CMP

Congestion Management Process
for the Pioneer Valley

July 2010

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.

Congestion Management Program (CMP)
In the Pioneer Valley Region

For the
Pioneer Valley Metropolitan Planning Organization

Final Report

Endorsed by the Metropolitan Planning Organization
On July 27,2010

TABLE OF CONTENTS

INDEX OF FIGURES

INDEX OF TABLES

Chapter 1 Introduction

No one likes to be stuck in traffic. Roadway congestion is frustrating because its causes are usually out of the driver's control. Further, what seems like a "major traffic jam" to one person might be "just a little delay" to another. In either case, the consequences of excessive traffic congestion are real: aggressive driving, decreased personal safety, and, eventually, stifled community development. The environment also suffers. Stop-and-go traffic needlessly increases greenhouse gas emissions from vehicles and wastes fuel. Congestion also wastes people's personal and professional time.

Understanding where and why traffic congestion is happening is an important step toward reducing it. The Pioneer Valley Congestion Management Process (CMP) identifies the major traffic congestion spots in the 43 cities and towns of our region. This information is essential in advancing future transportation improvements that will reduce traffic congestion and improve the overall safety and efficiency of our transportation network.

The CMP is an integrated planning activity. It supports the Metropolitan Planning Organization (MPO) planning process for regional transportation infrastructure, maintenance and operating investments. In addition, CMP activities and information are valuable to planning at the municipal level for non-federal transportation investments, as well as for decision-making about land use, environmental protection, housing and community development.

CMP activities are iterative. They are intended to identify existing deficiencies in the regional transportation system through ongoing monitoring and analysis of key performance measures. These performance measures themselves may evolve as a region's transportation capacities, needs and shortcomings change.

CMP activities are comprehensive. They involve multiple agencies at all levels of government and stakeholders in communities large and small.

The Pioneer Valley Planning Commission (PVPC) has produced this CMP report as part of the ongoing regional planning activities of the Pioneer Valley MPO. Because of the constantly changing nature of transportation and land use in the Pioneer Valley, this report represents a snapshot of transportation congestion in the region based on the performances measures developed during this process and the availability of resources to collect and analyze the data that support them.

PVPC developed a vision to provide a framework for the development of the CMP.

> ***VISION***
> *The Pioneer Valley Congestion Management Process identifies, evaluates, and implements transportation performance measures that enhance the safety and efficiency of the movement of people, goods, and information.*

Regulatory Context

The CMP is a requirement of the most recent federal transportation authorization, the Safe Accountable Flexible Efficient Transportation Equity Act – a Legacy for Users (SAFETEA-LU) of 2005. CMP activities are required in all Transportation Management Areas (TMAs) of 200,000 or more residents.

CMP activities and this report are a continuation of the predecessor Congestion Management System (CMS) process established by the 1991 federal Intermodal Surface Transportation Efficiency Act (ISTEA). PVPC has continuously engaged in congestion monitoring and analysis since then consistent with federal guidance in support of the MPO process.

The CMP builds on the seven original steps of the original CMS guidance and adds an eighth step identified in bold below.

1. Develop congestion management objectives;
2. Identify areas of application;
3. Define system or network of interest;
4. Develop performance measures;
5. Institute system performance monitoring plan
6. Identify and evaluate strategies;
7. Implement selected strategies and manage transportation system;
8. **Monitor strategy effectiveness.**

CMP Report Development Process

This CMP report builds on previous versions completed for the Pioneer Valley Metropolitan Planning Organization. Consistent with Federal Highway Administration (FHWA) guidance published in May 2008, the CMP process for the Pioneer Valley has been broadened to better incorporate assessment of the congestion impacts and benefits experienced by transit, cyclists and pedestrians. This necessitated a significant review and expansion of performance measures. PVPC therefore took this opportunity to engage in a public and agency review of CMP performance measures. Steps included:

1. Generate draft performance measures for all transportation modes;
2. Engage agency participants and stakeholders in review of draft measures;
3. Identify performance measures and timeframe for availability;
4. Develop implementation measures and timeframe for action;
5. Data collection and analysis;
6. Public review of preliminary findings.

Performance and Implementation Measures

The goal of the CMP is to identify, evaluate, and implement transportation performance and implementation measures that enhance the safety and efficiency of the movement of people, goods, and information throughout the Pioneer Valley. In order to achieve this goal PVPC identified the performance measures necessary to obtain the data needed to fulfill this goal. To remain consistent with the current Regional Transportation Plan for the Pioneer Valley, performance measures were divided into the following four categories.

Movement of People

The movement of people is generally what most people associate with the term “transportation.” This area consists of the identification of needs for all modes of transportation and how to increase their efficiency. Needs will be identified to assist in reducing existing and anticipated future congestion in the region as well as improving the connections between the various transportation modes.

Movement of Goods

The Pioneer Valley Region is strategically located at a geographic crossroads in which more than one third of the total population of the United States can be reached by an overnight delivery. The availability of an efficient, multimodal transportation network utilized to move goods through the region is essential to maintain economic vitality. Several modes of transportation are available in the region to facilitate the movement of goods. These modes include truck, rail, air, and pipeline.

Movement of Information

The movement of information consists of the ability to utilize technology to maximize the efficiency of the existing transportation system and to convey information to the traveling public. Intelligent Transportation Systems (ITS) technology can include devices that integrate with traffic signal systems, provide real-time schedule information and electronic fare payment. In addition, information sharing between agencies can reduce duplicative data collection and assist in the completion of ongoing studies.

Safety and Security

The safety and security of the regional transportation system are vital to the efficient movement of people, goods and information. It is important to ensure that the transportation system is safe for all users across all modes. Similarly, the security of our transportation infrastructure and operations centers will rely on the development of sound planning for their safeguard.

Recurring and Non-Recurring Congestion

There are two types of congestion: recurring and non-recurring. Recurring congestion can be expected to occur at the same time every weekday as a result of high volumes of commuter traffic traveling on roadways that are at or near their carrying capacity. Non-recurring congestion occurs as a result of an unexpected or non-typical event. Some causes of non-recurring congestion include: vehicular crashes, vehicle breakdowns, roadway construction, inclimate weather, and additional traffic resulting from special events.

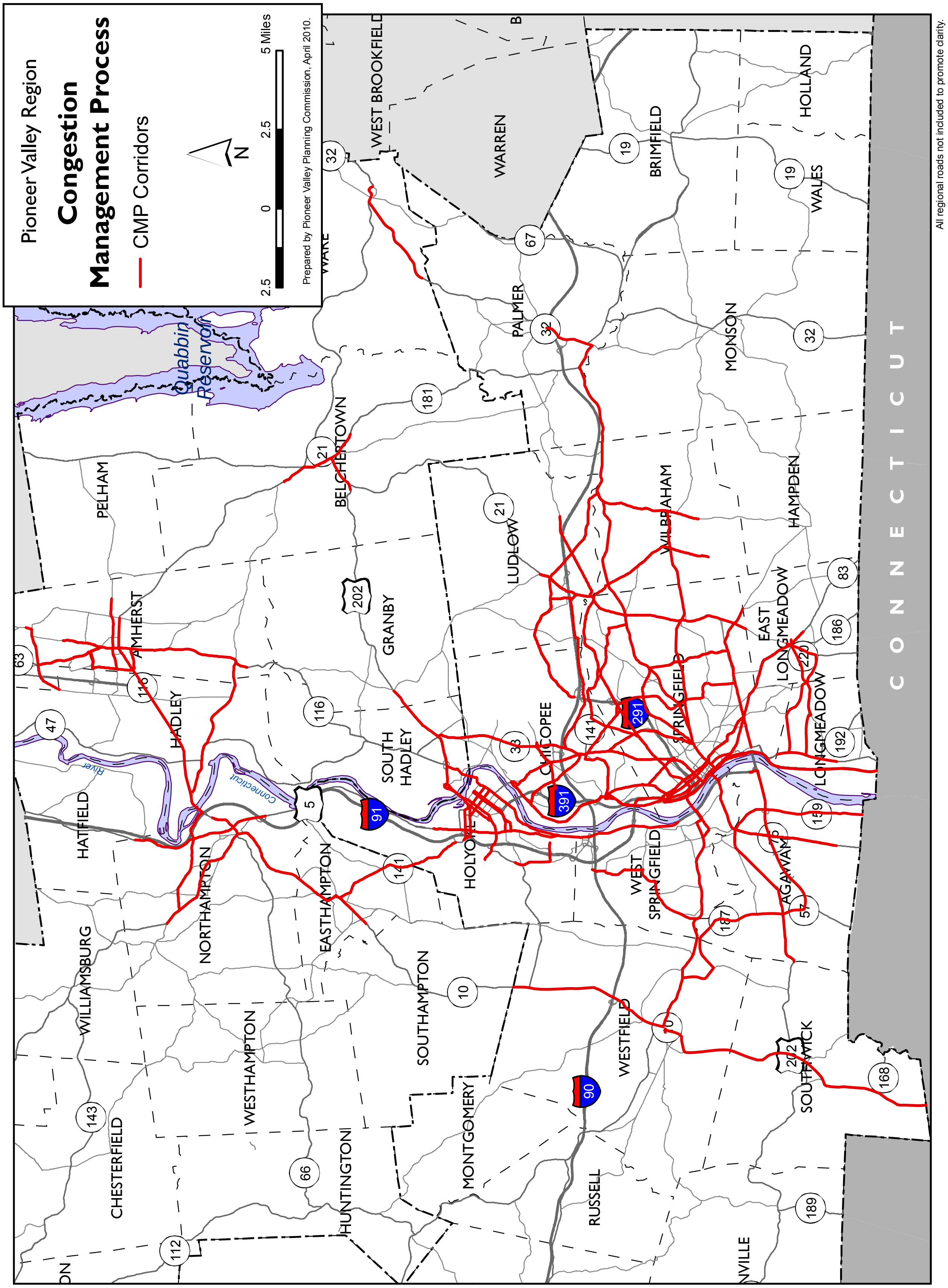
Previous versions of the Pioneer Valley CMP only included the impacts of recurring congestion. In the past, travel time data that was thought to have been influenced by unexpected events such as roadway improvement projects or vehicle breakdowns was not used. The CMP now incorporates all regional travel time data regardless of the cause of congestion or its perceived severity. A number of new performance measures have also been developed to include the impacts of non-recurring congestion in the CMP.

Corridor Description

The CMP corridors are the basis for all data collection and analysis carried out in this CMP report. When developing the corridors, PVPC staff utilized data and results from previous CMP reports, past congestion relief studies, and general knowledge of the region. This information was used to develop the draft CMP corridor map. The draft map was then presented to the Joint Transportation Committee (JTC), the Congestion Management Sub-committee, PVPC Commissioners, as well as the Pioneer Valley Metropolitan Planning Organization (MPO) for comment (See Appendix B). This process resulted in the creation of 76 unique corridors that are mapped in Figure 1.

It is difficult to ensure that every congested roadway in the region is being monitored. As technology continues to advance data will become more readily available allowing more corridors to be analyzed in the CMP. PVPC will consider adding corridors at the request of a communities chief elected official. If requested to do so, PVPC will perform 3 days of travel time data collection. If the data verifies congestion, PVPC will consider adding the corridor. Likewise, PVPC can discontinue a corridor if the corridor is not congested.

Figure 1 CMP Corridors of the Pioneer Valley



Chapter 2 Development of Performance Measures

Previous versions of the CMP were based on two performance measures developed from vehicle travel time data collected during the morning and afternoon peak hours. These measures did not incorporate the concept of non-recurring congestion or adequately address all transportation modes. In order to effectively incorporate all transportation modes into the CMP initial efforts focused on the development of regional needs specific to the reduction of congestion in the region. To promote consistency between the CMP and the Regional Transportation Plan (RTP) for the Pioneer Valley, each need was categorized into one of the four emphasis areas of the RTP. Performance measures and implementation measures were then developed to monitor, quantify, and identify possible alternatives to each need. Based on the availability of existing data and resources, these measures were classified as ongoing, immediate, and future performance measures. Ongoing performance measures are based on data and information that is readily available or already collected by the PVPC. Immediate performance measures are data and information that are anticipated to be available in the near future due to the implementation of a transportation improvement project. Future performance measures are based on data and information that is highly valuable but is currently unavailable.

The following sections describe the performance measures that have been identified for each Emphasis Area. All performance measures are summarized at the beginning of each section and sorted by their current status. This is followed by a brief description of the performance measure and potential strategies for their implementation.

Movement of People

Table 1 Movement of People – Summary of Performance Measures

Performance Measure	Status
Monitor on-time performance, ridership, and customer satisfaction for all transit and paratransit services of the Pioneer Valley Region	Ongoing
Develop regional route Congestion Ratio, Delay per Mile, and Congestion Index through collection of travel time data.	Ongoing
Inventory and monitor pavement conditions for all federally aid eligible roadways.	Ongoing
Increase awareness and availability of park-and-ride lots in the Pioneer Valley region.	Ongoing
Monitor and update the inventory of bicycle lanes and trails in the region.	Ongoing
Increase the percentage of bicycle rack utilization on buses.	Immediate
Increase customer satisfaction levels of the bus terminal and shelters.	Immediate
Increase and inventory the number of municipal bicycle racks in the region.	Future
Identify regional auto/transit mode split.	Future
Identify systemwide transportation alternatives and monitor, update, and increase the number of intermodal transfer points.	Future

Monitor on-time performance, ridership, and customer satisfaction for all transit and paratransit services of the Pioneer Valley region.
Ridership and customer satisfaction are the leading performance measures of transit use. The PVTA, in coordination with its operating units of SATCo, VATCo, and UMass Transit, conducts on-board ridership surveys throughout the year. These surveys determine the current levels of customer satisfaction and ridership of transit and paratransit services. Furthermore, these surveys identify additional demand on all transit related services provided by the PVTA and its affiliates. Additional services include the increases of transit transfer points, express bus service, regular bus services, and frequency of bus trips.

It is important to note that on-time performance is critical to increasing and maintaining ridership along the 44 routes where it is monitored. On-time performance is defined as a bus departing the designated time point (a destination listed on the schedule) no more than 5 minutes after the printed departure time. Paratransit services operate under customers requests and therefore do not operate on any particular fixed route or schedule. Paratransit on-time performance is defined as arriving for a pick-up within a 15-minute window of the scheduled time and is recorded by the operating company. Congestion of any kind prohibits the transit system from providing reliable services and negatively affects riders attempting to make one or more transfers.

The PVTA is currently working towards implementing an Automatic Vehicle Locator (AVL) system which will be utilized to accurately track bus and vehicle locations and provide on-time performance to riders. This interactive and accurate information will allow riders to make alternate transit plans during situations where buses are not expected to be on-time. Additionally, this information in conjunction with ridership surveys, will allow PVTA to identify more efficient bus routes that serve the demand of riders. For example, the PVTA will have the ability to monitor the express bus route system with transit signal priority and expand its availability depending on ridership demand. Overall on-time performance will positively increase with the implementation of the AVL system designed to give riders control of their transit related travel.

Develop regional and route Congestion Ratio, Delay per Mile, and Congestion Index through collection of travel time data.
Travel time data is collected utilizing a GPS device which records the actual time it took to travel along corridors during the morning and afternoon peak hours. This information is then converted to determine the levels of congestion. The Congestion Ratio, Delay per Mile, and Congestion Index are products of the travel time data. An in-depth analysis of these equations is discussed in Chapter 3 of this report. PVPC continually monitors, maintains, and updates the travel time data that is collected. This information serves as an integral part of congestion management.

Inventory and monitor pavement conditions for all federally aid eligible roadways.
PVMPO has an ongoing Regional Pavement Management Program. A Pavement Management System (PMS) is a systematic process that collects and analyzes roadway pavement information for use in selecting cost-effective strategies for providing and maintaining pavements in serviceable condition. The role of PMS is to provide an opportunity to improve roadway conditions, and to help make cost-effective decisions on maintenance priorities and schedules.

The PVPC's regional PMS involves a comprehensive process for establishing the network inventory and project histories, collecting and storing the pavement distress data, analyzing the data, identifying the network maintenance activities and needs and integrating the PMS information in the metropolitan and statewide planning processes. The roadway network covered by the regional PMS includes all urban and rural Federal-Aid eligible highways of the 43 cities and towns in the region constituting approximately 1,400 miles. The region is divided into several sub-regional areas with data collection activities performed on a 3-4 year rotational basis.

Increase awareness and availability of park-and-ride lots in the Pioneer Valley region.
Park-and-ride lots provide and encourage the use of alternate modes of transportation which has the potential to reduce congestion. PVPC records occupancy levels of the designated park-and-ride lots on a monthly basis. An in depth analysis of park-and-ride lots is available in Chapter 3 of this report. In theory, high occupancy levels suggest that additional lots may be required to meet demand while low occupancy levels suggest the lot might benefit from enhanced promotion regarding location and the benefits of utilization. PVPC will continually monitor and assess the demand of these facilities. This information also provides the PVTA the information needed to consider route changes that maximize the utilization of park-and-ride lots.

Increase the percentage of bicycle rack utilization on buses.
The availability of bike racks on buses encourages intermodal travel and increases ridership. Given the success of bus-bike rack utilization and ridership demand from the UMass Transit operating unit, PVTA is providing bus-bike racks systemwide within the next several months. It is important to monitor the bus-bike rack utilization and provide educational outreach to our member communities with information and the benefits of utilizing alternate modes of transportation. Most recently, PVTA created a user guide and video regarding bicycle rack operations for its riders.

Monitor and update the inventory of bicycle lanes and trails in the region.
Bicycling has become a safe and efficient alternative to single occupancy automobiles in the Pioneer Valley. Our member communities benefit from an accurate inventory on availability and locations of bike lanes and trails. Bicycle maps detailing the location of these bicycle lanes and trails are published and made available to the public on a regular basis and are well received from the bicycling community.

Increase and inventory the number of municipal bicycle racks in the region.
The availability of bicycle racks promotes and encourages bicycle use throughout the Pioneer Valley region. In theory, an increase in bicycle use decreases traffic volume and vehicular congestion. Additionally, bicycle racks provide transfer points for bicyclists to utilize other modes of transportation to reach final destinations. PVPC has had a program in place to assist communities

with the purchase and installation of bicycle racks. This information will assist PVPC in providing more resources to bicyclists and increase community participation. An inventory of bicycle rack locations will greatly benefit communities utilizing the bicycle network in our region. This information can be obtained utilizing GPS recording devices and this data can be made available in the regional bike map. It is the intent of PVPC, in cooperation with its member communities, to obtain this data in the near future.

Increase customer satisfaction levels about bus terminal and shelters.
PVTA's regular bus rider surveys sample customer satisfaction with bus terminals and facilities, which are an important part of the transit user's experience. Customer satisfaction with these facilities helps attract and retain transit riders, and in existing riders recommending transit to a friend. This would require an inventory of existing shelters and the amenities they currently provide. A series of recommendations can be developed to improve shelter aesthetics, lighting, and comforts

Identify regional auto/transit mode split.
This is the ratio of individual trips made by people using private autos to those made by people using transit. Increasing the proportion of travelers making their trips on transit vehicles and reducing the number of single occupancy vehicle (SOV) trips in private autos reduces congestion. Tracking the regional mode split will be important in order to determine how the mode split changes in response to economic trends and improvements to the regional transit system.

Identify systemwide transportation alternatives and monitor, update, and increase the number of intermodal transfer points.
Intermodal transfer points benefit bicyclists, pedestrians, transit riders and vehicle operators by providing easy access to alternate modes of transportation. Some examples of such facilities include a bus stop with a bicycle rack; a park-and-ride lot with a bus stop; or, a train station with a parking lot, a bus stop and bicycle racks. There are several developments that are currently underway or are in design such as the Springfield Union Station Intermodal Transportation Center, the Holyoke Intermodal Center, and the Westfield State College Intermodal Center that will enhance intermodal transportation. It is important to assess the number of different travel modes available between popular destination points in the region such as the UMass campus and the City of Northampton or between the City of Springfield's Central Business District and the City of Holyoke's Central Business District. In the future, with assistance from the PVTA, PVPC will attempt to address potential transportation alternatives for popular commutes that will reduce congestion within the Pioneer Valley region.

Movement of Goods

Table 2 Movement of Goods – Summary of Performance Measures

Performance Measure	Status
Decrease the number of structurally deficient and functionally obsolete bridges.	Ongoing
Identify safe alternate heavy vehicle routes in the region.	Ongoing
Map travel time contours to show distance traveled in 15 minute intervals.	Ongoing
Identify off-ramps that are operating at above capacity.	Immediate
Increase efficiency of rail systemwide.	Future
Improve LOS on major intermodal connector routes to the National Highway System.	Future

Decrease the number of structurally deficient and functionally obsolete bridges.
Given the age and deterioration rate of the regions infrastructure, it is expected that the level of structurally deficient and functionally obsolete bridges will dramatically increase over the next several years if the current funding levels are maintained. The Massachusetts Accelerated Bridge

Program aims to improve the safety and condition of bridges and generate significant cost savings by accelerating bridge improvement projects now. This can be accomplished by avoiding construction cost inflation and cost increases due to deterioration caused by deferred maintenance. These efforts to curtail the expanding inventory of these bridges are enforced by the state and federal governments. MassDOT provides PVPC with a 'bridge conditions' inventory on an annual basis. PVPC, in cooperation with MassDOT, continually monitors bridge conditions and works with its member communities to improve structurally deficient and functionally obsolete bridges in our region.

Identify safe alternate heavy vehicle routes in the region.
Structurally deficient and functionally obsolete bridges can restrict the movement of goods. The location of bridges and underpasses that do not provide proper height and weight clearances and heavy vehicle restrictions on local roadways require the identification of appropriate alternate routes. Alternate heavy vehicle routes are usually pre-determined or occur by default as drivers familiarize themselves with the region. PVPC collects vehicle classification during the annual traffic count program and identifies routes with higher heavy vehicle traffic volumes. This data, when compared to bridge and roadway capacity, can identify potential alternatives for heavy vehicle travel between popular destinations in the region.

Increase efficiency of rail systemwide.
Rail is an efficient method of transporting freight in the region. Businesses should be encouraged to participate in 'direct-to-rail' freight movement. Benefits in utilizing rail for transport include a decrease in congestion produced by trucks along roadways, significant cost benefits in transport for businesses, and additional alternatives for the movement of people. An inventory of the current rail track condition, location, and usage is essential in determining the ability to meet future demand on rail systemwide. Further, rail efficiency in freight can be accomplished by what is called 'double-stack' capabilities where two freight compartments are stacked on top of each other which in turn decreases the amount of trips needed. An updated rail bridge capacity inventory identifies bridges that do not meet the height requirements for double-stacked freight. PVPC, in cooperation with rail providers, will develop and monitor these inventories in the region.

Identify off-ramps that are operating above capacity.
Off-ramps that routinely back up cause both travel delays as well as safety issues on and off the interstate system. Many of the off ramps in the region back up during peak hours of travel. By identifying these locations PVPC will be able to perform more in-depth studies to identify what is causing the delay and develop recommendations to improve traffic flow. This currently requires enhanced data collection through video monitoring or other measure. The PVPC will continue to explore appropriate methods to obtain this information in the future.

Map travel time contours to show distance traveled in 15 minute intervals.
A series of travel time contours were developed for the Pioneer Valley Region based on the location of centers of employment in the region. A total of six employment centers were selected because of their significance and to achieve geographic diversity. Many employment centers were not selected due to their close proximity to a site that was already mapped. Travel contours are broken down into 15, 30, and 45 minute intervals. This information identifies average commute times along major roadways and assists in identifying existing limitations and deficiencies encountered by both automobile and freight traffic. PVPC will continually collect interstate travel times on a regular basis.

Improve Level of Service (LOS) on major intermodal connector routes to the National Highway System.
Roadway and intersection LOS is an indication of the overall effectiveness of traffic flow along a corridor. Roadways with a good LOS typically experience lower levels of congestion. The identification and monitoring of major intermodal connection routes will assist in maintaining efficient and convenient access for the transportation of goods to and from the PVPC region.

Movement of Information

Table 3 Movement of Information – Summary of Performance Measures

Performance Measures	Status
Monitor and update the percentage of areas without broadband access.	Ongoing
Increase the number of ITS based cameras, variable message boards, and detection units in the PVPC region.	Ongoing
Continue to utilize car based GPS travel time data collection.	Ongoing
Identify and monitor the number of closed-loop traffic signal systems in the Pioneer Valley.	Immediate
Improve access to advance information on ongoing construction activity.	Immediate
Develop an inventory of traffic signals with video detection capability.	Immediate
Data sharing with regional public and private partners.	Immediate
Provide more advance information for transit riders on anticipated vehicle arrival time.	Future
Monitor the average incident response time	Future

Monitor and update the percentage of areas in the region without broadband access.
Broadband is vital to the movement of information throughout the region. Broadband allows for the transfer of large amounts of data in real-time. Not only will expanding access to broadband increase the use of telecommuting and teleconferencing, it will also increase access to real time traffic information which will allow for early notifications systems allowing commuters to find alternative routes.

Increase the number of ITS based cameras, variable message boards, and detection units in the PVPC region.
Real-time traffic information is a key element in reducing congestion due to construction and/or incidents on our roadway network. The University of Massachusetts at Amherst (UMass) houses the Regional Transportation Information Center (RTIC). RTIC provides real-time traffic information on several major roadways in the PVPC region. MassDOT is also in the process of installing ITS technology on I-91. When completed MassDOT will have the capability to monitor and notify commuters of current traffic conditions. Increasing the number of locations being monitored will allow for more opportunities for commuters to receive real-time updates on regional traffic conditions.

Continue to utilize car-based GPS travel time data collection.
PVPC has developed an automobile travel time data collection program which utilizes GPS data loggers. Prior to GPS based data collection, PVPC staff were required to drive the predetermined corridors while manually timing each run with a stop watch and recording the times verbally with an audio recorder. GPS based data collection allows for a much safer and more efficient data collection process. The GPS units also allow for a more accurate and efficient analysis process by using a GIS based traffic analysis software.

Identify and monitor the number of closed-loop traffic signal systems in the Pioneer Valley.
Closed loop traffic signals operate more efficiently than conventional stand alone signals. Closed-loop systems can be monitored and timing plans can be modified from a remote computer site to allow for more efficient traffic flow. By identifying the number of closed loop systems, PVPC can identify locations where closed loop systems would help decrease congestion and make recommendations on locations that could benefit from a dedicated peak hour timing plan.

Improve access to advance information on ongoing construction activity.
Roadway construction is a major source of non recurring congestion. The UMass RTIC program as well as the ongoing I-91 ITS project are both tools for informing commuters of potential delays due to

ongoing construction projects. By improving access to information regarding construction and potential alternative routes, the potential for non recurring congestion can be decreased.

Develop an inventory of traffic signals with video detection capability.
Traffic signals with video detection systems are used to monitor and improve the efficiency of the intersection. Many of the video detection camera's can also be linked to a web site to give real time video of the intersection of interest. Having an inventory of all traffic signals with video detection capabilities will not only allow for the potential expansion of advanced information systems but also for future intersection improvements.

Increase data sharing with Regional Public and Private Partners.
With the expanding resources of the RTIC program at UMass, the implementation of the AVL system on PVTA buses, and the ongoing I-91 ITS project, new sources of data are becoming available for use in the CMP. RITC, PVTA, and MassDOT will all have access to real time traffic information for informing the public of current conditions. A data sharing agreement which allows access to all real-time data would greatly increase the value of the data. The data archive of these three data sources would be of great value to future updates of the CMP.

Provide more advance information for transit riders on anticipated vehicle arrival time.
Advanced information services for transit customers is an important tool for attracting and retaining ridership. PVTA's AVL system includes transit customer information components, such as "next bus" arrival data at major stops; travel information delivered via cell phones and personal digital devices; and websites. These services will be implemented during the next two to five years in both trial and full implementation.

Monitor the average incident response time.
Incidents on the roadway system do not only cause non recurring congestion by restricting lane use, but are also a distraction as drivers tend to slow down to see what has happened. The time it takes for information to be relayed to the appropriate authorities can greatly increase or decrease the effects of non-recurring congestion due to incidents on the roadway. Having advanced ITS systems in place to monitor and detect incidents on the roadway will greatly reduce response time, which in turn will reduce the amount of non-recurring congestion caused by incidents.

Safety and Security

Table 4 Safety and Security – Summary of Performance Measures

Performance Measures	Status
Monitor Peak hour loading vs. vehicle rated capacities (load factors).	Ongoing
Monitor transit vehicle crash rate and identify high crash locations	Ongoing
Monitor PVTA customer satisfaction related to safety throughout the PVTA system.	Ongoing
Monitor the EPDO ranking at intersections in the region	Ongoing
Monitor the percent of the Federal Aid Eligible Roadway Network rated in "Poor" condition.	Ongoing
Identify communities in the Pioneer Valley with a Safe Route to School Program.	Ongoing
Annual totals of fatalities and injuries caused by motor vehicle crashes.	Ongoing

Monitor Peak hour loading vs. vehicle rated capacities (load factors).
The number of seats available for transit customers during peak hours is critical to attracting and maintaining ridership. At present, this information is available only from on-site observation and bus driver reports. PVTA's new AVL system will include passenger count capabilities to provide real

time data on vehicle loads. This information can then be used to help adjust schedules and vehicle deployment to reduce vehicle crowding and improve operations.

Monitor transit vehicle crash rate and identify high crash locations.
Transit vehicle crashes cause non-recurring congestion for both passengers and motorized vehicles. The higher the transit vehicle crash rate, the higher the non-recurring congestion for both transit riders and vehicles navigating the corridor. By monitoring the locations where transit crashes take place, PVPC staff will be able to identify high crash locations within the transit routes. Locations identified as high crash locations would need further study to identify the problem and recommend solutions to prevent or reduce future crashes.

Monitor PVTA customer satisfaction related to safety throughout the PVTA system.
The comfort level of potential transit riders is a key element to the continued use of the bus system. PVPC plans on monitoring customer satisfaction related to safety throughout the PVTA system by: monitoring safety incidents at the bus terminal located at 1776 Liberty Street, routinely performing onboard passenger surveys to sample transit customer satisfaction with safety, and by inventorying the number of bus stops and transit shelters with solar lighting. The safety incident reports will allow for the identification of needed improvements at the bus terminal. PVPC routinely surveys PVTA users and uses that data to make any needed adjustments. Well lit bus stops greatly increase the level of comfort of potentials riders during the hours of darkness.

Monitor the Equivalent Property Damage Only (EPDO) ranking at intersections in the region.
The EPDO method takes into account the total number of crashes at a location and the severity of each crash. This allows PVPC to calculate crashes per mile per corridor based on the EPDO. Locations that experience higher levels or more severe crashes not only contribute to non-recurring congestion, but to the safety of all modes of travel though that area.

Monitor the percent of the Federal Aid Eligible Roadway Network rated in “Poor” condition.
PVPC has an ongoing Pavement Management System (PMS) for the Pioneer Valley Region. PMS is a systematic process of collecting and analyzing pavement data in order to be able to select cost-effective strategies for providing and maintaining pavements in a serviceable condition. Pavement data can be used to identify locations were pavement conditions have deteriorated to the point were travel speeds are affected. Roadways rated as “Poor” have the potential to experience more congestion due to reduced speeds caused by the roadway conditions. Keeping the federal aid eligible roadway network in “Fair” or better condition could have a positive impact on reducing congestion.

Identify communities in the Pioneer Valley with a Safe Route to School Program.
The purpose of the Safe Route to School Program is to examine the conditions around schools and implement projects and activities that work to improve safety, accessibility, and reduce traffic in the vicinity of schools. As a result, these programs help make bicycling and walking to school a safer transportation choice and can play a role in reducing congestion.

Chapter 3 Summary of Ongoing Performance Measures

As discussed in Chapter 1, CMP activities are interactive and comprehensive. Also, the availability of resources and data will guide the assessment of the congestion in the region. The data evaluated and analyzed for the creation of this report included auto travel times, transit information, inventoried park and ride lots, high crash locations, bridges, bicycle lanes, and at-grade railroad crossings. Their descriptions are presented in this chapter.

Automobile Travel Time

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

Method

The PVPC staff has identified 76 congested corridors 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 the auto travel time data by performing multiple data collection runs along each of the corridors using a Qstarz Global Positioning System (GPS) travel recorder. This data was then downloaded for evaluation and analysis using, TravTime™ 2.0 software by GeoStats. The speed, direction, and time of 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 congestion measures described below.

Congestion Measures

Three separate measures are currently being utilized to evaluate congestion in the PVMPO region. They are the travel time index, total delay, and the congestion ratio. A combination of congestion measures was utilized to compensate for the impacts of very short or very long travel times that can be experienced due to daily and seasonal traffic variations as well as the impacts of 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 a 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.

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

Park and Ride Lots

There are currently three designated Park and Ride lots in the PVMPO's region. In addition, the Damon Road lot for the Norwottuck Rail Trail is also used as an informal Park and Rid Lot due to its location off of I-91 Exit 19. The PVPC monitors all four parking areas on a monthly basis. A summary of the existing Park and Ride lot use is presented in Table 5.

Data Collection

The data collection for the Park and Ride lots was conducted on Tuesdays, Wednesdays, and Thursdays between the hours of 10:00 AM and 2:00 PM. The occupancy was determined by dividing the number of occupied spaces by the total available parking spaces. Parking occupancy that exceeds 85% may be an indication of expansion needs while parking occupancy that is less than 30% may indicate the Park and Ride lot could benefit from additional marketing to increase use. As can be seen by the table, occupancy has increased over the past two years. This may be as a result of roadway congestion and higher gas prices, but could be considered as a more cost effective method of transportation, particularly at Park and Ride lots on existing transit routes. The Springfield Park and Ride lot has over 500 spaces available and has an occupancy level of just over 10%. Usage at this location may be impacted by the $0.50 per hour fee associated with the utilization of this lot. The Park and Ride lots located in Northampton at Sheldon Fields and Damon Road have an overall average occupancy of 20% and 29% respectively. However, both locations are experiencing increased utilization as data from 2008 and 2009 show average occupancy rates over 40%.

Table 5 Park and Ride Lots and Yearly Average Occupancy

Community	Location	Spaces Available	Occupancy 2002	2003	2004	2008	2009	% Occupied (Avg)	Parking Cost
Ludlow-MA Turnpike- Exit 7	Route 21 (Center St) Rear of McDonalds	42	21	15	27	30	27	56	No
Ludlow-MA Turnpike- Exit 7 (Center Lot)	Route 21 (Center St) Rear of McDonalds	52	NA	NA	NA	NA	39	74	No
Springfield	10 Centre St. Under I-291	502	57	67	60	48	51	11	$.50 per hr / or permit
Northampton	Sheldon Fields (Route 9)	76	4	4	3	34	31	20	No
Northampton	Damon Rd. (Norwottuck Bike Trail Lot)	30	8	3	8	12	14	29	No

Occupancy is average for entire year
Data provided by PVPC
Data for years 2002 to 2008 is partial year data

Future Park and Ride Lots

Two new park and ride lots are now under design by MassDOT:

- Northampton VA Medical Center located on Route 9 in the Leeds section of Northampton.
- Whately and Deerfield Town Line in I-91 median at Exit 24.

PVPC supports the development of additional park and ride lots and is cooperating with MassDOT Highway Division to develop standards for the identification and implementation of new park and ride lots. These include:

- Identify existing parking lots which are under utilized during the business day.
- Evaluate the lot’s proximity to the National Highway System as well as to other modes of transportation.
- Contact the property owner and discuss incentives for the property owner that would allow commuters to utilize the lot during the day, these incentives could be a donation bucket or free advertisement on park and ride lot information resources.
- Create a contract with the property owner to formalize the agreement.
- Submit contract to MassDOT and request the placement of Park and Ride Lot as well as trailblazing signs for the location and update park and ride resources to include new location.

High Crash Locations

PVPC continually tracks high vehicle crash locations. In March 2008, PVPC released the Top 100 High Crash Intersections in the Pioneer Valley Region 2003-2005 report. This report identifies intersections with a history of safety problems based on crash location and severity data provided by MassDOT. The high crash locations were considered within this report because of their potential to create non-recurring congestion along CMP corridors.

The Top 100 High Crash Intersections report considers all crashes that occur within 200 feet of an intersection, but does not include information on other crashes that may have occurred along a corridor. These lane departure crashes would also have an impact on the congestion experienced along a corridor. The number of high crash intersections per mile was calculated for each CMP corridor and factored into the congestion severity calculation for each corridor. More information on this process is provided in Chapter 4. Figure 2 shows the locations of the high crash intersections on CMP corridors in the Pioneer Valley.

Bridges

There are a total of 674 bridges in the Pioneer Valley Region. As our roadway infrastructure continues to age many of our regions bridges fall below the accepted standards required to be considered “Structurally Sufficient”. As bridges deteriorate, they can have a negative impact on travel throughout our region. All bridges in the state undergo routine structural inspection using a generally accepted rating system developed by the American Association of State Highway and Transportation Officials (AASHTO). A bridge is classified structurally deficient when the bridges sufficiency rating falls below the acceptable sufficiency rating set by the AASHTO. As of March 2009, 11 percent of the bridges in the Pioneer Valley Region were classified as structurally deficient. The number of structurally deficiently bridges virtually stayed the same since the Pioneer Valley Regional Transportation Plan (RTP) was completed in 2007. A recent analysis completed by MassDOT showed that to achieve a net reduction of one structurally deficient bridge it was necessary to repair just over two structurally deficient bridges.

A bridge is classified functionally obsolete when deck geometry, local capacity, clearance or alignment of the approach roadway no longer meets the need of the functional classification of the roadway it serves. As of March 2009, 24 percent of the bridges in the Pioneer Valley Region were considered to be functionally obsolete. Table 6 lists the condition of the pioneer valley bridges by community and Figure 3 illustrates the location by classification of these bridges. As can be seen from the table, 238 or 35.3% of the 674 bridges in the region are considered deficient. The deficient bridges were identified along each CMP corridor to assist in calculating the severity of congestion along each corridor.

A number of bridges in the Pioneer Valley have posted signs describing weight restrictions for larger vehicles such as trucks and buses. Some bridges have deteriorated to the point that they are closed to vehicular traffic. This can necessitate long detours that increase regional travel times and add to congestion. Other “structurally sufficient” bridges have a negative impact on congestion by failing to meet current standards of geometry and lane clearance capacity. This can result in reductions of travel speed and adversely impact alternative modes of transportation such as bicycle and pedestrian travel.

Figure 2 Crash Locations of CMP Corridors

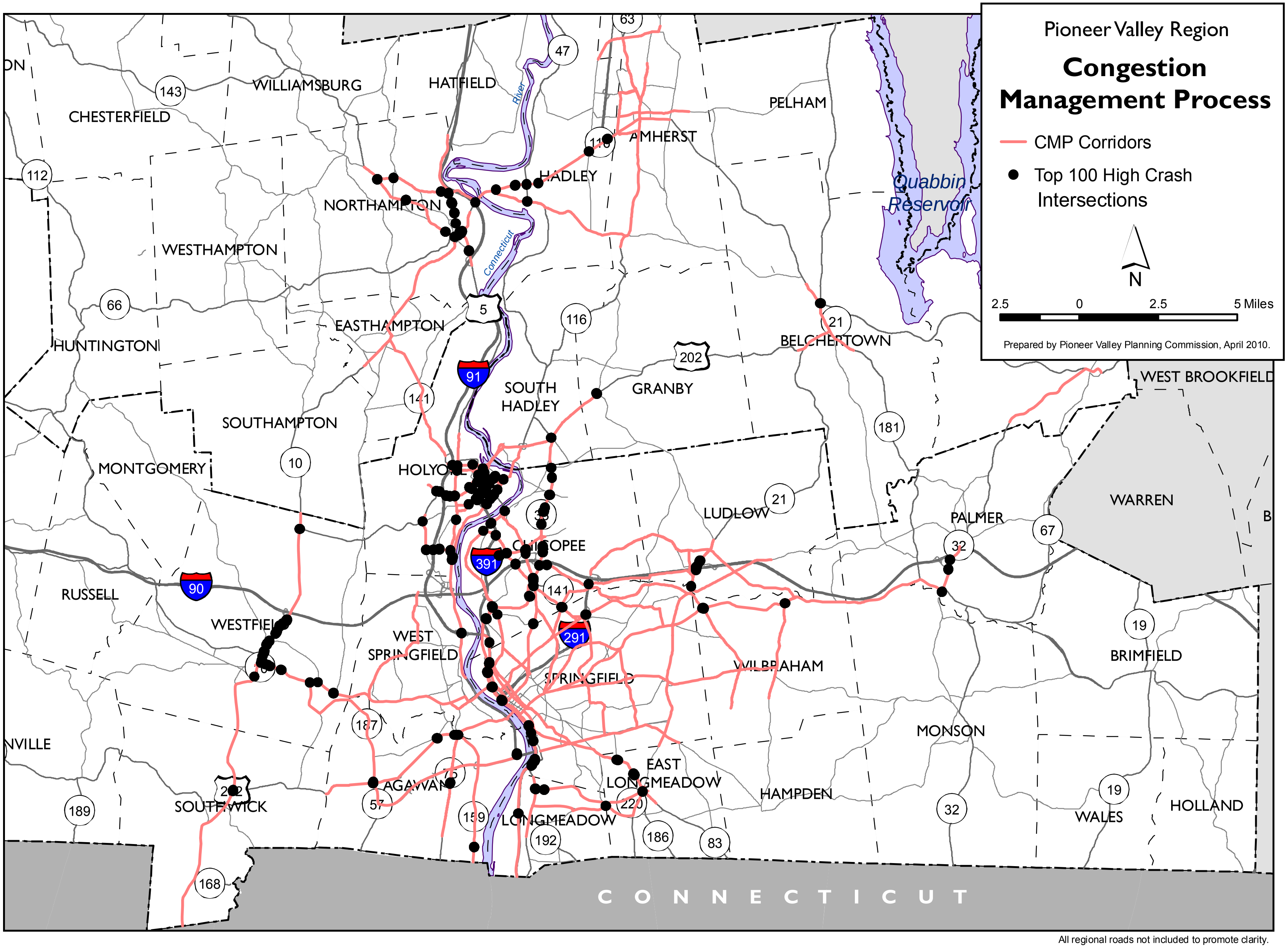
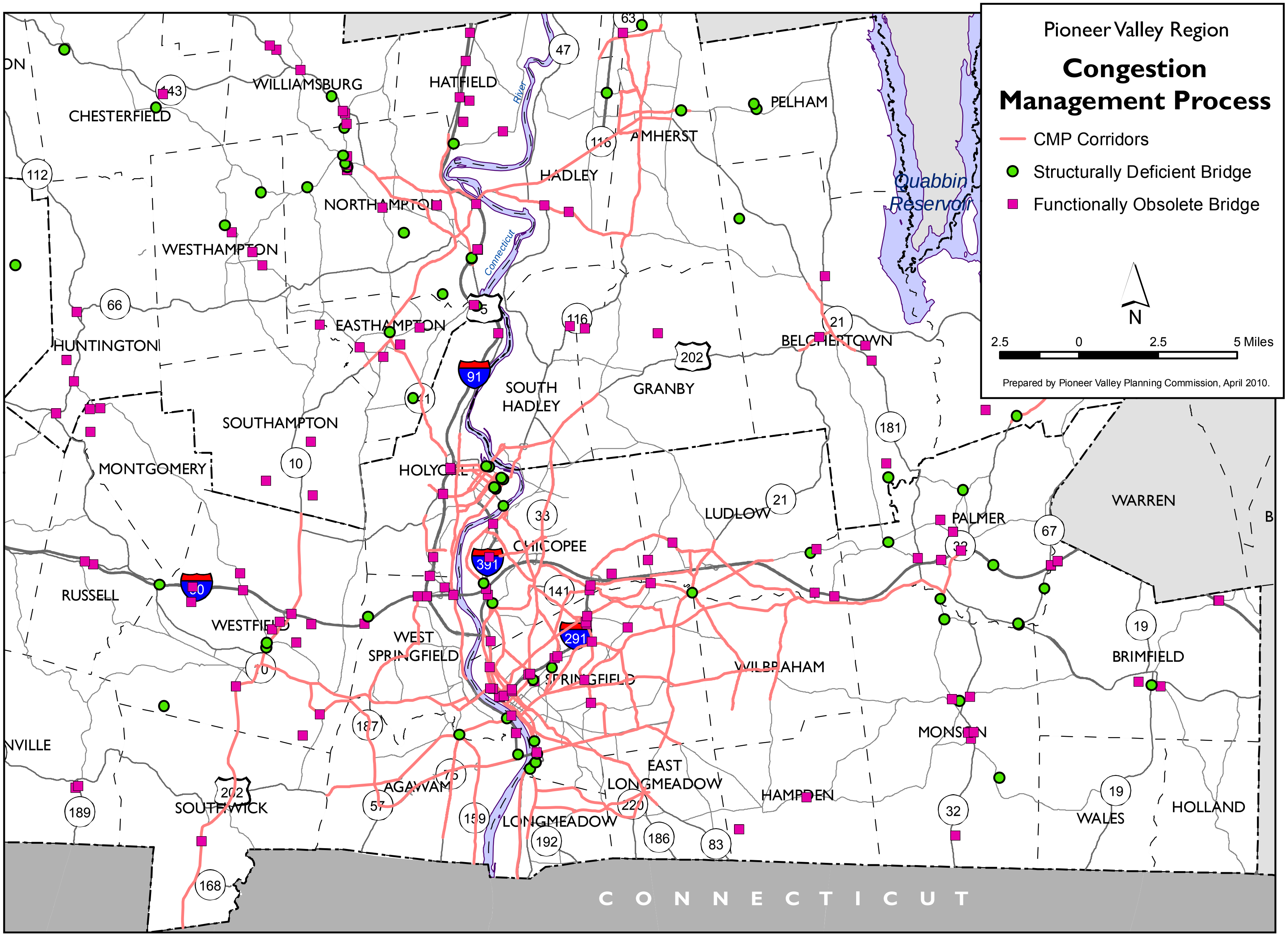


Figure 3 Structurally Deficient and Functionally Obsolete the Pioneer Valley Region



All regional roads not included to promote clarity.

Table 6 Pioneer Valley Bridge Conditions - 2009

Community	Functionally Obsolete	Structurally Deficient	Total Deficient Bridges	Total Bridges	% Deficient	% Functionally Obsolete	% Structurally Deficient
Agawam	2	2	4	18	22.2%	11.1%	11.1%
Amherst	1	3	4	15	26.7%	6.7%	20.0%
Belchertown	5	2	7	12	58.3%	41.7%	16.7%
Blandford	1	1	2	11	18.2%	9.1%	9.1%
Brimfield	6	2	8	26	30.8%	23.1%	7.7%
Chester	4	6	10	23	43.5%	17.4%	26.1%
Chesterfield	1	2	3	9	33.3%	11.1%	22.2%
Chicopee	8	3	11	50	22.0%	16.0%	6.0%
Cummington	1	0	1	13	7.7%	7.7%	0.0%
Easthampton	6	4	10	19	52.6%	31.6%	21.1%
Goshen	0	0	0	4	0.0%	0.0%	0.0%
Granby	2	0	2	8	25.0%	25.0%	0.0%
Granville	2	0	2	8	25.0%	25.0%	0.0%
Hadley	2	1	3	10	30.0%	20.0%	10.0%
Hampden	2	0	2	8	25.0%	25.0%	0.0%
Hatfield	7	1	8	15	53.3%	46.7%	6.7%
Holland	0	0	0	1	0.0%	0.0%	0.0%
Holyoke	8	6	14	49	28.6%	16.3%	12.2%
Huntington	5	0	5	8	62.5%	62.5%	0.0%
Longmeadow	0	0	0	4	0.0%	0.0%	0.0%
Ludlow	4	2	6	22	27.3%	18.2%	9.1%
Middlefield	2	0	2	9	22.2%	22.2%	0.0%
Monson	6	4	10	23	43.5%	26.1%	17.4%
Montgomery	3	1	4	5	80.0%	60.0%	20.0%
Northampton	10	9	19	44	43.2%	22.7%	20.5%
Palmer	9	5	14	31	45.2%	29.0%	16.1%
Pelham	0	2	2	3	66.7%	0.0%	66.7%
Plainfield	2	0	2	2	100.0%	100.0%	0.0%
Russell	3	0	3	15	20.0%	20.0%	0.0%
South Hadley	1	1	2	11	18.2%	9.1%	9.1%
Southampton	3	0	3	10	30.0%	30.0%	0.0%
Southwick	1	0	1	3	33.3%	33.3%	0.0%
Springfield	24	7	31	59	52.5%	40.7%	11.9%
Wales	0	0	0	1	0.0%	0.0%	0.0%
Ware	3	2	5	16	31.3%	18.8%	12.5%
West Springfield	6	2	8	26	30.8%	23.1%	7.7%
Westfield	12	3	15	35	42.9%	34.3%	8.6%
Westhampton	3	2	5	14	35.7%	21.4%	14.3%
Wilbraham	2	0	2	4	50.0%	50.0%	0.0%
Williamsburg	6	1	7	16	43.8%	37.5%	6.3%
Worthington	0	1	1	14	7.1%	0.0%	7.1%
Grand Total	163	75	238	674	35.3%	24.2%	11.1%

2009 Bridge data provided by MassDOT

Chapter 4 Regional Congestion Severity

The PVPC reviewed each of the ongoing performance measures with respect to their impacts on congestion severity. In previous versions of the CMP, congestion severity was defined solely by the total delay and congestion ratio calculated for each CMP corridor. As new performance measures are integrated into the CMP it becomes more difficult to quantify congestion as each corridor has a number of different factors that contribute to congestion.

A Regional Congestion Severity formula was developed to assist in our goal of developing an objective driven, performance based congestion management process that incorporates both recurring and non-recurring congestion. This formula is intended to be a dynamic metric that can be modified to incorporate Immediate and Future performance measures as data becomes available. A number of variations of this formula were tested. Each variation attempted to incorporate a variety of performance measures that considered the impacts of a variety of transportation modes on regional congestion. The current version of the formula includes data from six performance measures and integrates the impacts of non-recurring congestion, roadway geometry, and bridge conditions in addition to travel time data.

$$\text{Regional Congestion Severity} = \text{AVG}\overbrace{\left(\text{Travel Time Index} + \text{Travel Time Delay} + \text{Congestion Ratio}\right)}^{\text{Inverse Ranking of:}} + 5 \times \left(\frac{\text{\# High Crash Locations}}{\text{Length of Corridor}}\right) + \left(3 \times \text{Structurally Deficient Bridge Total}\right) + \left(2 \times \text{Functionally Obsolete Bridge Total}\right)$$

Travel Time Data

As detailed in Chapter 3, travel time data is analyzed using three different performance measures: Travel Time Index, Travel Time Delay, and Congestion Ratio. Each CMP corridor was ranked based on the inverse value of each of the travel time performance measures. Corridors with higher values for each of the performance measures received higher weight in the ranking scheme. Currently, there are a total of 57 CMP corridors with available travel time data. The ranking scheme ranges from 1 to 57 with a value of 57 indicating the highest level of congestion and 1 indicating the lowest level of congestion. A weighted average was performed of the inverse rankings of each performance measures and the average values were again inversely ranked. Priority on corridors that had the same rank was given to the corridor with the higher Travel Time Index. The actual value of this final ranking was used in the Regional Congestion Severity formula.

High Crash Locations

As detailed previously, high crash locations identified in the Top 100 High Crash Intersections in the Pioneer Valley Region report were plotted along each of the CMP corridors. The number of high crash locations was divided by the distance of the corridor in the miles, thus placing a greater emphasis on the concentration of crashes rather than total experience. This figure was then multiplied by a factor of 5 to increase its weight in the regional congestion severity formula.

$$\text{High Crash Location} = 5\left(\frac{\text{\# of High Crash Locations}}{\text{Distance of Corridor}}\right)$$

Bridges

Structurally deficient and functionally obsolete bridges are discussed and defined in Chapter 3 of this report. As mentioned, bridges that fall into these two categories negatively contribute to congestion throughout the region especially during peak hour travel. Deficient and obsolete bridges occasionally require vehicles to travel alternate routes, create bottle necks due to lane elimination or lack of exclusive turning lanes, and influence driver confidence resulting in deceleration. For these reasons, the Regional Congestion Severity formula attempts to capture the impacts of structurally deficient and functionally obsolete bridges. Table 6 identifies structurally deficient and functionally obsolete bridges in the Pioneer Valley. Each structurally deficient bridge and functionally obsolete bridge located within a corridor was multiplied by the value of 3 and 2 respectively.

Congestion Severity Descriptions

The values produced for each corridor by the Regional Congestion Severity formula are ranked to create a congestion severity table ranging from the most congested to the least congestion. For analytical and evaluative purposes, four descriptive levels of congested were created. Each Level is explained below. The corridors were grouped into 15 severely congested corridors, 15 seriously congested corridors, 15 moderately congested corridors, and 12 minimally congested corridors based on their calculated severity value.

Severe Congestion

Severe congestion is characterized by a condition of heavy traffic congestion resulting in significantly slower traveling speeds, longer trip times, significant queuing and high side-street delay. Contributing factors include vehicle volume, pedestrian volumes, multi-purpose lane utilization, multi-modal utilization and availability, functionally obsolete and structurally deficient bridges, vehicle crashes and uncoordinated signalized intersections. These corridors will greatly benefit from further study to identify recommendations useful in relieving congestion. These corridors are operating above capacity and driving conditions are highly unstable.

Serious Congestion

Serious congestion is characterized by a condition of medium traffic congestion approaching unstable flow caused by slower travel speeds, queuing and increased levels of delay. Contributing factors include vehicle volumes, pedestrian volumes and the number of signalized and unsignalized intersections along the corridor. These corridors operate at or near capacity.

Moderate Congestion

Moderate congestion is characterized by a condition of stable traffic congestion and flow, non-sporadic travel speeds and reasonable trip times. Contributing factors include reasonable traffic volume and opportunities for non-recurring congestion. These corridors may have small pockets of congestion, but generally operate at posted speed limits.

Minimal Congestion

Minimal congestion is characterized by a condition of ideal traffic congestion operating at desired travel speeds, with reasonable trip times and little to no queuing or delay. These corridors are ideal for commuting purposes and operate at free-flow travel speeds.

Chapter 5 Findings

The results of the Regional Congestion Severity formula are summarized in Table 7. Corridor descriptions can be obtained by cross referencing Corridor numbers with the Appendix of this report. The regional congestion severity rank, as described in Chapter 4 of this report, has been color coded for map readability. They are as follows; Severe Congestion is color coded red, Serious Congestion is color coded orange, Moderate Congestion is color coded yellow, and Minimal Congestion is color coded green.

Table 7 Congestion Assessment 2009

Rank	Corridor	Communities	Corridor Summary	Congestion Score	Crash Intersection Score	SD Score	FO Score	Regional Congestion Severity
1	69	Holyoke	Dwight sty eastbound from I-91 Exit Ramp to South Hadley Rotary, westbound Purple heart dry to Rotary over Muller bridge on to Hampden St ending at Easthampton Rd	54	13.6	6	6	80
2	75	Chicopee	Chicopee St, Front St, Cabot St, Exchange St, and Groove St from Florence St to East Main St	57	6.9	6	4	74
3	30	Westfield	Route 10/202 northbound from Broad St to Southampton TL	37	30.4	3	2	72
4	71	Holyoke	Appleton St from Dwight St to Canal St	45	17.9	6	0	69
5	42	Holyoke	Maple St from Lyman sty to Route 5 and South St, and High St from Route 5 to Lyman St	43	23.7	0	0	67
6	74	Chicopee	McKinstry Ave, Granby Rd, and Westover Rd from Arcade St to Bernice St	52	11.8	0	0	64
7	72	Chicopee	Chicopee St, Prospect St, Yelle St, and Montgomery St from Front St to Wells Ave	41	10.0	6	6	63
8	66	Chicopee / Ludlow	Fuller Rd from Shawinigan Dr to West Ave ending at Center St in Ludlow	56	3.0	3	0	62
9	44	Holyoke	Cherry St and Beech St eastbound from Frost Dr to South Hadley Rotary, westbound from South Hadley Rotary to Linden to West Franklin west on Beech St ending at Frost Dr	28	26.0	6	2	62
10	9	Holyoke	Laurel St, Brown Ave, South St, and High St ending at Lyman St	21	40.9	0	0	62
11	79	Springfield	E Columbus Ave from Bruno St to Liberty St	53	8.8	0	0	62
12	84	Springfield Chicopee	Saint James Ave from State St to Broadway in Chicopee	55	2.8	3	0	61
13	25	Springfield	Sumner Ave, and Allen St from Long Hill Rd to E. Longmeadow TL	47	11.9	0	0	59
14	22	Springfield	Roosevelt Ave from East St to Sumner Ave	40	8.3	0	10	58
15	77	Springfield	Liberty St and Armory St from W Columbus Ave to Atwater Rd	51	5.0	0	2	58

Red = Severe
Orange = Serious
Yellow = Moderate
Green = Minimal

SD = Structurally Deficient
FO = Functionally Obsolete

Table 7 Congestion Assessment 2009 Continued

Rank	Corridor	Communities	Corridor Summary	Congestion Score	Crash Intersection Score	SD Score	FO Score	Regional Congestion Severity
16	51	Northampton	Route 5 from I-91 Exit 18 to I-91 Exit 21	38	11.5	6	0	56
17	18	Springfield	Main St from State St to Sumner Ave	49	5.0	0	0	54
18	80	Springfield	W Columbus Ave from I-2291 on Ramp to South St	50	2.1	0	0	52
19	52	Springfield	Bay Rd from State St to Boston Rd	46	4.5	0	0	51
20	67	Amherst	Snell St, University Dr, Massachusetts Ave, N Pleasant St, and E Pleasant sty from Route 116 to Eastman Ln	48	0.0	0	0	48
21	73	Chicopee	Grattan St from Chicopee St to Memorial Dr	42	3.4	0	0	45
22	28	West Springfield	Route 20 from East Mountain Rd eastbound to N. End Bridge	44	1.0	0	0	45
23	12	Springfield	Parker St from N. Branch Pkwy north ending at east and Center St in Ludlow	39	2.8	3	0	45
24	37	Holyoke	Route 5 from Providence Hospital north to River Terrace	36	7.3	0	0	43
25	2	Agawam	Route 147 Mill St to River St	29	7.1	3	2	41
26	31	Westfield	Route 20 westbound from East Mountain Rd to Broad St	22	17.4	0	0	39
27	85	Springfield	Breckwood Blvd and Bradley Rd from Boston Rd to Bradley Rd	35	3.8	0	0	39
28	8	E. Longmeadow Springfield	Route 83 from Quarry Hill Rd to Sumner Ave	33	5.3	0	0	38
29	21	Springfield Chicopee	Liberty St from Chestnut to Broadway St in Chicopee ending on Memorial dry at Exit 5	24	8.8	0	4	37
30	82	Springfield	Southbound Springfield St in Chicopee, Chestnut St, Noble St, Bernie Ave ending at Plainfield St in Springfield, Northbound Plainfield St, Wasson Ave, Bernie Ave, Noble St, Chestnut and Springfield St from West St to Center St in Chicopee	31	5.3	0	0	36

Red = Severe
Orange = Serious
Yellow = Moderate
Green = Minimal

SD = Structurally Deficient
FO = Functionally Obsolete

Table 7 Congestion Assessment 2009 Continued

Rank	Corridor	Communities	Corridor Summary	Congestion Score	Crash Intersection Score	SD Score	FO Score	Regional Congestion Severity
31	35	Wilbraham	River Rd and Stony Hill Rd from Route 21 to Tinkham Rd	34	1.1	0	0	35
32	24	Springfield	State St from W. Columbus Ave to Boston Rd	27	4.8	0	2	34
33	86	Springfield Chicopee	E Main St, Worcester St, Main St from Main St in Chicopee to River Rd on the Indian Orchard/Wilbraham TL	32	0.0	0	0	32
34	23	Springfield	St. James Blvd, Page Blvd, and Pasco Rd from Carew to Boston Rd	9	22.7	0	0	32
35	27	West Springfield Holyoke	Route 5 from Providence Hospital South to Elm St	30	1.3	0	0	31
36	33	Westfield Southwick	Route 10/202 southbound from Court St to CT Line	26	1.1	0	4	31
37	10	Holyoke	Lower Westfield Rd and Homestead Ave from Route 5 to Cherry St	18	11.8	0	0	30
38	40	Chicopee	Route 33 from Granby Rd to I-90 exit 5	14	15.0	0	0	29
39	15	Northampton Easthampton	Route 9 from Florence St to Day Ave	16	11.5	0	0	27
40	14	Hadley Northampton	Bridge St, Damon Rd, Russell St from N. Main St to Agua Vitae Rd	20	6.3	0	0	26
41	50	Easthampton	Route 141 from Route 10 to I-91	25	0.0	0	0	25
42	49	Springfield Wilbraham	Boston Rd from State St to the Wilbraham/Monson TL	17	7.3	0	0	24
43	6	Springfield	Route 20A from Plainfield to Cadwell St	23	0.0	0	0	23
44	53	Palmer	Route 32 south from High St, Route 20 and 32 east to Boston Rd	19	3.7	0	0	23
45	13	Ludlow	Center St and East St from Rood St to Owens Way	11	10.5	0	0	22
46	39	Belchertown	Federal St, N Main St, S Main St, and Mill Valley Rd from Amherst Rd to Jensen St	15	1.7	0	0	17

Red = Severe
Orange = Serious
Yellow = Moderate
Green = Minimal

SD = Structurally Deficient
FO = Functionally Obsolete

Table 7 Congestion Assessment 2009 Continued

Rank	Corridor	Communities	Corridor Summary	Congestion Score	Crash Intersection Score	SD Score	FO Score	Regional Congestion Severity
47	41	Hadley Northampton	Bay Rd from West St westbound to Russell St	6	3.4	0	4	13
48	3	Agawam	Route 75 Mill Street to Route 159	13	0.0	0	0	13
49	56	Hadley	Route 9 from Agua Vitae Rd to North east St in Amherst	8	4.7	0	0	13
50	36	Wilbraham	Main St from Tinkham Rd northbound to Boston Rd eastbound to Benton St	12	0.0	0	0	12
51	20	West Springfield Springfield Chicopee	Route 20 from North/South Blvd to Park Ave to Carew St ending in Chicopee at Main St	3	3.2	0	4	10
52	5	Amherst	Meadow, Pine St, Bridge St, and Market Hill Rd	10	0.0	0	0	10
53	16	Northampton	Route 10 from Lovefield St to Pleasant St	4	2.1	3	0	9
54	11	Longmeadow	Route 5 Springfield TL to CT Line	7	1.4	0	0	8
55	1	Agawam	Route 57 from Rotary to Southwick TL	5	1.3	0	0	6
56	4	Agawam	Route 187 from Route 20 to Route 147 @ Mill St	1	1.9	0	2	5
57	48	West Springfield	Dewey St, Amostown Rd, Pease Ave, Morgan Rd, and Bernie Ave from Route 20 to Prospect Ave	2	0.0	0	0	2

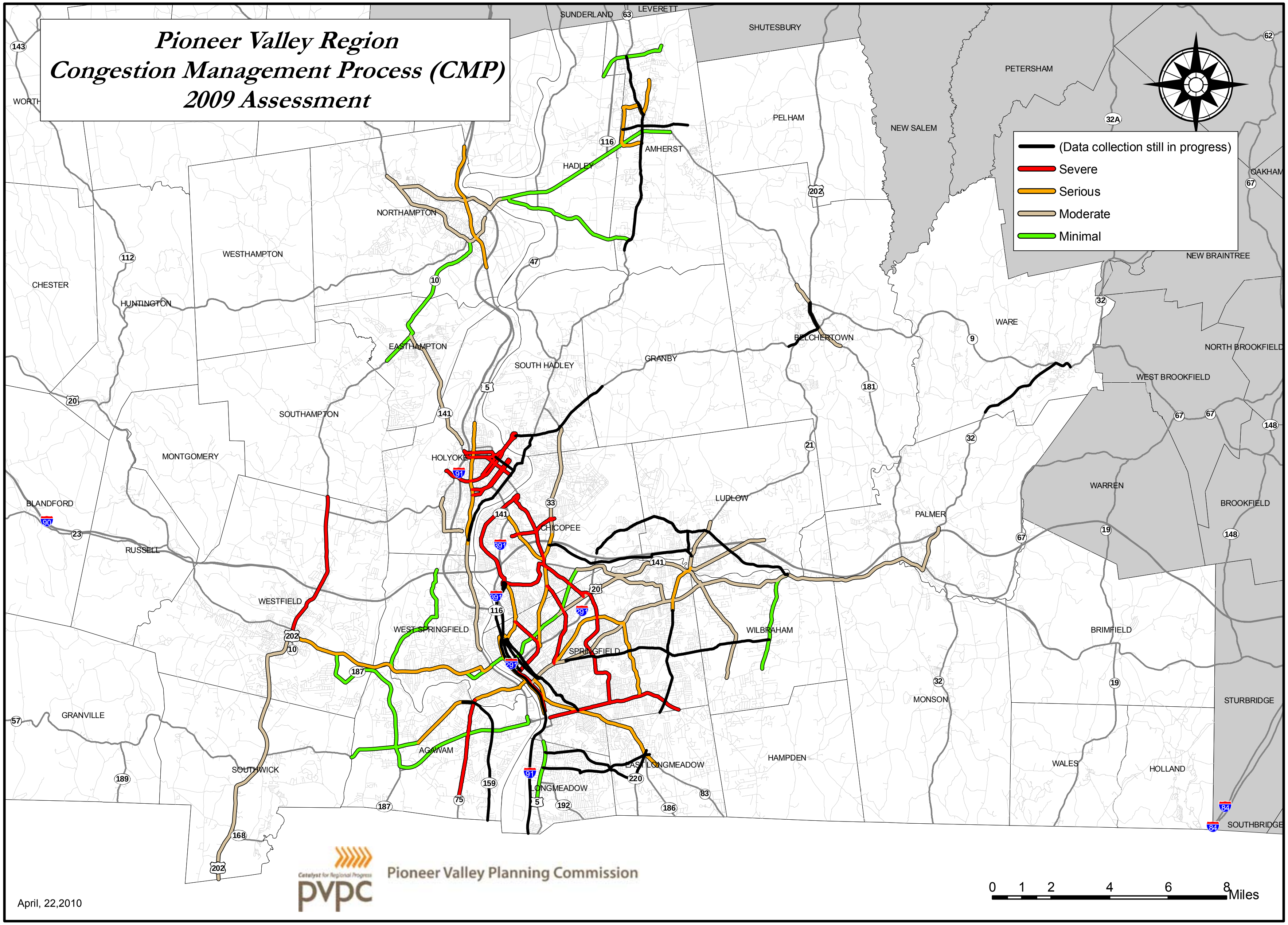
Red = Severe
Orange = Serious

Yellow = Moderate
Green = Minimal

SD = Structurally Deficient
FO = Functionally Obsolete

Figure 4 also illustrates the location of each corridor. Corridors are color coded by severity. Those denoted in black are corridors where data is still in the process of being collected. It is important to note that this figure illustrates a uniform congestion severity for the entire corridor. Each corridor experiences varying levels of congestion over its length. As a result, intersections that currently experience long delays could have an adverse impact on the congestion severity rating for the entire corridor. The calculated regional congestion severity is based on the performance measure data collected for the length of each corridor. In reality, some sections of CMP corridors can be expected to operate under less congestion than the regional congestion severity formula indicates. This issue will be analyzed in greater detail in future versions of the CMP.

Figure 4 Locations and Severity of Congestion 2009



CHAPTER 6 Summary of Immediate and Future Performance Measures

Transit Performance Measures

The public transit system of the Pioneer Valley provides essential mobility to thousands of the region's residents and commuters every day. The Springfield Metropolitan Statistical Area (MSA), which contains the PVMPO region, was ranked 49th in U.S. for transit rides per capita (TTI 2006) with an average 17.3 transit trips per capita per year (America's top transit city, New York, has 200 transit trips per capita).

In the context of this CMP study, public transit offers a significant and viable alternative to reducing regional roadway congestion caused by private motor vehicles. Yet, public transit vehicles are also vulnerable to the delays caused by traffic congestion itself in certain areas. In fact, while having a generally positive regional impact on reducing congestion, transit vehicles may actually contribute to congestion in discrete segments of some corridors, depending on such corridor-specific characteristics as roadway layout, traffic signal timings, density of trip generators, peak travel volumes and other factors.

This study offers an assessment of the opportunities that transit may offer for mitigating recurring and non-recurring vehicular congestion in the CMP corridors. Due to the widely varying conditions under which transit operates within the 76 CMP corridors evaluated, transit-related performance measures are not included in the formula used to assess the severity of congestion for each corridor.

In the Pioneer Valley, available transit services include:

- 44 fixed Pioneer Valley Transit Authority (PVTA) bus routes that provided nearly 10 million rides in FY2009;
- On-demand paratransit van service for people with disabilities and seniors, also operated by PVTA, that provided 330,000 rides in FY2009;
- Intercity bus routes operated by Peter Pan, Greyhound, Vermont Trailways and other companies;
- Amtrak passenger rail at two stations (Springfield and Amherst), with approximately 300 riders per day traveling to Springfield and points north;
- Dial-a-ride and van ride services by many municipal councils on aging;
- Private taxi and jitney carriers.

For this CMP corridor-based analysis, fixed bus route ridership is the most relevant and available data. Regular routes do not exist for paratransit and other demand-responsive services, and therefore their ridership cannot be meaningfully incorporated. Likewise, intercity bus and rail transit lines do not, for the most part, follow CMP corridors or provide the same type of local access as the PVTA bus.

This section presents a description of the PVTA fixed route system; recent ridership and customer demographic information; transfer data; and on-time performance information.

Regional Fixed Route Transit System Characteristics.

The PVTA fixed route bus system consists of 44 routes totaling approximately 650 route miles and is illustrated in Figure VI-1. A fleet of 130 buses operate from three garages: 1208 Main Street in downtown Springfield; 54 Industrial Boulevard in Northampton; and 255 Governors Drive on the University of Massachusetts Amherst campus. Most routes are geographically oriented on the Springfield, Northampton and Amherst urban centers, following the historic transit corridors established by railroad, street railway and trolley lines dating as long as a century ago. Other routes, such as shuttles and lines in suburban and rural areas, are geared to serve more recent development.

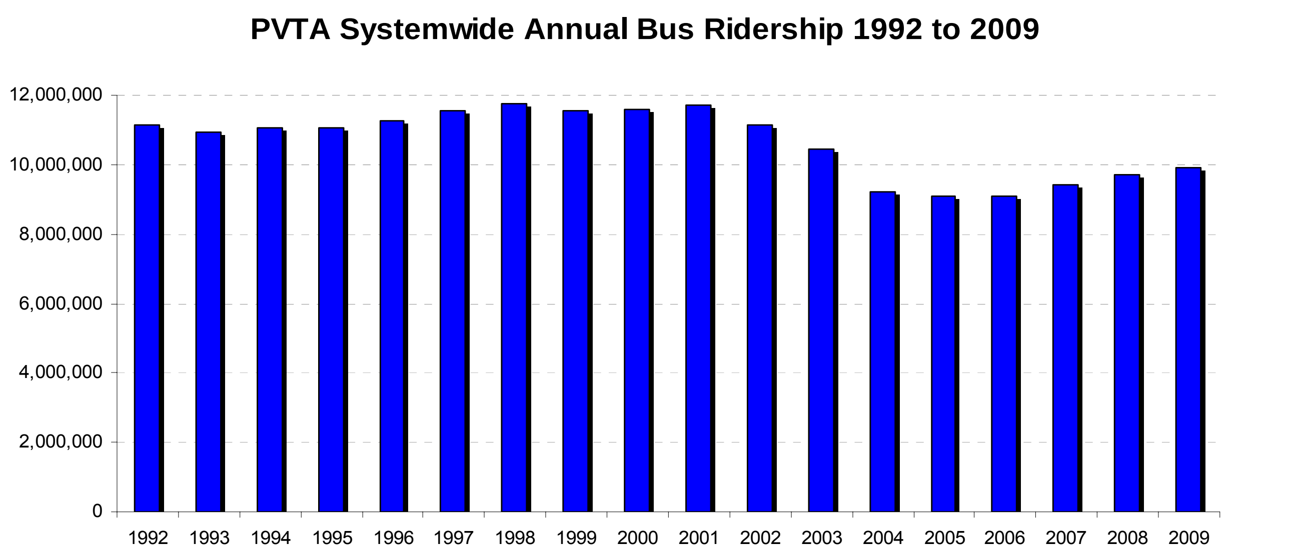
Regional Transit System Ridership

FHWA guidance cites transit ridership as a key CMP performance measure. Bus ridership is typically reported on an annual and monthly basis for individual routes. Following are PVTA ridership highlights for FY2009:

- 9.7 million total rides
- 850,000 average monthly rides (947,000 during academic months)

PVTA full system ridership since 1992 is displayed below. Significantly, PVTA cut service approximately 20% in FY2002 and subsequent years in response to reduced government support; total ridership fell as a result. Detailed FY2009 ridership by month and route is provided in the Appendix C of this document.

The annual and monthly systemwide ridership statistics do not constitute a metric that is comparable to the corridor-level automobile congestion data collected for this study, as this is gathered on a daily single-trip basis. Similarly, MassDOT roadway traffic volumes are also reported on a daily basis (i.e., vehicles per day).



Further, the pattern of transit use throughout the year in the PVTA's northern service area (Hampshire County) is significantly different from its southern service area (Hampden County). This is due to the relatively large number of students and academic employees who ride the bus to work when the University of Massachusetts and the four major private colleges in the county (Amherst, Hampshire, Mount Holyoke and Smith Colleges) are in session. In fact, ridership on several bus routes triples during the academic year; other routes simply do not operate during the summer.

Estimate of Transit Ridership in CMP Corridors

To create a comparable daily travel volume performance measure, this study offers an estimate of the transit trips taking place per weekday within each CMP corridor. The intent is that this metric will be a comparable measure for analysis with respect to the CMP vehicle trip observations. In effect, this is a "person trips by transit" for each corridor, which is roughly comparable to person trips by private auto.

This estimate was calculated by identifying all PVTA bus routes passing through each of the 76 CMP corridors and the proportion of those routes that exist within the corridor. This information is presented in Figure 5.

The percentage of each route that exists within each corridor was applied to each individual route's average monthly FY2009 ridership (academic months only on Hampshire County routes) and then divided by 28, which is the estimated number of "full" service days in the month (a discount from the total number of days per month to compensate for reduced service frequencies on most PVTA routes on weekends and holidays). These adjusted daily ridership estimates for CMP corridors were summed for corridors with more than one bus route. The result is an estimate for the number of person trips by transit taking place along each CMP corridor per day. The average distance of each transit trip was also calculated by applying the distance of the respective bus route that operates within a CMP corridor. These results are presented on the following table. CMP corridors are ranked (high to low) according to total number of estimated transit trips per day occurring within the respective corridor.

Table 8 shows that CMP Corridor #38 (West St in Amherst from the Country Corners (S/O Atkins) to South Pleasant Street to North Pleasant Street ending at Route 63.) had the most transit travel, with an estimated 6,157 PVTA transit trips occurring within the corridor per day. This was nearly twice the estimate transit usage in the next highest ranked CMP Corridor, #67, which had 3,520 transit trips per day. Both corridors have multiple bus routes and a relatively high density of trip generators, such as academic institutions, that attract a greater percentage of transit riders.

Figure 5 PVTA Bus Routes along CMP Corridors

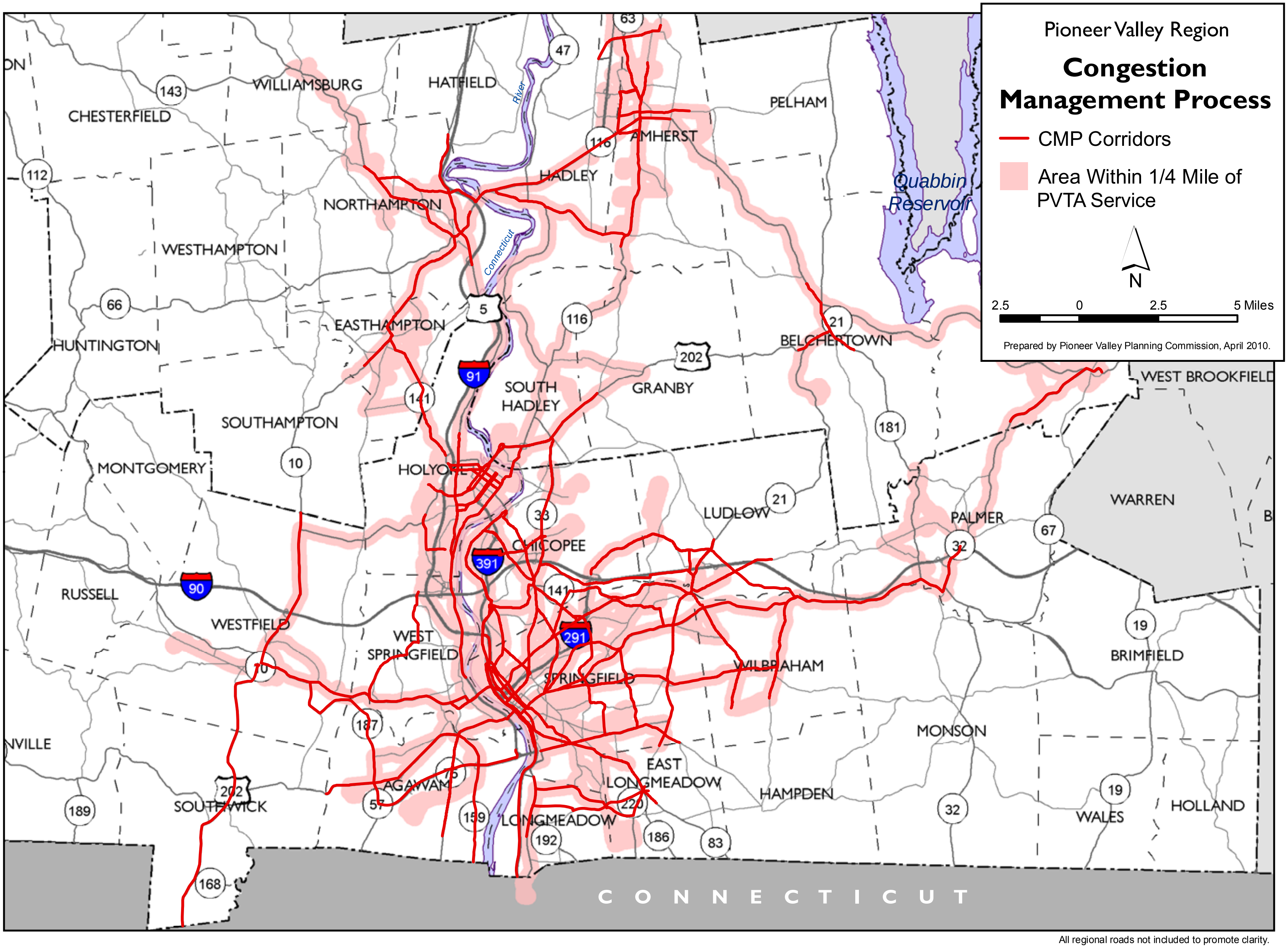


Table 8 Estimated Transit Trips per Day in CMP Corridors in 2009

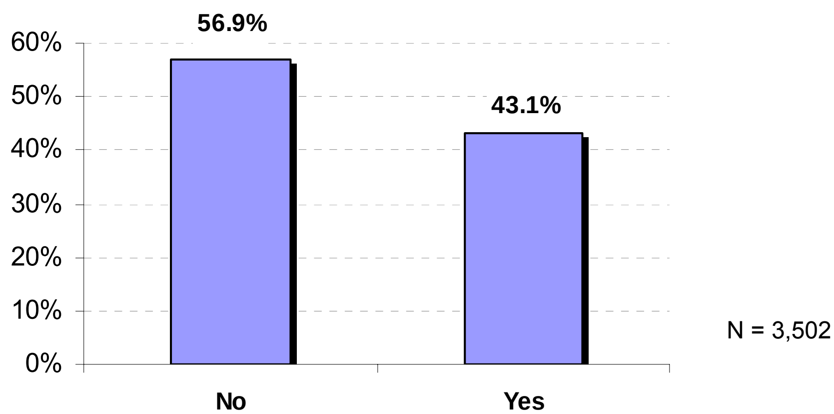
Corridor	Corridor Length (mi)	Transit Trips Per Day	Transit Trips per Mile	Corridor	Corridor Length (mi)	Transit Trips Per Day	Transit Trips per Mile
1	7.3	21	2.8	48	4.3	0	0.1
2	4.6	145	31.6	49	8.5	1,734	203.4
4	5.9	36	6	50	4.3	112	26.1
5	2.5	231	94.3	51	4.4	137	30.9
7	4.5	14	3.2	52	3.2	489	151.4
8	3.5	533	152.4	53	5	0	0
9	1.8	392	216.8	54	7.2	30	4.2
10	1.8	228	129.5	55	3.6	102	28.1
11	1.9	55	28.5	56	6.4	1,884	293.6
12	1.7	41	24	57	3.6	21	5.7
13	4.6	275	60.4	58	3.6	0	0
14	3.9	271	69.6	59	2.1	38	17.8
15	4.8	783	161.4	60	2.3	1,138	501.3
16	5.4	94	17.2	61	4.4	0	0
18	1.9	768	396	62	5.2	2	0.3
19	8.4	51	6	63	4.5	105	23.6
20	5.9	1,001	169.5	64	3.9	1	0.3
21	4.3	663	154.3	65	4.7	50	10.6
22	4.8	52	11	66	3.7	3	0.8
23	4.5	667	147.5	67	4.8	3,520	726.9
24	3.2	2,262	711.4	68	4.4	64	14.5
25	4.7	1,043	223.3	69	4.6	83	17.9
27	3.7	549	148.6	70	0.8	35	46.5
28	4.9	328	66.8	71	1	54	52.3
30	5.1	173	33.7	72	8.2	422	51.2
31	2.5	180	70.5	73	2.8	164	58.7
33	9.5	10	1.1	74	1.8	40	22
35	4.4	22	5	75	3.1	544	177.7
36	3.5	10	2.8	77	2.5	341	135.5
37	4.2	207	49.5	78	4.5	1,722	380.8
38	6.9	6,157	889.4	79	1.7	61	36.4
39	2.7	70	25.7	80	2.4	13	5.4
40	3.7	88	23.6	82	3.3	199	61.1
41	4.7	251	54	83	6.4	490	76.8
42	1.7	469	272.2	84	3.4	189	55.2
44	3.6	104	28.8	85	2.7	6	2.4
				86	4.2	165	39

Transit Transfers

Recent federal guidance (2008) and input from the CMP working group for this study suggest that the number of transit customers who must transfer from one route to another to complete their trips offer insight on which CMP corridors may have greater potential to increase intermodal travel opportunities.

Detailed information about transfers among bus routes on the PVTA system is not available. General information is reported in the most recently completed PVTA onboard bus rider survey report (PVTA Southern Area Onboard Riders Survey December 2008). This survey found that more than half of riders of routes in Hampden County transfer among one or more bus routes.

Question 4: Will you transfer to another bus before reaching your final destination?



The top routes to which riders report transferring and the CMP corridors in which those routes run are shown below.

PVTA Route	% Transfers	Corresponding CMP Corridor
B7	20.1%	State Street
P20	16.6%	Springfield/Holyoke via Holyoke Mall and Route 5
G1	13.2%	Chicopee/Springfield/Sumner-Allen
G2	11.8%	Carew/East Springfield/Belmont-Dwight
B6	6.5%	State Street
R10	5.9%	Route 20 Westfield
P21	5.7%	Holyoke/Springfield via Chicopee
G3	5.3%	Liberty Street to Springfield Plaza

Transit On-Time Performance

Transit on time performance information is cited by FHWA guidance as an important performance measure in CMP analysis. Industry research tends to show that transit passengers are willing to tolerate longer trips as long as they can be certain they will arrive on time.

PVTA is improving its ability to gather and analyze on-time performance data; however, detailed and routinely collected information about on-time performance for each route is not available. Staff and technical resources currently allow only for such data to be collected at a limited number of time points on a limited number of routes. This data is presented in the Appendix to this document.

PVTA is now implementing an automated vehicle location (AVL) system that will allow real-time tracking and dispatching of buses anywhere on the system. Therefore, transit on time performance information will be incorporated in future years as it becomes available from the PVTA system. The first phase of AVL implementation is expected in FY2011.

Limits of Transit Performance Measures and Analysis

The public transit load factor is a measure of ridership that compares the available seating capacity of the vehicles on a route during a given time period. This performance measure is useful in understanding the degree of vehicle crowding and transit congestion that may exist, and is included in recent CMP reports by MPOs in comparable-sized regions in the U.S. However, PVTA ridership data is not collected in a method that reports time of day. Therefore load factor analysis of routes is not currently possible.

Bicycles

The PVPC and its partners in the public and private sector continue to implement strategies to promote bicycling in the Pioneer Valley. PVPC reaches out to municipalities, private businesses, and advocacy groups to educate the public on the benefits of bicycling as an alternative form of transportation. PVPC also serves to build new infrastructure and advocate for bike-friendly policy changes. Over the last few years this bicycle friendly coalition has installed hundreds of bike racks in the region's urban core municipalities, has mounted bicycle racks on the front of PVTA buses along key routes, built over 20 miles of multi-use paths (with more on the way), and has printed numerous bicycle maps of the Pioneer Valley. With more community interests and involvement, it is expected that the Pioneer Valley will continue to experience an increase in bicycle interest and use.

The CMP has incorporated bicycle lanes into this report due to the impacts bicycle lanes have on daily vehicle traffic. A bicycle lane helps to define road space, serve as a traffic calming device and promotes a more orderly flow of traffic. Establishing different modes of transportation along a corridor may result in a decrease in vehicle volume which will potentially decrease congestion. Bicycling also promotes a healthier alternative for both the environment and bicycle riders.

Bicycle lanes can be found on several CMP corridors identified in this report. Table 9 shows information on the miles of bicycle lane along existing corridors. As can be seen, there are currently 5 bicycle lanes that correspond with CMP corridors. The table also determines the total amount of bicycle lane coverage along the corridor. All bicycle lanes, except for the bicycle lane in Amherst along Corridor 60, are 100% contained within the CMP corridor. Bicycle lane 5 has a total length of 1.27 miles over several roadways but only intersects with Corridor 60 for 0.29 miles. Corridors 35 and 60 have not been ranked under the Regional Congestion Severity formula due to limitations in the data collected.

Table 9 Bicycle Lane Miles on CMP Corridors

Corridor	Community	Bike Lane Length in Miles	Percentage of Bike Lane Within Corridor
69	Holyoke	0.953	100.0%
37	Holyoke	0.886	100.0%
15	Northampton / Easthampton	0.431	100.0%
35	Amherst	0.418	100.0%
60	Amherst	1.272	21.1%

At Grade Railroad Crossings on Active Railroads

Many major roadways across the nation operate at or above capacity. As a result, ground transportation and the movement of goods and services are not always as efficient as possible. Many agencies are promoting rail as a viable alternative as highway congestion continues to increase; environmental considerations of single vehicle traffic becomes more predominant; and the costs of maintaining the current roadway infrastructure increase. The success of our nation's transportation system can be accredited to the railroad network that spans the country. At one point, rail was the primary source of movement. Today, active and inactive rail networks can be found in urban and rural areas throughout the entire United States of America.

When one or more railroad tracks cross a roadway, it is considered an at-grade railroad crossing. Control measures for at-grade railroad crossings vary dramatically as traffic volume, rail usage and resources are taken into consideration by each city and town. An at-grade railroad crossing may be controlled by a variety of safety equipment, including automatic gates, flashing warning beacons, pavement markings, and audible bells and/or whistles.

According to the regulations set by the U.S. Federal Railroad Administration, the traffic control measures implemented for an at-grade railroad crossing must be activated on average of 30 seconds prior to the arrival of the train. This can create significant delay as vehicles are required to wait for several minutes as a train clears the crossing.

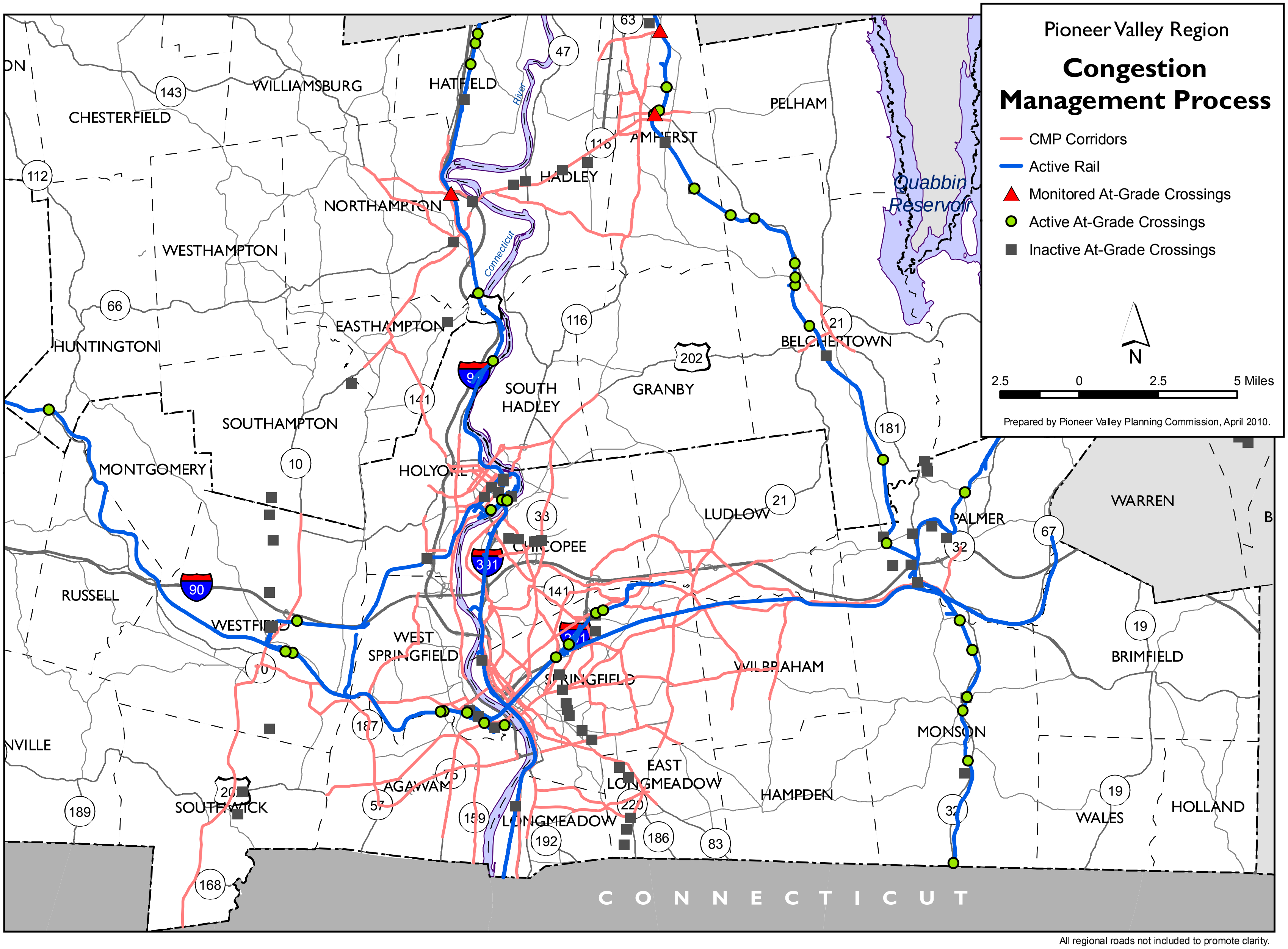
The PVPC staff analyzed all active at grade railroad crossings along the CMP corridors in the Pioneer Valley Region. Out of the 136 railroad crossing in the Pioneer Valley, 95 are located on active rail lines. There are currently 3 at-grade rail crossings that intersect directly with CMP corridors. The first of the 3 locations is at the intersection of Damon Road and North King Street in Northampton, the second is on Main Street in Amherst west of Gray Street, and the third location is on Bridge Street south east of Market Hill Road in Amherst. As can be seen in Figure 3 there are many opportunities for conflicts between rail and motorized transportation. As rail use continues to increase throughout the region, so will the need to address at-grade rail crossings.

Table 10 Active at Grade Rail Crossings on CMP Corridors

Community	Corridor	Corridor Description	At Grade Crossing Locations
Hadley/Amherst	56	Beginning at the intersection of Russell Street (Route 9) and Aqua Vitae Road in Hadley traveling eastbound on Russell Street (Route 9) which becomes Northampton Road (Route 9 and Route 116) in Amherst, continuing eastbound on College Street (Route 9) and ending at the intersection of College Street (Route 9), Southeast Street, and Northeast Street in Amherst.	Main Street
Amherst	5	Beginning at the intersection of Meadow Street and Russelville Road traveling eastbound on Meadow Street which becomes Pine Street, which becomes Bridge Street, northbound on Market Hill Road and ending at the intersection of Market Hill Road and Flat Hills Road.	Bridge Street
Northampton/Hadley	14	Beginning at the intersection of North Main Street (Route 9) and Bridge Street in Northampton traveling eastbound on Bridge Street onto Damon Road, eastbound over the Calvin Coolidge Bridge into Hadley and ending at the intersection of Russell Street (Route 9) and Aqua Vitae Road.	Damon Road

Figure 6 illustrates the locations of the 136 at-grade railroad crossing in the region. The active railroad crossings are illustrated as a green circle while the inactive railroad crossings are illustrated with black squares. The red triangles indicate the active at-grade rail crossings currently being monitored through the CMP data collection process. As discussed above, there is potential for the inactive rail lines to become active once again.

Figure 6 At Grade Rail Road Crossings in the Pioneer Valley Region



APPENDICES

APPENDIX A Corridor Descriptions

Corridor	Community	Corridor Description	Rank
1	Agawam	Beginning at the entrance ramp of Henry E. Bodurtha Highway (Route 57) from the Agawam Rotary traveling westbound on Bodurtha Highway (Route 57), northbound on South Westfield Street (Route 57 and Route 187), westbound on Southwick Street (route 57) and ending at the Agawam and Southwick Town Line.	55
2	Agawam	Beginning at the intersection of Springfield Street (Route 147) and Mill Street traveling northbound over the Suffield Street Bridge and ending at the intersection of Memorial Avenue (Route 147) and River Street in West Springfield.	25
3	Agawam	Beginning at the intersection of Suffield Street (Route 75) and Mill Street traveling northbound on Suffield Street ending at the intersection of Suffield Street, Main Street (Route 159) and Springfield Street.	48
4	Agawam	Beginning at the intersection of East Main Street (Route 20) and Little River Road (Route 187) in Westfield traveling southbound on Little River Road (Route 187), eastbound on Feeding Hills Road (Route 187) into Agawam, southbound on North Westfield Street (Route 187), eastbound on Springfield Street (Route 147) and ending at the intersection of Springfield Street (Route 147) and Mill Street.	56
65	Agawam	Beginning on Route 159 (Main Street) from Ct Stateline traveling northbound on Route 159 to Springfield Street ending at the intersection of Springfield St and Columbus St.	N/A
66	Agawam	Beginning at the intersection of Colony Road and Memorial Avenue (Route 147) in West Springfield traveling southbound along Suffield Street (Route 75) and ending at the south most Long Brook Estates access driveway.	8
5	Amherst	Beginning at the intersection of Meadow Street and Russellville Road traveling eastbound on Meadow Street which becomes Pine Street, which becomes Bridge Street, northbound on Market Hill Road and ending at the intersection of Market Hill Road and Flat Hills Road.	52
38	Amherst	Traveling northbound on Route 116 (West St) Country Corners Rd) to South Pleasant St continuing north on North Pleasant St ending at Route 63.	N/A
60	Amherst	Beginning at the intersection of Main St and Poets Corner Rd traveling westbound on Main St to Amity St ending at the intersection of Rocky Hill Rd and North Pleasant St in Hadley.	N/A
67	Amherst	Beginning at the intersection of South Pleasant Street (Route 116) and Snell Street westbound through the intersection with Northampton Road (Route 116) northbound onto University Drive, westbound on Massachusetts Avenue, southbound on North Pleasant Street, northbound on East Pleasant Street and ending at the intersection of East Pleasant Street and Eastman Lane.	20

Corridor	Community	Corridor Description	Rank
39	Belchertown	Beginning at the intersection of Amherst Road (Route 9), Federal Street (Route 9) traveling southbound on Federal Street (Route 9), southbound on North Main Street (Route 202), southbound on South Main Street (Route 181) which becomes Mill Valley Road (Route 181) and ending at the intersection of Mill Valley Road (Route 181) and Jensen Street.	46
59	Belchertown	Beginning at the intersection of Route 202 (State St) and Underwood St traveling eastbound and then northbound on Route 202 (Maple St and Main St) ending at the intersection of Route 202 (North Main St) and Sargent St	N/A
7	Chicopee	I-291, Burnett Rd - Exit 5 to Holyoke St (Ludlow) to Chapin to Fuller to West Ave.	N/A
40	Chicopee	Beginning at the intersection of Granby Road (Route 202) and Willimansett Street (Route 33) in South Hadley traveling southbound on Willimansett Street (Route 33) which turns into Memorial Drive (Route 33) in Chicopee and ending at the intersection of the I-90 exit 5 entrance/exit signal.	38
72	Chicopee	Beginning at the intersection of Chicopee Street (Route 116) and Front Street traveling northbound along Chicopee Street (Route 116), turning onto Prospect Street, then traveling southbound along Yelle Street which becomes Montgomery Street and ending at the intersection of Memorial Drive (Route 33), Sheridan Street, Montgomery Street and Wells Avenue.	7
73	Chicopee	Beginning at the intersection of Chicopee Street (Route 116) and Grattan Street (Route 141) traveling southbound on Grattan Street (Route 141) and ending at the intersection of Memorial Drive (Route 33) and Grattan Street (Route 141).	21
74	Chicopee	Beginning at the intersection of McKinstry Avenue and Arcade Street traveling eastbound On Mckinstry Ave and continuing eastbound onto Granby Road through the Westover Rotary and ending at the intersection of Westover Road and Bernice Street.	6
75	Chicopee	Beginning at the intersection of Chicopee Street (Route 116) and Florence Street travel southbound along Route 116 over bridge onto eastbound direction of Front Street via Cabot Street, Exchange Street and Center Street one-way vehicle movements. End at the intersection of East Main Street and Maple Court by traveling northbound onto Groove Street eastbound onto Main Street which becomes East Main Street.	2
62	Chicopee Ludlow	Beginning at the intersection of Fuller Rd and Route 33 Memorial Dr eastbound on Fuller Rd to Shawinigan Drive to West Ave ending at the intersection of West Ave and Center Street (Ludlow)	N/A

Corridor	Community	Corridor Description	Rank
8	East Longmeadow Springfield	Beginning at the intersection of Somers Road (Route 83) and Quarry Hill Road in East Longmeadow traveling northbound through the rotary onto North Main Street (Route 83) which becomes Belmont Avenue (Route 83) and ending at the intersection of Sumner Avenue, Dickinson Street and Belmont Avenue (Route 83) in Springfield.	28
50	Easthampton	Beginning at the intersection of Main Street (Route 10) and Cottage Street (Route 141) in Easthampton traveling southbound on Cottage Street (Route 141) which turns into Holyoke Street (Route 141), Mountain Street (Route 141) and turns into Easthampton Road (Route 141) in Holyoke and ending at the westbound and eastbound one-way split of Easthampton Road (Route 141) west of I-91.	41
56	Hadley	Beginning at the intersection of Russell Street (Route 9) and Aqua Vitae Road in Hadley traveling eastbound on Russell Street (Route 9) which becomes Northampton Road (Route 9 and Route 116) in Amherst, continuing eastbound on College Street (Route 9) and ending at the intersection of College Street (Route 9), Southeast Street, and Northeast Street in Amherst.	49
14	Hadley Northampton	Beginning at the intersection of North Main Street (Route 9) and Bridge Street in Northampton traveling eastbound on Bridge Street onto Damon Road, northbound over the Calvin Coolidge Bridge into Hadley and ending at the intersection of Russell Street (Route 9) and Aqua Vitae Road.	40
41	Hadley Northampton	Beginning at the intersection of West Street (Route 116) and Bay Road traveling westbound on Bay Road ending at the intersection of Bay Road and Russell Street (Route 9).	47
9	Holyoke	Beginning at the intersection of Northampton Street (Route 5) and Laurel Street traveling eastbound onto Brown Ave, northbound onto South Street, eastbound onto High Street and ending at the intersection of Lyman Street and High Street.	10
10	Holyoke	Beginning at the intersection of Ingleside Street (Route 5) and Lower Westfield Road traveling westbound along Lower Westfield Road, northbound on Homestead avenue which turns into Homestead Avenue (Route 202) and ending at the intersection of Homestead Avenue (Route 202) and Cherry Street.	37
37	Holyoke	Beginning at the intersection of Providence Hospital Road and Main Street (Route 5) traveling northbound on Main Street (Route 5) which becomes Northampton Street (Route 5) and ending at the intersection of Northampton Street (Route 5) and River Terrace.	24

Corridor	Community	Corridor Description	Rank
42	Holyoke	Southbound traffic flow beginning at the intersection of Lyman Street and Maple Street travel southbound on Maple Street (one-way) onto South Street and ending at the intersection of Northampton Street (Route 5) and South Street. / Northbound traffic flow beginning at the intersection of Northampton Street (Route 5) and South Street traveling northbound onto High Street (one-way) and ending at the intersection of Lyman Street and High Street.	5
44	Holyoke	Beginning at the intersection of Cherry Street and George Frost Drive traveling eastbound along Cherry Street (Route 202) which becomes Beech Street (Route 202) over the Mueller Bridge, around the South Hadley Rotary, returning over the Mueller bridge, traveling westbound through Linden Street, traveling southbound on West Franklin, westbound onto Beech Street (Route 202) and ending at the beginning intersection.	9
69	Holyoke	Eastbound on Dwight Street (Route 141) starting from the Interstate 91 exit ramp over the Muller Bridge ending at Purple Heart Drive (Route 202) entrance of the rotary in South Hadley. Westbound beginning at the Purple Heart Drive (Route 202) entrance of the rotary in South Hadley traveling southbound over the Muller Bridge and westbound onto Hampden Street (Route 141) and ending at the Interstate 91 entrance ramp.	1
70	Holyoke	Beginning at the intersection of Dwight St and Linden St traveling southbound on Dwight St ending at the intersection of Dwight St and South Main St	N/A
71	Holyoke	Beginning at the intersection of Dwight Street (Route 141), Pleasant Street, and Appleton Street (Route 141 travel southbound along Appleton Street (Route 141) ending at the intersection of Appleton Street, North Canal Street, and South Canal Street.	4
68	Holyoke South Hadley	Beginning at the intersection of Main Street (Holyoke) and Route 5 (Ingleside St) travel eastbound on Main St to Race St to Canal St northbound on Route 116 (Vietnam Veterans Memorial Bridge) to Bridge St (South Hadley) Lamb St. (Route 116) ending at the intersection of Lamb St and Gaylord St	N/A
11	Longmeadow	Beginning at the Springfield and Longmeadow Town Line traveling southbound on Longmeadow Street (Rout 5) and ending at the Massachusetts and Connecticut Town Line.	54
63	Longmeadow East Longmeadow	Beginning at the intersection Converse St and Route 5 (Longmeadow St) traveling Eastbound to Dwight Street southbound on Dwight St to Chestnut St (East Longmeadow) travel eastbound on Chestnut St to Shaker Rd then northbound on Shaker Rd to Elm St ending at the intersection of Elm St and Taylor St.	N/A
64	Longmeadow East Longmeadow	Beginning at the intersection of Bliss St and Route 5 (Longmeadow St) traveling eastbound on Bliss St to Williams St eastbound on Williams St to Maple St (East Longmeadow) eastbound on Maple St to Pleasant Street ending at the intersection of Pleasant St and Taylor St.	N/A

Corridor	Community	Corridor Description	Rank
13	Ludlow	Beginning at the intersection of Center Street (Route 21) and Rood Street traveling southbound on Center Street (Route 21), eastbound on East Street and ending at the intersection of East Street and Owens Way.	45
61	Ludlow	Beginning at the intersection of Chapin St and Holyoke St traveling eastbound on Chapin St through Ludlow into Wilbraham on Cottage Street ending at the intersection of Cottage St and Boston Road (Wilbraham)	N/A
16	Northampton	Beginning at the intersection of Easthampton Road (Route 10) and Lovefield Street traveling northbound on Easthampton Road (Route 10), which becomes South Street (Route 10), eastbound on Main Street (Route 10) and ending at the intersection of Main Street (Route 10), Bridge Street (Route 9), and Pleasant Street (Route 5).	53
51	Northampton	Beginning at the intersection of Interstate 91(Exit 18 northbound off ramp) and Pleasant Street (Route 5) travel northbound on Route 5 ending just north of the of Interstate 91 (exit 21) at MassDOT Highway Division Office on North King Street (Route 5)	16
15	Northampton Easthampton	Beginning at the intersection of North Main Street (Route 9) and Florence Street traveling southbound on North Main Street (Route 9) which becomes Locust Street (Route 9), which becomes Elm Street (Route 9), northbound on Main Street (Route 9) which becomes Bridge Street (Route 9) and ending at the intersection of Bridge Street (Route 9) and Day Avenue.	39
53	Palmer	Beginning at the intersection of Thorndike Street (Route 32) and High Street traveling southbound on Thorndike Street (Route 32), eastbound on Park Street (Route 20 and Route 32) and ending at the intersection of Park Street (Route 20), Boston Road (Route 67) and Brimfield Road (Route 20).	44
57	South Hadley Granby	Beginning at the exit to the Route 202 Rotary and Purple Heart Dr traveling eastbound on Route 202 (Granby Rd) into Granby ending at the Five Corners (Pleasant/Amherst St intersection)	N/A
6	Springfield	Beginning at the intersection of Carew Street (Route 20A), Main Street and Plainfield Street (Route 20A) traveling northbound on Carew Street (Route 20A) which becomes Page Boulevard (Route 20A) and ending at the intersection of Page Boulevard (Route 20A) and Cadwell Street.	43
12	Springfield	Beginning at the intersection of Parker Street and North Branch Parkway traveling northbound on Parker Street continuing north through the Ludlow Avenue Bridge and ending at the intersection of East Street and Center Street (Route 21 and Route 141) in Ludlow.	23

Corridor	Community	Corridor Description	Rank
18	Springfield	Beginning at the intersection of State Street and Main Street traveling southbound on Main Street, eastbound on Locust Street and onto Belmont Avenue ending at the intersection of Belmont Avenue and Sumner Avenue (Route 83).	17
22	Springfield	Beginning at the intersection of Roosevelt Avenue and East Street traveling southbound on Roosevelt Avenue and ending at the intersection of Sumner Allen and Roosevelt Avenue.	14
23	Springfield	Beginning at the intersection of Carew Street (Route 20A) and Saint James Boulevard (Route 20A) traveling eastbound along Stain James Boulevard which becomes Page Boulevard (Route 20), southbound on Pasco Road (Route 20) and ending at the intersection of Boston Road and Pasco Road (Route 20).	34
24	Springfield	Beginning at the intersection of West Columbus Avenue and State Street traveling northbound on State Street and ending at the intersection of Boston Road and State Street.	32
25	Springfield	Beginning at the intersection of Sumner Avenue and Long hill Road traveling eastbound on Sumner Avenue to Allen Street crossing Cooley Street ending on Allen Street at the East Longmeadow town line.	13
52	Springfield	Beginning at the intersection of State Street and Magazine Street traveling northbound onto Bay Street northbound ending at the intersection of Boston Road, Breckwood Boulevard and Bay Street.	19
54	Springfield	Beginning at the Intersection of Wilbraham Rd and State St traveling eastbound on Wilbraham Rd, Wilbraham Rd turns into Springfield St (Wilbraham) ending at the intersection of Springfield St and Main St	N/A
55	Springfield	Beginning at the intersection of Parker St and the North Branch Parkway traveling southbound on Parker St to Cooley St continue southbound on Cooley St ending at the East Longmeadow T.L.	N/A
77	Springfield	Beginning at the intersection of Liberty Street and West Columbus Avenue traveling northbound onto Armory Street, traveling northbound an ending at the intersection of Amory Street and Atwater Road.	15
79	Springfield	Beginning at Bruno Street traveling northbound on East Columbus Avenue ending at the intersection of East Columbus Avenue and Liberty Street	11
80	Springfield	Beginning at the intersection of West Columbus Avenue and the base of the Interstate 291 on Ramp traveling southbound on West Columbus Avenue ending at the intersection West Columbus Avenue and South Street.	18

Corridor	Community	Corridor Description	Rank
82	Springfield	Beginning at the intersection of Center Street and Springfield Street in Chicopee traveling southbound to Springfield along Springfield Street, northbound on Chestnut Street, eastbound on Noble Street, southbound on Bernie Avenue and ending at the intersection of Bernie Avenue and Plainfield Street (Route 20) in Springfield. Beginning at the intersection of West Street (Route 20), Plainfield Street and Avocado Street traveling northbound on Plainfield Street, eastbound on Wasson Avenue, southbound on Bernie Avenue, eastbound on Noble Street, southbound on Chestnut Street, northbound on Springfield Street and ending at the intersection of Center Street and Springfield Street in Chicopee.	30
83	Springfield	Dickinson St, Maple St, and Chestnut St from the X to Dover St Dwight St, Maple St, and Dickinson St from Dover St ending at the X	N/A
85	Springfield	Beginning at the intersection of Boston Road traveling southbound on Breckwood Boulevard through the intersection of Wilbraham Road continuing southbound onto Bradley Road and ending at the intersection of Allen Street and Bradley Road.	27
21	Springfield Chicopee	Beginning at the intersection of Liberty Street and Chestnut Street in Springfield traveling northbound on liberty through the rotary of I-291, Armory Street and Liberty Street continuing northbound along Liberty Street which becomes Broadway Street in Chicopee, northbound over the Bridge Street Bridge, northbound on Memorial Drive (Route 33) and ending at the I-91 exit 5 entrance/exit signal.	29
84	Springfield Chicopee	Beginning at the intersection of State Street and Saint James Avenue traveling northbound on Saint James Avenue and ending at the intersection of Saint James Avenue and Broadway in Chicopee.	12
86	Springfield Chicopee	Beginning at the intersection of Main Street and East Main Street (Route 141) traveling eastbound on East Main Street (Route 141) which turns into Worcester Street (Route 141) in Springfield, continuing eastbound onto Main Street (Route 141), eastbound on River Road and ending at the intersection of River Road and Weston Street in Springfield.	33
49	Springfield Wilbraham	Beginning at the intersection of State Street, Berkshire Avenue and Boston Road in Springfield traveling eastbound on Boston Road which becomes Boston Road (Route 20) into Wilbraham and ending at the Wilbraham/Monson town line.	42
78	Springfield Chicopee	Beginning Main St at Center St (Chicopee City Line) travel southbound on Main St ending at State St	N/A
19	Springfield Longmeadow	I-91 Exit 12 to CT Exit 49	N/A

Corridor	Community	Corridor Description	Rank
58	Ware	Beginning at the intersection of Route 32 (Palmer Road) and Bacon Road traveling northbound to Route 9 (Main St), continuing eastbound ending at the intersection of Route 9 and Knox Ave	N/A
28	West Springfield	Beginning at the intersection of Springfield Road (Route 20) and East Mountain Road in Westfield, traveling eastbound on Westfield Street (Route 20), southbound on Elm Street (Route 20) and northbound Park Avenue (Route 20) ending at the rotary exit and entrance point of the North End Bridge.	22
48	West Springfield	Beginning at the intersection of Westfield Street (Route 20) and Dewey Street traveling northbound on Dewey Street, northbound on Amostown Road, eastbound on Pease Avenue which becomes Morgan Road, northbound on Bernie Avenue and ending at the intersection of Prospect Avenue and Bernie Avenue.	57
27	West Springfield Holyoke	Beginning at the intersection of Providence Hospital Road and Main Street (Route 5) traveling southbound along Main Street (Route 5) which becomes Riverdale Street (Route 5) and ending at the intersection of Elm Street and Riverdale Street (Route 5).	35
20	West Springfield Springfield Chicopee	Beginning at the intersection of Westfield Street (Route 20), North Boulevard, and South Boulevard in West Springfield traveling eastbound on Westfield Street (Route 20), southbound on Elm Street (Route 20), eastbound on Park Avenue over the North End Bridge onto Plainfield Street (Route 20) in Springfield, northbound on Carew Street (Route 20A) into Chicopee and ending at the intersection of East Main Street (Route 141) and Carew Street in Chicopee.	51
30	Westfield	Beginning at the intersection of Main Street (Route 20) and Broad Street (Route 10) travel northbound on North Elm Street (Route 20 and Route 10) which becomes Southampton Road (Route 20 and Route 10) ending at the Southampton and Westfield town line.	3
31	Westfield	Beginning at the intersection of Springfield Road (Route 20) and East Mountain Road traveling westbound along Springfield Road (Route 20) which becomes East Main Street (Route 20), then Main Street (Route 20) and ending at the intersection of Main Street (Route 20), Broad Street (Route 10) and Elm Street (Route 20 and Route 10).	26
33	Westfield Southwick	Beginning at the intersection of Court Street and Pleasant Street (Route 10 and Route 202) in Westfield traveling southbound on Pleasant Street which becomes Southwick Road (Route 10 and Route 202) into Southwick continuing southbound on College Highway (Route 10 and Route 202) and ending at the Massachusetts/Connecticut town line.	36

Corridor	Community	Corridor Description	Rank
35	Wilbraham	Beginning at the intersection of Main Street (Route 21) and Ludlow Avenue in Springfield traveling eastbound on Main Street which becomes Stony Hill Road in Wilbraham, southbound on Stony Hill Road and ending at the intersection of Stony Hill Road and Tinkham Road in Wilbraham.	31
36	Wilbraham	Beginning at the intersection of Main Street and Tinkham Road traveling northbound on Main Street, eastbound on Boston Road (Route 20) and ending at the intersection of Boston Road (Route 20) and Benton Street.	50

APPENDIX B Assessment Comments

Comment by	Comment	Action	Date
Southwick DPW	Route 57 should probably be color coded (green or yellow?) from the Agawam/Southwick line westward to 202/10.	Needs Evaluation	12/1/209
Northampton DPW	There is a section of Bridge St in Northampton that is not highlighted (from Day Ave to Water St). This section should be corrected to reflect the "moderate" status, which is the same as the other streets connecting with it	Needs Evaluation	12/82009
West Springfield DPW	South Boulevard, Park Street and Park Avenue are colored green (minimal congestion). These should be colored orange which would be consistent with Elm Street and Route 20. These are major connections to the City of Springfield as well as I-91 and I-291 and has significant traffic.	Needs Evaluation	12/15/2009
West Springfield DPW	The Morgan Road approach to Route 5 should be colored orange	Needs Evaluation	12/15/2009
West Springfield DPW	The section of Route 5 from East Elm Street north to Highland Avenue should possibly be orange rather than yellow	Needs Evaluation	12/15/2011
West Springfield DPW	Approaches to the Memorial Avenue and North End Rotaries should possibly be labeled orange. These get significant peak hour traffic as well as traffic during events at the Eastern States	Needs Evaluation	12/15/2012
West Springfield DPW	River Street approach to Route 147 should be orange	Needs Evaluation	12/15/2013
West Springfield DPW	River Street from Baldwin Street to Park Street should be orange. This approach backs up during the peak periods	Needs Evaluation	12/15/2014
West Springfield DPW	Birnie Avenue is labeled green and ends at Prospect Avenue. This should be continued east on Prospect Avenue and then north on Interstate Drive. People are using this route to access I-91 and I-90 as well as the Holyoke Mall and Holyoke Community College	Needs Evaluation	12/15/2015
West Springfield DPW	Dewey Street is labeled as green from Route 20 north. The section of Dewey Street from Route 20 to Old Westfield Road has minimal traffic due to turning restrictions on Route 20. This section should be removed and Old Westfield Road added in its place. This is the travel route people use	Needs Evaluation	12/15/2016
East Longmeadow DPW	Longmeadow Street, along with the Converse Street/Laurel/Forest Glen area should be considered above Williams and Bliss, especially at the morning and evening commute times. One other area that might be looked at is the Dwight/Williams intersection and that might receive more priority points as it conducts traffic to Converse Street as a heavily travelled corridor between Springfield and East Longmeadow	Needs Evaluation	1/5/2010
Westfield Engineering	Western Avenue in Westfield is a congested corridor. The city and college have addressed this via traffic studies, designs for improvements for Western Ave its self as well as a relief road to Route 20 and the installation of a temporary traffic signal at the college commuter lot. Please accept this request for inclusion in your current Congestion Management Process (CMP) for the Pioneer Valley Region.	Needs Evaluation	1/7/2010

APPENDIX C Transit Ridership

Route	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	FY09 Total	Monthly Ave	% System Total
SATCo	**482,361**	**453,050**	**568,556**	**569,555**	**454,752**	**484,103**	**429,686**	**480,075**	**521,792**	**508,657**	**483,102**	**488,442**	**5,924,131**	**493,678**	**61.4%**
B04	9,295	7,914	17,643	17,771	12,574	12,628	12,408	11,713	15,385	13,458	14,008	12,881	157,677	13,140	1.6%
B06	27,798	26,248	39,232	40,215	31,299	32,322	30,817	32,869	36,995	35,748	34,885	35,058	403,485	33,624	4.2%
B07	91,424	84,814	100,993	96,388	78,913	84,824	75,639	82,992	90,103	87,596	80,420	81,140	1,035,245	86,270	10.7%
B12	1,258	1,250	1,659	1,457	1,300	1,301	1,096	1,251	1,140	1,223	1,177	1,680	15,792	1,316	0.2%
B13	11,003	9,909	10,692	11,571	8,762	9,879	8,183	9,198	9,562	9,554	8,512	9,608	116,433	9,703	1.2%
B15	2,477	2,392	3,163	2,529	2,046	2,239	2,108	2,376	2,839	2,662	1,464	1,884	28,181	2,348	0.3%
B17	13,733	12,851	14,970	15,019	12,134	13,616	12,163	13,981	15,398	15,541	14,845	16,005	170,255	14,188	1.8%
B23	7,135	7,650	13,544	13,674	9,955	9,583	8,061	11,077	10,989	10,374	9,347	8,619	120,008	10,001	1.2%
G01	65,640	61,603	75,577	78,454	63,659	66,661	63,669	68,879	74,028	72,187	70,414	73,506	834,276	69,523	8.6%
G02	67,928	59,232	72,114	75,482	59,931	65,055	59,092	65,347	71,200	69,761	65,004	65,093	795,240	66,270	8.2%
G03	34,127	31,694	37,446	38,292	29,991	31,881	28,445	31,491	34,282	33,427	33,061	33,874	398,013	33,168	4.1%
G05	7,817	7,158	8,401	8,407	6,355	7,094	6,597	6,917	7,197	7,099	6,262	6,936	86,240	7,187	0.9%
G08	8,796	7,686	8,737	9,021	6,580	8,464	6,384	7,548	7,575	7,945	7,141	7,479	93,356	7,780	1.0%
G19	3,246	2,050	3,050	2,986	2,455	2,958	2,495	2,865	2,886	3,212	2,941	3,355	34,498	2,875	0.4%
P11	0	100	8,848	8,986	6,327	4,716	1,313	6,412	5,014	5,735	3,818	0	51,270	4,272	0.5%
P20	64,755	64,813	65,494	64,356	57,282	63,348	51,056	57,125	60,404	60,001	59,495	61,120	729,250	60,771	7.6%
P21	27,170	25,859	30,464	29,791	22,687	23,529	21,795	23,045	26,764	26,096	24,923	25,707	307,830	25,653	3.2%
R10	19,016	19,480	25,279	22,888	17,692	17,611	16,130	19,895	21,680	20,454	18,840	19,825	238,788	19,899	2.5%
R14	7,592	7,719	8,251	7,526	6,327	7,051	5,884	7,293	7,135	7,449	7,092	7,545	86,863	7,239	0.9%
R22	4,091	4,702	6,044	7,047	5,556	5,874	5,059	5,623	6,536	6,499	6,554	6,246	69,832	5,819	0.7%
R24	3,768	3,523	12,519	13,061	9,480	9,494	8,128	8,881	10,702	9,178	9,738	7,907	106,378	8,865	1.1%
R25	2,694	2,971	2,924	3,159	2,223	2,684	2,415	2,667	3,295	2,533	2,326	2,520	32,411	2,701	0.3%
R27	1,597	1,432	1,512	1,473	1,226	1,291	749	630	683	923	835	456	12,808	1,067	0.1%
VATCo	**44,674**	**42,873**	**107,561**	**105,352**	**83,125**	**73,565**	**53,919**	**92,921**	**86,603**	**92,129**	**71,559**	**45,559**	**899,840**	**74,987**	**9.3%**
M40	0	0	5,121	5,396	4,027	2,994	851	4,553	3,529	4,643	2,771	20	33,906	2,825	0.4%
R41	1,884	1,676	4,670	4,702	3,459	3,437	2,691	4,310	4,141	4,309	3,289	1,435	40,003	3,334	0.4%
R42	5,105	4,797	5,053	5,193	4,185	4,811	4,143	4,741	5,471	5,268	4,825	4,911	58,502	4,875	0.6%
B43	23,059	22,407	78,637	75,379	60,035	48,404	34,141	65,722	58,112	62,880	45,351	23,171	597,298	49,775	6.2%
R44	6,005	5,411	5,987	6,885	5,409	6,778	6,045	6,492	7,192	6,620	6,390	6,830	76,045	6,337	0.8%
B48	8,621	8,582	8,093	7,797	6,009	7,141	6,047	7,103	8,158	8,409	8,933	9,192	94,086	7,840	1.0%

Route	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	FY09 Total	Monthly Ave	% System Total
UMass Transit	**78,410**	**74,923**	**373,429**	**369,322**	**287,606**	**228,672**	**142,972**	**339,219**	**286,806**	**350,647**	**221,559**	**75,201**	**2,828,766**	**235,731**	**29.3%**
30 N Amherst	14,930	14,546	54,686	54,958	43,178	35,569	21,947	49,868	42,713	53,720	36,257	14,769	437,138	36,428	4.5%
30 Old B-town Rd	14,093	13,731	51,623	51,880	40,760	33,577	20,718	47,075	40,321	50,712	34,227	13,941	412,658	34,388	4.3%
31 Sunderland	16,500	16,017	55,666	54,980	41,722	34,528	21,824	46,428	42,089	49,759	36,466	15,777	431,756	35,980	4.5%
31 S Amherst	15,657	15,199	52,822	52,172	39,591	32,764	20,710	44,057	39,939	47,218	34,603	14,972	409,702	34,142	4.2%
32 Atkins-Puffers	2,719	2,054	4,128	3,626	2,775	2,659	2,258	4,053	3,441	3,781	2,767	2,508	36,769	3,064	0.4%
34 Orchard Hill	0	0	26,648	28,792	21,076	17,883	6,872	29,263	22,795	27,774	14,490	0	195,593	16,299	2.0%
35 Mullins Center	0	0	34,086	37,752	30,771	25,107	8,457	39,778	32,844	40,067	22,132	0	270,994	22,583	2.8%
36 Gatehouse	320	272	603	595	463	409	300	573	480	517	374	279	5,184	432	0.1%
37 Amity Shuttle	8,849	8,425	13,678	13,045	10,375	9,376	8,906	11,651	10,779	11,667	9,190	8,173	124,114	10,343	1.3%
38 MHC	0	0	49,486	43,114	34,670	21,423	16,533	39,090	29,890	38,364	18,266	0	290,836	24,236	3.0%
39 Smith/Hamp	0	0	15,558	14,566	11,830	6,582	8,350	14,132	10,781	14,906	4,451	0	101,156	8,430	1.0%
45 Belchertown	4,261	3,728	9,522	9,448	7,381	6,377	4,442	8,933	7,531	8,545	6,038	3,817	80,024	6,669	0.8%
46 South Deerfield	1,081	951	2,425	2,393	1,847	1,595	1,114	2,203	1,895	2,111	1,535	965	20,117	1,676	0.2%
Trippers	0	0	2,498	2,002	1,167	824	541	2,114	1,309	1,507	763	0	12,725	1,060	0.1%
VATCo+ UMass Subtotal	**123,084**	**117,796**	**480,990**	**474,674**	**370,731**	**302,237**	**196,891**	**432,140**	**373,409**	**442,776**	**293,118**	**120,760**	**3,728,606**	**310,717**	**38.6%**
Full System Totals	**605,445**	**570,846**	**1,049,546**	**1,044,229**	**825,483**	**786,340**	**626,577**	**912,215**	**895,201**	**951,433**	**776,220**	**609,202**	**9,652,737**	**804,395**	**100.0%**

Endorsement Sheets

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 July 27, 2010 and discussed the following item for endorsement: The Pioneer Valley Region's Congestion Management Process.

Massachusetts Department of Transportation (Mass DOT)

I, Secretary of the Massachusetts Department of Transportation, hereby

☑ Endorse ☐ Do Not Endorse the above referenced item.

for 27 Jul 10

Jeffrey Mullan — 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.

07/27/10

Luisa Paiewonsky — 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 E Butler 07/27/10

Richard Butler — 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.

7/27/10

Mary MacInnes — Date

Administrator - PVTA

City of Springfield

I, Mayor of the City of Springfield, hereby

☑ Endorse ☐ Do Not Endorse the above referenced item.

Domenic Sarno — 7/27/10
Mayor-Springfield — Date

City of Chicopee

I, Mayor of the City of Chicopee, hereby

☐ Endorse ☐ Do Not Endorse the above referenced item.

Michael Bissonnette — 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 — 7/27/10
Mayor-Northampton — Date

City of West Springfield

I, Mayor of the City of West Springfield, hereby

☑ Endorse ☐ Do Not Endorse the above referenced item.

Edward Gibson — July 27, 2010
Mayor-West Springfield — Date

Town of Belchertown

I, Board of Selectmen member of the Town of Belchertown, hereby

☐ Endorse ☐ Do Not Endorse the above referenced item.

James Barry — 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 — 27 Jul 10
Selectman-Hatfield — Date