

# Congestion



## 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. Areas of congestion were identified through local knowledge, public input from surveys, MRPC studies, identified bottlenecks and various technical data sources.

### **System Analysis**

#### <u>Model</u>

The capacity of a road, or the maximum amount of traffic capable of being handled, is a good indication of a congested road. Utilizing the travel demand model, those road segments identified as having a volume-to-capacity (V/C) ratio greater than 1.0 were highlighted. The various links were grouped to develop corridors of concern. The following table is a listing of identified road segments.

Congested Roadways in the Montachusett MPO - Regional Travel Demand Model

Community	Road	Limits		
Athol	Route 32 (Petersham Road)	Between Routes 2 and 2A		
Ayer	Route 2A (Main Street)	Between West Main and East Main Streets		
	Brook Street	Between Main and High Streets		
Clinton	Route 110 (Main Street)	Between Beacon and Water Streets		
Fitchburg	Clarendon Street	Between Cleghorn St. and Franklin Rd.		
Titchburg	Blossom Street	Between Green and Crescent Streets		
Fitchburg/ Leominster	Route 12	Between downtown Leominster and downtown Fitchburg		
Gardner	Route 68 (Timpany Blvd)	Between Amer. Legion Circle and Central St. (Rt. 101)		
Groton	Route 111 (Farmers Row, Pleasant St., Elm St.)	Between West Main and Main Streets		
Harvard/ Ayer	Route 110/111 (Ayer Road, Harvard Road)	Between Rt. 2 and Fredrick Carlton Circle		
Leominster	Prospect Street	Between Rt. 13 and Lunenburg town line		
Leominster	Route 13	Between Route 12 and Lunenburg town line		
	Leominster Road	Between Lancaster and Prospect Streets		
Lunenburg	Townsend Harbor Road	Between Mulpus Road and Townsend town line		
Lanenburg	West Townsend Road	Between Northfield Road and Townsend town line		
	West Street	Between Rt. 13 and Pleasant Street		
Sterling	Route 12 (Main Street, Leominster Road)	Between Worcester Road and Leominster city line		
Winchendon	Route 12 (Spring Street)	Between Gardner Road (Rt. 140) and School Street		



An additional analysis of these segments was conducted to verify and document congestion problems. Field surveys of the locations above during peak travel times resulted in the following segments being identified with congestion issues:



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

• 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. In addition, significant changes in traffic volumes are anticipated with the full development of Devens. The Devens Traffic Monitoring Program, 2005 Five Year Traffic Report (2006) projected AM and PM peak hour traffic volumes at identified intersections in Shirley, Ayer and Harvard to increase from 17% to 223% from current levels. The following table lists those intersections within the Montachusett Region that should continue to be monitored for congestion and safety issues.

#### Estimated Peak Hour Future Traffic Percentage Increase Due to Devens Development

Community	Intersection	AM	PM
Shirley	Main Street/Lancaster Road/Leominster Road/Center Road	81%	69%
-	Ayer Road/Hospital Road	92%	97%
Ayer	West Main Street/Grant Road	25%	22%
	West Main Street/Sherman Avenue	223%	193%
	Main Street (Rt 2A/111)/West Main Street/Park Street (Rt 2A/111)	94%	71%
	Park St (Rt 2A/111)/Fitchburg Rd (Rt 2A)/Groton School Rd (Rt 111)	141%	90%
	Central Avenue/Groton Harvard Road	18%	17%
	Ayer Road (Rt 2A/110)/Willow Road/Bruce Street	91%	135%
Harvard	Ayer Road (Rt 110/111)/Mass Ave (Rt 111)/Still River Road (Rt 110)	53%	66%

Source: Devens Traffic Monitoring Program, 2005 Five Year Traffic Report, March 2006

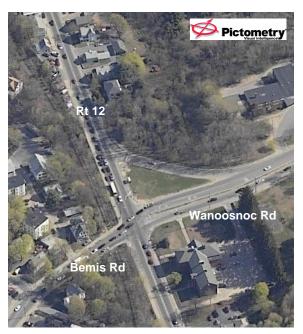


was well

• Route 12, Fitchburg and Leominster – Traffic congestion along this corridor was well documented in a previous study conducted through MassDOT entitled the "Fitchburg/Leominster/Lunenburg Transportation Analysis Project" (F/L/L TAP) in 1999. Many suggestions to improve the transportation system throughout the three towns stemmed from this study including various recommendations for the improvement of Route 12 between Erdman Way in Leominster and Bemis Road in Fitchburg. Final construction has been completed in the summer of 2010 and it is the intention of the MRPC to revisit congestion and traffic related operations to determine levels of improvement within the next few years as new data becomes available.



Route 12 looking North from Nichols Street in Leominster to Benson Street in Fitchburg.



Route 12/Bemis Road/Wanoosnoc Road in Fitchburg looking South.

 Route 12 (Spring Street), Winchendon – Previous travel time and delay studies showed some congestion due to the intersection of Spring Street and Gardner Road (Route 140). Since that time this intersection was completely redesigned and a traffic signal was installed. Traffic flow through this crossing has improved significantly. The Spring Street/Front Street/Central Street and Route 12/River Street (Route 202) intersections continue to have traffic problems due to volumes as well as geometric issues. Traffic warrant studies have been conducted that indicated that signals are justifiable at these locations.



Route 13 Leominster and Lunenburg – This segment was also included in the "Fitchburg/Leominster/Lunenburg Transportation Analysis Project". 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 Rte. 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. The proposed improvements will also address safety at the Route 13 and Prospect Street intersection, which is identified as #35 on the list of high crash locations across the Commonwealth. This project or a project with a similar scope may be included on the TIP within the next few years.



Route 13 at Haws Street and Route 2 On/Off Ramps in Leominster Looking West



Route 13 at Route 2 Westbound On/Off Ramps in Leominster Looking West



#### **Local Input/Analysis**

#### **Major Corridors**

In addition to data developed from the travel model, local knowledge of the road network as well as input from officials and various studies have identified other road segments and intersections where congestion is or can be an issue. When asked what the biggest concern regarding the regions transportation system in a public survey conducted as part of the development of this Regional Transportation Plan the most common responses cited congestion in one form or another. The following is a list of some additional areas frequently mentioned.

#### **Congested Roadways in the Montachusett MPO**

Road	Community	Limits
South Street/ Merriam Ave/Twin City Mall	Fitchburg, Leominster	Wanoosnoc Rd. to Leominster City Line; Fitchburg City Line to Lindell Ave
Main Street	Fitchburg	Route 2A to Route 31 (Mechanic St)
Route 117	Lancaster	Rt 70N to Rt 70S
Route 2	Harvard, Lancaster, Leominster	Between I-190 and I-495
Route 2	Leominster Fitchburg Westminster Gardner	Between I-190 and Rt 68 Gardner
Route 12	Leominster	Erdman Way to Washington St; Washington St to Union St
Route 13	North Leominster	Lunenburg Town Line to Route 12
Route 119	Townsend Groton	Rt 13 to Route 225
Downtown Area	Ayer	Confluence of Routes 110 / 111 / 2A and West Main Streets and surrounding areas

- 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.
- Main Street, Fitchburg Traffic between Water Street (Route 12) and Lunenburg Avenue (Rt 2A)/Summer Street are impacted by three traffic signals. One at each end of this segment as well as a signal at North Street that helps traffic access the Commuter Rail Parking Facility at the Fitchburg Intermodal Center and Fitchburg State University.





Main Street in Fitchburg Looking North.

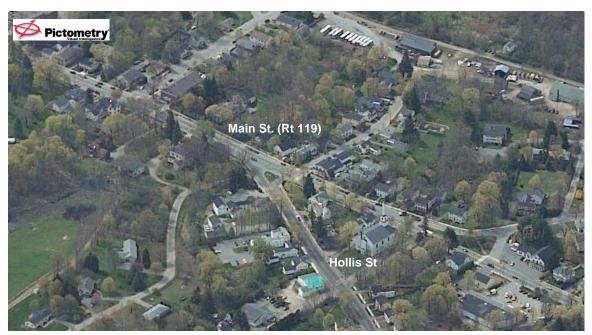
- Route 117, Lancaster and Leominster This state route is a major commuter road that provides access to I-190 at the Leominster/Lancaster line and I-495 in Bolton located east of Lancaster. Most of the congestion along this corridor occurs during AM and PM peak hours. Also causing significant delays 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 few 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. Further analysis on the function of this section of Route 117 may be conducted as it reaches full development.
- 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 affect 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. Due to recent funds available through the Federal Stimulus program additional work on Route 2 throughout the region has been completed in the past few years, however, 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 considered by the Montachusett Metropolitan Planning Organization (MMPO) staff. Designation of this type, i.e. interstate highway, would make this segment eligible for Interstate Maintenance funds.
- Route 12, Leominster This route runs north/south through the City of Leominster and provides access to Route 2 in the north side of Leominster and I-190 just south of the city in Sterling. The segment from Route 2 into Fitchburg was evaluated during the F/L/L TAP and improved upon recently as previously mentioned. However the



- segment from Route 2 south through the downtown center to the Sterling town line also experiences significant volumes and congestion.
- 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.



#### **Major Intersections/Crossings**

Congestion at major intersections or crossings 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 to issues with Route 2. Adequate access to this major east/west highway 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 community's 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.

The following table lists those additional major intersections and crossings identified.

**Congested Intersections/Crossings in the Montachusett Region** 

Community	Road	Intersection With		
Ayer	Route 2A	Route 111 / West Main St. / Park St.		
Fitchburg Leominster	Route 2	Exit 30 Merriam Ave/South St		
	Route 31	J Fitch Highway		
	Route 2A	Princeton Rd (Rt 31)		
Fitchburg	Route 2A/2A/31	Ashburnham St (Rt 12)		
Thoribarg	South St	Electric Ave		
	Bemis Rd	Airport Rd		
	Summer St	J Fitch Highway		
	Davita 0	Exit 23 Pearson Blvd		
Gardner	Route 2	Exit 22 Rt 68		
	Route 140	Route 101		
Groton	Route 119	Route 225		
	Route 2	Exit 34 Harvard St/Old Union Turnpike		
Lancaster	Route 117	Route 70N		
	Noute 117	Route 70S		
		Exit 32 Route 13		
Leominster	Route 2	Exit 31 Route 12		
		I-190		
	Route 140	Route 62		
Sterling	I-190	Route 12		
		Route 140		
Templeton	Route 2A	South Main St. / Route 101 / North Main St.		
Townsend	Route 119	Route 13		
	Route 2	Exit 25 Rt 2A/Rt 140		
Westminster	Noute 2	Exit 24 Rt 140 Bypass		
	Route 2A	Main St. / South St. / Leominster St.		
		Route 140		
Winchendon	Route 12	Central St		
		School St		

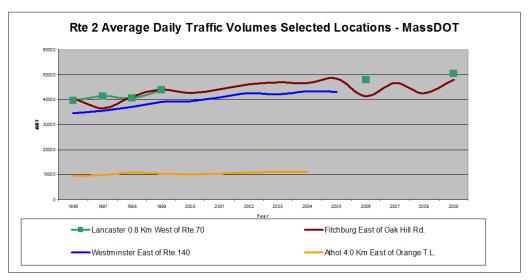


Route 2 Interchanges, Lancaster, Leominster, Fitchburg, Westminster, Gardner, Templeton - As indicated, Route 2 represents one of the most important arteries to the region and its continued improvement and maintenance remains a priority. Continued growth has resulted in significant increases in traffic volumes along the entire segment of this highway. Data from MassDOT count locations show steady traffic increases at locations along Route 2 between 1996 and 2009. The latest available volume numbers range from 57,000 Vehicles Per Day (VPD) just west of Route 13 in Leominster (2009) to 11,127 VPD in Athol approaching the Orange Town Line (2004). It should be noted that the table below is not necessarily an average VPD for each year but in most cases data collected on a specific midweek day during that year which may not fully exemplify the every day average. The few permanent count stations in Athol - east of the Orange town line, Lancaster - west of Route 70 and Westminster – east of Route 140 represented in the chart below show steady increases. Additional factors such as increased gas prices and developments on the MBTA Fitchburg Commuter Rail Line will be monitored as they may affect the Average Daily Traffic (ADT) on Route 2. With such high traffic volumes, access on to and off of Route 2 becomes critical both from a traffic flow and safety standpoint.

Route 2 Average Daily Traffic Volumes - MassDOT Count Stations

CITY/TOWN	Harvard	Lancaster	Leominster	Leominster	Leominster	Fitchburg	Westminster	Westminster	Gardner	Gardner	Templeton	Phillipston	Athol
LOCATION	At Littleton T.L.	0.8 Km West of Rte.70	West of Lancaster T.L.	West of Rte.13	West of Rte.12	East of Oak Hill Rd.	Between Exits 24 & 25	East of Rte.140	East of Rte.68	West of Rte.68	At Gardner C.L.	East of Rtes.2A & 202	4.0 Km East of Orange T.L.
1996		39567				40700		34494					9538
1997		41221		51400		36500		35572				13800	9915
1998	42800	40627		52200		41100		37151			17000		10963
1999		43870			46600	44200		39018					10401
2000				54500		42500		39362				16000	10196
2001	50000		38000	67400		44100		40923			19400		10415
2002					51100	46100		42663					10800
2003				55500		46800		42168				16600	10967
2004	46900		36900	60700		46600	44400	43257			22400		11127
2005					48700	48300		42991	32700	23500			
2006		47800		55100		41400							
2007	48800		47200	52400		46600							
2008					47000	42700							
2009		50498		57000		47900							





Inadequate geometrics would appear to be an issue at several of the remaining locations. In particular, problems at Exit 35 - Fort Pond Road/Old Union Turnpike in Lancaster, Exits 32 - Route 13 and 31 - Route 12 in Leominster, Exit 30 - Merriam Avenue/South Street in Fitchburg/Leominster and Exit 25 - Route 2A/140 in Westminster should be priorities due to volumes as well as safety. Exit 32 - Route 13 was evaluated as part of the "Fitchburg/Leominster/Lunenburg Transportation Analysis Project". Improvement options that were recommended however related more to the ramp (in particular the westbound ramp) and its connection to Route 13 and not with the acceleration and deceleration lanes on both sides of Route 2.

One interchange recently improved by MassDOT in 2005 is Exit 34 - Harvard Street/Old Union Turnpike in Lancaster. Improved access lanes corrected a deficient interchange. However, large commercial developments in the immediate area have increased traffic using this ramp tremendously, especially during holiday seasons. MRPC is working with the town of Lancaster to re-classify surrounding as the increased use has clearly affected their standing in the hierarchy of roads in the region.

• Route 2 and I-190 – Leominster; This crossing is the connection/merge of Route 2, Exit 33 - Leominster Connector, Exit 32 - Route 13, and I-190 - a major interstate highway that begins at this location and runs south to Worcester, I-290 and the Massachusetts Turnpike. The current configuration experiences regular delays and backups, most notably during afternoon peak periods with westbound traffic. I-190 northbound traffic merges with Route 2 westbound traffic in a configuration that has four lanes (two from I-190 and two from Route 2) closing down to two lanes resulting in weaving between inside and outside lanes by drivers attempting to maintain speed and "jockey" for position. This same weaving section combines with traffic backed up attempting to utilize Exit 32 and causes many congestion and safety issues. In times of heavy volumes, slow downs and delays occur. An examination of the travel lanes and patterns should be undertaken to improve the situation.



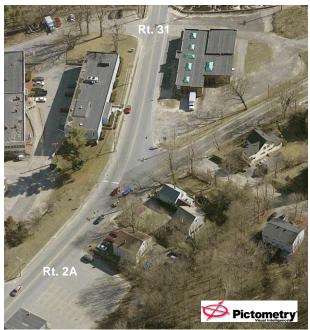
Route 2 and I-190 Interchange in Leominster Looking South.



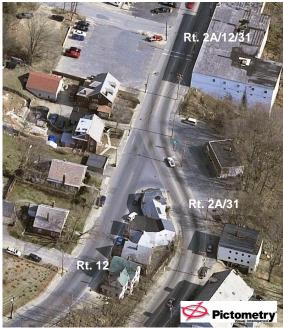
Route 2 and I-190 Interchange in Leominster Looking West. Point Where I-190 Northbound Lanes Merge With Route 2 Westbound Lanes.



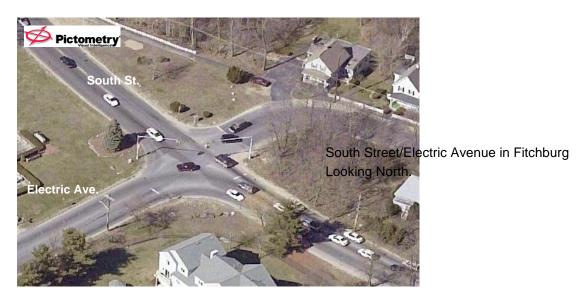
• Route 2A/Princeton Road (Route 31), Route 2A/Route 31/Route 12 (Ashburnham Road), and South Street/Electric Avenue Intersections, Fitchburg; and Route 2A/Route 111/West Main St. intersection in Ayer - These intersections experience significant volumes but in the case of Route 2A/Princeton Road (Route 31) and Route 2A/Route 31/Route 12 (Ashburnham Road), geometrics appear to be the major factor in their poor operation. Improvements such as traffic signals or a roundabout would likely address the deficiencies present. The South Street/Electric Avenue intersection is currently signalized and changes to the timings or phases should be investigated.



Route 2A/Route 31 in Fitchburg Looking South.



Route 2A/Route 31/Route 12 in Fitchburg Looking North.





• Route 68 (Main Street)/Route 101 (Central Street), Gardner; Route 101/Route 2A/North Main Street/South Main Street, Templeton; Route 2A/Main Street/South Street/Leominster Street, Westminster; Route 140/Route 62 intersection and I-190 interchanges at Route 12 and at Route 140, Sterling - These intersections have geometric problems that result in numerous driver conflict points. Although volumes are a concern, safety would appear to be the major issue and not necessarily congestion. The Gardner crossing, however, located in the downtown area, not only has geometric problems but volumes that contribute to congestion. The I-190 Exits in Sterling were examined by the MRPC and MassDOT and designs have been discussed that would improve safety and reduce congestion backup stemming from the ramps onto I-190.



Route 101/Route 2A/North Main Street/South Main Street in Templeton Looking South.





Route 2A/Main Street/South Street/Leominster Street in Westminster Looking South.



Route 140 and Route 62 in Sterling Looking North





I-190 Southbound at Route 140 on-off Ramp Looking North



I-190 Northbound at Route 140 on-off Ramp Looking North



I-190 Northbound at Route 12 on-off Ramp Looking North



I-190 Southbound at Route 12 on-off Ramp Looking North



#### **Bottlenecks**

Traffic "bottlenecks" are specific physical locations on roadways that routinely and predictably experience congestion because traffic volumes exceed highway capacity. Bottlenecks may exist due to any number of reasons in the roadway network. They are typically characterized by queues upstream and freely flowing traffic downstream. Once the traffic flow breaks down to stop-and-go conditions, capacity is actually reduced – fewer cars can get through the bottleneck because of a backup of extra vehicles waiting to navigate through the congested area.

In the Montachusett Region bottlenecks are a large factor in causing congestion. Through public input, observing characteristics in traffic flow throughout the region and investigating areas traditionally known to have bottleneck characteristics, the following list of five bottlenecks are determined to be the most troublesome in the region. Although many locations throughout the region display bottleneck characteristics, the overall affect that the following locations routinely have on surrounding traffic flow sets them aside from other locations.

#### Worst Bottlenecks in the Montachusett Region

Downtown Main Street	Ayer
Lower Main Street	Fitchburg
Water St. (Rte. 12)/ Main St. (Rte. 2A)	Fitchburg
South St./ Merriam Ave./ Twin City Mall	Leominster/Fitchburg
Route 2 exit 32/ Route 13	Leominster

Aside from Lower Main Street in Fitchburg all areas listed above have been previously mentioned. In the Lower Main Street area multiple roadways meet as high volumes of vehicles navigate through a cluster of traffic signals. Especially during the peak PM hours traffic backs up and drivers often wait through multiple signal queues before moving through. The city has shown interest in improving this area which has sparked discussion of many improvement options. Further Study is needed.



#### Recommendations/Projects

Congestion issues are currently being addressed through projects currently under construction or listed on the Transportation Improvement Plan (TIP).

#### Congestion Related Projects Represented in TIP or Under Construction

Community	Project	TIP Year	Cost
Fitchburg	Intersection Improvements - Installation of a Roundabout at John Fitch Highway and Ashby State Road (Route 31)	Under Construction	\$1,400,000
Leominster	Intersection & Signal Improvements at Merriam Avenue and Lindell Avenue	FY 12	\$5,600,000
Lancaster	Reconstruction on Route 70 (Lunenburg Road) At Old Union Turnpike	FY 12	\$159,160
Lancaster	Intersection Improvements @ Five Corners: Route 110 (Bolton Road, High Street Extension), Center Bridge Road, Old Common Road	FY 13	\$800,000
Leominster	Reconstruction on Route 13, From Hawes Street to Prospect Street	Appendix	\$6,330,987
Harvard/ Lancaster	Reconstructon & Widening on Route 2 Ramps @ 35, 36 & 38	Appendix	\$4,000,000

Based upon the congestion information reviewed, the following are recommended locations for projects or in some cases, further analysis/study (due to the need to further define an improvement project). Cost estimates are provided for each location based upon generalized project costs from MassDOT for comparable improvements or through discussions with MassDOT District offices. Please see the financial section of the RTP for a more detailed discussion of cost estimates.

#### Recommendations of Congested Areas for Further Analysis/Study

Community	Road	Limits	Action
Leominster/ Fitchburg	Merriam Avenue/South Street	From Lindell Avenue/West Street to Wanoosnoc Road	Further Study
Fitchburg	Main Street/Mechanic Street (Rte. 31)/ Rollstone Street/Boulder Drive/Academy Street	Lower Main Street Common	Further Study
Leominster	Route 12	From Hamilton Street/Lindell Avenue to Sterling Town Line	Further Study
Townsend/ Groton	Route 119	From Route 13 to Littleton Town Line	Further Study
Ayer	Main Street/Park Street Rte 2A & Rte 111)	Downtown Area to Littleton Town Line	Further Study
Harvard/ Lancaster/ Leominster	Route 2	From I-495 to I-190	Possible Classification Change



## **Recommendations for Congestion Related Projects in Region**

Community	Location	Est. Cost
Leominster	Route. 2 Exit 31 Route 12 (incl Rt 12 Bridge Repair)	\$8,500,000
Sterling	I-190 Exit 5 / Route 140	\$2,000,000
Sterling	I-190 Exit 6 / Route 12	\$2,000,000
Sterling	Route 140 / Route 62	\$1,500,000
Leominster/Fitchburg	Route. 2Exit 30 Merriam Ave/South St	\$1,250,000
Westminster	Route 2 Exit 25 Rt 2A/Rt 140	\$1,250,000
Gardner	Route 2 Exit 23 Pearson Blvd	\$1,250,000
Leominster	Route. 2 / I-190	\$1,250,000
Fitchburg	Route 2A/Route 31/Ashburnham St (Rt 12)	\$750,000
Fitchburg	South Street / Electric Ave	\$250,000
Gardner	Route 68 / Route 101 (Central St)	\$750,000
Templeton	Route 101 / Route 2A / N Main St / S Main St	\$750,000
Westminster	Main St (Route 2A) / South St / Leominster St	\$750,000

Estimated Total \$22,250,000

