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Executive Summary

Introduction

The Massachusetts Department of Transportation (MassDOT) requested that Southeastern Regional Planning & Economic Development District (SRPEDD) conduct a study of the Route 140 Corridor through the towns of Foxborough, Mansfield and Norton. This was precipitated by a letter of request dated August 20, 2015, delivered to the MassDOT District 5 Office from Massachusetts Senator James Timilty and Massachusetts Representatives Jay Barrows and Steven Howitt. The area of concern includes Route 140 at the intersection with Route 123 in Norton, extends north through the entire length of Mansfield into Foxborough up to Leonard Street and includes the Foxborough Regional Charter School (FRCS).

Public Outreach

Before the commencement of the Route 140 transportation study, a public outreach strategy was devised. This public outreach effort was developed to inform the public, including local residents, business owners and any interested parties of the study and to encourage and garner feedback on the issues facing the corridor in all three communities.

The strategy consisted of a total of 7 public meetings during the course of the study, as well as a public survey that garnered over 550 responses. These responses, as well as written and verbal comments received during meetings and by e-mail assisted greatly in the findings of the study. The public outreach also allowed concerned residents, business owners and others who utilize Route 140, to express their concerns, voice their opinions and be allowed the opportunity to participate in the planning process.

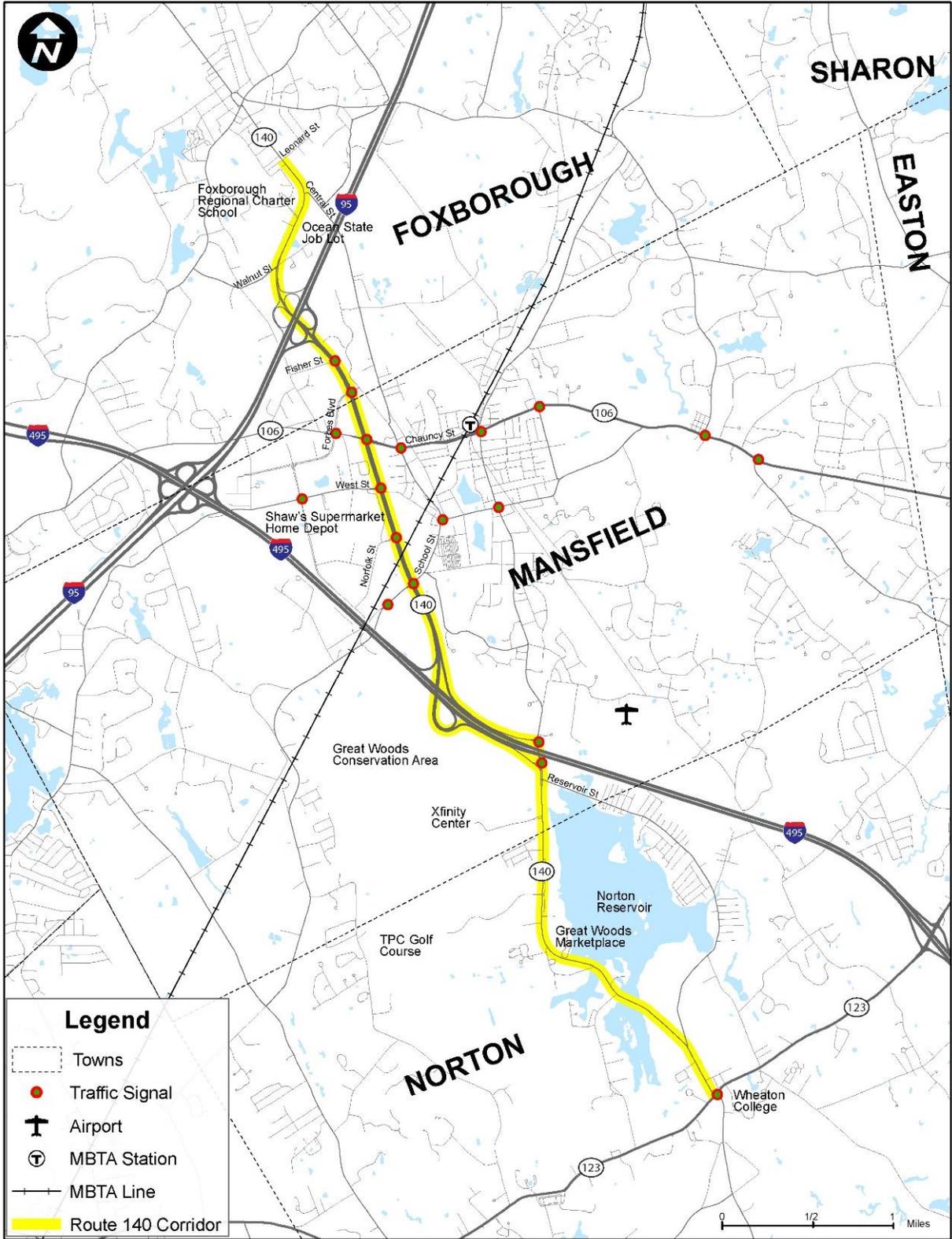
The Study Area

The Route 140 corridor, also known as Mansfield Avenue in Norton, South Main Street and Commercial Street in Mansfield, and Commercial Street and Central Street in Foxborough, is a north/south running, MassDOT owned and maintained corridor. The Route 140 study area encompasses nearly 8 miles of roadway and begins at the intersection with Route 123 in Norton,

extending north through the entire expanse of Mansfield and continues into the town of Foxborough just past the Foxborough Regional Charter School to Leonard Street.

In Norton, beginning with the signalized intersection of Route 140 at Route 123, the study area encompasses parts of Wheaton College, the Norton Reservoir, the Great Woods Marketplace (Roche Brothers, Dunkin Donuts and McDonalds), and the TPC Boston Golf course. At the town line with Mansfield the study area includes the Xfinity Center and the Great Woods Conservation area, followed by an interchange to I-495 which is controlled by two separate traffic signals. Route 140 shares a brief stretch of highway with I-495, before it then splits off and continues north past a shopping plaza that includes Home Depot and Shaw's Supermarket, as well as the signalized intersections at School Street, Norfolk Street, West Street and Chauncy Street (Route 106). Route 140 crosses into Foxborough and includes signalized intersections with Forbes Boulevard and Fisher Street, an interchange with I-95, Walnut Street, the Foxborough (Ocean State Job Lot) Shopping Plaza, Central Street with the study area ending just past the Foxborough Regional Charter School.

There are 9 signalized intersections within the study area, as well as two highway interchanges with Interstate 495 and Interstate 95.



The Route 140 Study Area

Common Concerns

Common concerns voiced in all three communities were additional traffic / congestion due to ongoing and future development and safety concerns, particularly with the difficulty and danger associated with left turns onto Route 140 from uncontrolled intersections.

A significant number of people commented on the lack of multimodal accommodations throughout the corridor, especially for pedestrians. Representatives from GATRA commented on the need for Bus Turnouts.

In the town of Norton, the most prevalent concerns included:

- The signalized intersection of Route 140 at Route 123;
- The access and egress driveways to the Roche Brothers Plaza. Specifically, the need for signalization at the most northern driveway that intersects with the Wingate / EPOCH Assisted Living & Senior Health Care Center;
- The significant lack of sidewalks and other accommodations for pedestrians and bicyclists;
- The difficulty in accessing their own homes during an event at the Xfinity Center; and
- There were also a significant number of comments concerning the access to New England Ice Cream was allowed directly onto Route 140, adding to the access management, safety and congestion issues already present along this stretch of road.

In the town of Mansfield, the most prevalent public concerns included:

- The congestion at the intersection of Route 140 at Route 106 (Improvements planned by MassDOT for FFY2019 project # 608053);
- The malfunctioning of the signal system causing vehicular conflicts and a large number of crashes at the intersection of Route 140 at School Street (Improvements planned by MassDOT for FFY2017 project # 608751);
- Red-light-running and the need for additional enforcement along the corridor;

- Traffic congestion caused by events at the Xfinity Center;
- Most comments were in favor of the addition of an I-495 northbound on-ramp to allow traffic to go southbound; and
- Unnecessary traffic control for northbound thru movements at the Route 140 (South Main Street) at I-495 ramps intersection (Improvements planned by MassDOT for FFY2017 project #608751).

In the town of Foxborough, the most prevalent public concerns included:

- The lack of safety for left-turning vehicles both to access or egress the Route 140 corridor, particularly at the intersection of Route 140 at Walnut Street, at the intersection of Route 140 at Central Street, and at the access to the Ocean State Job Lot Plaza (Foxborough Plaza) and the Dunkin Donuts within; and
- The congestion caused by the Foxborough Regional Charter School during drop-off and pick-up times.

Additional issues of concern mentioned include the intersection of Route 140 at Fisher Street and its close proximity to Interstate 95, the intersection of Route 140 at Forbes Street, and the development within the Foxborough Plaza.

Corridor Wide Recommendations

In order to address common concerns related to safety and the lack of multimodal accommodations throughout the corridor it is recommended that the cross section of the Route 140 corridor have a consistent layout with multi-modal accommodations. Also, to accommodate transit, bus turn-outs need to be included in the design where deemed appropriate. Ideally, the roadway layout should consist of two 11-foot travel lanes, two 5-foot bicycle lanes and two 6-foot sidewalks. A consistent lane width of 11 feet throughout the corridor will provide clear delineation and promote lower speeds.

To address overall safety and congestion along the corridor, serious consideration needs to be given to an Access Management Plan by the communities.

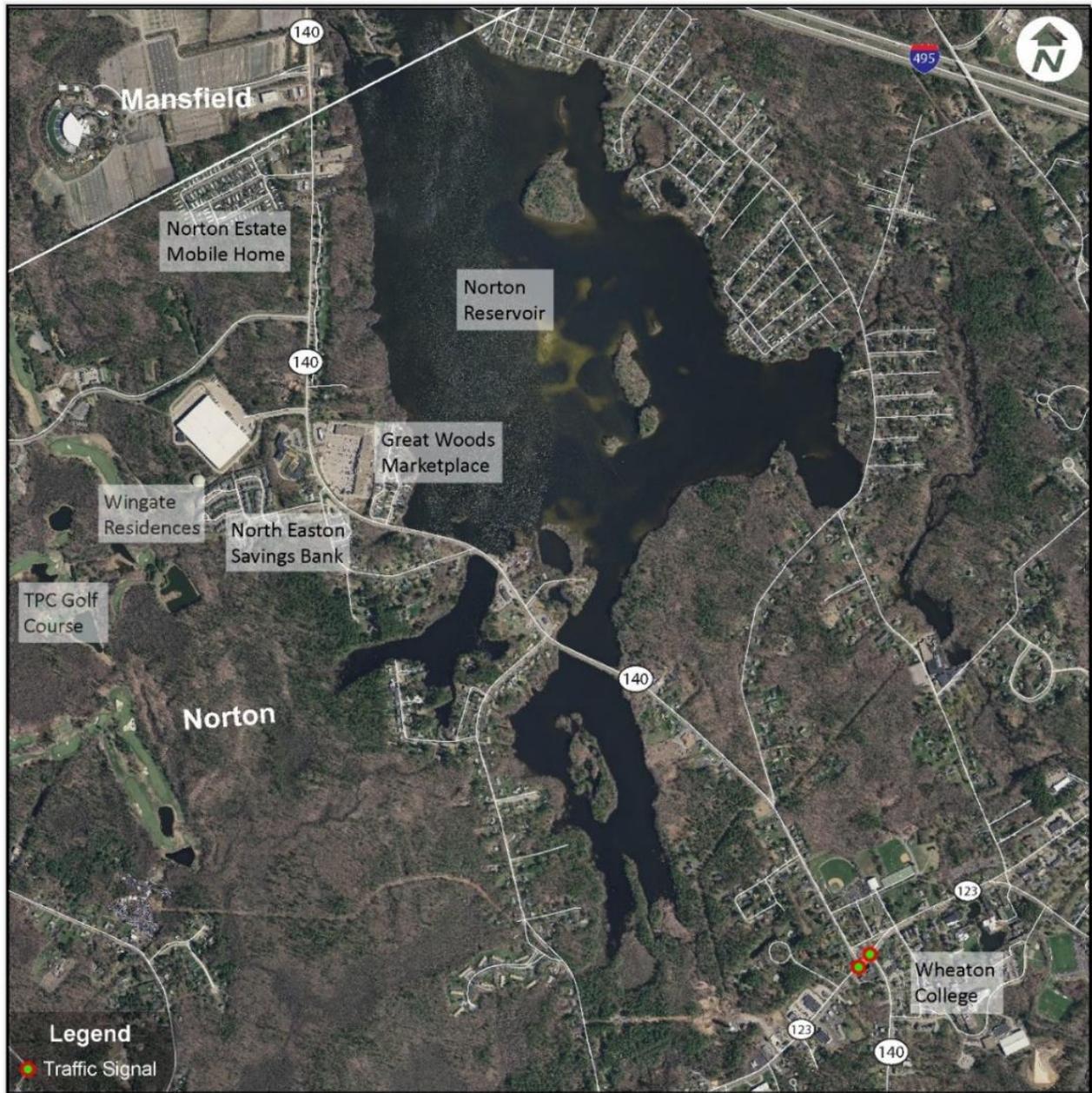


A pedestrian walking on the gravel shoulder on Route 140 Across from the Produce Barn in Norton.

This plan should include the consolidation of curb cuts, as well as promoting and making cross access between businesses available. There are numerous areas along the Route 140 corridor where Access Management is needed. These locations have a number of curb cuts located in close proximity to one another, have curb cuts that are located too closely to an intersection or have curb cuts that are not clearly marked or are much too wide, contributing to safety and congestion issues on the corridor.

Curb cut access should be limited and opening widths of curb cuts reduced whenever possible. Such driveways create opportunities for crashes that can be fatal or injurious.

Access Management should also be considered in all future development along the corridor. For more detail, please see Safety & Access Management on page 79 of the study.



The Route 140 Study Area in Norton

Norton Recommendations

Route 123 (East & West Main Street) Intersection

Consideration should be given to the realignment of Route 140 to create a four-way intersection with Route 123. Two options for consideration include: a realignment of Mansfield Avenue through Library Square in a southerly direction; or a realignment of Taunton Avenue through the church parking area in a northerly direction. Because the realignment through Library Square would infringe on the heart of the Norton Center Historic District, and was met with great opposition from the public and town officials alike during the public process it is recommended that the realignment through the church parking lot be considered as the sole option.

Realignment of this intersection would include the need for additional/extended storage lanes. Ideally, the northbound approach would consist of three lanes (an exclusive left-turn lane, a thru lane and a right-turn lane) to accommodate the heavy volumes of turning vehicles. The westbound, eastbound, and southbound left-turn lanes would all be extended to 150 feet. If these improvements were to be implemented today the intersection would operate at a LOS C. . In 2040 the intersection is forecasted to operate at LOS D with motorists experiencing 46 seconds of delay. Future traffic growth projections only worsen the existing delay at this intersection.

Regardless of improvements, the addition of signal pre-emption equipment should be incorporated into the signal system. This equipment provides a temporary right-of-way for emergency vehicles to travel quickly and safely through the intersection. In addition, the pedestrian signal timing for the Route 140 northbound approach should be investigated to see if it meets current standards as outlined by the Manual on Uniform Traffic Control Devices (MUTCD).

There is a need for improvements at the pedestrian crosswalk at the northern terminus of Howard Street. The most pressing need is to repair the pedestrian signal. Future improvements for enhanced visibility should consider removing/relocating the utility box and pole blocking pedestrian sight lines here and the installation of pedestrian signage.

Reservoir Street to Smith Street

The overall improvement recommendation for the Route 140 corridor in Norton is for a consistent cross section with multi-modal accommodations (consistent travel lanes, bicycle lanes and sidewalks). There is also a need for improved lighting along the corridor.

In addition, curb cut access should be limited and opening widths of curb cuts reduced whenever possible. Reducing the number of curb cuts will reduce conflict points and any potential confusion for motorists when multiple driveways and/or turning movements are involved. These driveways create situations where crashes can be fatal or injurious.

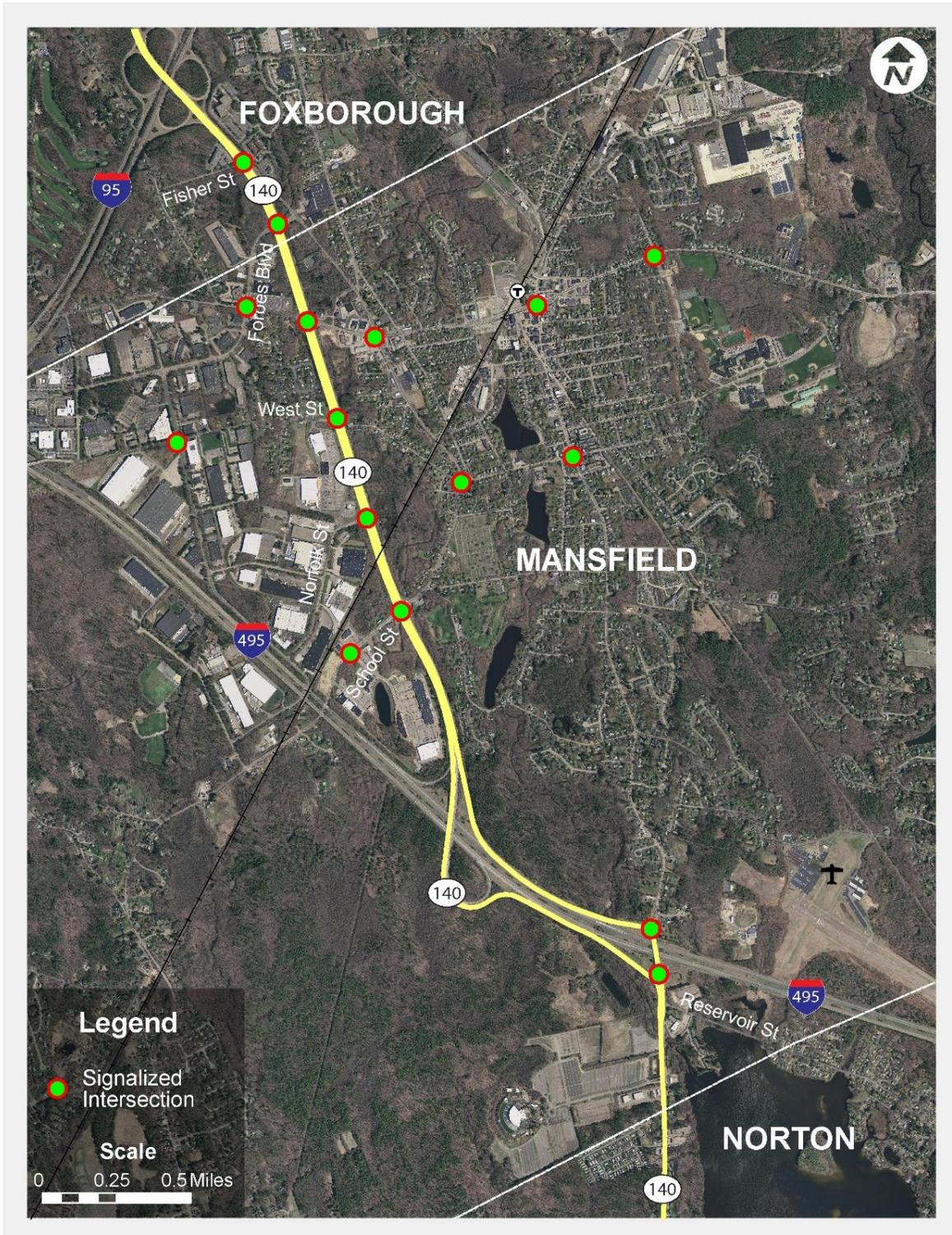
Great Woods Marketplace / Roche Brothers Plaza

Although the crash rate was low at the southern driveway at the Great Woods (Roche Brothers) Plaza, local business employees stated that there are many “near misses” at this driveway. A 2005 study conducted by SRPEDD recommended access at this secondary driveway be limited to *right-turns-in* and *right-turns-out* only with geometric modifications to physically prevent left turns in and out of this entrance. These changes were never implemented by the management of the Great Woods Plaza.

In addition, the overall recommendation for a consistent cross section along the corridor with multi-modal accommodations (consistent travel lanes, bicycle lanes and sidewalks) will assist with reducing speeds along the corridor and provide safer opportunities for left turning vehicles along this segment of roadway.

Arnold Palmer Boulevard to the town line

The numerous driveways along this section of Route 140 create conflict points that increase the potential for vehicle crashes. Compounding this problem is the geometry of the roadway, with narrow lanes, little to no shoulders and traffic traveling at high speeds. The town should adopt an Access Management Plan to alleviate conflict points and delay due to left-turning vehicles. This plan should include the consolidation of curb cuts and promote cross access between adjacent businesses.



The Route 140 Study Area in Mansfield

Mansfield Recommendations

Interstate 495 on- and off-ramps

There is currently no existing I-495 northbound off-ramp to Route 140 (South Main Street). A northbound off-ramp was not initially built into the interchange due to public opposition from nearby residents over the proposed land takings, including a private home, needed for the construction. These same objections could continue to prove to be a challenging obstacle to the future construction of this ramp.

During the course of this study, an analysis was conducted using SRPEDD's Regional Travel Demand Forecasting Model. The model analyzes existing traffic operations for the entire SRPEDD region and forecasts future traffic patterns based on projected growth in the region. This area is expected to see a robust amount of continued development.

The analysis indicates that a northbound exit ramp from Interstate 495 to Route 140 will be heavily used and will accommodate the projected traffic from future developments, providing easier access to Route 140 southbound, the XFinity Center and Norton. The analysis also shows a substantial savings in Vehicle Miles Traveled due to an estimated 6,850 vehicle trips per day using the new ramp if built. These nearly 7,000 vehicle trips would have direct access to South Main Street (Route 140) from I-495 northbound and would no longer be forced to take alternate routes, alleviating congestion on Route 123 in Norton, School Street in Mansfield and other surrounding roads. The expected increased development will only worsen traffic congestion on these alternate routes without the addition of the ramp.

School Street Intersection

The most pressing issue is to repair or replace the pedestrian signal button located at the northwest corner of the School Street intersection. It has components missing and is completely inoperable at this time.

There are improvements planned at this intersection by MassDOT. This intersection is included in the list of Transportation Improvement Program (TIP) projects for FFY2017 (project # 608751). SRPEDD is in contact with MassDOT to determine if the pedestrian signal button and issues concerning westbound left turning traffic is included in the scope of the project. Following the completion of the project SRPEDD recommends that traffic and crashes be reevaluated to determine if additional measures are warranted.

Consideration should be given to an Intelligent Transportation System (ITS) warning sign to alert motorists of the approaching signal being red.

Optimization of the signal system will improve the existing delay from 41 to 39 seconds, however the LOS remains at D.

Traffic growth projections indicate operations at this intersection, will decline and operate at a LOS E with vehicles experiencing 56 seconds of delay by 2040. Signal optimization will improve operations to a LOS D with motorists experiencing 51 seconds of delay.

Norfolk Street Intersection

By optimizing the existing signal phasing, the intersection at Norfolk Street will still operate at a LOS D but the delay will only decrease by 5 seconds from 52 to 47. In 2040 the intersection is forecasted to operate at LOS E with motorists experiencing 73 seconds of delay. Optimization of the signal will decrease future delay by 10 seconds to 63.

West Street Intersection

By optimizing the signal phasing the intersection at West Street will still operate at a LOS B as the delay will only decrease by 2 seconds from 20 to 18. In 2040 the intersection is forecasted to operate at LOS C with motorists experiencing 26 seconds of delay. Optimization of the signal will decrease future delay by 4 seconds to 22. The pedestrian signal timing is presently inadequate and should be upgraded to meet current standards as outlined by the Manual on Uniform Traffic Control Devices (MUTCD).

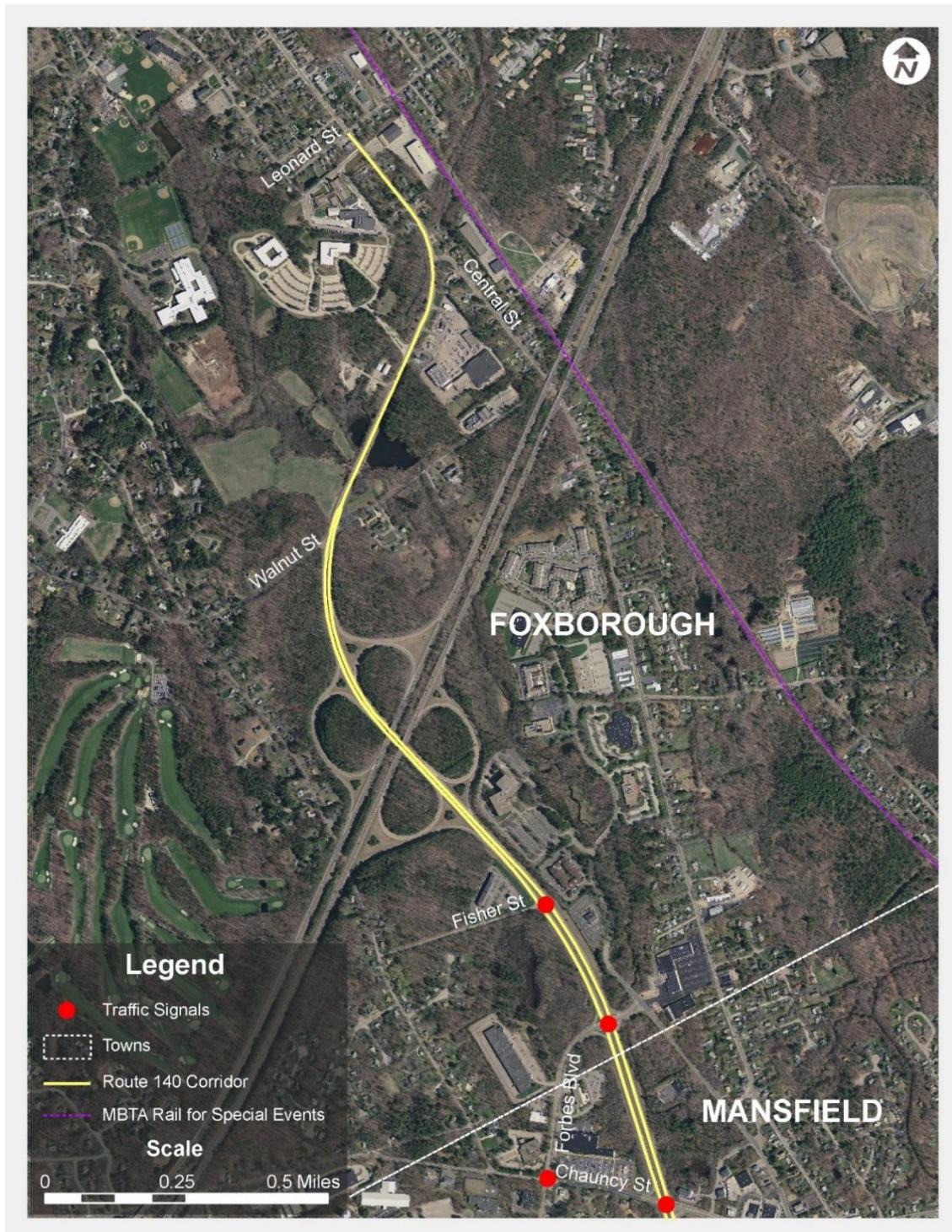
Chauncy Street (Route 106) Intersection

Based on the analysis of the Chauncy Street intersection, SRPEDD offers the following recommendations for geometric modifications:

- the addition of a southbound left-turn lane;
- the extension of the westbound approach to 350 feet; and
- the extension of the southbound right-turn lane to 300 feet.

In addition, optimization of the signal timing will potentially improve the LOS to D with 49 seconds of delay per vehicle, a substantial improvement over current conditions.

Without any improvements the intersection will continue to operate at a LOS F with motorists experiencing more than 120 seconds of delay in 2040. Optimization of the signal system with the future projected traffic growth will improve the delay to 101 seconds of delay per vehicle. Implementation of the recommendations with optimization will improve the LOS to E with 72 seconds of delay per vehicle, a substantial improvement over a 'no-build' scenario.



Route 140 Study Area in Foxborough from the town line to FRCS

Foxborough Recommendations

Forbes Boulevard Intersection

Based on traffic growth projections to the year 2040, the intersection of Route 140 at Forbes Boulevard will worsen to LOS F with 96 seconds of delay per vehicle. Based on the traffic distribution through the intersection, an additional westbound right lane and an additional eastbound approach lane to provide two left-turn lanes and one thru lane is recommended. Implementation of these improvements will improve the operation to a LOS D with 49 seconds of delay, a substantial improvement. Traffic conditions at LOS D are considered tolerable.

Consideration should be given to an Intelligent Transportation System (ITS) warning sign to alert motorists, especially those exiting from I-95, of the approaching signal being red.

A roundabout is proposed east of the intersection at Forbes Boulevard and Foxborough Boulevard to assist with traffic mitigation for the Foxfield Plaza redevelopment project. At this time, the roundabout project is on hold.

Fisher Street Intersection

Consideration should be given to extending the all-red clearance interval at this signal system, as and additional signage, such as “Intersection Ahead” for vehicles exiting I-95 north of the intersection. Consideration should also be given to an Intelligent Transportation System (ITS) warning sign to alert motorists of the approaching signal being red.

Walnut Street Intersection

A signal warrants analysis was conducted for the intersection which analyzes traffic conditions, pedestrian characteristics, and physical conditions to determine whether installation of a traffic control signal is justified. Based on the analysis, this intersection is a candidate for a signal.

Implementation of a signal would improve the existing LOS from a B to an LOS A with 5 seconds of delay per vehicle but would improve safety by protecting vehicles making turns onto Route 140. The addition of future traffic growth will not worsen the LOS, as the delay will increase slightly to 7 seconds of delay per vehicle with signalization in 2040.

Included with any design of a signal system should be an advanced warning signs (Signal Ahead) on Route 140 due to the layout of the roadway.

Foxborough (Ocean State Job Lot) Plaza

With 4 driveways providing access to the plaza, this leads to confusion over which driveway to use and where cars are actually turning. There are also sight distance issues related to the curvature of the road and obstructions along the side of the road that make exiting the plaza difficult. The wide cross-section of the roadway at this location lends itself to higher speeds and evasive driver movements.

Reducing the width of the travel lanes and adding infrastructure such as bicycle lanes will help to calm traffic. Consideration should also be given to investigating whether driveways can be combined or reconfigured at the plaza to reduce the number of conflict points and if obstructions to sight distance can be removed or minimized. Wayfinding signage should also be considered to allow for better guidance in and out of the plaza.

Central Street Intersection

A signal warrants was conducted for the Central Street intersection which includes an engineering study of traffic conditions, pedestrian characteristics, and physical conditions to determine whether installation of a traffic control signal is justified. The results indicated that this intersection is a candidate for a signal. If a signal were installed under current traffic volumes the intersection would improve from an LOS D to an LOS C with 21 seconds of delay per vehicle. It would also make turning onto Route 140 easier and safer.

By 2040 the intersection will continue to operate at a LOS C with 31 seconds of delay per vehicle based on projected traffic patterns. LOS A through C is considered acceptable because it provides an adequate quality of service to motorists.

Included with any design of a signal system should be an advanced warning sign (Signal Ahead) on the approaches of Route 140 due to the layout of the roadway.

As an interim improvement, consideration could be given to stripe the roadway to allow for a free-flow right turn from Central Street.

The Foxborough Regional Charter School (FRCS)

Since the commencement of this study, the school has expanded and added a secondary access which has alleviated some of the congestion at the primary entrance. Since the beginning of the school year the Foxborough Police Department has voiced concerns with the traffic flow into the Charter School at the new secondary Commercial Street entrance. Motorists driving along Route 140 are delayed by left-turning vehicles attempting to enter the new school entrance with many motorists are using the break down lane and passing the left-turning vehicles on the right.

Since that time, a project has been initiated to realign the Route 140 northbound approach to the secondary driveway (33 Commercial Street) providing a left-turn lane. The school and town officials are coordinating this effort with MassDOT.

SRPEDD recommends that traffic conditions continue to be monitored once the realignment is implemented to determine the effectiveness of this change to traffic flow.