



## CONGESTION

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, *"Downtown 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 20 years this corridor still remains among 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 2020-2014 Transportation Improvement Program lists this project as being funded in 2020.

- 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. In 2018 MRPC completed the Merriam Avenue – South Street Corridor Bottleneck Study which profiled this area and made recommendations to improve congestion.
- 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 20 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. Improvements are scheduled to occur in year 2021 of the 2020-2024 Transportation Improvement Program.
- 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.



**Figure 4-48 - 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



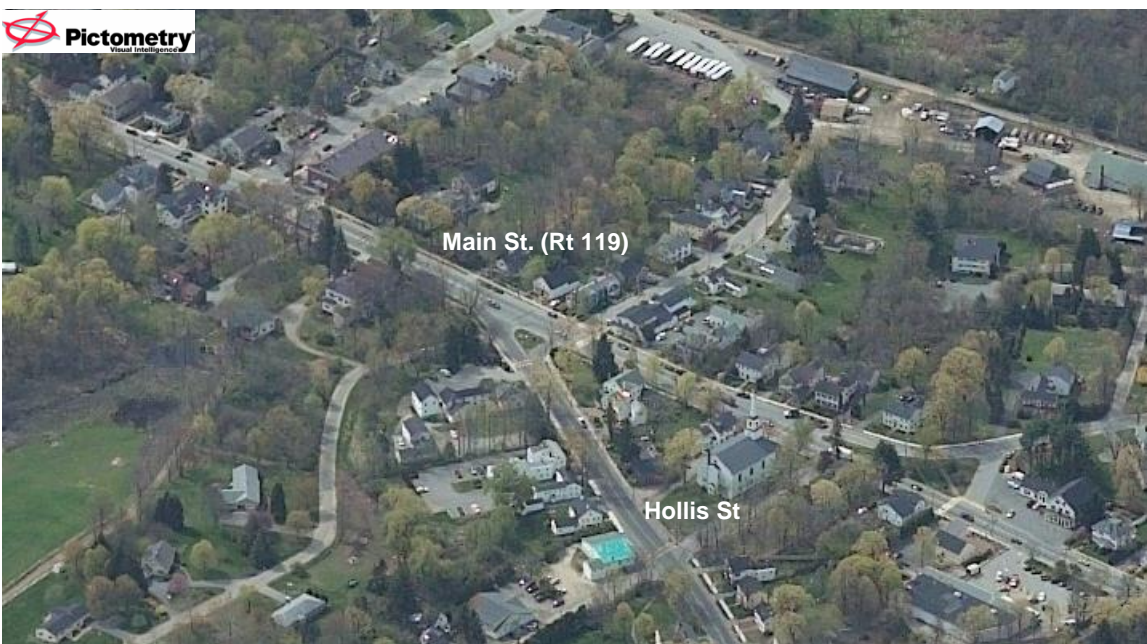


in the AM and reversed in the PM reflecting its use as a commuting road to the I-495/Boston area. The route runs through the town centers of Townsend and Groton and as such greatly impacts local travel patterns.

**Figure 4-49 – Route 119 in Townsend Looking North**



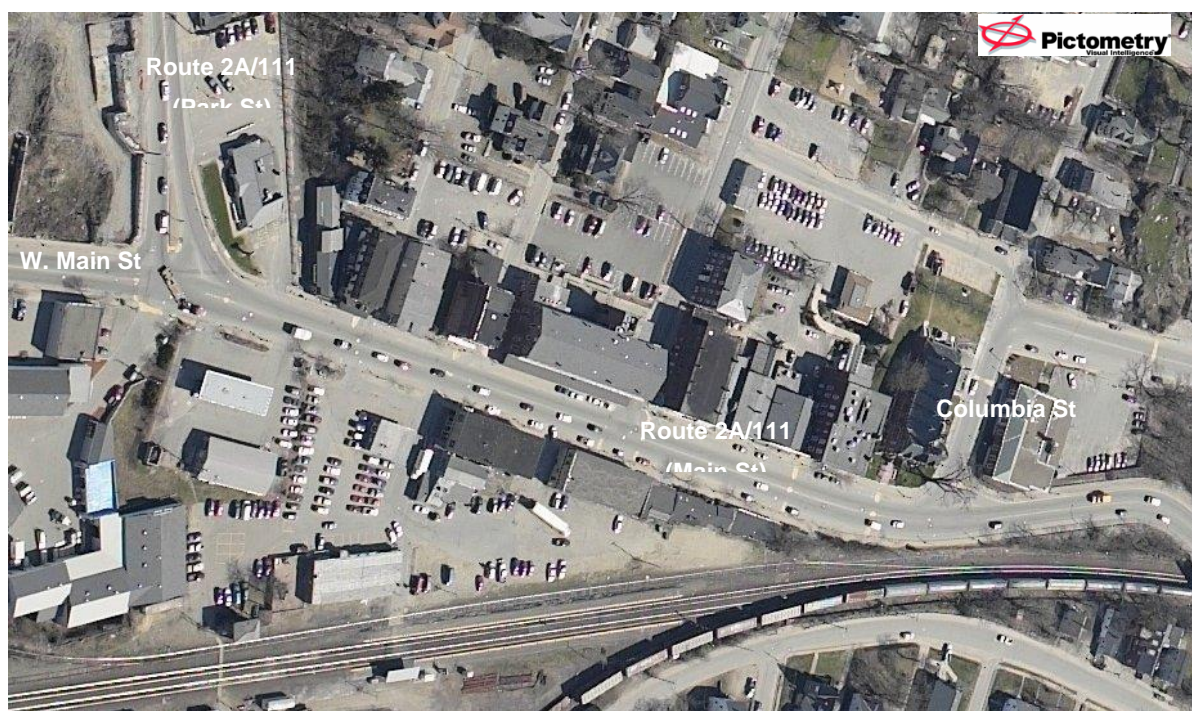
**Figure 4-50 – Route 119 in Groton Looking South**





- 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.

**Figure 4-51 - Main Street (Routes 2A/111) in Ayer from Park Street to Columbia Street Looking North**



## 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.

**Table 4-27 - 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

Three recent studies which included travel time analysis have been completed in recent years. 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.



### 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.

### Travel Time

	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	<b>1.40</b>
Westbound (Minutes)	5.7	5.83	4.35	3.95	6.03	5.17	<b>2.18</b>
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.

Figure 4-52 - Main Street in Fitchburg Looking North







### 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.

#### *Travel Time*

	Run 1	Run 2	Run 3	Average Time	Travel Time Index (TTI)
Eastbound (Minutes)	8.68	8.33	8.93	8.65	<b>1.15</b>
Westbound (Minutes)	8.3	8.47	11.95	9.57	<b>1.28</b>
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 alternatives were presented to the town and a project at this location is listed in year 2021 of the 2020-2024 Transportation Improvement Program.



Figure 4-53 - Lancaster Route 117/70 looking North



#### Merriam Avenue – South Street Corridor Bottleneck Study (2018)

The Merriam Avenue - South Street Bottleneck study stems from a goal set in the 2016 RTP of the to “reduce congestion and improve mobility”. One performance measure set under this goal was to “identify one (1) bottleneck location and conduct a study every 2 years in order to develop and/or implement corrective measures”. This section of Merriam Avenue and South Street in the cities of Leominster and Fitchburg has long been considered one of the regions congested corridors and is considered a traffic “bottleneck”. The Federal Highway Administration’s (FHWA) definition of a traffic bottleneck is "a localized section of highway that experiences reduced speeds and inherent delays due to a recurring operational influence or a nonrecurring impacting event." This study profiles existing conditions and identifies factors adding to the congestion of the Merriam Avenue - South Street corridor.



### Study Area

The study area extends from the south at the intersection of Merriam Avenue and Lindell Avenue in Leominster, to the north at the intersection of South Street and Wanoosnoc road in Fitchburg. The Merriam Avenue - South Street corridor serves as one of two major connecting roads between the cities of Fitchburg and Leominster in addition to providing direct access to Route 2. Contained within this corridor are the following primary locations, listed from south to north, which are the main catalysts for congestion and are highlighted in this study.

- Intersection of Merriam Ave./ Route 2 East ramp
- Merriam Ave. bridge over Route 2
- Signalized Intersection of Merriam Ave./ South St./ Whalon St./ Twin City Plaza
- Signalized Intersection of South St./ Wanoosnoc Rd.

**Figure 4-54 - Leominster/Fitchburg, Merriam Ave/South Street Corridor**





### Travel Time

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

Southbound

Northbound

Southbound Traffic through the study area measures no or low congestion (TTI of 1.34). Northbound traffic experienced high congestion (TTI of 2.51). The study also considered delay caused by the intersections along the corridor and physical challenges along the road such as the road being limited to two lanes over the route 2 bridge. A number of improvement alternatives were presented in the study.

### 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.

- Counts have recuperated to pre-recession levels after a period of decline throughout the region in the mid 2000's.
- Steady growth has been occurring throughout the region since 2015
- If the trend of traffic growth continues, increased congestion can be expected, especially during rush hour.





Route 2 Littleton East of Harvard Town Line			Route 2 Lancaster West of Route 70			Route 2 Westminster East of Route 140		
Year	Volume	Growth	Year	Volume	Growth	Year	Volume	Growth
2018	54,452	2%	2018	59,761	7%	2018	52,062	2%
2016	53,207	2%	2016	55,471	2%	2016	50,872	4%
2015	52,262	9%	2015	54,277	6%	2015	48,912	15%
2014	47,432	2%	2013	50,847	1%	2014	41,401	2%
2013	46,642	2%	2012	50,113	1%	2013	40,614	2%
2012	45,692	0%	2011	49,476	-3%	2012	39,880	-6%
2011	45,569	-3%	2010	51,104	1%	2011	42,088	-2%
2010	47,100	-3%	2009	50,435	5%	2010	43,000	1%
2009	48,540	-1%	2008	47,806	1%	2009	42,770	-1%
2008	48,803	0%	2007	47,186	-1%	2008	42,999	3%
2007	48,800	8%	2006	47,800	6%	2007	41,887	-1%
2006	45,112	-2%	2005	45,104	-3%	2006	42,172	-2%
2005	46,229	-1%	2004	46,433	2%	2005	42,991	-1%
2004	46,900	-7%	2003	45,454	0%	2004	43,257	3%
2003	50,022	-1%	2002	45,457		2003	42,168	-1%
2002	50,603	1%	Growth since 2015: 9%			2002	42,663	4%
2001	50,000					2001	40,923	
Growth since 2015: 4%						Growth since 2015: 6%		

Route 2 Athol East of Orange TL			I-190 Leominster North of Route 117			I-190 Sterling North of Route 12		
Year	Volume	Growth	Year	Volume	Growth	Year	Volume	Growth
2018	14,910	15%	2018	51,923	2%	2018	39,013	2%
2016	12,699	9%	2016	50,736	6%	2016	38,121	0%
2015	11,514	5%	2015	47,892	7%	2015	37,931	4%
2014	10,965	3%	2013	44,399	0%	2014	36,505	6%
2013	10,615	-2%	2012	44,239	1%	2013	34,322	-1%
2012	10,826	-5%	2011	43,774	-1%	2012	34,819	8%
2011	11,385	1%	2010	44,293	1%	2011	32,080	3%
2010	11,274	-30%	2009	43,792	3%	2010	31,131	-12%
2009	14,711	27%	2008	42,272	7%	2009	34,735	7%
2008	10,740	-2%	2007	39,149	-6%	2008	32,180	-1%
2007	11,003	-2%	2006	41,503	1%	2007	32,612	-2%
2006	11,202	0%	2005	41,154	0%	2006	33,168	2%
2005	11,180	0%	2004	41,168	4%	2005	32,646	-9%
2004	11,127	1%	2003	39,579	0%	2004	35,700	22%
2003	10,967	2%	2002	39,700	8%	2003	28,000	0%
2002	10,800	4%	2001	36,548		2002	28,000	10%
2001	10,415		Growth since 2015: 8%			2001	25,100	
Growth since 2015: 23%			Growth since 2015: 8%			Growth since 2015: 3%		



I-190 Sterling North of Route 140			I-190 Sterling South of Route 140			12 Sterling North of I-190		
Year	Volume	Growth	Year	Volume	Growth	Year	Volume	Growth
2018	37,374	6%	2018	39,961	23%	2018	9,193	5%
2016	34,959	2%	2016	30,844	0%	2016	8,709	1%
2015	34,322	7%	2015	30,691	-8%	2015	8,629	-1%
2014	31,828	4%	2014	33,143	2%	2014	8,712	-14%
2013	30,586	-1%	2013	32,625	-1%	2013	9,946	12%
2012	30,764	0%	2012	33,058	1%	2012	8,763	-17%
2011	30,802	3%	2011	32,629	-1%	2011	10,284	21%
2010	30,003	-3%	2010	33,026	2%	2010	8,137	-3%
2009	31,050	-15%	2009	32,483	3%	2009	8,375	-2%
2008	35,782	17%	2008	31,398	-1%	2008	8,501	1%
2007	29,524	0%	2007	31,653	6%	2007	8,385	0%
2006	29,537	1%	2006	29,722	6%	2006	8,379	-3%
2005	29,290	0%	2005	27,919	-23%	2005	8,625	-4%
2004	29,300	4%	2004	34,300	0%	2004	9,003	0%
2003	28,078	4%	2003	34,200	11%	2003	8,969	4%
2002	26,965	1%	2002	30,600	23%	2002	8,647	-1%
2001	26,800		2001	23,500		2001	8,693	
Growth since 2015:		8%	Growth since 2015:		23%	Growth since 2015:		6%

202 North of Templeton Town-Line		
Year	Volume	Growth
2018	5,130	2%
2016	5,013	6%
2015	4,720	
Growth since 2015:		8%

## Progress

The table 4-28 below shows projects with congestion benefits which are scheduled on the 2020-2024 Transportation Improvement Program. 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 Leominster, currently listed for major improvements in 2020.



**Table 4-28 - 2020-2024 TIP Projects with Congestion Benefits**

City/Town	Project	Year	Cost
Leominster	LEOMINSTER- RECONSTRUCTION ON ROUTE 13, FROM HAWES STREET TO PROSPECT STREET	2020	\$5,994,626
Lancaster	LANCASTER- INTERSECTION IMPROVEMENTS ON ROUTE 117/ROUTE 70 AT LUNENBURG ROAD AND ROUTE 117/ROUTE 70 AT MAIN STREET	2021	\$2,723,583
Fitchburg	FITCHBURG- BRIDGE REPLACEMENT AND RELATED WORK, F-04-017, WATER STREET (STATE 2A) OVER BOULDER DRIVE AND PANAM RAILROAD & F-04-018, WATER STREET (ROUTE 12) OVER NORTH NASHUA RIVER	2021	\$21,543,216
Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	2022	\$9,537,724
Sterling- West Boylston	STERLING- WEST BOYLSTON- IMPROVEMENTS ON ROUTE 140 AT I-190	2023	\$834,840
Templeton	TEMPLETON- ROUNDABOUT CONSTRUCTION AT THE INTERSECTION OF PATRIOTS ROAD, SOUTH MAIN STREET, NORTH MAIN STREET AND GARDNER ROAD	2023	\$2,495,018
Lancaster	LANCASTER- INTERCHANGE IMPROVEMENTS AT ROUTE 2 EXIT 34 (OLD UNION TURNPIKE)	2024	\$5,568,000
Leominster	LEOMINSTER- IMPROVEMENTS AT ROUTE 12 (NORTH MAIN STREET) AT HAMILTON STREET; ROUTE 12 (NORTH MAIN STREET) AT NELSON STREET	2024	\$5,145,920

## Trends

### Traffic

Counts throughout the region show a period of increased traffic. Along with increased traffic comes heavier and more frequent periods of congestion. Many of the highlighted areas in this section have shown congestion for many years, especially during rush hour. Trends indicate that these areas, along with others, will continue to face problems with congestion as they currently exist.

## Recommendations

It is important to prepare for increased traffic and congestion throughout the region. Investments must be well thought out and balanced with other needs such as investments in maintenance and expansion. The following recommendations are made to help prevent the spread of congestion in the region.

- Continue to monitor trends throughout the region.



- Continue to monitor emerging technologies such as autonomous vehicles and ride hailing services and the impact made on congestion throughout the region.
- Continue to profile areas of heavy congestion and make recommendations for improvements.
- Work with MART and the MBTA to increase ridership in modes other than automobiles.