Chapter 8 - CONGESTION

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Chapter 8 – Congestion

Introduction

Congestion occurs at intersections and along road segments throughout the region which adversely impact commuter travel, the efficient movement of goods and air quality. The following areas of congestion were identified through local knowledge, public input from surveys, MRPC studies, identified bottlenecks and various technical data sources.

Congested Corridors

Congestion in the following corridors/locations tends to create the greatest impacts to traffic flow in the region. Inadequate geometrics, right-of-way issues and improper signal timings and/or phases result in poor vehicle flows and in many cases unsafe conditions. Concerns will range from local intersections and corridors to congestion on regionally important highways such as Route 2.

- Route 2, Harvard, Lancaster, Leominster, Fitchburg, Westminster, and Gardner – This highway serves as the second major east-west connector for the Commonwealth and has a significant effect on development well beyond the Region. Improvements and maintenance are vital along the entire stretch of Route 2 to maintain its usefulness and move commuters. Regular resurfacing and maintenance costs are significant in terms of dollars and are usually well beyond the limited federal funds allocated to the Region. There is still a need for an increased investment to maintain Route 2, along with all roadways in the region, in an acceptable condition. The possibility of the section of Route 2 between I-495 and I-190 being incorporated into the interstate system due to its natural connection between these two major routes has been discussed. Designation of this type, i.e. interstate highway, would make this segment eligible for Interstate Maintenance funds. Connections to nearly all major routes in the region exist on Route 2, as does the interchange of Route 2 and I-190. Recent improvements to the pavement striping in this location seem to have reduced confusion and congestion, although further study is needed.

- Route 12, Fitchburg and Leominster – This main corridor through the cities of Fitchburg and Leominster may be the most congested in the region. Many improvement projects have been completed in recent years to address congestion issues. Most notably were major signal and lane improvements between Bemis Road in Fitchburg and Erdman Way in Leominster completed in 2010. Adequate access to Route 2 often dominates local concerns. The City of Fitchburg continues to maintain the need for improved access between Route 2 and its downtown as a major force in the communities' economic development; this would also serve as a congestion mitigation measure for traffic on

surrounding streets and intersections leading into the city from the highway. This concern is echoed by the North Central Massachusetts Chamber of Commerce as one of the major needs for the area as well as the city. Major issues also remain in both downtown areas of Fitchburg and Leominster especially during peak hours. An MRPC study, "*Downton Fitchburg Bottleneck Profile*" (2012), ultimately determined that major signal improvements were needed in that area.

- Route 13 Leominster– This segment was well documented in the 1999 MassDOT Study "Fitchburg/Leominster/Lunenburg Transportation Analysis Project". Although many improvements have been made in the last 15 years this corridor still remains amoung the regions most congested. Several recommendations were proposed to address congestion as well as safety issues associated with heavy traffic volumes and the poor geometrics of the Route 13/Haws Street/Route 2 interchange. In 2008 the Route 13 Bridge over the North Nashua River was rehabilitated and pedestrian safety improvements were made. In 2010 MassDOT introduced design plans for Route 13 in Leominster between Prospect and Haws Streets, the most congested area of Route 13, which involves a new signal at Route 13 and Mead, as well as signal equipment upgrades and coordination of existing signals. Many amendments to this project have been made since the original concept. The 2016-2019 Transportation Improvement Program lists this project as being funded in 2018.

- South Street/Merriam Avenue, Fitchburg and Leominster – This corridor serves as one of two major connecting roads between Fitchburg and Leominster in addition to providing direct access to Route 2. Volumes along this corridor are mainly affected by a traffic signal at the Route 2 westbound ramp/Twin City Mall entrance crossing as well as by the Merriam Avenue Bridge over Route 2. Road widths are limited by the bridge and abutting land uses to two travel lanes; one northbound and one southbound.

- Route 117, Lancaster and Leominster – This state route is a major commuter road that provides access to I-190 at the Leominster/Lancaster line and I-495 in Bolton located east of Lancaster. Most of the congestion along this corridor occurs during AM and PM peak hours. Also causing significant delays is an at-grade freight railroad crossing east of Route 70 in Lancaster which frequently stalls traffic for long periods of time as trains pass through. Within the past 10 years there has been major commercial development on both sides of Route 117 on the Leominster/Lancaster line. These commercial developments have been complemented by various improvements to the roadway including the addition of turning lanes and stop lights allowing easier access to both I-190 and the commercial access roads. MRPC conducted the "Route 117 Corridor Profile" (2014) through the town of Lancaster which suggested major improvements to the intersections of Route 117/Lunenburg Road and Route 117/Main Street. The town has favored the installation of roundabouts at one or both of these locations.

- Route 2, Harvard, Lancaster, Leominster, Fitchburg, Westminster, and Gardner – Commuter traffic on Route 2 has grown throughout the Montachusett Region. This highway serves as the second major east-west connector for the Commonwealth and has a significant effect on development well beyond the Region. Improvements and maintenance are vital along the entire stretch of Route 2 to maintain its usefulness and move commuters.

- Downtown Gardner – Route 101 (Central Street/Parker Street) runs east-west through this corridor while Route 68 (Main Street/Parker Street) runs north-south. The layout of this intersection can be confusing to drivers and is a high crash location in the region. Furthermore traffic routinely backs up through downtown during peak hours. While many variations of geometrics have been tried over the years Right of Way issues make it difficult to make an ideal improvement. Long term efforts may need to involve complete reconstruction and reconfiguration of this intersection.

Main Street (Route 68)/Central Street (Route 101) in Gardner Looking North.

- Route 119, Townsend and Groton – This road has become a major commuting route for the northern portion of the Region. Route 119 runs southeast from New Hampshire to I-495 in Littleton to Route 2 at the Concord Rotary. Peak hour flows are heaviest eastbound in the AM and reversed in the PM reflecting its use as a commuting road to the I-495/Boston area. The route runs through the town centers of Townsend and Groton and as such greatly impacts local travel patterns.

Route 119 in Townsend Looking North

Route 119 in Groton Looking South

- Route 2A, Ayer - from Park Street (Routes 2A/111) to the Littleton town line, includes Main Street, East Main Street, and Littleton Road. Peak hour traffic suffers from slow travel speeds along the Main Street segment through the downtown area due to side street traffic, on-street parking, an MBTA Commuter Rail stop downtown and narrow lanes. A notable intersection in this corridor is Park Street (Routes 2A/111) and Main Street. Park Street traffic looking to continue onto Route 2A east/111 south must stop and wait for a gap in traffic on East Main Street/Main Street which results in long peak hour delays from this approach.

Main Street (Routes 2A/111) in Ayer from Park Street to Columbia Street looking North.

Continuous Count Stations in Region

The following tables list average daily traffic volumes from MassDOT continuous count stations on major routes (Route 2 and I-190) in the Montachusett region going back to 2001. From these tables the following patterns can be seen.

- After peaking in the mid-2000's, traffic on Route 2 west of I-190 has since decreased and now steadied at the pre-recession levels of 15 years ago.
- Route 2 on the eastern edge of the region has seen traffic decrease since highs of over 50,000 daily 15 years ago and has fluctuated slightly over the last 10 years.
- Steady increases are seen in volumes throughout I-190 in the region and in the immediate vicinity of I-190 on Route 2 in the Leominster/Lancaster area.

Route 2 Littleton East of Harvard Town Line			Route 2 Lancaster West of Route 70			Route 2 Westminster East of Route 140			Route 2 Athol East of Orange TL		
Year	Volume	Annual Growth	Year	Volume	Annual Growth	Year	Volume	Annual Growth	Year	Volume	Annual Growth
2013	46,642	2%	2013	50,847	1%	2013	40,614	2%	2013	10,615	-2%
2012	45,692	0%	2012	50,113	1%	2012	39,880	-5%	2012	10,826	-5%
2011	45,569	-3%	2011	49,476	-3%	2011	42,088	-2%	2011	11,385	1%
2010	47,100	-3%	2010	51,104	1%	2010	43,000	1%	2010	11,274	-23%
2009	48,540	-1%	2009	50,435	5%	2009	42,770	-1%	2009	14,711	37%
2008	48,803	0%	2008	47,806	1%	2008	42,999	3%	2008	10,740	-2%
2007	48,800	8%	2007	47,186	-1%	2007	41,887	-1%	2007	11,003	-2%
2006	45,112	-2%	2006	47,800	6%	2006	42,172	-2%	2006	11,202	0%
2005	46,229	-1%	2005	45,104	-3%	2005	42,991	-1%	2005	11,180	0%
2004	46,900	-6%	2004	46,433	2%	2004	43,257	3%	2004	11,127	1%
2003	50,022	-1%	2003	45,454	0%	2003	42,168	-1%	2003	10,967	2%
2002	50,603	1%	2002	45,457	1%	2002	42,663	4%	2002	10,800	4%
2001	50,000	5%				2001	40,923	4%	2001	10,415	2%
Total Growth: -6.7%			Total Growth: 11.9%			Total Growth: -0.8%			Total Growth: 1.9%		

I-190 Leominster North of Route 117			I-190 Sterling North of Route 12			I-190 Sterling North of Route 140			I-190 Sterling South of Route 140		
Year	Volume	Annual Growth	Year	Volume	Annual Growth	Year	Volume	Annual Growth	Year	Volume	Annual Growth
2013	44,399	0%	2013	34,322	-1%	2013	30,586	-1%	2013	32,625	-1%
2012	44,239	1%	2012	34,819	9%	2012	30,764	0%	2012	33,058	1%
2011	43,774	-1%	2011	32,080	3%	2011	30,802	3%	2011	32,629	-1%
2010	44,293	1%	2010	31,131	-10%	2010	30,003	-3%	2010	33,026	2%
2009	43,792	4%	2009	34,735	8%	2009	31,050	-13%	2009	32,483	3%
2008	42,272	8%	2008	32,180	-1%	2008	35,782	21%	2008	31,398	-1%
2007	39,149	-6%	2007	32,612	-2%	2007	29,524	0%	2007	31,653	6%
2006	41,503	1%	2006	33,168	2%	2006	29,537	1%	2006	29,722	6%
2005	41,154	0%	2005	32,646	-9%	2005	29,290	0%	2005	27,919	-19%
2004	41,168	4%	2004	35,700	27%	2004	29,300	4%	2004	34,300	0%
2003	39,579	0%	2003	28,000	0%	2003	28,078	4%	2003	34,200	12%
2002	39,700	9%	2002	28,000	12%	2002	26,965	1%	2002	30,600	30%
2001	36,548	-3%	2001	25,100	-1%	2001	26,800	4%	2001	23,500	-8%
Total Growth: 21.5%			Total Growth: 36.7%			Total Growth: 14.1%			Total Growth: 38.8%		

System Analysis

Transportation Studies with Congestion Elements

Member communities regularly request various types of transportation studies which the MRPC conducts through the Unified Planning Work Program (UPWP). Many of these studies involve examining congestion issues along a roadway or corridor. One of the most useful data sets pertaining to congestion issues is travel time. Travel time data is collected using a GPS Device and TravTime 2.0™, a software program which measures travel time and delays on a roadway. Since MRPC has acquired TravTime software, it has regularly been included in analysis in transportation studies done throughout the region. Numerous travel time runs are taken through the study area. From this, an average travel time can be computed during the peak hour through a particular road or corridor. This data is compared to free flow travel time to depict a travel time index rating. The free-flow travel time is the amount of time in seconds it

takes to travel a particular corridor at the posted speed limit without any delay. The travel time index (TTI) is a ratio between the average peak hour travel time and free-flow travel time. For example a TTI value of 1.30 indicates that the average travel time at peak hour takes 30 percent longer than free flow travel time. The table below shows the different congestion levels of the TTI of an arterial roadway.

Travel Time Index (TTI) Levels of Congestion

Functional Class	No/Low Congestion	Moderate Congestion	High Congestion	Severe Congestion
Arterials	< 1.5	1.5 - 2.0	2.0 - 2.6	> 2.6

*Source: Federal Highway Administration

Two recent studies which included travel time analysis are the *Downtown Fitchburg Bottleneck Profile* and the *Route 117 Corridor Profile* done in Lancaster. Below are descriptions of each of these study areas and results from our Travel Time analysis.

Downtown Fitchburg Bottleneck Profile (2012)

The *Downtown Fitchburg Bottleneck Profile* was an effort to highlight various issues causing one of the most significant bottlenecks in the Montachusett Region – Downtown Fitchburg. Throughout the program year various data was collected and analyzed to draw attention to issues leading to traffic delays in the area. In its efforts MRPC staff has consulted with City officials as well as Tighe & Bond, an engineering firm attained by the City, to better coordinate traffic signals in the area.

Study Area

The study area encompasses the downtown area from Moran Square at the intersection of Main (Rte. 2A), Lunenburg (Rte. 2A) and Summer Streets in the east extending west to the area known as the "Upper Common" at the intersection of Main, River (Rte. 31) and Mechanic (Rte. 31) Streets. Traffic along the roadways of Main Street and Boulder Drive, including the intersections with other side streets were considered for this report.

	Run 1	Run 2	Run 3	Run 4	Run 5	Average Time	Travel Time Index (TTI)
Eastbound (Minutes)	3.73	3.63	3.73	3.85	3.45	3.08	**1.40**
Westbound (Minutes)	5.7	5.83	4.35	3.95	6.03	5.17	**2.18**
Posted Speed Limit = 25 MPH		Corridor Distance (Miles) = 0.99 WB / 0.92 EB			Free Flow Travel Time (Minutes) = 2.38 WB / 2.21 EB		

From the travel time results it is clear that traveling westbound on Main Street during peak hour entails dealing with a high level of congestion. A major inhibitor of traffic flow through downtown was the lack of a system of properly operating and coordinated network of traffic signals.

Main Street in Fitchburg Looking North.

In 2014 the City was awarded a $1 million dollar MassWorks grant that will address issues at Water and Main Streets. The project is underway and will include new signals and sidewalk improvements at this intersection.

Route 117 Corridor Profile (2014)

The Town of Lancaster requested the Montachusett Regional Planning Commission (MRPC) to conduct a study of Route 117 through the community in the spring of 2013. In its efforts the MRPC in turn has engaged town officials to form an informal Steering Committee to assist, offer guidance and provide local knowledge that would contribute to a Corridor Profile along the road. The goal was to assess the conditions and problems that may exist along Route 117 and offer recommendations and avenues to make improvements where necessary. After much data collection, analysis, site visits and public engagement the MRPC completed the ***Route 117 Lancaster Corridor Profile*** in 2014. As part of the report, multiple Travel Time runs were taken during the measured peak hour times through the entire 4.7 miles of Route 117 in Lancaster.

	Run 1	Run 2	Run 3	Average Time	Travel Time Index (TTI)
Eastbound (Minutes)	8.68	8.33	8.93	8.65	**1.15**
Westbound (Minutes)	8.3	8.47	11.95	9.57	**1.28**
Posted Speed Limit = 40 MPH		Corridor Distance (Miles) = 5.0 Miles		Free Flow Travel Time (Minutes) = 7.5 WB / 7.5 EB	

Although congestion did not pose a great issue through the corridor as a whole, the junction of Route 117 and Route 70 and its two major intersections were identified as having long delays for the Route 70 approaches. Improvement alternative were presented to the town and the town is interested in making improvements in the near future.

Progress

The table below and corresponding map at the end of this section show projects with congestion benefits which were recently completed or are scheduled on the current Transportation Improvement Program (TIP). As mentioned, some of the most congested roadways have been or will be addressed in the near future. Perhaps most notable in the below list is Route 13 through North Leominster currently listed on the 2018 TIP.

City/Town	Project	Year Advertised	Cost	Status
Leominster	BRIDGE RECONSTRUCTION & RAMP IMPROVEMENTS, L-08-024, ROUTE 12 OVER ROUTE 2 (EB & WB)	2011	$8,665,495	Complete
Leominster	INTERSECTION & SIGNAL IMPROVEMENTS AT MERRIAM AVENUE AND LINDELL AVENUE	2011	$569,166	Complete
Lancaster	INTERSECTION IMPROVEMENTS @ FIVE CORNERS: ROUTE 110 (BOLTON ROAD, HIGH STREET EXTENSION), CENTER BRIDGE ROAD, OLD COMMON ROAD	2013	$1,163,920	Complete
Fitchburg	INTERSECTION IMPROVEMENTS @ JOHN FITCH HIGHWAY & ASHBY STATE ROAD (ROUTE 31)	2009	$1,224,365	Complete
Lancaster	ROUNDABOUT CONSTRUCTION ON ROUTE 70 (LUNENBURG ROAD) AT OLD UNION TURNPIKE	2012	$1,807,354	Complete
Sterling	INTERSECTION IMPROVEMENTS AT ROUTE 12 AND CHOCKSETT ROAD	2016 TIP	$5,151,860	Design
Leominster, Fitchburg, Lunenburg	RECONSTRUCTION OF SUMMER STREET AND NORTH STREET	2017 TIP	$6,944,357	Design
Leominster	RECONSTRUCTION ON ROUTE 13, FROM HAWES STREET TO PROSPECT STREET	2018 TIP	$3,200,000	Design
Sterling	IMPROVEMENTS ON ROUTE 140 AT I-190	2019 TIP	$660,000	Design

Needs

Listed below are priority needs identified which relate to congestion mitigation in the region. Some of the most apparent needs exist in the regions congested downtown areas.

- Downtown Fitchburg: Infrastructure upgrades in traffic signals and traffic signal coordination
- Downtown Leominster: Further study, traffic flow/infrastructure analysis
- Downtown Gardner: Traffic flow study and possible geometric improvements needed along Central Street
- Lancaster: Geometric improvements on Route 117 intersections with Lunenburg Road and with Main Street and Seven Bridge Road
- Downtown Ayer: Geometric or infrastructure improvements at Main Street (Route 2A/111)/ Park Street (Route 2A/111)/ West Main Street intersection

Challenges

- How can we reduce delays on key corridors through the region?
- How can we maintain a reliable system of travel options?
- How do we maintain and increase access to key corridors in the region and beyond?

Moving Forward – Addressing Challenges

- Monitor locations and promote projects that address congested roadways in the region.
- Encourage communities to address local mobility issues in order to promote mode shift options in congested areas.
- Promote additional travel options by facilitating the growth and use of trails, Complete Streets and transit in the region.

Congestion throughout the region exists mostly at certain locations or corridors at specific peak travel times. As population and traffic increase it is important to promote Complete Streets concepts and multi-modal travel approaches as viable options. Monitoring, along with prioritizing needs, will continue to be an important part of congestion mitigation. Performance measures set in this plan should allow for further improvements future years.

Action	Next Steps	Outcome
Determine affect new transit developments have on commute patterns.	Monitor traffic data on major routes as improvements are implemented.	A better understanding of where congestion mitigation projects are most needed

Goals, Objectives and Performance Measures

As part of this RTP Performance Measures have been developed to determine whether this region is meeting goals set forth in this long range plan. Below are applicable Goals, Objectives and Performance Measures which are related to congestion throughout the region.

Goal: Congestion and Mobility

Objectives:

* Monitor locations and promote projects that address congested roadways withing the region

*Encourage communities to address local mobility issues in order to promote mode shift options in congested areas

* Seek to increase travel options within the region through the promotion of trails, complete streets, transit, land use and their interactions

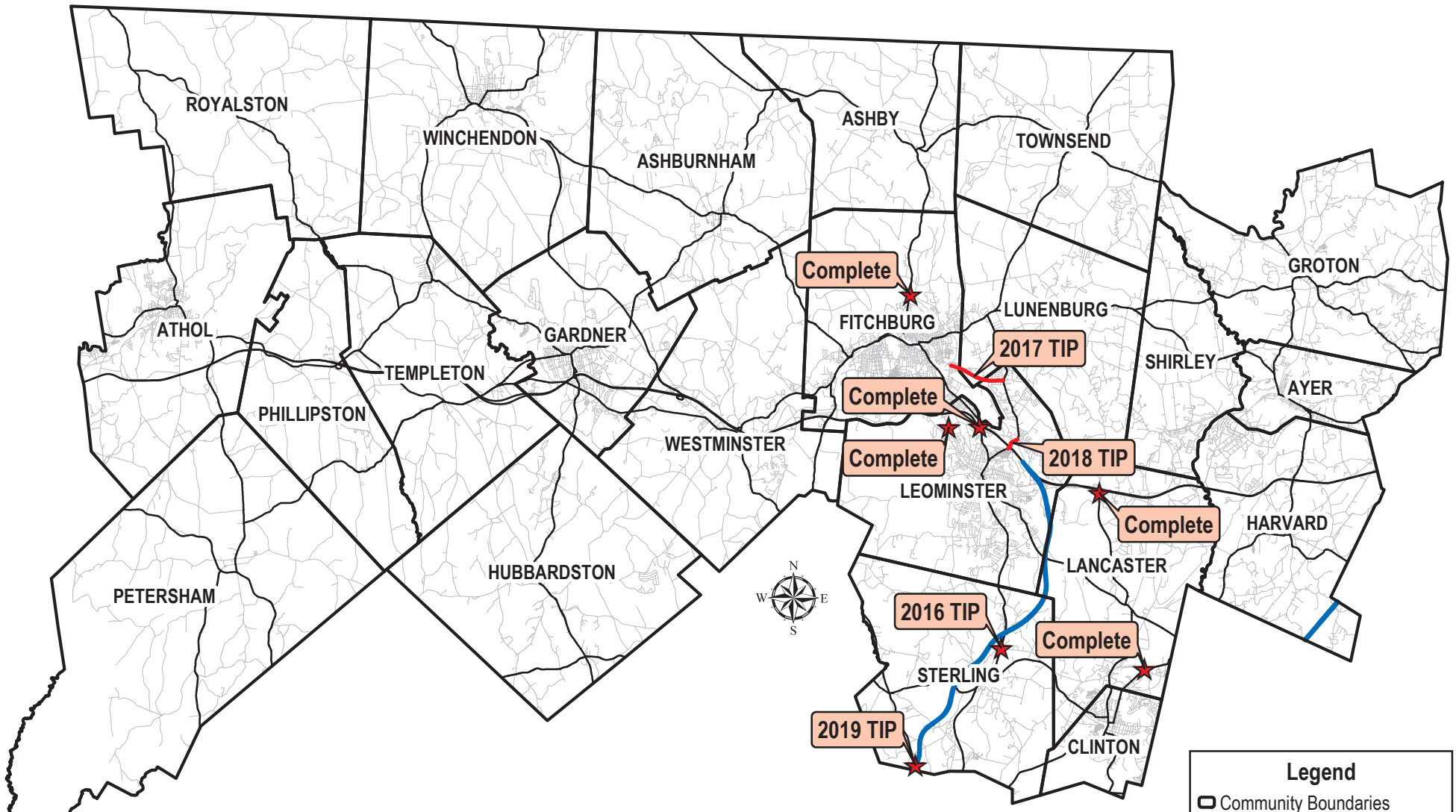
Performance Measures:

* Conduct Travel Time data collection along 3 to 5 major roadways throughout the region on an annual basis

* Identify 1 bottleneck location and conduct a study every 2 years in order to develop and/or implement corrective measures

* Increase the number of Complete Street certified communities within the region. Seek to have a majority of communities formally certified within 10 years

MRPC: RTP 2016
Congestion Improvements



Legend

- Community Boundaries

Roadways

- Interstate Routes
- US & State Routes
- Other Roadways

Congestion Improvements

- Locations
- Roadways

0 2.5 5 10 Miles

DATA SOURCES: MassGIS, MassDOT and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

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