster with a peak adjusted average daily traffic (ADT) count of approximately 19,000 vehicles from the most recent MassDOT analysis. Also worth noting is the intersection at Wattaquadock Hill Rd. in Bolton with a peak adjusted ADT of approximately 23,000 vehicles. To address the high vehicle volumes and to better accommodate multimodal transportation options, such as walking and bicycling, improvements will likely be required to ensure that the functionality of the corridor is efficient and safe for all traffic. A cursory field investigation was conducted in June 2014, by MassDOT engineers in conjunction with Town and utility representatives to better understand the state of the roadway and to identify the issues pertaining to a transfer of ownership.

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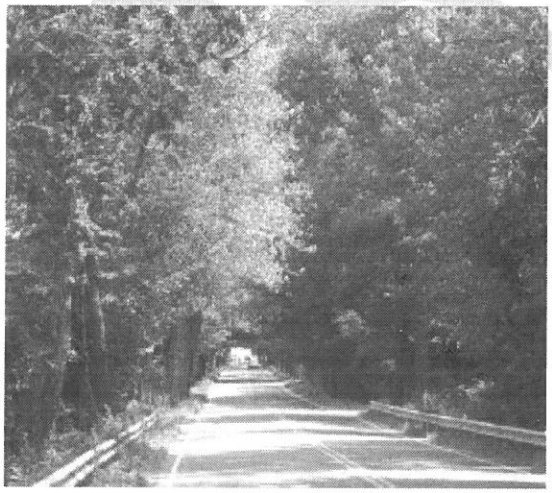
II. EXISTING CONDITIONS

A. Town of Lancaster Site-Investigation

Prior to the Lancaster site investigation, an initial on-site conversation was held with National Grid representatives who expressed interest in relocating several utility poles in the "Bolton Flats" area of Rte. 117. National Grid would like to relocate several utility poles (approximately 25) closer to the roadway shoulder in this area. These poles are setback far from the roadway shoulder in a wetland area that is identified by National Heritage & Endangered Species Program (NHESP) to contain various environmental constraints. Additionally, the section of highway near the Bolton Flats has been designated by residents as a scenic route. Concerns to preserve the canopy of trees along this area have been raised by members of the Lancaster Historical Commission. There is also minimal shoulder present and the roadway width.

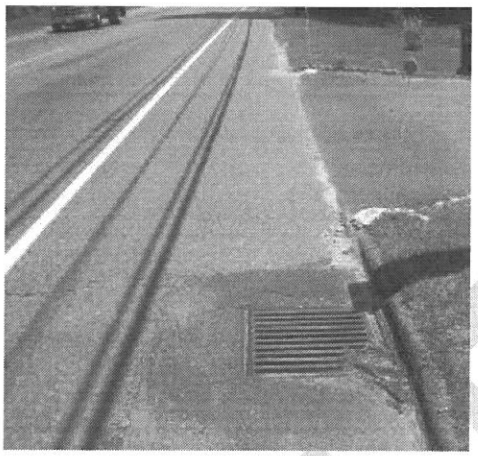
Utility poles at the Bolton Flats looking west

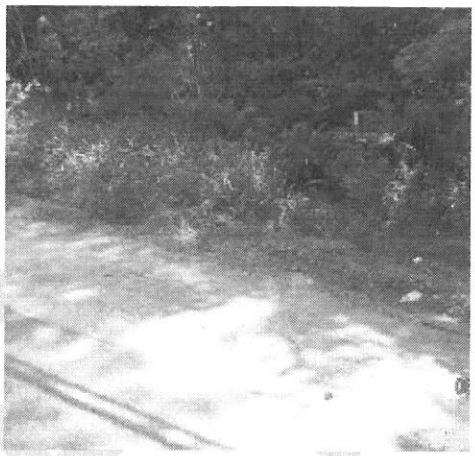


Canopy of trees over Rte. 117 at the Bolton Flats

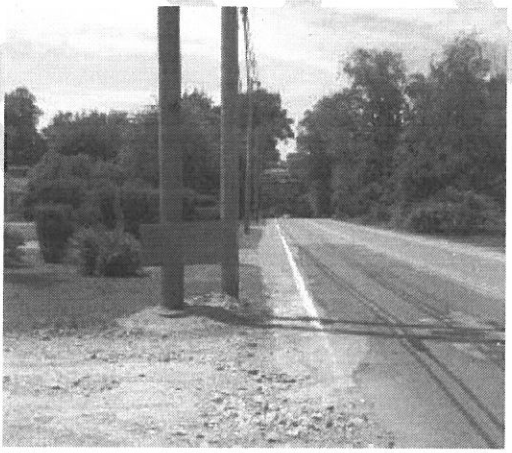
MassDOT has determined that the minimum setback for the utility poles from the roadway centerline is 23' (12' lane, 5' shoulder, 2' guardrail, 4' deflection zone). However, ideally the setback would be 26'. This would necessitate that many trees be clear cut to provide adequate space for the poles. If functional control of the corridor was to be transferred to the state, it is likely that in the interest of public safety that MassDOT would pursue removing many of the trees located near the roadway shoulder. The canopy of trees poses a safety hazard for traffic during snow and ice operations and increases the potential costs of roadway maintenance.

Beginning at the I-190 interchange moving eastbound, MassDOT engineers and the Lancaster Highway Superintendent reviewed the corridor. The following are field observations and pictures of present site conditions:



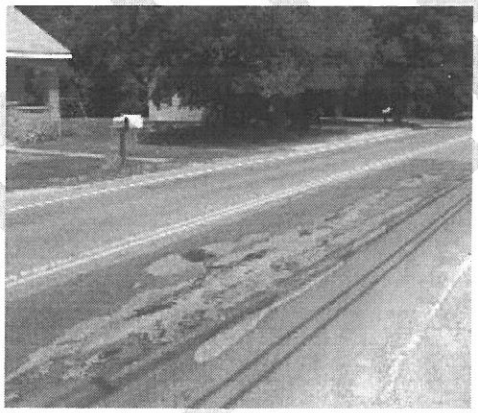


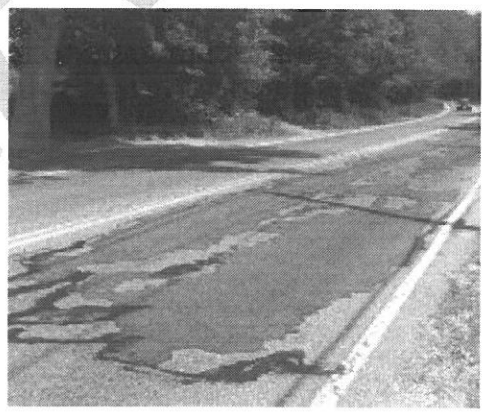
- Just east of the N. Main Street junction a catch basin was identified that suffers from intermittent blockage due to debris and sometimes floods over the roadway near the eastward outlet.



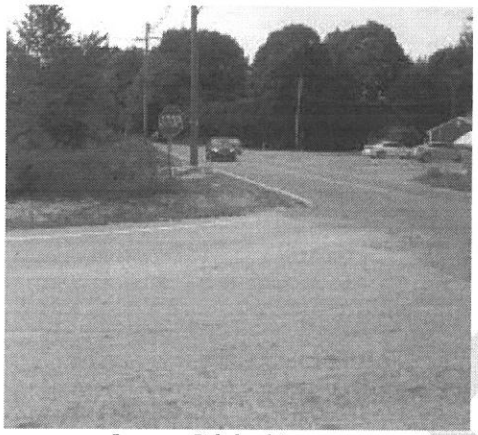
- Several utilities poles and some hydrants are located near the roadway and significantly limit shoulder widths. Additionally, it was acknowledged that gas and town water lines are present under the roadway.

- Many of the traffic signs look worn with insufficient retroreflectivity and are set too low to the roadway (< 7') and too close to the shoulder edge (< 4'). These signs would need to be replaced and/or adjusted to be in compliance with MassDOT standards.

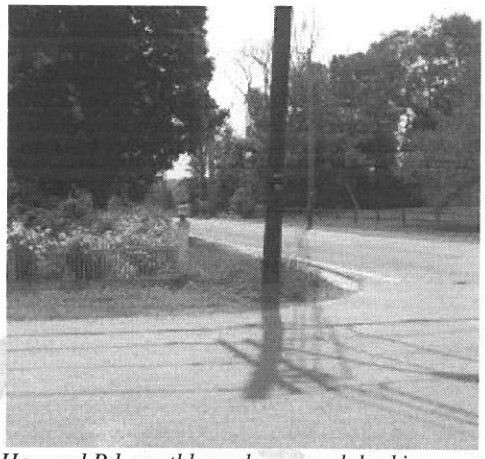




- Sections of the pavement overlays used to repair rutted pavement areas west of the Rte. 70 junction at Lunenburg Rd. and east of the Rte. 117/70 split show signs of unraveling and are in fair condition. It was expressed that approximately 12" of pavement is present in these areas.

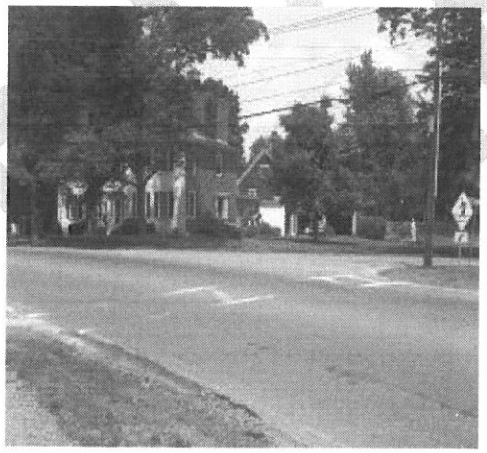


Langen Rd. looking west



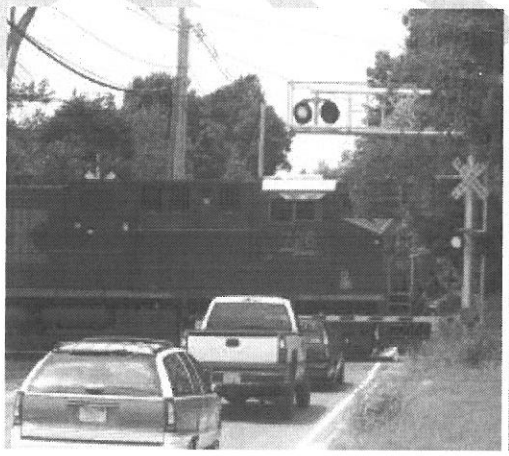
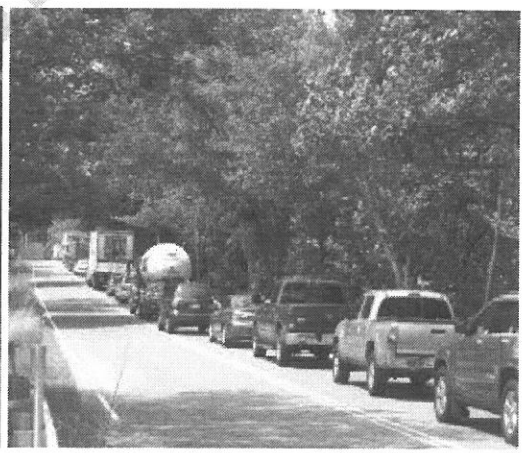
Harvard Rd. southbound approach looking east

- The sight distance for some of the minor roads that enter onto Rte. 117 were less than adequate.



- There are three (3) noncompliant crosswalks in the Rte. 117/70 overlap. The crosswalks do not have wheelchair ramps and are disconnected from the sidewalks. Sidewalks were mostly located throughout the Rte. 117/70 overlap along the eastbound side of the road.

- High volumes of heavy truck traffic were witnessed on the Rte. 117/70 overlap moving eastbound. Just east of the Rte. 117/70 split some of the utility poles are setback a few feet from the roadway edge reducing the travel lane width. The average truck volume counts measured along Rte. 117 in the September 2013 MRPC Corridor Profile report was 5.03%. This was higher than the most recent MassDOT historical data.

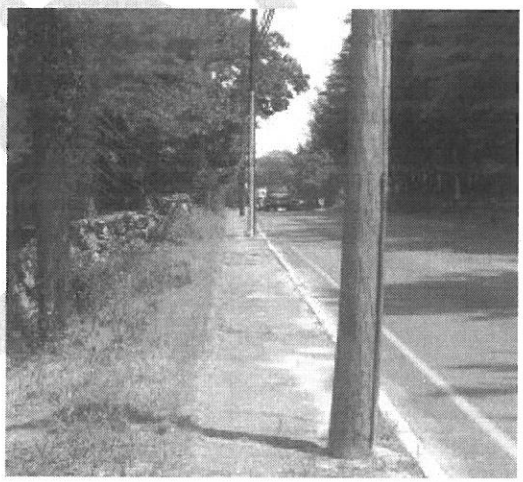



- A freight railroad crossing (Pan Am) exists just east of Harvard Rd. and may contribute to traffic congestion during peak hours.

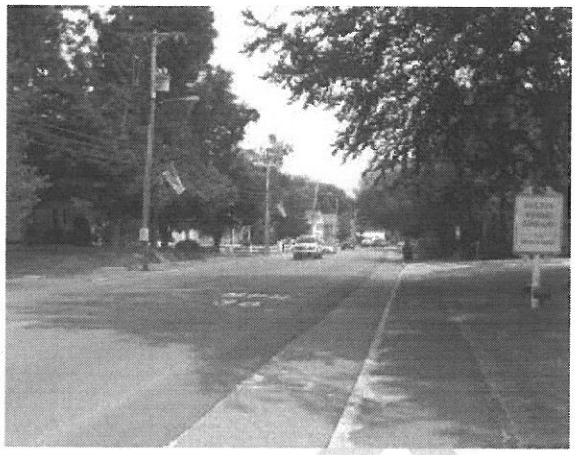
B. Town of Bolton Site-Investigation

MassDOT engineers met with representatives from the Town of Bolton to field review the corridor. The following are observations and pictures were taken of the existing site conditions:

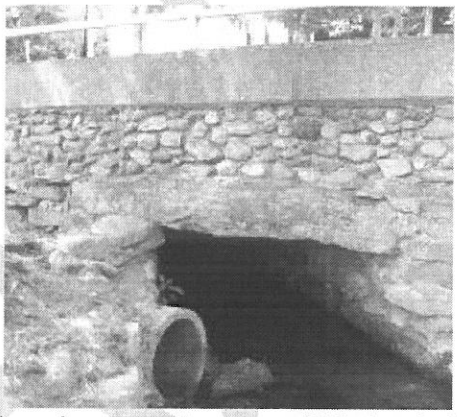
- Interest has been expressed by town residents for the construction of a pedestrian crosswalk from the Nashoba Regional High School to the Classic Pizza shop located just west of Forbush Mill Road. The speed limit of 45 mph through this area is high and would need to be reevaluated.



- Pedestrian sidewalks are present along the westbound lane near Pondside Dr., as well as, from Harvard Rd. to the Bolton Office Park. Much of the existing sidewalks contain obstructions from utilities and residential posted mailboxes and are not in conformance with MassDOT standards.



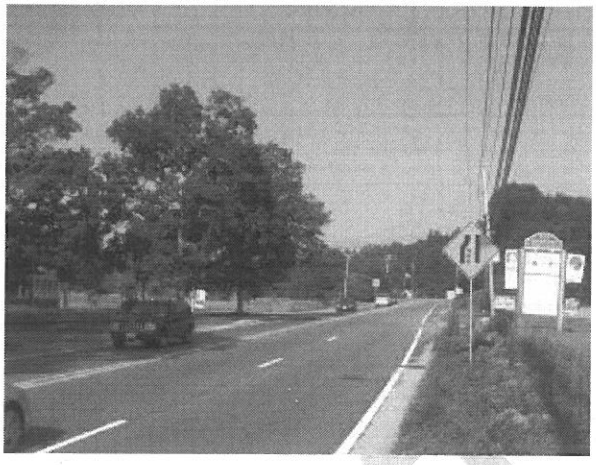
- Roadway shoulder width between the Bolton Public Library and the Bolton Town Hall looks adequate to support bicycle traffic.



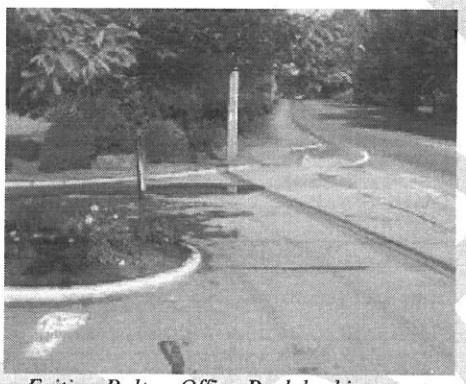
- An old stone box culvert is present just east of Mechanic Street at Pond Park.

I-495 Southbound ramp

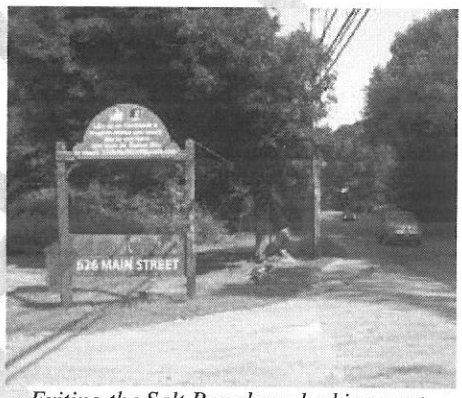
- There is a potential need to add a dedicated right turn lane to I-495 South to mitigate queuing issues for eastbound traffic at the I-495 interchange.



- The lane merge sign just past the I-495 interchange moving westbound could be moved further eastward to allow earlier notification to traffic.

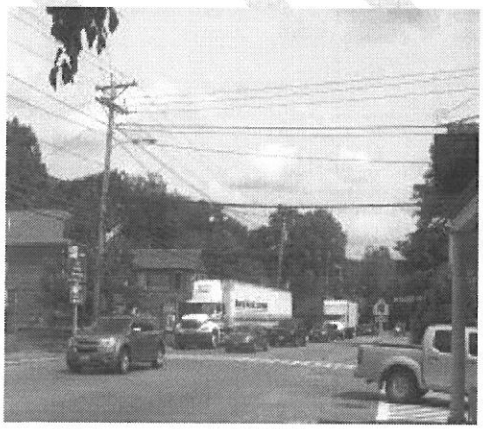


Exiting Bolton Office Park looking west



Exiting the Salt Box shops looking west

- Left turning movements coming from Bolton Office Park and The Salt Box shops experience high delays and may need improvements.



- Wattaquadock Hill Rd. intersection may require a traffic signal system or other capacity improvement to address heavy traffic flow. An historic structure located on Rte. 117 westbound provides a constraint to widening.

III. LIKELY ACTIONS UNDER MASSDOT OWNERSHIP

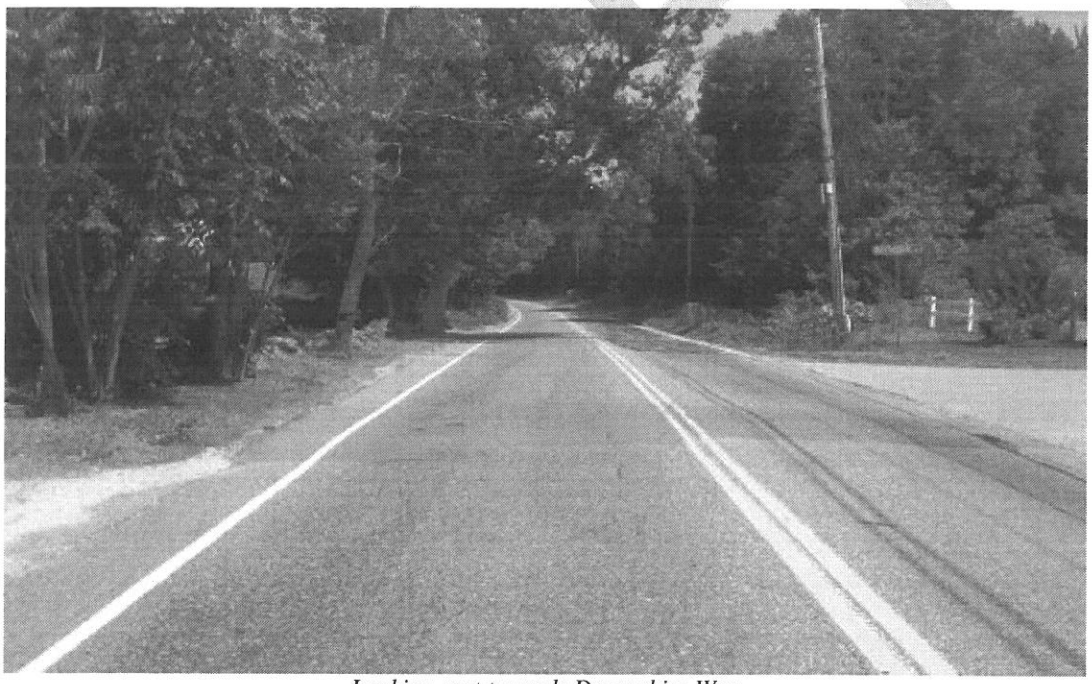
Immediate Action

Upon receipt of ownership of the corridor MassDOT would begin by scheduling thorough inspections and data collection of existing conditions. This would include inspections of all bridges and culverts, review of passing lane zones, and determining pavement condition limits in conjunction with obtaining pavement cores. Also, MassDOT engineers would develop and create projects in MassDOT's database of projects to address needed near-term and long-term improvements

Near Term (Within 5 Years)

The following highlights anticipated modifications that would likely occur within 5 years of MassDOT taking ownership of the roadway.

A. Town of Lancaster

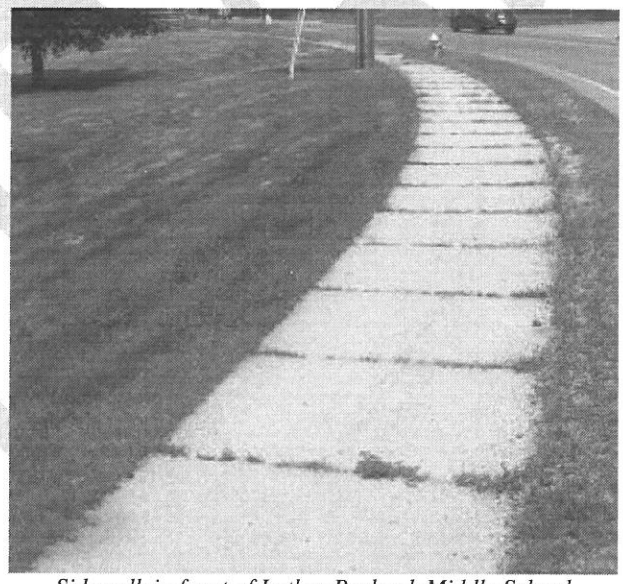


Looking east towards Devonshire Way

- All areas of the corridor where 4" wide pavement marking exists would be restriped with 6" pavement markings.

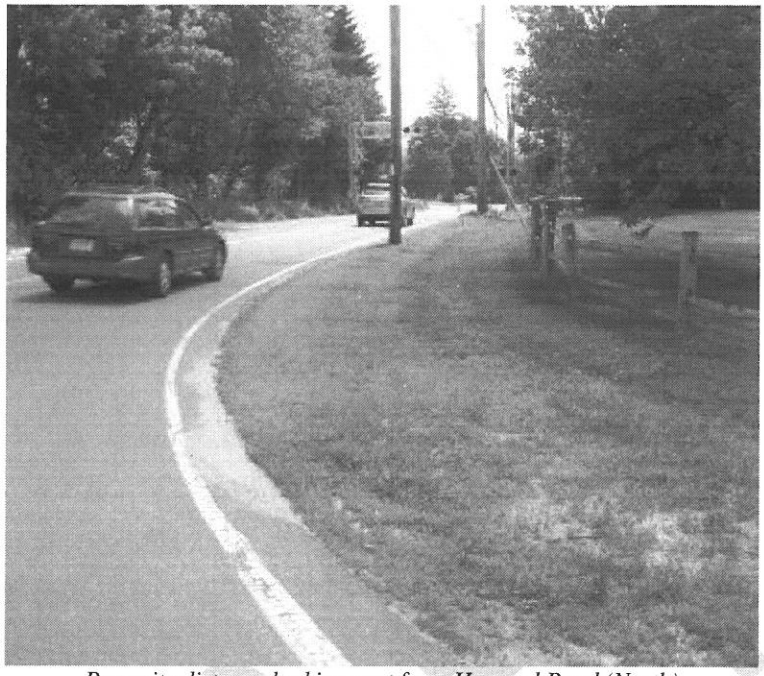
Rte. 117 east of I-190 interchange

- Upgrades to guardrail and guardrail end treatments would be performed.



Sidewalk in front of Luther Burbank Middle School

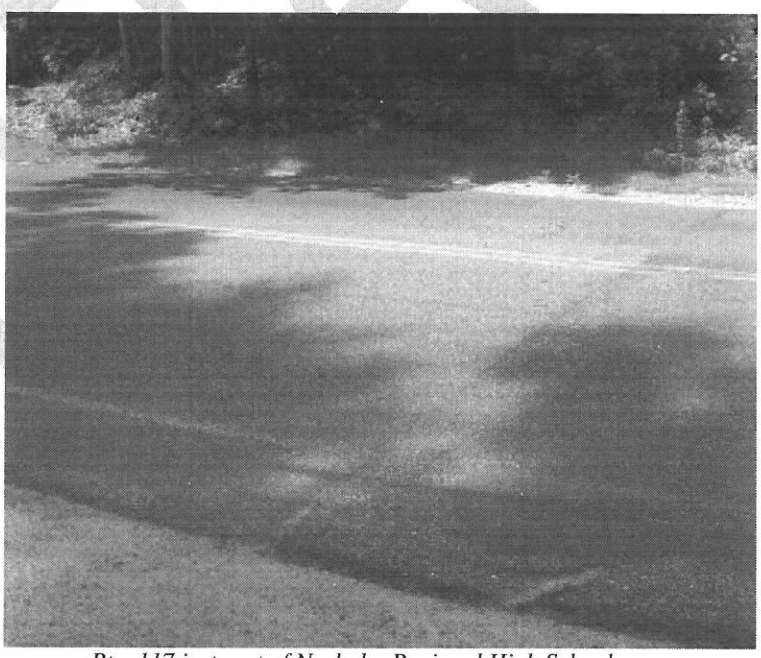
- Americans with Disabilities Act (ADA) compliance issues with wheelchair ramps, crosswalks, and sidewalks would be addressed. Specifically repair and reconstruction of sidewalk in front of Luther Burbank Middle School in Lancaster which has considerable vegetation growth.



Poor site distance looking east from Harvard Road (North)

- Sight Distances at intersections would be evaluate and improved.

B. Town of Bolton



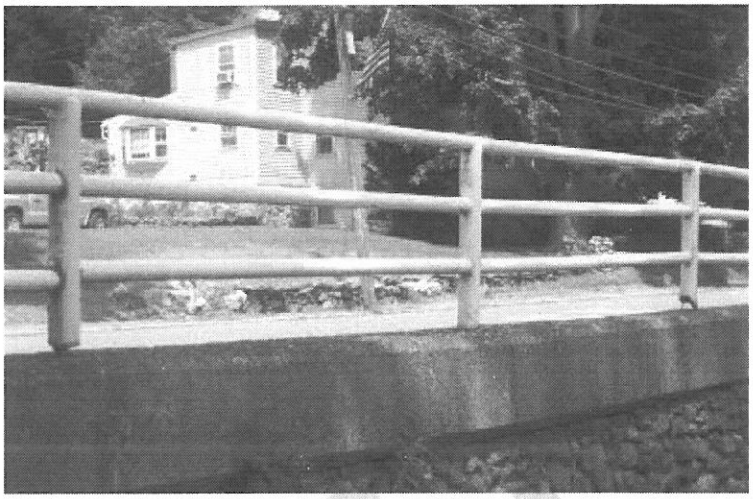
Rte. 117 just east of Nashoba Regional High School

- All areas of the corridor where 4" wide pavement marking exists would be restriped with 6" pavement markings.

Missing crosswalk curb cut & wheelchair ramp at Mechanic Street.

Missing crosswalk curb cut & wheelchair ramp at Wattaquadock Hill Road.

- Americans with Disabilities Act (ADA) compliance issues with wheelchair ramps, crosswalks, and sidewalks would be addressed.



- The damaged metal railing along concrete wall at Pond Park next to Mechanic St. would be replaced and upgraded. Currently several of the railing posts are corroded at their base to a point where they are disconnected from the wall. These posts are effectively providing no support and pose a safety hazard to pedestrians and vehicular collisions.

- Upgrades to guardrail and guardrail end treatments would be performed.

- Sight Distances at intersections would be evaluate and improved.

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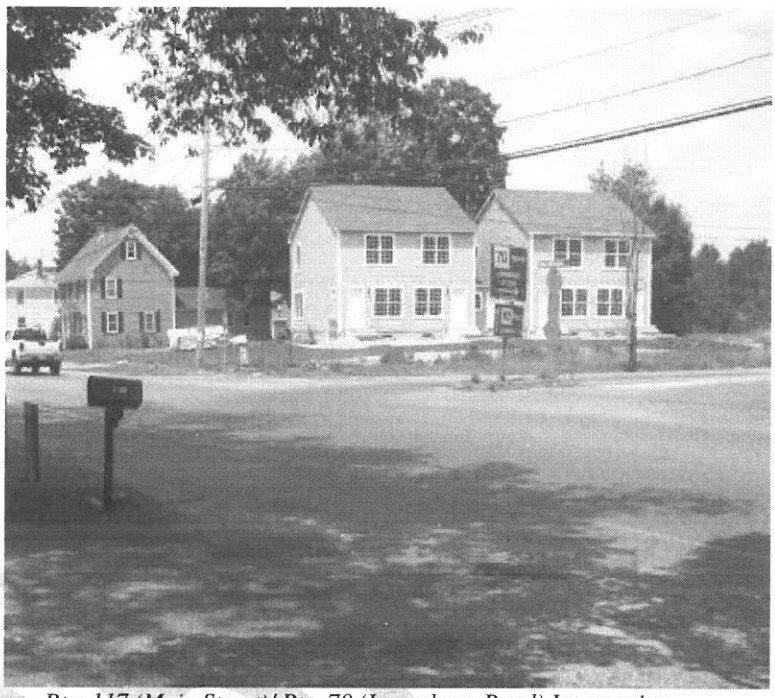
Long Term (5 to 15 Years)

The following highlights anticipated modifications that would likely occur within 5 to 15 years of MassDOT taking ownership of the roadway.

A. Town of Lancaster



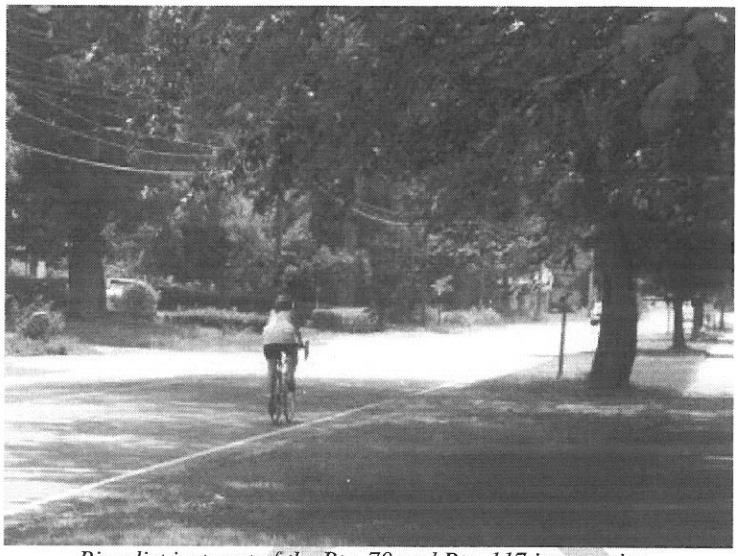
Rte. 117 (Main Street)/ Rte. 70 (Lunenburg Road) Intersection

- Based on the MRPC 2013 corridor profile, the unsignalized intersection of Main Street (Rte. 117/70) and Rt. 70 (Lunenburg Rd.) has been classified as a high crash location. The crash analysis from 6/22/09 to 9/22/10 found that 23 crashes occurred at the intersection, with the southbound direction seeing the highest percentage of crashes at 78%. Both the AM and PM peak hour level of service (LOS) values for the southbound approach on Lunenburg Rd. for left-turning traffic were (F), indicating high delays. Furthermore, the intersection satisfies four Manual on Uniform Traffic Control Devices (MUTCD) signal warrants: Warrant 1, Eight-Hour Vehicular Volume, Warrant 2, Four-Hour Vehicular Volume; Warrant 3, Peak Hour; and Warrant 8, Roadway Network. It is under these conditions that MassDOT recognizes that major safety and traffic flow improvements are needed for the intersection. Viable solutions to achieve this would be the construction of a roundabout or installation of a traffic signal system.

Intersection of Main St./Seven Bridge Rd. (Rte. 117/70) and Main St. (Rte. 70)

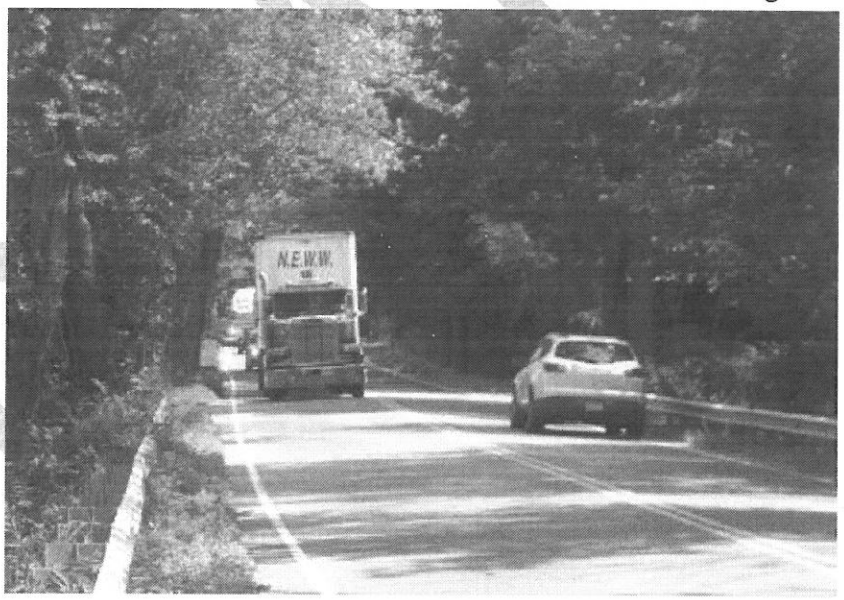
- The skewed intersection of Seven Bridge Road (Rte. 117) at Main Street (Rt. 70) contains east and westbound approaches that are primarily uncontrolled excepted for a single flashing yellow light and a channelized eastbound right-turn, and the northbound approach is stop-controlled with a flashing red light and a channelized right-turn. The 2013 MRPC Corridor Profile report designated this intersection a high crash location. The crash analysis from 7/30/10 to 5/20/13 found that 15 crashes occurred at the intersection, with the northbound approach seeing the highest percentage of crashes at 73%. Both the AM and PM peak hour LOS for the left/right Rte. 70 northbound approaches were (F), indicating high delays. The intersection also satisfies four MUTCD signal warrants: 1,2,3, and 8. Additionally, there is inadequate sight distance available for the northbound approach looking eastward, as private bushes and trees block the line of sight. It is under these conditions that MassDOT recognizes that safety and traffic flow improvements are needed for the intersection and would likely pursue the construction of a roundabout or the installation of a traffic signal system to address these concerns. A minor profile adjustment may also be required to reduce the vertical alignment of the roadway just east of the intersection, improving sight distance and safety.

Profile crest east of Rte. 117/70 spilt



Bicyclist just east of the Rte. 70 and Rte. 117 intersection

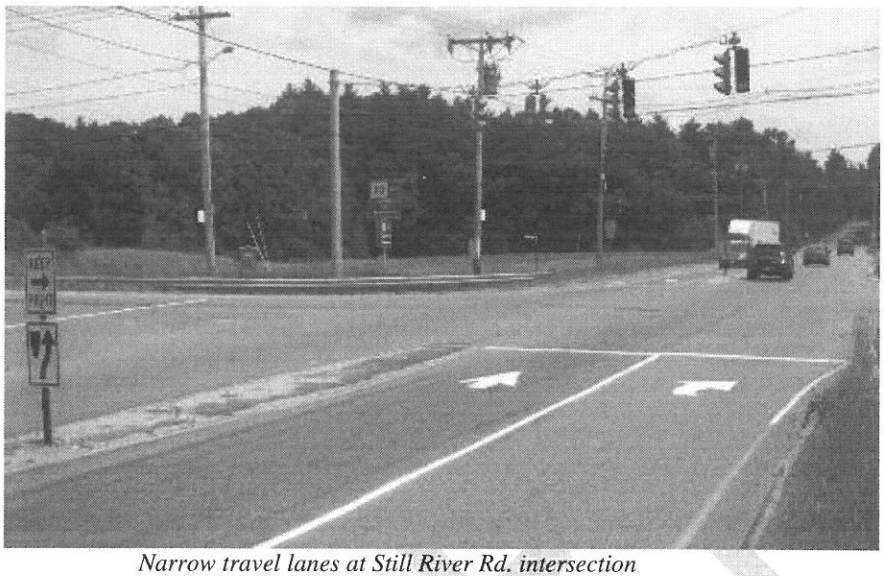
- The typical cross section of the roadway along the Rte. 117 corridor has pavement widths of 24' and narrow to no shoulders. The lack of adequate shoulder clearance makes bicycle travel unsafe and discourages its use. One of the higher bicycle focused areas along the corridor is where Rte. 117/70 converge in



Heavy truck in Bolton Flat Section

Lancaster. To accommodate safer multimodal traffic and sustainable transportation methods, MassDOT is inclined to take long term steps like roadway box widening at the most narrow sections of the bicycle focused areas. MassDOT would likely encourage 5' shoulders in both the eastbound and westbound directions in future project developments. Roadway widening would also likely be used to add additional space in some of the more constricted travel lanes found near the Bolton Flats region where narrow shoulders are present with high volumes of heavy truck traffic.

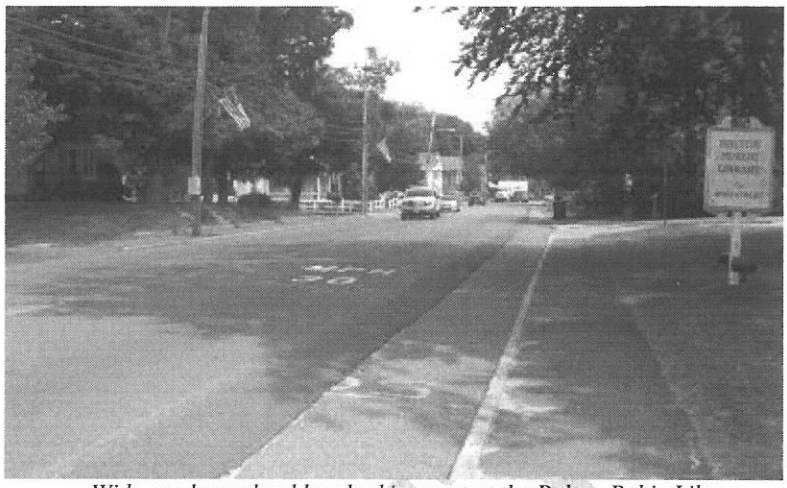
B. Town of Bolton



Narrow travel lanes at Still River Rd. intersection

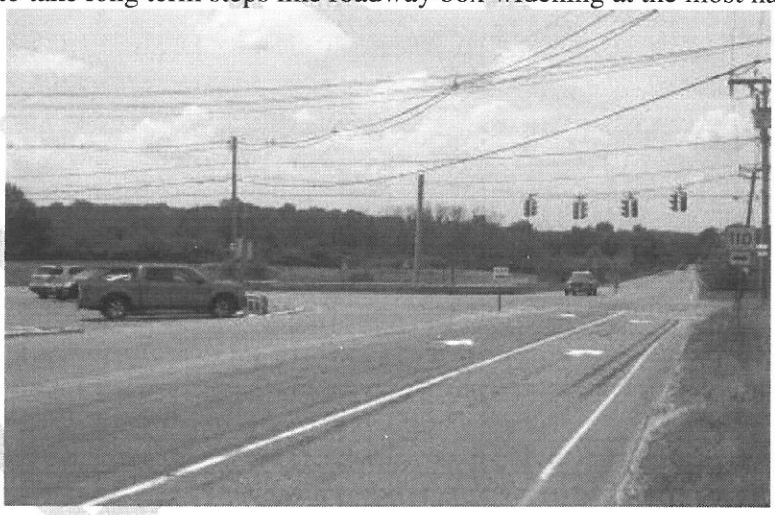
- The intersection of Rte. 117 and Still River Rd (Rte. 110) in Bolton is a signalized intersection which sees heavy bicycle traffic coming from Rte. 110 and is adjacent a busy commercial store, Bolton Orchards. In spring 2014 MassDOT recorded a peak adjusted ADT count of approximately 2,600 vehicles for the north and southbound Rte. 110 approaches. The intersection traffic signal system is old and the travel lanes are narrow with minimal shoulder clearance available for bicycles. MassDOT would likely address several of the intersection issues in efforts to improve traffic flow efficiency and safety for all traffic modes. Safety upgrades that would be needed involve complete reconstruction of the intersection. This would include sidewalk connections, new signs, traffic signal system, and improved travel lanes. Moreover, MassDOT would look to move many of the access points to Bolton Orchards away from the intersection due to the increases in delays and potential crash hazards associated with turning entering/exiting traffic.

Bolton Orchards at Rt. 117 and Still River Rd. Intersection



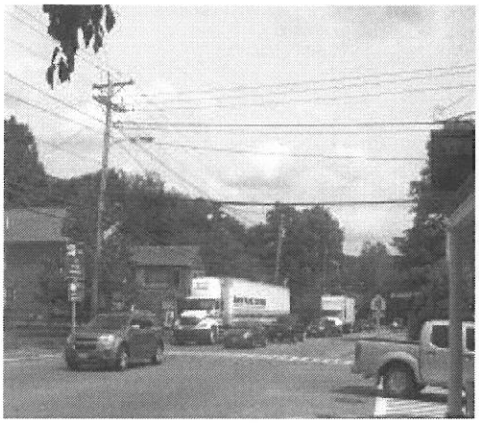
Wide roadway shoulders looking east at the Bolton Pubic Library

- The typical cross section of the roadway along the Rte. 117 corridor has pavement widths of 24' and narrow to no shoulders. The lack of adequate shoulder clearance makes bicycle travel unsafe and discourages its use. One of the higher bicycle focused areas along the corridor is from the Rte. 117/110 junction at Still River Road moving eastwards towards the Bolton Town Hall. To accommodate safer multimodal traffic and sustainable transportation methods, MassDOT is inclined to take long term steps like roadway box widening at the most narrow



Narrow shoulders and travel lanes at Still River Rd. Intersection

sections of the bicycle focused areas. However, existing shoulders between the Bolton Library and the Town Hall may require less widening, as shoulder widths are increased in these locations. MassDOT would likely encourage 5' shoulders in both the eastbound and westbound directions in future project developments. This section in Bolton is presently used by some local residents to park their vehicles. On-street parking would be prohibited if control of Rte. 117 fell under state ownership. Roadway widening would also likely be used to add additional space in some of the more constricted travel lanes found near the Still River Rd. intersection of the corridor.



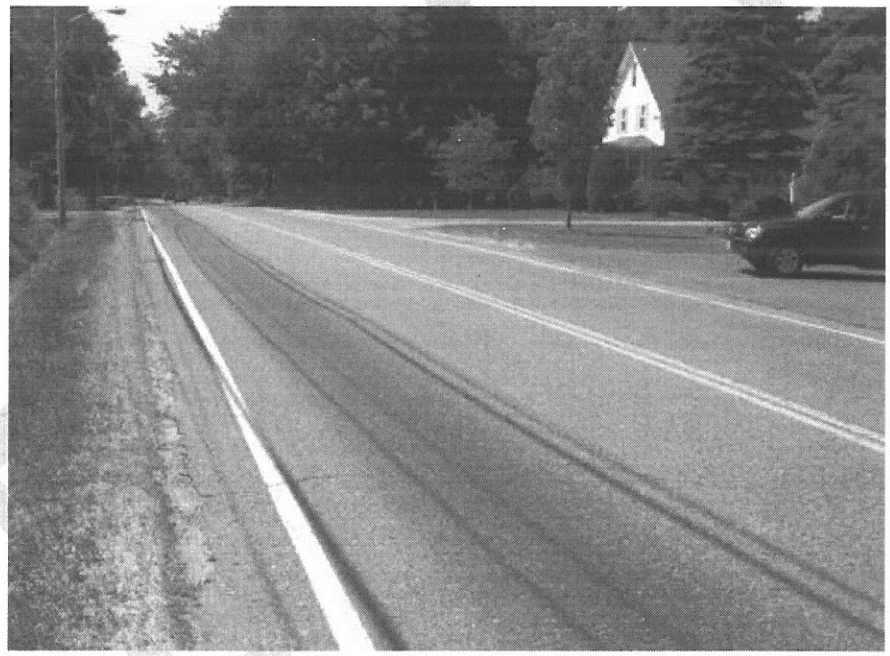
- The Rte. 117 intersection with Wattaquadock Hill Rd. experiences significant delays in the peak hours. Traffic backups can extend as far I-495 along Rte. 117 and for over 1000 feet on Wattaquadock Hill Rd. MassDOT is likely to widen both roadways to accommodate additional turning lanes at the intersection. The pavement widenings would also accommodate wider shoulders for bicyclists. Sidewalk would also be added. It is anticipated that structure takings would most likely be required.

DRAFT

IV. SUMMARY AND OTHER CONSIDERATIONS:

This report was produced to review the section of the Rte. 117 corridor between the I-190 and I-495 interchanges currently under the functional control by the Town of Lancaster and the Town of Bolton. This report highlights the existing conditions of the corridor and indentifies probable actions MassDOT would likely take in the immediate, near, and long term future if control was transferred over to the state. Many of the improvements recommended in the 2013 MRPC Corridor Profile report are reasonably justified and are in agreement with the State's assessment of the corridor. Other issues not identified as high priority, but that MassDOT recognizes as having merit for future attention are as follows:

A. Town of Lancaster

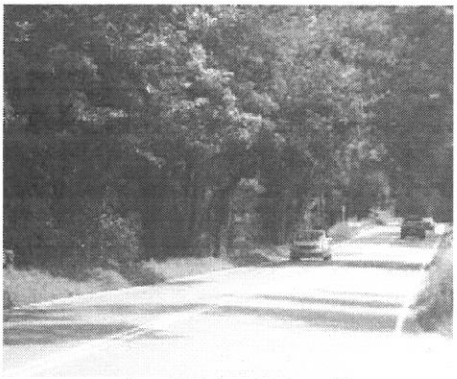


- Sections of pavement overlays in the western section of Rte. 117 in Lancaster show signs of unraveling and are in fair condition. Evidence of roadway rutting that has not been recently overlaid is also apparent (See above photo). Conversations with the town DPW have indicated that overlays have been applied over the years. There is an estimated 12" of pavement present in this location of the corridor.

Bolton Flats located near Lancaster Fairgrounds entrance

- Drainage/flooding concerns around the Bolton Flats area have been raised by Committee participants for the Town of Lancaster. Major rain events and spring thaws have sometimes caused the Nashua River to flood in this area, causing the closure of Rte. 117. The 2013 MRPC Corridor Profile report acknowledges that raising the roadway through this section should be given strong consideration.

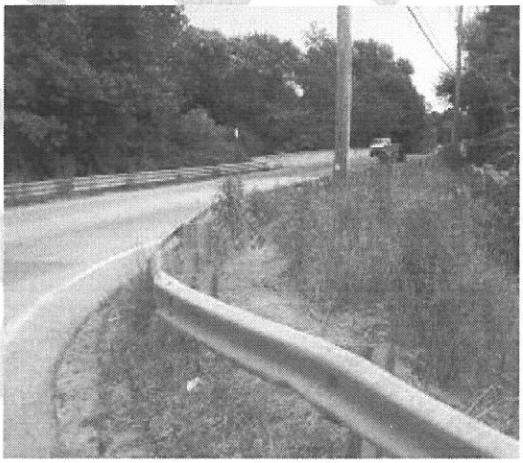
Rte. 117 just east of the Rte. 117/70 split



Rte. 117 thru Bolton Flats

- Additional signage to improve bicycle awareness especially in areas with no shoulders and limited ROW, such as the Bolton Flats area, should be considered.

- The boat launch along the Nashua River in the Bolton Flats region of Lancaster has poor visibility due to a sloped driveway and vegetation growth. Crash hazards are magnified due to increased potential for turning vehicles towing trailers.



Langen Rd. approach looking east

- The Langen Rd. intersection is a potential high crash location with 13 crashes between 2/15/10 and 11/20/12, and a MRPC Equivalent Property Damage Only (EPDO) point total of 25. The intersection is approximately 1,800' to the west of the Rte. 117 (Main St.) and Rte. 70 (Lunenburg Rd.) intersection. Drivers can anticipate a LOS of (E) entering Rte. 117 from Langen Rd. in the PM peak hour.

Harvard Rd. southbound approach looking west

- Harvard Rd. in Lancaster has insufficient stop control sight distance from southbound approach looking east/west and from the northbound approach looking east. Private bushes, trees, and fence reduce visibility at the intersection. Furthermore, drivers can expect a LOS of (F) in the PM peak hour entering Rte. 117 from the north and southbound Harvard Rd. approaches.

- Continued enforcement of the speed limit around the Rte. 117/70 intersection. The Rte. 117 speed analysis indicates the measured 85th percentile speed was slightly higher than the posted speed limit in this area. The exception being the Rte. 70 southbound approach which measured an 85th percentile speed of 26 mph above the posted speed limit from the 2013 MRPC Corridor Profile report.

- The section of the corridor where Rte. 117/70 overlap in Lancaster is recognized as a National Register Historic District (North Village).

B. Town of Bolton

- Between just west of the Bolton Public Library and the Bolton Office Park is recognized as a National Register Historic District (Bolton Center).

V. APPENDIX:

- Montachusett Regional Planning Commission, October 2006, Traffic Study of Selected Intersections for the Town of Lancaster, Massachusetts
- Montachusett Regional Planning Commission, September 2013, Route 117 Corridor Profile, Town of Lancaster, Massachusetts
- Montachusett Regional Planning Commission, September 2013, Route 117 Corridor Profile, Town of Lancaster, Massachusetts, Technical Appendix
- Montachusett Regional Planning Commission, Disc for MassDOT Lancaster 2006 & 2014 Traffic Studies, June 2014
- Town of Bolton Non-motorized Transportation Recommendations dated July 2014
- MassDOT Traffic Volume Analysis Reports S13-068, S13-069, and S13-070.
- March 3, 2014 Letter from District to Town of Bolton and the Town of Lancaster
- May 6, 2014 and May 30, 2014 correspondence between District 3 and Lancaster Historical Commission

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