# BOTTLENECKS

## As Defined by the Congestion Management Process for the Pioneer Valley

Endorsed March 2, 2011

Prepared by:
The Pioneer Valley Planning Commission

This document was prepared under contract with the Massachusetts Department of Transportation. This report was funded in part through grant(s) from the Federal Highway Administration (and Federal Transit Administration), U.S. Department of Transportation. The views and opinions of the authors (or agency) expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

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## Final Report

Endorsed March 2, 2011

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Prepared Under the Direction of the
Pioneer Valley Metropolitan Planning Organization
by the Pioneer Valley Planning Commission
60 Congress Street
Springfield Massachusetts, 01104

## March 2010

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# Introduction

The Congestion Management Process (CMP) in the Pioneer Valley Region identifies and evaluates congested corridors, while implementing transportation performance measures that enhance the safety and efficiency of the movement of people, goods, and information. The "Bottlenecks" report further refines the existing CMP methodology and evaluates individual roadway segments along each corridor. Segments are determined on a corridor by corridor basis and vary in length and physical characteristics. As a result, the degree of congestion severity can vary significantly along a given corridor.

The Federal Highway Administration (FHWA) defines a congestion bottleneck as "A localized section of highway that experiences reduced speeds and inherent delays due to a recurring operational influence or a nonrecurring impacting event"[1]. If congestion occurs along an entire corridor, then the corridor is considered congested. Likewise, if the corridor is experiencing congestion only at a specific location, then the corridor is considered a congestion bottleneck. This report will highlight the Top 15 congestion bottleneck locations in the Pioneer Valley.

# Methodology

Automobile travel time data provides a snapshot on the overall operating conditions along a given corridor. Data collected as part of this process allows for a variety of performance measures to be established to help compare the level of congestion to other roadways in the region. The methodology and performance measures used in this process are described below.

### Data Collection

The PVPC has identified 76 congested corridors (see the Congestion Management Process for the Pioneer Valley Region report for corridor description for data collection in the region. The data collection for all corridors is facilitated by a four-year data collection cycle. A data collection year is scheduled to correspond with an average academic school year beginning in early September and ending in late May. Data collection is restricted by factors to include but not limited to: inclement weather, federally observed holidays, and school vacations. The data is collected for each corridor on multiple days and in both directions during the AM and PM peak hours (7:00 AM - 9:00 AM and 4:00 PM - 6:00 PM). Drivers are instructed to travel with the flow of traffic but not exceed the posted speed limit for each 2 hour data collection period.

PVPC staff collected all travel time data by performing multiple data collection runs along each of the CMP corridors using a Qstarz Global Positioning System (GPS) travel recorder. This data was downloaded for evaluation and analysis using the TravTime™ 2.0 software by GeoStats. The speed, direction, and time of all recorded data points are summarized for each travel time run along every corridor. Each corridor is also divided into segments determined by landmarks such as intersections in order to identify pockets of congestion within each corridor. Base maps, including defined segment locations and speed limits, are created on TravTime™ 2.0 prior to the download of data. Once these maps are created, the data points are evaluated to determine the three performance measures that define congestion.

### Performance Measures

Three separate measures are currently being utilized to evaluate congestion in the Pioneer Valley region. They are: travel time index, total delay, and congestion ratio.

[1] http://www.ops.fhwa.dot.gov/bn/lbr.htm#g3

A combination of different performance measures was utilized to compensate for the impacts of very short or very long travel times that can occur as a result of daily and seasonal traffic variations in conjunction with recurring and non-recurring congestion. A summary of each of the three measures is provided below.

**Travel Time Index**

The travel time index is the ratio of average peak travel time to free-flow travel time. Index values can be described as an indicator of the length of extra travel time spent during a trip. A travel time index of 1.0 represents free-flow travel conditions in which there are no delays. Any congestion increases the travel time index. For example, a value of 1.20 means that average peak travel times are 20 percent longer than free-flow travel times.

$$\text{Travel Time Index} = \frac{\text{(Actual Travel Time)}}{\text{(Free Flow Travel Time)}}$$

**Travel Time Delay**

Travel Time Delay is defined as the difference between the second worst and second best travel time in seconds per mile.

$$\text{Delay} = \frac{\text{(Second Worst Travel Time)}}{\text{(Length of Roadway)}} - \frac{\text{(Second Best Travel Time)}}{\text{(Length of Roadway)}}$$

**Travel Time Congestion Ratio**

Travel Time Congestion Ratio is defined as the second worst travel time divided by the second best travel time in seconds,

$$\text{Congestion Ratio} = \frac{\text{(Second Worst Travel Time)}}{\text{(Second Best Travel Time)}}$$

**Analysis**

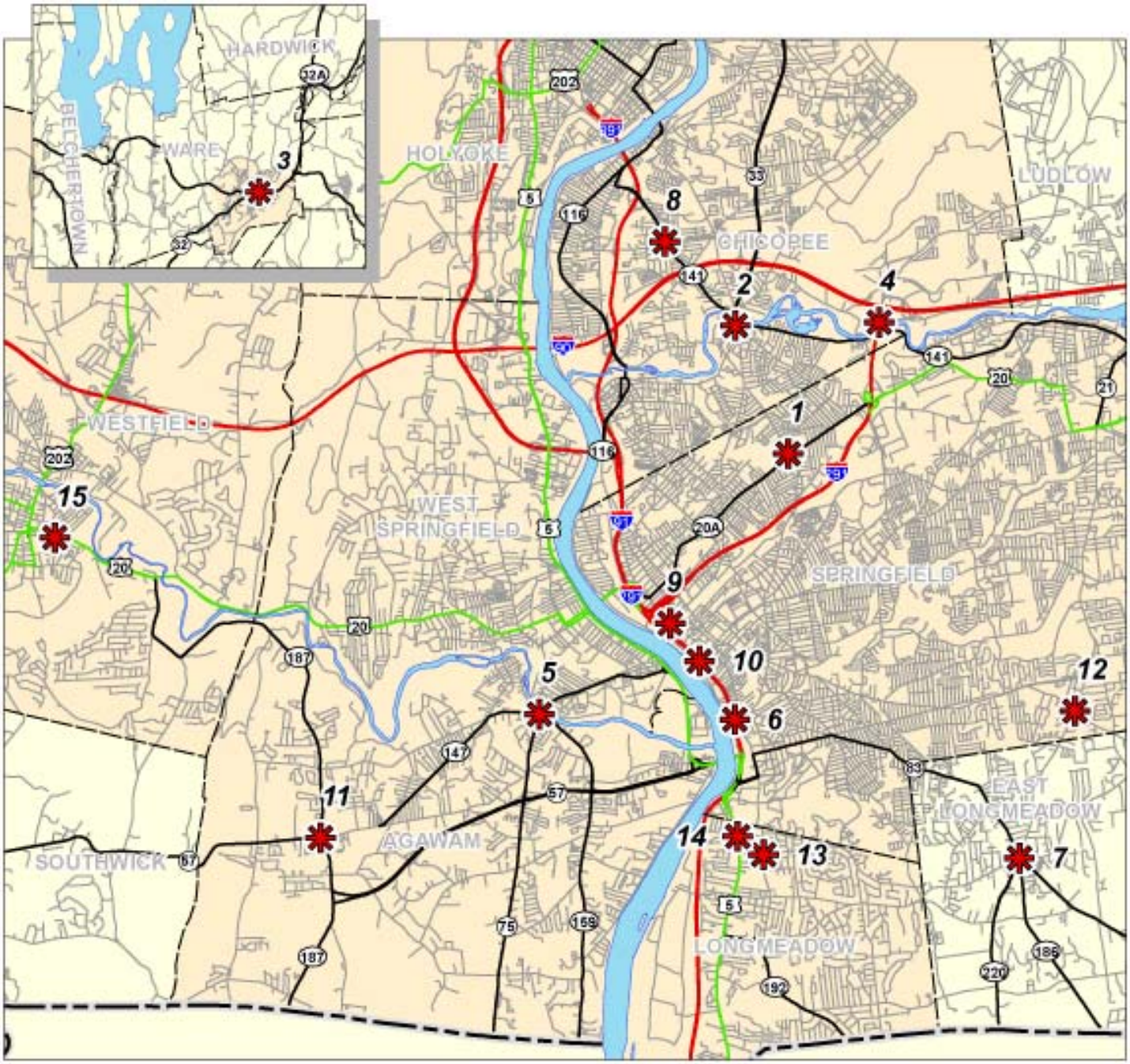
Unlike the Congestion Management Process (CMP) which identifies congested corridors, this report focuses on congested segments within each CMP corridor. Each segment was ranked based on the inverse value of each of the travel time performance measures. As a result segments, with higher values for each of the performance measures received a higher weight in the ranking scheme. Currently, there are a total of 338 segments with travel time data available. The ranking scheme ranges from 1 to 338 with a value of 338 indicating the highest level of congestion and 1 indicating the lowest level of congestion. Priority on segments that had the same rank was given to the corridor with the higher Travel Time Index.

PVPC used this process to identify the top 15 congested segments in the region to identify the top bottlenecks in the Pioneer Valley Region. The list of 15 locations was then brought before the Pioneer Valley Joint Transportation Committee (JTC) for their review. The results of the analysis are presented in Table 1 and Figure 1.

**Table 1: Congestion Bottlenecks in the Pioneer Valley Region**

| Rank | Municipality | Checkpoint | Congestion Score |
|---|---|---|---|
| 1 | Springfield | Saint James Avenue from Carew Street intersection to Saint James Boulevard intersection | 336.67 |
| 2 | Chicopee | Main Street and East Main Street at Bridge Street and Broadway | 335.00 |
| 3 | Ware | Main Street (Route 9/32) at Church Street and South Street | 330.00 |
| 4 | Chicopee | I-291 from Exit 5 to Fuller Road at Exit 6 and Fuller Road at I-291 northbound and southbound Ramps | 327.33 |
| 5 | Agawam | Main Street and Springfield Street at Suffield Street and Walnut Street Intersections | 320.33 |
| 6 | Springfield | East Columbus Avenue intersections at Long Hill Street and Mill Street | 308.00 |
| 7 | East Longmeadow | East Longmeadow Rotary | 308.00 |
| 8 | Chicopee | McKinstry Avenue at Grattan Street | 305.00 |
| 9 | Springfield | Main Street at Liberty Street | 301.00 |
| 10 | Springfield | East Columbus Avenue intersections at State Street and Boland Way | 295.00 |
| 11 | Agawam | North Westfield Street and South Westfield Street at the intersection Springfield Street and Southwick Street (Feeding Hills Center) | 281.67 |
| 12 | Springfield | Allen Street at Cooley Street | 279.33 |
| 13 | Longmeadow | Laurel Street at Converse Street and Forest Glen Road | 276.33 |
| 14 | Longmeadow | Longmeadow Street From Converse Street to the Springfield City Line | 268.67 |
| 15 | Westfield | Elm Street and Main Street from the Great River Bridge to Nobel Street | 268.33 |

**Figure 1 Congestion Bottlenecks in the Pioneer Valley Region**




*TOP 15 TRAFFIC CONGESTION BOTTLENECKS*

## *Top 15 Bottlenecks*

### 1. Springfield: Saint James Avenue from Carew Street intersection to Saint James Boulevard intersection


The area of study is defined by the triangle formed by St. James Avenue, Carew Street, and St. James Boulevard from their intersections with Corona Street, Sherbrook Street and Shaine Street. The signalized intersections of St. James Avenue at Carew Street and St. James Avenue at St. James Boulevard are included in the CMP data collection process.

Heavy pedestrian traffic can contribute to congestion in this area especially during peak hours of travel. The intersection with the most pedestrian traffic is at the intersection of Shaine Circle, Carew Street and Sherbrook Street due to the nearby schools. A total of 106 pedestrians were observed at the intersection of St. James Avenue with St. James Boulevard during the afternoon peak hour.

Automobile crashes are considered a source of non-recurring congestion. The intersections of St. James Avenue with St. James Boulevard and St. James Avenue with Carew Street experienced a significant number of crashes. These intersections have averaged 25 and 15 crashes per year from 1999 – 2003. By comparison, an intersection that experiences an average of 5 crashes per year can be considered as having a safety problem. Both intersections experience a high percentage of angle type collisions. This is likely a result of the high concentration of curb cuts in the immediately vicinity of both intersections.

A number of factors may contribute to the high rate of crashes occurring in the study area. All of the traffic signals at both intersections with St. James Avenue are displayed on posts. This can result in one or both of the traffic signal heads being blocked from view by larger vehicles such as a truck or a bus. The high concentration of curb cuts also increases the opportunity for vehicle conflicts in the vicinity of both intersections. A common collision at site driveways that exit onto a four lane roadway is the exiting vehicle colliding with a through moving vehicle in the inside travel lane after a vehicle in the outside travel lane slows or stops.

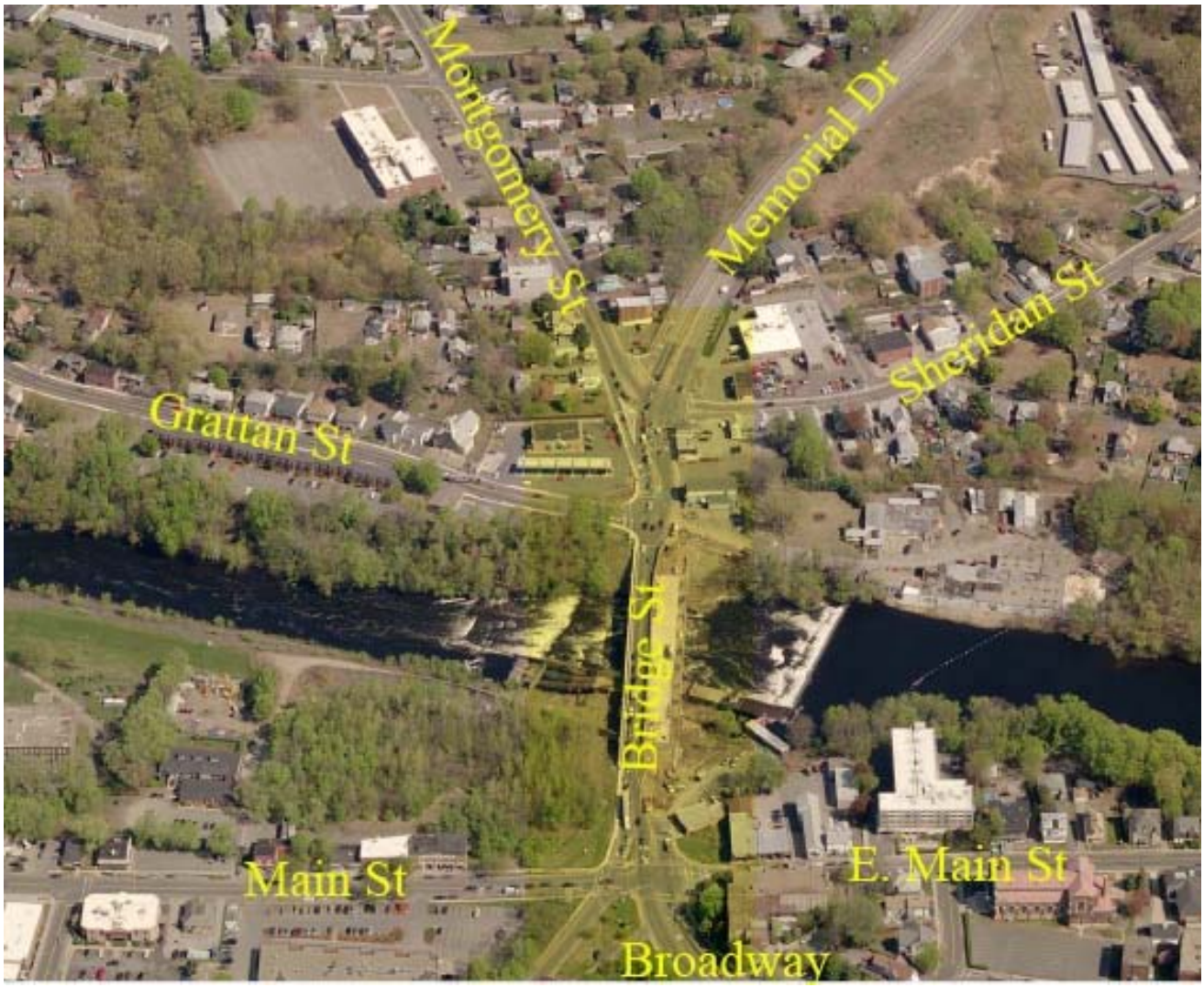
Although the actual signalized intersections function at an acceptable level of service, the high crash rate, high volume of pedestrians and numerous curb cuts all present safety concerns, which contribute to this congestion at this location.

**CURRENT ACTIVITIES** – PVPC completed the St James Avenue, St James Boulevard, and Carew Street safety study in 2005. The report highlighted the excessive curb cuts along St. James Avenue between St. James Boulevard and Carew Street as a potential cause of congestion.

**JURISDICTION** -The City of Springfield has jurisdiction.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES -** The potential improvements for this area are anticipated to be taken from the recommendations of the safety study completed by the PVPC. The St. James Avenue approaches to its intersections with St. James Boulevard in the northbound direction and Crew Street in the southbound direction have very wide travel lanes. The City of Springfield should consider painting a single white edge line along St. James Avenue to create a shoulder and define a twelve foot lane of travel. This will assist in guiding traffic along St. James Avenue and prevent vehicles from driving the roadway as four-lane roadway. As funding becomes available, the traffic signal control equipment at the intersections of St. James Avenue with Carew Street and St. James Avenue with St. James Boulevard should be upgraded to conform to the standards of the Manual on Uniform Traffic Control Devices. This upgrade should include the installation of overhead traffic signals via a mast arm or span wire to increase the visibility of the signal heads in this area. Push button actuated pedestrian traffic signals would also improve the safety of pedestrians in the study area. PVPC will continue to monitor congestion in this area.

## 2. Chicopee: Main Street and East Main Street at Bridge Street and Broadway and Memorial Drive at Montgomery Street, Sheridan Street, and Grattan Street




Congestion in this area occurs along Routes 33 and 141 in the vicinity of the Deady Memorial Bridge. Geographically from north to south, this includes the intersections of Route 33 (Memorial Drive) with Sheridan Street and Montgomery Street; Route 33 (Memorial Drive) with Route 141 (Grattan Street); Route 33 (Bridge Street) with Main Street, East Main Street, Church Street, and Broadway; and Broadway with East Street and Belcher Street. The Deady Bridge was reconstructed in 2008; however, an improvement project for the intersections surrounding the bridge is still in the design phase.

Based on the capacity analysis completed by MassDOT, several intersection approaches are operating at or near design capacity which causes unacceptable queuing and delay. The intersection of Broadway with Main Street, East Main Street and Church Street operates at a Level of Service (LOS) E during the PM peak hour. The existing traffic signal timing and phasing plans in the study area are antiquated and no longer serve existing traffic patterns.

**CURRENT ACTIVITIES** – MassDOT Highway Division completed the Route 141 Memorial Bridge Study in December of 2002. The study identified two areas of improvement needed to relieve congestion in the vicinity of the bridge. The first area, which was completed in 2008, recommended reconstructing the bridge to provide 5 travel lanes. This included a designated left turn lane at either end of the bridge. The second recommendation consisted of improvements to the intersections at either end of the bridge. It was recommended that both the Route 33 (Memorial Drive) with Montgomery Street and Sheridan Street, and the Route 33 (Montgomery Street) with Route 141 (Grattan Street) and Deady Bridge intersections have signal timing and phasing improvements implemented as well as operate in coordination to improve capacity and traffic flow. Additional widening was recommended at the intersection of Broadway with Route 141 (East Main Street), Main Street, Church Street and the Deady Bridge to provide for additional storage. Signal timing and phasing improvements were also proposed for the intersection of Broadway with East Street and Belcher Street. To date the traffic signal improvements have not been implemented. The City of Chicopee is currently at the 25% design phase with the signal and intersection improvement project.

**JURISDICTION** -The City of Chicopee has jurisdiction at intersections, MassDOT has jurisdiction for Deady Bridge

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – The City of Chicopee and MassDOT should continue to advance the traffic signal improvement project as recommended in the Deady Memorial Bridge Study. PVPC will continue to monitor congestion at this location.

## 3. Ware: Main Street (Route 9/32) at Church Street and South Street


Two major routes (Route 9 and Route 32) intersect within the downtown area of the Town of Ware. These roadways provide direct connections to the Town of Palmer, Amherst, Belchertown and Worcester County. South Street is the main access route to some of the major employers in the Town of Ware such as the Country Bank for Savings, Baystate Mary Lane Hospital, and Kanzaki Specialty Papers. As a result, a high volume of commuter traffic travels through the downtown area and the intersection of Main Street (Route 9/32) with South Street and Church Street during the afternoon peak hour.

Main Street (Route 9/32) intersects with South Street and Church Street to form a four-way signalized intersection. Capacity at this intersection is restricted by on-street parking, the existing land uses in close proximity to the intersection and Nenameseck Square, a historically protected town green. Both Pulaski Street and an unnamed access roadway intersect with Main and South Streets in close proximity to the intersection. This creates unusual traffic flow patterns and long vehicle queues that block the intersections. The current intersection geometry also causes problems for larger vehicles such as trucks when attempting to turn right from Main Street onto South Street. PVPC staff observed that most heavy vehicles must utilize the existing through travel lane to complete right turn maneuvers onto South Street. This still requires the vehicle to drive over the curbing and sidewalk that surrounds Nenameseck Square. Pedestrians are not allowed to use this sidewalk due to the potential for conflict in this area.

Based on the results of an analysis conducted by the PVPC, Main Street (Route 9/32) with Church Street and South Street suffers long delays during the PM peak hour. The intersection was calculated to operate at LOS of "D" with an overall delay of 45 seconds. South Street experiences the longest delays and was calculated to operate at LOS "F" with long vehicle queues. While not reflected in the Level of Service, traffic along Main Street does not always flow uniformly and vehicle queues often can interfere with turning movements and parking maneuvers.

**CURRENT ACTIVITIES** – This intersection is included in a traffic signal coordination study completed by the PVPC for the Town of Ware. The Ware Downtown Signal Coordination and Safety Study outlines both short and long term goals for the study area. The short term goals include the retiming of South Street and Main Street to eliminate an inefficient and antiquated all-red pedestrian crossing phase, re-painting existing pavement markings to increase visibility, and improving the geometry in the vicinity of Nenameseck Square to allow for right turns by heavy vehicles onto South Street. Long term goals include: signalizing the Main Street at West Street intersection, implementation of a traffic signal coordination plan along Main Street, and providing additional capacity for South Street to accommodate the heavy volume of traffic that turns left onto Main Street during the afternoon peak hour.

**JURISDICTION** - The Town of Ware.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** - The Town of Ware should implement the recommendations of the Ware Downtown Signal Coordination and Safety Study**.** These recommendations include the retiming and phasing of the traffic signals, improving the existing intersection geometry in order to facilitate the movement of heavy vehicles, and the coordination of traffic signals along Main Street. PVPC will continue to monitor congestion at this location.

## 4. Chicopee – Interstate 291 from Fuller Road Exits (Exits 5 and 6) to Massachusetts Turnpike Exit 6


Interstate 291 (I-291) is a four lane, limited access highway that connects Interstate 91 in Springfield with Massachusetts Turnpike Exit 6 in Chicopee. I-291 terminates at its signalized intersection with Burnett Road and the access road to the Massachusetts Turnpike. This area is characterized by a high volume of commuter traffic as well as a large number of trucks from a number of local industrial uses. Additional truck traffic is also generated by a tandem trailer lot located off of the access road to the Massachusetts Turnpike. Both Burnett Road and Shawinigan Drive provide a direct connection between Chicopee and Ludlow, making them popular routes for intra regional travel as well as east-west commuting traffic from neighboring towns to access the I-291 and the Massachusetts Turnpike.

Existing peak hour volume in this area can contribute to congestion and safety problems at the intersection of I-291 with Burnett Road and the access road to the Massachusetts Turnpike and cause frustrated drivers to "run" red lights – particularly from the Massachusetts Turnpike approach. Left turning vehicles from the Massachusetts Turnpike Access road and Burnett Road approaches to the intersection currently experience long delays during the peak travel hours with vehicle queues that can extend beyond the storage capacity of the turn lanes.

Traffic flow on I-291 in the northbound direction is compromised by the close proximity of the Exit 6 ramps to the entrance to the Massachusetts Turnpike. Vehicles entering the Massachusetts Turnpike access road can queue back past the Exit 6 off ramp causing long delays for vehicles attempting to enter I-91 in the northbound direction. This also causes through moving traffic to shift to the inside travel lane on I-291 in an attempt to bypass slower moving traffic.

Similarly, northbound vehicles exiting I-291 via Exit 6 to Shawinigan Drive can queue back onto the Interstate causing traffic to flow at a reduced speed. The Exit 6 on and off ramps to I-291 intersect with Shawinigan Drive to form a three-way unsignalized intersection. The I-291 off-ramp serves as the minor approach to this intersection and operates under "STOP" sign control. Approximately 1200 feet away from the intersection; a traffic signal is located on Shawinigan Drive at its intersection with the Exit 6 Off Ramp for I-291 southbound and Fuller Road. Queues from this intersection can create traffic flow restrictions for the I-291 Exit 6 northbound on and off ramps. The I-291 Exit 6 off ramp currently operates at LOS "F" during both morning and afternoon peak hours at its intersection with Shawinigan Drive.

**CURRENT ACTIVITIES** – PVPC completed a Safety Study for the intersection of I-291 with Burnett Road and the access road to the Massachusetts Turnpike in 2005. A second safety study was also completed in 2007 for the intersection of Shawinigan Drive with the I-291 Exit 6 off-ramp. MassDOT recently installed conduit and fiber optic cable along a portion of I-291. This project also included the installation of ITS equipment such as variable message signs and cameras. The City of Chicopee recently studied the Fuller Road corridor.

**JURISDICTION** – MassDOT has jurisdiction of I-291 and the Massachusetts Turnpike. The City of Chicopee has jurisdiction of Shawinigan Drive and Burnett Road.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – The intersection of Shawinigan Drive with the I-291 Exit 6 Off Ramp was found to satisfy the requirements for the installation of a traffic signal. Further study is required to determine if the intersection can accommodate exclusive left turn lanes and operate in coordination with the adjacent traffic signal at the intersection of Shawinigan Drive with the off Ramp for I-291 southbound, the Veterans Memorial Bridge and Fuller Road. Implementation of a new traffic signal timing and phasing plan along with the potential coordination of the two intersections could improve the efficiency of traffic operations in this area.

Modifications to the existing traffic signal timing plan at the intersection of I-291 with Burnett Road and the access road to the Massachusetts Turnpike could similarly reduce delay and vehicle queues in this area. In addition, the installation of queue detection equipment could also improve the efficiency of the existing traffic signal. A feasibility study is also recommended to determine if a dual left turn lane could be constructed for the Burnett Road approach to the intersection. PVPC will continue to monitor congestion at this location.

## 5. Agawam – Main Street and Springfield Street at Suffield Street and Springfield at Walnut Street


Congestion in this area occurs in the immediate vicinity of the Route 147 (Memorial Avenue) Bridge that connects the Town of Agawam and with the City of West Springfield. Signalized intersections at both ends of the bridge experience a high volume of peak hour traffic that can overwhelm the existing capacity of the intersections. A concentration of retail development on the Agawam side of the bridge also contributes to congestion in this area.

The Town of Agawam commissioned a study, completed in April of 2008, to evaluate the condition of the Memorial Avenue Bridge and analyze three intersections in its immediate vicinity. The study area is comprised of three signalized intersections: Route 147 (Springfield Street) at Walnut Street with Walnut Street Extension; Route 147 (Springfield Street / Memorial Avenue) at Route 75 (Suffield Street) and Route 159 (Main Street); and, Route 147 (Memorial Avenue) at River Street. The intersection of Springfield Street at Walnut Street was analyzed to operate at Level of Service (LOS) "F" under existing conditions in the afternoon peak hour. The intersection of Springfield Street at Main Street and Suffield Street currently operates at LOS "E" during the afternoon peak hour.

**CURRENT ACTIVITIES** – MassDOT is currently in the preliminary design phase of a project (SID 605384) which will reconstruct and widen the current bridge as well as upgrade the existing traffic signals.

**JURISDICTION** – MassDOT has jurisdiction over the bridge and the Town of Agawam and City of West Springfield over their respective intersections.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** - The Town of Agawam should explore signal timing and phasing changes as a possible short term remedy to reduce congestion until the bridge and intersection improvement project can be implemented. In the long term, the recommendations of

the Memorial Avenue Bridge and Intersection Improvement study should be implemented. These recommendations include the upgrade of the existing bridge to provide additional capacity via dedicated left turn lanes. It was also recommended that each of the intersections be upgraded to improve existing geometry, add additional turn lanes and upgrade the existing traffic signal control equipment. PVPC will continue to monitor congestion at this location.

## 6. Springfield - East Columbus Avenue intersection at Main Street and Longhill Street


The major cause of congestion at this location is a high volume of traffic combined with the close proximity of traffic signals along Main Street. East Columbus Avenue, West Columbus Avenue and Longhill Street all intersect Main Street over a distance of approximately 500 feet. The close spacing of these intersections does not allow sufficient distance for vehicle queues resulting in periods where vehicles can block adjacent intersections. This location is also in close proximity to Interstate 91 (I-91) Exit 4 which results in a number of weaving movements as a result of vehicles exiting I-91 onto West Columbus Avenue and then reversing direction onto East Columbus Avenue via an extension of the Exit 4 off ramp.

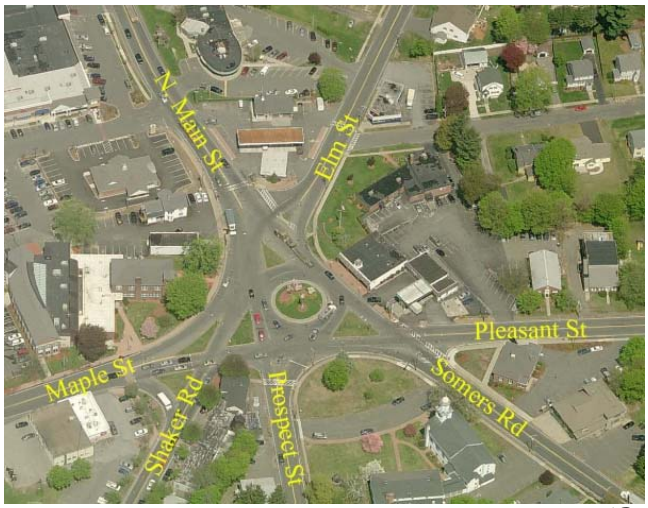
**CURRENT ACTIVITIES** – None.

**JURISDICTION** - The City of Springfield.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – The City of Springfield should explore signal timing and phasing changes as a possible means to reduce congestion in this area. An in-depth study is recommended to identify the exact cause of congestion and develop potential long term improvement alternatives for this area. PVPC will continue to monitor this location for congestion.

## 7. East Longmeadow - East Longmeadow Rotary

The East Longmeadow Rotary is a seven leg, unsignalized intersection, consisting of North Main Street, Maple Street, Shaker Road, Prospect Street, Somers Road, Pleasant Street, and Elm Street. These seven roads intersect at Center Square in the downtown of East Longmeadow. Each of these roadways operates under "STOP" sign control. Once in the rotary, there are several yield signs and islands which control movement through the rotary. The unusual geometry, confusing circulation patterns and close spacing of the seven approach roadways all contribute to congestion in this area.



The rotary experiences high volumes of traffic on a daily basis. A study of the East Longmeadow Rotary was completed in 2001. This study included a detailed origin/destination study that identified the predominant travel routes through the rotary during the peak hour. At the time of the study, Prospect Street, Shaker Road, and Maple Street were calculated to operate at LOS "D" or worse during the PM peak hours. Approaches to the rotary are characterized by long delays associated with commuting traffic from industrial land uses to the south and the East Longmeadow High School.

A series of conceptual improvement alternatives were proposed as part of the study to improve traffic flow in this area. The preferred recommendations of the study included short-term changes to existing pavements markings and geometry and the eventual signalization by reconfiguring the rotary into a large triangle controlled by three coordinated traffic signals.

**CURRENT ACTIVITIES** – None.

**JURISDICTION** - The Town of East Longmeadow

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – Improvements to pavement markings and signage to better define right of way in rotary. The preferred recommendations of the East Longmeadow Rotary Study are included in the regional transportation plan. PVPC will continue to monitor congestion at this location.

## 8. Chicopee - McKinstry Avenue at Grattan Street

McKinstry Avenue intersects with Grattan Street and Dale Street at two separate signalized intersections spaced approximately 150 feet apart. The close proximity of these two intersections combined with high vehicle volumes, narrow lanes and the lack of sufficient lane capacity all contribute to congestion in this area. A narrow single travel lane on McKinstry Avenue in the eastbound direction can result in long queues for vehicles attempting to turn left onto Grattan Street. Land uses in the vicinity of this area closely abut the two intersections which limits the ability to improve lane width. Dale Street also intersects with Grattan Street to the south of the intersection of McKinstry Avenue with Grattan Street. Vehicle queues on Grattan Street often block the entrance and exit to Dale Street creating additional congestion.


**CURRENT ACTIVITIES** – None.

**JURISDICTION** - The City of Chicopee.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – The City of Chicopee should review the traffic signal timing and phasing plan on a regular basis to assist in the efficient flow of traffic. A study should be completed for this location in order to determine the causes of congestion and proposed potential improvement alternatives. PVPC will continue to monitor congestion at this location.

## 9. Springfield - Main Street at Liberty Street

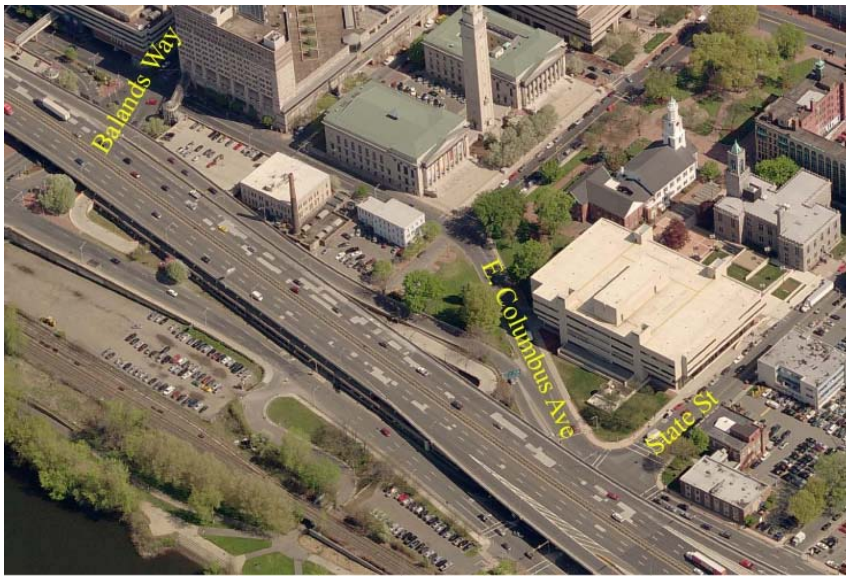

A potential cause of congestion at this intersection are the conflicts created by the mix of multiple modes of transportation. The Springfield Bus Terminal and Peter Pan bus facility are located on the southwestern corner of this intersection. The United States Post Office is located on the northeastern corner of this intersection. As a result, a significant number of transit vehicles navigate through this intersection. Both locations also generate a high percentage of pedestrian traffic. Pedestrians were observed to cross the roadway outside of the marked crosswalks on several different occasions. This causes vehicles to stop midblock creating congestion and safety issues.

**CURRENT ACTIVITIES** – None.

**JURISDICTION** - The City of Springfield.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – It is recommended that existing signage and roadway markings in the vicinity of this intersection be reviewed to ensure that pedestrians accessing land uses such as the post office and bus terminal properly cross the intersection. This will increase safety and improve congestion by reducing potential conflicts between the different modes of transportation in this area. A study should be completed for this intersection in order to identify potential recommendations to improve safety and congestion at this location. PVPC will continue to monitor congestion at this location.

## 10. Springfield - East Columbus Avenue intersections at State Street and Boland Way




The major cause of congestion at this location is a high volume of traffic combined with the close proximity of traffic signals along East Columbus Avenue, West Columbus Avenue, State Street, Boland Way and the Memorial Bridge. Entrance and exit ramps to/from I-91 also intersect with East and West Columbus Avenue in this area creating additional conflict points with merging traffic. A number of land uses in the Springfield Central Business District such as the Springfield District Court, Springfield City Hall, Springfield Symphony Hall and parking facilities located under I-91 all generate traffic that can contribute to congestion in this area.

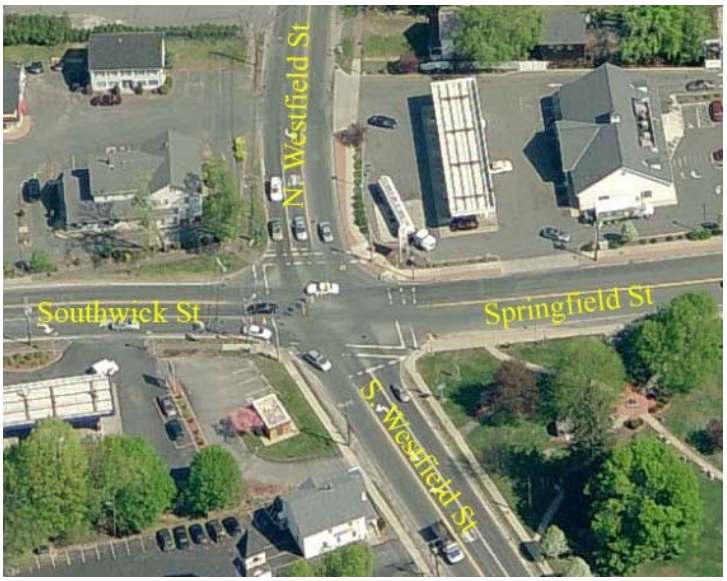
**CURRENT ACTIVITIES** – The I-91 Ramp Reversal project was completed in 2007. The goal of the project was to remove a dangerous lane weave between I-91 and I-291 as well as improve access to and from I-91 and the central business district by altering access points to the I-91. This result in a change in traffic flow and turning movements through this area.

**JURISDICTION** - The City of Springfield

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – Existing traffic signals in this area should be closely monitored to ensure the existing timing and phasing plans efficiently move traffic through this area. A study should be completed for this area in order to identify recommendations to reduce congestion and improve safety. PVPC will continue to monitor congestion at this location.

## 11. Agawam - North Westfield Street and South Westfield Street at the intersection Springfield Street and Southwick Street (Feeding Hills Center)

Congestion at the intersection of Springfield Street, North Westfield Street (Route 187), Southwick Street (Route 57) and South Westfield Street (Route 187) is caused by a combination of a high volume of peak hour traffic, numerous curb cuts in close proximity to the intersection, and the need for additional lane capacity.




The northbound left turn from South Westfield Street (Route 187) to Southwick Street (Route 57) operated at LOS "F" in the afternoon peak hour with long vehicles queues. The northbound approach of South Westfield Street was also calculated to operate at LOS "F" during school hours. The drop off/pick up area for an elementary school on Springfield Street contributes to this delay during school dismissal and creates traffic congestion on the eastbound and northbound approaches to the intersection.

**CURRENT ACTIVITIES** – MassDOT project #604203, which includes the reconstruction of the Feeding Hills intersection, is currently in the design process. The project includes the widening of intersection approaches to provide additional capacity as well as the upgrade of existing signal equipment. PVPC completed the Feeding Hills Center Transportation Safety Study in 2007. The study identified several areas of concern and a number of recommendations to improve congestion and safety at this intersection.

**JURISDICTION** - The Town of Agawam.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – In the short term, the intersection could benefit from advanced lane usage signs, improved pavement markings, and signal timing and phasing adjustments. MassDOT and the Town of Agawam should continue to advance the intersection improvement project. PVPC will continue to monitor congestion at this location.

## 12. Springfield - Allen Street at Cooley Street


Allen Street intersects with Cooley Street to form a four-way signalized intersection in the "Outer Belt" neighborhood of the City of Springfield. This intersection is characterized by a high volume of commuter and retail traffic with numerous curb cuts in close proximity to the intersection.

This intersection was included in the Springfield "Outer Belt" report which was completed on behalf of the City of Springfield in 2002. The intersection of Allen Street with Cooley Street currently experiences very long delays and a high number of vehicle crashes. Additional through traffic lanes are required on both approaches of Cooley Street, however the close proximity of the existing land uses on all four corners of the intersection severely restrict improvement alternatives within the existing right of way.

**CURRENT ACTIVITIES** – The City of Springfield is currently advancing an improvement project for the intersection of Allen Street with the Bicentennial Highway. While this project does not directly impact the intersection of Allen Street with Cooley Street it may have an indirect positive benefit by changing the existing traffic flow patterns through this area.

**JURISDICTION** - The City of Springfield.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – As discussed in the "Outer Belt" report the signal timing and phasing of this intersection should be adjusted as needed to meet the demand of traffic at the intersection. In the long term, the City of Springfield should explore opportunities to increase capacity at this intersection. The construction of a second through traffic lane on the northbound approach of Cooley Street at Allen Street and extension of the existing left turn storage lane would dramatically reduce existing vehicle queues along this approach and improve the overall LOS at the intersection from "F" to "D". PVPC will continue to monitor congestion in this area.

## 13. Longmeadow - Laurel Street at Converse Street


The intersection of Converse Street with Laurel Street currently experiences a high level of congestion during both the morning and afternoon peak hours. This four-way signalized intersection provides a single approach lane in each direction. The lack of dedicated turn lanes contributes to the long delays and vehicle queues experienced during the morning and afternoon peak hours. During school hours, a crossing guard stationed at the intersection manually operates the push button actuated pedestrian phase to assist students crossing the street. As a result, the level of congestion can fluctuate based on the number of times the pedestrian signals are activated. During the height of the peak hour of traffic, it is not uncommon for vehicles to wait through multiple signal cycles to travel through the intersection.

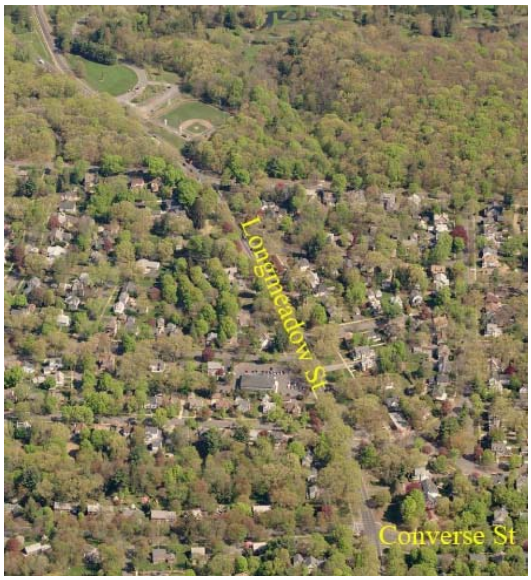
The intersection of Laurel Street with Converse Street was included in the Route 5 Longmeadow Street Signal study. The study, completed in 2005, examined the operations of the signalized intersections along both Route 5 and Laurel Street in the town of Longmeadow. A follow-up safety study was completed for the intersection of Laurel Street with Converse Street in 2010. The intersection was calculated to operate at LOS "F" during both the morning and afternoon peak hours.

**CURRENT ACTIVITIES** – The 2010 study completed by the PVPC found that a high percentage of vehicles traveling west on Converse Street turn right onto Laurel Street. Most of these vehicles are attempting to access Interstate 91 via Forest Glen Road and Route 5. The construction of an exclusive right turn lane for this approach would increase the roadway capacity in the vicinity of the intersection and assist in reducing delay. This, in combination with improvements to the existing traffic signal timing plan, could potentially assist in reducing delay at this intersection. Allowing more vehicles to be processed through the intersection could result in much longer queues at adjacent signals leading to the Route 5 corridor.

**JURISDICTION** - The Town of Longmeadow.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – The 2005 transportation study included a number of recommendations to reduce congestion and improve safety in the Town of Longmeadow. The intersections of Longmeadow Street with Converse Street and Longmeadow Street with Forest Glenn Road were both found to experience congestion and operate at poor levels of service. The Town of Longmeadow should consider an engineering study to review the feasibility of improving the intersections of Longmeadow Street with Converse Street, Longmeadow Street with Forest Glenn Road, and Converse Street with Laurel Street. This could assist in identifying options that improve traffic flow and safety in a manner that does not adversely impact other roadways. PVPC will continue to monitor congestion at this location.

## 14. Longmeadow - Longmeadow Street (Route 5) from Converse to Springfield Line




The Longmeadow Route 5 Signal Study was completed in 2005. The study identified the major causes of congestion as being a combination of a high volume of traffic, lack of sufficient lane capacity and outdated traffic signal control equipment at several major intersections between Williams Street and I-91. These intersections include Forest Glen Road, Converse Street and Bliss Road, all of which are used as cut through roads for accessing points east. The poor intersection performance also contributes to high crash rates at several of these intersections.

**CURRENT ACTIVITIES** – None

**JURISDICTION** - The Town of Longmeadow.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** - The 2005 transportation study included a number of recommendations to reduce congestion and improve safety in the Town of Longmeadow. The intersections of Longmeadow Street with Converse Street and Longmeadow Street with Forest Glenn Road were both found to experience congestion and operate at poor levels of service. The Town of Longmeadow should consider an engineering study to review the feasibility of improving the intersections of Longmeadow Street with Converse Street, Longmeadow Street with Forest Glenn Road, and Converse Street with Laurel Street. This could assist in identifying options that improve traffic flow and safety in a manner that does not adversely impact other roadways. PVPC will continue to monitor congestion at this location.

## 15. Westfield - Elm Street (Route 10/202) and Main Street (Route 20) from Great River Bridge to Nobel Street

This area consists of portions of the Route 20 and Route 10/202 corridors in the downtown section of the City of Westfield. Congestion in this area is characterized by high vehicle volumes combined with numerous signalized and unsignalized intersections operating above capacity, as well as a high number of curb cuts. Two projects funded as part of the Transportation Improvement Program (TIP) are currently under construction and expected to have a positive impact on congestion in this area.

The Great River Bridge project consists of the reconstruction of the existing bridge, with the addition of a sister span along the east side of the existing bridge. Upon completion, the two bridges will operates as "one-way pairs" each providing three lanes of travel. The Main Street/Broad Street improvement project consists of upgrades to the existing traffic signals along Elm Street, Broad Street, and Main Street. The project also includes lane widening and the addition of turning lanes. Both improvement projects are expected to have a positive impact on traffic flow and safety in this area.

**CURRENT ACTIVITIES** – This location is under construction. Both projects are expected to be complete by 2012.

**JURISDICTION** – MassDOT has jurisdiction over the Great River Bridge, the City of Westfield has jurisdiction over the roads.

**POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES** – Reevaluate the corridor once the construction projects are complete.

# Comments Received During Public Review

The Pioneer Valley Region draft bottlenecks report was released for 30 day public review by the Metropolitan Planning Organization (MPO) on January 22, 2011 to February 28, 2011. Below is the list of comments received during the review period.

| Comments by | Comment | Action | Date |
|---|---|---|---|
| Lucia Foley South Hadley, MA | In reviewing the report on bottlenecks, it seemed that Route 5 going into downtown Northampton should have received some mention. While this is not a daily drive time issue, it is a regular problem on most Friday nights to a greater or lesser degree depending on the time of the year. Also, as a regional concern, the increasingly ridiculous weekend backups on the MassPike have reached a critical level, as anyone who regularly travels this road between the Pioneer Valley and Boston (which I do, every two weeks) well knows. Westbound traffic routinely slows from Sturbridge to Auburn; more often than not, the backup extends to Worcester, for fifteen full miles of fun. During certain travel periods, the mess at Sturbridge causes lengthy backups in the other direction as well. It's a capacity issue. This exit needs a thoughtful, major overhaul, including at least three high speed lanes with overhead toll technology to handle the huge amount of traffic heading toward Connecticut, New York, and New Jersey, where probably 80% of those traveling west of Worcester are headed.<br><br>Clearly, an awareness of the problem at the statehouse level is needed to get this problem addressed, and I'm hopeful that groups like PVPC are already advocating for a solution. This severely impacts our area, yet I'm not entirely sure that anyone in Boston has a true understanding of just how bad this has become in recent years. I know there is hope; last time I went back to New Jersey, lo and behold, work had commenced on the Jersey turnpike's notorious Exit 8A mess! If NJ can do it... | Comment Noted | 1/22/2011 |

## PIONEER VALLEY MPO ENDORSEMENT SHEET

The signatures below signify that all members of the Pioneer Valley Region's Metropolitan Planning Organization, or their designees, have met on March 2, 2011 and discussed the following item for endorsement: Pioneer Valley Region's Top Traffic Bottlenecks Report

**Massachusetts Department of Transportation (Mass DOT)**

I, Secretary of the Massachusetts Department of Transportation, hereby

☑ Endorse ☐ Do Not Endorse the above referenced item.

Jeffrey Mullan — 2 Mar 11 (Date)

Secretary &CEO Mass DOT

**Massachusetts Department of Transportation Highway Division**

I, Administrator of the Highway Division of MassDOT, hereby

☑ Endorse ☐ Do Not Endorse the above referenced item.

Luisa Paiewonsky — 03/02/11 (Date)

Administrator, Mass DOT

**Pioneer Valley Planning Commission (PVPC)**

I, Chair of the Pioneer Valley Planning Commission, hereby

☐ Endorse ☐ Do Not Endorse the above referenced item.

Richard Butler — 3/2/11 (Date)

Chair - PVPC

**Pioneer Valley Transit Authority (PVTA)**

I, Administrator of the Pioneer Valley Transit Authority, hereby

☑ Endorse ☐ Do Not Endorse the above referenced item.

Mary MacInnes — 3/2/11 (Date)

Administrator - PVTA

**City of Springfield**
I, Mayor of the City of Springfield, hereby
☐ Endorse ☐ Do Not Endorse the above referenced item.

Domenic Sarno — Date
Mayor-Springfield

**City of Chicopee**
I, Mayor of the City of Chicopee, hereby
☒ Endorse ☐ Do Not Endorse the above referenced item.

Michael Bissonnette — 3/2/11 Date
Mayor-Chicopee

**City of Northampton**
I, Mayor of the City of Northampton, hereby
☒ Endorse ☐ Do Not Endorse the above referenced item.

Mary Clare Higgins — 3/2/11 Date
Mayor-Northampton

**City of West Springfield**
I, Mayor of the City of West Springfield, hereby
☒ Endorse ☐ Do Not Endorse the above referenced item.

Edward Gibson — March 2, 2011 Date
Mayor-West Springfield

**Town of Belchertown**
I, Board of Selectmen member of the Town of Belchertown, hereby
☒ Endorse ☐ Do Not Endorse the above referenced item.

James Barry — 3/2/11 Date
Selectman-Belchertown

**Town of Hatfield**
I, Board of Selectmen member of the Town of Hatfield, hereby
☒ Endorse ☐ Do Not Endorse the above referenced item.

Marcus Boyle — 2 March 11 Date
Selectman-Hatfield