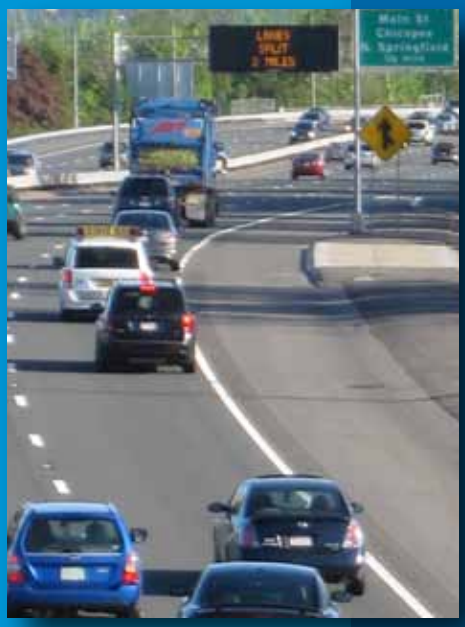

2012

Regional Transportation Plan

for the Pioneer Valley Metropolitan Planning Organization

Prepared by:
Pioneer Valley Planning Commission

July 2012

2012 Update

to the

Regional Transportation Plan

Final Report – September, 2011

Prepared by the

Pioneer Valley Planning Commission

For the Pioneer Valley

Metropolitan Planning Organization

Pioneer Valley MPO Members

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Prepared in cooperation with the Massachusetts Department of Transportation, the U.S. Department of Transportation - Federal Highway Administration and Federal Transit Administration, and the Pioneer Valley Transit Authority. The views and opinions of the Pioneer Valley Planning Commission expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

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CHAPTER 1

2012 UPDATE TO THE REGIONAL TRANSPORTATION PLAN FOR THE PIONEER VALLEY METROPOLITAN PLANNING ORGANIZATION

The Pioneer Valley Regional Transportation Plan (RTP) outlines the direction of transportation planning and improvements for the Pioneer Valley through the year 2035. It provides the basis for all state and federally funded transportation improvement projects and planning studies. This document is an update to the current RTP (last published in 2007) and is endorsed by the Pioneer Valley Metropolitan Planning Organization (MPO).

The long range plan concentrates on both existing needs and anticipated future deficiencies in our transportation infrastructure, presents the preferred strategies to alleviate transportation problems, and creates a schedule of regionally significant projects that are financially constrained - in concert with regional goals and objectives and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFTEA-LU) legislation.

Although the RTP focuses on transportation, it is a comprehensive planning document. The Pioneer Valley has taken great strides in coordinating the RTP development process with other non-transportation planning efforts in the region. The Pioneer Valley Plan for Progress presents a strong case for improving our transportation infrastructure to encourage growth and economic development. The plan also recognizes that the region's cities and towns are experiencing changes which will affect its people, landscape, economy, and governmental institutions for decades. Changes in land use and development patterns are transforming the traditional visual character and function of the region and there is an increased awareness of the role transportation plays in influencing regional growth and change.

Strategic planning is a continuing process that produces planning documents and agendas which decision-makers can use to prioritize local needs. A truly effective planning process relies upon the input of the chief elected official(s), city and town staff, and the general public. In addition, the strategic planning process is based on a realistic assessment of external forces - political, social, economic, and technological - that can affect Pioneer Valley communities and residents. All recommendations generated through the strategic planning process must have a real potential for implementation. By developing the RTP for the Pioneer Valley in such a manner, the region will be able to conduct successful transportation improvement programming through the year 2035.

A. REGIONAL VISION, GOALS, AND EMPHASIS AREAS

The Pioneer Valley Metropolitan Planning Organization developed a vision to provide a framework for the development of the RTP.

VISION

The Pioneer Valley region strives to create and maintain a safe, dependable, environmentally sound and equitable transportation system. We pledge to advance strategies and projects that promote sustainable development, livable communities, provide for the efficient movement of people and goods, and advance the economic vitality of the region.

1. Regional Goals

To support the realization of the Vision of the plan for the Pioneer Valley MPO, a series of thirteen transportation goals were developed that are consistent with SAFETEA-LU. Cooperation between federal, state, regional, and local decision makers will be necessary in order to achieve these goals. Through cooperative planning efforts the region can maintain a dependable transportation system and develop strategies to maximize the efficiency of transportation funding for the region.

Safety	To provide and maintain a transportation system that is safe for all users and their property.
Operations and Maintenance	To provide a transportation system that is dependable and adequately serves users of all modes. To give priority to the repair of existing streets, roads and bridges.
Environmental	To minimize the transportation related adverse impacts to air, land, and water quality and strive to improve environmental conditions at every opportunity.
Coordination	To collaborate the efforts of the general public with local, state and federal planning activities.
Energy Efficient	To promote the reduction of energy consumption through demand management techniques and increase the use of energy efficient travel modes.
Cost Effective	To provide a transportation system that is cost effective to maintain, improve and operate.
Intermodal	To provide access between travel modes for people and goods while maintaining quality and affordability of service.
Multimodal	To provide a complete choice of adequate travel options that are accessible to all residents, visitors and businesses.
Economically Productive	To maintain a transportation system that promotes and supports economic stability and expansion.
Quality of Life	To provide and maintain a transportation system that enhances quality of life and improves the social and economic climate of the region.
Environmental Justice	To provide an equitable transportation system that considers the needs of and impacts on low-income, minority, elderly and disabled persons.
Land Use	To incorporate the concepts of Sustainable Development in the regional transportation planning process and integrate the recommendations of the current Regional Land Use Plan into transportation improvements.
Climate Change	To promote and advance transportation projects that reduce the production of greenhouse gasses, such as CO2, and advance new energy technologies consistent with the Pioneer Valley Clean Energy Plan.

2. Emphasis Areas

A total of five emphasis areas were identified to assist in the development of regional transportation needs and strategies to assist in the achievement of the regional goals. These emphasis areas are not intended to be a replacement for the regional transportation goals. Instead, they were established with the recognition that many of the transportation improvement strategies included as part of the RTP Update can meet multiple regional transportation goals. This coordination between the Regional Transportation Goals and Emphasis Areas is shown in Table 1-1.

Table 1-1 - Coordination of Regional Transportation Goals and Emphasis Areas

	Safety	Operations and Maintenance	Environmental	Coordination	Energy Efficient	Cost Effective	Intermodal	Multimodal	Economically Productive	Quality of Life	Environmental Justice	Land Use	Climate Change
Safety and Security	√			√		√	√	√		√	√		
The Movement of People	√	√	√	√	√	√	√	√	√	√	√	√	√
The Movement of Goods	√	√	√	√	√	√	√	√	√	√	√	√	√
The Movement of Information			√	√		√	√	√	√	√	√		√
Sustainability	√	√	√	√	√	√	√	√	√	√	√	√	√

The transportation emphasis areas consist of broad topics related to transportation planning that are related to each of the thirteen Regional Transportation Goals. Regional Transportation Needs, Strategies, and Improvements were developed for each emphasis area in this RTP Update to advance each of the thirteen goals without the need for repetitiveness. The following provides more information on each of the five emphasis areas:

a) Safety and Security

The safety and security of the regional transportation system are vital to the efficient movement of people and goods. It is important to ensure that the transportation system is safe for all users across all modes. The RTP will identify locations for additional study that may benefit from recommendations to improve safety. Similarly, the security of our transportation infrastructure and operations centers will rely on the development of sound planning for their safeguard. The RTP will be coordinated with ongoing Homeland Security efforts for the region.

b) The 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.

c) The 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 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.

d) The 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.

e) Sustainability

Sustainability considers both the environmental and social costs of the transportation system. A sustainable transportation system improves access and mobility while reducing environmental impacts such as the production of greenhouse gas emissions and increased air pollution. Sustainable transportation projects also have a positive impact on society through a reduction in single occupant vehicle use, the promotion of fuel-efficiency, advancing healthy lifestyles, and supporting livable communities.

CHAPTER 2

TRANSPORTATION PLANNING PROCESS

A. REQUIREMENTS

1. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)

On August 10, 2005, the President signed into law the SAFETEA-LU legislation authorizing highway, highway safety, transit and other surface transportation programs through September 30, 2009. The legislation has since been temporarily extended. Reauthorization of new federal transportation legislation is currently in the early development stages. SAFETEA-LU addresses challenges that face our transportation system such as improving safety, reducing congestion, improving the efficient movement of freight, protection of the environment, and increasing connectivity for intermodal uses. Additional flexibility is given to State and local transportation decision makers under SAFETEA-LU to identify solutions for transportation problems.

Significant features of SAFETEA-LU include:

- A new core Highway Safety Improvement Program has been established with the goal of reducing highway fatalities. Strategic Highway Safety Planning is required for all states with the focus on establishing goals and strategies to improve safety.
- An Equity Bonus Program ensures that each state will receive a minimum of a 90.5% return on its contributions to the Highway Trust Fund.
- More flexibility is provided to assist states in managing congestion. Real-time traffic management is promoted to help improve transportation security and provide better information to travelers and emergency responders.
- Improved freight transportation is addressed in a number of planning, financing and infrastructure improvement provisions.
- Innovative technologies and practices are promoted through the Highways for LIFE pilot program to speed up the construction of highways and bridges.
- Environmental programs from the TEA 21 legislation have been retained and new programs have been added such as a pilot program for non-motorized transportation and Safe Routes to School.
- Changes aimed at improving and streamlining the environmental process for transportation improvement projects have been incorporated into the legislation. This includes a new environmental review process for transportation projects and improvements to the air quality conformity process with changes in the frequency of conformity determinations and conformity horizons.

Under the new requirements of SAFETEA-LU the RTP must address the following new requirements:

- The update cycle for Regional Transportation Plans was changed from three to four years.
- MPOs and states must consult "as appropriate" with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation to develop the long range transportation plan.
- The RTP must include operational and management strategies to improve the performance of the existing transportation facilities, to relieve vehicular congestion, and maximize the safety and mobility of people and goods.
- Metropolitan Planning Areas must have a process to provide congestion management and provide for effective congestion management and operation of the multimodal transportation system.
- Appropriate "visualization" techniques must be incorporated into the RTP and the public participation process used to develop the RTP.
- MPOs must publish the RTP in electronic formats to increase accessibility.
- MPOs should review current public involvement plans and make necessary changes to reflect SAFETEA-LU provisions.

2. Clean Air Act Amendments of 1990

As a result of federal Clean Air legislation, the Regional Transportation Plan must include a complete analysis of air quality issues in the region, along with demonstrations of how this plan will work to achieve National Ambient Air Quality standards. Further, it must include regional short and long range transportation plans and projects indicating the future direction of the transportation system. The degree to which the short and long range plans are discussed is essentially the option of the organization(s) preparing the plan. It is important to note, however, that it is necessary for transportation projects/plans to be included in a Regional Transportation Plan if they are to receive federal funding for implementation.

3. Title VI/ Environmental Justice

Title VI states that "No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." Title VI bars intentional discrimination as well as disparate impact discrimination (i.e., a neutral policy or practice that has a disparate impact on protected groups).

The Environmental Justice (EJ) Orders further amplify Title VI by providing that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

In response to Environmental Justice Executive Order 12898, and at the request of the Massachusetts Department of Transportation and the Federal Highway Administration, PVPC has been incorporating environmental justice into the transportation planning process. Environmental Justice seeks to ensure

equity in the distribution of benefits and burdens of transportation resources. As the Metropolitan Planning Organization (MPO), PVPC is responsible for identifying minority and low-income populations within the region and ensuring that transportation programs, policies, and activities do not have a disproportionately high and adverse human health or environmental effects on these populations. In addition, PVPC is responsible for providing opportunities for participation in the decision making process for all socio-economic groups.

Goals of Title VI and Environmental Justice include:

- Identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of the transportation programs, policies, and activities on minority populations and low-income populations.

- Assess the distribution of impacts on different socio-economic groups for the investments identified in the transportation plan and TIP.

- Make a special effort to engage and involve representatives of minority and low-income groups to hear their views regarding changes to and performance of the planning process.

- Enhance analytical capabilities to ensure that the long-range transportation plan and the transportation improvement program (TIP) comply with Title VI. Integrate this analysis into transportation programs, policies, plans and activities.

- Identify strategies and efforts in the planning process for ensuring, demonstrating, and substantiating compliance with Title VI.

- Develop a demographic profile of the metropolitan planning area or State that includes identification of the locations of socio-economic groups, including low-income and minority populations as covered by the Executive Order on Environmental Justice and Title VI provisions.

- Identify the needs of low-income and minority populations. Use demographic information to examine the distributions across these groups of the benefits and burdens of the transportation investments included in the plan and TIP.

- Create an analytical process for assessing the regional benefits and burdens of transportation system investments for different socio-economic groups.

- Create a public involvement process that identifies a strategy for engaging minority and low-income populations in transportation decision making.

- Demonstrate efforts to engage low-income and minority populations as part of the certification review and public outreach effort.

- Identify mechanisms to ensure that issues and concerns raised by low-income and minority populations are appropriately considered in the decision making process.

B. PARTICIPANTS IN THE TRANSPORTATION PLANNING PROCESS

A variety of public and private entities are involved in the Transportation Planning Process. A summary of these organizations and their responsibilities follows.

1. Member Communities

The Pioneer Valley Region consists of 43 incorporated cities and towns. Each has a large responsibility to provide local transportation facilities and services. As a result, a significant portion of each local budget is expended for transportation purposes. Communities also receive state funds, called Chapter 90, for transportation purposes. Some of these local responsibilities and/or expenditures include:

- Initiation of federally assisted projects for roadways not under state jurisdiction;
- Support for public transit by more than half of the region's 43 municipalities that are members of the Pioneer Valley Transit Authority (PVTA);
- Contribution by some rural municipalities to special, local paratransit services in their towns;
- Provision of school transportation, public service vehicles (such as police, fire and, in some areas, trash removal), local traffic regulation, and road and sidewalk maintenance by all municipalities in the Pioneer Valley Region; and,
- Seasonal maintenance of local roadways (snow, etc.).

To provide a well-maintained and efficient transportation network for the Pioneer Valley region, it is important that the municipalities adopt suitable plans, policies, and programs for guiding future transportation and land use improvements in their areas, and that these municipal plans and programs be coordinated with regional planning efforts.

2. The Pioneer Valley Metropolitan Planning Organization (MPO)

The Pioneer Valley Metropolitan Planning Organization (MPO) implements and oversees the 3C transportation planning process in the Pioneer Valley region. The objective of the 3C transportation planning process is to assist, support, and provide the capability to maintain an open comprehensive, cooperative, and continuing transportation planning and programming process at all levels of government in conformance with applicable federal and state requirements and guidelines. The Pioneer Valley MPO was restructured in August of 2006 to enhance the role of the local communities in the transportation planning process and allow local MPO members to represent subregional districts respective to community size and geographic location. The number of voting members was also increased from eight to ten. A more recent update in 2011 recognized changes to the MPO membership as a result of the creation of the Massachusetts Department of Transportation. The Pioneer Valley MPO consists of the following officials, their designee (as allowed under the current Memorandum of Understanding), or alternate.

- The Secretary of the Massachusetts Department of Transportation
- The Administrator of the Massachusetts Department of Transportation – Highways Division
- The Chairman of the Pioneer Valley Planning Commission
- The Chairman of the Pioneer Valley Transit Authority

- The Mayors of two of the following three (3) urban core cities:

Chicopee	Holyoke	Springfield

- The Mayor or a Selectman of one of the following four (4) cities and towns:

Agawam	Southwick	Westfield
West Springfield		

- The Mayor or a Selectman of one of the following five (5) cities and towns:

Amherst	Easthampton	Hadley
Northampton	South Hadley	

- A Selectman of one of the following fourteen (14) suburban and rural towns:

Belchertown	Brimfield	East Longmeadow
Granby	Hampden	Holland
Longmeadow	Ludlow	Monson
Palmer	Pelham	Wales
Ware	Wilbraham	

- A Selectman of one of the following seventeen (17) suburban and rural towns:

Blandford	Chester	Chesterfield
Cummington	Goshen	Granville
Hatfield	Huntington	Middlefield
Montgomery	Plainfield	Russell
Southampton	Tolland	Westhampton
Williamsburg	Worthington	

In addition, the Joint Transportation Committee (JTC) Chairman, and one representative each from the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Chair of the Infrastructure Committee of the Western Massachusetts Economic Development Council (EDC), the five (5) alternate community MPO representatives, and one representative each from both the Massachusetts Department of Transportation Highways Division District One and District Two Offices shall be considered ex-officio, non-voting members of the Pioneer Valley MPO. Alternate members shall be additional chief elected officials from each of the above-cited categories of communities and he/she shall be eligible to attend, participate and vote at MPO meetings in the event that the primary member cannot attend.

The MPO jointly develops, reviews, and endorses annually a Planning Work Program which includes a Unified Planning Work Program; a Transportation Plan; a Transportation Improvement Program' as well as transportation plans and programs as may from time to time be required by federal and state laws and regulations. Each of the MPO members reviews regional transportation documents/plans and, if acceptable, indicates its acceptance by endorsing the document. Endorsement is made by a simple majority of those members present and voting, provided that one of the state agencies is included in the majority vote. The MPO is the forum for cooperative transportation decision-making in the Pioneer Valley region.

a) Pioneer Valley Planning Commission (PVPC)

The Pioneer Valley Planning Commission serves as the comprehensive regional planning agency for the 43 cities and towns of Hampshire and Hampden Counties in Western Massachusetts. It is one of the eight signatory bodies to the region's MPO and is responsible for guiding growth and development (both physical and economic) in the Pioneer Valley. In its role as the lead planning agency for the MPO, PVPC provides the staff to conduct MPO and other transportation planning activities for the Pioneer Valley. Transportation planning funds come from many sources including its member communities, the Federal Highway Administration, the Federal Transit Administration, the Massachusetts Department of Transportation, and the Pioneer Valley Transit Authority, among others.

b) Pioneer Valley Transit Authority (PVTA)

The PVTA is the regional transit authority in the Pioneer Valley. Like PVPC, it is also a signatory agency to the region's MPO. The Pioneer Valley Transit Authority provides fixed route bus services and paratransit van services to 24 cities and towns in the region.

The PVPC provides a significant planning support to the PVTA. Further, PVPC includes transit improvement projects in the Transportation Improvement Program (TIP) and in the Regional Transportation Plan (RTP), both of which serve as guides for determining future facilities and service improvements of the PVTA. PVTA receives funds from the Federal Transit Administration, the Massachusetts Department of Transportation, member communities, passenger fares, and advertising.

c) Massachusetts Department of Transportation

The Massachusetts Department of Transportation is a merger of the former Executive Office of Transportation and Public Works and its divisions with the Massachusetts Turnpike Authority, the Massachusetts Highway Department, the Registry of Motor Vehicles, and the Massachusetts Aeronautics Commission. Developed under Chapter 25 of the Acts of 2009, this transportation reform legislation was signed into law in June 2009 and became effective in November 2009.

MassDOT oversees four divisions: Highway, Mass Transit, Aeronautics, and the Registry of Motor Vehicles (RMV) in addition to an Office of Planning and Programming, the Massachusetts Bay Transportation Authority (MBTA), and all Regional Transit Authorities (RTA).

The Mission of the MassDOT is to deliver excellent customer service to people who travel in the Commonwealth, and to provide our nation’s safest and most reliable transportation system in a way that strengthens our economy and quality of life.

(i) Massachusetts Department of Transportation – Highways Division

The Highway Division includes the roadways, bridges, and tunnels of the former Massachusetts Highway Department and Massachusetts Turnpike Authority. It also includes many bridges and parkways previously under the authority of the Department of Conservation and Recreation. They are responsible for the design, construction and maintenance of the Commonwealth's state highways and bridges. The Division is responsible for overseeing traffic safety and engineering activities including the Highway Operations Control Center to ensure safe road and travel conditions.

There are a total of five Highway Division offices representing distinct areas of the state. The majority of the Pioneer Valley region is located in District Two, with the westernmost portion of the region falling in District One.

d) Joint Transportation Committee (JTC)

The JTC is a committee comprised of representatives of local, regional and state governments, as well as private groups and individuals involved in providing transportation facilities, services, and/or planning, including Peter Pan Bus Lines, Inc., the Pioneer Valley Railroad, and the Westfield Airport. The JTC was established by the 3C Memorandum of Understanding for the purpose of incorporating citizen participation in the transportation planning process. It is intended that the JTC be representative of both public and private interests in the region and provide a forum for reviewing transportation plans and projects, offering comments and recommendations to guide transportation planning and transportation improvements in the region. The JTC also serves in an advisory capacity to the MPO as they decide on whether accepting and endorsing a plan or project is appropriate. The JTC plays a key role in reviewing documents such as the Regional Transportation Plan, the annual Transportation Improvement Program and the Unified Transportation Work Program.

(i) Non-Motorized Transportation Committee

The Pioneer Valley Joint Transportation's Bicycle and Pedestrian Subcommittee was established by the JTC in 2000. The subcommittee is responsible for oversight and coordination of activities related to the implementation of the Bicycle and Pedestrian Plan. The subcommittee establishes priorities for implementation of action items defined in the Bike and Ped Plan and provides recommendations to the JTC on work tasks included in the Unified Planning Work Program. Members on the subcommittee are appointed by the JTC and include representatives from the Pioneer Valley Chapter of MassBike, the West Springfield Community Police Department, Northeast Sport Cyclists, the Westfield Open Space Committee, the Route 9 Transportation Management Association, the City of Northampton, MassDOT Highways Division District 2, and JTC representatives from Westfield, Springfield, Wilbraham, East Longmeadow, South Hadley and Northampton.

(ii) TIP Subcommittee

The Pioneer Valley Transportation Improvement Program (TIP) Subcommittee was established by the JTC in 2003. The subcommittee was formed to provide local input on the establishment of project milestones to track the status of current and future TIP projects. The goal of the subcommittee is to develop recommendations for the entire JTC on candidate projects to be included as part of the current TIP. Factors such as the projects score from the MassDOT Project Evaluation Criteria, current design status, environmental permitting status, and status of any needed right of way acquisition are all used to develop the listing of projects recommended for inclusion in the TIP. The subcommittee also assists the PVPC as community liaisons to increase public participation in TIP related tasks such as the update of the PVPC TIP database of projects.

3. Other State Agencies

In addition to federal funds made available by SAFETEA-LU, the Commonwealth spends a large portion of its own available funds on transportation improvement projects. All federal funds received by the Commonwealth for transportation projects must be supplemented with a state match (usually 80% federal/ 20% state ratio). Assistance is also provided for some local street improvements, mass transit, school transportation, and special paratransit services. In order to provide these funds, the Commonwealth's Legislature periodically enacts a transportation bond bill. In each Transportation Bond, funds are appropriated to communities based on a formula under the provisions of MGL Chapter 90, section 34. These funds are commonly known as Chapter 90 funds. The Chapter 90 highway formula is comprised of three variables: local road mileage (58.33 %), employment figures (20.83 %) and population estimates (20.83 %). Under this formula, those communities with a larger number of road miles receive proportionately more aid than those with fewer road miles. Transportation Bonds have also earmarked funds for the design and/or construction of specific projects. Funding for these projects has occurred at the discretion of the legislature.

a) Department of Environmental Protection (DEP)

The Clean Air Act Amendments of 1990 require all states that do not meet federal air quality standards to prepare a State Implementation Plan (SIP) identifying specific strategies for achieving National Ambient Air Quality standards. The Commonwealth of Massachusetts is considered a non-attainment area, meaning that it does not meet the established air quality standards. The lead organization in preparing the required SIP is the Department of Environmental Protection. DEP monitors the air quality status and recommended improvement strategies (by region) from the Commonwealth's thirteen (13) Regional Planning Agencies. This information is then used to prepare a statewide strategy for meeting federal air quality standards.

4. Federal Agencies

The federal government and its various agencies develop national transportation policies and are the principal funding source for many transportation improvements. Most federal activity is exercised through agencies of the US Department of Transportation (DOT), but the US Department of Health and Human Services (HHS) also provides some transportation assistance, predominantly paratransit funding.

a) Department of Transportation (DOT)

The US Department of Transportation administers and coordinates highway, transit, air, and rail planning at the federal level in addition to a substantial number of assistance programs to state and local governments. Specific activities (typically broken down by mode) are handled by individual federal agencies housed within the Department of Transportation. These agencies include the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Federal Aviation Administration (FAA), the United States Coast Guard (USCG), the Surface Transportation Board (STB) and the Federal Railroad Administration (FRA).

(i) Federal Highway Administration (FHWA)

The FHWA performs its mission through three main programs:

The Federal-Aid Highway Program provides federal financial assistance to the States to construct and improve the National Highway System, urban and rural roads, and bridges. The program provides funds for general improvements and development of safe highways and roads.

The Motor Carrier Safety Program develops regulations and enforces federal requirements for the safety of trucks and buses to reduce commercial vehicle crashes. It also governs hazardous cargoes as they move over the nation's highways.

The Federal Lands Highway Program provides access to and within national forests, national parks, Indian reservations and other public lands by preparing plans, letting contracts, supervising construction facilities, and conducting bridge inspections and surveys.

(ii) Federal Transit Administration (FTA)

FTA is the primary federal funding source for planning and implementing mass transportation improvements. FTA provides financial assistance for both urban and rural mass transportation, and subsidizes some paratransit services for non-profit organizations. Both capital and operating funds are made available.

(iii) Federal Aviation Administration (FAA)

FAA provides funding assistance for airport planning and construction, as well as for air traffic control, establishment of safety standards and inspection of accidents.

(iv) Federal Railroad Administration (FRA)

FRA is a regulatory body concerned with safety issues related to rail traffic. The FRA is responsible for investigating rail accidents, but also works to develop and implement programs to promote safe rail operation.

b) Department of Health and Human Services

The Department of Health and Human Services assists service agencies in their effort to provide transportation for the elderly, medical services, and community service operations. Most of these are paratransit services.

c) Department of Homeland Security

The Department of Homeland Security was created on January 23, 2002. It is responsible for securing our nations borders and transportation systems while working to prevent the entry of terrorists and instruments of terror. The Department of Homeland Security is comprised of four divisions:

- Border and Transportation Security
- Emergency Preparedness and Response
- Chemical, Biological, Radiological and Nuclear Countermeasures
- Information Analysis and Infrastructure Protection

A key mission of the Department is to increase measures to ensure the security of the nation's transportation system while continuing to efficiently serve the needs of legitimate travelers and industry.

5. Other Transportation Planning and Service Organizations

In addition to the many local, state, and federal government agencies involved in transportation planning and improvements, other public and private organizations are also important to the operation and improvement of transportation facilities and services in the Pioneer Valley region.

- A number of social and human service agencies in the Pioneer Valley region operate paratransit service. Although some of these operators receive federal assistance, many are privately operated and funded.

- Amtrak is the primary provider of intercity passenger rail service. No commuter rail is currently offered for inter-regional commuters to areas like Hartford and Boston.

- CSX Transportation took over Conrail's operations in the Pioneer Valley region in June of 1999. They are the largest rail freight operator in the region with providing services to the eastern half of the US. Several short lines and one regional railroad also operate freight service within the region.

- Many associations of transportation service providers, such as the American Trucking Association (ATA), are working within federal and state legislation to enact changes that have the potential to impact transportation planning and the focus of transportation improvements.

- Pursuant to the goals of SAFETEA-LU, transportation planning in the Pioneer Valley has been very successful in involving business leaders, environmentalists and developers. Efforts like the Plan for Progress and Valley Vision 2 - the Regional Land Use Plan bring these new partners to the transportation planning table.

C. KEY PRODUCTS

1. Transportation Improvement Program

The Transportation Improvement Program (TIP) is the central program management tool for structuring transportation programs. The TIP is to be fully consistent with the RTP and the planning process. In doing this, the projects identified in the TIP will concur with the goals, policies and objectives of the RTP.

The TIP is scheduled for update every year. Additional changes may be made to the TIP after the required public participation and an MPO meeting. The current TIP identifies a four year listing of projects for implementation. The TIP must be fiscally constrained and programmed according to a regional target (estimate of federal funds) which is provided by MassDOT. All projects, regardless of funding source, are to be identified in the TIP.

Projects identified in the TIP are to be prioritized. Conformity to environmental regulations is key in determining the feasibility and priority of projects. Environmental analysis will also assist in identifying the funding source of projects based on federal restrictions.

The TIP shall also be available for public official review and comment. Included in this public participation is the update on the amendment process associated with the TIP.

2. Unified Planning Work Program

The Unified Planning Work Program (UPWP) is a narrative description of the annual technical work program for a continuing, cooperative, and comprehensive (3C) transportation planning process in the Pioneer Valley Region. The UPWP provides an indication of regional long and short-range transportation planning objectives, the manner in which these objectives will be achieved, the budget necessary to sustain the overall planning effort, and the sources of funding for each specific program element.

Work tasks within the UPWP are reflective of issues and concerns originating from transportation agencies at the federal, state, and local levels. Many tasks are specifically targeted to implement provisions of federal legislation such as SAFETEA-LU, the CAAA, and the Americans with Disabilities Act (ADA).

3. Certification with Title VI

The State and the Metropolitan Planning Organization must annually certify to the Federal Highway Administration and the Federal Transit Administration that their planning process is addressing the major issues facing the region and is being conducted in accordance with all applicable requirements. FHWA and FTA jointly review and evaluate the transportation planning process of each Transportation Management Area (an urbanized area of greater than 200,000) to determine if the process meets the requirements. The review must take place at least once every four years. FHWA and FTA certify the transportation planning process and/or specify corrective actions. Highway and transit funds may be withheld from the region if it is determined that the planning process does not meet the requirements.

The certification process must identify which mechanisms are in place to ensure that issues and concerns raised by low-income and minority populations are appropriately considered in the decision making process. Appropriate evidence must be presented to demonstrate that these concerns have been appropriately considered and that the MPO has made funds available to local organizations that represent low-income and minority populations to enable their participation in the planning processes.

D. THE EIGHT FACTORS OF SAFETEA-LU

SAFTEA-LU requires all metropolitan planning organizations to incorporate eight factors into their planning process. The Pioneer Valley MPO has taken great strides to incorporate these eight factors into the Regional Transportation Plan and the regional planning process. This section addresses each factor separately and shows how the Pioneer Valley has incorporated the factor into our regional planning process.

a) Support the economic vitality of the metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.

In 1994, the Pioneer Valley Planning Commission completed the "Pioneer Valley Plan for Progress: A Regional Economic Strategy for the Pioneer Valley." The Regional Plan for Progress brings together the vital economic interests of the Pioneer Valley to build a competitive regional community with a world class environment which stimulates development and growth. The Plan for Progress was updated in 2004 and reflects a broader concept of regional development that capitalizes on the dynamic interaction of people, place and work. In 2009, a new strategy was added – Develop a Green Regional Economy. The heart of the plan is seven cross-cutting themes that strategy teams must consider in their action plans in order to meet the region's goals: cross-border collaboration (with the greater Hartford region), diversity, education, industry clusters, sustainability, technology, and urban investment.

The Pioneer Valley Region was designated as an official Economic Development District (EDD) by the Economic Development Administration (EDA) in the Fall of 1999. The PVPC annually prepares a Comprehensive Economic Development Strategy (CEDS) report to update the current economic conditions of the Pioneer Valley region, summarize the current status of action strategies, and prioritize a listing of potential projects from our region that are likely to seek EDA financial assistance.

In September of 2000, the Hartford-Springfield Economic Partnership (HSEP) was formed. This partnership helps market the region north and south of the Connecticut-Massachusetts border along the I-91/Connecticut River Valley corridor. HSEP has advanced projects with regional implications and furthered the economic progress of the interstate region by capitalizing on historic, economic, natural, and cultural ties. The region was branded "New England's Knowledge Corridor: Gateway to Innovation" for marketing purposes.

The Pioneer Valley RTP promotes many strategies to enhance the economic vitality of the region. These include recommendations to revitalize the urban core, redevelop Brownfield sites, and improve congested locations. By promoting projects to maintain a safe and efficient multi-modal regional transportation system, local businesses are assured of quick, reliable access to the Interstate Highway System. This facilitates easy access by employees and the efficient movement of products to and from the region.

The PVPC has produced an annual State of the Region Report since February of 2000. This report identifies trends that are either improving or degrading the livability of the Pioneer Valley Region. Information on trends in community vitality, the regional economy, regional commuting trends, and environmental quality was compiled to assist our region in making wise choices to promote responsible growth in the future. The PVPC has created a dedicated website for the State of the

Region Report (http://www.stateofthepioneervalley.org/). This web site is a source for evaluating the current state of the Pioneer Valley in western Massachusetts and to view trends of selected economic indicators for the region.

b) Increase the safety of the transportation system for motorized and non-motorized users.

The Pioneer Valley Planning Commission consciously addresses the area of safety in all aspects of our transportation planning process. All transportation studies conducted by the PVPC include a safety component. Historical crash data is utilized to identify past trends and existing pedestrian and vehicular safety issues. Short and long term recommendations are identified as part of these studies to both reduce congestion and improve safety.

The PVPC participated in the development of the Massachusetts Strategic Highway Safety plan to establish the context for how safety will be incorporated into all aspects of transportation planning and project implementation. The mission of this plan is to develop, promote, implement and evaluate data-driven, multi-disciplinary strategies to maximize safety for users of the roadway system.

In March 2008, PVPC completed the Top 100 High Crash Intersections in the Pioneer Valley Region report. A defined strategy of the 2007 RTP to improve safety, this document ranks intersections based on the number and severity of crashes. It identifies the location of each intersection, current improvement projects that could improve safety, and locations with no currently planned improvements that could benefit from further study.

In addition to the traditional intersection safety studies, the PVPC has also completed both the Merrick-Memorial Redevelopment Plan in West Springfield and the Route 9 Railroad Overpass Safety Study in Northampton. Both areas have existing low-clearance railroad bridges that result in numerous bridge strikes by overheight vehicles. The Merrick Plan also identified a serious safety issue at an existing at-grade railroad crossing. The combination of inadequate safety gates and a second adjacent railroad crossing encouraged vehicles to drive around the safety gates to cross the tracks. The PVPC developed a series of recommendations to increase safety in all of these areas.

Safety of pedestrians, bicyclists and motorists are analyzed and integrated into all transportation projects that PVPC conducts. PVPC is a Highway Safety Improvement Program (HSIP) partner with MassDOT. Road safety audits have become an integral part of the HSIP. PVPC has participated in roadway safety audits in the communities of Agawam (Route 57), Granby, Granville, Holyoke (I-91), Southwick, and West Springfield.

Finally, the safety of pedestrians, bicyclists and transit riders are also addressed as part of ongoing transportation planning activities and in all transportation surveys produced by PVPC. A survey completed by the PVPC along the State Street corridor in the City of Springfield will assist in the identification of areas that required improved lighting and transit waiting areas. More recently, PVPC surveyed users of the Easthampton Manhan Rail Trail and inquired specifically about the safety of users. Concerns regarding pedestrian and bicycle safety expressed by the public during outreach efforts related to the Knowledge Corridor Rail Project were driving influences in securing funds for a grade separated railroad crossing in Northampton. Similar public hearings, studies and outreach efforts identified pedestrians and bicyclists concerns that resulted in safer crosswalks, intersection design, and improved traffic control devices.

c) Increase the security of the transportation system for motorized and non-motorized users.

The security of the transportation system has quickly become a major priority in the transportation planning process. PVPC staff has worked closely with federal, state and local officials to improve

existing databases and maps on critical areas of the transportation infrastructure. Correspondence with local emergency personnel has also been critical to develop plans to implement in the event of natural disasters and acts of terrorism.

Transit facilities in the Pioneer Valley are improving security capabilities and measures. PVTA is implementing an automated vehicle location system that will track the entire service fleet in real time. New security cameras and audio with alert equipment have been installed in passenger terminals, vehicle storage, and maintenance facilities.

The Merrick-Memorial Redevelopment Plan identified a number of issues surrounding the existing security of the CSX rail yard in West Springfield. This led to the development of a number of recommendations for this area and spurred numerous discussions with CSX to advance improvements in this area.

PVPC has conducted evacuation planning studies using the regional transportation model and dynamic traffic assignment. The TransCAD modeling software was used to analyze pre-determined evacuation scenarios at the macro level. Dynamic Traffic assignment was utilized because it is more responsive to operational factors, route changes, and produces more realistic results for modeling unexpected results than traditional travel demand models. PVPC has conducted analysis on the following four evacuation scenarios using this methodology.

- Hurricane evacuation for Hampden, Hampshire, Franklin and Berkshire Counties
- UMass-Amherst Campus Evacuation
- Flooding Scenarios (3 total) for the City of Springfield
- I-91 Chemical Spill near Exit 13 during PM peak hour commute

d) Increase the accessibility and mobility of people and for freight.

Accessibility to the regional transportation system is a high priority in the Pioneer Valley. The Pioneer Valley Regional Congestion Management Process (CMP) proposes improvement alternatives to maintain convenient access to the regional highway system, and maintain the efficient mobility of vehicles in the region. Performance measures have been implemented into the CMP process for the movement of people and for the movements of goods. These performance measures are utilized to promote consistency with the RTP.

The Pioneer Valley Transit Authority (PVTA) provides wheelchair lifts on all of their fixed route transit vehicles and provides bicycle racks on all buses. Strategies to promote and enhance pedestrian and bicycle travel throughout the region are included as part of the Pioneer Valley Regional Bicycle and Pedestrian Transportation Plan.

The Holyoke Transportation Center was a joint development project between public and private partners that opened on September 27, 2010. This transportation center provides vastly improved transportation access, facilities and amenities for persons traveling to, from and through downtown Holyoke. The transportation center will facilitate intra- and intercity bus service. PVTA operates 7 bus routes to this transportation center; furthermore the center provides connection between bus routes that serve the northern and southern parts of the region. Union Station in Springfield is also planned to be rehabilitated to create a state of the art regional intermodal center. The plan features an expanded and enhanced passenger-rail and bus service. The station could potentially be served by Amtrak, Peter Pan Bus Lines and PVTA.

PVPC has been working with Connecticut DOT to establish commuter rail service between New Haven and Springfield. The corridor was identified as a key component in meeting the goals of improving and sustaining the regional economic viability and improving regional livability in the Pioneer Valley as well as in Connecticut's Capitol region. In addition to serving commuters traveling between the towns and cities along the corridor, the service could provide a connection to Bradley International Airport and multiple links to Amtrak Intercity service.

The efficient movement of freight is a high priority in the Pioneer Valley Region. Representatives from local freight carriers are included as part of the Pioneer Valley Joint Transportation Committee and their needs are addressed as part of the RTP. The movement of freight is also considered in the planning and design of local projects such as the Route 10/202 Great River Bridge project in Westfield. A large component of this project consists of the elevation of an existing railroad viaduct to facilitate the movement of freight along the Route 10/202 corridor.

PVPC was directed by the FHWA district office in 2009 to update the inventory of freight connectors to the National Highway System (NHS) in the Pioneer Valley Region. This task included an inventory and evaluation of the condition of NHS connector highway infrastructure, a review of improvements and investments made or programmed for each connector; and the identification of impediments and options to making improvements to the intermodal freight connector.

In 2009, MassDOT submitted a stimulus grant application to the Federal Railroad Administration's High Speed and Intercity Passenger Rail Program to implement the realignment of Amtrak service along 63 miles of the Knowledge Corridor between Springfield and the Vermont state line. In January 2010, FRA awarded MassDOT $70 million for this realignment project. Construction is to be complete and Amtrak service realigned by the end of 2012. This will result in significant time savings for the movement of people and goods through the Pioneer Valley.

The Merrick-Memorial Neighborhood Redevelopment Plan identifies ways to enhance the longstanding relationship between the CSX rail yard in West Springfield and the neighborhood's various constituencies including residents, industrial users and commercial businesses. A project, currently in the design stage, is being advanced to improve the vertical clearance of the existing Union Street overpass. When completed, this improvement will facilitate access to the CSX rail yard while reducing the impact on heavy vehicles on a residential area.

e) Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.

Travel demand management initiatives, land use strategies, and non-motorized transportation programs are all included in the RTP and will play a vital role in promoting energy conservation efforts in the region. The RTP focuses on both supply-side strategies such as travel demand management, traffic control measures and use of alternate modes of transportation and demand-side strategies such as stronger land use regulations to comply with the Clean Air Act Amendments in the Pioneer Valley.

The Pioneer Valley Planning Commission incorporates the strategies and recommendations of the Regional Transportation Plan into future versions of the Regional Transportation Improvement Program and the Unified Planning Work Program. Through the advancement of projects and studies of regional importance in combination with a strong public participation process it is hoped that an improvement in the quality of life in the Pioneer Valley can be realized.

In 1997, the Pioneer Valley Planning Commission unveiled their regional land use plan - Valley Vision. This plan developed a set of regional goals and objectives and specific action strategies that could be used for implementing our goals to preserve land use at the local level. The first update to the regional land use plan - Valley Vision 2 - expanded on the first plan to incorporate the latest data on population and the results of recent efforts by the Commonwealth to promote Smart Growth and Sustainable Development. Valley Vision 2 is a Smart Growth plan, in that it is designed to promote compact, mixed use development in and around existing urban and town centers, while promoting protection of open space and natural resources outside developed centers. In 2010, PVPC received a grant from the Massachusetts Executive Office of Housing and Economic Development. As part of the grant requirement PVPC has updated Valley Vision to reflect the Commonwealth's Sustainable Development Principals. Creating the new Valley Vision 3 included reviewing changes to regional growth and preservation trends, ensuring regional goals, strategies and tools are consistent with the Commonwealth's, identifying priority areas for protection and priority areas for future growth, and ensuring that our 43 communities are consistent with proposed legislation.

PVPC and Franklin Regional Council of Governments (FRCOG) was funded by the Massachusetts Technology Collaborative to develop a Strategic Plan for Renewable Energy for the Pioneer Valley. As part of this plan an inventory of renewable energy activities in the Pioneer Valley was created. Additional efforts have focused on raising the awareness of residents on conserving energy and the identification of goals and strategies to decrease our reliance on fossil fuels. The plan was completed in the Summer of 2007.

GreenDOT was launched by the Massachusetts Department of Transportation's as a comprehensive initiative to encourage environmental responsibility and sustainability. Through the GreenDOT policy, MassDOT will promote sustainable economic development, protect the natural environment, and enhance the quality of life for all of the Commonwealth's residents and visitors through the full range of our activities, from strategic planning to construction and system operations. GreenDOT will be driven by three major goals:

- Reduce greenhouse gas (GHG) emissions;
- Promote the healthy transportation options of walking, bicycling, and public transit;
- Support smart growth development.

This policy requires Metropolitan Planning Organizations to integrate GreenDOT's goals into their planning process and documents. Furthermore, the policy requires that the MPOs and MassDOT balance highway system expansion projects with other projects that support smart growth development and promote public transit, walking and bicycling.

The RTP for the Pioneer Valley Metropolitan Planning Organization adheres to GreenDOT's policies. All proposed transportation planning tasks for the MPO have been modified to incorporate these policies to the extent possible.

f) Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.

The Pioneer Valley transportation planning process focuses on new and innovative ways to enhance the integration and connectivity of the regional transportation system. The revitalization of Union Station in Springfield is an example of a regional project to improve the connectivity between transportation modes. Union Station will be the new regional intermodal transportation center providing access to public transit, private bus companies, and passenger rail. The downtown Springfield location has convenient access to the Interstate Highway System, ample

parking at local garages, as well as convenient pedestrian access. Transit Centers on a smaller scale are also proposed for the communities of Belchertown, Northampton and Westfield.

The Pioneer Valley RTP in combination with the Pioneer Valley Bicycle and Pedestrian Plan promotes strategies to encourage people to bicycle or walk as an alternative to making a trip by car. Recommendations include providing bicycle racks at retail centers and places of employment as well as making neighborhoods more walkable, through the installation of sidewalks, bike paths and lanes, and traffic calming measures. The plan supports "complete streets" initiatives that reduce greenhouse gas emissions and promote the healthy transportation options of walking, bicycling, and public transit in balance with automobile use.

Since 1999 the Pioneer Valley Region and Connecticut have been studying and planning for the implementation of commuter rail service between Springfield, Hartford and New Haven. The Connecticut Department of Transportation completed an implementation study for the commuter project which recommended Commuter Rail service to be provided on a ½ hourly service basis during commuting times for commuters and passengers for each direction. It is anticipated in FY2011 that MassDOT will issue a Request for Proposals to study the feasibility of increasing opportunities for east/west passenger rail service from Springfield to Boston. This could result in the development of additional planning work to perform data collection, analysis and additional public participation necessary to support passenger rail service along this corridor.

A recently completed Passenger Rail Study for the "Knowledge Corridor" identified recommendations to relocate rail service back to 63 miles of the Knowledge Corridor between Springfield and the Vermont state line. In 2009, MassDOT submitted a stimulus grant application to the Federal Railroad Administration's High Speed and Intercity Passenger Rail Program to implement the realignment of this Amtrak service. In January 2010, FRA awarded MassDOT $70 million for this realignment project. Construction is to be complete and Amtrak service realigned by the end of 2012.

g) Promote efficient system management and operation.

The Pioneer Valley Planning Commission utilizes the 3C (Comprehensive, Continuing, Cooperative) Transportation Planning Process for all transportation planning in this region. Public participation is included at all stages of the transportation planning process so that recommendations can be reflective of local needs.

All projects eligible for funding through the Transportation Improvement Program (TIP) are evaluated using the Project Evaluation Criteria developed by the Commonwealth of Massachusetts. Each project is ranked numerically based on several different criteria in consultation with representatives from the PVPC, the state and local government. The results of this procedure are used to develop a priority listing of projects for the TIP to be considered by the MPO.

Previously programmed transportation facilities and construction improvements are re-evaluated to determine changing regional transportation needs, priorities and long range considerations before including such projects in the RTP. The Pioneer Valley regional transportation model is utilized to evaluate long-range projects to determine their impact on congestion and air quality in the region.

The planning and development of transportation facilities and services in the Pioneer Valley is coordinated with adjoining Regional Planning Agencies such as the Berkshire Regional Planning Commission (BRPC), Franklin Regional Council of Governments (FRCOG), Central Massachusetts Regional Planning Commission (CMRPC), and the Capitol Region Council of Governments (CRCOG) in Hartford, Connecticut. Traffic counts performed along the regional

borders are shared with the neighboring region. In addition, neighboring regions are invited to participate in transportation planning activities of interest.

During FY2009, PVTA began integration and installation of an Intelligent Transportation System (ITS). This ITS system will equip PVTA vehicles with information and communications technology that will increase the security of the transit system for operators and passengers, while providing real-time transportation data to dispatchers' thereby increasing operational efficiency. Currently under construction is a communications infrastructure and ITS in the Western Massachusetts region as part of the Commonwealth's transportation system. This project design includes a fiber-optic communications and ITS surveillance system for the I-91 corridor from the Connecticut border to the Vermont border. The fiber-optic communications is central to the installation of ITS on this corridor and as a means of serving the local communities and businesses with broadband access to the Internet.

h) Emphasize the preservation of the existing transportation system.

Preserving and maximizing the efficiency of the transportation infrastructure has been identified as a high priority in the Pioneer Valley Planning process. A regional pavement management system has been in place in the Pioneer Valley since 1993 to ensure that federal-aid eligible roadways are maintained in the most cost effective and efficient manner. In addition, many communities in the region have enlisted planning commission assistance to establish a local pavement management system in order to efficiently maintain all community roadways. PVPC is updating the inventory and correlating pavement condition of all federal aid eligible roads in the region as part of this RTP update.

In May of 2008, Massachusetts Governor Deval Patrick filed legislation to accelerate the repair and replacement of structurally deficient bridges. The $3 billion Accelerated Bridge Program will greatly reduce the number of structurally deficient bridges in the state system. Since 2008, the number of structurally deficient bridges has dropped from 543 to 482, a decline of over 11 percent. Over the course of the eight year program, more than 200 bridges are planned to be replaced or repaired.

Another form of infrastructure preservation consists of the efforts within the region to preserve abandoned rail corridors and toe path canal beds. These right of ways are maintained for future non-motorized transportation uses. The Norwottuck Rail Trail, Connecticut Riverwalk and the Manhan Rail Trail are all examples of projects that reuse existing transportation rights of way in the region.

The Western Massachusetts Regional Intelligent Transportation System (ITS) Architecture identifies strategies to advance ITS and ensure compatibility between ITS projects. It is hoped that future expansion of our regions highways will be minimized by the use of ITS technology in the region.

CHAPTER 3

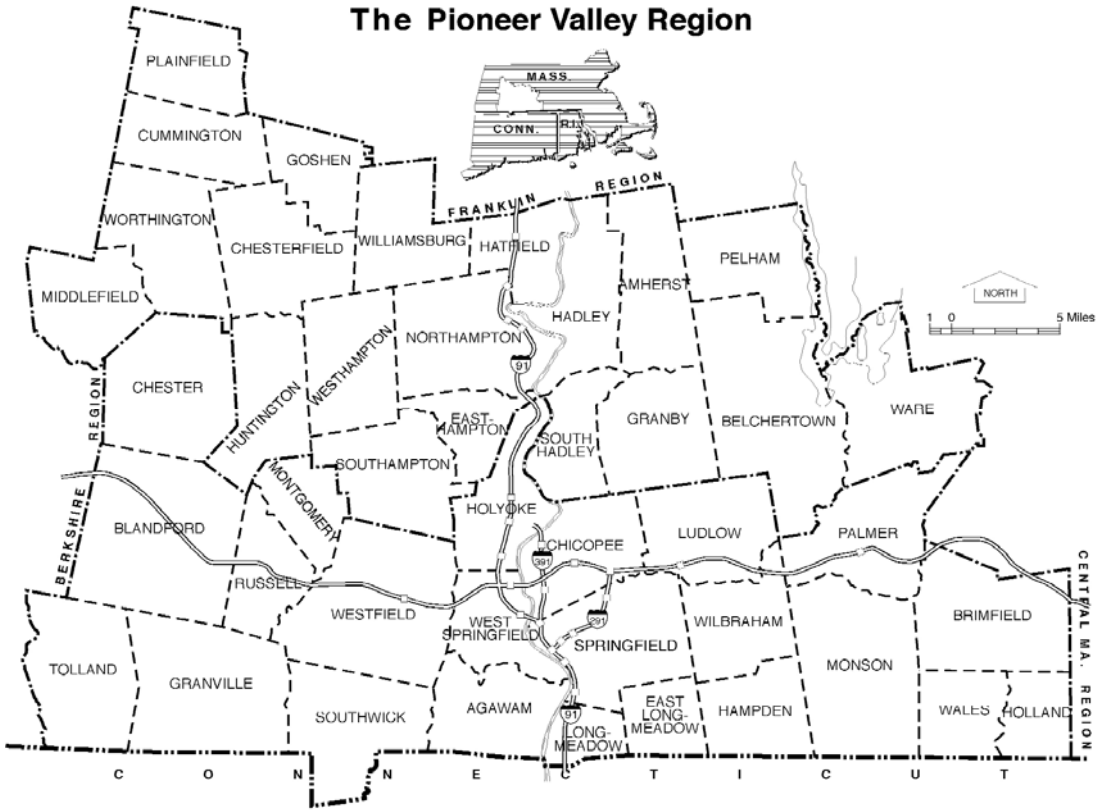
REGIONAL PROFILE

Social and economic trends can have significant implications on transportation planning. This chapter presents a profile of the region's physical, socioeconomic, demographic and environmental characteristics as they relate to transportation planning and construction.

A. PHYSICAL CHARACTERISTICS

The Pioneer Valley Region is located in the midwestern section of Massachusetts. Encompassing the fourth largest metropolitan area in New England, the region covers 1,179 square miles. The Pioneer Valley is bisected by the Connecticut River and is bounded on the north by Franklin County, on the south by the State of Connecticut, on the east by Quabbin Reservoir and Worcester County and on the west by Berkshire County.

Figure 3-1 - Pioneer Valley Region Map



The Pioneer Valley Region, which is comprised of the 43 cities and towns within the Hampden and Hampshire county areas, is home to more than 627,000 people. Hampden County, the most populous of the four western counties of Massachusetts, is approximately 635 square miles. Hampden County is made up of 23 communities including the Springfield-Chicopee-Holyoke urbanized area. Hampshire County is situated in the middle of Western Massachusetts and includes an area of 544 square miles.

The third largest city in Massachusetts, Springfield is the region's cultural and economic center. Springfield is home to several of the region's largest employers, including Massachusetts Mutual Life Insurance Company, Baystate Medical Center, Mercy Hospital Incorporated, Solutia, Smith & Wesson Company, and Verizon. Major cultural institutions include the Springfield Symphony, City Stage, MassMutual Center, Quadrangle Museums, the Basketball Hall of Fame, and the Dr. Seuss National Memorial Sculpture Garden.

The cities of Chicopee and Holyoke were the first planned industrial communities in the nation. Merchants built an elaborate complex of mills, workers' housing, dams, and canal systems that evolved into cities. While many historic mills and industries are now gone, a number of 19th and 20th century structures are maintained and improved through municipal preservation and revitalization initiatives.

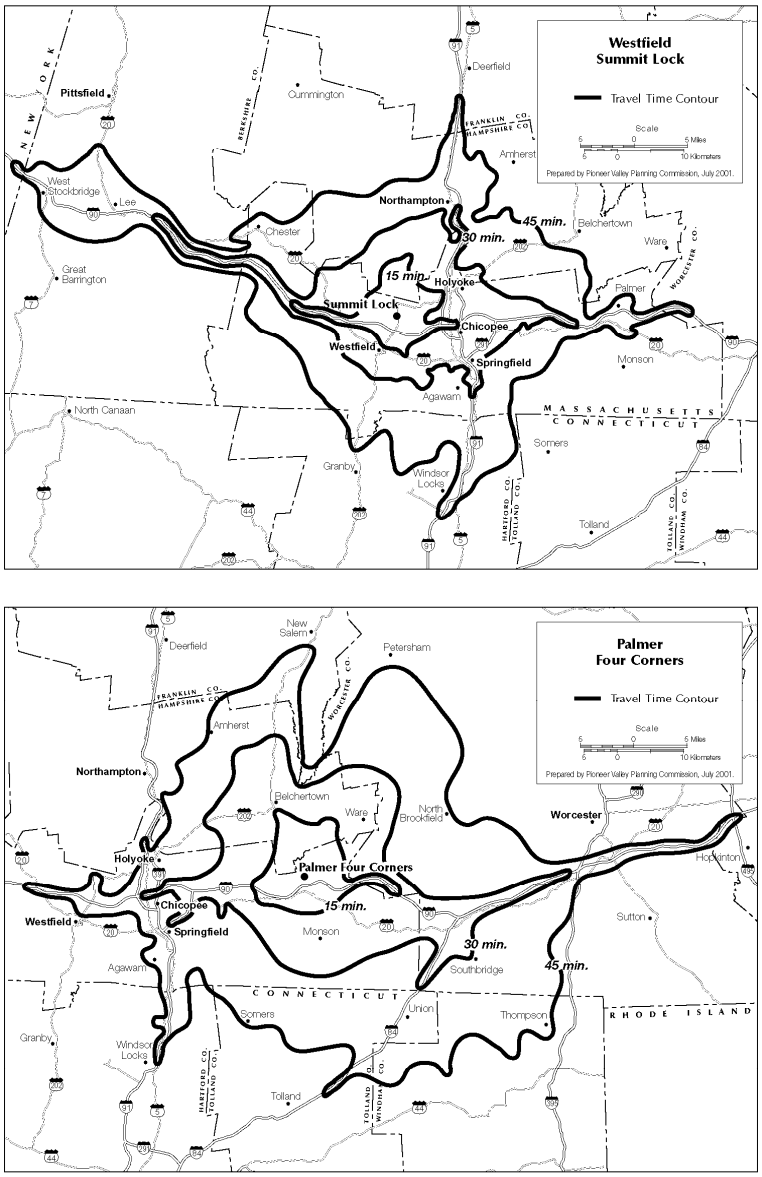
Unique within the Commonwealth of Massachusetts, the Pioneer Valley region contains a diverse economic base, internationally known educational institutions, and limitless scenic beauty. Dominant physical characteristics include the broad fertile agricultural valley formed by the Connecticut River, the Holyoke Mountain range that traverses the region from Southwick to Pelham, and the foothills of the Berkshire Mountains. Prime agricultural land, significant wetlands, and scenic rivers are some of the region's premier natural resources. Choices in lifestyle range from contemporary downtown living to stately historic homes, characteristic suburban neighborhoods, and rural living in very small communities—a variety that contributes to the diversity and appeal of the region. Its unique combination of natural beauty, cultural amenities, and historical character make the Pioneer Valley region an exceptional environment in which to live and work.

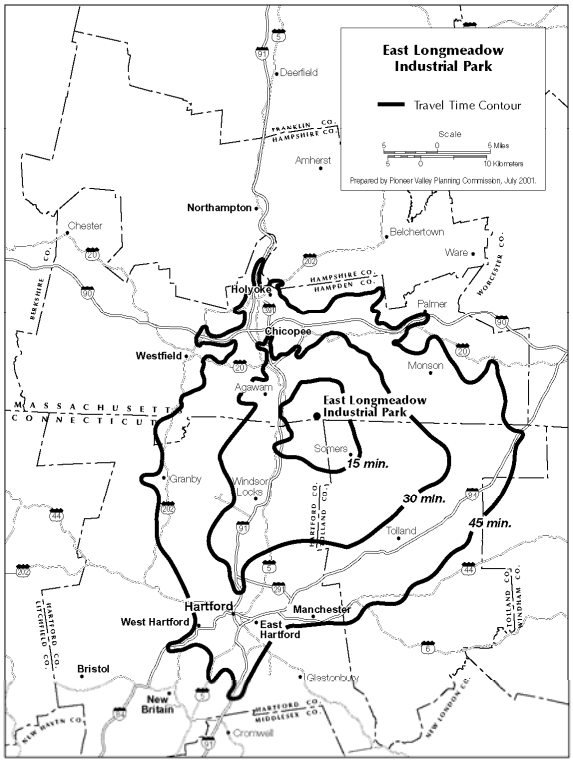
B. HIGHWAY

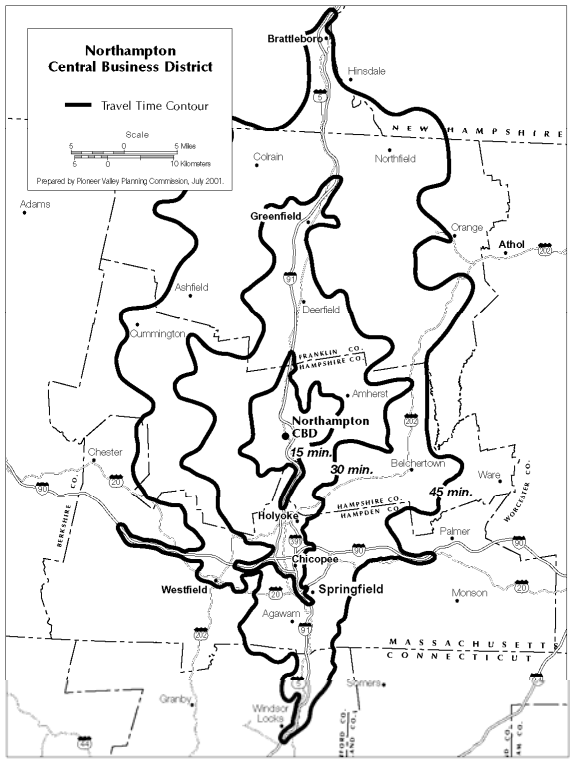
1. Access

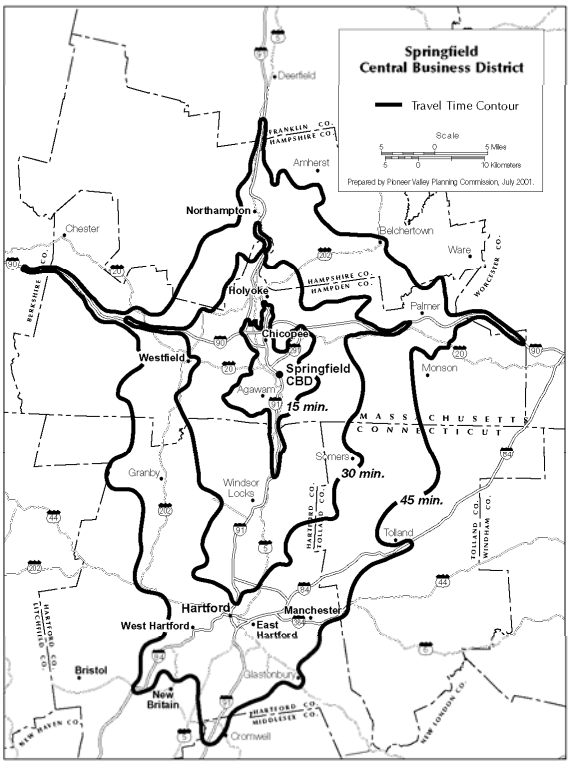
The Pioneer Valley area is considered the crossroads of transportation in Western Massachusetts. Situated at the intersection of the area's major highways, Interstate 90 (Massachusetts Turnpike) traveling east-west and Interstate 91 traveling north-south, the region offers easy access to all markets in the Eastern United States and Canada. Major southern New England population centers are accessible within hours, as can be seen from the travel time contours below. The contours were developed 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. Travel contours are broken down into 15, 30, and 45 minute intervals.

Figure 3-2 - Regional Travel Time Contours




East Longmeadow
Industrial Park
Travel Time Contour
Scale
5 0 5 Miles
5 0 10 Kilometers
Prepared by Pioneer Valley Planning Commission, July 2001.
Deerfield
Amherst
Northampton
Chester
Belchertown
Ware
Holyoke
Palmer
Chicopee
Westfield
Monson
Agawam
East Longmeadow
Industrial Park
Somers
15 min.
Granby
Windsor
Locks
30 min.
Tolland
45 min.
Hartford
Manchester
West Hartford
East
Hartford
Bristol
Glastonbury
New
Britain
Cromwell
MASSACHUSETTS
CONNECTICUT


Northampton
Central Business District
Travel Time Contour
Scale
5 0 5 Miles
5 0 10 Kilometers
Prepared by Pioneer Valley Planning Commission, July 2001.
Brattleboro
Hinsdale
NEW HAMPSHIRE
Colrain
Northfield
Adams
Greenfield
Orange
Athol
Ashfield
Deerfield
Cummington
Amherst
Northampton
CBD
15 min.
30 min.
45 min.
Chester
Belchertown
Ware
Holyoke
Palmer
Chicopee
Westfield
Springfield
Monson
Agawam
MASSACHUSETTS
CONNECTICUT
Granby
Somers
Windsor
Locks


Springfield
Central Business District
Travel Time Contour
Scale
5 0 5 Miles
5 0 10 Kilometers
Prepared by Pioneer Valley Planning Commission, July 2001.
Deerfield
Amherst
Northampton
Chester
Belchertown
Ware
Holyoke
Palmer
Chicopee
Westfield
Springfield
CBD
Monson
Agawam
15 min.
MASSACHUSETTS
CONNECTICUT
Somers
30 min.
Granby
Windsor
Locks
45 min.
Tolland
Hartford
Manchester
West Hartford
East
Hartford
Bristol
Glastonbury
New
Britain
Cromwell

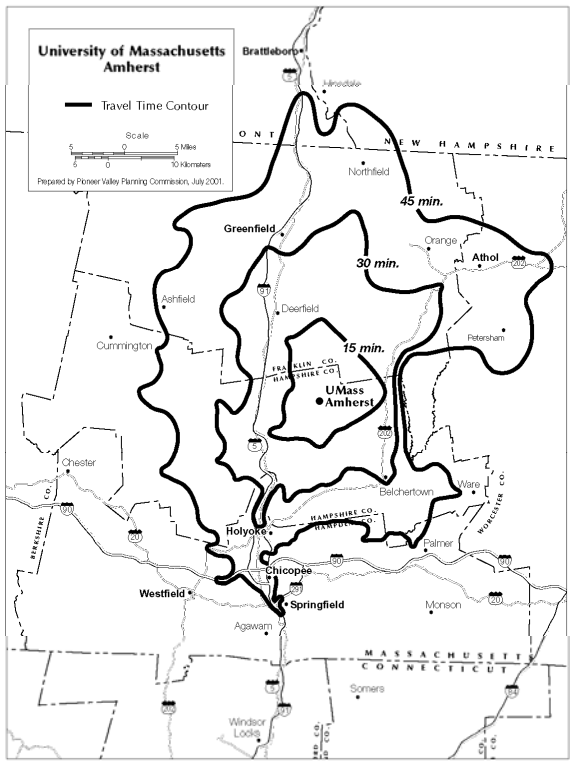

University of Massachusetts
Amherst
Travel Time Contour
Scale
5 0 5 Miles
5 0 10 Kilometers
Prepared by Pioneer Valley Planning Commission, July 2001.
Brattleboro
Hinsdale
NEW HAMPSHIRE
Northfield
45 min.
Greenfield
Orange
30 min.
Athol
Ashfield
Deerfield
Cummington
15 min.
Petersham
UMass
Amherst
Chester
Belchertown
Ware
Holyoke
Palmer
Chicopee
Westfield
Springfield
Monson
Agawam
MASSACHUSETTS
CONNECTICUT
Somers
Windsor
Locks

Table 3-1 - Driving Distance and Time from Springfield

Destination	Distance	Time
Albany, NY	85 miles	1.5 hours
Boston, MA	91 miles	1.5 hours
New York City, NY	140 miles	3.0 hours
Philadelphia, PA	260 miles	5.0 hours
Montreal, Quebec	301 miles	5.5 hours
Washington DC	400 miles	8.0 hours

The interstate expressways (I-90/I-91) link most of the major urban centers in the region. The basic highway network including interstate highways, U.S. numbered routes and state routes, along with other traffic arteries, provides access to all municipalities in the region, both urban and rural. The pattern of principal arterial highways in the region is radial, extending outwards from each of the region's major centers, a consequence of development and topographic influences.

Table 3-2 - Regional Interstate Highways

Interstate Highways	Principal Orientation	# of In- Region Interchanges	In-Region Mileage	Toll Road?
I-90	East/West (Mass. Turnpike)	6	46.08	Yes
I-91	North/South	22	31.17	No
I-291	Connector (Springfield to I-90)	6	5.44	No
I-391	Connector (I-91 to Chicopee/Holyoke)	6	3.82	No

The highway network is composed of various facilities that are separated into systems within the federal-aid highway program by the Massachusetts Department of Transportation on the basis of their functional classification which takes into account the various functions and uses of the roads. The federal-aid highway program in Massachusetts is a state administered program. The program consists of three separate federal aid systems, the National Highway System (NHS), the Interstate System and the Surface Transportation Program.

The Federal-Aid highway system in the Pioneer Valley region consists of approximately 1,324 miles, of which approximately 224 miles are on the National Highway System (NHS), and approximately 1,100 miles belong to the Surface Transportation Program (STP). The STP program is a competitive funding program, used for the maintenance and construction of the federal aid system, all roads other than those functionally classified as local or rural minor collectors. Approximately 70% of all roadways in the Pioneer Valley are classified as Local roads, meaning they are not eligible for STP funds.

The roadway mileage in the Pioneer Valley has remained fairly consistent over the last several years, since the construction of Interstate 391. New roadway construction has become more difficult in recent years as a result of rising construction costs and the requirements of the Clean Air Act Amendments of 1990. The last major new roadway to be constructed in the region occurred in 1996 when a portion of Route 57 was relocated in Agawam. This project extended the existing limited access portion of Route 57 out to Route 187.

2. Functional Classification

The Federal-Aid Highway Act of 1973 required the use of functional highway classification to update the Federal-Aid Highway system and identify the National Highway System. Both of these highway systems are used as inventory mechanisms and funding eligibility criteria for our nation's roadway network.

In 1992, the PVPC, under the direction of the Massachusetts Department of Transportation (MassDOT), began the reclassification process to update the federal-aid network in the Pioneer Valley Region. The region's roadways were grouped into classes according to the service they are intended to provide. The region's urbanized area is updated as a result of the 2000 census. In 2005, the PVPC solicited information on roadway classification changes from local officials in order to identify existing roadways that have been permanently closed to through traffic in response to enhanced regional security or changes in local traffic flow and develop a proposed new functional classification scheme to maintain a comprehensive and continuous network of functionally classified roadways in the region. The region's urbanized area is expected to be updated again as a result of the 2010 census.

The seven functional classifications adopted by Massachusetts are summarized below:

Interstate - Freeways providing service to substantial statewide and interstate travel.

Rural Principal Arterials - Major highways that serve corridor movements having trip length and travel density characteristics that indicate substantial statewide or interstate travel.

Rural Minor Arterial - Roadways with statewide significance that link cities and large towns forming an integrated network of intracounty importance.

Rural Major Collectors and Urban Minor Arterials - Those roads that provide service to cities, towns and other traffic generators not served by the arterial system; roads that link these places with the arterial system; and roads that serve the more important intracounty travel corridors.

Rural Minor Collectors and Urban Collectors - Roads that bring traffic from local roads to collector roads; roads that provide service to small communities and link local traffic generators to the rural areas.

Local Roads - Roads that provide access to adjacent land; roads that provide service to relatively short distances. Local roads include all roads not classified as part of the principal arterial, minor arterial, or collector system.

Other Urban Principle Arterials - Roadways with significance that provide access to and within the urbanized area. These roads may also provide a connection to interstate and rural principle arterials.

After local and state reviews, a final federal-aid network was completed for the Pioneer Valley Region. Table 3-3 summarizes the roadway mile by functional classification for each community. The functional classification of a roadway may be upgraded or downgraded based on changes in land use, population, and vehicular volume. Communities can request a change in the functional classification through a written request to the PVPC. If PVPC concurs that a change is warranted, the request is submitted to MassDOT Planning for their approval. Once approved by MassDOT, the change requires endorsement by both the MPO and the FHWA before the functional classification can be officially changed.

Table 3-3 - Miles of Roadway by Community and Functional Classification

		Functional Classification					
Community	**Total**	**Interstates**	**Urban Arterials**	**Rural Arterials**	**Urban Collectors**	**Rural Collectors**	**Local Roads**
Agawam	152.3	0.0	29.2	0.0	27.8	0.0	95.3
Amherst	137.3	0.0	40.2	1.0	5.1	2.2	88.8
Belchertown	159.4	0.0	16.8	12.7	6.9	15.2	107.8
Blandford	89.5	8.5	0.0	0.0	0.0	27.2	53.8
Brimfield	79.4	2.9	0.0	8.8	0.0	17.0	50.7
Chester	65.7	0.0	0.0	6.5	0.0	22.3	36.9
Chesterfield	58.4	0.0	0.0	7.8	0.0	15.6	35.0
Chicopee	259.6	11.2	39.8	0.0	15.6	0.0	193.0
Cummington	61.7	0.0	0.0	13.1	0.0	9.4	39.2
East Longmeadow	97.0	0.0	21.4	0.0	9.4	0.0	66.2
Easthampton	89.2	0.5	25.0	0.0	5.0	0.0	58.7
Goshen	42.6	0.0	0.0	5.4	0.0	8.3	28.9
Granby	67.8	0.0	14.4	3.4	7.4	10.9	31.7
Granville	73.8	0.0	0.0	9.0	0.0	14.4	50.4
Hadley	83.6	0.0	16.8	4.6	4.3	12.2	45.7
Hampden	54.8	0.0	5.8	0.0	2.5	7.2	39.3
Hatfield	59.4	3.7	4.4	0.0	0.0	10.2	41.1
Holland	37.5	0.1	0.0	0.0	0.0	11.6	25.8
Holyoke	174.2	9.9	37.4	0.0	20.9	0.0	106.0
Huntington	54.3	0.0	0.0	11.2	0.0	10.9	32.2
Longmeadow	99.6	3.3	14.1	0.0	5.0	0.0	77.2
Ludlow	135.7	5.9	25.1	0.0	10.0	1.6	93.1
Middlefield	38.4	0.0	0.0	0.0	0.0	7.5	30.9
Monson	110.4	0.0	12.8	3.4	0.9	17.0	76.3
Montgomery	30.8	0.1	0.0	0.0	0.0	8.3	22.4
Northampton	183.3	6.1	48.3	0.0	16.1	0.0	112.8
Palmer	114.8	7.6	23.2	5.1	7.0	13.4	58.5
Pelham	46.0	0.0	2.7	5.7	0.0	8.4	29.2
Plainfield	48.8	0.0	0.0	0.0	0.0	17.7	31.1
Russell	36.4	4.0	2.5	5.3	0.0	7.8	16.8
South Hadley	105.0	0.0	17.7	0.2	10.2	0.0	76.9
Southampton	75.8	0.0	10.9	0.0	4.9	4.4	55.6
Southwick	85.3	0.0	16.2	2.9	10.8	7.7	47.7
Springfield	498.0	11.2	99.5	0.0	46.6	0.0	340.7
Tolland	42.3	0.0	0.0	5.7	0.0	5.4	31.2
Wales	28.8	0.0	0.3	0.0	0.0	13.1	15.4
Ware	117.6	0.0	13.9	4.8	8.6	5.9	84.4
West Springfield	144.0	6.2	30.9	0.0	8.9	0.0	98.0
Westfield	247.9	6.7	46.7	0.0	20.1	0.0	174.4
Westhampton	47.8	0.0	0.0	0.0	0.0	22.4	25.4
Wilbraham	115.3	1.0	20.2	0.0	12.4	4.6	77.1
Williamsburg	50.6	0.0	2.7	7.0	0.0	12.9	28.0
Worthington	64.4	0.0	0.0	10.3	0.0	10.6	43.5
Pioneer Valley Region	**4,364.5**	**88.9**	**639.0**	**133.9**	**266.4**	**363.3**	**2,873.1**

Source: MassDOT

3. Jurisdiction

There are over 4,364 miles of road in the region. As of 2009, city and town governments administered nearly 81 percent of the road miles and MassDOT was responsible for seven percent. The Department of Conservation and Recreation, the Federal Government, various park systems and the state colleges and universities administered a small number of roadway miles. Table 3-4 gives an inventory of the region's roadway miles according to the governmental unit responsible for maintaining them.

Table 3-4 - Miles of Roadway by Community and Administrative Unit

Community	Total	MassDOT	City/ Town	DCR	State Park	Inst./ College	Private	Federal
Agawam	152.3	14.3	121.9	0.0	3.9	0.0	12.2	0.0
Amherst	137.3	5.3	100.6	0.0	0.0	8.3	23.1	0.0
Belchertown	159.4	15.3	122.5	7.9	0.0	2.0	11.7	0.0
Blandford	89.5	18.2	63.2	0.0	3.6	0.0	4.5	0.0
Brimfield	79.5	15.1	64.3	0.0	0.0	0.0	0.1	0.0
Chester	65.6	6.5	58.0	0.0	1.1	0.0	0.0	0.0
Chesterfield	58.2	0.1	53.3	0.0	0.2	0.0	4.7	0.0
Chicopee	259.4	17.2	153.7	0.0	1.2	0.0	71.6	15.7
Cummington	61.7	9.9	49.2	0.0	0.0	0.0	1.8	0.8
East Longmeadow	96.9	0.0	92.6	0.0	0.0	0.0	4.3	0.0
Easthampton	89.3	3.0	80.2	0.0	2.4	0.0	3.7	0.0
Goshen	42.7	7.2	25.6	0.0	5.0	0.0	4.9	0.0
Granby	67.9	7.7	57.0	0.2	0.0	0.0	2.9	0.2
Granville	73.8	0.0	64.7	0.0	1.2	0.0	7.9	0.0
Hadley	83.5	8.1	66.8	0.0	1.2	3.8	3.6	0.0
Hampden	54.8	0.0	53.7	0.0	0.0	0.0	1.1	0.0
Hatfield	59.5	7.6	50.9	0.0	0.0	0.0	1.0	0.0
Holland	37.4	0.1	35.4	0.0	0.0	0.0	1.9	0.0
Holyoke	174.3	16.8	132.6	0.0	5.1	1.8	18.0	0.0
Huntington	54.4	11.8	37.1	0.0	0.0	0.0	1.8	3.7
Longmeadow	99.6	3.3	85.6	0.0	0.0	0.0	10.7	0.0
Ludlow	135.7	6.1	121.7	0.1	0.3	0.9	6.6	0.0
Middlefield	38.4	0.0	38.4	0.0	0.0	0.0	0.0	0.0
Monson	110.5	7.1	100.6	0.0	0.0	0.6	2.1	0.0
Montgomery	30.8	0.1	30.7	0.0	0.0	0.0	0.0	0.0
Northampton	183.3	13.9	150.7	0.0	0.0	4.0	12.4	2.3
Palmer	114.9	23.3	87.9	0.0	0.0	0.0	3.7	0.0
Pelham	46.0	5.7	22.8	14.7	0.8	0.0	2.0	0.0
Plainfield	48.8	0.0	47.9	0.0	0.0	0.0	0.9	0.0
Russell	36.3	13.5	22.7	0.0	0.0	0.0	0.1	0.0
South Hadley	105.1	8.4	86.2	0.0	0.6	0.0	9.9	0.0
Southampton	75.7	5.4	66.4	0.0	0.0	0.0	3.9	0.0
Southwick	85.3	7.2	68.0	0.0	0.0	0.0	10.1	0.0
Springfield	498.0	13.0	411.4	0.0	6.7	1.4	65.5	0.0
Tolland	42.3	0.2	40.2	0.0	2.0	0.0	0.0	0.0
Wales	28.8	5.1	23.7	0.0	0.0	0.0	0.0	0.0
Ware	117.5	11.3	86.2	17.0	0.0	0.0	3.1	0.0
West Springfield	144.1	15.2	117.7	0.0	0.0	0.0	11.2	0.0
Westfield	247.8	16.3	185.2	0.0	0.0	0.4	45.9	0.0
Westhampton	47.8	0.0	44.0	0.0	0.0	0.0	3.8	0.0
Wilbraham	115.4	6.1	101.1	0.0	0.0	0.0	8.2	0.0
Williamsburg	50.6	5.7	41.9	0.0	0.0	0.0	3.0	0.0
Worthington	64.4	6.0	58.1	0.0	0.2	0.0	0.1	0.0
Pioneer Valley Region	**4364.0**	**336.7**	**3,522.1**	**39.9**	**35.6**	**23.3**	**383.8**	**22.7**

Source: MassDOT

4. Bridges

Among the existing transportation facilities in the Pioneer Valley Region major bridge crossings remain a focal point for regional transportation concerns, as many streets and highways converge into a

limited number of crossings over the Connecticut, Westfield and Chicopee Rivers. Table 3-5 lists the bridges by community according to the governmental unit responsible for maintaining them.

Table 3-5 - Number of Bridges by Community and by Administrative Unit

Community	Total	MHD	City/ Town	MTA	Parks and Forests	Other State
Agawam	18	17	1			
Amherst	15	6	9			
Belchertown	12	5	7			
Blandford	11	2	5	4		
Brimfield	26	4	16	6		
Chester	23	7	15		1	
Chesterfield	9	3	6			
Chicopee	50	24	5	20		1
Cummington	13	7	6			
East Longmeadow	1	1				
Easthampton	19	9	10			
Goshen	4	1	3			
Granby	8	1	7			
Granville	8	3	5			
Hadley	9	6	3			
Hampden	8		8			
Hatfield	15	10	5			
Holland	1		1			
Holyoke	49	40	9			
Huntington	8	6	2			
Longmeadow	4	4				
Ludlow	22	1	7	14		
Middlefield	9		9			
Monson	23	9	13			
Montgomery	5		4	1		
Northampton	43	23	20			
Palmer	31	7	8	16		
Pelham	3		3			
Plainfield	2		2			
Russell	15	7	4	4		
South Hadley	11	7	4			
Southampton	10	2	8			
Southwick	3	2	1			
Springfield	59	48	11		1	
Tolland						
Wales	1		1			
Ware	16	7	8			1
West Springfield	26	17	0	9		
Westfield	35	12	11	12		
Westhampton	14	1	13			
Wilbraham	4	1	2	1		
Williamsburg	16	7	9			
Worthington	14	5	9			
Total:	**673**	**312**	**270**	**87**	**2**	**2**

5. Vehicle Miles Traveled

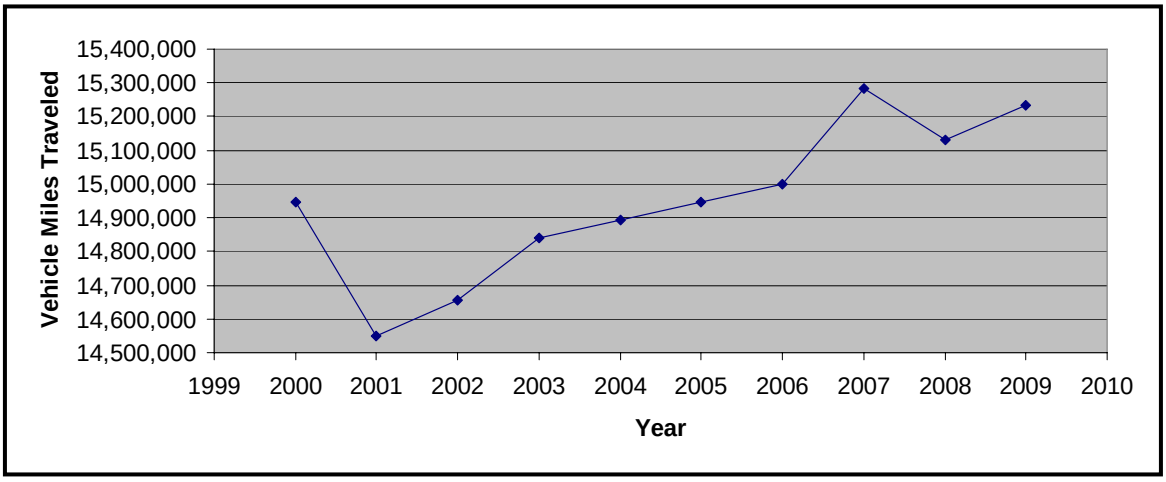
In general, traffic on the region's roadways has been increasing. Between 2000 and 2001, however, the estimated number of daily vehicle miles traveled (DVMT) in the Pioneer Valley Region decreased by nearly 400,000 miles per average weekday. This decrease was short lived as the DVMT has steadily increased over the last several years. The magnitude of increase is shared in the region's rural areas as well. Table 3-6 presents the Pioneer Valley's estimated urban VMT by functional class for the years 2000 through 2009. Information on the changes in total VMT from 1993 – 2009 is shown on Figure 3-3.

Table 3-6 - 2000 - 2009 Estimated Urban Vehicle Miles of Travel in the Pioneer Valley (in thousands)

Year	Interstate Highway	Other Urban Principle Arterials	Urban Principal Arterials and Rural Minor Arterials	Urban Minor Arterials and Rural Major Arterials	Urban Collectors and Rural Minor Collectors	Local Roads	Total
2000	4,408	775	3,451	3,511	852	1,951	14,948
2001	4,377	896	3,398	3,132	787	1,962	14,551
2002	4,455	897	3,416	3,136	789	1,964	14,657
2003	4,352	798	3,470	3,451	839	1,930	14,840
2004	4,366	801	3,482	3,466	842	1,936	14,893
2005	4,380	805	3,495	3,481	846	1,941	14,947
2006	4,394	808	3,507	3,496	849	1,946	15,000
2007	4,475	824	3,573	3,564	865	1,981	15,282
2008	4,431	816	3,538	3,529	857	1,961	15,132
2009	4,460	821	3,561	3,553	863	1,974	15,232

Sources: Massachusetts State HPMS (Highway Performance Monitoring System) Submittals to FHWA
Massachusetts Road Inventory Data
Massachusetts Statewide Travel Demand Model

Figure 3-3 - Daily Vehicle Miles Traveled



The increase in VMT is the result of several major trends identified in the Pioneer Valley as well as other areas of the state and nation. Vehicle ownership is on the rise as vehicle occupancy rates decline. Generally speaking, this puts more single occupant vehicles on the roadway system, thus, increasing the total vehicle miles of travel daily. The decrease in VMT from 2000 to 2001 coincides with decreases in daily traffic volumes in the region. An increase in traffic volume ranging 1.7% to 3.9% in the past two years between 2008 and 2009 in Massachusetts reflects the continued upward trend presented above (Traffic Volume Trends, March 2009, FHWA).

6. Average Daily Traffic Counts

The Pioneer Valley Planning Commission (PVPC) monitors traffic levels throughout the Region. Conducting close to 200 roadway segment counts annually as well as compiling counts from various local traffic studies; the PVPC continuously expands its count database. This information is used to measure Average Daily Traffic (ADT), Daily Vehicle Miles Traveled (DVMT), and identify seasonal, daily and hourly trends related to vehicle travel.

In addition to the selective ground counts conducted throughout the region, there are fourteen permanent monitoring stations maintained by MassDOT as well as four such stations maintained by PVPC. The MassDOT locations collect counts hourly, 365 days a year. The PVPC locations collect counts hourly, 7 days a month during the months of May through August. These permanent count locations are shown in Table 3-7.

Table 3-7 - MassDOT Permanent Count Stations in the Pioneer Valley

Community	Roadway	Location	Years Available
Longmeadow	I-91	South of the Springfield City Line	1994-1997,1999,2006
Chicopee	I-391	South of I-90 at Route 116	1995-2003,2006-2008
Chicopee	I-391	North of I-90	1994, 1996-2003,2005-2007
Chicopee	I-391	At the Connecticut River Bridge	2005-2008
Northampton	Route 5/10	South of the Hatfield Town Line	1994-2008
Northampton	I-91	North of King Street Interchange	1995-1997,1999,2000, 2002-2004
Springfield	I-291	South of Roosevelt Avenue	1998, 2003-2005,2007,2008
Springfield	I-291	At the Chicopee City Line.	2007,2008
Brimfield	Route 20	East of Holland Road	1997-2004,2006-2008
West Springfield	Route 5	At the Holyoke City Line	1996, 1998-2008
West Springfield	I-91	North of Route 5	1994-2002,2005-2008
Huntington	Route 112	South of Route 66/112	1995-2003,2005-2008
Goshen	Route 112	South of the Ashfield Town Line	1996-2002
Russell	Route 20	West of Route 23	1998-2005,2007,2008

Source: Massachusetts Department of Transportation

Table 3-8 provides information on the percent change in traffic volumes at the above mentioned interstate locations.

Table 3-8 - Percent Change in Interstate Highway Traffic Volumes

Community	Roadway	Location	Years Available	% Change
Longmeadow	I-91	South of the Springfield City Line	1994-1997,1999,2006	8.41
Northampton	I-91	North of King Street Interchange	1995-1997,1999,2000, 2002-2004	18.16
West Springfield	I-91	North of Route 5	1994-2002,2005-2008	25.00
Springfield	I-291	South of Roosevelt Avenue	1998, 2003-2005, 2007, 2008	1.74
Springfield	I-291	At the Chicopee C.L.	2007,2008	-1.14
Chicopee	I-391	South of I-90 at Route 116	1995-2003,2006-2008	23.26
Chicopee	I-391	At the Connecticut River Bridge	2005-2008	1.81
Chicopee	I-391	North of I-90	1994, 1996-2003.2005-2007	-18.33

Source: Massachusetts Department of Transportation

By examining the change in traffic volumes at the permanent count stations, information can be developed on the amount of growth occurring at specific locations throughout the region. Locations have been grouped by the functional classification of the roadway and plotted on graphs in Figures 3-4 through 3-6. The functional classification of the roadway is an indication of the type and amount of traffic a roadway is expected to serve.

Figure 3-4 - Average Annual Traffic for Interstate Routes

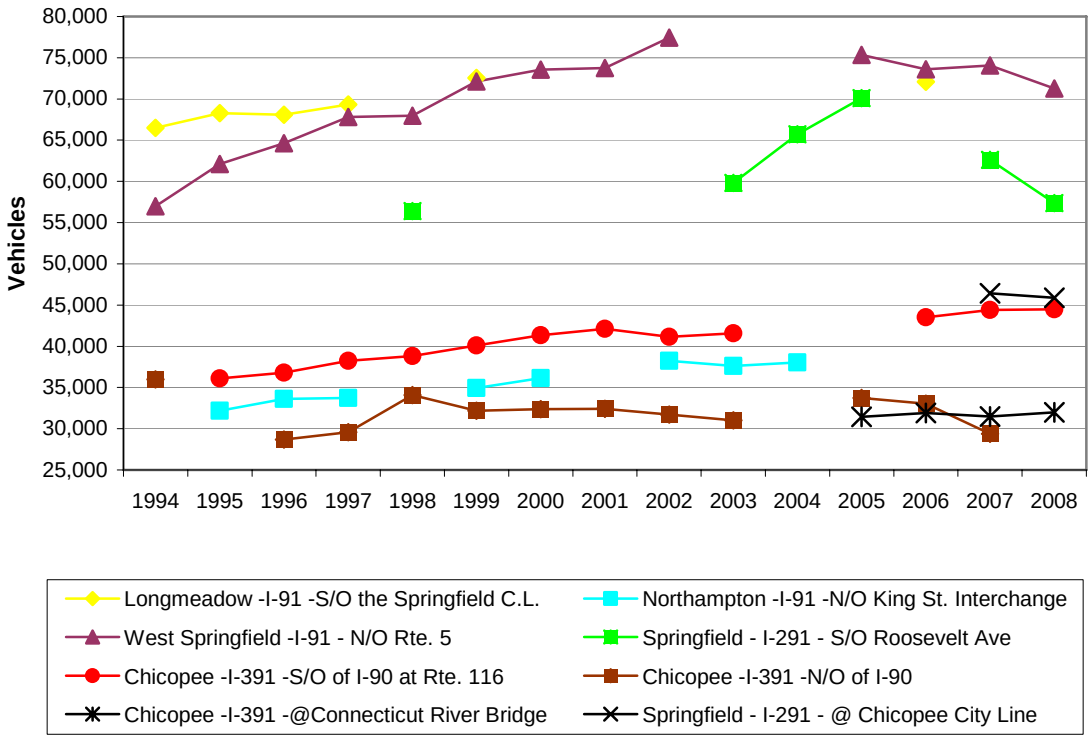


Figure 3-5 - Average Annual Daily Traffic for Arterial Roadways

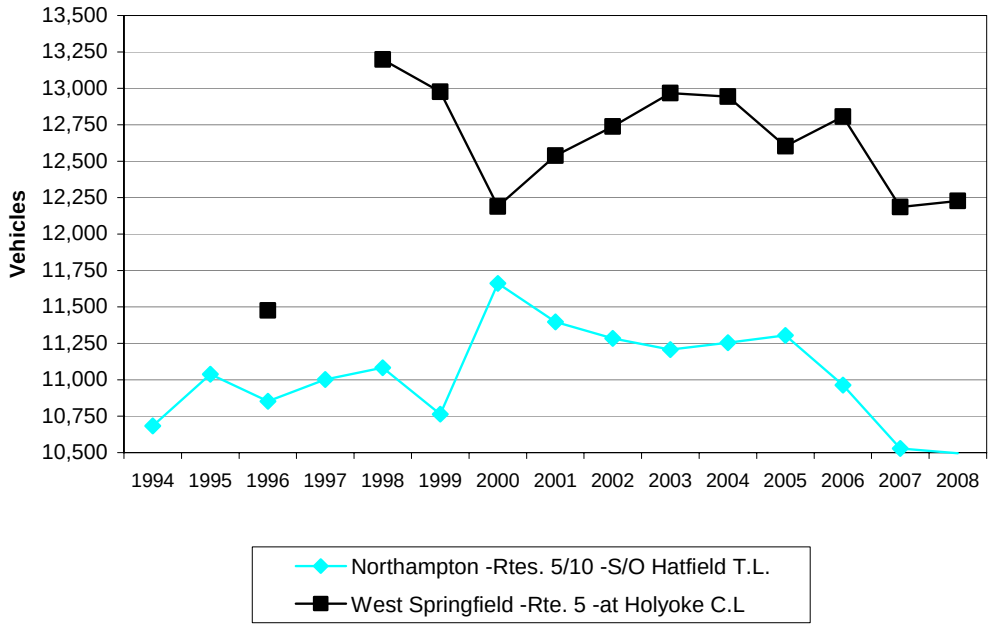
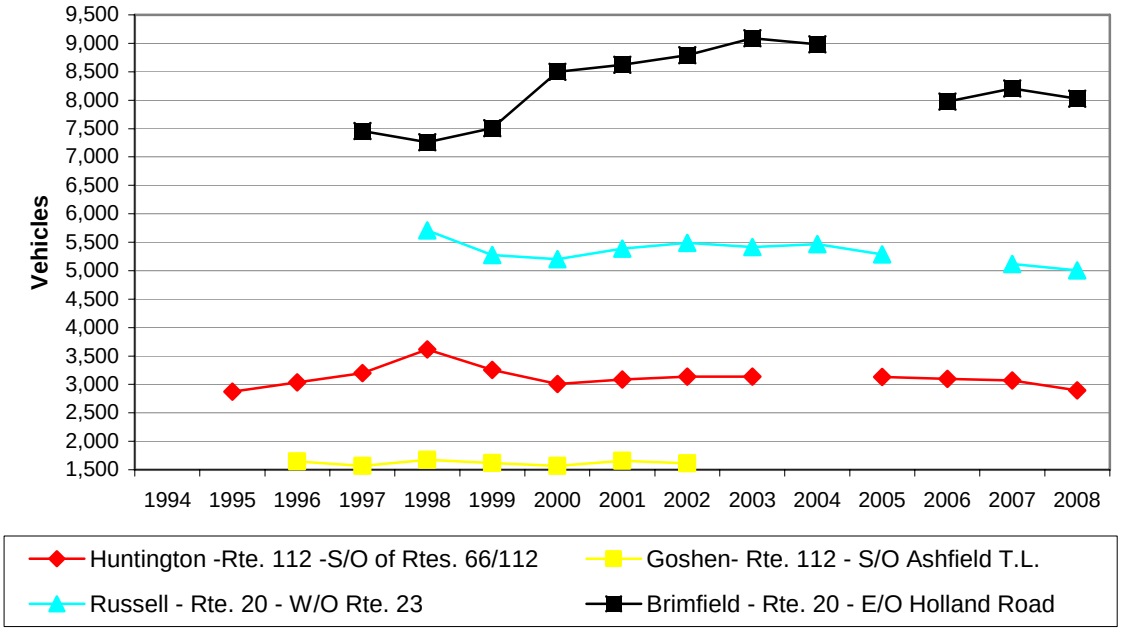
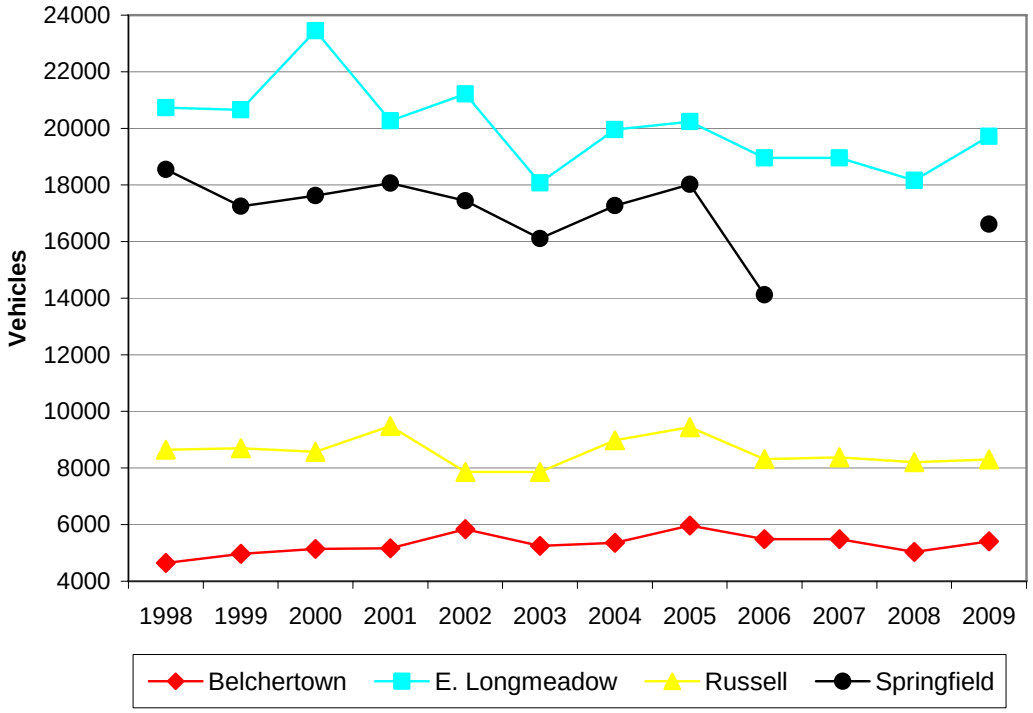


Figure 3-6 - Average Annual Daily Traffic for Rural Roadways



The PVPC also maintains four of its own traffic count stations to collect information on seasonal variations in traffic count data. This information is presented in Figure 3-7.

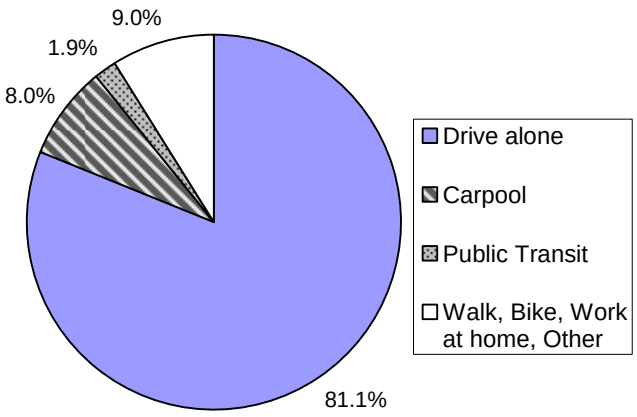
Figure 3-7 - Regional Traffic Count Station Data



7. Mode Share

The mode of personal travel in the region tilts heavily toward private autos. The 2006-2008 American Community Survey (ACS), which provides the most recent information on mode share, finds that approximately 81% of commuters in the region drive alone to work. Public transportation in the region accounts for 1.9% of commuters traveling by transit compared, to 9% statewide.

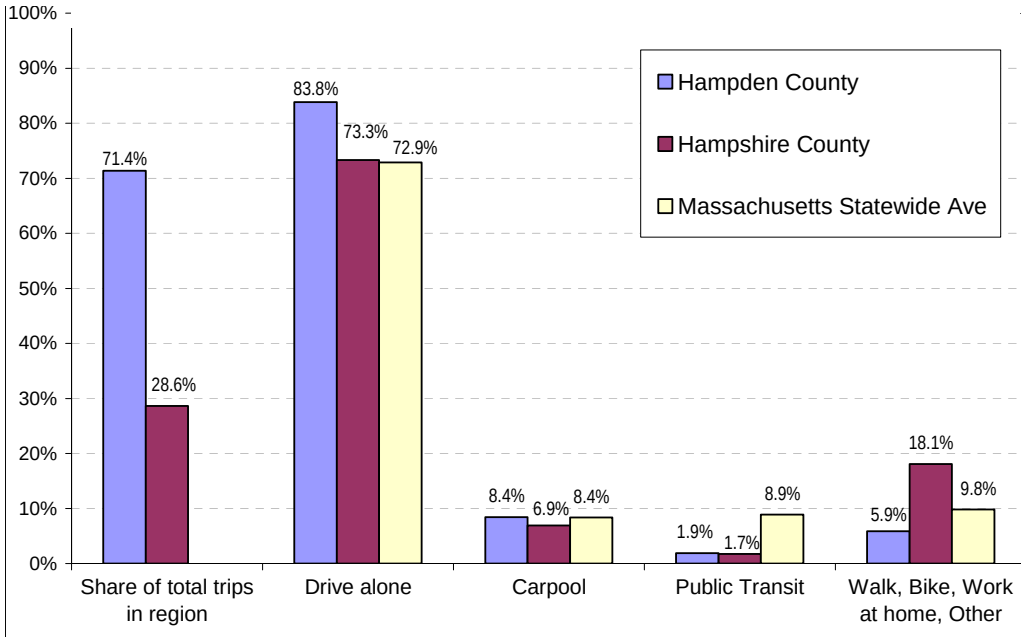
Figure 3-8 - Pioneer Valley Travel Modes for Employment 2006-2008



Margin of error < 1.0%; Average is weighted for number of trips per county

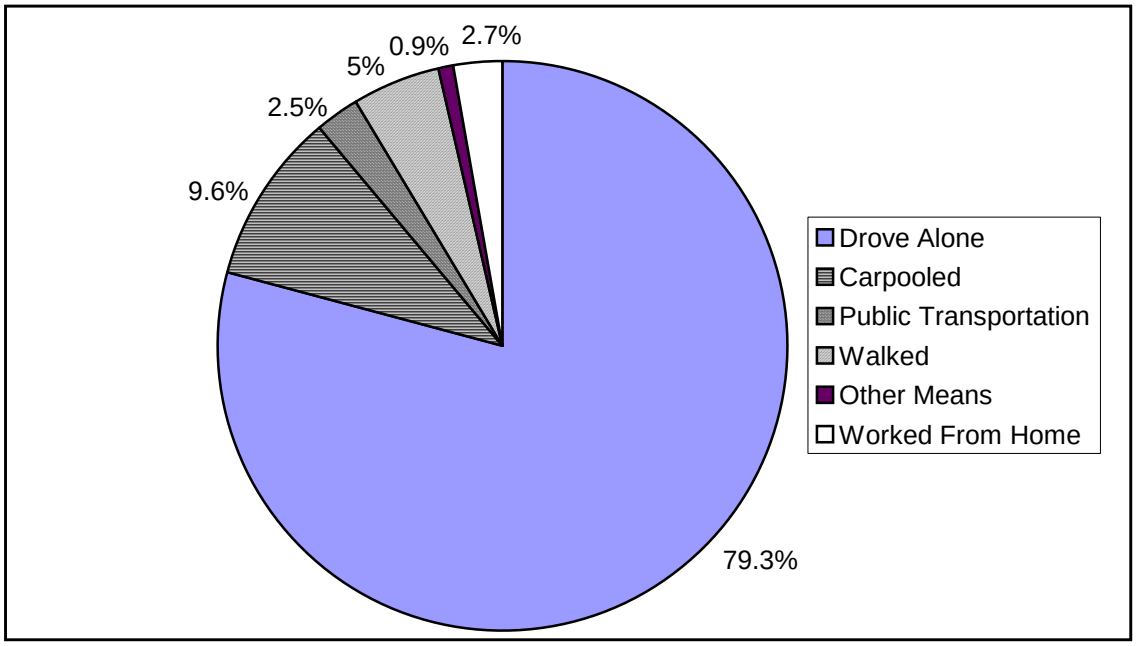
The mode share differences between Hampden and Hampshire Counties are significant, as seen in Figure 3-9. For reference, Massachusetts statewide averages are also shown for each mode.

Figure 3-9 - Hampden and Hampshire County Employment Travel Modes 2006-08



One reason for the differences seen above may be the commuting patterns of the 30,000 or so students, faculty and staff at UMass Amherst, who may have more choices for travel modes to campus, as well as work flexibility. ACS does not provide detailed information on walking, working from home or other modes of commute. The most recent data available for those modes is the 2000 Census, which reported that 79.3% of all work trips are made by people driving alone. Of the remaining 20% of travelers, almost half carpooled, which is nearly 2 percentage points, or one-fifth, greater than the 2006-2008 ACS share. People working from home were 2.7% of the 2000 total.

Figure 3-10 - Pioneer Valley Travel Modes for Employment 2000



2000 U.S. Census

8. Scenic Byway Planning

The National Scenic Byways Program is part of the U.S. Department of Transportation, Federal Highway Administration. The program is a collaborative effort to help recognize, preserve and enhance selected roads throughout the United States. Projects included in this program focus on the betterment of the services and facilities that attract and please the traveling public. Over the last eighteen years, the PVPC has taken an active role in the development of planning studies and project development to support the preservation of scenic roadways in the Pioneer Valley region.

a) Jacob's Ladder Trail

The Jacob's Ladder Trail Scenic Byway (Route 20) provides a travel route through the hilly and classic New England landscapes of Chester, Huntington and Russell in the Pioneer Valley. In 1992, the Massachusetts legislature conferred upon the roadway special designation as a state scenic byway which laid the path for federal funding of a corridor management plan to inventory evaluate, and make recommendations on land use, highway safety, and scenic and cultural resources.

Completion of the first corridor management plan in 1994 has led to nearly $1.7 million in federal funding over the intervening years for more than 20 projects aimed at recognizing, preserving, and interpreting the resources of the built environment and the natural landscape. Through

improvement of Byway resources, these projects are also aimed at helping to stimulate related economic development.

An update to the corridor management plan was completed in 2009. This update included an assessment and reevaluation of the progress made to date on the recommendations of the 1994 plan. It presents new inventories and evaluations of outdoor recreation resources, natural resources, market, tourism, and traveler resources. In addition, the plan includes 12 maps of Byway resources developed from state, regional, and local GIS systems for the five Byway towns. New recommendations were developed as part of an Action Plan for preserving the Byway's resources in the future. The completion of this plan coincides with the 2010 Centennial of the Trail.

b) Connecticut River Scenic Farm Byway

The Connecticut River Scenic Farm Byway was recently designated a state scenic byway by an act of the state legislature and is the newest scenic byway in Massachusetts. The scenic byway runs along the Connecticut River on Routes 47 and 63 in South Hadley, Hadley, Sunderland, Montague, and Northfield. PVPC and FRCOG have assisted these communities in completing a Byway Plan, which identifies projects and strategies. The PVPC continues to work with the Byway Area Committee to prioritize projects for the byway, and to provide planning services and technical assistance to each of the communities involved with the Scenic Byway.

c) Route 112 Scenic Byway

The Massachusetts Legislature designated Route 112 as a state scenic byway in the Acts of 2004. This designation laid the path for the development of a Corridor Management Plan that was completed in 2009. In the PVPC region, the Route 112 corridor begins in the Town of Huntington and continues north to Worthington and Cummington. In the Town of Cummington, Route 112 proceeds to the east, sharing an alignment with Route 9 into the Town of Goshen until it again changes alignment to the north into Franklin County. The Route 112 Scenic Byway Corridor Management Plan is a cooperative project to recognize, preserve, and promote the unique resources of the Byway as well as identify threats to the character and viability of the Byway. The plan provides a framework for guiding future byway projects, while also remaining flexible and dynamic so that communities can respond to opportunities and needs. Development of the plan included the following objectives:

- Identify the unique scenic, natural, recreational, historic, and cultural resources of the Route 112 Scenic Byway corridor.
- Develop recommendations and strategies to preserve and enhance Byway resources.
- Identify opportunities to expand economic activities related to agricultural heritage and recreational tourism along the Byway.
- Develop an assessment that identifies potential recreational linkages to other scenic byways, hiking trails, state forests, river access points, and cultural and recreational features along the Route 112 corridor.

d) Scenic Byways of Western Massachusetts Marketing Campaign

There have been several successful applications submitted by the Berkshire Regional Planning Commission (BRPC), Franklin Regional Council of Governments (FRCOG), and the Pioneer Valley Planning Commission (PVPC) to promote activities associated with Scenic Byways. As many of these proposed projects contain similar tasks, the project scope has been combined in

order to eliminate duplicative efforts and create a synergy to work cooperatively to promote the byways. The project involves the following five byways in Western Massachusetts:

- Connecticut River Scenic Farm Byway – Routes 47/63/10
- Jacobs Ladder Trail – Route 20
- Mohawk Trail (east and west) – Route 2/2A
- Mount Greylock Scenic Byway
- Route 112 Scenic Byway

The proposed activities in this campaign include:

- Development of a coordinated and cohesive marketing campaign strategy that will brand and promote the Scenic Byways of Western Massachusetts as a local and regional travel destination.
- In coordination with the UMass Regional Traveler Information Center (RTIC), development of a coordinated web presence that includes an overall structure for the Scenic Byways of Western Massachusetts as well as a substructure for the individual byways.
- Creation of promotional materials such as maps and brochures that help travelers find the scenic byways, navigate from one byway to another, and locate specific sites and attractions along the byways. This will also include the development of electronic tools including smartphone applications and GPS information.
- Develop and install a coordinated sign system that includes highway destination signs as well as local wayfinding signs. This also entails identifying and mapping locations for signs, obtaining approval for sign installation from MassDOT, the local communities and any other applicable permitting agencies.
- Implementation of the marketing campaign that will promote the newly branded Scenic Byways of Western Massachusetts as a destination.

C. PASSENGER TRANSPORTATION

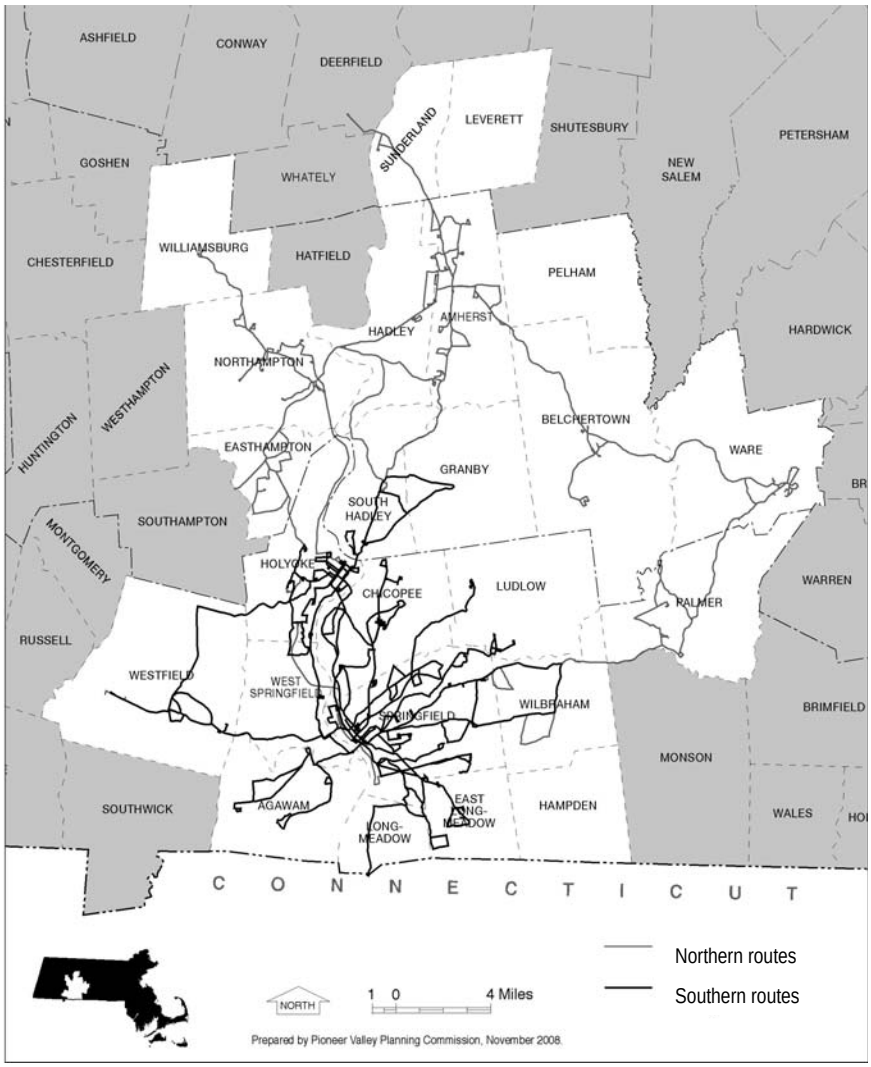
Transportation services that carry passengers for a fare are generally known as transit. In the Pioneer Valley, transit includes a mix of public and commercial passenger carriers that offer alternatives to automobile travel. This section summarizes the following major transit services that are available in the region:

- Public buses operating on regular routes and schedules
- On-demand paratransit vans for disabled residents and senior citizens
- Commercial scheduled bus service within the region, as well as to destinations outside it
- Commercial and non-profit van shuttles, charter buses and taxis
- Passenger rail

1. Pioneer Valley Transit Authority (PVTA) Bus and Paratransit Service

PVTA is the regional transit authority for the Pioneer Valley. It was created in 1974 to consolidate public transportation in the region. Today, PVTA provides service on 44 scheduled bus routes and on-demand paratransit van service in 24 communities with a total population of 579,832 (2009 U.S. Census estimate).

Figure 3-11 - PVTA Service Communities and Scheduled Bus Routes



Agawam	Granby	Ludlow	Sunderland
Amherst	Hadley	Northampton	Ware
Belchertown	Hampden	Palmer	West Springfield
Chicopee	Holyoke	Pelham	Westfield
Easthampton	Leverett	South Hadley	Wilbraham
E. Longmeadow	Longmeadow	Springfield	Williamsburg

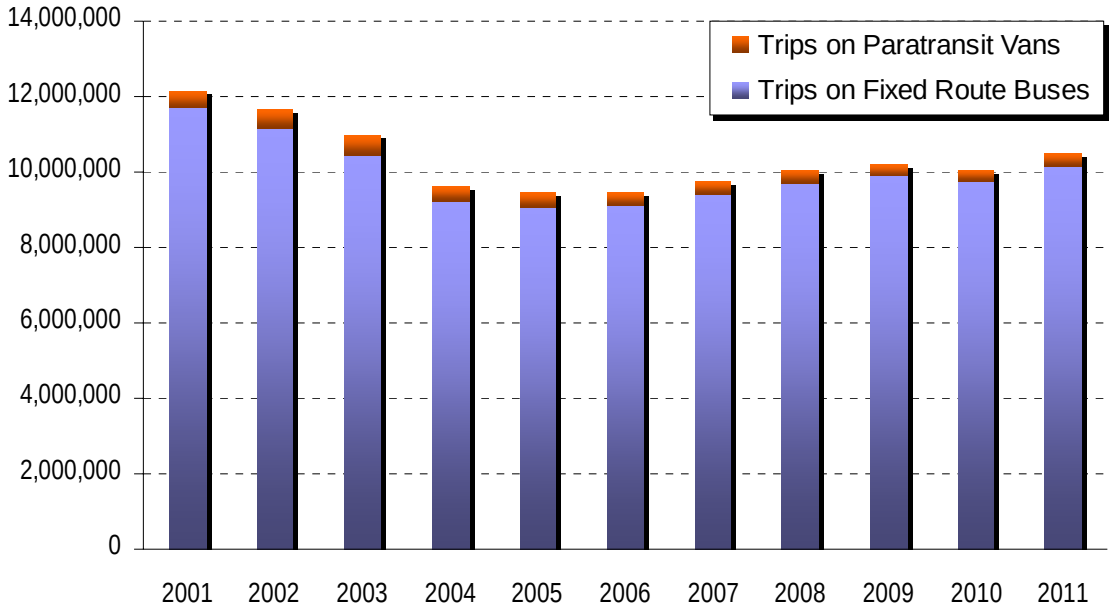
PVTA's funding comes from federal, state and local governments; passenger fares; and advertising. The authority's operating budget in FY12 is $37.6 million. The 24 member cities and towns of PVTA contribute an annual assessment based on the level of service received. Passenger fares cover about 18% of the total cost of the service. Funds for capital improvements are received through various state and federal grant programs and are not subject to forward funding.

To comply with state law that prohibits regional transit authorities from directly operating transit services, PVTA contracts with three private operating companies: First Transit operates bus routes based in Springfield and Northampton; UMass Transit Services operates bus routes based at the University of Massachusetts serving the Amherst area; and Hulmes Transportation operates all paratransit van services, as well as community mini-bus shuttles in Belchertown, Easthampton, Palmer and Ware. PVTA's operators employ 375 fulltime drivers and maintenance staff and 198 part time drivers.

a) PVTA Ridership

Ridership is the number of trips provided in a given period (as distinguished from individual "riders," who typically make multiple trips during the same period). PVTA ridership information is presented below.

Figure 3-12 - PVTA Bus Route Ridership



Fiscal years July 1 through June 30

Capital and service improvements implemented by PVTA during the 1970s-1990s resulted a ridership peak of nearly 13 million in 1985. However, state-imposed budget reductions in 2002 necessitated deep service cuts, eliminating nearly one-fifth of bus service, including many Sunday trips. Ridership fell during the following two years to about 9 million rides. Since 2006, ridership has recovered to approximately 10 million rides per year, even though funding has not been restored to pre-2002 levels (when annualized for inflation).

b) PVTA Scheduled Bus Service

There are 44 PVTA scheduled bus routes in the Pioneer Valley. Most routes radiate from four service hubs, or "pulse" points: the Springfield Bus Terminal, the Holyoke Transportation Center, downtown Northampton (Academy of Music), and the UMass Amherst/downtown Amherst corridor. There are three express routes (G1 Sumner Express, P21 I-391 Express, and M40 Minute Man Express); three community shuttles (Easthampton, Palmer and Ware); and two "circulators" (Route 37 Amity Shuttle and OWL Shuttle at Westfield State University). Importantly, several routes serving UMass Amherst (34, 35, 38, 39, M40, 45, 46) do not operate when the university and local colleges are not in session, and other routes in the Five College area (30, 31, B43) have reduced schedules during non-academic periods.

PVTA's basic fare is $1.25 per ride. Transfers cost an extra 25 cents and are good for 90 minutes from time of purchase. Reduced fares of 60 cents per ride are offered for elderly and disabled customers, as well as Medicaid card holders (transfers are 10 cents). The fare for children age 6 to 12 is 75 cents; children younger than age 6 ride free with an adult. Monthly unlimited ride passes are $45, with a discounted price of $22 for elderly, disabled, and Medicaid card holders. PVTA also offers 1-day unlimited ride passes for $3 and 7-day passes for $12.50.

Fares for routes serving the University of Massachusetts are collected under a "proof of payment" system in cooperation with the University and other Five Colleges institutions (Smith, Mount Holyoke, Hampshire and Amherst Colleges). Instead of onboard collection, fares on these routes are received through activity fees that are paid by students, as well as subsidies from the institutions. Students, faculty and staff of these institutions must be prepared to show their current school ID cards as proof of fare payment when riding the bus. Riders who do not have a valid school ID card must purchase multi-ride passes at the Amherst Big Y Supermarket or single-ride tickets at the Amherst Collector's Office the regular prices. Cash is not collected aboard buses in the Amherst area.

c) PVTA Bus Riders

Surveys find that half of all PVTA riders use the bus to commute to work or school. The remaining trip purposes are shopping, attending social and recreational events, and medical appointments. Nearly three-quarters of riders report earning less than $20,000 per year; three of every five riders say they do not own a car; and four of five riders say they have no other way to make their trip other than using PVTA.

Table 3-9 - PVTA Bus Route Ridership

Fiscal Year	Passenger Trips	% Change
2001	11,705,973	1.13%
2002	11,154,252	-4.71%
2003	10,427,793	-6.51%
2004	9,221,309	-11.57%
2005	9,071,913	-1.62%
2006	9,108,550	0.40%
2007	9,435,885	3.47%
2008	9,722,016	2.94%
2009	9,896,940	1.77%
2010	9,745,869	-1.55%
2011	10,152,538	4.01%

Fiscal years July 1 through June 30 Source: PVTA

Because transit customers typically ride the bus or van every day (or at least most days), and usually make at least two trips per day (going to and from their destinations), the actual number of transit customers per year is actually much less than annual "ridership." Using survey information on rider frequency, PVPC estimates that there are 15,000 to 20,000 regular bus riders in the region; however, this varies widely, depending on whether or not school is in session.

d) PVTA Bus Fleet

PVTA's bus fleet consists of 161 vehicles from two manufacturers: 111 Gillig low-floor clean diesel vehicles manufactured after 2006, and 50 General Motors Rapid Transit Series (RTS) diesel vehicles manufactured in the mid to late 1990s. Both Gillig and RTS buses provide comparable passenger amenities: all are air conditioned and equipped with wheelchair lifts or ramps. PVTA's buses are based at three garages, as shown below.

Table 3-10 - PVTA Bus Fleet

Bus Model	Springfield Garage (Southern Area)	Northampton Garage (Northern Area)	UMass Garage (Northern Area)	**Totals**
Gillig	*83	10	18	**111**
RTS	23	8	19	**50**
Totals	**106**	**18**	**37**	**161**

**includes 1 Gillig diesel-electric hybrid*

The 50 RTS buses have exceeded their rated 12-year useful life or will be outdated by the end of 2011. A 2009 American Reinvestment and Recovery Act grant allowed PVTA to replace 31 vehicles. In addition to the RTSs' poor fuel economy (about 2.5 mpg versus 5 mpg for the newer Gillig models), these older vehicles have higher maintenance costs, especially for the repair of frames, floors, bulkheads, and wheelchair lifts.

PVTA will also take delivery of 28 new GM Flyer buses in the fall of 2011. Ten of these vehicles will be have diesel-electric hybrid propulsions. This procurement will allow retirement of most outdated RTS vehicles.

e) PVTA Paratransit

Paratransit is demand response door-to-door van service that is scheduled by the rider, usually by telephone or through a community service agency or council on aging. Vans are equipped with wheelchair lifts and other special equipment to insure the safety of disabled riders. As the average age of the region's residents continues to rise, the need and demand for paratransit mobility will also go up. Paratransit fares typically cover 10% of the service cost.

This section describes the three types of paratransit van service that PVTA provides to residents of its 24 member communities. Total ridership for all three types of services is presented below.

Table 3-11 - PVTA Annual Paratransit Ridership

Fiscal Year	Annual Rides	% Change
2001	462,683	11.20%
2002	527,698	14.05%
2003	548,363	3.92%
2004	407,430	-25.70%
2005	373,622	-9.05%
2006	373,448	-0.05%
2007	299,529	-24.68%
2008	308,787	3.00%
2009	308,323	-0.15%
2010	317,733	2.96%
2011	318,869	0.36%

Fiscal years July 1 through June 30 Source: PVTA

- **Americans with Disabilities Act (ADA) Service --** Federal ADA law requires that public transit providers offer paratransit service that is comparable to their scheduled bus service to disabled customers who are unable to use regular buses. Customers must be eligible to use the service, and an application is required. Trips must be scheduled at least one day in advance. ADA paratransit is available only within three-quarters of a mile of a scheduled regular bus route, and the trip must start and be completed during the same hours that the nearest regular bus route operates. The fare is $2.50, $3.00, or $3.50 per ride, depending on pickup and drop off locations.

- **Senior Dial-A-Ride Service --** PVTA also provides van service to people age 60 and over in its 24 member communities. This service is operated on a space-available basis Monday through Friday from 8:00 AM to 4:30 PM. Fares are $2.50, $3.00 and $3.50 per ride depending on the pickup and drop off locations. Tickets are available from local senior centers and the PVTA Information Center in $0.50 or $2.50 denominations and discounts are often available.

2. Franklin Regional Transit Authority (FRTA) Paratransit Service

There are 14 additional towns in the PVPC region that are not members of PVTA and instead contract with the Franklin Region Transit Authority (FRTA), based in Greenfield, for paratransit service. These towns are: Blandford, Chester, Chesterfield, Cummington, Goshen, Huntington, Middlefield, Montgomery, Plainfield, Russell, Southampton, Southwick, Westhampton, and Worthington.

Because these communities are located in the furthest western and southern portions of the PVPC region, they are not within the ¾ mile buffer of any fixed route bus service in the region and therefore no ADA paratransit service is available. Senior dial-a-ride service is offered for persons age 60 and older through municipal senior centers. In some cases, pre-certification of eligibility is required. Days, hours of operations, fares and service frequency vary by town. The FRTA paratransit fare within the same town is $1 per ride; to an adjacent town is $1.50; and to any town beyond that is $2. FY2009 ridership for all these towns was 10,025 trips.

3. Commercial Scheduled Bus Service

The Pioneer Valley is served by three major commercial bus passenger carriers that provide scheduled service to destinations within the region, as well as cities and towns throughout New England and North America. These carriers serve three bus terminals and other stops in the region.

f) Bus Terminals and Service Locations

- **Springfield Bus Terminal –**Located at 1776 Liberty Street in downtown Springfield, this terminal is the regional hub for commercial bus service. The terminal is owned and operated by Peter Pan Bus Lines. It has 16 boarding gates, eight of which are leased to PVTA, and a limited number to other commercial carriers. There are waiting areas, a ticket counter and concessions vendors for passengers. There are approximately 150 commercial bus departures serving an estimated 2,000 commercial passengers on weekdays, and approximately 7,500 PVTA customers traveling on some 550 public bus departures each weekday. Adjacent to the terminal is the Peter Pan garage and maintenance facility, which has 8 maintenance bays and indoor parking for 60 buses.

- **Northampton Bus Terminal –** This three-story building at One Roundhouse Plaza behind City Hall accommodates two intercity buses and includes an enclosed waiting area (PVTA service is available one block west at the Academy of Music). Approximately 12-15 trips per day depart this terminal. The building also contains commercial offices and a restaurant. The terminal was built in 1984 as a project of Peter Pan Bus Lines and the former Western Mass Bus Lines. Today, it is operated by Peter Pan and is also served by Greyhound.

- **Holyoke Intermodal Center –** This new transit hub is located in a renovated city firehouse at 206 Maple Street in downtown Holyoke. The center opened in September 2010 and has six bus bays for PVTA, Peter Pan and Megabus vehicles. It has an enclosed waiting area, ticket and information desk and a coffee shop. It is a joint project of PVTA, Peter Pan and the City of Holyoke. Community and education facilities are located on the upper floors.

- **Other Commercial Bus Service Locations –** Frequent service (typically every two hours) is available from the University of Massachusetts and Amherst Center via the Northampton Bus Terminal and Holyoke Mall. Daily service is available to South Hadley and Hampshire College.

g) Commercial Carriers

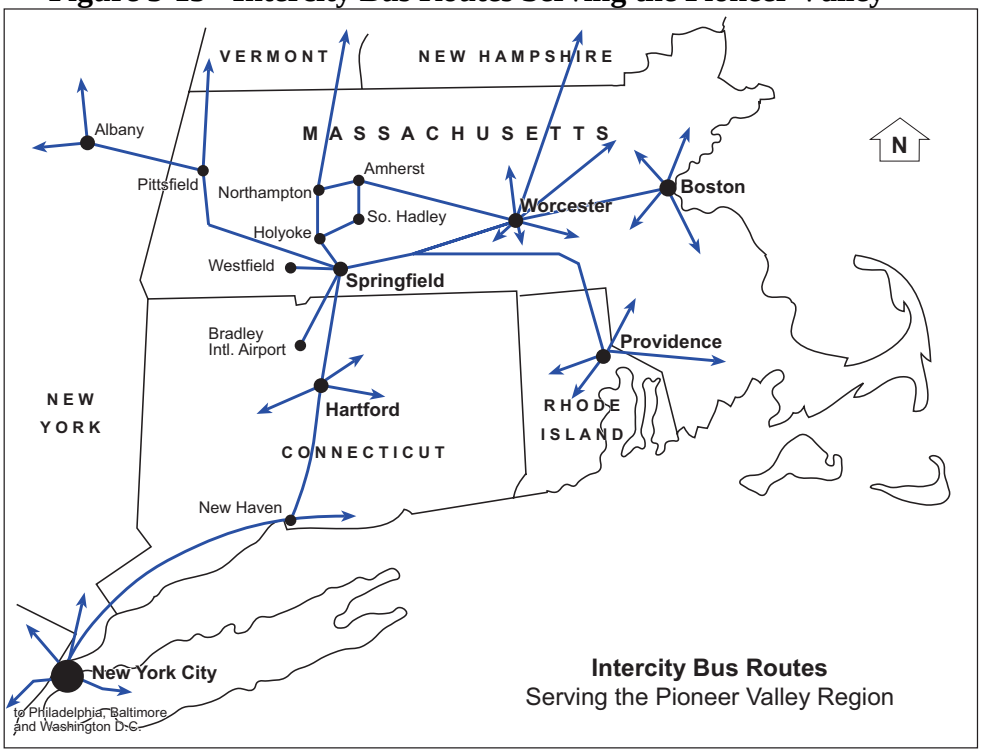
The commercial bus passenger market in New England is highly competitive. Commercial carriers continue to consolidate; in the Pioneer Valley, there are now two intercity carriers, down from four in 2007. These are described below.

- **Peter Pan Bus Lines** has served the region for more than 75 years. The company carries the most commercial passengers in the region, providing frequent service to destinations within and outside the Pioneer Valley. The carrier has two primary routes with hourly service: Amherst to Boston (via Springfield), and Springfield to New York City. An average of 23 buses per day run in each direction on these two routes. Peter Pan also operates east-west service between Boston and Albany, New York. Travelers can obtain convenient connections from Amherst, Northampton, Springfield, Worcester, and Boston. Peter Pan also operates 16 nonstop trips per day between Springfield and Hartford, Connecticut via I-91, with a travel time of 35 minutes. Six of these 16 daily buses continue on to New Haven, Connecticut. Service is also provided to Foxwoods Casino in Ledyard, Connecticut and Washington DC.

- **Greyhound Lines, Inc.,** based in Dallas, Texas, serves approximately 3,700 destinations in North America. Greyhound is owned by the Scottish company FirstGroup. Greyhound acquired Vermont Transit Lines of Burlington, Vermont in 2008 and now operates those routes as part of its network. Greyhound has a reciprocal ticketing agreement with Peter Pan Bus Lines to offer riders hourly service between major destinations in the region. Through its own network and a shared ticketing agreement with Peter Pan, Greyhound offers service from the following locations in the region: Amherst Center, University of Massachusetts Amherst, Chicopee Park Inn, Hampshire College, Holyoke Mall, Northampton, Palmer (limited), South Hadley, and Springfield.

- **Megabus.** This UK-owned carrier began service from the Hampshire Mall to New York City via Hartford in 2010. The number of trips per day in each direction currently varies from two to four. Service is operated by DATCO of Connecticut.

Figure 3-13 - Intercity Bus Routes Serving the Pioneer Valley



4. Shuttles, Charters and Taxis

There are a variety of transportation services in the region that are geared to help people make trips for tourism, recreation or other special purposes. These are summarized below.

a) Shuttles

Van shuttles serve an important segment of the region's transportation market by serving destinations for which demand maybe relatively frequent; or involve passengers with special needs or schedule requirements. Commercial shuttle operators include Valley Transporter, which focuses on service to and from airports and rail stations in New England. Service to Bradley International Airport is provided hourly from most locations the Pioneer Valley. Service to Boston, Providence, and New York is also provided, though not on a scheduled basis. Non-profit organizations also

operate shuttles, typically for their clients. Examples include municipal councils on aging, day care providers and social service agencies.

b) Charters and Tours

Charter and tour bus services in the region provide special trips for tourism and other purposes within and outside the region. Commercial companies offer package trips and private party excursions to many attractions throughout the Pioneer Valley, including Yankee Candle Company in South Deerfield, Basketball Hall of Fame in Springfield, gambling casinos in Connecticut, Six Flags Amusement Park in Agawam, senior tours to Atlantic City, and other recreational trips. Major charter and tour providers in the region include Peter Pan Bus Lines, King Ward Coach Lines and Laidlaw, Inc.

c) Taxis

There are more than 20 taxi companies operating in the region. Approximately half of these companies are based in Springfield, with another 9 operating in the Amherst/Northampton area, and one company each in Easthampton, Holyoke and Chicopee. Taxi companies provide a vital link in the transportation system by offering mobility during times and at locations where other transportation is not available.

5. Ridesharing

The Pioneer Valley has a number of facilities, organizations and programs to help people share rides, either on public transportation or by private autos. These include:

- Ride sharing
- Park and ride lots

Ride sharing is increasingly popular as more facilities and programs for it become available and the price of auto fuel fluctuates. There are several opportunities for ride sharing in the Pioneer Valley. These are summarized below.

- **MassRides** is a private non-profit organization working with MassDOT. The MassRides Employer Partner Program helps businesses and their employees cut commuting costs, shorten travel times, and improve the quality of commutes. MassRides holds commuter events at a participating business's worksites to provide information to employees. Also, MassRides can help set up carpooling, vanpooling, preferential parking, transit, teleworking, flexible work hour programs, or other cost-saving programs, such as pre-tax payroll deductions of transit costs. MassRides Partner Program participants currently include Westfield State College, Solutia, Mass Mutual, Holyoke Community College and PVPC.

- **NuRides** has recently partnered with MassRides to offer rewards to people who take greener trips. It provides ride matching services for people that would like to carpool to similar destinations.

- **UMASS Rideshare** helps University of Massachusetts employees and students form carpools, use the bus, or find other ways to get to campus. The goal of the program is to reduce the number of private cars on campus; UMass has approximately 11,000 on campus parking spaces (not including metered spaces), but 12,000 to 15,000 vehicles that come to campus each day. The service is free to employees and students and includes carpool

matching, reduced parking fees, preferred parking spaces, free one-day passes, guaranteed rides home, and information on alternative commuter options.

- **The Route 9 Corridor Transportation Management Association (TMA)** is an organization composed of the University of Massachusetts, Cooley-Dickenson Hospital, the City of Northampton and private businesses in the area that offers transportation and carpooling incentives to member employees.

- **Carpooling matching services** in the area help people find fellow travelers who are traveling to similar destinations so they may share rides—either for regular daily commutes within the region, or for one-time long distance trips. One of the region's leading such services is RideBuzz (www.ridebuzz.org); many other people use online bulletin boards, such as CraigsList, to find carpooling partners.

- **Commercial car sharing** provides a much needed alternative for private vehicle ownership to people desiring to live car free either by choice or necessity. While rural public transit provides its users with mobility through the Pioneer Valley, it faces limitations in frequency and access to outlying areas. The first car-sharing program to reach our region was offered by Zipcar at the end of the summer of 2006 through Smith College in Northampton followed by Amherst College in Amherst. Hampshire College joined in 2011 by hosting two vehicles on its campus. Due to the popularity of this program and the increased participation of its users, the regional fleet has been growing each year. The local area fleet started with four vehicles in 2006 and reached eleven vehicles in 2011. Six vehicles are located in the town of Amherst and five in the City of Northampton. Depending on vehicle availability, members can rent by the hour or by the day using a self-service. The Zipcar Company maintains a policy which gives its members access to any car available in their system at any location in the United States, Canada, or the UK. Members can access the reservation system through a variety of ways including phone, internet, and text messaging. Nationwide, car-sharing companies are considering partnerships with local organizations and community centers to help meet the needs of the low-income population.

a) Park and Ride

In the Pioneer Valley, there are several officially designated and "informal" park and ride lots. Those using these lots may be leaving their cars to board a PVTA bus for a local trip, catch a Peter Pan bus for an intercity trip, or join a carpool for a local or long distance trip. These lots are described below.

- **Northampton Sheldon Field Lot**—Bridge Street at Day Street. Connection with PVTA B43, M40 and 39. Designated by City of Northampton.

- **Northampton Norwottuck Rail Trail Lot**—Damon Road near Bridge Street (Route 9). Mainly used for carpooling; no convenient PVTA stop. Informal.

- **Springfield Five Town Plaza Lot**—Cooley and Allen Streets. Connection with PVTA G1 and Sumner Express. Informal.

- **Springfield Trolley Park Lot**—Main Street at Boylston Street. Connection with PVTA G1, G2, B4, G19, P20, P21). This lot is also near the intersection of I-91 and I-291, making it attractive for regional commuters who may not wish to drive in downtown Springfield. Designated by City of Springfield.

- **Ludlow MassPike Exit 7**—Center Street (Route 21) at Cherry Street near MassPike (I-90) Exit 7. Two lots near the rear and center areas of the McDonalds parking lot. Used

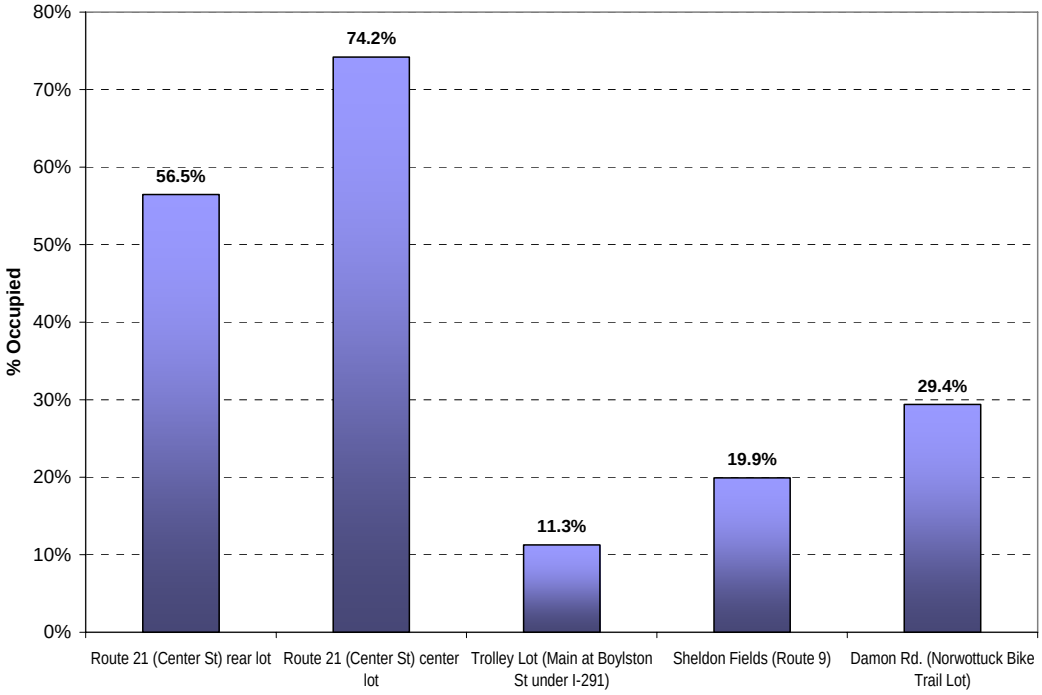
principally for carpooling and those parking to ride Peter Pan buses to Boston. Rear lot is formally designated; center lot is informal.

MassDOT is currently designing future park and ride lots at the Veterans Administration campus on Route 9 in the Leeds section of Northampton, as well as at the I-91 Exit 24 median area in Whately near South Deerfield Center.

There are also numerous "informal" park and ride lots, often at shopping malls and commercial businesses near major highway access points.

A summary of average weekday park and ride usage at known lots is presented below.

Figure 3-14 - Park and Ride Lot Average Daily Occupancy 2007-2009



6. Passenger Rail

The Springfield station is currently served by 11 trains daily providing extensive service in the northeastern U.S. and connections nationwide. Passenger Rail service is provided on both East-West routes and North-South Routes through the region. The Pioneer Valley has an additional station located in Amherst that is served by two trains per day.

a) North - South Services

Most trains in Springfield are part of Amtrak's Northeast Corridor Business unit and have recently been branded as Acela Regional Service. This service includes six daily departures between 5:30 AM and 3:00 PM, and six arrivals between 10:00 AM and 10:30 PM. Amtrak provides frequent daily service between Springfield and Washington D.C., with major stops at Hartford, New York City and Philadelphia. None of the trains are convenient for commuters to jobs outside the region and are basically limited to long distance travelers. As traffic congestion on I-90 to Boston and I-

91 to Hartford increases, it will become necessary to explore the use of commuter rail as an alternative mode. PVPC has been working with officials from the Connecticut Department of Transportation (ConnDOT) on expanded passenger rail service between New Haven Hartford and Springfield. ConnDOT submitted an application for federal rail stimulus funding to fund this additional service.

b) Vermonter

The Vermonter travels once a day in each direction between Washington D.C. and St. Albans Vermont. The State of Vermont, concerned about the possibility of losing its Amtrak service, provided Amtrak with state funds to maintain the service and make improvements. Between Washington D.C. and New Haven Connecticut, the Vermonter runs on Amtrak's North East Corridor. North of New Haven, the train runs on Amtrak's Springfield Line to Springfield and then heads east on CSX's Boston Line to Palmer where the train changes directions before heading north on the New England Central Railroad all the way to St. Albans Vermont. The train stops in Springfield and Amherst in Massachusetts.

In 2007, Congressman Olver secured funding to study the feasibility of returning the Vermonter to the Connecticut River line, the same track that was used until 1989 when the train was moved to its current alignment. Moving the train back to the Connecticut River line would reduce the travel time between Springfield and St. Albans by approximately 40 minutes, it would eliminate the need to use the CSX line between Springfield and Palmer, and it would better serve the region's urbanized area with stops in Greenfield, Northampton and Holyoke, replacing the single stop in Amherst. In 2009, MassDOT applied for high speed intercity rail stimulus funds to return the Vermonter to the Connecticut River line, and in January of 2010 the project was funded. Construction is expected to require two years, and service on the new line is anticipated in late 2012.

c) East - West Service

In addition to the Northeast Corridor service, there is also a long distance train that serves the region. The *Lake Shore Limited* serves Springfield by providing daily service between Chicago and New York. Unlike all other Northeast Corridor trains out of Springfield, the Lake Shore Limited requires reservations.

The Pioneer Valley's East-West service is limited by a situation common to many Amtrak routes. Amtrak leases the tracks it must use from a local freight railroad. Amtrak owns the trains but does not own the track and physical infrastructure that they travel on. The track and ultimate control over trains is held by the host freight railroad. Here in the Pioneer Valley CSX is the host freight railroad. Since CSX runs its own freight trains over tracks that are also used by Amtrak, opportunities for expanding service on the East-West line may be limited.

Congressman Olver has secured funds to study the feasibility of increased passenger rail service between Springfield and Boston and MassDOT has circulated a Request for Proposals from engineering firms capable of conducting this work.

D. INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems (ITS) utilizes technology in traffic control, communications, computer hardware and software to improve the performance of an existing transportation system. Through the dissemination of real-time travel information many benefits can be realized including increased safety, more efficient travel, and reduced congestion levels.

The Intelligent Transportation Systems (ITS) Strategic Deployment Plan for the Metropolitan Springfield and Pioneer Valley Region was completed in 1998. This project developed a plan of recommended ITS strategies and applications for the Pioneer Valley as well as a regional architecture to identify the various transportation management systems and the linkages between these systems.

The first ITS project in the PVPC region was the Advanced Traveler Information System for the Route 9/Calvin Coolidge Bridge reconstruction project. This project consisted of the development of a Regional Traffic Operations Center (RTOC) at MassDOT District 2, the upgrade of three traffic signals to provide emergency vehicle pre-emption capability, and the installation of variable messages signs at key locations along major roadways.

In March of 2005, the Commonwealth of Massachusetts developed a Regional Intelligent Transportation Systems Architecture for Western Massachusetts. Key transportation agencies and other stakeholders provided input during this process to develop an architecture that represents a vision of an integrated transportation system for the Western Massachusetts region and the interagency agreements required to support it. An update to the regional architecture was completed in 2010. The webpage for the Western Massachusetts Regional ITS Architecture is located at: http://www.eot.state.ma.us/regionalitsarchitecture/westernmass/web/_regionhome.htm.

1. Regional Traveler Information Center (RTIC)

The University of Massachusetts - Amherst and the Massachusetts Department of Transportation are also cooperating in a federally funded project that developed a Regional Traveler Information Center (RTIC) for the Pioneer Valley. The RTIC is located in the UMass Transit Operations Facility and is responsible for the collection and dissemination of traffic, public transportation and travel advisory information. Currently, 18 cameras are positioned at the following locations:

- Route 9 in Downtown Northampton, facing East
- Route 9 at the Coolidge Bridge, facing East
- I-91 Exit 19 off ramp at Route 9, facing South
- Route 9, near Valley Veterinary, facing West
- Route 9 at Middle Street, facing West
- Route 9 at West Street, Hadley, facing West
- Route 9 at Bay Road, Hadley, facing East
- Route 9 at Bay Road, Hadley, facing West
- Bay Road at Route 9, Hadley, facing South
- Damon Road at Bike Path, facing North
- Damon Road at Bike Path, facing South
- UMass - Commonwealth Avenue at Mass Avenue, facing North
- UMass Commonwealth Ave/Holdsworth Way facing South
- UMass Governors Drive at North Pleasant Street facing West
- UMass North Pleasant Street at Governors Drive facing North
- UMass North Pleasant Street at Eastman Lane facing East
- Route 116 Amherst, near Annie's, facing North
- Route 116 Amherst, near Annie's, facing South

Real-time travel time information is also collected along Route 9 between the Mountain Farms Mall and Damon Road. Travel speed data for Route 9 is provided in the vicinity of the intersection of Route 9 with West Street in Hadley. RTIC also provides information on commuting alternatives, upcoming events, and current construction projects in the region. The RTIC website is: www.masstraveler.com.

(i) Bus Tracker

The UMass Transit bus tracker is part of a UMass Computer Science experiment (made possible by collaborative efforts between the Department of Computer Science, Office of Information Technology, and Transit Services). The system provides real time information on the current status of 10 transit routes that serve the Five College area. The bus tracker also supports a feature where transit riders can receive the bus arrival times via a text or email. The bus tracker is located at: http://dieselnet.cs.umass.edu/

2. I-91 ITS Project

MassDOT initiated a project to design and deploy a communications infrastructure and Intelligent Transportation System (ITS) along the entire length of Interstate 91 and portions of Interstate 291. This project was completed in 2011 and includes:

- 33 closed circuit television cameras (CCTV) and 17 Variable Message Signs
- A fiber-optic communications network connecting the field devices to the District Traffic Operations Center (DTOC) in MassDOT District 2 Headquarters, and to the Statewide Traffic Operations Center (TOC) in Boston,
- I-91 camera monitoring equipment in the State Police facilities in Springfield, Northampton and Shelburne,
- The development of additional capacity to address the needs of regional stakeholders via the installation of 4 empty conduits within the communications network, and
- Communications shared resource infrastructure to support future private telecommunications initiatives.

3. Pioneer Valley Transit Authority ITS Project

In 2010, PVTA began deploying an Intelligent Transportation System (ITS) that includes every bus and paratransit van in its fleet. This is the first ITS installation in Massachusetts to track the real time movements of every vehicle operating for a regional transit authority. The PVTA system is being implemented in phases; routes in Northampton will be the first to go online, followed by Springfield area routes, and then UMass and Amherst area routes.

a) On Board Vehicle Equipment

Every PVTA vehicle will be equipped with a mobile data terminal, global positioning system (GPS) locator, data radio and emergency alarm. Paratransit vans will have audible and visual navigation assistance. PVTA buses will have:

- Automatic audio and visual stop announcements
- Automatic passenger counters
- Video and audio monitoring

Each vehicle will transmit its GPS location, passenger data and vehicle performance information via radio to the dispatch center. A central computer will process the data from all vehicles to create a real time view of fleet operations and schedule adherence. In emergencies, real-time information will be available for public safety responders. The audio and visual stop announcements will make the PVTA system easier and safer for sight- and hearing-impaired passengers, as well as the general public. This phase of the project is scheduled to be complete in 2012.

b) Transit Traveler Information Systems and Transit Facility Systems

Following installation of ITS equipment on all vehicles, PVTA will begin rolling out Transit Traveler Information (TTI) systems using the real time data. These may include:

- Audio and visual "Next Bus" announcements at terminals and major stops
- Fare purchasing kiosks
- Travel planning kiosks
- Real-time vehicle information on the PVTA website
- Real-time vehicle information to the Regional Traveler Information Center (RTIC) and MassDOT
- Text messaging of service updates to mobile phone or PDA users
- Cell phone notification of paratransit vehicle arrivals

By increasing the availability of real-time customer information and generating new information on ridership and usage, PVTA will dramatically enhance the overall quality of public transit in the region and make the system more accessible to people who do not ride now.

4. 511

On March 8, 1999, The U.S. Department of Transportation (USDOT) petitioned the Federal Communications Commission (FCC) to designate a nationwide three-digit telephone number for traveler information. On July 21, 2000 the Federal Communications Commission designated "511" as the single traffic information telephone number to be made available to states and local jurisdictions across the country. Access to 511 services for Massachusetts residents are available free of charge at: http://www.mass511.com. Mass511.com allows drivers to set up custom travel alerts and receive real-time traffic information for all major routes.

5. Western MA Connect

WesternMA Connect, Inc. (formerly Berkshire Connect, Inc. and Pioneer Valley Connect) is a regional non-profit organization with the mission to provide affordable, reliable and redundant high capacity broadband services throughout Berkshire, Franklin, Hampden and Hampshire counties. Previously, both Berkshire Connect and Pioneer Valley Connect worked independently to encourage the deployment of infrastructure and access to broadband services for businesses, governments, and residents in unserved areas. A formal collaborative effort of the two organizations began in 2005 to address broadband access inequity in western Massachusetts. In 2009, Pioneer Valley Connect dissolved and secured representation on the Berkshire Connect Board of Directors. To better reflect the magnitude of the region it serves and the scope of its activities, Berkshire Connect, Inc. changed its name to WesternMA Connect, Inc. This also resulted in the creation of the Massachusetts Broadband Institute as a regional solution to achieve more efficient and effective results in providing high-speed internet access to all.

E. NON-MOTORIZED TRANSPORTATION

1. Bicycle and Pedestrian Facilities

Bicycling and walking are inextricably linked to quality of life in our communities and the Pioneer Valley region affords some of the best environments for walking and bicycling in Commonwealth. An expanding network of off-road trails, vibrant downtowns laced with sidewalks and scenic shared-use roadways create an unmatched potential. As a destination or as a place to call home, the Pioneer Valley offers a wide range of transportation choices.

Interest and enthusiasm for walking and bicycling is reshaping many of our communities and not just through traditional infrastructure improvements. The walking school bus is an everyday reality for Jackson Street Elementary School in Northampton where parents and the administrator have implemented a "Safe Routes to School" program. Students and faculty at Springfield's Alice Beal Elementary have installed bike racks and improved sidewalk connections to their school. Springfield's Renaissance School has opened a bike coop to repair and re-circulate bicycles to the community, and students there have actively participated in Pioneer Valley Bike Week.

The support for bicycling and walking is not without its challenges. The most significant challenge for advancing regional goals for these modes is funding. While new state guidelines are "friendlier" to bicycle and pedestrian needs and federal programs are recognizing the importance of "inclusive" investments in transportation, infrastructure needs are growing while funding options are dwindling. The most dramatic impact has been at the municipal level. Many of our communities have serious transportation funding gaps. Sidewalks, bridges and locally maintained roads have fallen into disrepair and gaps in the maintenance of these infrastructure needs are widening. Because bicycling and walking is inherently dependant on short local trips this degradation is a real threat to creating "walkable" or "bikeable" communities.

Another trend has been the increase in the use of single occupancy vehicles. While the region's population remained fairly stable between 1990 and 2000, vehicle ownership increased 26% to an average of 0.81 vehicles per person. While many communities such as Springfield and Amherst have very "walkable" downtown areas, the traffic volumes in and around suburban communities can create significant obstacles and challenges for those bicycling or walking.

To get more people walking and biking PVPC has developed a strategic plan of policy-related actions and physical projects on which municipal and regional officials and citizens can collaborate to improve conditions for pedestrians and bicyclists in the Pioneer Valley. The Plan includes information and recommendations on incorporating bicycle and pedestrian features into road reconstruction projects, using zoning and development tools to help create environments that support bicycling and walking, increasing bicycle and pedestrian safety, and promoting bicycling and pedestrian activities as alternative transportation choices. The plan was developed by the Bike-Pedestrian Sub-Committee of the Pioneer Valley Planning Commission's (PVPC) Joint Transportation Committee as the bicycle and pedestrian component to the Regional Transportation Plan.

In 2006 MassDOT completed an overhaul of the state's highway design manual and with the new "Project Development and Design Guide" the Commonwealth instituted a comprehensive shift in policy. The "Design Guide' has become a national model for developing better road and bridge projects through a "Complete Streets" approach that balances the need for access and mobility through context sensitive design solutions. The manual "ensures that the safety and mobility of all users of the transportation system (pedestrians, bicyclists and drivers) are considered equally through all phases of a project so that even the most vulnerable (e.g. children and the elderly) can feel and be safe within the public right of way."

A major concern for pedestrians and bicyclists are the many bridges in the region. While most new or reconstructed bridge projects have followed state and federal guidelines for improving pedestrian and bicycle access, many bridges still lack sidewalks, and adequate shoulder width. The design and maintenance of these bridges directly influences the ability of people to walk or bicycle.

2. Bicycle Compatibility Index Analysis for Roadways

PVPC frequently uses the FHWA Bicycle Compatibility Index (BCI) to evaluate road conditions for bicyclists. The BCI uses data collected on the roadway including travel lane width, shoulder width, vehicle speed, traffic volume and parking along each roadway segment. The FHWA analysis tool assigns an alphanumeric score to each roadway segment ("A" through "F"). "A" roads represent

"perfect" roads for bicycling and "F" is the least favorable. In the Pioneer Valley Region data has been collected for all the federal aid roadways. The BCI data is a useful tool for bicycle coordinators, transportation planners, traffic engineers, and others to evaluate existing facilities in order to determine what improvements may be required as well as determine the geometric and operational requirements for new facilities to achieve the desired level of bicycle service.

The BCI model has been used for the following applications in the Region:

a) Operational Evaluation

Existing roadways have been evaluated using the BCI model to determine the bicycle Level of Service (LOS) present on all segments. This operational evaluation was useful in several ways. First, the bicycle compatibility map was produced for the bicycling public to show them the LOS they can expect on each roadway segment. Second, roadway segments or "links" being considered could be evaluated to determine which segments are the most compatible for bicyclists. Finally, alternative treatments (e.g., addition of a bicycle lane vs. removal of parking) for improving the bicycle compatibility of a roadway were evaluated using the BCI model.

b) Design

Designers have used BCI data to assess new roadways or roadways which are being re-designed to ascertain if they are bicycle compatible. Planned geometric parameters and predicted or known operational parameters can be used as inputs to the model to produce the BCI value and determine the bicycle LOS that can be expected on the roadway. If the roadway does not meet the desired LOS, the model can be used to evaluate changes in the design necessary to improve the bicycle LOS.

c) Planning

The model has provided a mechanism to quantitatively define and assess long-range bicycle transportation plans and to develop the region's new bicycle map. Data from long-range planning forecasts can also be used to assess the bicycle compatibility of roadways in the future using projected volumes and planned roadway improvements

3. On-Road Infrastructure

There are 4,364 miles of functionally classified roadway in the Pioneer Valley. Massachusetts law requires that bicyclists and pedestrians be accommodated on all roadways except limited access or express state highways. Currently there are 27 miles of designated on-road bicycle facilities. These include bike lanes and designated bike routes in Amherst, Brimfield, Holyoke, Monson, and Northampton. Many more of these bicycle design treatments are in the planning stages.

In 2007 as part of a Transportation Demand Management proposal, the Pioneer Valley Planning Commission was awarded federal and state transportation funding for the purchase of "Share the Road" signs as part of a regional "Share the Road" program. The signs were distributed and in many cases installed along roadways in many of the region's 43 communities.

"Today, I want to announce a sea change. People across America who value bicycling should have a voice when it comes to transportation planning. This is the end of favoring motorized transportation at the expense of non-motorized." Secretary of Transportation Ray Lahood 2010.

a) Bicycle Parking Improvements

The PVPC has worked with local communities to upgrade and expand existing opportunities for bicycle parking. Through a series of Transportation Demand Management funding commitments, PVPC has worked with local communities to install parking for more than 700 bicycles. Parking racks have included "U" style racks, ribbon racks, "rib" racks and bicycle lockers.

b) Bicycle Accommodations on Transit

The Pioneer Valley Transit Authority's bikes on bus program "Rack and Roll" has dramatically improved access for bicyclists to transit and given thousands of people another choice in their mode of travel. In 2010 PVTA expanded the popular program from the northern tier to its entire fixed route system. The Region's transit operator also increased marketing and promotion for the service and developed an instructional video to acclimate new users.

4. Off Road Infrastructure (Bikepaths and Multi-use Trails)

Off-road facilities include multi-use trails and traditional bikepaths or rail trails. The Norwottuck Rail Trail, the region's largest bikeway project, opened in 1993. The Norwottuck is 10 miles long connecting the communities of Northampton, Hadley, Amherst, and Belchertown. The route facilitates travel between the communities, educational facilities, downtown commercial areas, and major employment centers. Weekend counts on the bikepath range from 600 to 1200 users per day during the peak season. A summary of on and off road bicycle facilities is provided in Table 3-12.

The popularity of multiple use trails in the Pioneer Valley has brought new challenges and opportunities to those that use and manage these facilities. In-line skates push scooters, and baby joggers have been added to the mix with bicyclists and pedestrians on trails. While recreation use dominates trail activity many people also use the facilities for non-recreational trips. A trail survey in 2002 showed 25 percent of weekday trail use was for commuting to work, school or shopping. Many of these trips replaced travel that would otherwise have been made with a motor vehicle.

Off-road facilities including bike paths and multi-use trails have been popular in the region for a number of reasons. The facilities allow new users to be introduced to the benefits of walking and bicycling while isolating them from potential conflicts with motorized traffic. The facilities provide economic benefits through increased tourism; and increase the percentage of bicycling and walking trips. The census block groups in Northampton and Amherst where four off-road facilities exist averaged 23.7 percent of commuter trips by bike or on foot, compared to only 5.4 percent for the region as a whole.

Table 3-12 - Existing On and Off-Road Bikepaths in the PVPC Region

Pioneer Valley Bicycle Facility	Communities	on/off road	Length (in miles)	Date Opened
CT. River Riverwalk and Bikeway	Agawam	off	1.50	9/17/04
Amherst Bike Route	Amherst	on	1.00	
Amherst Bikeway (Route 116)	Amherst	off	3.50	
Five College Bikeway	Amherst	on	6.00	
South Pleasant St. Bike Lanes	Amherst	on	0.25	7/15/01
UMass Connector Bikeway	Amherst	off	1.90	5/15/03
Norwottuck Belchertown Extension	Amherst/Belchertown	off	1.20	5/12/00
Chicopee Center Canal Walk	Chicopee	off	0.20	5/21/10
Redstone Rail Trail	East Longmeadow	off	1.57	9/9/10
Manhan Rail Trail	Easthampton	off	4.20	6/19/04
Dwight Street Bike Lanes	Holyoke	on	0.50	6/12/05
Hampden Street Bike Lanes	Holyoke	on	0.60	5/13/04
Route 5 Bike Lanes	Holyoke	on	1.20	7/8/06
Holyoke Canalwalk	Holyoke	off	0.30	6/25/10
Route 5 Bike Route	Holyoke/Northampton	on	8.00	6/25/86
Springfield (Ludlow) Reservoir Trail	Ludlow	off	3.10	
MBW Trail	Monson, Brimfield, Wales	on	17.00	6/10/98
Elm Street Bike Lanes	Northampton	on	0.80	6/15/00
Manhan Rail Trail Earl Street thru downtown	Northampton	off	2.10	7/1/05
Northampton Bike Path (Ryan Bikeway)	Northampton	off	2.50	6/6/84
Northampton Manhan Ice Pond Spur	Northampton	off	0.50	
Norwottuck Damon Road to Woodmont	Northampton	off	0.80	5/1/08
Norwottuck Look Park Extension to Grove St	Northampton	off	2.00	7/1/05
South Street Bike Lanes	Northampton	on	1.10	9/10/03
William P Nagle Walkway	Northampton	off	1.00	9/26/89
Norwottuck Rail Trail	Northampton/Hadley/Amherst	off	8.50	5/15/93
Southwick Rails to Trails Phase I	Southwick	off	3.14	5/3/10
CT. River Riverwalk and Bikeway	Springfield	off	3.70	7/18/03
Westfield Riverwalk	Westfield	off	2.00	4/16/98
Total Mileage			**80.16**	

5. Pedestrian Circulation

Pedestrian access and circulation are typically better in town or city centers due to the physical design of such places. Shops, offices, restaurants and other amenities are generally clustered together and connected by a pedestrian network which is often more accessible and efficient than the vehicle network. The central business districts of Amherst, Northampton and Springfield offer good examples of downtowns sensitive to pedestrian circulation and access. Sidewalks and walkways are extensive; crosswalks are signalized and access points for persons with disabilities are incorporated.

Sidewalks are the most common infrastructure feature devoted to pedestrian circulation. Whether or not sidewalks are provided in a community can influence the area's overall character and function. In addition to the sidewalks themselves, crosswalks and points of access for persons with disabilities can

influence the degree to which these pedestrian networks facilitate circulation. The provision of sidewalks in the region varies with respect to location, quality and function. Many communities in the Pioneer Valley have realized the benefit of encouraging walking through infrastructure improvements. The Town of Ludlow constructed sidewalks within a mile of every elementary school. With children walking to school the town revamped its crossing guard program and saved money on busing. With local funding sources in short supply, many communities have had to "get smart" when it comes to pedestrian improvements. To lower costs, East Longmeadow developed a prioritized sidewalk infrastructure improvement plan and began incorporating the cost of sidewalk improvements into larger roadway re-construction projects. In the Forest Park neighborhood of Springfield, public works officials replaced painted crosswalks with new long wearing thermoplastic designs. While more expensive initially, the new crosswalks will last 5 times as long as painted crosswalks.

a) Safe Routes to School Program

The Massachusetts Safe Routes to School program promotes healthy alternatives for children and parents in their travel to and from school. The program aims to reduce congestion, air pollution, and traffic conflicts near participating schools, while increasing the health and mobility of school-aged children.

The following Pioneer Valley schools are partners in the Safe Routes to School program.

- Holyoke - HB Lawrence
- Longmeadow - Center Street School, Blueberry Hill, Wolf Swamp Road School, Williams Middle School, Glenbrook Middle School
- Northampton - Bridge Street Elementary School, Jackson Street Elementary School

The SAFETEA-LU transportation legislation allocated federal funds for statewide Safe Routes to School initiatives. As a result, Massachusetts has dedicated funds to promote walking and bicycling to and from school through program activities and infrastructure improvements.

Schools who wish to participate in the program are asked to complete the form and return it to MassRides. The form, which can also be found on the MassRides website at www.commute.com, allows schools to select a level of participation within the Safe Routes to School Program. Schools have the opportunity to indicate their primary interests, identify stakeholders, and also report on the makeup of the student body. After the Safe Routes to School coordinators receive an application, a decision is then made on whether or not the school is a good fit for the program. Selected schools become partners with the program and can begin planning events and activities with the help of a Safe Routes to School coordinator.

6. Pioneer Valley Commuter Bike Map

In September of 2005, PVPC released an update to the 1983 commuter bike map. The Pioneer Valley Regional Bike Map is designed to be a tool for active use by area cyclists. In addition to popular on-road cycling routes and bike paths in the region, the map shows popular destinations and local landmarks, along with safety and commuting information. These maps were produced as part of the "Share the Road" Transportation Demand Management funding program with the Franklin Regional Council of Governments. Maps were distributed to the public at no charge through bike shops and select locations throughout the Pioneer Valley region and during at Pioneer Valley Bike Commute Week events.

7. Tourism and Commerce

The popularity of bicycling in the Pioneer Valley has led to the creation of a several guidebooks specific to the region including the Rubel Bike Map to Western Massachusetts, Bicycle Touring in the

Pioneer Valley (Nancy Jane), Bicycling the Pioneer Valley (Marion Gorhan), Touring Jacob's Ladder by Bicycle or Car (PVPC) and Jacob's Ladder Trail Western Region Off-road Bicycle and Trail Guide (PVPC). These publications and the popularity of regional cycling clubs such as the Franklin-Hampshire Freewheelers, the Springfield Cyclonauts, MassBike, and Northeast Sport Cyclists are testimony to the unique quality and growing popularity of bicycling in the Pioneer Valley.

8. Massachusetts Bicycle Plan

The Massachusetts Bicycle Plan was updated by MassDOT in 2007. The plan prioritizes on- and off-road bicycling improvements and identifies a statewide bicycling network. The network improves multi-modal transportation generally and bicycle transportation specifically, as well as recreation, tourism, and economic vitality.

F. AVIATION

The Pioneer Valley is well served by air transportation facilities located within or adjacent to the region. Most air travel from the region goes through Bradley International Airport in Windsor Locks, Connecticut situated 15 miles south of the City of Springfield.

Within the Pioneer Valley there are also a number of airports, the largest of which is the Westover Air Force Base facility in Chicopee and Ludlow. Westover, now a reserve base and metropolitan airport, was recently reactivated as a major military facility during operation Desert Shield/Storm. The second largest airport in the region is Westfield-Barnes Airport located and operated by the City of Westfield. It is the third busiest airport in Massachusetts, a general aviation facility home of the Air National Guard 104th Tactical Fighter Group.

The remaining airport in the region, the Northampton Airport, is privately owned and operated with much smaller and less sophisticated facilities. This airport serves both business and recreational uses.

1. Public Airports

a) Bradley International Airport

Bradley Airport located in Windsor Locks, Connecticut, is a state-owned facility that is operated by the Connecticut Department of Transportation and the Bureau of Aviation and Ports. It is New England's second largest airport, serving Connecticut, Massachusetts, New York, Vermont and New Hampshire, and was designated as a medium hub airport by the Civil Aeronautics Board. The airport opened as an Army Air Corps Base in 1941. After World War II it was taken over by the State of Connecticut and was converted to a commercial facility under the name Bradley Field. The name was changed to Bradley International Airport in the 1960s after a 9,500 foot paved runway was opened to accommodate jet aircraft. There are currently three runways and 17 taxiways. The total land area of the airport is 2,358 acres.

The airport, located 15 miles south of the City of Springfield, is the principal commercial airport serving people traveling to and from the Pioneer Valley Region. Survey data indicates that 30 percent of air travelers using Bradley are from the Springfield/Holyoke/Chicopee area and that about four out of five of the region's commercial air travelers use the Airport.

The seven major airlines that currently serve Bradley Airport are Air Canada, American, Continental, Delta, Southwest, United, and US Airways. There are also several regional airlines including Air Georgian, Air Wisconsin, Chautauqua Airlines, Colgan Air, Comair, Commpass Airlines, CommutAir, ExpressJet, Freedom Airlines, Mesa Airlines, Mesaba Airlines, Pinnacle Airlines, Republic Airlines, Southeast Airlines, and Trans States Airlines. Approximately 202

daily flights to 32 destinations make Bradley the second busiest New England Airport Behind Logan International Airport in Boston. The airport served 6,112,979 in 2008 which is 624,069 less than the 6,737,048 travelers in 2004. There are no landing/takeoff limitations or nighttime operational curfews. The airport can handle all types of commercial aircraft including Boeing 747, Concorde, and the Russian-built Antonov, the largest passenger aircraft in the world.

The State of Connecticut employs approximately 100 people at Bradley Airport. Salaries are paid through the Bradley Enterprise Fund, which does not use taxpayer funds. Approximately 27,000 jobs are directly or indirectly dependent on airport operations. Bradley Airport generates 4 billion in economic activity yearly with $1.2 billion being in the form of wages.

Since 1982, funds for improvements have been provided through the Bradley Enterprise Fund. No state tax receipts are used in operating Bradley. Operating revenues are obtained from airline landing, parking and facility fees, airport owned parking facilities, land rental revenues from tenants, and fees from various airport concessions. Some of the accomplishments under this program are: a new terminal with ten boarding gates, the renovation of the existing terminal, the renovation of the concourse C, increased short and long term parking, and reconstruction of the main runway. Future plans include construction of a new terminal and concourse to replace terminal B which has been closed since April 2010. The plan includes the construction of a 24 gate terminal consisting of two 12 gate concourses. A third phase of the plan will construct a west concourse which will connect the new Federal Inspection Station (FIS) facility to the rest of the airport.

In October 2008, the Embraer Executive Jet Service Center opened a 47,700 square foot center. The $10,000,000 center is one of three in the U.S. The center employs 60 highly skilled aircraft technicians to maintain and repair Embraer's line of business jets.

Bradley provides regular International service to two cities in Canada; Montreal and Toronto, as well as international flights to Cancun, Mexico (seasonal) and Amsterdam, Netherlands. Due to the recent increases in fuel cost and decreased air travel caused by slowed economies world wide, flights to Amsterdam were officially suspended as of March 27, 2009. Direct international charter flights are presently available. International service facilities include customs, immigration and agriculture inspection services that are available for international arrivals in the new Federal Inspection Station. A foreign trade zone is located adjacent to the airport.

Bradley Airport is well located to provide easy air access to both the Springfield and Hartford metropolitan areas. For more information on the airport please visit their website at http://www.bradleyairport.com/index.shtml

b) Westfield-Barnes Municipal Airport

Westfield-Barnes is a public airport operated by the City of Westfield and is the home base for the Massachusetts Air National Guard 104th Fighter Wing. The Region's second largest airport is located within the boundaries of the City of Westfield, north of Westfield's central business district and adjacent to the Massachusetts Turnpike (I-90). The airport is also within minutes of I-91. A total of about 1200 acres are owned by the facility. Approximately 600 acres are presently developed with pavement, hangers and airport buildings.

The airport is classified by the Massachusetts Airport System Plan as a general aviation airport providing general aviation service. It serves virtually all aircraft, including commercial jet liners and large, heavy and wide body aircraft. It is capable of handling precision instrument approach operations. The airport consists of two asphalt runways: 02/20 and 15/33. Runway 15/33 is a visual runway that is 5,000 feet long and 100 feet wide. It is equipped with medium intensity

runway lights. The primary runway 02/20 is 9,000 feet long and 150 feet wide and equipped with high intensity runway lighting and precision instrument approaches.

Land-side development is concentrated in three quadrants: The Southwest quadrant, houses general aviation functions as well as fixed-base operators, based aircraft storage facilities, transient aircraft parking, and airport and Federal Aviation Administration administrative facilities.

The Northwest quadrant consists of the land leased to the Massachusetts Air National Guard (MANG) and Army Aviation Services. Located within this quadrant are the MANG facilities, aircraft parking aprons, alert facilities, hangars, operations buildings, and office space. The F-15's on base now have a 24/7 air sovereignty alert mission. An industrial park is also planned for this area of the airport. In addition, the army aviation support facility operates here with two large hangars, 6 Blackhawk helicopters and 2 operations buildings.

Up until September 2007, the 131st Fighter Squadron (131 FS), 104th Fighter Wing (104 FW) of the Massachusetts Air National Guard at Westfield, operated 25 A-10 Thunderbolt II aircraft until they were realigned through the Department of Defense Base Realignment and Closure (BRAC) of 2005. The 104th changed its mission from Close Air Support to Air Superiority, and its A-10 aircraft were redistributed to other fighter units as a result of BRAC. The 104 FW has now received 15 F-15 Eagles from the former 102nd Fighter Wing.

The Northeast quadrant is the home of General Dynamics Aviation Services, a subsidiary of Gulfstream, which provides a full service maintenance facility to corporate aircraft with its three hangars and one support facility.

For more information on the airport please visit their website at http://www.barnesairport.com

c) Westover Air Force Base and Metropolitan Airport

Located at the "Crossroads of New England" in the City of Chicopee and the Town of Ludlow, the Westover Metropolitan Airport is strategic to the state and federal aviation systems. Situated in the heart of the Pioneer Valley in Western Massachusetts, with a population of 600,000 within a thirty mile radius, Westover Metropolitan Airport is a unique public airport. While large enough to handle the Space Shuttle and Corporate aircraft fully loaded for trans-Atlantic flights, the Airport is also flexible enough to welcome the emergence of the very light jet era. Originally, a World War II Air Force Base geographically positioned for European missions, the Airport is now the nation's most successful joint use, civilian and military facility. Under the joint use agreement the Air Force Reserves retain the responsibilities for the runways, two Instrument Landing Systems (ILS) and a new state-of-the-art air traffic control tower. The Westover Metropolitan Development Corporation (WMDC) has responsibility for three taxiways, its hangars, a fully equipped passenger terminal and overall civilian aviation operations.

Today, Westover continues its military use as home to the U.S. Air Force Reserves 439th Military Airlift Wing, which operates 16 Lockheed C-5's, and its civilian use with a growing civilian aviation operation. Recent BRAC decisions have affirmed the C-5 mission for well into the future and have expanded the military reserve personnel at Westover. In addition, the airport encompasses 3 industrial airparks with more than 55 industries employing over 4,000 skilled workers. Westover Metropolitan Airport proudly demonstrates daily its importance to our region's economy and the state's transportation system.

Westover Metropolitan Airport is a navigational hub, located between Boston and the greater New York City region. By air, all major North American and Western European cities can be reached within hours. The global marketplace is within easy reach of the Westover Metropolitan Airport.

The Westover Metropolitan Airport has been maintained to both military and FAA standards. Significant recent improvements have been made by both the military and civilian authorities. Both runways and all taxiways have been resurfaced and a new air traffic control tower was constructed.

The Westover Metropolitan Development Corporation (WMDC) was organized in 1974 to facilitate the conversion of former military property at Westover to constructive civilian re-use. It is a public non-profit corporation governed by an autonomous 10 member Board of Directors. WMDC has successfully developed industrial airparks in both the Town of Ludlow (Airpark East) and the City of Chicopee (Airparks/North & West) and manages the Westover Metropolitan Airport. WMDC is the civil airport authority which holds the FAA Part 139 Airport Operating Certificate and is responsible for the development of the 188+/- acres which comprise the Westover Metropolitan Airport.

Westover Metropolitan Airport has the longest runway east of the Mississippi. It is also a back up landing site for the Space Shuttle. The runway system is long enough to accommodate all types of aircraft. Its primary runway 5-23 is 11,597 feet long by 300 feet wide and includes two Instrument Landing Systems. The Airport's second runway, 15-33, is 7,081 feet long by 150 feet wide. These runways provide pilots with safe approach during variable wind and weather.

Westover's state-of-the-art control tower has typically operated between the hours of 7:00 AM to 11:00 PM. Its airport facilities include a paved parking lot for 240 vehicles at the passenger terminal and 13 large aircraft hangars, ranging in size from 28,600 to 30,000 square feet. Next to the passenger terminal building is a reinforced concrete apron over an acre in size to handle arrivals and departures.

As the Airport remains an integral part of the Westover regional economy, continuing capital improvements are essential to the Airport's operating efficiency. The WMDC, FAA, and MAC are currently pursuing renovation of its large hangars, off airport land acquisitions and soundproofing as recommended in the FAA Part 150 study and the dismantling and cleanup of the former military fuel farm. These projects will further improve the Airport.

The WMDC has proactively initiated efforts to protect the air space around Westover through participation in the FAA Part 150 program. During the first phase of the Part 150 program the WMDC purchased 37 acres of property in the airport's approaches underneath the flight path located in the 75 "day-night sound level" (dnl) noise levels. Future plans include additional land acquisitions and sound insulation for homes in the 74dnl to 70dnl noise levels. This is a multi-year commitment (up to 20 years) by all three funding groups to protect the airport at Westover.

For more information on the airport please visit their website at http://www.wmass-arptcef.com/

2. Private Airports

a) Northampton Airport

The Northampton Airport, operating under the names of both Paradise City Aviation and Pioneer Valley Balloons in the past, is privately owned and operated. In August 2004, a local corporation, Seven Bravo Two, LLC purchased the assets of the airport. Along with this purchase, a new flight school/FBO office was established at the airport know as Northampton Aeronautics, Inc. The airport has been running since the early 1920's and became an official airport on April 1, 1929. It is classified as a Basic Utility II airport that serves general aviation uses, both business and recreational. Located in the City of Northampton, the airport has one asphalt runway 3,365 feet long and 50 feet wide with variable high intensity, pilot operated runway lighting. Northampton Airport has an estimated 73 flights per day and estimated 60 based aircraft The runway

underwent a $1.2 million reconstruction in 2000. In spring of the 2010 the ramp in front of the maintenance hanger was expanded allowing for more operating space. A new hanger is also currently under construction as of July 2010. Northampton Airport offers 24 hour self service fueling, and minor and major maintenance service. The airport is closed to aircraft and helicopters with a gross operating weight in excess of 12,500 lbs. Seaplanes can operate on the Connecticut River, which is parallel to the runway.

The Northampton Airport normally employs between 15 and 17 employees with as many as 30 during the peak summer months. Besides its large commercial business the airport has chartered flights flying 24 hours a day, 7 days a week to destinations all over the country. It also has an FAA approved part 141 flight school, which is the largest flying school in Western Massachusetts.

For more information on the airport please visit their website at http://www.northamptonairport.com/

G. TRANSPORTATION OF GOODS

The major interstates and rail lines in the Pioneer Valley Region enable the quick delivery of goods to some of the world's largest economies of New York, Boston, and Philadelphia. The regions economics are also influenced by the surrounding mid sized cities such as Albany, Hartford, Worcester, and New Haven. The proximity of these major and middle sized cities allows goods from the Pioneer Valley to be quickly transported to competitive markets. With the emergence of the European Union and the Free Trade Agreement with neighboring Canada and Mexico, the region is uniquely positioned to take advantage of the growing international trade. In 1960 the international market accounted for 10% of the United States GDP. In 2006, the international market had increased to 28% of the United States GDP. To participate successfully in this new economy, the region must maintain an efficient road and rail network while encouraging the creation of an efficient multimodal transportation network. Enhancement and preservation of these multi modal connections with these cities is important as the regional, national and global market continue to evolve and integrate.

Freight is moved in and out of the Pioneer Valley primarily by truck with rail, air and pipeline carrying the remaining goods. Exporting and importing of goods in the Pioneer Valley region is accomplished by the use of one of these modes, or a combination of several modes. The top ten goods which the Pioneer Valley exports to these surrounding regions can be seen in Table 3-13. The list reveals the important mineral and natural resources the region possesses. The manufacturing industry remains a major exporter for the region. Despite employing less people than the service industry, this sector produces valuable exportable goods.

Table 3-13 - Top 10 Pioneer Valley Major Freight Exports

1. Nonmetallic Mineral Products
2. Stone and Gravel
3. Wood Products
4. Miscellaneous Manufacturing
5. Crop Products
6. Plastics and Rubber Products
7. Food Products
8. Paper
9. Waste and Scrap
10. Fabricated Metals

In 2008, MassDOT (formerly the Executive Office of Transportation and Public Works) identified challenges within the freight industry in the Pioneer Valley. One of the first identified challenges was the lack of intermodal regional transportation links, where goods can be transferred from one mode to another. The region has two transloading facilities which is one method to attain this intermodal relationship. The region's freight movement is dominated by trucking; this mode accomplishes 91% of all freight movement. Expanding and maintaining rail service with the region's class one shippers of Pan Am and CSX potentially could reduce the amount of trucking currently required to transport goods in the region. The region's intermodal facilities are based and are expected to continue to focus on truck and rail. The Connecticut River is not adequate to serve as a major waterway to transport goods. Furthermore, the region does not have a major airport to move goods. The lack of these alternate modes limits the intermodal facility choice. The changing economic landscape of the state has also affected the practices of freight movement. The state and its regional economies have transitioned from a manufacturing based to a service based economy. The freight sent with this type of economic base will typically ship smaller packages and are high value commodities. The service industry runs on the "just in time" model, where freight is delivered to vendors as consumer demand dictates. This reduces vendors carrying costs, inventory required and overall logistical costs. This model places a heavy reliance on the current freight network to transport goods that the local economy requires.

The freight within the Pioneer Valley is further influenced by global economic trends. Fuel prices continue to be a growing issue for truck freight shipments. Fuel is one of the largest costs for freight companies; this commodity is an important variable in predicting costs. This particular commodity has had large price fluctuations in recent years. The industry is continuing to develop and improve as technology advances. Freight loads are increasing the ability to carry more freight and facilities are improving their efficiency. Governmental influence such as federal deregulation of the carrier industry would have massive impacts on the freight industries ability to generate capital.

1. Trucking

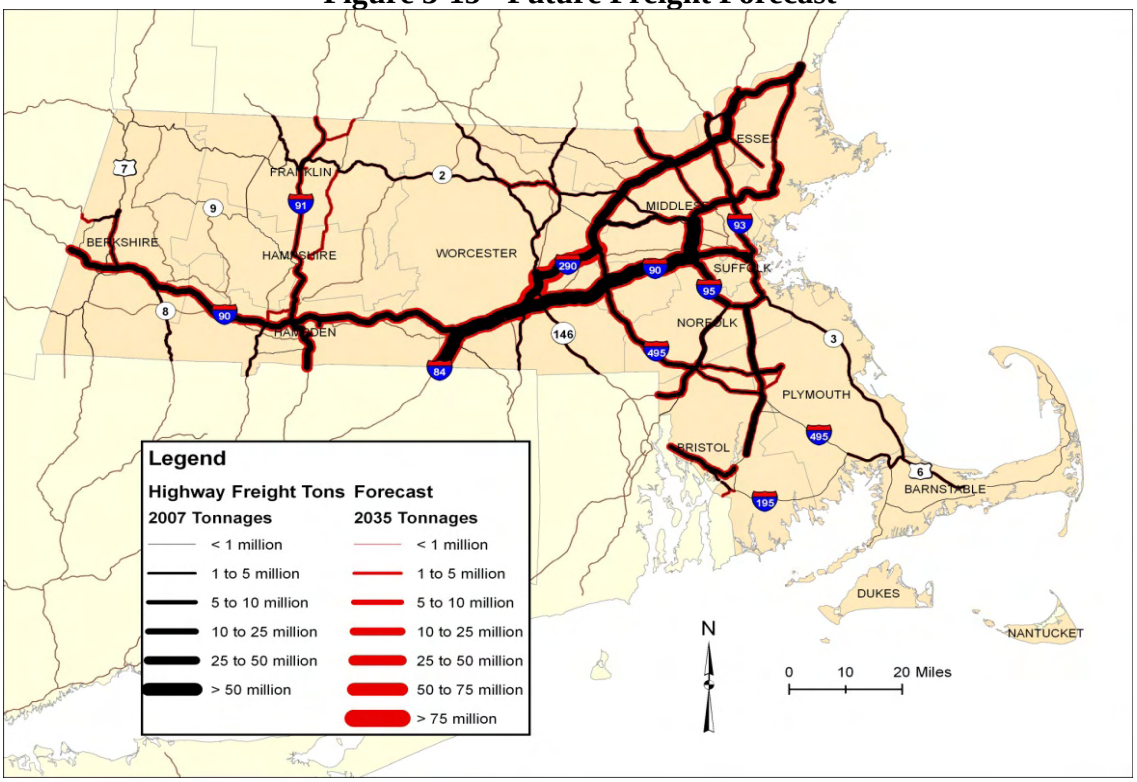
Trucking is the dominant mode for moving freight in the Pioneer Valley. This mode carries over 91% of all freight in the region. This regional percentage share is slightly higher than the state, which on average transports 86% of freight by truck. Urbanized communities in the region have at least one trucking firm, the majority of these carriers are small, short haul carriers handling feeder and distribution traffic. They provide both full truckload and less than truckload deliveries. This mode has the ability to transport goods to the northeastern United States and southeastern parts of Canada by overnight service. These freight companies carry goods for a variety of industries outside Hampden and Hampshire County. Franklin County possesses few freight companies and often employ/hire Hampden and Hampshire based trucking companies to transport their goods. Essentially, this transportation service sector is exported to other areas, in turn producing regional income. The future competitiveness of the industry hinges on the investment in the maintenance and development of interstate, state and local roadways, multimodal facilities and all related infrastructure.

Truck traffic is expected to grow throughout the state over the next twenty years (Figure-3-15). According to the USDOT, truck traffic moving to and from Massachusetts accounted for 6% of the annual average daily truck traffic (AADTT) on the USDOT Freight Analysis Framework (FAF) road network. This increase in freight trucking movement will occur mainly on Interstate 91 and Interstate 90. These highways already carry the largest volumes of freight movement in the two counties. Freight traffic is anticipated (by 2035) to increase on some state numbered routes such as:

- Route 202 between Westfield and Holyoke
- Route 9 between Hadley and Amherst
- Route 116 and Route 63 in Amherst
- Route 5 in Hatfield

These routes currently carry freight trucks, however as regional production and demand of goods is expected to increase, the volume of freight trucks needed will also increase. The modal split of freight movement is expected to rely on trucking more in the future. Truck are predicted to move between 92 and 93% of the total share of freight transport. Even if freight is imported or exported by rail or air in the region, trucks typically provide the final trip between freight terminals, manufacturers or distributors.

Figure 3-15 - Future Freight Forecast



Source: TRANSEARCH Forecast released 2009.

A portion of freight goods the Pioneer Valley exports stays within the states borders. A 2009 TRANSEARCH report to MassDOT quantified that 99% of all in-state shipments are performed by trucks. This reliance on in-state truck shipments is mainly due to the short distance between origin and destination of the commodities. The Greater Boston area is the destination for the largest share of these goods originating in the Pioneer Valley. The top commodities transported by truck to the Greater Boston area include (percent share of goods in parentheses): Rubber or miscellaneous plastics (31%) Fabricated Metals (31%), Food/Kindred Products (30%), Clay, Concrete, Glass or Stone (17%) and Nonmetallic minerals (14%). The Worcester area also receives 19% of the total share of Clay, Concrete, Glass and Stone produced in the Pioneer Valley. Some freight is moved within the borders of the Pioneer Valley. Similar to in-state shipments, the freight moved within the two counties is transported almost entirely via trucking. Approximately 63% of the non metallic minerals that originate in the region are transported within the region. Lumber and chemical or allied products have 13% and 11% of their total product respectively moved internally in the valley.

2. Rail

Five rail carriers provide freight service in the Pioneer Valley Region: CSX Transportation, Pan Am Southern, New England Central, Pioneer Valley Railroad, and MassCentral Railroad.

a) CSX Transportation

In June 1999 the assets of Conrail were split between CSX and Norfolk Southern. The break-up of Conrail ended its virtual monopoly on northeastern rail service and allowed new opportunities for price and service competition for the regions rail shippers. CSX took over Conrail's operation in Massachusetts and now owns and operates the east-west mainline between Selkirk, New York and Boston. CSX also owns and operates a spur line between Springfield and Ludlow.

Height clearances above the rail on the Boston and Albany Main line through the region allow for short double stack container service (9'6''+ 8'6") to both West Springfield and Palmer. Clearance improvements would be needed to allow full double stack service (9'6''+ 9'6") in the region.

b) Pan Am Southern Railways

In 2008, the Surface Transportation Board approved the merger between Pan Am Railways and Norfolk Southern Railway creating a new joint venture railroad consisting of a portion of Pan Am Railways in New York, Vermont, Massachusetts, and New Hampshire. Pan Am Southern Railways now owns the Boston & Maine Railroad (B&M) and its subsidiary Springfield Terminal Railway Company (STRC). B&M is the region's second largest rail carrier, operating a north-south mainline along the Connecticut River from Springfield, to East Deerfield. Pan Am Southern also owns secondary lines that run from Chicopee to Chicopee Falls and from Holyoke to Westover Industrial Airpark in Chicopee. Lying north of the region, but also important to the region's rail system is the B&M east-west mainline. This Pan Am Southern line is now known as the Patriot Corridor and provides Norfolk Southern the opportunity to compete with CSX for New England Traffic.

c) New England Central.

The New England Central Railroad (NECR) is owned by RailAmerica and offers freight service between St. Albans, Vermont near the Canadian border, and New London, Connecticut via the eastern portion of the Pioneer Valley region. Although the line is not heavily traveled, it has been rehabilitated and operates profitably.

d) Pioneer Valley Railroad

The Pioneer Valley Railroad (PVRR) is owned by the Pinsly Company and provides short line service on tracks formerly owned by Conrail. The PVRR took over two lines in 1982, each approximately 15 miles long, connecting Westfield with Holyoke and Northampton. The PVRR can accommodate intermodal transfers at the ends of each route, has 48-state motor carrier authority, and directly connects to both CSX and the B&M railroads.

e) MassCentral Railroad

MassCentral (Massachusetts Central Railroad Corporation) is an independent firm based in Palmer, Massachusetts. The operation of the railroad is managed by the Finger Lakes Railroad. Like PVRR, MassCentral Railroad provides short line service on a former Conrail line. Since 1979 this railroad has operated the former Ware River secondary line, which runs 24 miles from Palmer, through Ware, to North Barre, Massachusetts. MassCentral connects with CSX in Palmer. After abandonment by Conrail, the line was purchased and rehabilitated by the Commonwealth of Massachusetts. The Commonwealth maintains ownership of the majority of the line and leases the tracks to MassCentral.

f) Yards Terminals

The region's major freight and intermodal yard is located in West Springfield (CSX). CSX is currently making significant infrastructure improvements to the West Springfield facility. Another major freight and switching yard important to the region but located outside the region, is B&M's East Deerfield Yard in Franklin County. Within the Pioneer Valley other smaller freight yards are located in Holyoke, Palmer, and Westfield

g) Services

Much of the freight moved in Massachusetts is interstate traffic with either Selkirk, New York (CSX) or Mechanicville, New York (Pan Am Southern) providing connections to long haul lines. In addition to traditional general freight (boxcar) service, all of the region's railroads offer contract rates for volume shipments, consultation services for custom-designed transportation packages, and intermodal freight facilities allowing the transfer of goods from rail to truck and vice versa. The geographic location of the Pioneer Valley at the crossroads of interstate highways (I-90 and I-91) and long-haul rail lines (CSX and B&M) creates a strategic and attractive location for businesses and industry participating in the local or international marketplace.

3. Air Freight

Air freight serves particular markets, which are primarily focused on time-sensitivity issues and accommodating high-value commodities (typically light weight). Due to this limited market, this mode typically carries a much smaller share of goods than truck or rail, however air freight annually generates billion of dollars. The air freight industry is the most expensive method of freight movement. Air cargo needs to be light and high value to maximize profits. Lighter weight goods require fewer resources to transport which reduces overall shipping costs. Traditionally retail, service and manufacturing sectors are more likely to use air freight.

Air freight can be sent in two different methods. The first option would be to transport air freight by companies which own and maintain their own all-cargo aircraft fleet, such as AirNet or DB Schekner. The second option is via scheduled passenger aircraft for which the shipper places the cargo with a freight forwarding (pooling) company. The forwarder contracts for blocks of space on commercial airlines for specific routes. According to the U.S. Department of Transportation, for identification purposes, air freight services are categorized into whether goods are time sensitive, or less time sensitive; whether they are sent by integrated or nonintegrated providers; or by the major type of cargo carrier, which are identified as being one of the following: express carrier, scheduled, mail or chartered air service providers.

Currently there are no major air freight facilities in the region. This lack of this particular regional shipment method does not limit the air freight and package services options for Pioneer Valley residents. Air freight inbound or outbound of the region typically travels through these airports: Bradley International Airport in Windsor Locks, Connecticut, Logan Airport in Boston, or New York City's metropolitan airports. Westover Metropolitan Airport in Chicopee, MA seldom has automotive or large machine parts shipments. This limited amount of freight is not tracked or reported by the airport.

Bradley International Airport is a medium-hub airport located 15 miles southwest of Springfield, MA, in Windsor Locks, CT. Bradley's convenient location near Interstate 91, and air cargo facilities, make it the primary choice for the regions shippers. In 2009, there was a total of 114,689 tons of air cargo that enplaned or deplaned at Bradley International. Of this amount approximately 47% (53,631 tons) enplaned, the remaining 53% (61,059 tons) deplaned. These freight totals are down by 20% compared to the totals in 2008. Mailing in 2009 was down 5% compared to 2008. There was a total of 2,111 tons of outbound mail with 1,346 tons of inbound mail. The economic struggles of these years as well

as the closure of some of the air cargo fleets that accessed this airport may be the cause of these reduced percentages. However, airport choice for air cargo transport is dependent on a number of factors, including destination coverage/schedule factors, tariff structure, logistical and contractual considerations, and access time and distance of individual airports. Therefore, some of the region's shippers may choose Boston's Logan airport, or one of New York City's metropolitan airports for air cargo services.

4. Pipeline

There are presently three pipelines serving the Pioneer Valley. One provides natural gas, while the other two provide petroleum products. Pipeline goods are critical to the national and regional economy. These lines provide energy resources for buildings, motor vehicles and power plants to maintain the economy and existing infrastructure. The Research and Innovative Technology Administration predict that the role of pipelines will remain critical as freight demand is anticipated to increase.

a) Natural Gas

Natural gas pipelines, owned by Tennessee Gas Pipeline Company (An El Paso Corporation Company), runs along the region's southern edge. The system's trunk lines originate in the southern Louisiana/Texas/Gulf of Mexico area, travels northeast through the country and region, divides in Hopkinton, Massachusetts, and terminates in Gloucester, Massachusetts, Providence, Rhode Island and Concord, New Hampshire. The main lines cut through ten area communities from Tolland in the west to Holland in the east. These mainlines are 24-inch and 30-inch diameter pipelines.

A lateral line also runs north from Southwick to Northampton. This lateral is 8-inch diameter pipeline and becomes a 12-inch diameter pipeline north of Cook Road in Easthampton. This lateral serves Berkshire Gas, Holyoke Gas, Westfield Gas and Bay State Gas Companies. Additionally, Tennessee Gas has two laterals originating from its compressor station in Agawam, MA: a 10-inch lateral that feeds Bay State Gas in Agawam, MA and an 8-inch lateral that feeds the Berkshire Power plant located in Agawam, MA.

The Federal Energy Regulatory Commission (FERC) approves expansion plans based on a demonstrated increase in demand, with approval limited to only the facilities necessary to satisfy any increased demand. The current system is operating at capacity.

There are several natural gas distribution companies in the Pioneer Valley providing service to the region's communities via their own network of pipelines. Identification of these individual pipeline networks is outside the scope of this report. All, however, are fed by the main Tennessee Gas trunk lines.

b) Jet Fuel

Buckeye Pipeline Company is a common carrier of petroleum products within the states of Connecticut and Massachusetts. Buckeye Pipeline Company is a wholly owned subsidiary of Buckeye Partners, L.P. (NYSE: BPL). Buckeyes' local office is located in East Hartford, Connecticut, but management control is directed from Brenigsville, Pennsylvania.

The Buckeye Pipeline Company system includes a trunk line of approximately 111 miles in length. Of this, 93 miles are 12-inches in diameter, 7 miles are 10-inches in diameter, and 11 miles are 8-inches in diameter. There are also a number of spur lines to individual shippers that vary in length and diameter. Petroleum products enter the system at Buckeye Pipeline Company's New Haven Harbor receiving terminals. These products originate from refineries at various

locations including the East and Gulf Coast of the United States. The trunk line terminates in Ludlow, Massachusetts.

The products can be taken off at any of the several delivery locations located along the line, plus three branch lines. The delivery locations are (in order traveling northward along the trunk line) Portland, Rocky Hill, Wethersfield, East Hartford, Hartford, Melrose, Enfield, (all in Connecticut) Springfield and Ludlow (both in Massachusetts). The branch lines extend to the Kleen Energy power plant in Middletown, CT, Bradley International Airport in Windsor Locks, CT, and Westover Air Force Base in Chicopee, MA

c) Gasoline, Kerosene, Distillates

Mobil Pipeline Company, Inc. operates a petroleum product pipeline between Providence, Rhode Island and Western Massachusetts. The branch office that operates this pipeline is located in East Providence, Rhode Island. The branch office has limited authority and the pipeline is primarily managed at the Mobil Pipeline Company's main headquarters, located in Houston, Texas. The pipeline located in the Pioneer Valley is 6-inches in diameter. Petroleum products are generally delivered to the pipeline by water at Providence, Rhode Island. The products then travel in a northwest direction and terminate in Springfield, Massachusetts

H. POPULATION

1. Trends

While the population in the Pioneer Valley region grew at a modest rate during the 1980s—increasing 3.6% to 602,878 residents—population growth slowed to a trickle in the 1990s. Between 1990 and 2000, the region's population grew by 0.9 percent, reaching 608,479 persons. This is compared to a 5.5 percent increase for the Commonwealth of Massachusetts and a 13.2 percent increase for the nation as a whole. That the population of the Pioneer Valley region grew at all is a direct result of foreign immigration. Every year of the 1990s the region experienced a net loss in domestic migration (more people moved away to other parts of the country than moved into the region from other parts of the country). Apart from the arrival of 16,025 foreign born persons in the 1990s, the region would have experienced a 1.7 percent loss in population during the decade. Table 3-14 shows the region's population in the last six decades. However, population growth between 2000 and 2009 may reflect a change in the region's fortunes; the population of the Pioneer Valley region increased by more than 18,000 people between 2000 and 2009, an increase three times greater than the growth in the entire decade of the 1990s.

Table 3-15 shows the shift of population from urban areas to suburban and rural areas over the past 50 years. Suburbanization of the region became prominent in the 1950's when the communities adjacent to the urban core cities experienced unprecedented rates of growth. In the 1990's, with ongoing expansion, the highest rates of growth were found at the edges of the traditional suburbs, in the region's rural communities. Belchertown, for example, which has the largest land area of any community in the region had a population increase of 22.6 percent between 1990 and 2000. Other communities that experienced significant population growth in the 1990s include Cummington (27.9 percent), Middlefield (48.0 percent), Southampton (20.3 percent), Southwick (15.2 percent), and Tolland (48.1 percent). Interestingly, not only has population decreased in urban core communities like Holyoke and Springfield, but it also decreased during the 1990s in the population centers of the region's northern half: Amherst (down 1.0 percent) and Northampton (down 1.1 percent).

These trends have continued since 2000 with communities such as Brimfield, Montgomery, Southampton, Belchertown, and Granville experiencing sizable population change (up 14.0 percent,

11.1 percent, 10.7 percent, 10.1 percent, and 8.1 percent respectively). Positively, the population of the region's two poorest communities, Holyoke and Springfield, has not declined further since 2000.

2. Ethnic and Racial Diversity

The Pioneer Valley region's ethnic and racial diversity continues to grow. Unfortunately, the alteration of racial categories for the 2000 Census prevents us from analyzing changes in the population of specific racial groups over the last decade. However, using more broad categories, we can conclude that persons of color have gone from being 15.4 percent of the population in 1990 to 21.8 percent of the population in 2000. In fact, apart from a growing population of people of color, especially those who are Hispanic or Latino, the region's population would have shrunk between 1990 and 2000. In 2000, there were 34,000 fewer white, non-Hispanic residents of the region than in 1990 (a 6.7 percent decline), while there were 26,000 more Hispanic residents in 2000 than in 1990 (an enormous 55.1 percent increase).

The region's people of color continue to be concentrated in either the urban core area or its surrounding communities. With the region's population increase attributed primarily to growth in minority groups, it can be inferred that the bulk of new residents are located in or around the Springfield-Chicopee-Holyoke urbanized area. Given that the core cities diminished in population, this implies a significant out-migration of white people from the urban core. In addition, the average annual income for persons of color is, generally, less than that for white persons. Combined, these factors indicate that the region's urban area may experience an increase in demand for transit service.

3. Age

Reflecting a national trend, the Pioneer Valley region's population is aging. In 1990, the region's median age was 32.8, but by 2000 it had risen to 35.9. This trend is projected to continue for the next several decades because fertility rates are low and baby boomers are becoming seniors. Figure 3-16 shows the actual 2000 population and the projected 2020 population by age group. All four age groups over age 50 show increases in population between 2000 and 2020.

Decreases in the size of the region's young adult population are also expected to continue. Figure 3-17 contrasts the change in the elder population with that of the 25 to 40 year old population.

Table 3-14 - Pioneer Valley Region Population Change

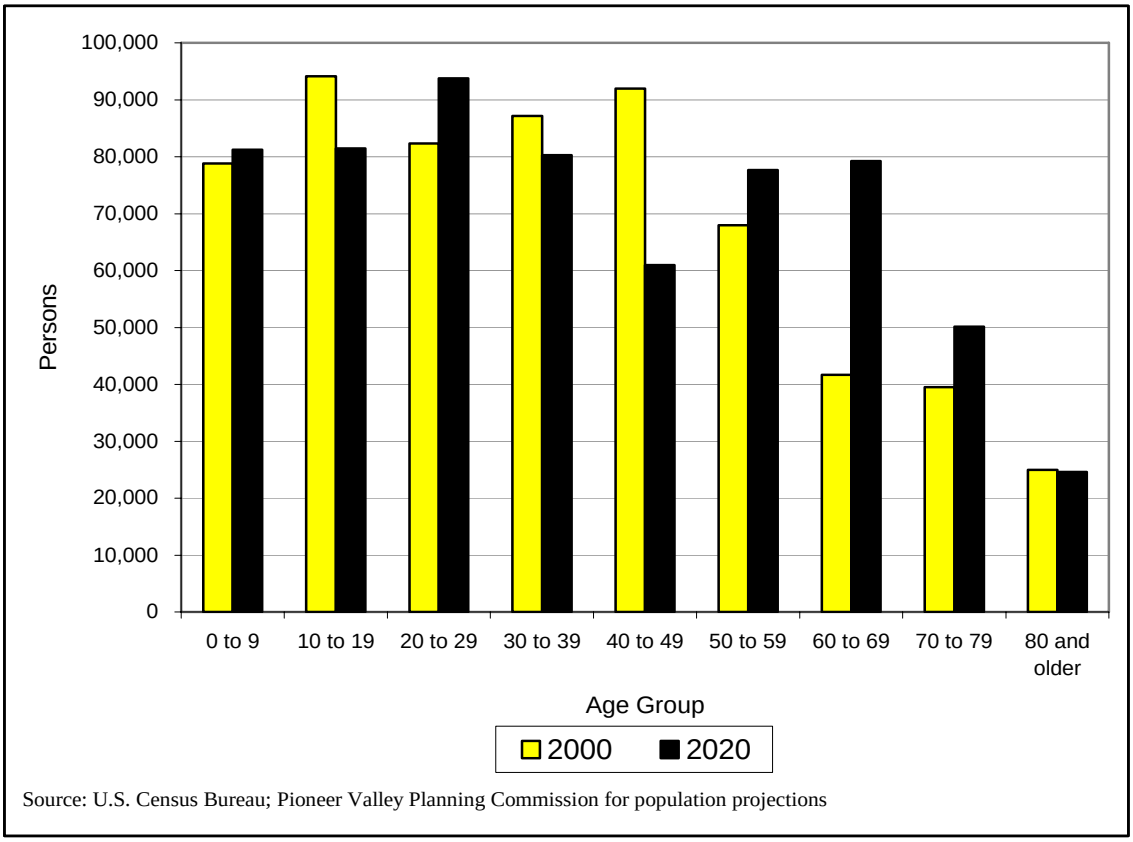
	1950	1960	1970	1980	1990	2000	2009
Agawam	10,166	15,781	21,717	26,271	27,323	28,144	28,485
Amherst	10,856	13,781	26,331	33,229	35,228	34,873	36,247
Belchertown	4,487	5,186	5,936	8,339	10,579	12,968	14,272
Blandford	597	636	863	1,038	1,187	1,214	1,298
Brimfield	1,182	1,414	1,907	2,317	3,001	3,339	3,807
Chester	1,292	1,155	1,025	1,123	1,280	1,306	1,305
Chesterfield	496	556	704	1,000	1,048	1,201	1,291
Chicopee	49,211	61,553	66,676	55,112	56,632	54,653	55,915
Cummington	620	550	562	657	785	1,004	968
East Longmeadow	4,881	10,294	13,029	12,905	13,367	14,100	15,909
Easthampton	10,694	12,326	13,012	15,580	15,537	15,994	16,262
Goshen	321	385	483	651	830	903	976
Granby	1,816	4,221	5,473	5,380	5,565	6,132	6,280
Granville	740	874	1,008	1,204	1,403	1,521	1,644
Hadley	2,639	3,099	3,750	4,125	4,231	4,793	4,730
Hampden	1,322	2,345	4,572	4,745	4,709	5,171	5,375
Hatfield	2,179	2,350	2,825	3,045	3,184	3,249	3,247
Holland	377	561	931	1,589	2,185	2,407	2,562
Holyoke	54,661	52,689	50,112	44,678	43,704	39,838	40,400
Huntington	1,256	1,392	1,593	1,804	1,987	2,192	2,221
Longmeadow	6,508	10,565	15,630	16,301	15,467	15,633	15,501
Ludlow	8,660	13,805	17,580	18,150	18,820	21,209	22,165
Middlefield	295	315	288	385	392	580	556
Monson	6,125	6,712	7,355	7,315	7,776	8,359	9,057
Montgomery	157	333	446	637	759	656	729
Northampton	29,603	30,058	29,664	29,286	29,289	28,978	28,528
Palmer	9,533	10,358	11,680	11,389	12,054	12,497	13,101
Pelham	579	805	937	1,112	1,373	1,403	1,393
Plainfield	228	237	287	425	571	576	592
Russell	1,298	1,366	1,382	1,570	1,594	1,655	1,768
South Hadley	10,145	14,956	17,033	16,399	16,685	17,196	17,310
Southampton	1,387	2,192	3,069	4,137	4,478	5,387	5,962
Southwick	2,855	5,139	6,330	7,382	7,667	8,835	9,689
Springfield	162,399	174,463	163,905	152,319	156,983	152,082	155,580
Tolland	107	101	172	235	289	428	465
Wales	497	659	852	1,177	1,566	1,737	1,901
Ware	7,517	7,517	8,187	8,953	9,808	9,708	9,839
West Springfield	20,438	24,924	28,461	27,042	27,537	27,899	28,137
Westfield	20,962	26,302	31,433	36,465	38,372	40,072	42,133
Westhampton	452	583	793	1,137	1,327	1,468	1,586
Wilbraham	4,003	7,387	11,984	12,053	12,635	13,473	14,155
Williamsburg	2,056	2,186	2,342	2,237	2,515	2,427	2,509
Worthington	462	597	712	932	1,156	1,219	1,275
Pioneer Valley Region	**456,059**	**532,708**	**583,031**	**581,830**	**602,878**	**608,479**	**627,125**
Massachusetts	**4,691,000**	**5,149,000**	**5,689,170**	**5,737,037**	**6,016,425**	**6,349,097**	**6,593,587**

Table 3-15 - Rate of Population Change by Community

	1950 to 1960	1960 to 1970	1970 to 1980	1980 to 1990	1990 to 2000	2000 to 2004
Agawam	55.2%	37.6%	21.0%	4.0%	3.0%	1.7%
Amherst	26.9%	91.1%	26.2%	6.0%	(1.0%)	(1.8%)
Belchertown	15.6%	14.5%	40.5%	26.9%	22.6%	6.8%
Blandford	6.5%	35.7%	20.3%	14.4%	2.3%	4.1%
Brimfield	19.6%	34.9%	21.5%	29.5%	11.3%	7.8%
Chester	(10.6%)	(11.3%)	9.6%	14.0%	2.0%	1.5%
Chesterfield	12.1%	26.6%	42.0%	4.8%	14.6%	5.1%
Chicopee	25.1%	8.3%	(17.3%)	2.8%	(3.5%)	0.3%
Cummington	(11.3%)	2.2%	16.9%	19.5%	27.9%	(1.0%)
East Longmeadow	110.9%	26.6%	(1.0%)	3.6%	5.5%	5.0%
Easthampton	15.3%	5.6%	19.7%	(0.3%)	2.9%	0.6%
Goshen	19.9%	25.5%	34.8%	27.5%	8.8%	6.1%
Granby	132.4%	29.7%	(1.7%)	3.4%	10.2%	3.4%
Granville	18.1%	15.3%	19.4%	16.5%	8.4%	6.8%
Hadley	17.4%	21.0%	10.0%	2.6%	13.3%	1.4%
Hampden	77.4%	95.0%	3.8%	(0.8%)	9.8%	2.8%
Hatfield	7.8%	20.2%	7.8%	4.6%	2.0%	1.9%
Holland	48.8%	66.0%	70.7%	37.5%	10.2%	3.2%
Holyoke	(3.6%)	(4.9%)	(10.8%)	(2.2%)	(8.8%)	0.6%
Huntington	10.8%	14.4%	13.2%	10.1%	10.3%	0.2%
Longmeadow	62.3%	47.9%	4.3%	(5.1%)	1.1%	(0.0%)
Ludlow	59.4%	27.3%	3.2%	3.7%	12.7%	3.4%
Middlefield	6.8%	(8.6%)	33.7%	1.8%	48.0%	(5.9%)
Monson	9.6%	9.6%	(0.5%)	6.3%	7.5%	3.9%
Montgomery	112.1%	33.9%	42.8%	19.2%	(13.6%)	12.2%
Northampton	1.5%	(1.3%)	(1.3%)	0.0%	(1.1%)	(0.2%)
Palmer	8.7%	12.8%	(2.5%)	5.8%	3.7%	3.2%
Pelham	39.0%	16.4%	18.7%	23.5%	2.2%	1.4%
Plainfield	3.9%	21.1%	48.1%	34.4%	0.9%	4.9%
Russell	5.2%	1.2%	13.6%	1.5%	3.8%	3.5%
South Hadley	47.4%	13.9%	(3.7%)	1.7%	3.1%	(0.1%)
Southampton	58.0%	40.0%	34.8%	8.2%	20.3%	7.1%
Southwick	80.0%	23.2%	16.6%	3.9%	15.2%	6.7%
Springfield	7.4%	(6.1%)	(7.1%)	3.1%	(3.1%)	0.0%
Tolland	(5.6%)	70.3%	36.6%	23.0%	48.1%	3.5%
Wales	32.6%	29.3%	38.1%	33.1%	10.9%	3.5%
Ware	0.0%	8.9%	9.4%	9.5%	(1.0%)	3.2%
West Springfield	21.9%	14.2%	(5.0%)	1.8%	1.3%	0.5%
Westfield	25.5%	19.5%	16.0%	5.2%	4.4%	1.2%
Westhampton	29.0%	36.0%	43.4%	16.7%	10.6%	6.5%
Wilbraham	84.5%	62.2%	0.6%	4.8%	6.6%	3.5%
Williamsburg	6.3%	7.1%	(4.5%)	12.4%	(3.5%)	0.7%
Worthington	29.2%	19.3%	30.9%	24.0%	5.4%	6.6%
Pioneer Valley	**16.8%**	**9.4%**	**(0.2%)**	**3.6%**	**0.9%**	**1.2%**
Massachusetts	**9.8%**	**10.5%**	**0.8%**	**4.9%**	**5.5%**	**1.1%**

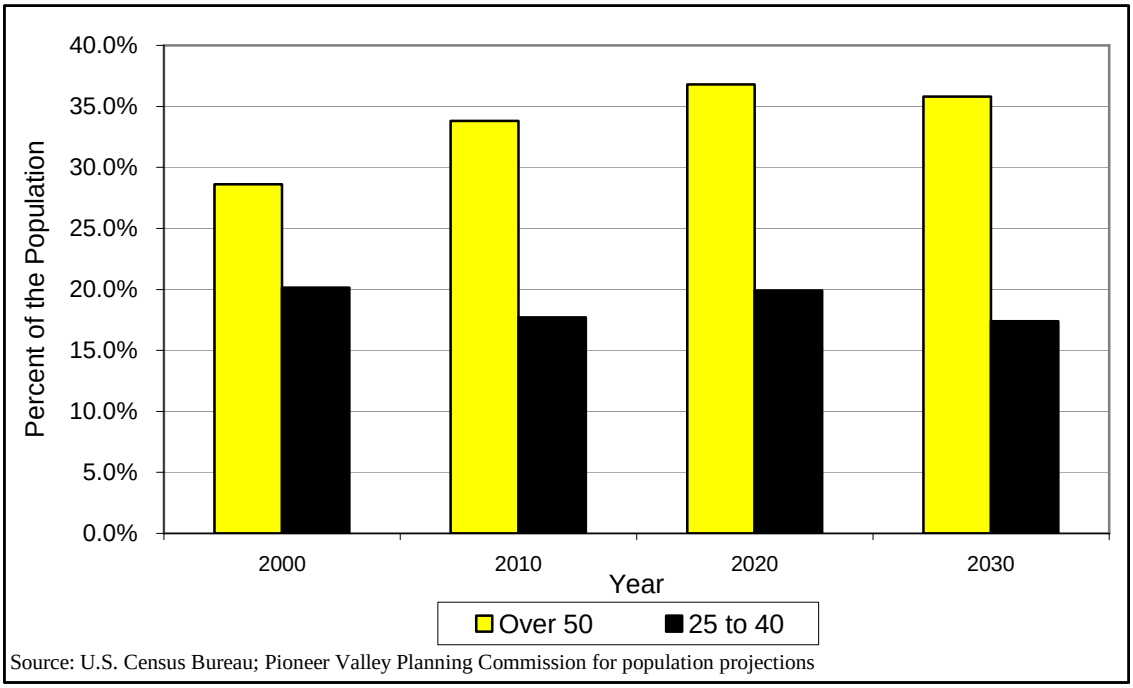
Source: U.S. Census Bureau

Figure 3-16 - Projected Population by Age Group for the Pioneer Valley Region



Source: U.S. Census Bureau; Pioneer Valley Planning Commission for population projections

Figure 3-17 - Projected Percent of the Population in select Age Groups



Source: U.S. Census Bureau; Pioneer Valley Planning Commission for population projections

I. HOUSING

1. Household growth

Despite population growth of only 0.9 percent, the number of households in the Pioneer Valley region grew by 5.2 percent between 1990 and 2000. In 1990 the region had 219,958 households and by 2000 that number had risen to 231,430. Households are defined as persons who occupy a housing unit in which the occupants live and eat separately from any other persons in the building and they have direct access to the unit from outside of the building or through a common hall. Between 1990 and 2000, Middlefield and Belchertown had the largest percentage increase in households (50.0 percent and 28.2 percent respectively), while Holyoke and Springfield experienced the only decreases in households in the region (down 5.4 percent and 1.0 percent respectively). (See Table 3-16).

Table 3-16 - Total Households, 1980-2000

	Total Households			Percent Change	
	1980	1990	2000	1980 to 1990	1990 to 2000
Agawam	9,355	10,432	11,271	11.5%	8.0%
Amherst	7,606	8,477	9,150	11.5%	7.9%
Belchertown	2,824	3,825	4,904	35.4%	28.2%
Blandford	343	424	460	23.6%	8.5%
Brimfield	820	1,078	1,252	31.5%	16.1%
Chester	409	464	490	13.4%	5.6%
Chesterfield	368	360	446	(2.2%)	23.9%
Chicopee	20,353	22,625	23,115	11.2%	2.2%
Cummington	259	317	406	22.4%	28.1%
East Longmeadow	4,271	4,670	5,236	9.3%	12.1%
Easthampton	5,715	6,170	6,859	8.0%	11.2%
Goshen	204	301	368	47.5%	22.3%
Granby	1,703	1,939	2,259	13.9%	16.5%
Granville	404	483	542	19.6%	12.2%
Hadley	1,511	1,633	1,895	8.1%	16.0%
Hampden	1,490	1,620	1,823	8.7%	12.5%
Hatfield	1,075	1,266	1,378	17.8%	8.8%
Holland	542	791	900	45.9%	13.8%
Holyoke	16,562	15,850	15,000	(4.3%)	(5.4%)
Huntington	611	703	813	15.1%	15.6%
Longmeadow	5,020	5,360	5,738	6.8%	7.1%
Ludlow	5,975	6,957	7,666	16.4%	10.2%
Middlefield	139	146	219	5.0%	50.0%
Monson	2,373	2,642	3,099	11.3%	17.3%
Montgomery	204	250	257	22.5%	2.8%
Northampton	10,235	11,164	11,863	9.1%	6.3%
Palmer	4,227	4,781	5,090	13.1%	6.5%
Pelham	383	492	537	28.5%	9.1%
Plainfield	153	209	247	36.6%	18.2%
Russell	540	557	598	3.1%	7.4%
South Hadley	5,242	5,884	6,584	12.2%	11.9%
Southampton	1,353	1,543	1,966	14.0%	27.4%
Southwick	2,464	2,713	3,312	10.1%	22.1%
Springfield	55,158	57,769	57,178	4.7%	(1.0%)
Tolland	90	108	183	20.0%	69.4%
Wales	378	550	660	45.5%	20.0%
Ware	3,381	3,836	4,020	13.5%	4.8%
West Springfield	10,488	11,485	11,866	9.5%	3.3%
Westfield	12,409	13,823	14,798	11.4%	7.1%
Westhampton	379	442	539	16.6%	21.9%
Wilbraham	3,893	4,474	4,941	14.9%	10.4%
Williamsburg	798	933	1,031	16.9%	10.5%
Worthington	318	412	471	29.6%	14.3%
Pioneer Valley Region	**202,025**	**219,958**	**231,430**	**8.9%**	**5.2%**

Source: U.S. Census Bureau

2. Size

Consistent with more growth in households than in population, the average size of households in the region decreased between 1990 and 2000 (See Table 3-17). This decrease in household size continues a trend seen throughout the nation over the past thirty years. In 1970, 47 percent of households had one or two people, by 2000 this number increased to 60.1 percent of all households. Large households (5 or more people) decreased from 20.1 percent of all households in 1970 to 9.4 percent of all households in 2000.

The trend toward more and smaller households (particularly single person households), and increased development in the region's rural areas, indicates increases in the total number of commuters as well as those inclined to commute alone, the number of vehicles, and the number of vehicle miles traveled. Table 3-18 shows the number of households in each community by type (family, non-family) and person size.

Another important factor in housing size is the number of dwelling units per household. The communities of the region represent a wide range of situations. In the urban areas, such as Springfield and Holyoke, there is a high density of multi-family dwellings, while some rural and suburban communities are almost exclusively single family homes. Of the total residential parcels in the region, 132,727, or 79.7 percent, are single family and 18,639, or 11.2 percent, are multi-family. The communities of Amherst and Northampton are an exception to the pattern described above. These communities have high college student populations which results in a disproportionate concentration of multi-family homes.

Table 3-17 - Household Size, 1960 to 2000

Year	Number of Households						
	1 Person	2 People	3 People	4 People	5 People	6 or more People	Total
1960	21,425	42,454	31,047	28,406	18,306	15,232	156,870
	13.7%	27.1%	19.8%	18.1%	11.7%	9.7%	
1970	32,998	50,799	31,071	27,378	17,644	18,092	177,982
	18.5%	28.5%	17.5%	15.4%	9.9%	10.2%	
1980	47,036	62,661	35,616	31,060	15,514	10,393	202,280
	23.3%	31.0%	17.6%	15.4%	7.7%	5.1%	
1990	55,863	68,760	39,324	34,276	14,429	7,306	219,958
	25.4%	31.3%	17.9%	15.6%	6.6%	3.3%	
2000	65,759	73,290	37,960	32,613	14,334	7,474	231,430
	28.4%	31.7%	16.4%	14.1%	6.2%	3.2%	

Source: U.S. Census Bureau

Table 3-18 - Number of Households by Type and Size, 2000

	Family Households by Size							Nonfamily Households by Size								Total All Households
	2 People	3 People	4 People	5 People	6 People	7 or more	Total	1 Person	2 People	3 People	4 People	5 People	6 People	7 or more	Total	
Agawam	3,204	1,738	1,639	598	224	44	7,447	3,154	570	48	45	7	0	0	3,824	11,271
Amherst	1,842	1,114	1,054	373	107	63	4,553	2,635	993	464	391	88	21	5	4,597	9,150
Belchertown	1,394	812	911	310	79	35	3,541	991	296	32	32	12	0	0	1,363	4,904
Blandford	140	75	89	33	7	4	348	92	16	4	0	0	0	0	112	460
Brimfield	343	198	203	96	23	20	883	293	67	4	5	0	0	0	369	1,252
Chester	120	97	77	42	11	2	349	109	25	4	1	2	0	0	141	490
Chesterfield	130	73	79	28	11	4	325	86	30	3	0	2	0	0	121	446
Chicopee	6,225	3,484	2,879	1,174	326	163	14,251	7,550	1,167	65	68	14	0	0	8,864	23,115
Cummington	152	64	27	16	2	2	263	109	29	3	0	2	0	0	143	406
East Longmeadow	1,623	893	941	408	88	25	3,978	1,121	117	6	14	0	0	0	1,258	5,236
Easthampton	1,873	1,052	844	300	72	52	4,193	2,079	532	45	10	0	0	0	2,666	6,859
Goshen	113	46	55	16	3	1	234	74	52	6	2	0	0	0	134	368
Granby	639	422	404	125	46	42	1,678	453	117	0	11	0	0	0	581	2,259
Granville	152	96	81	42	21	3	395	111	24	5	4	3	0	0	147	542
Hadley	592	276	240	91	32	9	1,240	473	117	36	29	0	0	0	655	1,895
Hampden	570	320	349	170	46	12	1,467	295	48	13	0	0	0	0	356	1,823
Hatfield	372	225	213	51	14	4	879	402	82	15	0	0	0	0	499	1,378
Holland	283	149	155	57	27	5	676	157	60	3	2	0	2	2	224	900
Holyoke	3,457	2,297	1,902	1,056	501	317	9,530	4,645	739	66	7	6	7	0	5,470	15,000
Huntington	242	184	98	57	29	8	618	153	36	4	0	2	0	0	195	813
Longmeadow	1,929	940	989	440	118	30	4,446	1,171	104	13	0	4	0	0	1,292	5,738
Ludlow	2,303	1,360	1,236	450	151	18	5,518	1,857	244	13	23	11	0	0	2,148	7,666
Middlefield	75	38	29	12	4	6	164	36	19	0	0	0	0	0	55	219
Monson	873	539	486	219	56	38	2,211	697	160	15	16	0	0	0	888	3,099
Montgomery	104	31	41	17	6	0	199	50	7	1	0	0	0	0	58	257
Northampton	2,684	1,489	1,183	416	96	38	5,906	4,435	1,259	185	61	2	4	11	5,957	11,863
Palmer	1,420	817	692	360	67	27	3,383	1,461		7	17	0	0	0	1,707	5,090
Pelham	166	87	83	32	7	3	378	109	32	12	6	0	0	0	159	537
Plainfield	88	20	36	19	0	2	165	67	15	0	0	0	0	0	82	247
Russell	204	110	105	46	8	6	479	94	20	5	0	0	0	0	119	598
South Hadley	1,997	930	815	337	113	11	4,203	2,001	337	24	9	10	0	0	2,381	6,584
Southampton	628	357	382	119	39	11	1,536	336	94	0	0	0	0	0	430	1,966
Southwick	895	601	606	237	53	27	2,419	723	152	15	3	0	0	0	893	3,312
Springfield	13,212	9,362	7,349	3,975	1,835	1,020	36,753	17,227	2,718	272	147	23	18	20	20,425	57,178
Tolland	81	12	24	7	4	2	130	48	3	0	2	0	0	0	53	183
Wales	214	116	93	34	21	9	487	130	34	4	0	3	2	0	173	660
Ware	1,129	629	507	255	56	22	2,598	1,174	221	21	6	0	0	0	1,422	4,020
West Springfield	3,069	1,747	1,387	658	203	129	7,193	4,012	621	34	6	0	0	0	4,673	11,866
Westfield	4,135	2,365	2,117	920	354	138	10,029	3,832	694	141	68	26	8	0	4,769	14,798
Westhampton	167	92	102	42	7	3	413	88	35	3	0	0	0	0	126	539
Wilbraham	1,694	856	913	421	91	24	3,999	869	65	8	0	0	0	0	942	4,941
Williamsburg	290	169	140	40	19	0	658	257	106	5	5	0	0	0	373	1,031
Worthington	158	71	67	18	16	4	334	103	30	3	1	0	0	0	137	471
Pioneer Valley Region	**60,981**	**36,353**	**31,622**	**14,117**	**4,993**	**2,383**	**150,449**	**65,759**	**12,309**	**1,607**	**991**	**217**	**62**	**36**	**80,981**	**231,430**

Source: U.S. Census Bureau

J. EMPLOYMENT

1. Type

The region's economic base continues to demonstrate the transition from the manufacturing to the service industry. Manufacturing once dominated the Valley's economy, employing over 28 percent of the work force in 1980. By 1990, nearly one-quarter of those manufacturing jobs had been lost or relocated out of the Region. This trend continued into the 1990s as the number of manufacturing jobs decreased by 25.3 percent between 1990 and 2000. At the same time service employment has increased, gaining 34,276 jobs between 1980 and 2000. Today, services employ more of the region's work force than manufacturing, with services comprising more than half of all jobs in 2009. Table 3-19 shows employment in the region's communities by employment sector, total payroll, and average wage for 2009. At $48,360, Springfield has one of the highest average annual wages within the region because it is home to many of the region's largest and most successful employers.

Several important implications for transportation can be derived from this information. First, the shift from primarily manufacturing jobs to high paying service jobs means that during that period the average annual income for many of the region's residents was increasing. This, in turn, has improved residential flexibility and choice for residents. Since the cost of housing in urban areas is typically less than that for suburbs or outlying areas, residents with increased incomes can afford to live outside the urban core and commute. This is clearly shown in Census 2000 data as population decreases in the urban core are accompanied by increases in outlying suburbs and rural towns.

Finally, increases in the number of two income households and the number of women in the work force indicate increases in the number of vehicles and vehicle miles traveled. Often the workers in a two income household are unable to share a commute due to the distance or time inconveniences. Therefore, the number of vehicles and miles traveled increases. In addition to more trips to and from work, the number of incidental or side trips also increases (particularly during rush hour) as children are taken to and from day care facilities and errands are combined with the commute. Due to the need to access child care, retail and business facilities during the workday, the single occupant vehicle remains the primary choice for transportation of the region's work force. Employer-based childcare facilities could enhance the opportunity for many people to use an alternative to the single occupant vehicle. Likewise, the provision of retail and business establishments near employment centers (such as drug stores, banks, restaurants) could reduce the need for all employees to have cars in order to take care of personal business during the work day.

Table 3-19 - Pioneer Valley Regional Employment by Industrial Sector, 2009

	Agriculture, Forestry, & Fishing	Utilities	Con-struction	Manufact-uring	Whole-sale Trade	Retail Trade	Transport & Ware-housing	Inform-ation	Finance & Insurance	Real Estate and Rental/ Leasing	Prof-essional & Technical Services	Manage-ment of Companies and Enterprises	Adminis-trative & Waste Services	Edu-cational Services	Health Care and Social Assistance	Arts, Entertain-ment, & Recreation	Accomo-dation & Food Services	Other Services	Public Adminis-tration	Total Employ-ment	Establish-ments	Average Annual Wage
Agawam			634	2,088	609	971	261	34	174	163	624		618		1,773		699	412		11,562	754	$37,804
Amherst	54		128	39	29	847	106	195	190	232	246		134	8,484	954	520	1,082	953	386	14,606	1,057	$45,604
Belchertown			98	82	133	264	562		60	36	88		136		195		168	127	169	2,589	312	$32,396
Blandford			6								10									219	20	$17,264
Brimfield			76		3	41	55		14		5						24	22		535	83	$35,672
Chester			3			14												9		108	25	$23,712
Chesterfield			25	25											31					122	26	$22,568
Chicopee			1,124	3,302	1,057	2,572	1,142	490	374	276	222	115	422	1,841	1,696	117	1,813	937	1,184	18,803	1,278	$39,364
Cummington							27							91				5		206	23	$28,236
East Longmeadow			305	2,048	250	772	196	172	188	51	279		132		1,265	173	513	479		7,855	572	$41,132
Easthampton			292	880	80	442	94	22	168	108	86		352	616	325	25	361	228		4,294	407	$35,828
Goshen			12			34												6		156	25	$28,392
Granby			87		39	75			16		13		55		27		67	53		745	141	$31,564
Granville			14															7		156	33	$21,476
Hadley	167		134	37	38	1,717		51	107	63	303		42	903	300	45	870	126	242	5,231	338	$29,224
Hampden			64	23		62			22		35		34				73	46		814	123	$36,972
Hatfield	73		49	63	873	70	48				24		348				52	27		1,945	117	$45,292
Holland			12			20												7		146	30	$27,872
Holyoke		672	658	1,879	397	3,773	212	77	430	270	521	178	432	2,391	5,124	166	1,642	1,249	874	20,949	1,634	$37,076
Huntington			12			29							5				25	20		416	47	$31,824
Longmeadow			96		13	395			223	35	69		74	875	854	191	182	155		3,353	317	$34,164
Ludlow			683	598	271	572	125	16	137	46	137		318		570	85	636	241		6,372	501	$40,872
Middlefield																		3		39	12	$24,128
Monson			125	139	54	120	44				22		44		53		77	115		1,283	201	$36,764
Montgomery			12																	26	10	$19,604
Northampton		58	565	1,307	249	2,003	137	356	416	116	524	215	365	2,484	5,212	352	1,784	891	947	17,980	1,163	$43,420
Palmer			234	536	156	585	126		89	30	191	112	117	489	1,304	19	396	218	176	4,942	403	$38,376
Pelham			16								16							17		154	36	$26,520
Plainfield																		5		40	19	$21,996
Russell			17			17												20		180	33	$41,184
South Hadley			257	235	202	436		50	101	44	49		73	1,618	505		363	166	175	4,401	327	$39,156
Southampton			121		60	270	27		17	4	39		33		29		171	38		1,075	125	$28,964
Southwick	121		116	449	22	371	30		54		57		56		123	115	304	116		2,511	274	$33,384
Springfield		469	1,306	3,808	1,287	5,806	3,914	1,579	6,551	934	2,164	1,480	2,398	7,926	20,201	607	4,669	6,003	3,176	74,280	5,763	$48,360
Tolland*																				37	9	$24,440
Wales			8														9	26		149	40	$30,420
Ware			78	379	23	796	30		49		28	200	40		403	9	214	115	117	2,703	248	$38,272
West Springfield			587	1,727	856	3,309	646	405	608	270	448	55	872	1,132	2,218	489	1,982	762	368	16,777	1,150	$38,636
Westfield			681	3,022	546	1,953	1,181	230	218	184	508	163	439	2,143	2,152	201	1,185	871	848	16,599	1,079	$41,236
Westhampton			35			4												19		288	32	$35,152
Wilbraham			140	88	141	631	332	24	131	18	157	6	192	751	662	86	298	144		4,469	352	$38,428
Williamsburg			103	40		76					24		14	131			45	45		550	82	$30,732
Worthington			9	25														22		192	34	$29,796
Pioneer Valley Region	**415**	**1,199**	**8,922**	**22,819**	**7,388**	**29,047**	**9,295**	**3,701**	**10,337**	**2,880**	**6,889**	**2,524**	**7,745**	**31,875**	**45,976**	**3,200**	**19,704**	**14,705**	**8,662**	**249,857**	**19,255**	**$41,890**

Source: Massachusetts Division of Career Services and Division of Unemployment Assistance, 2009

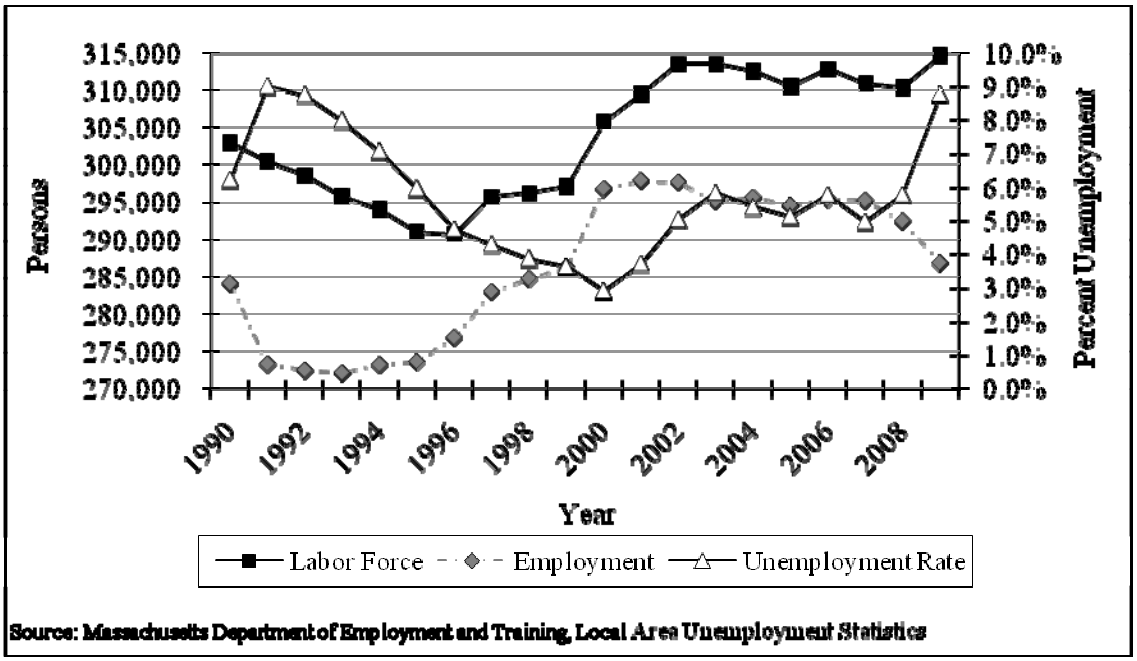
Note: Blanks indicate that the data is suppressed to preserve confidentiality.

2. Growth

As Figure 3-18 illustrates, the early 1990s saw sharp decreases in employment levels across the Pioneer Valley region, largely the result of economic recession. Consequently, people began leaving the region, provoking a steep drop in the size of the region's labor force between 1990 and 1996. This had the potential to be disastrous for growth in the region as employers grew frustrated at the lack of qualified workers to fill open positions. However, declines in employment and labor force size leveled off in the second half of the 1990s and, beginning in 2000, both measures appeared to be sharply increasing. About a year after the March 2001 return of recession, employment and labor force levels in the Pioneer Valley began to fall again, though not as precipitously as in the early 1990s. Employment levels have continued to see a steep decline since 2007.

The sectors of the economy that experienced the most employment growth between 1985 and 2001 are: services (51.1 percent); government (19.9 percent); transportation, communications, and utilities (16.9 percent); and construction (12.9 percent). It is likely that these industries will continue to grow and will account for the bulk of the region's employment gains in the near future. Manufacturing employment will most likely continue to decrease, though perhaps not as quickly as it has in the last two decades.

Figure 3-18 - Pioneer Valley Region Labor Force, Employment, and Unemployment



Source: Massachusetts Department of Employment and Training, Local Area Unemployment Statistics

3. Median Household Income

Despite rising average annual wages, median household income (when adjusted for inflation) dropped 3.8 percent between 1990 and 2000. This indicates a new trend as household income had increased 10.6 percent in the prior decade. The change in median household income varied across the region. In Hamden County the median household income dropped by 5.3 percent, while in Hampshire County it remained almost exactly the same.

Though median household income has declined, per capita income (see Figure 3-19) in the Pioneer Valley region, except for slight losses between 1989 and 1993, had been increasing steadily since

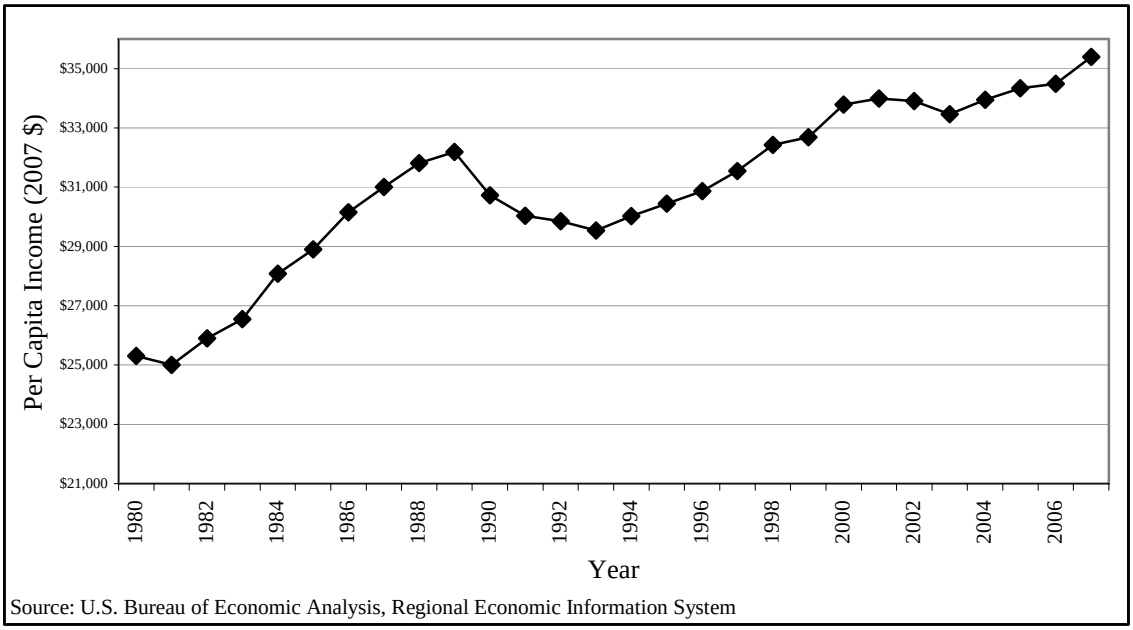
1980. Overall, declining household income coupled with rising average wages and per capita income is likely indicating that there are fewer wage earners per household now than in the past. This conclusion is also supported by our finding of shrinking average household sizes.

Table 3-20 - Median Household Income

	Median Household Income (1999 dollars)			Percent Change	
	1979	**1989**	**1999**	**1979 to 1989**	**1989 to 1999**
Hampden County	$38,527	$41,958	$39,718	8.9%	(5.3%)
Hampshire County	$39,741	$46,079	$46,098	15.9%	0.0%
Pioneer Valley Region*	**$38,793**	**$42,896**	**$41,261**	**10.6%**	**(3.8%)**

Source: U.S. Census Bureau
* Median household income for the region is a weighted average based on the number of households.

Figure 3-19 - Per Capita Income, 1980-2007



Source: U.S. Bureau of Economic Analysis, Regional Economic Information System

K. VEHICLE REGISTRATION AND OWNERSHIP

Based on information available from 2008, a total of 540,735 vehicles were registered in the Pioneer Valley region. This translates into approximately 0.87 vehicles per person and is an increase of 27.9 percent from 1996. Automobile ownership increased by only 1.2 percent between 1996 and 2008; however, light truck and SUV registrations increased by 109.6 percent in that same span. This translates into an increase from 0.14 light trucks and SUVs per person in 1996 to 0.28 per person in 2008. Despite rising gasoline prices at the end of the 1990s, the rate of increase in light truck registrations appears to be growing. Between 1991 and 1996, light truck registrations increased by 7.5 percent on average annually, but between 1996 and 2008, light truck registrations increased by 9.1 percent on average annually.

The City of Springfield has the most registered vehicles with 113,502 recorded in 2008. This translates to 21.0 percent of registered vehicles in the region. Outlying communities—including Belchertown, Brimfield, Goshen, Holland, Plainfield, Tolland and Wales—had the largest increase in registered vehicles between 1996 and 2008 (an increase of more than 50 percent in each case). However, in the light truck and SUV category, the region's wealthiest town, Longmeadow, had the largest increase in registrations at 178.3 percent (going well beyond doubling the number of light trucks and SUVs registered in Longmeadow at a time when the population increased by only 4.0 percent). Tables 3-21 and 3-22 summarize the number of registered motor vehicles in the Pioneer Valley by community and type of vehicle for 1996 and 2008. Table 3-23 highlights the percent change in registrations between 1996 and 2008 by type of vehicle and community.

Table 3-21 - Registered Motor Vehicles in the Pioneer Valley – 1996

	Automobiles	Trailers	Light Trucks (& SUVs)	Heavy Trucks	Motorcycles	Other	Total
Agawam	16,476	1,060	4,609	488	227	310	23,170
Amherst	12,018	409	2,256	133	137	274	15,227
Belchertown	6,067	666	2,621	170	139	192	9,855
Blandford	614	84	399	17	21	13	1,148
Brimfield	1,581	185	755	80	48	87	2,736
Chester	615	89	452	27	23	17	1,223
Chesterfield	481	57	348	16	9	21	932
Chicopee	29,027	1,723	7,357	880	401	680	40,068
Cummington	458	57	284	12	17	24	852
East Longmeadow	8,405	582	2,232	207	94	203	11,723
Easthampton	8,735	482	2,726	116	169	219	12,447
Goshen	396	43	267	24	15	12	757
Granby	3,186	403	1,467	109	64	99	5,328
Granville	789	108	436	44	22	28	1,427
Hadley	2,610	263	1,012	110	29	82	4,106
Hampden	2,723	343	1,105	83	52	78	4,384
Hatfield	1,962	359	883	275	36	74	3,589
Holland	1,097	102	544	26	39	26	1,834
Holyoke	17,775	537	3,547	204	195	297	22,555
Huntington	954	117	597	24	27	43	1,762
Longmeadow	10,036	282	1,594	43	64	97	12,116
Ludlow	10,658	765	3,321	316	161	206	15,427
Middlefield	221	21	173	9	13	10	447
Monson	3,986	446	1,938	156	124	140	6,790
Montgomery	386	59	237	15	12	10	719
Northampton	15,174	725	3,943	309	203	293	20,647
Palmer	6,578	575	2,479	224	164	195	10,215
Pelham	814	66	259	14	10	27	1,190
Plainfield	270	31	178	7	5	13	504
Russell	776	153	424	19	16	17	1,405
South Hadley	8,918	639	2,623	208	110	191	12,689
Southampton	2,677	377	1,266	89	48	124	4,581
Southwick	4,511	526	2,077	164	115	146	7,539
Springfield	68,264	2,875	13,165	1,474	761	1,734	88,273
Tolland	190	23	114	12	10	7	356
Wales	857	86	442	24	33	32	1,474
Ware	4,675	384	1,901	123	122	101	7,306
West Springfield	15,968	1,037	3,926	525	211	383	22,050
Westfield	19,163	1,563	6,204	534	300	467	28,231
Westhampton	700	86	410	25	16	26	1,263
Wilbraham	7,933	657	2,026	206	111	201	11,134
Williamsburg	1,375	113	679	62	20	48	2,297
Worthington	597	71	356	22	17	44	1,107
Pioneer Valley Region	**300,696**	**19,229**	**83,632**	**7,625**	**4,410**	**7,291**	**422,883**

Source: Massachusetts Registry of Motor Vehicles

Table 3-22 - Registered Motor Vehicles in the Pioneer Valley - 2008

	Automobiles	Trailers	Light Trucks (& SUVs)	Heavy Trucks	Motorcycles	Other	Total
Agawam	15,628	1,921	9,506	888	650	267	28,860
Amherst	11,877	538	4,118	172	231	265	17,201
Belchertown	6,953	1,349	5,600	302	494	162	14,860
Blandford	557	164	669	41	70	8	1,509
Brimfield	1,806	440	1,686	125	184	71	4,312
Chester	614	151	683	43	66	13	1,570
Chesterfield	494	163	600	32	55	22	1,366
Chicopee	28,873	2,425	15,293	1,115	1,081	475	49,262
Cummington	499	95	380	31	48	33	1,086
East Longmeadow	8,118	969	5,164	357	327	166	15,101
Easthampton	8,688	860	5,283	230	454	144	15,659
Goshen	476	125	486	43	48	18	1,196
Granby	2,937	762	2,700	173	242	99	6,913
Granville	814	200	805	75	102	26	2,022
Hadley	2,876	464	1,864	155	95	88	5,542
Hampden	2,558	564	2,180	188	179	60	5,729
Hatfield	1,913	399	1,366	329	119	66	4,192
Holland	1,305	286	1,131	37	124	24	2,907
Holyoke	18,252	775	8,360	290	791	283	28,451
Huntington	996	241	1,099	67	89	45	2,537
Longmeadow	8,609	490	4,436	122	183	92	13,932
Ludlow	10,185	1,480	7,134	649	541	206	20,195
Middlefield	224	62	293	17	24	12	632
Monson	4,045	964	3,706	369	380	129	9,593
Montgomery	375	134	420	30	37	12	1,008
Northampton	15,248	1,005	6,804	403	434	252	24,146
Palmer	6,736	1,059	4,916	411	430	169	13,721
Pelham	791	126	388	38	29	22	1,394
Plainfield	328	67	314	22	22	9	762
Russell	799	171	792	38	71	24	1,895
South Hadley	8,520	1,040	4,922	321	323	164	15,290
Southampton	2,851	701	2,510	165	228	76	6,531
Southwick	5,034	996	4,020	327	355	150	10,882
Springfield	73,572	2,876	31,863	18,855	1,764	1,572	113,502
Tolland	244	77	259	24	22	16	642
Wales	950	209	893	54	111	27	2,244
Ware	4,708	662	3,867	200	363	112	9,912
West Springfield	15,509	1,309	8,373	753	479	249	26,672
Westfield	18,940	2,488	13,164	973	862	416	36,843
Westhampton	705	186	783	48	66	16	1,804
Wilbraham	7,697	1,038	4,803	323	313	162	14,336
Williamsburg	1,461	257	1,089	100	83	42	3,032
Worthington	660	147	573	35	55	22	1,492
Pioneer Valley Region	304,425	30,435	175,295	28,970	12,624	6,286	540,735

Source: Massachusetts Registry of Motor Vehicles

Table 3-23 - Percent Change in Registered Motor Vehicles, 1996-2008

	Automobiles	Trailers	Light Trucks (& SUVs)	Heavy Trucks	Motorcycles	Other	Total
Agawam	(5.1%)	81.2%	106.2%	82.0%	186.3%	(13.9%)	24.6%
Amherst	(1.2%)	31.5%	82.5%	29.3%	68.6%	(3.3%)	13.0%
Belchertown	14.6%	102.6%	113.7%	77.6%	255.4%	(15.6%)	50.8%
Blandford	(9.3%)	95.2%	67.7%	141.2%	233.3%	(38.5%)	31.4%
Brimfield	14.2%	137.8%	123.3%	56.3%	283.3%	(18.4%)	57.6%
Chester	(0.2%)	69.7%	51.1%	59.3%	187.0%	(23.5%)	28.4%
Chesterfield	2.7%	186.0%	72.4%	100.0%	511.1%	4.8%	46.6%
Chicopee	(0.5%)	40.7%	107.9%	26.7%	169.6%	(30.1%)	22.9%
Cummington	9.0%	66.7%	33.8%	158.3%	182.4%	37.5%	27.5%
East Longmeadow	(3.4%)	66.5%	131.4%	72.5%	247.9%	(18.2%)	28.8%
Easthampton	(0.5%)	78.4%	93.8%	98.3%	168.6%	(34.2%)	25.8%
Goshen	20.2%	190.7%	82.0%	79.2%	220.0%	50.0%	58.0%
Granby	(7.8%)	89.1%	84.0%	58.7%	278.1%	0.0%	29.7%
Granville	3.2%	85.2%	84.6%	70.5%	363.6%	(7.1%)	41.7%
Hadley	10.2%	76.4%	84.2%	40.9%	227.6%	7.3%	35.0%
Hampden	(6.1%)	64.4%	97.3%	126.5%	244.2%	(23.1%)	30.7%
Hatfield	(2.5%)	11.1%	54.7%	19.6%	230.6%	(10.8%)	16.8%
Holland	19.0%	180.4%	107.9%	42.3%	217.9%	(7.7%)	58.5%
Holyoke	2.7%	44.3%	135.7%	42.2%	305.6%	(4.7%)	26.1%
Huntington	4.4%	106.0%	84.1%	179.2%	229.6%	4.7%	44.0%
Longmeadow	(14.2%)	73.8%	178.3%	183.7%	185.9%	(5.2%)	15.0%
Ludlow	(4.4%)	93.5%	114.8%	105.4%	236.0%	0.0%	30.9%
Middlefield	1.4%	195.2%	69.4%	88.9%	84.6%	20.0%	41.4%
Monson	1.5%	116.1%	91.2%	136.5%	206.5%	(7.9%)	41.3%
Montgomery	(2.8%)	127.1%	77.2%	100.0%	208.3%	20.0%	40.2%
Northampton	0.5%	38.6%	72.6%	30.4%	113.8%	(14.0%)	16.9%
Palmer	2.4%	84.2%	98.3%	83.5%	162.2%	(13.3%)	34.3%
Pelham	(2.8%)	90.9%	49.8%	171.4%	190.0%	(18.5%)	17.1%
Plainfield	21.5%	116.1%	76.4%	214.3%	340.0%	(30.8%)	51.2%
Russell	3.0%	11.8%	86.8%	100.0%	343.8%	41.2%	34.9%
South Hadley	(4.5%)	62.8%	87.6%	54.3%	193.6%	(14.1%)	20.5%
Southampton	6.5%	85.9%	98.3%	85.4%	375.0%	(38.7%)	42.6%
Southwick	11.6%	89.4%	93.5%	99.4%	208.7%	2.7%	44.3%
Springfield	7.8%	0.0%	142.0%	1179.2%	131.8%	(9.3%)	28.6%
Tolland	28.4%	234.8%	127.2%	100.0%	120.0%	128.6%	80.3%
Wales	10.9%	143.0%	102.0%	125.0%	236.4%	(15.6%)	52.2%
Ware	0.7%	72.4%	103.4%	62.6%	197.5%	10.9%	35.7%
West Springfield	(2.9%)	26.2%	113.3%	43.4%	127.0%	(35.0%)	21.0%
Westfield	(1.2%)	59.2%	112.2%	82.2%	187.3%	(10.9%)	30.5%
Westhampton	0.7%	116.3%	91.0%	92.0%	312.5%	(38.5%)	42.8%
Wilbraham	(3.0%)	58.0%	137.1%	56.8%	182.0%	(19.4%)	28.8%
Williamsburg	6.3%	127.4%	60.4%	61.3%	315.0%	(12.5%)	32.0%
Worthington	10.6%	107.0%	61.0%	59.1%	223.5%	(50.0%)	34.8%
Pioneer Valley Region	**1.2%**	**58.3%**	**109.6%**	**279.9%**	**186.3%**	**(13.8%)**	**27.9%**

Source: Massachusetts Registry of Motor Vehicles

CHAPTER 4

SAFETY

The vision of the RTP focuses on the attainment of a safe and dependable transportation system. In a first step to achieve this vision and its associated goals, the system's present and future needs have been identified. The second step is to develop appropriate strategies to address these needs while adhering to the policies and objectives of the RTP. The third and final step is to advance planning studies and implement program improvement activities that will enhance the transportation system. This continual process will simultaneously alleviate problems in the regional transportation system and advance the goals of the RTP.

Safety is a principal concern in most transportation plans and designs. Highway Safety focuses on the reduction of crashes and resulting deaths, injuries and property damage occurring on public roads. Passenger vehicle movements, truck conflicts, pedestrian and bicycle travel, and bridge conditions are all included as part of Highway Safety.

For the purposes of this plan both the preservation of the existing transportation system and its surrounding environment are considered under the category of Safety. Preservation of the system is critical to prevent continual deterioration which can lead to safety problems. PVPC follows the guidelines set by the Massachusetts Department of Transportation in the Strategic Highway Safety Plan and Traffic Safety Tool Box, for implementing necessary measures to ensure the safe operations of all the transportation components in the region.

A. STRATEGIC HIGHWAY SAFETY PLAN

The Strategic Highway Safety Plan (SHSP) is a statewide-coordinated safety plan that provides a comprehensive framework, and specific goals and objectives, for reducing highway fatalities and serious injuries on all public roads. This statewide document, developed by the MassDOT in a cooperative process, includes input from public and private safety stakeholders. The SHSP is a data-driven, four to five year comprehensive plan that integrates the four E's - engineering, education, enforcement and emergency medical services (EMS). The SHSP establishes statewide goals, objectives, and key emphasis areas developed in consultation with Federal, State, local, and private sector safety stakeholders.

The **MISSION** of the SHSP is to:

- Develop, promote, implement, and evaluate data-driven, multi-disciplinary strategies to maximize safety for users of the roadway system.

The **VISION** of the SHSP is to:

- Provide the safest roadway system in the country and promote its safe use.

The SHSP also has the following three **GOALS**:

- Reverse the increasing trend of traffic-related fatalities and injuries upon implementation of the MA SHSP (towards zero fatalities and injuries).

- Achieve a 20% reduction from 476 (2004) lives lost in traffic related fatal crashes by 2010.

- Achieve a 20% reduction from 5,554 (2004) in non-fatal traffic related injuries requiring hospitalizations by 2010.

1. Emphasis Area Goals and Performance Measures

A number of goals were established for each of the "Emphasis Areas" of the SHSP. A number of performance measures were also established for each goal. This information is summarized in Table 4-1. Table 4-2 summarizes the Emphasis Area Goals and Performance Measures for higher risk users of the transportation system such as pedestrians, bicyclists, motorcyclists, and younger drivers.

Table 4-1 - Emphasis Area Goals and Performance Measures

Emphasis Area	Goal	Annual Performance Measure(s)
Data Systems	Provide accessible, accurate, complete, consistent, integrated, and timely traffic records data to aid decision-makers working to reduce transportation-related fatalities, injuries, and economic loss in Massachusetts.	• Average timeframe from crash date to crash report submittal to the Registry of Motor Vehicles (RMV), by community and by police type • Number of police departments contacted regarding underreporting • Number of accurately linked data sets that can provide effective safety data to decision-makers on the causes of motor vehicle crashes • Number of trauma registry centers included in the statewide trauma registry • Number of crash reports electronically submitted to the RMV • Number of interagency data sharing agreements/arrangements pertaining to transportation-related injuries
Infrastructure	Reduce the number of fatalities and incapacitating injuries resulting from intersection and lane departure crashes, and expedite safety-related infrastructure projects.	• Number of intersection crashes – Number of fatalities resulting from intersection crashes – Number of incapacitating injuries resulting from intersection crashes' • Number of lane departure crashes – Number of fatalities resulting from lane departure crashes – Number of incapacitating injuries resulting from lane departure crashes • Number of Project Need Forms submitted with completed safety data information provided
At-Risk Driver Behavior	Reduce the number of fatalities and incapacitating injuries involving unbelted drivers and passengers, speeding, and impaired driving.	• Number of fatalities involving unbelted (or unhelmeted) drivers by vehicle type (passenger car, truck, or motorcycle) • Number of fatalities involving unbelted (or unhelmeted) occupants by vehicle type (passenger car, truck, or motorcycle) • Statewide safety belt use rate • Number of fatalities involving speed • Number of fatalities involving alcohol

Source: Massachusetts Strategic Highway Safety Plan

Table 4-2 - Emphasis Are Goals for Higher-Risk Transportation System Users

Emphasis Area	Goal	Annual Performance Measure(s)
Young Drivers	Reduce the number of fatalities and incapacitating injuries involving young drivers and encourage greater compliance with the Massachusetts Junior Operator Law.	• Number of fatalities involving drivers age 16-24 • Number of incapacitating injuries involving drivers age 16-24 • Number of non-fatal motor vehicle-traffic injury hospital stays (inpatient and observation) involving drivers 16-24 years (using Mass. DPH data) • Number of citations issued to drivers in violation of JOL requirements
Older Drivers	Reduce the number of fatalities and incapacitating injuries involving older drivers and encourage statewide implementation of infrastructure and system improvements that better accommodate their needs.	• Number of fatalities involving drivers age 65+ • Number of incapacitating injuries involving drivers age 65+ • Number of non-fatal motor vehicle-traffic injury hospital stays (inpatient and observation) involving drivers 65 years and older (using Mass. DPH data)
Pedestrians	Design and manage the roadway system to reduce the risk to pedestrians and reduce pedestrian fatalities and injuries requiring hospitalizations.	• Number of fatalities involving pedestrians • Number of non-fatal motor vehicle-traffic injury hospital stays (inpatient and observation) involving pedestrians (using Mass. DPH data)
Bicyclists	Design and manage the roadway system to reduce the risk to bicyclists and reduce bicyclist fatalities and injuries requiring hospitalizations.	• Number of fatalities involving bicyclists • Number of non-fatal motor vehicle- traffic injury hospital stays (inpatient and observation) involving bicyclists (using Mass. DPH data)
Motorcyclists	Raise the public awareness of motorcycle safety, educate riders and officials of the special vulnerabilities of motorcycle operation, and ultimately decrease the number of crashes involving motorcyclists.	• Number of fatalities involving motorcyclists • Number of incapacitating injuries requiring involving motorcyclists • Number of non-fatal motor vehicle-traffic injury hospital stays (inpatient and observation) involving motorcycle drivers (using Mass. DPH data) • Number of citations issued to motorcyclists in violation of the Massachusetts helmet law
Public Education and Media	Broaden awareness of safety issues through dissemination of messages to the public and elected officials; assist other Emphasis Area Teams with implementation of their education- or media-related strategies; and assist the Executive Leadership Committee with roll-out of the SHSP.	• Development and distribution of public information and education campaign regarding safe protocol for obtaining roadside assistance • Number of traffic safety mailings distributed annually (coordinate with RMV) • Number of public service announcements aired related to traffic safety

Source: Massachusetts Strategic Highway Safety Plan

Table 4-2 - Emphasis Are Goals for Higher-Risk Transportation System Users (cont.)

Safety Program Management	Work with the Executive Leadership Committee to institutionalize the SHSP through a Memorandum of Understanding (MOU) among agencies that includes a commitment to meet regularly to address safety issues raised by the Steering/Advisory Committee and to communicate how safety is being addressed within each individual agency.	• Signed Memorandum of Understanding Regarding the Massachusetts SHSP • Number of agencies reporting progress of individual agency safety initiatives at quarterly meetings

Source: Massachusetts Strategic Highway Safety Plan

2. Emphasis Area Strategies

Each of the Emphasis Area teams developed a series of strategies to support the Strategic Highway Safety Plan. In July 2006, the Executive Leadership Committee reviewed all final strategies and identified those that could be implemented within the first two years of the SHSP. These were defined as the Tier I Strategies of the SHSP. Tier I Strategies are typically low-cost strategies or strategies that have been previously identified as part of other ongoing planning efforts. A summary of all Tier I Strategies as well as the responsible and lead agencies for implementation is included in Table 4-3.

The remaining strategies, or Tier II Strategies, are summarized in Table 4-4. These strategies will be revisited on a regular basis as new data is analyzed and the SHSP is updated to determine the relevant safety issues. These strategies may be modified based on new data trends and/or changes in priorities.

Similar to the Emphasis Areas defined for the RTP, the Strategies included as part of the SHSP are intended to be cross-cutting and address multiple safety disciplines. Several strategies address the four E's (Engineering, Enforcement, Education, Emergency Response) as well as operations and management disciplines to improve safety in the Commonwealth of Massachusetts.

Table 4-3 - Massachusetts SHSP Tier I Strategies

Strategy Description	Supporting Agency	Lead Agency
Cross-Cutting Safety Strategies		
Increase high-visibility enforcement of alcohol impaired driving, speeding, and occupant protection of all motorists, including drivers of passenger vehicles, commercial vehicles, and motorcycles.	Massachusetts State Police (MSP) Massachusetts Chiefs of Police Association (MCOPA)	Governor's Highway Safety Bureau (GHSB)
Provide data, analysis, and research to the legislature and other elected officials as they consider traffic safety legislation and issues.	All agencies as needed and appropriate	GHSB
Expand availability and distribution of safety-related educational materials for all transportation system users with emphasis on personal responsibility and prevention.	All agencies as called upon.	MassDOT and RMV
Incorporate education on the safety needs of higher risk transportation system users in statewide law enforcement training programs, including the needs of young drivers, older drivers, pedestrians, bicyclists, and motorcyclists.	MSP (Municipal Police Institute (MPI), Municipal Police Training Committee (MPTC))	GHSB
Include pedestrian, bicyclist, motorcyclist safety information in comprehensive practitioner and driver education.		RMV
Improve infrastructure security.	All agencies as called upon.	MassDOT
Data Systems Emphasis Area Strategies		
Outreach to Local and State Police (regarding completeness of crash report form).	GHSB	RMV
Police training on Crash and Citation Reporting.	GHSB	UMass SAFE
Massachusetts Ambulance Trip Record Information System (MATRIS) and Statewide Trauma Registry.	GHSB	Mass. DPH
Increase electronic submission to the Crash Data System.	GHSB	RMV
Commonwealth-wide process for sharing data.	GHSB	RMV
Standard Massachusetts Highway Safety Data Reports.	GHSB	UMass SAFE
Infrastructure Emphasis Area Strategies		
Incorporate stronger safety criteria into project selection.	MPOs	MassDOT
Identify top lane departure and intersection crash locations and work at the local and regional levels to develop and implement location-specific strategies to mitigate the safety deficiencies.	Federal Highway Administration (FHWA), Regional Planning Agencies (RPA), GHSB	MassDOT
Incorporate safety elements in routine maintenance projects.		MassDOT
Work zone safety for workers and drivers.		MassDOT

Source: Massachusetts Strategic Highway Safety Plan

Table 4-3 - Massachusetts SHSP Tier I Strategies (cont.)

At-Risk Driver Behavior Emphasis Area Strategies		
Increase seat belt use in Massachusetts.	FHWA, NHTSA, and others as needed	GHSB
Increase the number and enhance current programs to educate parents on the proper use of child restraints and all adult passengers; and support child restraint loan programs in targeted areas.	Mass. DPH, MCOPA	GHSB
Increase the awareness of the dangers of speeding and conduct Speed Management Workshops for facilitators.	GHSB, MassDOT, MCOPA	NHTSA, FHWA, Federal Motor Carrier Safety Administration (FMCSA)
Support Drug Recognition Expert (DRE) training programs to assist in identifying driver drug use and providing expert testimony in court.	MSP	GHSB
Higher Risk Transportation System Users Emphasis Area Strategies		
Evaluate before and after Junior Operator Law (JOL) data for crashes involving teen drivers.	Mass. DPH	RMV
Educate parents on JOL responsibilities.	Mass. DPH	RMV
Support and participate in the healthy Aging Coalition and contribute to the development of their Strategic Plan for Healthy Aging.	Mass. DPH	RMV
Identify top pedestrian and bicycle crash locations and work at the local and regional levels to develop and implement location specific strategies to mitigate the safety deficiencies.	RPAs and MPOs, Mass. DPH	MassDOT
Expand the Safe Routes to School Program.	MassRides, Mass. DPH	EOT
Develop and execute a campaign regarding driving safely around motorcycles and encourage participation in motorcycle education programs.		RMV

Source: Massachusetts Strategic Highway Safety Plan

Table 4-4 - Massachusetts SHSP Tier II Strategies

STRATEGY DESCRIPTION
Cross-Cutting Safety Strategies
Develop a Safety Toolbox to provide technical assistance to local communities.
Tailor messages regarding speed, alcohol-impaired driving, and occupant protection to specific audiences particularly in high-risk locations or communities.
Conduct an evaluation of traffic violations, convictions, penalties, dismissals, pleas bargains in Massachusetts courts for offenses related to speeding, failure to wear seat belts, and alcohol impairment.
At the state and local levels, encourage greater knowledge and use of Massachusetts and national design guidelines.
Data Systems Emphasis Area Strategies
Support activities to improve data collection procedures and data quality, including the use of electronic license swiping equipment for police officers.
Infrastructure Emphasis Area Strategies
Develop a safety problem assessment checklist.
Evaluate the benefits of a statewide access management policy.
At Risk Driver Behavior Emphasis Area Strategies
Explore the possibility of deploying and maintaining a wed-based statewide safety calendar.
Support the statewide deployment of the State Courts Against Road Rage Program.
Coordinate clearinghouses of safety materials (GHSB and Mass. DPH).
Higher Risk Transportation System Users Strategies
Conduct literature/program review to identify existing sources of information regarding best practices in prevention and driver behavior modification methods.
Develop statewide guidance on infrastructure improvements that accommodate older driver needs.
Conduct an assessment of the mobility needs of older persons in Massachusetts.
Develop and disseminate an awareness campaign to encourage planning for future mobility needs.
Publicize pedestrian and bicyclist safety resources.
Provide input to the safety chapter of the updated Massachusetts Pedestrian Transportation Plan.
Consider providing reasonable bicycle and pedestrian accommodations in new roadway and bridge projects.
Publicize motorcycle safety resources.
Conduct detailed analysis of motorcycle crash problems in Massachusetts.
Public Education and Media Strategies
Use information on best practices from states and locals to enhance media campaign materials.

Source: Massachusetts Strategic Highway Safety Plan

B. TRAFFIC SAFETY TOOLBOX

MassDOT has published the Traffic Safety Toolbox to provide assistance and information to the local municipal and transportation officials to help them improve transportation conditions and increase safety within their region. The toolbox consists of several fact sheets addressing different traffic safety related issues and transportation engineering topics which are enlisted below. These fact sheets also provide information about some potentially valuable resources, including web links to several other related information sources. All these fact sheets are available online on MassDOT website.

Topics addressed in the Traffic Safety Toolbox:

1. New MUTCD Sign Retro Reflectivity Requirements
2. General Traffic Safety Information
3. Advanced Warning Signs
4. Crosswalks
5. Low Cost Intersection Safety Fixtures
6. Pavement Markings
7. Roadway Safety Audits
8. Retro Reflectivity
9. Sight Distance
10. Speed Limits and Speed Limit Setting
11. Stop Sign Installation
12. Work Zones

C. EXISTING CONDITIONS

The Safety Management Group of Traffic Engineering under MassDOT maintains a database of crash data by collecting the records of crashes from the Registry of Motor Vehicles. PVPC utilizes this information as well as crash information collected locally from the police departments to analyze and evaluate the existing problems at different intersections in the region that have safety related problems. MassDOT publishes and updates a report which summarizes the top 200 high crash locations in the state. The most recent report uses the crash data from the calendar years of 2006 -2008. Table 4-5 lists the top high crash locations in the Pioneer Valley which are ranked amongst the top 200 high crash locations in the State. The top high crash locations are ranked on the basis of Equivalent Property Damage Only (EPDO) index, which is based on the number of crashes weighted by the severity of each crash (fatal crashes are weighted by 10, injury crashes are weighted by 5, and property damage only or non-reported is weighted by 1). Due to the age of this data, some of these locations may have realized improvements to safety as a result of transportation improvement projects. Traditionally, rotaries with a history of crash problems such as the Route 5/20 rotary in West Springfield do not appear on the MassDOT list because the crash data is summarized by the individual intersections that comprise the rotaries rather than the rotary itself.

A summary of the total number of crashes reported by each community to the Massachusetts Registry of Motor Vehicles over the last ten years is provided in Table 4-6. This information consists of crashes that either resulted in a personal injury or fatality, or resulted in greater than $1000.00 worth of property damage. The City of Holyoke experienced the greatest number of crashes over the ten year period and the highest number of crashes per roadway mile.

Table 4-5 - High Crash Locations in the Pioneer Valley

Rank	Community	Location/Interscetion	Total Crashes	EPDO	Fatal Crashes	Injury Crashes	Property Damage Crashes
3	Westfield	North Elm Street (Route 202) / Pochassic Street	130	250	0	30	100
21	Chicopee	Broadway / Church Street	85	201	0	29	56
57	Westfield	East Main Street (Route 20) / Little River Road	61	165	0	26	35
112	Wilbraham	Boston Road (Route 20) / Stony Hill Road	71	131	0	15	56
131	Westfield	Franklin Street (Route 20) / Washington Street	40	124	0	21	19
149	Agawam / Springfield	South End Bridge (Route 5)	50	118	0	17	33
153	Holyoke	Main Street / Jackson Street	49	117	0	17	32
178	Westfield	Pleasant Street (Route 202) / West Silver Street	44	112	0	17	27
178	Holyoke	Main Street (Route 166) / Cabot Street	44	112	0	17	27
185	Westfield	North Elm Street (Route 202) / Lockhouse Road	39	111	0	18	21
199	Chicopee	Memorial Drive (Route 33) / Pendleton Avenue	45	109	0	16	29

Source: MassDOT

Bicycle / Pedestrian Crash Clusters: The latest top 200 high crash locations report that was published in March 2010 also includes the top 10 pedestrian and top 10 bicycle crash clusters in the State. The clustering analysis used for the top bike and pedestrian crash locations utilized crash data from the seven year period of 2002-2008 because of the relatively small number of reported crashes per year. A cluster of 27 pedestrian crashes along Main Street and its intersecting streets in Northampton is ranked 7th amongst the top 10 pedestrian crash clusters in the State. A cluster in Westfield with 18 bicycle crashes and another cluster in Northampton with 15 bicycle crashes are ranked 6th and 8th respectively amongst the top 10 bicycle crash clusters in the State.

Table 4-6 - Ten Year Community Crash History

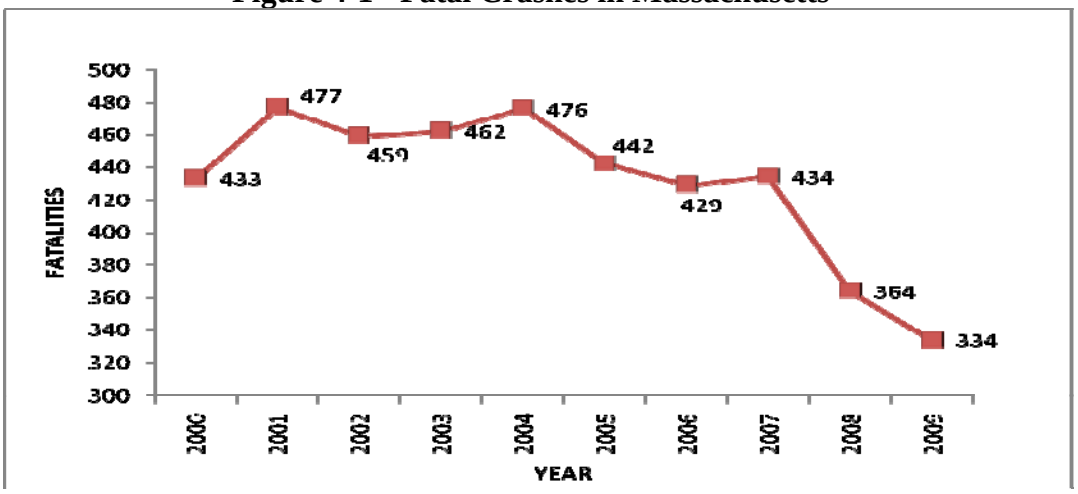
Town	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total Crashes	Average Crashes / Year	Average Crashes/ Roadway Mile
AGAWAM	658	722	822	659	759	687	704	541	603	586	6,741	674.1	4.48
AMHERST	513	466	492	159	2,594	132	238	222	218	182	5,216	521.6	3.85
BELCHERTOWN	100	108	111	56	239	256	289	223	215	221	1,818	181.8	1.17
BLANDFORD	84	66	91	80	72	67	62	55	72	72	721	72.1	0.81
BRIMFIELD	68	69	92	60	75	67	75	67	68	85	726	72.6	0.91
CHESTER	23	18	6	25	20	19	14	13	17	16	171	17.1	0.26
CHESTERFIELD	10	11	5	12	5	7	11	9	11	9	90	9.0	0.15
CHICOPEE	666	680	590	300	963	1,626	1,670	1,519	1,624	1,471	11,109	1110.9	4.27
CUMMINGTON	19	16	14	4	14	10	10	14	9	9	119	11.9	0.19
EAST LONGMEADOW	373	419	413	431	529	491	485	449	452	452	4,494	449.4	4.78
EASTHAMPTON	231	241	303	140	121	151	212	168	135	124	1,826	182.6	2.07
GOSHEN	12	9	12	20	15	23	22	16	23	17	169	16.9	0.38
GRANBY	121	155	145	136	157	178	187	150	150	165	1,544	154.4	2.29
GRANVILLE	28	37	18	21	31	16	21	16	18	22	228	22.8	0.31
HADLEY	387	416	427	323	435	381	372	383	388	319	3,831	383.1	4.60
HAMPDEN	42	65	65	61	57	65	62	57	55	63	592	59.2	1.10
HATFIELD	30	54	45	29	50	51	48	42	50	32	431	43.1	0.73
HOLLAND	10	15	13	30	15	12	12	12	5	7	131	13.1	0.35
HOLYOKE	880	892	692	297	1,832	1,609	1,749	1,627	1,342	1,654	12,574	1257.4	7.25
HUNTINGTON	29	31	19	26	25	17	15	8	13	19	202	20.2	0.37
LONGMEADOW	291	325	298	223	257	265	314	239	284	238	2,734	273.4	2.77
LUDLOW	103	115	110	63	233	433	462	417	479	449	2,864	286.4	2.21
MIDDLEFIELD	4	8	3	3	6	1	5	2	7	5	44	4.4	0.11
MONSON	158	201	172	134	108	108	137	108	117	110	1,353	135.3	1.20
MONTGOMERY	16	16	11	13	28	21	21	7	9	8	150	15.0	0.49
NORTHAMPTON	777	784	759	793	786	725	811	671	706	670	7,482	748.2	4.14
PALMER	513	540	598	485	477	503	498	441	429	379	4,863	486.3	4.25
PELHAM	13	16	19	12	14	16	28	21	20	11	170	17.0	0.37
PLAINFIELD	4	9	3	2	8	3	4	4	9	7	53	5.3	0.11
RUSSELL	49	51	44	30	58	54	59	35	36	45	461	46.1	1.28
SOUTH HADLEY	348	355	340	289	289	270	308	253	289	276	3,017	301.7	2.91
SOUTHAMPTON	55	31	43	41	49	69	69	57	62	50	526	52.6	0.71
SOUTHWICK	218	212	195	209	226	232	221	190	194	202	2,099	209.9	2.74
SPRINGFIELD	1,587	1,578	1,384	713	836	675	1,032	1,070	911	805	10,591	1059.1	2.13
TOLLAND	2	9	3	7	6	8	2	4	3	1	45	4.5	0.11
WALES	7	15	8	13	13	10	12	13	6	12	109	10.9	0.38
WARE	179	148	155	117	151	176	149	177	181	162	1,595	159.5	1.36
WEST SPRINGFIELD	285	296	333	239	213	174	194	194	150	145	2,223	222.3	1.55
WESTFIELD	931	959	936	860	906	969	944	878	850	755	8,988	898.8	3.64
WESTHAMPTON	19	13	20	18	20	27	21	16	17	20	191	19.1	0.40
WILBRAHAM	336	384	389	334	313	330	391	358	334	308	3,477	347.7	3.12
WILLIAMSBURG	58	57	44	49	46	34	29	57	65	67	506	50.6	1.01
WORTHINGTON	12	18	18	12	10	12	8	10	9	14	123	12.3	0.19
TOTAL	**10,249**	**10,630**	**10,260**	**7,528**	**13,061**	**10,980**	**11,977**	**10,813**	**10,635**	**10,264**	**106,397**	**10639.7**	**2.46**

Source: MassDOT

D. INCREASING SAFETY

The goal of the Strategic Highway Safety Plan for the Commonwealth of Massachusetts is to reduce the increasing trend of traffic-related fatalities and injuries. Two components of this goal are to achieve a 20% reduction in the 476 lives lost and 5,554 injuries sustained as a result of Massachusetts motor vehicle crashes during the 2004 calendar year by 2010. A summary of Fatalities in the State from 2000 to 2009 is presented in Figure 4-1.

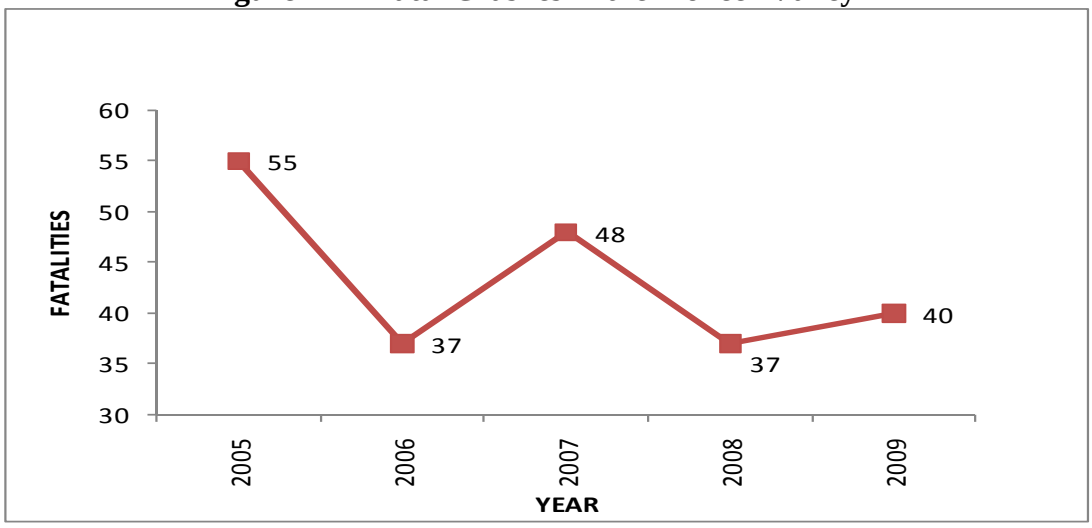
Figure 4-1 - Fatal Crashes in Massachusetts



Source: National Highway Traffic Safety Adminstration

The number of motor vehicle crash fatalities in the State was reduced by 30% from 476 in the calender year 2004 to 334 in the calender year 2009. Within Pioneer Valley this number was reduced by more than 27% from 55 in the calender year 2005 to 40 in the calender year 2009. Therefore, the Strategic Highway Safety Plan strategies have been successful in achieving a reduction in the number of lives lost in motor vechicle related crashes.

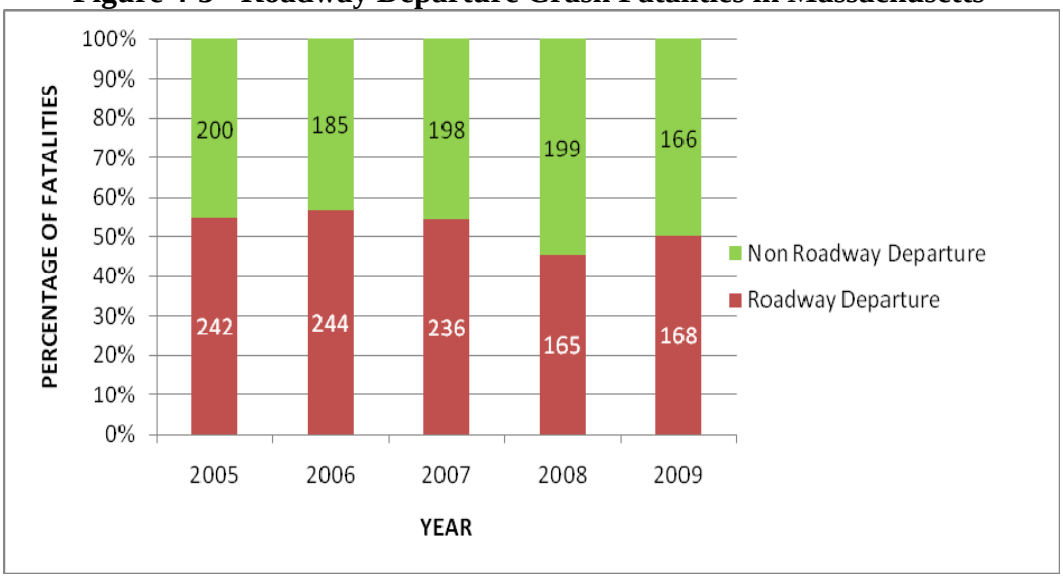
Figure 4-2 - Fatal Crashes in the Pioneer Valley



Source: National Highway Traffic Safety Adminstration

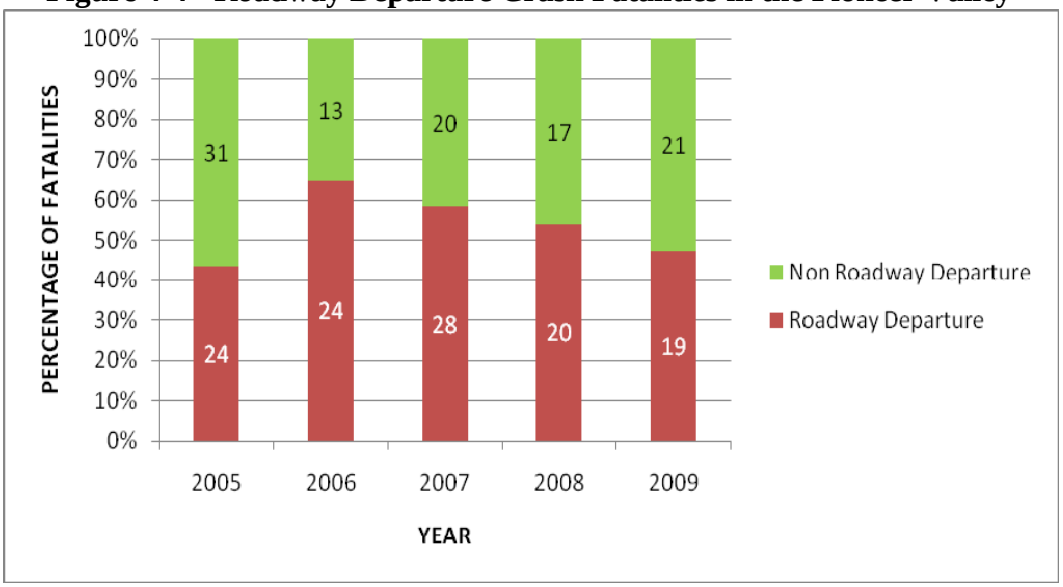
More than half of the fatalities in the State during the calendar years of 2005, 2006, 2007, and 2009 involved roadway departure crashes. Roadway departure crashes were also responsible in causing nearly 60% of fatalities in the Pioneer Valley during the calendar years of 2006, 2007, and 2008.

Figure 4-3 - Roadway Departure Crash Fatalities in Massachusetts



Source: National Highway Traffic Safety Adminstration

Figure 4-4 - Roadway Departure Crash Fatalities in the Pioneer Valley

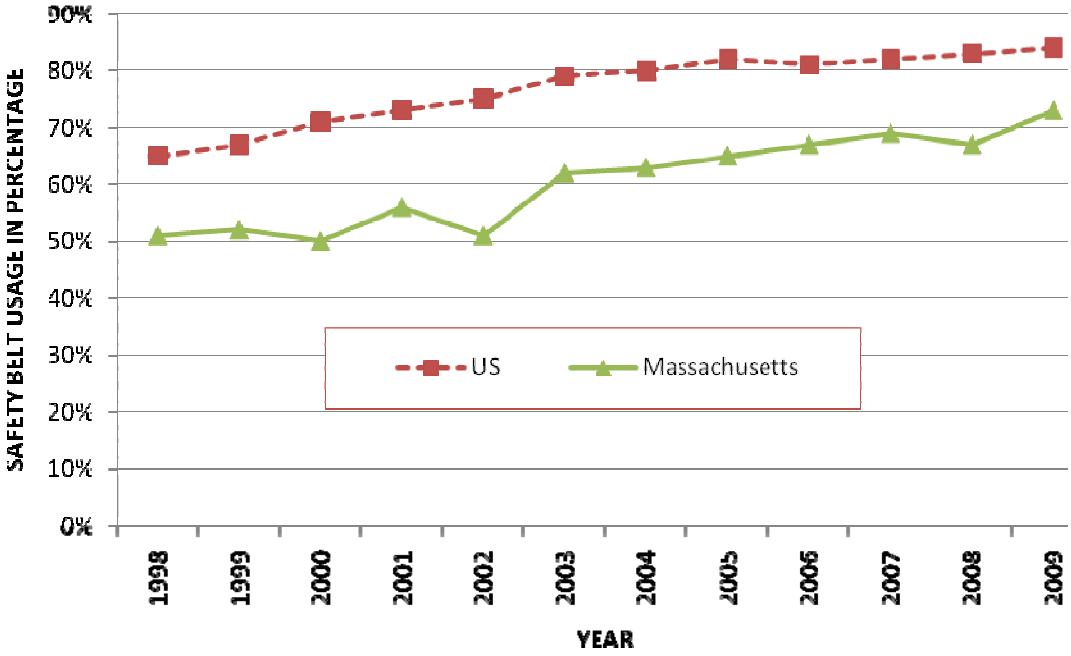


Source: National Highway Traffic Safety Adminstration

1. Safety Belt Usage

Personal injuries and fatalities resulting from motor vehicle crashes can be linked to safety belt usage. Although the use of safety belts in the Commonwealth of Massachusetts has increased over time, it still falls short of the national average. This information is shown on Figure 4-5.

Figure 4-5 - Safety Belt Use in Massachusetts compared to U.S.



Source: UMassSafe, National Occupant Protection Use Survey (NOPUS) National Highway Traffic Safety Administration

Information from the 2009 Massachusetts Safety Belt Usage Observation Study report indicates that observed safety belt usage in communities in the Pioneer Valley was on average 75%. This is higher than the statewide average of 74% from the same study, but still falls well below the national average of 84%. Table 4-7 summarizes the subsample data of observed safety belt usage at 6 locations in the Pioneer Valley between the time period of June 1 and June 30, 2009.

Table 4-7 - Safety Belt Usage in Pioneer Valley Communities

Community	Observation Location	Safety Belt Usage in Percentage
Chicopee	Center Street	74.35%
Holyoke	Beech Street	72.10%
Ludlow	Center Street	65.67%
Monson	Main Street	75.92%
Palmer	Palmer Ramp Route 32 to Route 90	82.75%
Springfield	West Columbus Avenue Exit	76.47%

Source: 2009 Massachusetts Safety Belt Usage Observation Study, UMass Safe

2. Crash Data Trends

The Commonwealth of Massachusetts Highway Safety Performance Plan 2010 report summarizes crash data trends in the State. As already discussed there is remarkable reduction in number of fatalities between the calendar years 2007 and 2008. The number of serious injuries incurred in motor vehicle crashes has also consistently decreased since calendar year 2005. Therefore, it can be seen that

the severity of crashes has gone down throughout the State in recent years. Since 2004, there has been a consistent decreasing trend in the number of speeding related fatalities. Increased awareness and vigilant enforcement can reduce these numbers even further.

One area of concern is the number of pedestrian fatalities which has not decreased over the last ten years. This may require special safety improvement initiatives. Many of the MassDOT reported crashes have an injury status listed as 'Unknown' or 'Unreported'. Further action is required to improve this data collection process to be able to have more accurate information regarding the severity of each crash.

Table 4-8 - Crash Data Trends in Massachusetts

Crash Data Trends	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Fatalities (Actual)	414	433	477	459	462	476	441	429	434	363
Number of Serious Injuries	3897	4286	N.A.*	5279	5370	5033	5052	4579	4182	3747
Number of Speeding-Related Fatalities	127	151	144	176	156	158	145	148	143	97
Number of Motorcyclist Fatalities	35	33	53	58	35	60	56	50	62	42
Number of Pedestrian Fatalities	74	82	79	58	86	81	76	61	66	75
Percent Belt Use for Front Seat Outboard Occupants	0.52	0.5	0.56	0.51	0.62	0.63	0.65	0.67	0.69	0.67

***Not Available**

Source: Commonwealth of Massachusetts Highway Safety Performance Plan, 2010

3. Crash Rate

A method is devised to evaluate the safety conditions of an intersection or a roadway segment in relation to conditions elsewhere in the region. The combination of crash frequency (crashes per year) and vehicle exposure (traffic volume or miles traveled) results in the development of a crash rate. Crash rates are expressed as 'crashes per Million Entering Vehicles' (MEV) for intersection locations and as 'crashes per Million Vehicle Miles Traveled' (MVMT) for roadway segments. By calculating the crash rate it can be determined how conditions along a roadway or at an intersection compare to the average condition of other similar locations. The MassDOT website provides the crash rates for intersections and segments based upon roadway classification for all Massachusetts Highway Districts. Table 4-9 summarize the crash rates for MassDOT Highway Districts.

Tables 4-9 - Crash Rates

Intersection – crashes per million entering vehicles

Location	Signalized Intersections	Unsignalized Intersections
Statewide	0.82	0.62
District 1*	0.92*	0.40*
District 2	0.83	0.67
District 3	0.93	0.68
District 4	0.78	0.59
District 5	0.77	0.62

* District 1 should use Statewide Rates due to low sample total

2008 Functional Classification – crashes per million vehicle miles traveled

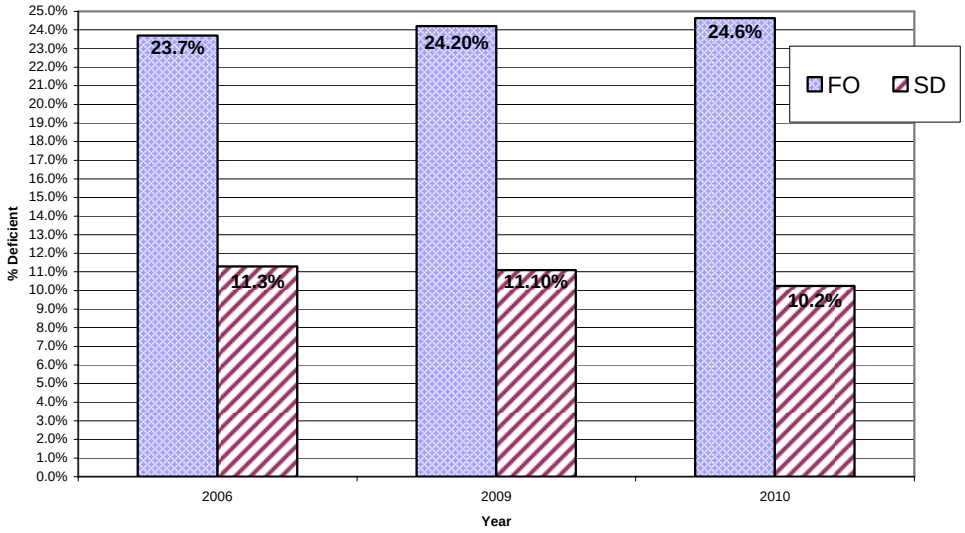
Roadway Functional Classification	Rural	Urban
Statewide	0.97	2.31
Interstate	0.48	0.64
Principal arterial	0.47	2.30
Rural minor arterial or urban principal arterial	1.16	2.89
Urban minor arterial or rural major collector	1.51	4.07
Urban collector or rural minor collector	2.62	4.12
Local	1.40	2.13

Source: MassDOT

4. Bridges

All of the bridges throughout the state undergo routine structural inspection. Using a generally accepted rating system developed by the American Association of State Highway and Transportation Officials (AASHTO), MassDOT surveyed and rated the state bridges. This process identified bridges that are structurally sufficient, functionally obsolete and structurally deficient. Figure 4-6 summarizes the status of bridge conditions within the Pioneer Valley Region.

Figure 4-6 - Bridge Deficiency by Year for the Pioneer Valley



A bridge is classified as functionally obsolete when deck geometry, local capacity, clearance or alignment of the approach roadway no longer meets the usual criteria for the highway it serves. A bridge is classified as structurally deficient when the structural scores are below the acceptable sufficiency rating. Sufficiency rating is a function of the structural adequacy and safety, functional obsolescence, and serviceability of a bridge. The percentage of structurally deficient bridges decreased by nearly one percent from 2008 to 2009. A summary of deficient bridges by community is presented in Table 4-10.

In May of 2008, Massachusetts Governor Deval Patrick filed legislation to accelerate the repair and replacement of structurally deficient bridges. The $3 billion Accelerated Bridge Program will greatly reduce the number of structurally deficient bridges in the state system. Since 2008, the number of structurally deficient bridges has dropped from 543 to 482, a decline of over 11 percent. Over the course of the eight year program, more than 200 bridges are planned to be replaced or repaired.

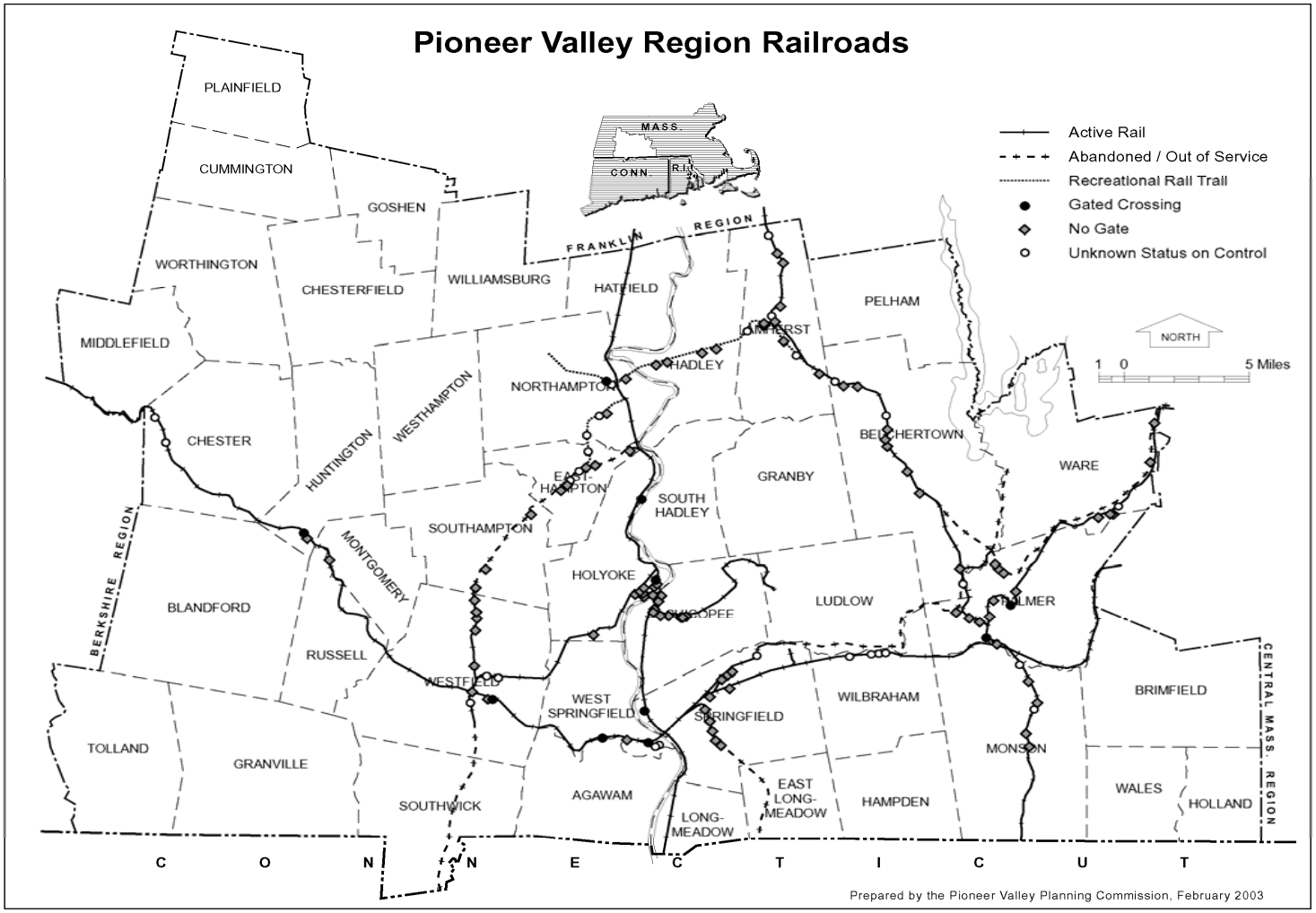
5. At-grade Railroad Crossings

Information on the location of all at-grade rail crossings in the Pioneer Valley Region is shown on Figure 4-7. There are currently 136 railroad crossings in the Pioneer Valley Region. A total of 95 of these crossings are located on active rail lines. However, less than 10 percent of all active rail crossings in the region are controlled by automatic gates to stop vehicle traffic. Many of the at-grade railroad crossings in the PVPC region do not have safety gates to separate motor vehicle traffic from railroad traffic. In addition, supplemental warning devices such as flashing lights, warning signs, and pavement markings require routine maintenance in order to provide maximum effectiveness. It is important to maintain an inventory of these at-grade crossings in order to determine when increases in traffic and surrounding developments require the installation of safety gates and other appropriate devices.

Table 4-10 - Deficient Bridges in the PVPC Region

Community	Functionally Obsolete	Structurally Deficient	Total Deficient Bridges	Total Bridges	% Deficient	% Functionally Obsolete	% Structurally Deficient
Agawam	1	2	3	18	16.7%	5.6%	11.1%
Amherst	1	2	3	15	20.0%	6.7%	13.3%
Belchertown	5	1	6	12	50.0%	41.7%	8.3%
Blandford	1	1	2	11	18.2%	9.1%	9.1%
Brimfield	5	2	7	26	26.9%	19.2%	7.7%
Chester	4	3	7	23	30.4%	17.4%	13.0%
Chesterfield	1	1	2	9	22.2%	11.1%	11.1%
Chicopee	8	3	11	50	22.0%	16.0%	6.0%
Cummington	1	0	1	13	7.7%	7.7%	0.0%
Easthampton	6	3	9	19	47.4%	31.6%	15.8%
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	1	1	2	8	25.0%	12.5%	12.5%
Hatfield	7	1	8	15	53.3%	46.7%	6.7%
Holland	0	0	0	1	0.0%	0.0%	0.0%
Holyoke	8	5	13	49	26.5%	16.3%	10.2%
Huntington	4	1	5	8	62.5%	50.0%	12.5%
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	7	4	11	23	47.8%	30.4%	17.4%
Montgomery	3	1	4	5	80.0%	60.0%	20.0%
Northampton	11	9	20	44	45.5%	25.0%	20.5%
Palmer	9	4	13	31	41.9%	29.0%	12.9%
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	26	6	32	59	54.2%	44.1%	10.2%
Wales	0	0	0	1	0.0%	0.0%	0.0%
Ware	3	3	6	16	37.5%	18.8%	18.8%
West Springfield	9	2	11	26	42.3%	34.6%	7.7%
Westfield	11	4	15	35	42.9%	31.4%	11.4%
Westhampton	3	2	5	14	35.7%	21.4%	14.3%
Wilbraham	1	0	1	4	25.0%	25.0%	0.0%
Williamsburg	8	1	9	16	56.3%	50.0%	6.3%
Worthington	0	1	1	14	7.1%	0.0%	7.1%
2010	166	69	235	674	34.9%	24.6%	10.2%

Figure 4-7 - Rail Crossings Map



6. Regional Dams

Revisions to state dam safety regulations (302CMR 10.00-10.16) currently being enforced by the Department of Conservation and Recreation's Office of Dam Safety significantly change the responsibilities of dam owners to register, inspect, and maintain dams in good operating condition. PVPC completed a study in 2009 to survey and assess the needs of the region's 43 communities and prioritize dams based on hazard index ratings, which reflect potential levels of threat to public safety.

a) High Priority Dams

There are 26 dams in the Pioneer Valley region reported to be in poor or unsafe condition. According to the Office of Dam Safety,

> "Poor condition indicates a dam with major structural, operational, maintenance and flood routing capability deficiencies….Unsafe condition indicates a dam whose condition, as determined by the Commissioner, is such that a high risk of failure exists. Among the deficiencies which would result in this determination are: excessive seepage or piping, significant erosion problems, inadequate spillway capacity and/or condition of outlet(s), and serious structural deficiencies, including movement of the structure or major cracking."

Fifteen of these poor or unsafe dams in the Pioneer Valley region are rated as high or significant hazard, while 11 are rated as low hazard. Table 4-11 provides a full listing of these poor and unsafe dams. While, six of the high and significant hazard dams in unsafe or poor condition are privately owned, these seem to be receiving attention through advocacy by the municipalities. It will be important to move forward with services for the highest priority public dams, but also find a way to help municipalities with these problem private dams in their midst. As such, the list of dams within the recommendations does not make a distinction between whether the dam is publicly or privately owned. It is important to note that safety and liability issues at dams can be addressed through removal as well as repair.

E. SAFETY STUDIES

As a part of PVPC's Unified Planning Work Program (UPWP), prime locations in the region which have a history of safety related issues are identified every year as proposed traffic study locations and short and long term recommendations are made to improve the conditions at such locations. As discussed earlier, the guidelines set by the Massachusetts Department of Transportation in Strategic Highway Safety Plan and Traffic Safety Tool Box are utilized for analysis to ensure the safe operations of all the transportation components in the region. Crash Data information obtained from MassDOT's crash database and local police departments is used in this analysis. In the past such study reports published by PVPC had been helpful to the towns and communities in providing them with preliminary guidelines for future safety measures as well as for obtaining appropriate funding to implement the recommended safety measures.

Table 4-11 - Dams in Poor and Unsafe Condition in Priority Order

Dam Name	ID	Municipality-location	Owner	Hazard index	Last Inspect.	Condition	Notes
MOUNTAIN LAKE DAM	*MA00530*	*CHICOPEE*	*JH JH, Inc.*	*H*		*Unsafe*	*City has indicated that needs removal.*
LOWER HIGHLAND LAKE DAM	*MA00598*	*GOSHEN*	*COMM OF MA - DCR*	*H*	*5/14/08*	*Poor*	*Town is very concerned about public safety.*
UPPER HIGHLAND LAKES DAM	MA00058	GOSHEN	COMM OF MA - DCR	H	5/14/08	Poor	Town is concerned about public safety.
PARADISE POND DAM	*MA00754*	*NORTHAMPTON*	*TRUSTEES OF SMITH COLLEGE*	*H*	*6/23/09*	*Poor*	*Not listed as concern to City. In subsequent conversation, City indicated that owner undertaking Phase 2 study.*
ROBERT'S MEADOW UPPER RESERVOIR DAM	*MA00760*	*NORTHAMPTON*	*CITY OF NORTHAMPTON, PUBLIC WORKS*	*H*	*9/9/09*	*Poor*	*Phase 2 completed. City is moving forward with possible removal.*
HATHAWAY & STEANE POND DAM #2	*MA01987*	*SOUTHWICK*	*JOHN WALLY*	*H*	*12/1/02*	*Poor*	*Town says likely that this dam is Non jurisdictional.*
VAN HORN PARK LOWER DAM	*MA00571*	*SPRINGFIELD*	*CITY OF SPRINGFIELD*	*H*	*4/10/09*	*Poor*	*City is working to get funding from state for repairs and maintenance--possibly through Heritage Parks grant*
ALDRICH LAKE DAM	*MA00491*	*GRANBY*	*COMM OF MA - DCR*	*S*	*4/17/08*	*Unsafe*	*Town is concerned about public safety.*
BONDSVILLE UPPER DAM	*MA00560*	*BELCHERTOWN*	*BELCHERTOWN LAND TRUST*	*S*	*5/9/09*	*Poor*	*Of concern to Town of Belchertown*
D.F. RILEY GRIST MILL DAM/ ADVOCATE DAM	*MA00493*	*HATFIELD*	*STANDICK TRUST*	*S*	*2/10/00*	*Poor*	*Town of Hatfield says need help in planning for the future of the dam.*
PULPIT ROCK POND NEW DAM	MA00552	MONSON	UNKNOWN	S	11/10/07	Poor	Town did not respond to survey.
BARTLETT FISH ROD CO. DAM	*MA01761*	*PELHAM*	*HUMAN RESOURCE DEV. PRESS "Hard*	*S*	*5/21/08*	*Poor*	*Town says impound. has been drained for 15 years. Not*
WHITE RESERVOIR DAM	*MA00606*	*SOUTHAMPTON*	*CITY OF HOLYOKE-OFFICE OF MAYOR*	*S*	*5/19/08*	*Poor*	*Town of Southampton concerned about public safety.*

Table 4-11 - Dams in Poor and Unsafe Condition in Priority Order (cont.)

Dam Name	ID	Municipality-location	Owner	Hazard index	Last Inspect.	Condition	Notes
FOREST PARK UPPER POND DAM	*MA00568*	*SPRINGFIELD*	*CITY OF SPRINGFIELD*	*S*	*12/21/06*	*Poor*	*City aware of issues.*
MONSANTO CHEMICAL CO. UPPER DAM	*MA00573*	*SPRINGFIELD*	*SOLUTIA, INC.*	*S*	*12/1/06*	*Poor*	*City talking about taking ownership as part of park.*
NINE LOT DAM	MA01333	AGAWAM	TOWN OF AGAWAM	L	2008	Poor	Phase 1 inspection help requested by Town of Agawam
QUENNEVILLE DAM	MA00492	GRANBY	MARK NIEDRALA	L	7/10/09	Unsafe	Impoundment has reportedly been drained.
BAHRE POND DAM	MA02892	GRANVILLE	COMM OF MA – DCR	L		Poor	Not listed as concern to Town of Granville.
CLEAR POND DAM	MA00540	HOLYOKE	CITY OF HOLYOKE	L	8/14/09	Poor	Not listed as concern to City of Holyoke.
VIRGINIA LAKE SHORE DAM	MA00494	MIDDLEFIELD	Riverview Land Association, Inc.	L	8/31/01	Poor	Not listed as concern to Town of Middlefield.
ROCKY HILL POND DAM	MA00495	NORTHAMPTON	COMM OF MA - DCR	L		Poor	Not listed as concern with City of Northampton.
PUTNAM'S PUDDLE DAM	MA00572	SPRINGFIELD	CITY OF SPRINGFIELD	L	8/26/88	Poor	Not listed as concern with City of Springfield. In follow up note, City indicates not familiar with this dam.
VAN HORN PARK UPPER DAM	MA00574	SPRINGFIELD	CITY OF SPRINGFIELD	L	7/7/09	Poor	Not listed as concern with City of Springfield. In follow up note, City indicates that Phase 1 inspection filed July 2009.
VINICA POND DAM	MA00538	WALES	NORCROSS WILDLIFE FUND IN	L	7/1/09	Poor	Not listed as concern with Town of Wales.
NORCROSS POND DAM #2	MA00566	WALES	NORCROSS WILDLIFE FUND IN	L	7/1/09	Poor	Not listed as concern with Town of Wales.
STRATHMORE PAPER DAM	MA00611	WEST SPRINGFIELD	FIBERMARK DSL, INC.	S	12/1/01	Poor	Town did not respond to survey.

Grey shading indicates dams where municipalities did not express concern, request services, or provide updates.
Italics indicate that DCR's Office of Dam Safety has sent the dam owner a letter of non-compliance.

CHAPTER 5

SECURITY

The security of the regional transportation system is an ever increasing priority. It is critical to ensure that the highest levels of security are provided for the users of our regional transportation system and that appropriate measures are taken to restrict access to our critical transportation infrastructure.

A. EXISTING CONDITIONS

Over the past few years, the region has concentrated on improving the security of the transportation system. This includes participation with the Massachusetts Executive Office of Public Safety (EOPS) and the Massachusetts Emergency Management Agency (MEMA). In cooperation with both agencies a number of changes have been made to increase both existing security measures and public awareness of potential threats to security. The following sections provide additional information on the topic of security for the Pioneer Valley Metropolitan Planning Organization.

1. Homeland Security

The Pioneer Valley Metropolitan Planning organization is part of the Western Massachusetts Homeland Security Region. The Western Region Homeland Security Advisory Council provides planning, financial and technical resources to all 101 communities within Hampden, Hampshire, Franklin, and Berkshire counties of Massachusetts.

The focus of this organization is to support the following activities:

- Identification of Threats and Vulnerabilities within the Region
- Plan Regionally to Protect Critical Infrastructure and Key Assets
- Training First Responders and Local Officials
- Improve Interoperability
- Multi-jurisdiction Exercises
- Intelligence Gathering & Information Sharing

One of the products of the Western Region Homeland Security Advisory Council (WRHSAC) was the development of a website to increase public awareness and provide the general public with information on the role of the council. This website is located at www.westernmassprepares.org. The Pioneer Valley MPO has also assisted in improving Homeland Security by providing planning assistance in the following areas:

- Assisting in the development of Mutual Aid Agreements between the state and local communities.
- Updating maps for critical infrastructure such as bridges and Tier II Haz-Mat locations.
- Providing technical assistance as needed for use in local and regional evacuation planning efforts.

Western Mass Ready (http://www.westernmassready.org/) was created by the WRHSAC and provides resources for individuals in the Pioneer Valley to prepare for emergency events. A marketing campaign for Western Mass Ready was conducted in conjunction with the Pioneer Valley Transit Authority (PVTA). Western Mass Ready ads were placed on the exterior of the buses as well as

brochures being placed near the schedule racks on the interior of the buses. Translated brochures were provided by the Individuals Requiring Additional Assistance Preparedness Project. Billboard and movie theater advertising was also utilized to provide public outreach.

a) Western Region Homeland Security Plan

This plan seeks to enhance the region's capabilities to support homeland security-related public safety efforts, and is guided by the principles established by the Commonwealth in the Massachusetts State Homeland Security Strategy. The Plan identifies and prioritizes key vulnerabilities that exist in the region and develops steps to mitigate these potential threats.

Regional solutions were developed in order to strengthen core functions and provide all public safety agencies the tools required to effectively prevent, provided early response, and recover from terrorist events or other high profile events that threaten security. The Plan also defines funding levels to address the identified priorities and improve interoperable communications and overall emergency preparedness through focused training exercises and upgraded equipment.

PVPC has conducted evacuation planning studies using the regional transportation model and dynamic traffic assignment. The TransCAD modeling software was used to analyze the evacuation scenarios at the macro level. The network used in this study excludes local roads; only major arterials and highways are considered. Dynamic Traffic assignment was utilized because it is more responsive to operational factors, route changes, and produces more realistic results for modeling unexpected results than traditional travel demand models. PVPC has conducted analysis on the following four evacuation scenarios using this methodology.

- Hurricane evacuation for Hampden, Hampshire, Franklin and Berkshire- Under this scenario, a hurricane forces a full evacuation of all four of the Western Massachusetts counties. The hurricane splits the region in two, sending people to the east and west.
- UMass Campus Evacuation- A severe snowstorm occurs, necessitating the evacuation of the University of Massachusetts Amherst campus. A phased evacuation is modeled using current university vehicle and housing data.
- Flooding Scenarios - 3 flooding scenarios were created for the City of Springfield which established the identification of site specific challenges and sensitive receptors. Changes in traffic flow were estimated for each scenario based on the identification of roadways that would not be accessible due to flooding. The effectiveness of existing detour routes was analyzed and recommendations were made on additional resources that may be required during an actual evacuation.
- I-91 Chemical Spill - A chemical spill occurring in the afternoon peak hours on Interstate 91 in the vicinity of Exit 12 results in the closure of the highway in both directions. This scenario identifies the impact of the unanticipated closure of I-91 on downtown Springfield and the regional roadway network.

2. Transit Security

The Pioneer Valley Transit Authority (PVTA) has undertaken extensive efforts in order to increase the security of the regional transit system. This includes the development of an emergency operations plan for the agency and the placement of security cameras on their entire fleet of buses. PVTA has also begun the installation of security cameras and audio alert equipment in passenger terminals, vehicle storage and maintenance facilities. Most importantly, the PVTA has committed transit vehicles for use in situations that may require the evacuation of residents.

The PVTA has participated in ongoing regional emergency drills and has also provided extensive emergency training for their staff. To make this training more widely available to first responders PVTA requested the PVPC to create 3 videos documenting response protocol. The three videos

involved: a simulation of a bus rollover, a simulation of a hostage situation on a bus, and a technical walkthrough of PVTA's newest Gillig buses, offering tips to first responder teams on how to access the bus and how to deal with systems during an emergency response.

3. Rail Security

Similar to rail service itself, rail security is usually defined by both passenger and freight rail services, separated into two parts: passenger rail and freight rail. Unlike air travel, neither passenger or freight rail transportation services lend themselves to the increased security measures utilized at airports. While each type of rail service has its own security concerns, they must not be separated because they often share the same track. Passenger rail stations are often located in densely populated areas, and freight rail transports nearly half of the nation's hazardous waste materials. As a result, the Pioneer Valley Metropolitan Planning Organization has continually integrated both passenger and freight rail security concerns into its regional planning efforts. Representatives from the region's rail providers are invited to participate in monthly Joint Transportation Committee meetings. In addition, all planning studies approved by the MPO include a rail component when appropriate.

a) Merrick-Memorial Neighborhood Redevelopment Plan

The Pioneer Valley Planning Commission in cooperation with the Town of West Springfield and a private consultant developed a redevelopment plan for the Merrick and Memorial sections of West Springfield. The West Springfield CSX Rail Yard has long dominated the physical landscape and functioned as the economic engine for the Merrick and Memorial neighborhoods. One component of this plan included an analysis of existing safety and security procedures at the CSX Rail Yard. This was prepared by Hatch Mott MacDonald, Inc., who conducted on-site day and nighttime inspections of the yard on August 18, 2004.

The West Springfield Rail Yard (QB-100) comprises a system of tracks primarily for the purposes of making up trains and storing rail cars. The northern portion of the yard contains transportation facilities that support CSXI and other industrial uses. Because of the commodities they transport, intermodal train cars have a potential risk of being targeted for theft and vandalism.

CSXT maintains working partnerships with the fire, police and emergency response personnel in the community, providing them with the Community Awareness Emergency Planning Guide to explain the steps required to handle railroad-based emergencies, should they occur. Approximately, 10 to 20 placarded Hazmat cars are routinely transported through the yard per day. They normally are turned around within 24-hours but do not sit in the rail yard for longer than 48 hours. Chemicals such as chlorine, styrene, propane, and liquefied petroleum gas are some of the types of chemicals that CSXT transports.

Trespassing by local residents within the rail yard and adjacent Connecticut River Bridge is frequently a security problem that involves theft and vandalism. Because of the hazardous materials, dangerous equipment, and unsafe settings found within the rail yard, this unhindered trespass is significant and needs to be addressed.

A series of safety and security improvements are recommended that address hazardous materials procedures, existing vulnerabilities, and overall security at the CSX Rail Yard so that security planning may be implemented in advance of an incident, rather than in response to an incident as mitigation. It is expected that these improvements will be implemented by CSX. These improvements include:

- Installing physical barriers;
- Installing and securing access gates at portals;
- Installing a closed circuit television system;

- Posting conspicuously located signage;
- Establishing surveillance patrols utilizing two-way radio communications building in sensors; and,
- Implementing local sensors, alarms and detectors using localized audible/visual alerts/ deterrents.

B. IMPROVING REGIONAL SECURITY

Although the region has made great strides in identifying and addressing potential threats to transportation security, additional deficiencies remain that must be addressed. The following sections summarize the regional needs and strategies that should be considered by the Pioneer Valley MPO to increase transportation security in the region.

A key component of homeland security is the ability to work with federal, regional, local, and private partners to identify the critical infrastructure that is at the greatest risk and take the necessary steps to mitigate these risks. This begins through the identification of our critical links in the transportation infrastructure and the agencies responsible for the maintenance and security of these areas. This is an ongoing process that is defined in the State Homeland Security Strategy (SHSS) for the Commonwealth of Massachusetts. The following needs have been identified as part of the SHSS.

- Continue to establish a prioritized list of potential targets and potential methodologies of attack.

- Share target lists with key officials.

- Identify conditions that may facilitate the ability of a terrorist to carry out an attack.

- Disseminate important information to key entities and support the development and implementation of risk mitigation efforts.

- Develop and track defined performance metrics that will allow for performance based management of risk mitigation efforts.

To this end, the PVPC, in cooperation with the Berkshire Regional Planning Agency and the Franklin Regional Council of Governments, is currently working on the development of a cohesive regional evacuation plan for the Western Massachusetts region. At a minimum, it is anticipated this plan will:

- Identify evacuation plans, their coverage area, and outstanding recommendations that may need to be addressed in order to fully implement the plan.

- Identify any potential conflicts between existing evacuations plans that may have similar impact areas.

- Identify plans that could potentially be updated in the near future.

- Develop a series of recommendations to enhance evacuation planning efforts, improve regional infrastructure, and employ the most current technology (i.e. the I-91 ITS system).

CHAPTER 6

CONGESTION

A. 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.

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.

1. 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 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 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.

- Develop congestion management objectives;
- Identify areas of application;
- Define system or network of interest;
- Develop performance measures;
- Institute system performance monitoring plan;
- Identify and evaluate strategies;
- Implement selected strategies and manage transportation system;
- **Monitor strategy effectiveness**.

2. CMP Development Process

The CMP 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:

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

3. 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. Performance measures included in the CMP are summarized in Table 6-1. The status of each performance measure is based on the availability of existing data. Ongoing performance measures have data which is currently collected by the PVPC or available from partner agencies. Immediate performance measure data is not currently available but is anticipated to be available in the near future. Future performance measure data is also not available but is highly desirable for use in future CMP activities.

Table 6-1 - CMP 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
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
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 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

4. 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.

5. CMP Corridors

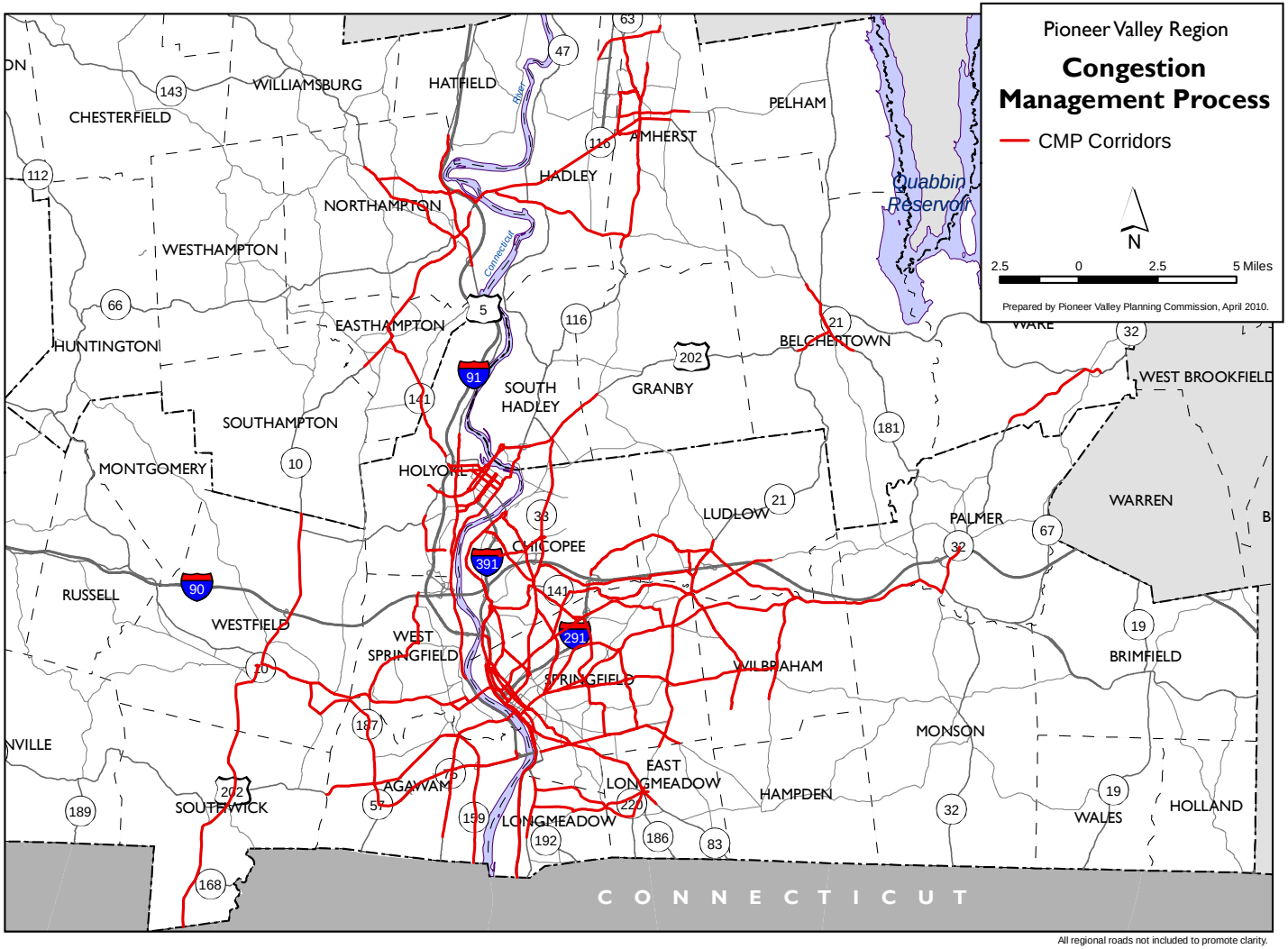
The CMP corridors are the basis for all data collection and analysis. When developing the corridors, PVPC staff utilized data and results from previous CMP reports, past congestion relief studies, and general knowledge of the region. This information was used to develop the CMP corridor map of 76 unique corridors that are presented in Figure 6-1.

It is difficult to ensure that every congested roadway in the region is being monitored. While CMP activities are both interactive and comprehensive, the availability of resources and data guides the assessment of congestion in the region. 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.

a) Travel Time Data Collection

Travel time data collection on the 76 CMP 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.

Figure 6-1 - CMP Corridors



B. 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.

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

1. Methodology

Currently, there are a total of 57 CMP corridors with available travel time data. Travel time data for each CMP corridor was ranked based on the inverse value of each of the travel time performance measures. 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. This total was added to the number of high crash locations, structurally deficient bridges and functionally obsolete bridges along each of the CMP corridors. Additional information on the six performance measures currently used in the Regional Congestion Severity formula is provided below.

- **Travel Time Index** is the ratio of the 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.

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

- **Travel Time Congestion Ratio** is defined as the second worst travel time divided by the second best travel time.

- **High Crash Locations** as defined 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 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.

- **Structurally deficient and functionally obsolete bridges** occasionally require vehicles to travel alternate routes, create bottlenecks due to lane elimination or lack of exclusive turning lanes, and influence driver confidence resulting in deceleration. Each structurally deficient bridge and functionally obsolete bridge located within a corridor was multiplied by the value of 3 and 2 respectively.

2. 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 to the least congestion. For analytical and evaluative purposes, four descriptive levels of congestion were created. 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. Each Level is explained below.

a) 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.

b) 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.

c) 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.

d) 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.

The results of the Regional Congestion Severity formula are summarized in Tables 6-2 – 6-5 and Figure 6-2. The regional congestion severity rank, 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 6-2- Corridors with Severe Congestion

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

Table 6-3- Corridors with Serious Congestion

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

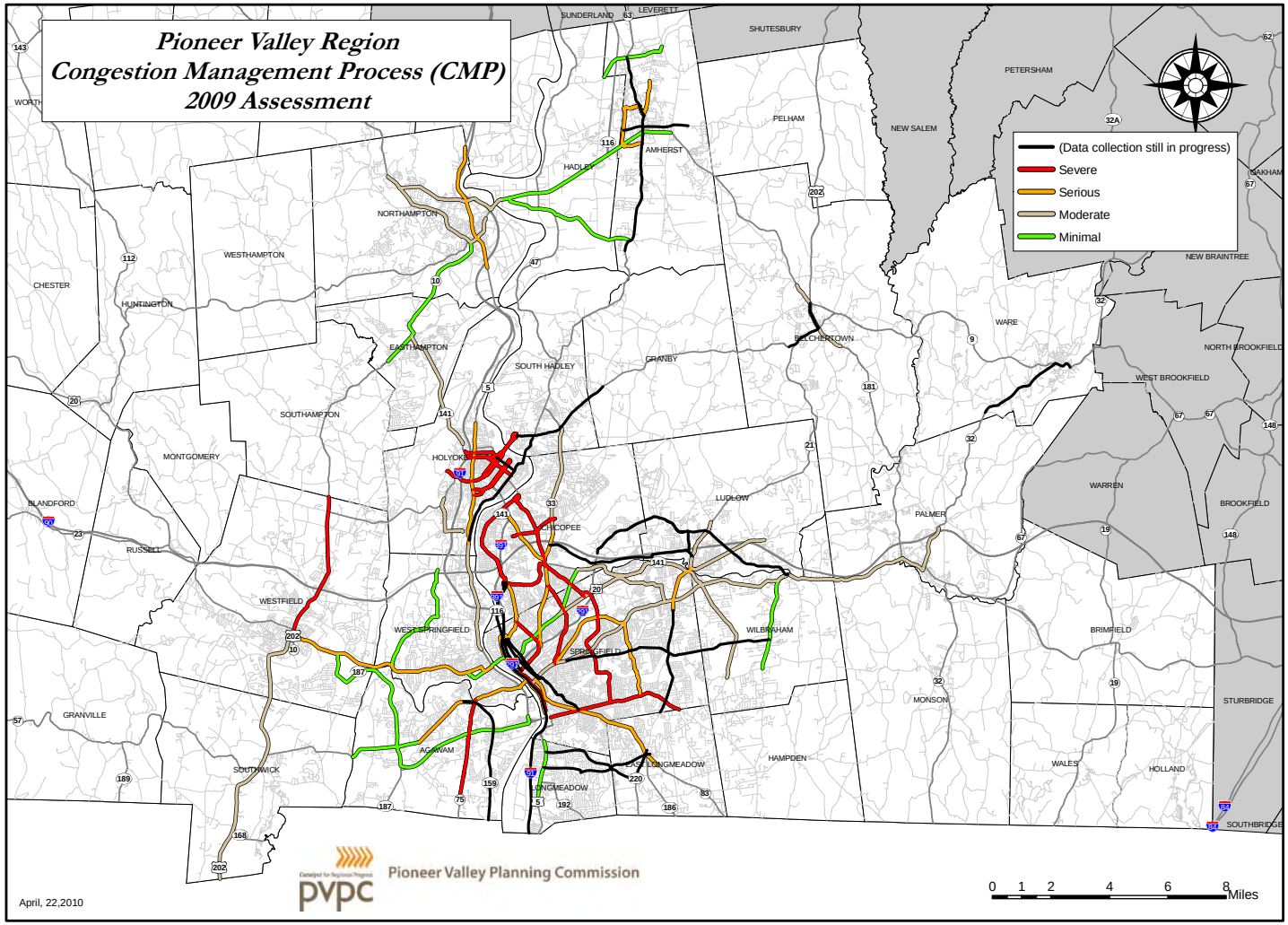
Table 6-4- Corridors with Moderate Congestion

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

Table 6-5- Corridors with Minimal Congestion

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

Figure 6-2- Congested Corridors in the Pioneer Valley



C. PIONEER VALLEY REGION BOTTLENECKS

1. Introduction

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

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

2. Analysis

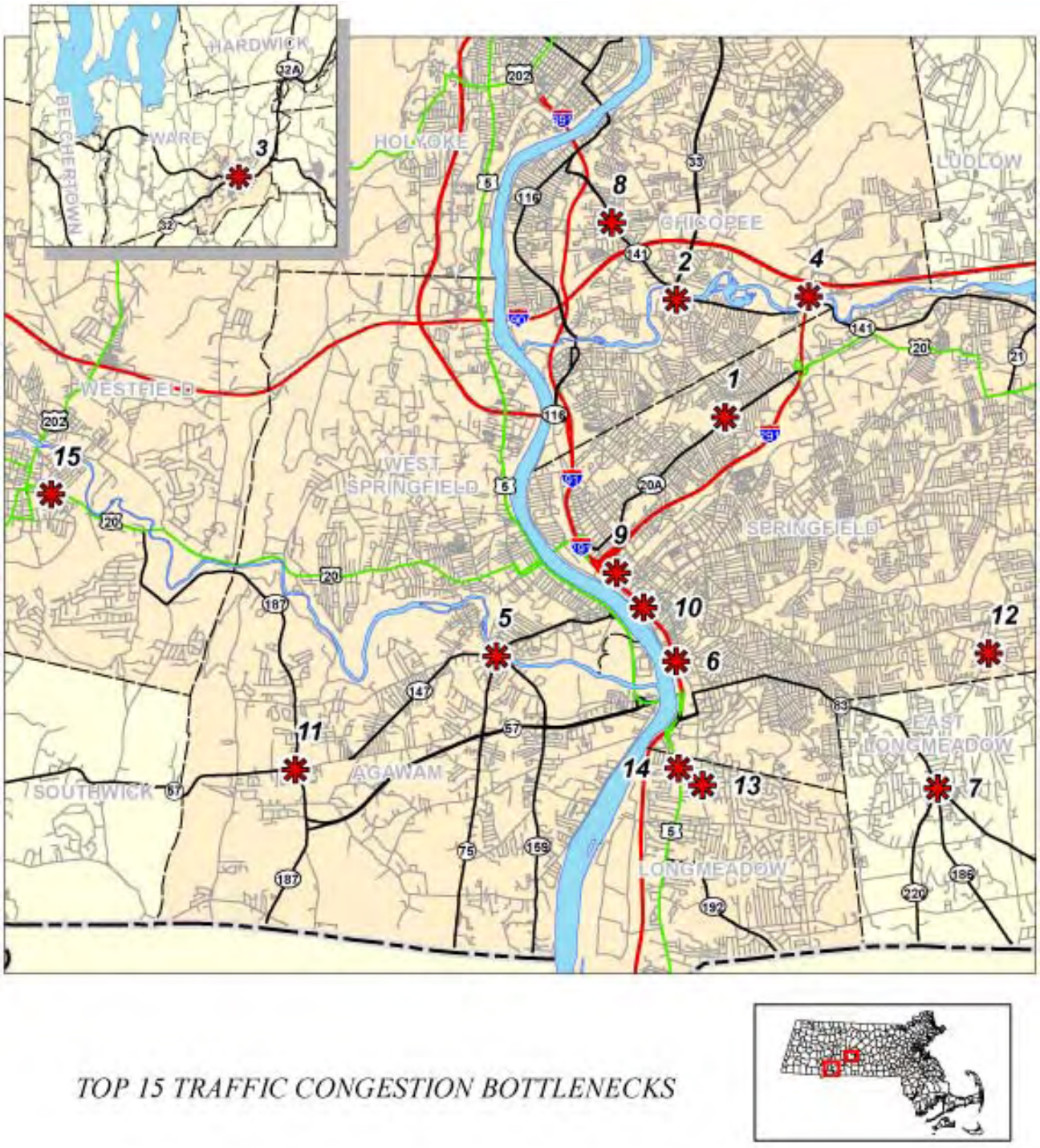
Each roadway segment was ranked based on the inverse value of each of the travel time performance measures. Currently, there are a total of 338 roadway segments with travel time data available. The ranking scheme ranges from 1 to 338 with a value of 338 indicating the highest level of congestion and 1 indicating the lowest level of congestion. For segments that had the same rank, priority was given to the corridor with the higher Travel Time Index. PVPC used this process to identify the top 15 congested segments in the region to identify the top bottlenecks in the Pioneer Valley Region. The results of the analysis are presented in Table 6-6 and Figure 6-3.

Table 6-6- Congestion Bottlenecks in the Pioneer Valley Region

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

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

Figure 6-3- Congestion Bottlenecks in the Pioneer Valley Region



CHAPTER 7

PAVEMENT

A. PAVEMENT MANAGEMENT SYSTEM

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 a serviceable condition. The role of PMS is to provide an opportunity to improve roadway conditions and make cost-effective decisions on maintenance priorities and schedules.

B. REGIONAL EFFORTS AND PROCESS

The Pioneer Valley Planning Commission's (PVPC) 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 Pioneer Valley region covers approximately 1,200 square miles, roughly the same size as the state of Rhode Island. The roadway network covered by the regional PMS includes all urban and rural Federal-Aid highways of the 43 cities and towns in the region. The Pioneer Valley region consists of approximately 1,400 miles of Federal-Aid eligible roadways. In October 2009, the Federal Highway Administration (FHWA) mandated that the Regional Planning Agencies (RPA) undertake a study to establish the cost of maintaining the Federal-Aid roadways that makeup their regions with the expectation that the results of these studies will be incorporated in the 2012 update of the Regional Transportation Plan. The PVPC's regional PMS efforts have been ongoing since 1995 at which time the RPAs were complying with the requirements of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. In an effort to comply with the 2009 federal mandate, the PVPC accelerated the regional PMS efforts starting in the spring of 2010. Staff collected and analyzed pavement distress data for all 43 cities and towns in the Pioneer Valley Region.

The PVPC utilizes the prepackaged Pavement Management software program "The PAVEMENT*View*" developed by Cartegraph Systems. The PAVEMENT*View* uses a Road Condition Index (RCI) as a measurement of roadway serviceability and as a method to establish performance criteria. Since the PVPC only collects pavement distress information, the Overall Condition Index (OCI) produced by PAVEMENT*View* was used for analysis purposes.

An OCI was generated for each inventoried roadway segment in the region using the pavement distress data collected by the PVPC staff. Deduct values assigned to each type of distress based on severity and extent, were applied to generate an OCI for each roadway segment. OCI is measured from 0 to 100, with 100 being an excellent or perfect condition and zero being failure or impassable condition. The OCI values generated are grouped into OCI category ranges which are defined by the user depending on the type and functional class of each segment. These OCI categories along with other factors, such as a Base Index, Average Curb Reveal, Functional Class and Pavement Type are used to assign a Repair Strategy for each of the defined segments.

The PVPC incorporates 6 default repair categories:

(i) Reconstruction of Collectors and Arterials

(ii) Reconstruction of Local Roads (not used in regional efforts)

(iii) Rehabilitation

(iv) Preventive maintenance

(v) Routine maintenance

(vi) No action

Reconstruction involves the complete removal and replacement of a failed pavement section which includes reclamation. For the most part, the cost per square yard differs for local roads as opposed to collectors and arterials. The rehabilitation of pavements includes the work necessary to restore the pavement to a condition that will allow it to perform satisfactorily for several years. Preventative maintenance activities are those which are performed at planned intervals to protect and seal the pavement. Routine maintenance activities are those which are taken to correct a specific pavement failure or area distress.

The following summarizes the findings of the region's surveyed federal-aid eligible roadways and recommends appropriate maintenance activities. A documented guideline of project priority, cost and recommended maintenance activity may be produced in a systematic and coordinated manner for the entire region. Project level analysis is conducted and highway maintenance projects are developed, the results of which are an integral part of the RTP and Transportation Improvement Program (TIP).

1. Existing Conditions

The PVPC staff surveyed 1,288 miles of federal-aid eligible roadways in the Pioneer Valley region which was divided into 2,511 roadway segments. Pavement distress data was collected for the entire Surface Transportation Program (STP) roadway network and select National Highway System (NHS) roadways. The average OCI for the surveyed roadways in the region is rated at 78, which indicates that majority of the roadways are in a moderately good condition. The average OCI information by community is depicted in Table 7-1. The OCI generated by PAVEMENT*View* was also used to establish pavement condition categories of "Excellent", "Good", "Fair", "Poor", and "Failed" with OCI ranges provided in Table 7-2.

The results indicate that most of the region's surveyed federal-aid eligible roadways are in good condition. Figures 7-1 and 7-2 depict the region's pavement condition graphically by functional class. As shown, the region's arterial and collector roadways follow a similar pattern with regards to pavement condition. The region's surveyed federal-aid roadways consist of 473 miles of arterial and 815 miles of collector roadways. The percentages are 37% and 63% respectively.

Table 7-1 - Average OCI by Community

Community	Arterial Miles	Collector Miles	Fed Aid Miles	Average OCI
Agawam	24.56	25.09	49.65	66
Amherst	16.32	34.15	50.46	70
Belchertown	26.23	21.27	47.48	80
Blandford	8.56	8.41	16.97	68
Brimfield	11.58	13.26	25.14	83
Chester	8.058	0	8.06	84
Chesterfield	7.713	9.96	17.68	81
Chicopee	18.32	43.33	61.65	81
Cummington	12.95	8.05	21	71
East Longmeadow	8.43	23.304	31.75	73
Easthampton	4.25	25.723	29.97	68
Goshen	5.401	3.7058	9.1	71
Granby	7.7155	14.117	21.83	85
Granville	8.803	6.452	15.256	76
Hadley	17.996	21.439	39.44	85
Hampden	0	12.65	12.65	84
Hatfield	0	14.687	14.69	83
Holland	0	7.279	7.28	77
Holyoke	16.27	46.34	62.61	82
Huntington	11.227	4.846	16.07	72
Longmeadow	3.26	15.96	19.22	61
Ludlow	24.46	9.689	34.1	83
Monson	8.64	25.484	34.13	83
Montgomery	0	5.197	5.2	83
Northampton	50.812	15.696	66.5	73
Palmer	16.603	30.572	47.17	87
Pelham	5.795	10.155	15.95	71
Plainfield	0	11.893	11.89	74
Russell	9.45	5.084	14.54	78
South Hadley	15.39	13.84	29.23	74
Southampton	0	17.17	17.17	88
Southwick	14.14	20.34	34.48	77
Springfield	117.42	42.7	160.12	78
Tolland	5.66	0	5.66	77
Wales	0	9.66	9.66	73
Ware	13.36	19.77	33.13	85
West Springfield	4.55	26.21	30.76	72
Westfield	19.15	49.39	68.54	78
Westhampton	0	21.08	21.08	71
Wilbraham	5.79	28.22	34.02	85
Williamsburg	7.87	11.2	19.07	74
Worthington	11.07	6.76	17.83	84
			Average OCI	**77.6**

Table 7-2 - Pavement Condition Range by Functional Class

	Excellent	Good	Fair	Poor	Failed
Arterial	>89.5	>69.5 and <89.5	>48.5 and <69.5	>25.5 and <48.5	<26.5
Collector	>88.5	>68.5 and <88.5	>47.5 and <68.5	>23.5 and <47.5	<24.5

Figure 7-1 - Pavement Condition of the Region's Arterial Roadways

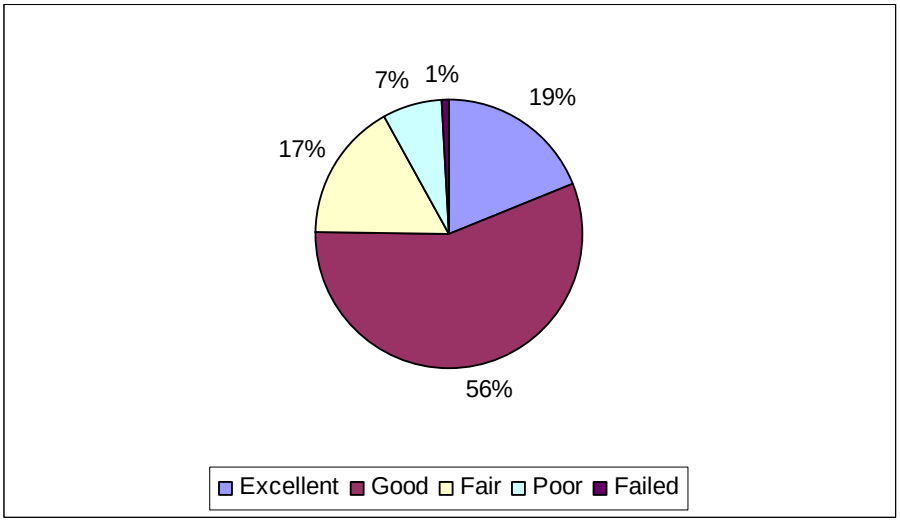
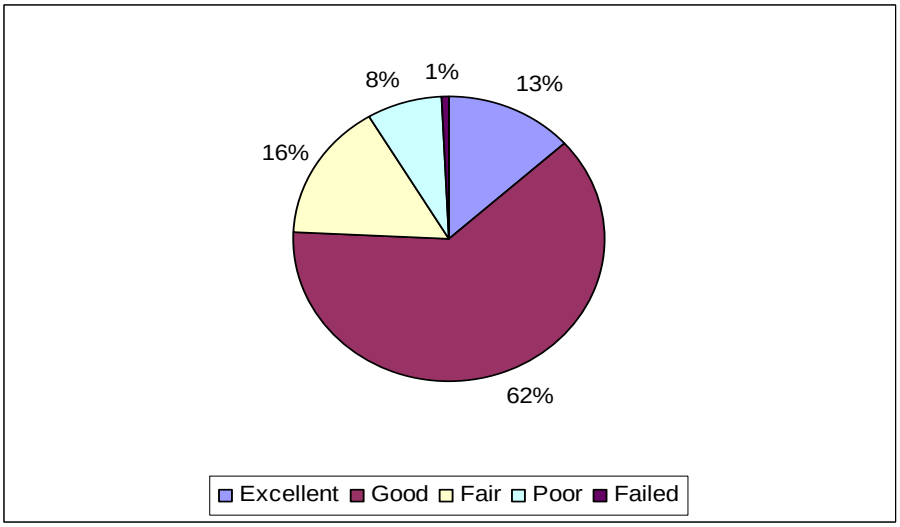


Figure 7-2 - Pavement Condition of the Region's Collector Roadways



2. Regional Roadway Improvement Needs

The budgeting process of the PAVEMENT*View* can be used to calculate the backlog of repair work for the region by assigning 100% of roadway segments within the best OCI range. The backlog is defined as the cost of bringing all roads up to a near perfect condition within one year.

The backlog represents how far behind the roadway network is in terms of its present physical condition and measures the cost of performing all desirable repairs to achieve the best OCI range. At the end of the year 2010 the backlog repair work for the Pioneer Valley Region was $134,403,254. This cost estimate is useful in identifying the pavement condition of the system at the end of the year 2010 and in comparing to future and/or past year's backlogs.

After the backlog of improvement needs have been determined, the recommended maintenance actions for roadway segments may be ranked by priority. The priority of segment improvement is determined based on its calculated Network Priority Ranking (NPR). NPR is a function of vehicle volume, roadway length, estimated life of repair, improvement cost, and OCI, and it is a measurement of the benefit/cost ratio for each segment improvement recommendation. NPR is used to rank roadway projects based on a priority scale. The projects with a higher NPR are assigned a higher priority and projects with a lower NPR are assigned a lower priority. The higher the NPR, the higher the project priority. The roadway segments with the same NPR are assigned the same priority ranking, and segments with no NPR are not assigned a priority ranking.

Table 7-3 summarizes the region's backlog of Federal-Aid eligible roadway repair work by community. The table also provides information on how far behind each community is as far as backlogs of reconstruction and resurfacing work are concerned. It is important to note that reconstruction and resurfacing needs of the region are quite similar in cost. Almost a third of the region’s backlog of repairs is claimed by the rural area, with Westhampton and Williamsburg carrying most of the burden.

Table 7-3 - Backlog of Repair Work by Community

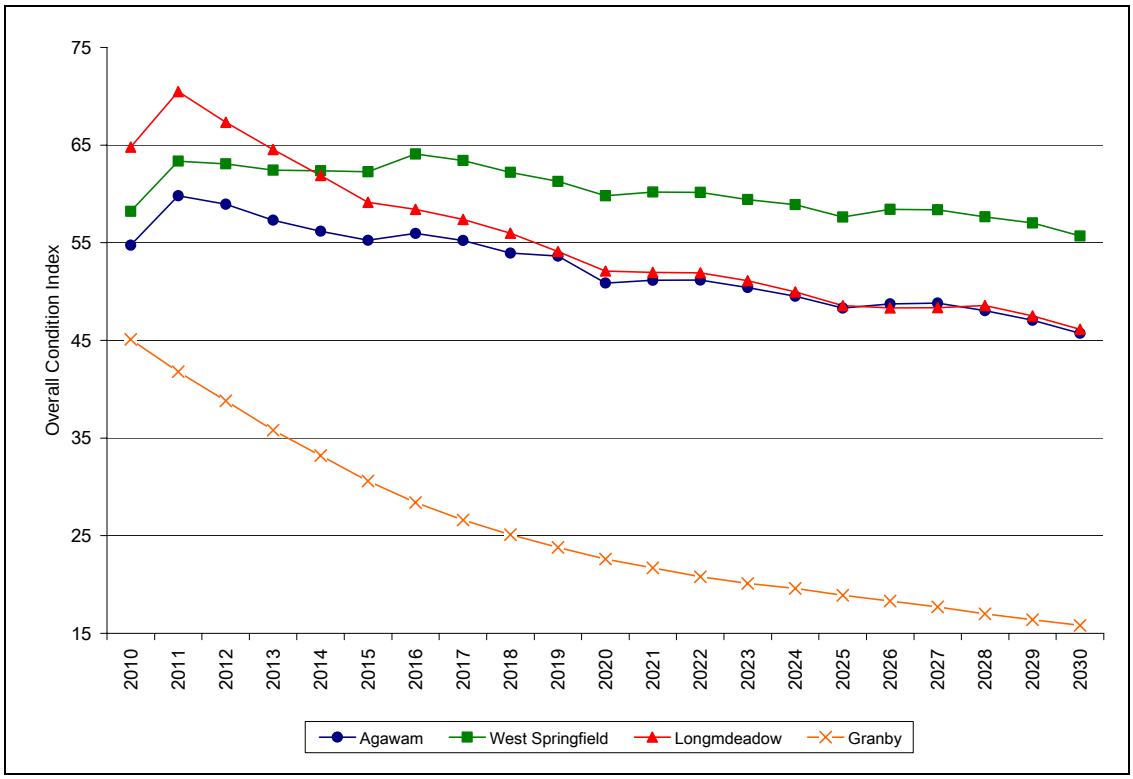
Community	Backlog	Reconstruction	Resurfacing	Average OCI
Agawam	$11,739,449.00	$2,425,844.00	$6,797,590.00	66
Amherst	$7,159,310.00	$1,210,123.00	$3,781,880.00	70
Belchertown	$2,272,828.00	$0.00	$1,306,193.00	80
Blandford	$2,202,833.00	$1,522,460.00	$115,664.00	68
Brimfield	$1,954,459.00	$0.00	$1,695,799.00	83
Chester	$103,172.00	$0.00	$0.00	84
Chesterfield	$189,452.00	$0.00	$0.00	81
Chicopee	$5,341,051.00	$1,632,146.00	$697,880.00	81
Cummington	$1,685,082.00	$0.00	$940,469.00	71
East Longmeadow	$4,157,136.00	$154,539.00	$2,055,656.00	73
Easthampton	$5,133,550.00	$1,000,955.00	$2,357,653.00	68
Goshen	$824,652.00	$0.00	$0.00	71
Granby	$483,171.00	$0.00	$288,340.00	85
Granville	$408,334.00	$0.00	$0.00	76
Hadley	$1,044,712.00	$0.00	$0.00	85
Hampden	$157,351.00	$0.00	$0.00	84
Hatfield	$734,532.00	$0.00	$34,532.00	83
Holland	$327,745.00	$0.00	$0.00	77
Holyoke	$2,487,747.00	$0.00	$349,819.00	82
Huntington	$927,743.00	$0.00	$671,051.00	72
Longmeadow	$6,306,051.00	$2,330,335.00	$3,274,126.00	61
Ludlow	$1,677,992.00	$0.00	$460,026.00	83
Monson	$1,503,192.00	$0.00	$81,455.00	83
Montgomery	$63,724.00	$0.00	$0.00	83
Northampton	$10,064,335.00	$2,165,788.00	$5,526,351.00	73
Palmer	$1,233,041.00	$0.00	$294,470.00	87
Pelham	$1,394,442.00	$0.00	$1,246,442.00	71
Plainfield	$744,790.00	$0.00	$538,980.00	74
Russell	$640,382.00	$0.00	$0.00	78
South Hadley	$4,734,456.00	$299,611.00	$2,587,814.00	74
Southampton	$161,373.00	$0.00	$0.00	88
Southwick	$3,413,098.00	$0.00	$2,413,172.00	77
Springfield	$13,203,196.00	$817,650.00	$4,544,126.00	78
Tolland	$349,425.00	$0.00	$0.00	77
Wales	$520,101.00	$0.00	$0.00	73
Ware	$1,175,447.00	$0.00	$0.00	85
West Springfield	$5,780,714.00	$1,317,184.00	$1,926,059.00	72
Westfield	$3,171,870.00	$323,172.00	$896,929.00	78
Westhampton	$15,368,747.00	$15,368,747.00	$0.00	71
Wilbraham	$438,182.00	$0.00	$0.00	85
Williamsburg	$12,881,174.00	$12,881,174.00	$0.00	74
Worthington	$243,213.00	$0.00	$0.00	84
Total	$134,403,254.00	$43,449,728.00	$44,882,476.00	**77.6**

3. Local Needs

During the past several years a number of political, social, and economic trends have influenced the form and substance of local highway maintenance practices. Significant among them is the increasing pressure of fiscal austerity on local resources, specifically constraints on local tax revenues, which make it difficult for the local highway superintendent or engineer to adequately meet the maintenance needs of roads in the community.

The cost increase in infrastructure, the loss of revenue, and the need for more Chapter 90 funds are common concerns of local communities in the region. It is imperative that local DPW staff be encouraged to communicate with their chief elected officials and other political figures as this may give cities and towns a better chance to secure more roadway improvement funds for the purpose of maintaining pavement in a serviceable condition. The state's Chapter 90 allocation has been level funded since the middle of 1990s. In this situation, the allocated budget for roadway maintenance is, for the most part, insufficient to obtain overall future roadway condition performance levels which are equal to or better than the present. Figure 7-3 illustrates the effect on the future OCI as local communities continue to operate under anticipated funding levels.

Figure 7-3 - Projected Overall Pavement Condition Index at Level Funding



The data shows a clear downward trend over time. With material cost increase and the potential impact of reductions in roadway improvement spending, the condition of roads will continue to deteriorate. This decline in the average OCI level is the result of the improvement rate being offset by the roadway deterioration rate. Also, the amount of needed repairs (backlog) increases as the average OCI declines.

CHAPTER 8

SUSTAINABILITY

A. MASSDOT/GREENDOT

The purpose of a Regional Transportation Plan (RTP) is to define an overarching vision of the future of the region, establish principles and policies that will lead to the achievement of that vision, and allocate projected revenue to transportation programs and projects that reflect those principles and policies. MassDOT has articulated the following 10 themes to guide transportation work in the Commonwealth

(i) Improve transportation system reliability

(ii) Focus more attention on maintaining our transportation system

(iii) Design transportation systems better

(iv) Encourage shared use of infrastructure

(v) Increase capacity by expanding existing facilities and services

(vi) Create a more user-friendly transportation system

(vii) Broaden the transportation system to serve more people

(viii) Provide adequate transportation funding and collect revenue equitably

(ix) Minimize environmental impacts

(x) Improve access to our transportation system

In addition, MassDOT has elaborated a Green DOT Vision:

"The Massachusetts Department of Transportation will be a national leader in promoting sustainability in the transportation sector. Through the full range of our activities, from strategic planning to construction and system operations, MassDOT will promote sustainable economic development, protect the natural environment, and enhance the quality of life for all of the Commonwealth's residents and visitors. This will enable MassDOT to use resources in a manner that serves its existing customers while preserving our resources for future generations."

MassDOT instituted this policy to assure a coordinated approach to sustainability and to integrate sustainability into responsibilities and decision-making of all MassDOT employees. The following three mutually-reinforcing goals form the foundation of GreenDOT:

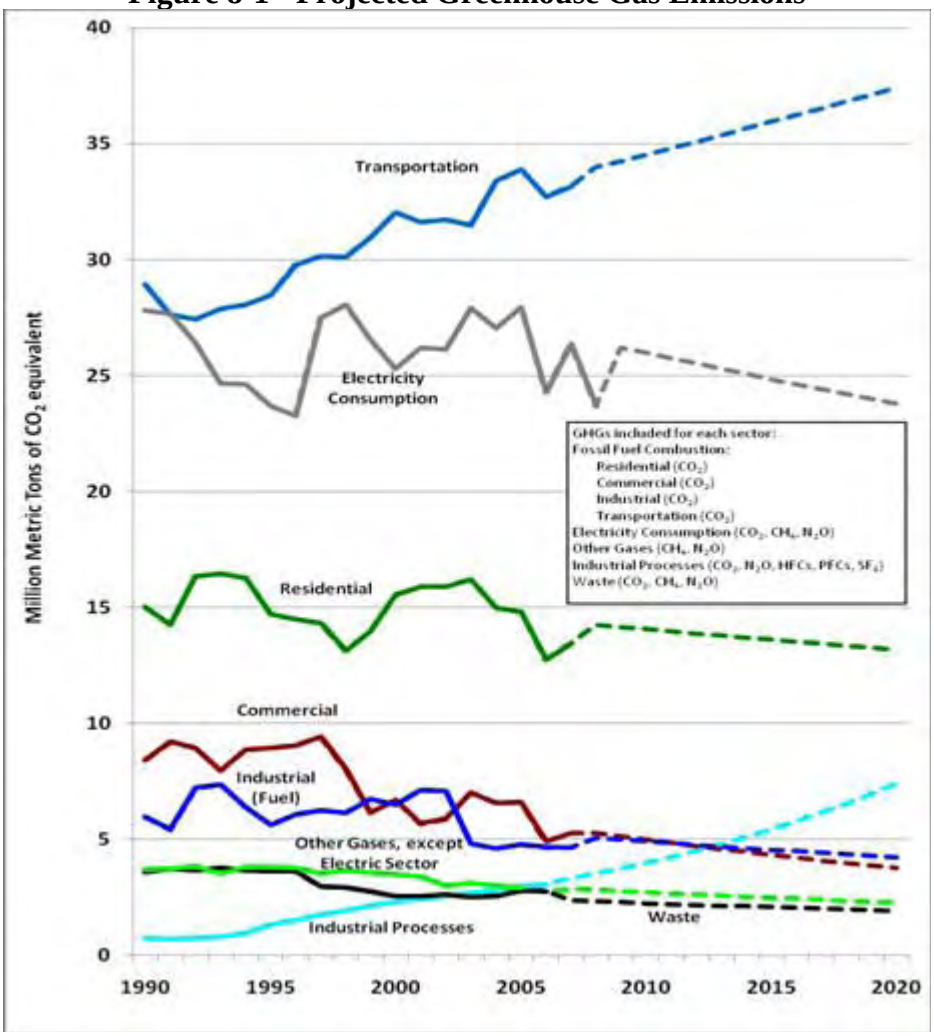
(i) Reduce greenhouse gas (GHG) emissions

(ii) Promote the healthy transportation modes of walking, bicycling, and public transit

(iii) Support smart growth development

The initiative is a comprehensive response to a range of state and MassDOT laws, policies and initiatives including: the Global Warming Solutions Act, the Green Communities Act, the Healthy Transportation Compact, Leading by Example, YouMoveMassachusetts, and Complete Streets. The Global Warming Solutions Act requires Massachusetts to reduce economy-wide GHG emissions: 10% -25% below 1990 levels by 2020 and an 80% reduction below 1990 levels by 2050. The transportation sector is largest GHG emitter, producing 31% of 1990 emissions and projected to produce 38% of 2020 emissions.

Figure 8-1 - Projected Greenhouse Gas Emissions



B. EXISTING CONDITIONS

There are many ways to assess existing conditions pertaining to sustainability and transportation. The Pioneer Valley Planning Commission (PVPC) affirms the United Nations Bruntland Commission's definition of sustainable development as development that meets the needs of the present generation without jeopardizing the ability of future generations to meet their own needs. Applied to transportation this means keeping people and goods moving safely and efficiently throughout the Pioneer Valley by planning, designing, building and maintaining a balanced interconnected transportation system that includes sidewalks, on and off road bike ways, rail, airports, and miles of paved and unpaved roadways, while minimizing negative impacts on the region's air, land, water and people.

In the Pioneer Valley we have 80 miles of bicycle paths as well as 44 fixed transit routes with an estimated 15,000 to 20,000 regular riders. In 2009, the regional VMT was 15,232,000 miles. Many of our communities are not well served by transit, nor are they bicycle or pedestrian friendly. Only now, after many years of advocacy from public and private coalitions, is the region looking forward to the arrival of improved commuter rail service.

At the same time, as our transportation system is not yet a well-balanced system accommodating multiple modes of users, it is also having a very negative effect on our environment: air, water, land and plants, and on our people. From 1987 to 2002 our region lost 20.6 percent of our farmland. Our region is classified as "serious" for non-attainment air quality. We also have serious water pollution problems in our rivers, streams and underground aquifers.

Many of these negative conditions that are diminishing the quality of life in the Pioneer Valley are directly or indirectly caused or exacerbated by our transportation system and the vehicles that use it. Preliminary analyses of sources of the region's GHG emissions suggest that, like the rest of the Commonwealth, approximately one-third of our GHG emissions come from transportation. Run-off from paved surfaces, both roads and especially parking lots, is polluting our rivers and streams. The vast majority of people in the region are dependent on the automobile for transportation which has been linked to increases in human ill health (e.g. respiratory, obesity, heart problems and diabetes).

At the same time, the region depends on the transportation system. None of the 43 cities and towns in the region functions independently. Everyone who lives here moves from municipality to municipality to shop, work, go to school, visit family and friends, or for recreational purposes. People need to move about and the safe and efficient transportation system makes that possible, but it needs to be enhanced to expand transit, walking and bicycling infrastructure for all to use.

The Pioneer Valley Sustainability Network has identified 10 key indicators of sustainability. They are:

(i) Air quality

(ii) Water quality

(iii) Green House Gas Emissions (GHG)

(iv) Health status

(v) Voter registration

(vi) Recycling rate

(vii) Housing affordability

(viii) Graduation rate

(ix) Local food production

(x) Vehicle Miles Traveled

Arguably every one of these indicators is affected by transportation. Motorized vehicles consume fossil fuels to operate and necessarily produce exhaust and other GHG emissions from burning these dirty fuels. Transportation affects air quality. Roads are impervious surfaces across which water has to run before being absorbed into surface water bodies or the ground. Motorized vehicles require impervious surfaces, which pollute ground water, as well as surface water sources. As noted above, the transportation sector is Massachusetts largest GHG emitter, producing 31% of 1990 emissions and projected to produce 38% of 2020 emissions. Polluted air and water and global warming caused by dramatic increases in GHG emissions in the last 10 years negatively affects humans. Transportation affects voter turnout by making it more or less easy to get to polls. Lack of transit services can hamper lower income people's ability to get to polls to participate in the democratic process. A balanced transportation system is more sustainable, as it meets more people's needs while using resources efficiently to make it more likely that future transportation systems will meet future generations' needs. Transportation doesn't have a very direct affect on recycling rate, but it certainly can affect housing affordability. Sprawl is the dominant form of housing development, and as a result homes are less affordable than in a region characterized by mixed use development. Local food production is not directly affected by transportation, although having the opportunity to produce local food can minimize transportation of food from outside the region to feed residents. The last sustainability indicator, VMT, is the cornerstone measurement of a sustainable transportation system.

The goal of PVPC's sustainable transportation system is to consistently reduce VMT per population. Access to resource efficient transportation options, especially public transportation, can maximize social equity, increase social connectivity, maximize safety, and maximize resource efficiency. Public transit and ridesharing reduce vehicle numbers on the road. Transportation efficiency benefits society and reduces its impacts, which account for one-third of greenhouse gas emissions and 20-25% of average U.S. household expenditures.

Figure 8-2 - Annual Vehicle Miles

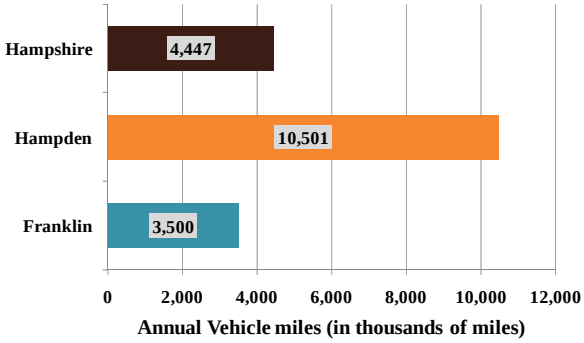
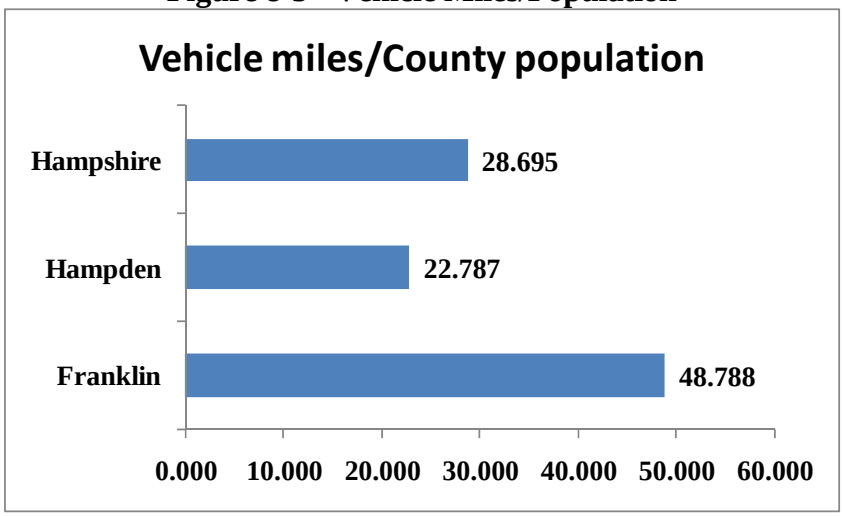


Figure 8-3 - Vehicle Miles/Population

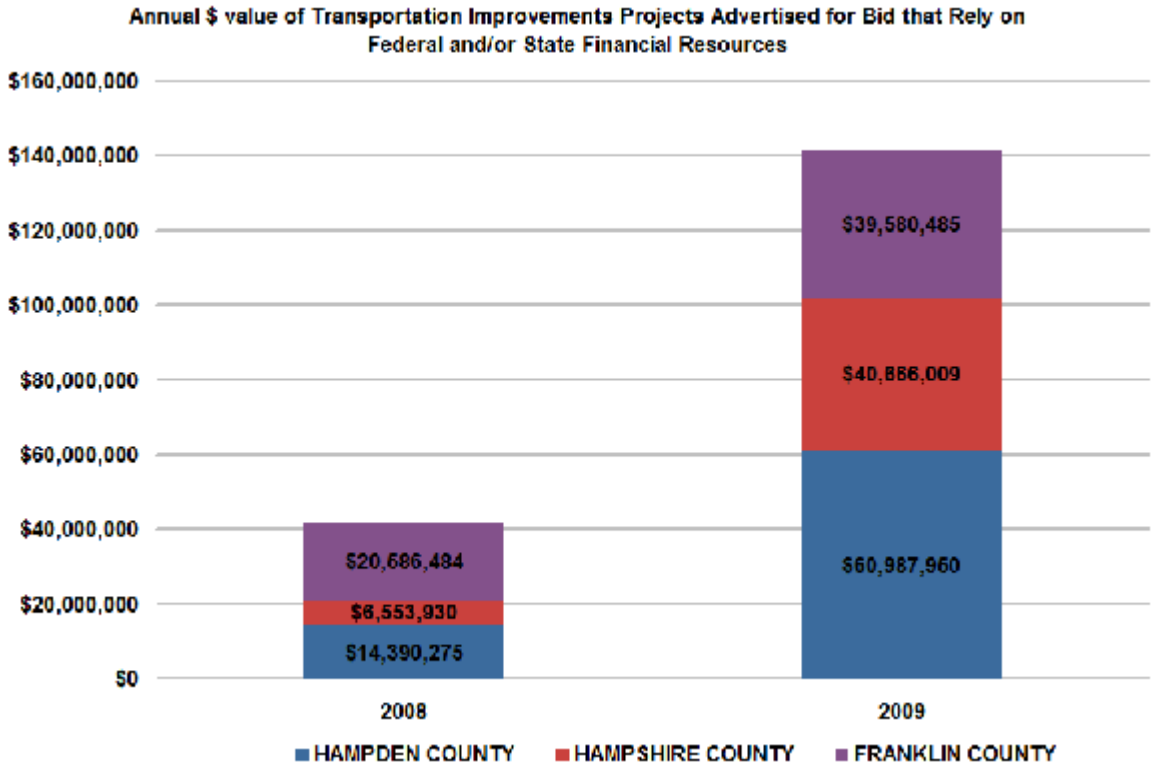


In addition to the Pioneer Valley Sustainability Network's indicators of sustainability, the Pioneer Valley Planning Commission has identified a number of indicators to assess the overall state of the region. One of the measures tracked is the annual dollar value of transportation improvement projects advertised for bid that rely on federal and/or state financial resources. As a result of the American Reinvestment and Recovery Act (ARRA), the region has received a significantly greater investment of transportation funds in 2009 than in 2008.

Transportation Improvement Projects included in this value are highway improvement projects identified through the Transportation Improvement Program report by the Pioneer Valley Planning Commission and Franklin Regional Council of Governments, and advertised by MassDOT. Between 2008 and 2009, the total value of transportation improvement projects advertised for the Pioneer Valley increased from $41,530,689 to $141,234,444, representing a 240.1% change. All three counties experienced significant increases. Franklin County saw an increase of 92.3%, Hampshire a 520.5%

increase, and Hampden a 323.8% increase. The significant increase in the total value of transportation improvement projects in the Pioneer Valley region is a result of federal funds directed through the American Reinvestment and Recovery Act money. It is unlikely that the region will be able to sustain this level of transportation investment, but certainly desirable.

Figure 8-4 - TIP Project Value



Data Source: Pioneer Valley Planning Commission and Franklin Regional Council of Governments

C. ENHANCING SUSTAINABILITY

Many transportation initiatives are underway to enhance sustainability. The top priority new initiatives are:

1. Stable funding

A goal of PVPC's sustainable transportation system is to have a stable source of funding for transportation projects that is removed from political squabbles and that reflects the true cost of different transportation options. The region would like more government and private financial support for a wide range of measures that will achieve greater sustainability. These include reduction of impervious surfaces, and improved accessibility provided by transit.

The financial sustainability of the regional transportation system needs to be part of an overall regional sustainability strategy; in particular, funding for the backlog of transportation projects in the region needs to be addressed.

We suggest the need to investigate the viability of alternative funding strategies for roadway projects, such as: 1) charging everyone who drives in the region a fee for driving in the region, 2) surcharges for drivers who exceed an agreed upon annual VMT limit. Our goal is to ensure revenue that is commensurate with maintenance needs and to discourage single occupancy vehicle travel.

a) Promoting Smart Growth and Climate Action

Transportation planning needs to place greater emphasis on land use and development patterns; more concentrated development should be encouraged in urban areas and suburban development should be deemphasized. The goal should be to reduce the conversion of open land to development and make it easier and more attractive to develop underutilized urban land through improved transportation accessibility—especially transit.

Transit oriented development (TOD) should be planned regionally over the long-term and consideration of innovative financing, such as TOD land banks, should be explored. Transit oriented development can simultaneously improve both housing and transportation in urban areas. There also needs to be more express bus routes and park and ride lots to help reduce single occupancy vehicle trips. The RTP should encourage the adoption of more mixed use zoning and land uses to help achieve higher densities in areas that are already built and served by transit.

In addition, green house gas (GHG) monitoring and reduction measures need to receive greater study and be incorporated in transportation planning. Transportation planning needs to address the issue of adaptation to climate change (rather than focus only on the mitigation of GHG emissions). One important example is the need to improve the capacity and number of stream crossings of roadways to reduce the number and frequency of washouts. Most Pioneer Valley municipalities have hazard mitigation plans that identify problem culverts and areas that consistently flood. These plans should be used to identify and prioritize funding for replacement of under-sized culverts with ecologically friendly infrastructure alternatives.

Federal Highway has identified four primary strategies to reduce GHG from transportation. They are:

(i) Improve System and Operational Efficiencies

(ii) Reduce Growth of Vehicle Miles Traveled (VMT)

(iii) Transition to Lower GHG Fuels

(iv) Improve Vehicle Technologies

These strategies should be integrated into the region's transportation planning activities. The strategies will help guide decisions by providing a framework to reduce GHG in the region. To be most effective, the region must pursue all four strategies together.

Every effort should be made to integrate the RTP with the state's Climate Change Mitigation Plan. All proposed and approved projects should demonstrate consistency with the recently implemented EOEEA GHG emissions reduction policy, even if the projects do not meet the threshold requirements of the GHG policy.

The allocation of Chapter 90 funds for local roadway repairs should be prioritized based on the density of population adjacent to the roadway and/or the usage of the road. The goal is to achieve the greatest benefit for the greatest number of drivers.

b) Ensuring Health and Safety

Health-related impacts of transportation projects, particularly those on environmental justice populations, need to receive greater consideration in transportation planning. The impacts of the aging population should receive greater consideration, as well as access to medical care and sources of healthy foods for all segments of the population. Both Springfield and Holyoke have been cited as "urban food deserts" where there are few supermarkets or grocery stores where fresh fruits and vegetables and unprocessed foods are available. Transportation planning needs to include measures and strategies to improve accessibility to healthy foods.

c) Avoided trips

Transportation planning needs to place greater emphasis on broadband internet service throughout the region to help more people work at home, which will also reduce single occupancy vehicle trips. As noted previously, western Massachusetts is still relatively under-served with respect to broadband internet access and this hampers people's ability to telecommute, shop on-line, and take classes on-line, making it more likely that they will need to drive to perform these functions of daily life.

d) Technology-Enhance Capacity of Existing Infrastructure

Intelligent transportation system (ITS) technologies need to be implemented to help existing transportation systems work more efficiently, rather than be expanded. This includes traffic congestion monitoring and transit schedule information as well as ride and car sharing programs linked to smart phones. Transportation planning needs to address and include electric charging infrastructure for electric-only vehicles that will be coming to market in 2011. This first free electric car chagrining station opened at Springfield Technical Community College in May of 2011. The use of highway medians and other transportation property for solar energy production should be studied. The use of recycled roadway materials should be encouraged on roadway projects carried out by MassDOT and municipal DPWs.

e) Complete Streets

The Complete Streets approach to roadway and street design should be incorporated in transportation projects in the region. This should include planting of trees on sidewalks, as the heat reduction benefits of urban foliage are significant. The RTP should offer a sample bylaw for requiring a tree canopy be retained wherever possible. Transportation planning needs to place greater emphasis on pedestrian facilities, both for people who choose to walk for their trips as well as people who walk to transit and park and ride lots for car/van pools. Integral to complete streets is the need to have each complete street connected to other complete streets within a community.

f) Land Use Policy

Road discontinuation, especially in rural areas of the region, is an opportunity to help municipalities reduce maintenance costs, as well as reduce approval not required ("ANR") residential development. Using the Congestion Management Process (CMP) to identify top priority projects based on congestion integrates the goal of reducing GHG emissions into planning because where there is congestion, there is excess GHG emissions.

g) Invest in Alternative Modes

Funding should be increased for greater PVTA bus operating frequencies and hours (especially Sunday service). Promote and encourage transportation centers, such as the Holyoke

Transportation Center and proposed Springfield Union Station, because they expand transit accessibility and connect the region to destinations outside the region.

h) Institutionalize sustainability and smart growth into decision-making process

Regional and municipal planners should strive to do more prioritization of the transportation assets in greatest need of maintenance, such as specific portions of roadway that would do the most damage if they were to fail, or areas with high numbers of wildlife collisions. Design guidelines for transportation projects should place greater emphasis on mitigating impacts to natural resources. The FEMA natural hazard resource map is one source of information for this type of prioritization.

The region will continue to monitor the progress of FHWA Self Evaluation Sustainable Highways Tool. It is currently in the pilot stage but a complete version is expected in the later half of 2012. The tool identifies characteristics of sustainable highways and provides best management practices to integrate sustainable techniques into roadway projects. Currently input from state and local transportation agencies and professional agencies such as American Association of State Highway and Transportation Officials (AASHTO) and American Society of Civil Engineers (ASCE) is being gathered to help refine the tool.

i) Education/Training

The PVPC should consider offering a briefing to incoming elected municipal officials on the overall regional transportation planning process and the development and evaluation of individual transportation projects.

D. REGIONAL SUSTAINABILITY PLANNING

The Pioneer Valley has actively incorporated sustainability planning practices to improve the regional quality of life. These projects improve livability of neighborhoods, provide alternate modes of transportations, and reduce environmental impacts. These projects typically enhance access for pedestrian, bicycle and transit use. Increased access to these alternative modes reduces individual's reliance on automobiles and can improve the local environment by using a cleaner and healthier mode of transportation.

While sustainability can be measured using a wide variety of indicators, the indicators used in Table 8-1 were chosen because they have a direct relationship to transportation planning practices. Each sustainability project has a relationship to one of the transportation sustainability indicators seen in Table 8-1. Each indicator has a correlating recommending agency: Federal Highway Administration (FHWA), MassDOT, or the PVSustain Network. The FHWA recommendations were formulated through information from "Context Sensitive Solutions: Integrating Sustainability and Climate Change Concerns and CSS Principle" and "Four Strategies to Reduce Green House Gases." MassDOT recommendations were formulated through "GreenDOT's Policy Directive." GreenDOT is MassDOT's sustainability initiative. Lastly, transportation related sustainability indicators were selected from the Pioneer Valley Sustainability Network. These three agencies were used to integrate federal, state and regional sustainability goals.

1. Bus System

The bus system is operated by the Pioneer Valley Transit Authority (PVTA) and is one of the primary mechanisms the Pioneer Valley possesses to attain greater sustainability. The system currently operates in 24 of the region's 43 communities and provides connection to academic institutions, major places of employment, shopping centers, and recreational areas. The transit system promotes regional

sustainability by reducing the number of vehicle trips, reducing emissions from fewer vehicle trips, promoting transportation options, and by providing connection to intermodal facilities.

The PVTA has pursued sustainability efforts from two perspectives: capital improvements and operational improvements. Capital improvements include improvements to the infrastructure of the system and the vehicles that operate on the system (e.g. bus replacement, facility improvement, and shelter maintenance). Operational improvements include efforts to make the system function more efficiently (e.g. ITS, traffic signal prioritization, and surveying).

Table 8-1 - Transportation Sustainability Indicators

Transportation Sustainability Indicators	Effect	Recommending Agency
Reduce VMT	Implementing land use strategies and transportation alternaitves that lessen the need to drive. Providing transit options, pedestrian and bicycle facilities, park and ride facilities, telecommuting and travel demand management programs.	FHWA (Context Sensitive Solutions, Strategy to Reduce GHG)
Reduced GHG Emissions	Reduce GHG emissions from transportation construction and operations. Reduced GHG would improve regional air quality as well as the health of the region's population.	FHWA, MassDOT, PVSustain
Improved Transit Accessibility	Investment in transit infrastructure to expand services to larger population and improve the system's ease of use.	MassDOT
Livability	Livability is about tying the quality and location of transportation facilities to broader opportunities such as access to good jobs, affordable housing, quality schools, and safe streets. This includes addressing safety and capacity issues on all roads through better planning and design, maximizing and expanding new technologies such as ITS and the use of quiet pavements, using Travel Demand Management approaches to system planning and operations, etc.	FHWA, GreenDOT (Smart Growth)
Promote Healthy Transportation Modes	Reducing automobile travel resulting from transportation investments that improve pedestrian, bicycle and public transit infrastructure and operation.	FHWA and MassDOT
Transition to Lower GHG Fuels	Replacing gasoline and diesel with fuels and systems which emit less GHG over the lifecycle.	FHWA, PVSustain
Water Quality	Water nourishes human communities, wildlife and the natural and built landscape. It contributes to aesthetic and recreational values that often translate into higher property values. Drinking water quality is a community and public health asset. Protecting water quality in our streams, ponds, lakes, rivers and aquifers is the focus of much regulatory policy at all levels of government.	PVSustain

a) Capital Improvements

(i) Intermodal Centers and Transportation Centers

The PVTA has actively pursued planning and construction efforts of intermodal and transportation centers within the region to improve connectivity and increase rider experience. These transportation centers enhance sustainability by improving transit access, increasing livability and promoting healthy transportation options.

Transit access is improved by providing hub points for passengers to transfer to intraregional bus routes and to intercity bus carriers. Rider experience is increased through the provision of amenities not typically associated with an outdoor bus stop. These constructed and proposed centers possess indoor waiting areas, bathrooms, customer service booth(s), and television monitors displaying schedule departures. The centers amenities make the system easier to use for riders.

(ii) Vehicle Improvements

Vehicle improvement is a direct method to impact system reliability and system energy requirements and can optimize a user's ability of the system. PVTA phases the replacement of their vehicles to limit capital expense each year. Bus emissions have improved as technology has improved. Newer buses produce less GHG's than their earlier counterparts. Replacement of vehicles is one of the most effective methods for PVTA to reduce their vehicle emissions. In fall 2011, PVTA will take delivery on 10 diesel-electric hybrid buses, bringing the total number of hybrid buses in the fleet to 11. PVTA continues to pursue grant funding opportunities for hybrid vehicles, including articulated buses with greater passenger carrying capacity.

(iii) PVTA Amenities

Bus system amenities can attract new riders who would otherwise travel using another mode. PVTA has bus shelters along many of the routes, and the majority of them have benches and trash cans. Shelters improve the accessibility of transit through protection of riders from weather such as rain and snow, and provide shade in the summer. PVTA is now installing solar-powered lighting at shelters and bus stops, as funds permit.

b) Operational Improvements

(i) Surveys

Surveys of the existing PVTA passengers and routes provide an opportunity to identify system deficiencies and barriers that customers face when using the service. Once challenges have been identified, measures can be implemented to improve the systems efficiency and ease of use. Removing barriers is important to generate new riders and retain current riders. In 2011, PVTA began planning for a systemwide study to improve operational efficiency of the entire bus system.

c) Intelligent Transportation Systems

An intelligent transportation system enables systems to operate more efficiently, saving resources and energy, and improving rider experience. These systems use high tech solutions to allow the system to communicate information instantaneously. This information improves the ability of transit operators to react to daily challenges and allows more in depth data on route usage. Passenger experience will improve, as bus arrival and departure times will be more easily attainable for customer service agents.

2. Bicycle Planning

The Pioneer Valley region possess high quality bike lanes and bike trails that connect people to neighborhoods, shopping, recreational areas, major places of employment, and schools. These trails and lanes allow users to travel safely and quickly to accomplish daily activities. The extensive network of bike lanes and the areas they serve makes the bicycle a viable transportation option in the Pioneer Valley region.

The network consists of on road bike lanes and off road bike trails. The on road bike lanes have pavement markings and are approximately 3.5 feet wide. Bike lanes must have the appropriate width to allow for safe and adequate spacing between automobile and bicycle. The majority of the regions off road bike trails are placed on top of old rail lines, the program is known as the rails to trails. The majority of the industry that utilized the rail system has left the Valley and provided an opportunity to expand alternate mode facilities.

a) Other Bicycle Planning Efforts

Bicycle planning efforts are also pursued through regular surveying and marketing. Surveying users of these trail systems provides an opportunity to identify system deficiencies and barriers individuals face when using the system. Once challenges have been identified measures can be implemented to improve the systems ease of use. Marketing efforts such as Bay State Bike Week promotes the use of bicycles. This week long initiative encourages people to use their bikes to complete their commuting, shopping, recreational and social trips.

3. Passenger and Freight Rail

The Pioneer Valley is served by both passenger and freight rail. Possessing these rail lines expands transportation options for traveling within the region and allows more environmentally friendly modes of transport for goods imported and exported. Springfield's Union Station is currently served by 11 trains daily providing extensive service in the northeastern U.S. and connections nationwide. Passenger Rail service is provided on both East-West routes and North-South Routes through the region. The Pioneer Valley has an additional station located in Amherst that is served by two trains per day. The region's major freight and intermodal yard is located in West Springfield (CSX). CSX is currently making significant infrastructure improvement to the West Springfield facility. The region is served by two class one shippers, Pan Am and Norfolk Southern. Goods are also transported by CSX Transportation, New England Central, Pioneer Valley Railroad and MassCentral Railroad.

4. HUD Grant

PVPC, in collaboration with the Capitol Region Council of Governments (CRCOG) in Hartford, was awarded a federal grant from the Department of Housing and Urban Development, (HUD) with an explicit goal of lessening the transportation and housing burden on the region's population via promotion of transit oriented development. Moving forward land use, housing, and transportation must be planned together to create a sustainable region. The two main goals of this collaboration are:

(i) To identify sustainable transportation strategies and projects for the Knowledge Corridor.

(ii) To advance Transit Oriented Development (TOD) that enhances transit services in the Pioneer Valley.

5. Land Use

The coordination of Land Use and Transportation Planning is an essential step in attaining sustainability opportunities for the region. The eight factors of Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) asserts the need for this coordination: "protect and enhance the environment, promote energy conservation, improve the quality of life, and

promote consistency between transportation improvements and State and local planned growth and economic development." Coordination provides opportunities for implemented sustainability practices from land use and transportation to support each other. Some of the most effective coordination efforts come from city and town master planning, transit oriented development districts, and creation of bike parking standards.

a) Master Planning

Master plans provide a vision for how a given municipality will grow, plan, and develop for the future. Incorporating sustainability into this process encourages towns to implement the concept into their standard practices. A number of municipalities in the region have or are currently updating their own master plans including: Easthampton, Granby, Ludlow, and Southampton.

b) Transit Oriented Development

Transit Oriented Development (TOD) promotes a balance of jobs and housing, and encourages the use of bus and other transit opportunities, while reducing single occupant vehicle trips and discouraging suburban sprawl. TOD attempts to limit sprawl, improve air quality, and provide access to goods, services and jobs in close proximity to residential areas. This is accomplished because TODs offer opportunities for mixed use development served by transit in higher density developments. TOD application is expected to increase as the use of rail becomes a more viable option for the region's population. The Knowledge Corridor rail line will have increased frequency of passenger cars and will connect to cities outside the region as well as providing connection between Springfield and Northampton.

6. Gravel Roads

Gravel roads require proper design, maintenance and repair to prevent erosion and sedimentation. Heavy storms produce rapid water velocities which increase the potential for soil erosion especially on and around gravel roads. Pollutants such as oil and grease can also be washed from gravel roads along with exposed soil, and fine sands and silts. These roads, by nature of their topography and design, can, if not properly managed, contribute heavily to this significant water pollution problem. These sediments and pollutants are then carried away into nearby streams and ponds. Sediment loading is a major cause of water quality problems in both lakes and streams.

E. DOCUMENTING GHG-EMISSIONS REDUCTION FOR GREENDOT IMPLEMENTATION

MassDOT, using its statewide travel demand model, has provided the Pioneer Valley MPO with statewide estimates of CO_2 emissions resulting from the collective list of all recommended projects in all the Massachusetts RTPs combined. Emissions are estimated in the same way as the criteria pollutants (volatile organic compounds, nitrogen oxides, and carbon monoxide) whose emissions are required for the air quality conformity determination (for further description, see Chapter 13). However, the CO_2 emissions shown here are part of an effort separate from the conformity analysis and are not part of those federal standards and reporting requirements.

The Global Warming Solutions Act (GWSA) legislation requires reductions by 2020 and further reductions by 2050, relative to the 1990 baseline. The project mix from this RTP (and all other RTPs) was modeled for both 2020 and 2035 using an Action (Build) vs. Baseline (No-Build) analysis to determine the CO_2 emissions attributed to the all MPO's mix of projects and smart-growth land use assumptions. The estimates of the modeled CO_2 emissions are provided below:

Table 8-2 - Massachusetts Statewide CO2 Emissions Estimates

(all emissions in tons per summer day)

Year	CO2 Action Emissions	CO2 Base Emissions	Difference (Action – Base)
2010	101,514.4	101,514.4	n/a
2020	105,747.5	105,856.4	-108.9
2035	115,034.1	115,028.0	6.1

As shown above, collectively, all the projects in the RTPs in the 2020 Action scenario provide a statewide reduction of nearly 109 tons of CO_2 per day compared to the base case. However, the 2035 Action scenario estimates an increase of about 6 tons of CO_2 emissions compared to the base case. It should be noted that this current analysis measures only projects that are included in the travel demand model. Many other types of projects that cannot be accounted for in the model (such as bicycle and pedestrian facilities, shuttle services, intersection improvements, etc.) will be further analyzed for CO_2 reductions in the next Transportation Improvement Program development cycle. This information will be updated and reported at that time.

Working closely with MassDOT, the Pioneer Valley MPO will continue to report on its actions to comply with the GWSA and to help meet the GHG reductions targets. As part of this activity, the MPO will provide further public information on the topic and will advocate for steps needed to accomplish the MPO's and state's goals for greenhouse gas reductions.

Table 8-2 - Relationship of Sustainable Transportation Projects to Indicators

Operational Improvements-Intelligent Transportation System		Reduce VMT	Reduce GHG Emissions	Improved Transit Accessibility	Livability	Promote Healthy Transportation Modes	Transition to Lower GHG	Water Quality
AVAIL	PVTA is currently integrating an ITS system into their bus fleet. Services and upgrades from this ITS project include: new vehicle radios, automatic vehicle location (AVL), ADA compliant audio and visual annunciation, enhanced vehicle equipment monitoring, automatic passenger counters, and farebox integration. This system should improve quality of information provided to PVTA and customers.				x	x		
Traffic Signal Premption	Traffic signal premption allows vehicles equipped with specific devices to receive green lights at intersections. PVTA buses that operate on the G-1 route have this device equipped. There is a proposal to expand use of this device to the B-43 route which operates on Route 9 from Amherst to Northampton.				x	x		
Operational Improvements-Surveys								
PVTA Northern Onboard Bus Rider Survey	In 2009, PVTA surveyed rider on the routes in Hampshire County, also known as the Northern Service area. These routes carried an average of 424,000 riders per month during the academic year. A total of 1442 bus riders completed surveys for the study.			x		x		
PVTA Southern Onboard Bus Survey	In 2008, PVTA surveyed rider on the routes in Hampden County, also known as the southern service area. These routes carried on average approximately a half million riders per month.			x		x		
G-1 and G-1 Express Survey	PVTA reviewed the Sumner Express (SE) and the Green 1(G1) to identify recommendations to increase customer service for the SE service. The SE was developed in partenership with the City of Springfield to serve the Bay State Medical and Mercy Medical Centers Campuses, as well as major employers in the downtown core. THe SE typically saves 10-15 minutes over the same trip on the G1.			x		x		
Mystery Rider Surveys	The mystery rider program was developed to monitor adheration to schedule and system regulations. Surveyors board PVTA buses unannounced and appear as regular customers. Surveyors would ride for a minimum of 15 minutes and upon completion of their trip would answer a series of written yes/no and five point scale questions. The goal of this surveying is to improve the consistency of the bus trip and to identify unsafe bus driver and passenger beahvior.			x		x		

Table 8-2 - Relationship of Sustainable Transportation Projects to Indicators (cont.)

Capital Improvements-Amenities		Reduce VMT	Reduce GHG Emissions	Improved Transit Accessibility	Livability	Promote Healthy Transportation Modes	Transition to Lower GHG	Water Quality
Bus Shelter Maintenance Plan	PVTA has implemented a maintenance plan for the bus shelters to optimize the shelters cleanliness and life span. The PVTA has 135 shelters throughout their service area.(2009-update)			x				
Wi-Fi on UMass Transit Buses	35 Umass Transit buses are equipped with Wi-Fi equipment. This allows riders to access the internet while on the buses for work, school, personal, and social purposes.			x				
Capital Improvements-Vehicle Improvements								
PVTA Bus Fleet Replacement	PVTA continously replaces their bus fleet to increase vehicle reliability and reduce green house gas emissions. The PVTA was also awarded a $6.2 million grant to purchase 10 diesel electric hybrids which should produce less GHG than the buses currently operating. The new low floor buses do not have steps for passengers to load and also have the ability to lower to curb height.		x	x			x	
Ride and Roll	PVTA's Ride and Roll program allows passengers to place their bikes on a bike rack on the front of buses while they ride. This program was introduced in the northern service area and has now been completely integrated into the southern service area as well.	x				x		
Capital Improvements-Transportation/Mulitmodal Centers								
Holyoke Transportation Center (Constructed)	Holyoke Transportation Center was opened in October of 2011 and is serviced by PVTA, Peter Pan, and Megabus. The station has an indoor waiting area, customer service booth, restrooms and 7 bus bays. The station also possess classrooms for Holyoke Commuinity College and the Holyoke HEAD start program.			x	x	x		
Westfield Transportation Center (Planning)	The Westfield ITC will be a focal point for transit, on-demand van mobility services, parking, pedestrian, and bicycle transportation modes. The Westfield ITC will support improved access to existing businesses and residences, as well as provide new and enhanced mobility for transit-dependent populations in Westfield.			x	x	x		

Table 8-2 - Relationship of Sustainable Transportation Projects to Indicators (cont.)

Capital Improvements-Transportation/Mulitmodal Centers (continued)		Reduce VMT	Reduce GHG Emissions	Improved Transit Accessibility	Livability	Promote Healthy Transportation Modes	Transition to Lower GHG	Water Quality
Union Station Springfield, MA (Planning)	The City of Springfield is currently in the planning process of redeveloping Union Station building on Frank B. Murray Street, Springfield, MA. This intermodal station would provide space for Amtrak, Peter Pan/Greyhound, and the PVTA. The station would be upgraded to serve high speed rail as well.			x	x	x		
Northampton Transportation Center (Planning)	The City of Northampton is investigating the possibility of constructing a transportation center to provide bus service as well as train service. The realignment of passenger rail to the Connecticut River will change the Hampshire County stop from Amherst to Northampton. The proposed plan will provide students at the various 5 college system bus service to this transportation center.			x	x	x		
Bike-On Road Facilities								
South Pleasant St. Bike Lanes Amherst, MA (7/15/2001)	This bike lane carries a significant volume of student and university traffic. The bike lane also passes through the central business district of Amherst.		x	x	x	x		
South Street Bike Lanes Northampton, MA (9/10/2003)	Neighborhoods along South Street in Ward 4b are provided convenient access to Northampton's Central Business District along this bike route.		x	x	x	x		
Hampden Street Bike Lanes Holyoke, MA (5/13/2004)	The Hampden Street bike lanes channelize bicycle traffic on this busy and frequently congested city street. The Highland Bike Shop and Stop and Shop are two of many popular destinations along this corridor connection to Route 202.		x	x	x	x		
Dwight Street Bike Lanes Holyoke, MA (6/12/2005)	Bike lanes on Dwight Street provide a one-way conterpart to the lanes on Hampden Street while connecting to similar facilities on Route 5.		x	x	x	x		
Route 5 Bike Lanes Holyoke, MA (7/8/2006)	These bike lanes provide direct access to businesses, schools, and churches along Route 5. The lane links to bike lanes on Dwight and Hampden Streets and provides connections to the Route 5 Bike Route running north/south to the Easthampton Manhan Rail Trail and the Northampton Norwottuck Network of trails.		x	x	x	x		

Table 8-2 - Relationship of Sustainable Transportation Projects to Indicators (cont.)

Bike-Off Road Facilities		Reduce VMT	Reduce GHG Emissions	Improved Transit Accessibility	Livability	Promote Healthy Transportation Modes	Transition to Lower GHG	Water Quality
UMass Connector Bikeway (Completed 5/13/2003)	In order to maximize the use of the Norwuttock Rail Trail by commuters to and from the Umass-Amherst campus it was necessary to establish a more direct link. An on road facility as well as a separated path have been constructed as part of the regional enhancement program.		X	X	X	X		
CT. River Riverwalk and Bikeway (Completed 7/18/2003)	This project was proposed under the Connecticut River 2020 Strategy. The project used public lands and easements on private property to create a linear greenbelt along the river.		X	X	X	X		
CT. River Riverwalk and Bikeway (Completed 9/17/2004)	A continuation of the Riverwalk and Bikeway project connected commercial areas, residential neighborhoods, subdivisions, schools, and recreation facilities in densely populated communities.		X	X	X	X		
Manhan Rail Trail (6/19/2004)	The Manhan Rail Trial is a 4.2 mile (off road) multiuse trail completed in 2003. The trail is 10 feet wide and provides access from the City's lively downtown destinations including shops, galleries, restaurants, vibrant neighborhoods, artist's studios and apartments, and the Williston Northampton School.		X	X	X	X		
Norwottuck Look Park Extension to Grove St (completed 7/1/2005)	This significant extention of Northampton's Ryan Memorial Trail links Look Park and the Leeds section of the City with the Norwottuck Network of trails.		X	X	X	X		
Manhan Rail Trail Earl Street through downtown (Completed 7/1/2005)	The Earl Street Extension fills a significant gap between Northampton and Eastampton while opening trail access to Veteran's Field and the residential neighborhoods of Hospital Hill.		X	X	X	X		
Norwottuck Damon Road to Woodmont (Completed 5/1/2008)	This critical Nowottuck Connection provides residents of Northampton with safe access to the Norwottuck Rail Trail and is an important commuter route to the University of Massachusetts.		X	X	X	X		
Southwick Rails to Trails Phase I (Completed 5/3/2010)	This project connected to the Farmington Valley Greenway in Connecticut and Multi-state East Coast Greenway.		X	X	X	X		

Table 8-2 - Relationship of Sustainable Transportation Projects to Indicators (cont.)

Bike-Off Road Facilities (continued)		Reduce VMT	Reduce GHG Emissions	Improved Transit Accessibility	Livability	Promote Healthy Transportation Modes	Transition to Lower GHG	Water Quality
Chicopee Center Canal Walk (Completed 5/21/2010)	This new trail is in the heart of Chicopee's historic downtown center. Additional segments are currently in development and will eventually link the downtown to the Public Library and Szot Park.		X	X	X	X		
Holyoke Canal Walk (Completed 6/25/2010)	A pedestrian walkway was constructed along the historic industrial power canals. The facility provides access to Holyoke Heritage State Park, the central business district, Holyoke Childrens's Museum, and Holyoke Boys and Girls Club.		X	X	X	X		
Redstone Rail Trail (Completed 9/9/2010)	This multi-use trail provides bicycle and pedestrian access to the heavily developed Shaker Road corridor. It includes access to major employers, post office, high school, and town recreational fields.		X	X	X	X		
Bike-Other Bike Planning Efforts								
Manhan Rail Trail Survey	The study identified th demographics of trail users, as well as data on trip purpose, travel behavior to get to the trail, and health benefits of the trail.					X		
Bay State Bike Week	Bay State Bike Week is a dedicated week to promote the use of the bicycle. Events are held throughout the Pioneer Valley such as free breakfasts, free lunches, scavenger hunts and musical events. Some fitness centers allow free showers and some companies allow employees to dress down for the week.	X	X			X		
Land Use-Implemented Sustainability Practices								
Adopt Chapter 40R-Smart Growth Districts	40R encourage housing and mixed use (residential and office or retail uses together) into an identified area. This helps create a range of transportation options for residents by living in closer proximity to retail areas and encourages walking or biking.	X			X	X		
Fuel Efficient Vehciles for Municipal Use	Adopt ordinance that requires municipal to purchase the most fuel efficient, low emissions vehicle available. Public works fleets should include diesel trucks tht burn bio-diesel or dual-fuel vehicles that burn ethanol mixtures.		X				X	X

Table 8-2 - Relationship of Sustainable Transportation Projects to Indicators (cont.)

Land Use-Implemented Sustainability Practices (continued)		Reduce VMT	Reduce GHG Emissions	Improved Transit Accessibility	Livability	Promote Healthy Transportation Modes	Transition to Lower GHG	Water Quality
Safe Routes to School	Safe Routes to Schools is designed to increase the number of children walking and biking to school. The program integrates health, fitness, traffic relief, environmental awareness and safety under one program.		x			x		
Build Safe and Adequate Sidewalks	Sidewalks enable safe travel for pedestrians and can provide connection to sorrounding residential and commercial areas. Sidewalks should always be constructed with curb cuts to accommodate disabled pedestrians.				x	x		
Land Use-Transit Oriented Development								
City of Northampton-Roundhouse Parking Lot	The roundhouse parking lot project in the City of Northampton is an example of transit oriented development, infill, and brownfields re-development. The project is located in close proximity to the existing Peter Pan bus station and immediately adjacent to the primary PVTA transit pulse point for northern Hampshire County. A total of 146 PVTA/FRTA buses arrive and depart this transit pulse point per work day. The project consists of a hotel, restaurant and conference space with a parking garage.	x			x	x		
Passenger and Frieght Rail								
Knowledge Corridor Study	The study's objectives were to improve mobility and promote economic development. The study assessed the feasibility of possible future passenger rail improvements intended to reduce travel time, maximize accessibility, and provide viable transportation alternatives within the Knowledge Corridor. It also evaluated the impact to freight rail shipping costs and opportunities to move goods by rail rather than truck.			x		x		
Merrick Transportation Study	The PVPC has been awarded a grant from FHWA's TCSP program to develop a plan for transportation improvements, economic development options and appropriate neighborhood linkages for the Merrick Neighborhood of West Springfield. The goals of the project include: improving the efficiency of the transportation system in and around the Merrick Neighborhood; reducing the environmental impacts of road and rail transportation within the Merrick Neighborhood; ensuring the efficient access to jobs, services, and centers of trade; and examining private sector development patterns and investments that support these goals.	x	x		x			x

Table 8-2 - Relationship of Sustainable Transportation Projects to Indicators (cont.)

THUD-Livability Objectives	Reduce VMT	Reduce GHG Emissions	Improved Transit Accessibility	Livability	Promote Healthy Transportation Modes	Transition to Lower GHG	Water Quality
Identify strategies and projects that can be advanced to support sustainable transportation.	x	x		x			x
Identify locations in the Pioneer Valley that can support and advance TOD.		x		x	x		
Decrease single occupant vehicle trips and increase transit ridership.	x	x		x			
Advance transportation infrastructure projects which incorporate sustainability principles, land use plans, and smart growth goals.				x			x
Monitor the effectiveness of implemented strategies and projects to assist in future planning efforts.				x			
Identify funding to purchase a greenhouse gas monitor to assist in future monitoring efforts.		x		x			
Strengthening the relationship between transportation and land use planning.				x			x

CHAPTER 9

CLIMATE CHANGE

A. REGIONAL WEATHER TRENDS AND ANTICIPATED CHANGES

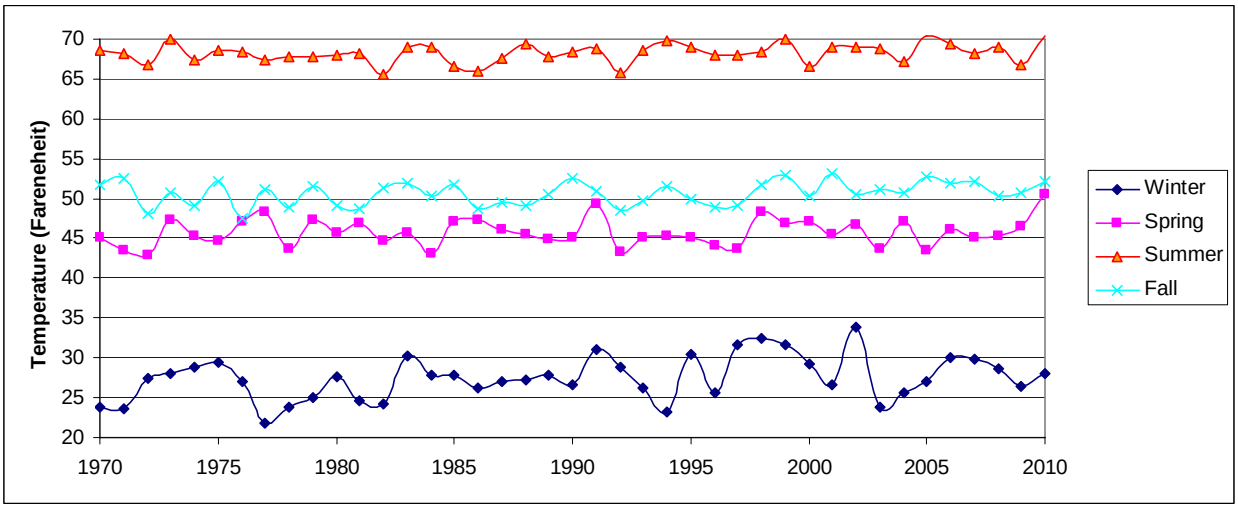
The transportation sector is a significant source of greenhouse gases, accounting for 1/3 of the Pioneer Valleys emissions. While it is widely recognized that emissions from transportation have a major impact on climate, climate change will have a major impact on transportation.

1. Temperature

Since the 1970s the Pioneer Valley had a small temperature increase in the spring, summer and fall months. Winter months have increased 2 degrees Fahrenheit on average during that same time period. The increase in temperature has resulted in many other climate-related changes, including:

- More frequent days with temperature above 90 degrees Fahrenheit
- A longer growing season
- Reduced snowpack
- Earlier breakup of winter ice on lakes and rivers
- Earlier spring snowmelt resulting in earlier peak river flows
- More freeze-thaw conditions are projected to occur in northern states, creating frost heaves and potholes on road and bridge surfaces and resulting in load restrictions on certain roads to minimize the damage.

Figure 9-1 - Regional Temperature Trends by Season (1970-2010)



The 2009 U.S. Global Change Research Program (USGCRP) report anticipates a continued seasonal increase of temperatures; winter months are expected to have the highest average temperature increase. The USGCRP reports evaluated weather conditions under a low and a high emission scenario when calculating predicted weather changes. The two scenarios allow for demonstration of uncertain future mode share changes and transportation enhancements for emissions. Using these two scenarios a

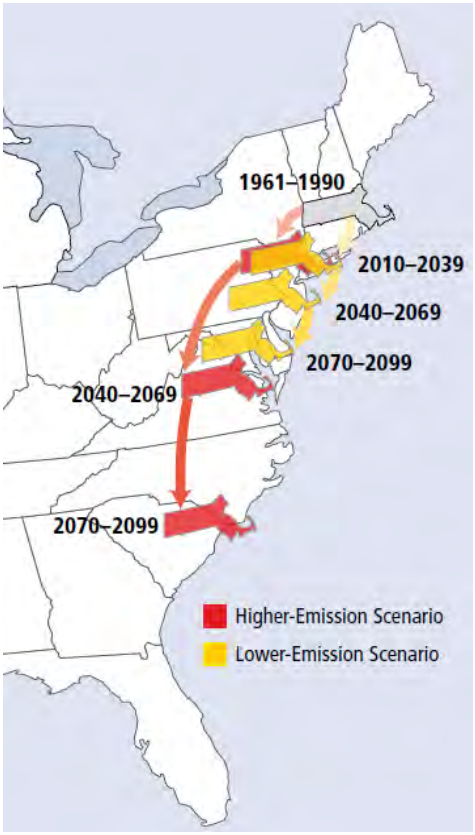
range of anticipated "likely" and "very likely" weather conditions can be created over the next 19 years.

Table 9-1 below summarizes anticipated temperature changes and temperature change range by season. Both low and high emission scenarios anticipate a minimum increase of 2 degree for each season. Additionally, the "likely" and "very likely" ranges for each season predict increases in temperature for each season. The northeast should anticipate a continued temperature increase over the next 19 years.

Table 9-1 - Northeast Anticipated Temperature Changes by Season

Anticipated Temperature Changes for the Northeast	Average Temperature Increase for Northeast (F°)		Average Temperature Increase Range for Northeast from 2010 to 2029	
Season	B1 (Low Emission Scenario)	A2 (High Emission Scenario)	Likely	Very Likely
Winter	2.8	3	1.8 to 3.8	0.9 to 4.7
Spring	2.3	2.5	1.8 to 3.1	1.3 to 3.7
Summer	2	2.2	1.2 to 3.0	0.4 to 3.8
Fall	2.5	2.7	1.9 to 3.3	1.2 to 3.9
Source: USGCRP				

Figure 9-2 - Potential Future Summer Heat Index for Massachusetts



Source: NEICA

Figure-9-2 displays the anticipated change in the average summer heat index for Massachusetts. This prediction was guided by the low and high emission scenarios created in the USGCRP report. The heat index is measured by combining air temperature and relative humidity. The heat index measurement provides the human perceived temperature. The higher temperatures and climate change could affect the quality of life in the future of Massachusetts residents. The emissions scenarios predict what the perceived summer temperatures might feel like over the next century. The red arrows track the higher emissions scenario while the yellow tracks the low emission scenario.

The USGCRP report predicted extreme heat conditions for the City of Hartford. Hartford is located 20 miles south of Springfield, MA and weather conditions are consistently similar. The Pioneer Valley should anticipate similar future weather patterns due to this geographic proximity. Extreme heat is the approximate number of days per year of extreme heat greater than 90 degrees F. Hartford is predicted to average 22 to 25 days from 2010-2040 which is an increase from 1960-1990 when the city averaged 15 days. From 2001 to 2005 the average summer in Massachusetts included nearly 20 days that did not meet EPA's air-quality standards for ground-level ozone, putting additional stress on people with respiratory diseases.

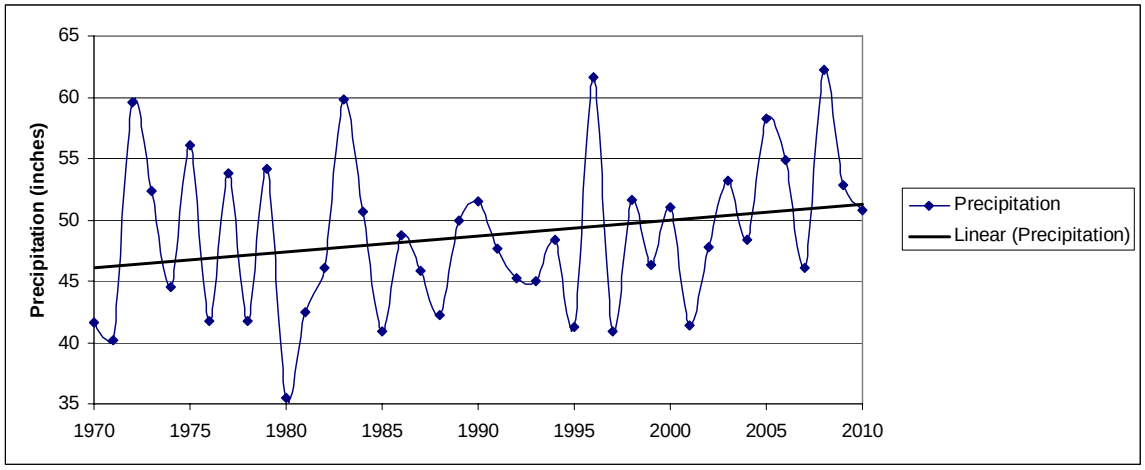
- Longer periods of extreme heat in summer can damage roads in several ways, including softening of asphalt that leads to rutting from heavy traffic.
- Extreme heat can cause deformities in rail tracks, at minimum resulting in speed restrictions and at worst causing derailments.
- Increases in very hot days and heat waves are expected to limit construction activities due to health and safety concerns for highway workers.
- Extreme heat creates poor air quality which reduces the length of time individuals can spend outside. Exposure to poor air quality has been connected to respiratory alignments such as asthma. Furthermore, children have proven to be the most susceptible to poor air quality due to their increased respiratory rate.

2. Precipitation

Throughout the northeast heavy, damaging rainfall events have increased measurably in recent decades. The Pioneer Valley was also subject to an increase in total rainfall and an increase in heavy rain events. This has also caused flooding events on many of the regions river's including the Mill River in Northampton in March of 2011. The increase in precipitation has resulted in many other climate-related changes, including:

- Increased heavy precipitation events
- Less winter precipitation as snow and more as rain
- Increased frequency of flooding events

Figure 9-3 - Regional Precipitation Trends by Season (1970-2010)



The 2009 USGCRP report anticipates a continued precipitation increase annually from 2010 to 2040. The Northeast region is projected to see an increase in winter precipitation on the order of 20 to 30 percent. The ranges reflect the uncertainty of future weather events, as shown in the "very likely" range precipitation has a small potential to decrease over this 30 year period. The Northeast Climate Impacts Assessment (NEICA) reports that the number of days with rain greater than 2 inches to increase 1 day (low scenario) to 1.25 day (high scenario). The increase in heavy precipitation could potentially result in weather-related crashes, delays, and road closures in a network already challenged by increasing congestion. Other effects that climate change will have on the transportation system include:

- Increased flooding of roadways, rail lines, and underground tunnels
- Drainage systems will be overloaded more frequently and severely, causing backups and street flooding. Areas where flooding is already common will face more frequent and severe problems.

- Limitation on visibility because of precipitation and windshield obstruction
- Decreased skid resistance affecting vehicles performance, including traction and maneuverability, resulting in loss of control and skidding
- Lower travel speeds and greater speed variability resulting from differing driving habits and abilities

These climate change effects may reduce roadway capacity, travel speed, increase delay, increase crash risk and flooding events may cause road closures.

Table 9-2- Northeast Anticipated Precipitation Annual Percentage Change

Anticipated Northeast Precipitation Events	Average % Change for Northeast		Average % Change Range for Northeast from 2010 to 2029	
	B1 (High Emission Scenario)	A2 (Low Emission Scenario)	Likely	Very Likely
Annual	3.2%	2.9%	0.5 to 5.8%	(-2.0) to 8.0%

Table 9-2 above summarizes anticipated precipitation percentage change and precipitation percentage change range by season. Both low and high emission scenarios anticipate a percentage increase of approximately 3%. The "likely" and "very likely" percentage change ranges demonstrate the unpredictability of future weather trends. While the "likely" range anticipates there will be an increase in precipitation, the "very likely" range demonstrates that there is a possibility of a reduction in precipitation. However, most research and data suggest that the northeast should anticipate an increase in annual precipitation over the next 19 years.

An increase in precipitation and flooding events could potential impact critical transportation links in the region. Figure 9-4 below displays major roadways and railroad lines proximity to 100 year and 500 year flood zones. A 100 year flood zone began in the 1960s when "the United States government decided to use the 1-percent annual exceedance probability (AEP) flood as the basis for the national flood insurance. The 1-percent AEP flood has a 1 in 100 chance of being equaled or exceeded in any 1 year, and has an average recurrence interval of 100 years, it is often referred to as the 100-year flood. The 500 year flood corresponds to an AEP of 0.2 percent, which means a flood of that size or greater has a 0.2 percent chance (or 1 in 500 chance) of occurring in a given year[2]." While the likelihood of a flood of either magnitude is minimal, these events would require numerous roadway closures. This would detour many transportation services onto surrounding roadways. While many of the major roadways in the region are affected by these flood zones the areas identified in this report highlight the roadways and areas that move large volumes of population and goods.

[2] U.S. Department of the Interior, *General Information Packet 106,* April 2010

Figure 9-4 - 100 and 500 Year Flood Areas

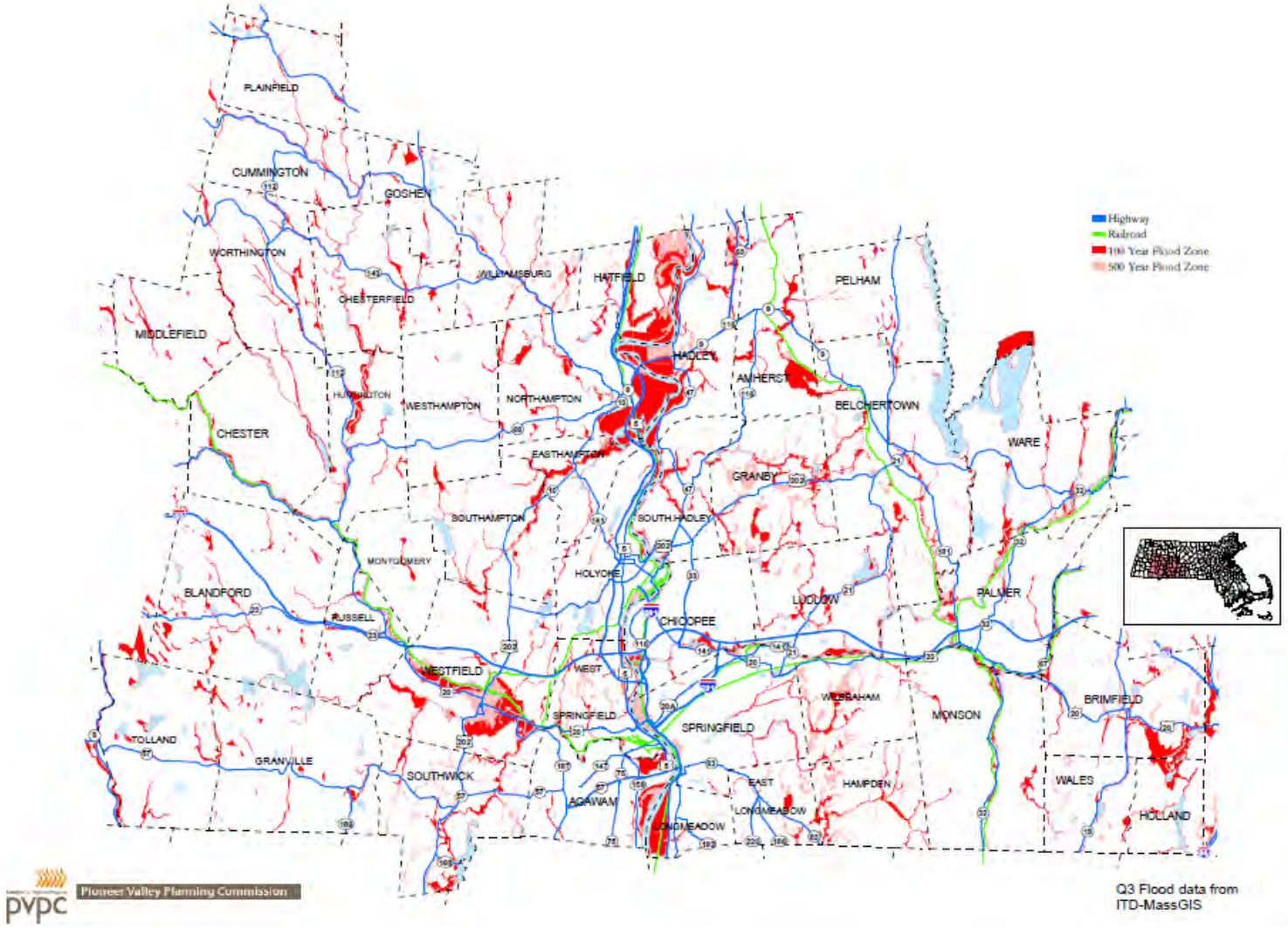
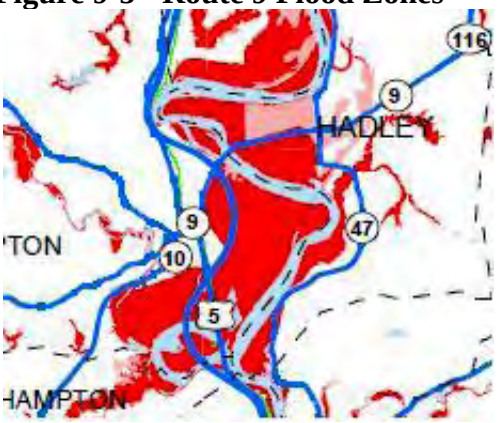
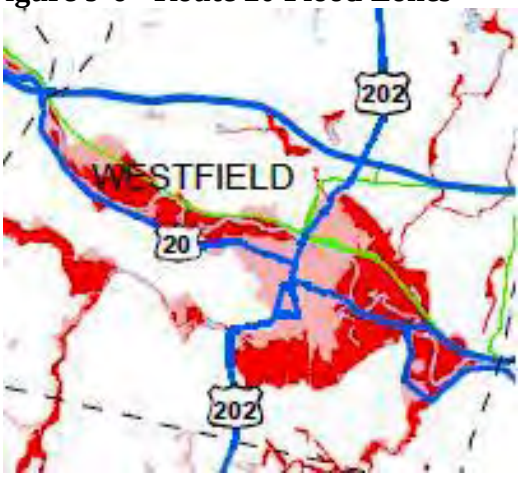


Figure 9-5 - Route 9 Flood Zones



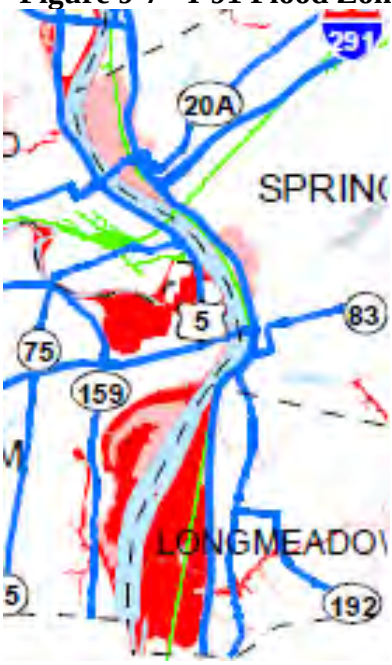
Hadley/Northampton-The western border of Hadley and the eastern border of Northampton possess a 100 year flood zone. During flood events road closures could potentially occur on Routes 5, 9, and 47. The Connecticut River would be the source of the flooding event.

Figure 9-6 - Route 20 Flood Zones



Westfield-The commercial and industrial areas along Route 20 and Union Street respectively are within the 100 year flood zone. During a 100 year flood Route 20 and Union Street could potentially be closed. The CSX rail line could also be potentially flooded at its lower elevation points through Westfield. Downtown Westfield is within the 500 year flood zone. If a flood of that magnitude occurs the area potentially could have Routes 10, 20, and 202 as well as other local road closures. The CSX line could potentially be flooded during this event as well. The Westfield River would be the source of the flooding event.

Figure 9-7 - I-91 Flood Zones



I-91 Ramps - I-91 is expected to be accessible during a flood event due to the higher elevation. However, many ramps in near downtown Springfield are at a lower elevation and at risk of flooding.

Knowledge Corridor-The proposed realignment under the "Knowledge Corridor" plan utilizes rail lines that are in close proximity to the Connecticut River. The rail line runs north through Chicopee and across the river to Holyoke. The rail line travels on the western side of the Connecticut River through Easthampton and parts of Northampton. Portions of the rail line through Easthampton and Northampton are within the 100 year flood zone.

B. EXISTING POLICIES

EPA and the National Highway Traffic Safety Administration (NHTSA) have set GHG emissions standards and fuel efficiency standards for light-duty vehicles for model years 2012-2016. California is expected to propose stricter standards for model years 2017-2020, and Massachusetts law requires the state to adopt the California standards. Both EPA and NHTSA have proposed GHG emissions standards and fuel efficiency standards for medium- and heavy-duty vehicles for model years 2014-2018.

The federal renewable fuel standard requires an increase in the volume of renewable fuels used in the U.S. Additionally, Massachusetts' Biofuels Act, passed in 2008, instructs the state to pursue the development of a regional low-carbon fuel standard (LCFS). An LCFS would include targets and timelines for reducing the average carbon content of vehicle fuels. The Massachusetts' Sustainable Development Principles, last updated in 2007, are aimed at promoting clean energy to reduce GHG emissions and encouraging reductions in VMT through the creation of "pedestrian-friendly" neighborhoods.

1. Expanded Policy

It will be important to implement additional smart growth policies to make it easier for households and businesses to decrease VMT. The Plan suggests that such policies focus on influencing infrastructure investments by state agencies and planning decisions made by local governments.

C. NEW POLICIES

In 2006 the Pioneer Valley region was selected by ICLEI, Local Governments for Sustainability to participate in a pilot effort to reduce GHG emissions from transportation by promoting smart growth. Since 2007 we have partnered with the Massachusetts Department of Environmental Protection to remove old polluting vehicles from the road through our "voluntary vehicle recycling" initiative. The Pioneer Valley Planning Commission has long been recognized by MassDOT as a leader in encouraging bicycling as evidenced by our 12 years of success in facilitating Pioneer Valley Bike Commute week, a collaboration between our region and MassBike, the state bicycling advocacy program, that has now been replicated by MassDOT and MassBike at the statewide level. Thanks to diligent and ongoing education and advocacy efforts, we have many miles of on and off road bicycle ways and work to encourage sidewalks in all new developments. We have been working for 15 years to bring commuter rail back to the I-91 corridor; we have facilitated region-wide idling reduction programs and have a robust regional transit system through the Pioneer Valley Transit Authority.

In December, 2010 the Commonwealth of Massachusetts released their Clean Energy and Climate Plan for 2020 that sets out an ambitious state-wide GHG emissions reduction target and lays out a framework for how the state will achieve that target. In January, 2008 the PVPC released our Clean Energy (and Climate Action) Plan (CEP) which set out our regions' emissions reduction targets and laid out a framework for how we would achieve those targets. The Commonwealth's Plan was released in compliance with the state's Global Warming Solutions Act of 2008 (GWSA), a legislative initiative adopted in June of 2008, six months after the release of our regional CEP. The GWSA mandates an 80 percent reduction in state-wide GHG emissions from 1990 levels by 2050. This goal is consistent with the Pioneer Valley Clean Energy Plan. In addition to a goal for 2050, GWSA required the Secretary of Energy and Environmental Affairs to establish an interim GHG emissions reduction target of between 10 and 25 percent below 1990 levels for 2020, and to issue a plan for achieving those reductions.

Both the Pioneer Valley Clean Energy Plan and the Massachusetts Clean Energy and Climate Plan include a mix of existing, expanded and recommended new policies to address climate change, including energy efficiency requirements, advanced building codes, a renewable portfolio standard

(RPS), fuel efficiency standards, incentives for purchasing more efficient vehicles and reducing vehicle miles traveled (VMT), and smart growth policies. The Commonwealth's Plan portfolio of policies is broken down into five categories: buildings; electricity supply; transportation; non-energy related sources of emissions; and cross-cutting policies.

In order to meet the established interim GHG emissions reduction targets, it will be important to establish new policies that encourage a change in existing driving habits. Together, these policies and programs are estimated to reduce state-wide GHG emissions 7.6% by 2020. Below is a brief summary of the policies and programs that pertain to transportation.

- Provide incentives for consumers to shift their vehicle purchases to more fuel-efficient models, including varying the rates on new car sales taxes, annual auto excise taxes, and registration fees.
- Implement a pilot "pay-as-you-drive" (PAYD) vehicle insurance program. Under PAYD, car insurance rates would increase the more miles a person drives, creating an incentive to reduce discretionary driving.
- Implement GreenDOT, a sustainability program recently announced by the Massachusetts Department of Transportation. The program focuses on reducing GHG emissions in the transportation sector; promoting alternative modes of transportation such as walking, bicycling, and public transit; and supporting smart growth development of the state's transportation systems.

In the Pioneer Valley we are committed to doing all that we can to further these policies. Our region is eager to serve as the pilot site for the PAYD vehicle insurance program and is also an established leader in understanding the connection between land use planning and transportation particularly when it comes to reducing GHG emissions. Both our regional smart growth plan and our regional clean energy plan have been recognized through national planning awards.

D. PIONEER VALLEY CLEAN ENERGY PLAN

PVPC and FRCOG developed an award winning first of its kind Clean Energy Plan, with financial assistance from the Massachusetts Technology Collaborative. The plan was released in January 2009. Specific action recommendations to address climate change via transportation-related solutions, that we made in our Pioneer Valley Clean Energy Plan, on which we continue to work are summarized below.

a) Educate and make it possible for people to use cars efficiently or not at all

Cars emit as much CO2 as an entire house. Everything we can do to improve the fuel efficiency of cars will have an enormous impact on climate change. The Commonwealth has already committed to statewide policies requiring the most fuel efficient vehicles available, and the Green Communities program requires as one of its five criteria that municipalities commit to purchasing only fuel efficient vehicles. PVPC is working diligently to assist member municipalities to achieve Green Communities certification. In addition, we support community-based efforts to educate drivers about fuel efficiency so they can operate their vehicles as efficiently as possible. PVPC has a "Green Tips" element on our website.

PVPC promotes and encourages buses, rail, bicycling, walking, ride-sharing, vanpools, car-sharing and tele-commuting, tele-conferencing and webinars. We also work to create compact, mixed use communities, neighborhoods and village centers so people do not necessarily need cars to get to work, school, recreation or shopping, and we educate drivers to obey the speed limit, stop idling, and to buy fuel efficient vehicles when they can.

b) Provide financing and funding to promote fuel efficiency

- Support redirecting fuel taxes to renewable energy, green planning, and mass transit.
- Work toward tax and regulatory policies that reflect the true cost to society of energy production and manufacturing processes based on a life-cycle "cradle to grave" analysis.
- Support an excise tax based on miles driven with funds to be used to support green transportation projects.
- Support use of fuel taxes for clean energy and green development projects.
- Support the use of congestion pricing on appropriate regional roadways.
- Work with financial institutions to promote location-efficient mortgages.
- Encourage the state to add a fee to vehicle-inspection charges to fund transportation-option education.
- Investigate a region-wide parking permit and/or state-wide registration fee based on a vehicle's greenhouse gas emissions. Revenue will be used to reduce use of single-occupancy vehicles.
- Work with the state to provide loans and other financial incentives to promote the purchase of vehicles with fuel efficiency by business, government, and individuals.

c) Specific actions we encourage for businesses, municipalities, and individuals

- Provide transit passes for all residents funded through a household levy or business tax.
- Encourage the Pioneer Valley Transit Authority (PVTA) and the Franklin Regional
- Transit Authority (FRTA) to consider additional van pools to make connections between existing routes.
- Enhance transportation management associations (TMAs) and encourage the development of TMAs in all regional centers to make more efficient use of existing transportation resources.
- Work with the PVTA and the FRTA to improve access to transit service.
- Ensure prompt snow removal and clearing of pedestrian paths at bus stops and around traffic signal poles with crosswalk push buttons, to maintain safe access for transit riders and pedestrians.
- Encourage shared parking opportunities such as movie theaters with primary parking needs in evenings and churches or other facilities with weekend-only parking needs.
- Support park-and-ride lots to encourage car pooling.
- Provide additional services such as secure, covered bicycle parking, coffee and newspapers during peak hours, and other amenities.
- Continue and expand projects that increase pedestrian accessibility to transit stops, neighborhood shopping areas, schools, churches, and parks.
- Help transit riders to show their neighbors, friends, and co-workers how easy it is to take transit.
- Encourage citizens to commute to goods and services by bicycle or foot.
- Promote the Pioneer Valley Bicycling map and the new Franklin County Bikeway Map.
- Provide secure, covered bicycle parking at schools, in commercial districts, and at other destinations.
- Promote growth through redevelopment and infill that maintains or improves the quality of life for existing neighborhoods.
- Promote proximate commuting (i.e., living near a workplace).

d) Support continued use of transportation demand management strategies.

As noted previously, the Pioneer Valley is one of 35 regions in the country selected to receive federal funding to enhance sustainability in our region. With this federal funding we will be updating our existing regional plans, and developing a new Climate Action plan to further our region's initiatives to address climate change.

CHAPTER 10

FUTURE FORECASTS

Air quality conformity regulations related to the latest planning assumptions require a consistent approach to the estimate of future population, household and employment data used in the regional transportation plan. This data is input into the regional transportation model and used to estimate future traffic volumes in the region that are used to analyze the effects of transportation improvement projects, identify areas where congestion could occur in the future, and perform an air quality conformity determination for the region.

The MassDOT Office of Transportation Planning (OTP) developed the future forecasts of population, households and employment for Massachusetts and each MPO region. Their procedures and preliminary estimates were reviewed by the Pioneer Valley Planning Commission and modifications were made based on our comments. These control totals were allocated to the 43 communities in the Pioneer Valley region based on current trends and potential for future growth. The forecasts for population, households and employment are shown in Tables 10-1 – 10-3.

A. REGIONAL TRAVEL DEMAND MODEL

Travel demand forecasting is a major step in the transportation planning process. By simulating the current roadway conditions and the travel demand on those roadways, deficiencies in the system are identified. This is an important tool in planning future network enhancements and analyzing currently proposed projects.

Travel demand models are developed to simulate actual travel patterns and existing demand conditions. Networks are constructed using current roadway inventory files containing data for each roadway within the network. Travel demand is generated using socioeconomic data such as household size, automobile availability and employment data. Once the existing conditions are evaluated and adjusted to satisfactorily replicate actual travel patterns and vehicle roadway volumes, the model inputs are then altered to project future year conditions.

There are four basic steps in the traditional travel demand forecasting process: trip generation, trip distribution, modal choice, and trip assignment. There is also a preliminary step of network and zone development and a subsequent step of forecasting future conditions. The Pioneer Valley Planning Commission (PVPC) uses the TransCAD software to perform the traditional 4-step process for forecasting near and future conditions.

1. Network and Zone Development

a) Highway Network

The preliminary step in the development of a travel demand model is identifying the network and dividing the area into workable units. The highway network is composed of nodes and lines. Nodes represent intersections or centroids. Centroids are used to identify the center of activity within a zone and connect the zone to the highway network. Lines represent roadway segments or centroid connectors. Centroid connectors represent the path from a centroid to the highway network and typically represent the local roads and private driveways within the centroid. General information required for network developments include system length, demand, service conditions and connections to zones.

Table 10-1 - Population Forecast for the Pioneer Valley Region

	2000	2010	2017	2020	2025	2030	2035
Agawam	28,144	28,438	29,145	29,328	29,603	29,879	30,108
Amherst	34,873	37,819	38,779	39,031	39,411	39,792	40,112
Belchertown	12,968	14,649	15,215	15,398	15,689	15,983	16,254
Blandford	1,214	1,233	1,263	1,271	1,282	1,293	1,303
Brimfield	3,339	3,609	3,781	3,841	3,937	4,034	4,126
Chester	1,306	1,337	1,371	1,379	1,392	1,406	1,417
Chesterfield	1,201	1,222	1,285	1,307	1,342	1,378	1,413
Chicopee	54,653	55,298	56,408	56,649	56,988	57,325	57,570
Cummington	1,004	872	893	898	906	913	920
East Longmeadow	14,100	15,720	16,240	16,398	16,645	16,894	17,119
Easthampton	15,994	16,053	16,450	16,553	16,707	16,861	16,989
Goshen	903	1,054	1,081	1,089	1,100	1,111	1,120
Granby	6,132	6,240	6,443	6,504	6,600	6,696	6,783
Granville	1,521	1,566	1,604	1,614	1,629	1,643	1,655
Hadley	4,793	5,250	5,386	5,423	5,478	5,533	5,580
Hampden	5,171	5,139	5,290	5,334	5,401	5,469	5,528
Hatfield	3,249	3,279	3,361	3,382	3,414	3,447	3,473
Holland	2,407	2,481	2,561	2,586	2,623	2,661	2,696
Holyoke	39,838	39,880	40,729	40,924	41,205	41,484	41,698
Huntington	2,192	2,180	2,275	2,306	2,357	2,409	2,457
Longmeadow	15,633	15,784	16,011	16,040	16,070	16,098	16,100
Ludlow	21,209	21,103	21,748	21,936	22,229	22,524	22,785
Middlefield	580	521	534	537	542	547	551
Monson	8,359	8,560	8,893	9,001	9,172	9,346	9,506
Montgomery	656	838	871	881	898	915	930
Northampton	28,978	28,549	29,145	29,280	29,472	29,663	29,807
Palmer	12,497	12,140	12,523	12,637	12,814	12,993	13,153
Pelham	1,403	1,321	1,353	1,361	1,374	1,386	1,396
Plainfield	576	648	665	669	676	682	688
Russell	1,655	1,775	1,845	1,868	1,905	1,942	1,976
South Hadley	17,196	17,514	17,885	17,970	18,092	18,213	18,306
Southampton	5,387	5,792	6,065	6,158	6,309	6,462	6,606
Southwick	8,835	9,502	9,906	10,041	10,257	10,475	10,679
Springfield	152,082	153,060	155,922	156,496	157,281	158,053	158,571
Tolland	428	485	497	501	505	510	514
Wales	1,737	1,838	1,935	1,970	2,026	2,082	2,136
Ware	9,708	9,872	10,252	10,374	10,569	10,765	10,947
West Springfield	27,899	28,391	28,932	29,043	29,195	29,346	29,450
Westfield	40,072	41,094	42,367	42,743	43,326	43,914	44,437
Westhampton	1,468	1,607	1,681	1,706	1,746	1,787	1,826
Wilbraham	13,473	14,219	14,630	14,747	14,927	15,108	15,267
Williamsburg	2,427	2,482	2,569	2,597	2,640	2,683	2,723
Worthington	1,219	1,156	1,212	1,232	1,263	1,295	1,325
Pioneer Valley	**608,479**	**621,570**	**637,000**	**641,000**	**647,000**	**653,000**	**658,000**

Table 10-2 - Household Forecast for the Pioneer Valley Region

	2000	2010	2017	2020	2025	2030	2035
Agawam	11,271	11,664	12,225	12,352	12,600	12,760	12,896
Amherst	9,150	9,259	9,712	9,817	10,050	10,160	10,300
Belchertown	4,904	5,595	5,943	6,046	6,230	6,360	6,485
Blandford	460	492	515	521	530	537	543
Brimfield	1,252	1,429	1,530	1,560	1,613	1,658	1,702
Chester	490	543	569	575	586	594	601
Chesterfield	446	511	548	559	579	596	613
Chicopee	23,115	23,739	24,777	24,990	25,329	25,627	25,854
Cummington	406	404	423	427	435	440	445
East Longmeadow	5,236	5,851	6,183	6,269	6,450	6,544	6,660
Easthampton	6,859	7,224	7,571	7,649	7,788	7,891	7,984
Goshen	368	416	436	441	450	456	462
Granby	2,259	2,374	2,507	2,541	2,601	2,650	2,695
Granville	542	608	637	643	655	663	671
Hadley	1,895	2,107	2,211	2,235	2,277	2,309	2,338
Hampden	1,823	1,898	1,999	2,023	2,067	2,101	2,133
Hatfield	1,378	1,483	1,555	1,571	1,600	1,621	1,640
Holland	900	994	1,049	1,063	1,088	1,108	1,127
Holyoke	15,000	15,361	16,044	16,187	16,441	16,617	16,773
Huntington	813	868	926	942	971	996	1,020
Longmeadow	5,738	5,741	5,952	5,980	6,009	6,036	6,036
Ludlow	7,666	8,080	8,516	8,625	8,817	8,970	9,111
Middlefield	219	218	228	231	235	238	241
Monson	3,099	3,279	3,484	3,541	3,640	3,723	3,803
Montgomery	257	330	350	356	366	374	382
Northampton	11,863	12,000	12,533	12,644	12,835	12,978	13,099
Palmer	5,090	5,099	5,376	5,446	5,569	5,666	5,758
Pelham	537	549	575	581	591	599	606
Plainfield	247	269	282	285	291	295	298
Russell	598	656	698	710	730	747	764
South Hadley	6,584	6,793	7,095	7,157	7,269	7,347	7,415
Southampton	1,966	2,249	2,408	2,455	2,536	2,608	2,677
Southwick	3,312	3,710	3,954	4,024	4,160	4,250	4,350
Springfield	57,178	56,752	59,112	59,567	60,350	60,904	61,351
Tolland	183	197	207	209	213	216	218
Wales	660	736	792	809	838	864	890
Ware	4,020	4,120	4,371	4,439	4,570	4,658	4,754
West Springfield	11,866	12,124	12,642	12,746	12,898	13,048	13,150
Westfield	14,798	15,335	16,172	16,383	16,754	17,049	17,370
Westhampton	539	623	666	679	701	720	739
Wilbraham	4,941	5,309	5,587	5,655	5,775	5,868	5,955
Williamsburg	1,031	1,118	1,182	1,199	1,228	1,252	1,274
Worthington	471	522	558	568	587	602	618
Pioneer Valley	**231,430**	**244,000**	**250,100**	**252,700**	**257,300**	**260,700**	**263,800**

Table 10-3 - Employment Forecast for the Pioneer Valley Region

	2000	2010	2017	2020	2025	2030	2035
Agawam	11,523	11,624	11,939	12,170	12,263	12,309	12,355
Amherst	12,408	14,677	15,023	15,291	15,369	15,389	15,408
Belchertown	1,812	2,609	2,726	2,798	2,853	2,897	2,942
Blandford	143	222	241	251	263	273	284
Brimfield	478	538	553	563	568	570	572
Chester	113	109	116	120	123	127	130
Chesterfield	124	123	126	128	129	130	130
Chicopee	21,200	18,931	19,639	20,105	20,401	20,621	20,843
Cummington	208	207	213	217	218	219	220
East Longmeadow	9,125	7,897	8,111	8,268	8,331	8,363	8,394
Easthampton	4,786	4,324	4,494	4,603	4,677	4,733	4,789
Goshen	90	157	165	170	174	177	180
Granby	883	751	783	803	818	829	841
Granville	151	157	161	164	166	166	167
Hadley	4,442	5,287	5,632	5,830	6,022	6,193	6,366
Hampden	759	818	841	857	863	867	870
Hatfield	2,962	1,957	2,023	2,068	2,093	2,111	2,128
Holland	131	147	151	154	155	155	156
Holyoke	24,145	21,084	21,814	22,307	22,593	22,796	23,000
Huntington	402	418	430	438	441	443	445
Longmeadow	3,308	3,363	3,400	3,443	3,429	3,402	3,375
Ludlow	5,891	6,406	6,580	6,707	6,758	6,784	6,809
Middlefield	40	39	40	41	42	42	42
Monson	1,374	1,290	1,325	1,350	1,361	1,366	1,371
Montgomery	50	26	27	27	28	28	28
Northampton	17,681	18,060	18,429	18,734	18,789	18,772	18,754
Palmer	5,459	4,967	5,091	5,185	5,217	5,229	5,241
Pelham	175	155	159	162	164	164	165
Plainfield	108	40	41	42	43	43	43
Russell	266	181	188	193	196	198	200
South Hadley	4,841	4,425	4,544	4,633	4,668	4,685	4,703
Southampton	1,046	1,081	1,110	1,132	1,140	1,145	1,149
Southwick	2,534	2,523	2,583	2,629	2,643	2,646	2,650
Springfield	78,559	74,640	76,381	77,739	78,124	78,213	78,300
Tolland	52	37	38	39	40	40	40
Wales	136	150	154	157	158	158	159
Ware	2,749	2,718	2,791	2,845	2,867	2,877	2,888
West Springfield	18,485	16,858	17,249	17,555	17,640	17,659	17,677
Westfield	16,267	16,673	17,012	17,293	17,343	17,326	17,309
Westhampton	238	290	297	303	306	307	308
Wilbraham	4,155	4,493	4,615	4,704	4,740	4,758	4,776
Williamsburg	504	553	568	579	583	586	588
Worthington	196	193	198	202	204	204	205
Pioneer Valley	**259,999**	**251,200**	**258,000**	**263,000**	**265,000**	**266,000**	**267,000**

b) Traffic Analysis Zones

Zones are geographic aggregations of individual households and business establishments in the region. Zones are generally referred to as traffic analysis zones or TAZs. Centroids represent the activity center of a TAZ, which can best represent the average trip time in and out of the TAZ. Centroid connectors represent local streets that carry traffic out of or into the TAZ. Centroid connectors generally connect to adjacent collector or arterial roads.

2. Trip Generation

Trip generation is the first step in the modeling process. It identifies the number of trips that are made to and from a designated area (traffic analysis zones). Trip generation analysis estimates the number of trips that are produced by each zone and the number of trips attracted to each zone for each of the three trip purposes:

- Home-Based Work (HBW) - trips from home to work;
- Home-Based Non-Work (HBNW) - trips from home to other destinations other than work; and
- Non-Home Based (NHB) - trips from a place other than home.

Households generally produce trips, while employment and other activity centers generally attract trips. Estimates of household based trips are affected by socioeconomic factors, such as auto ownership, and household size. Employment based trips depend on employment type and size.

3. Trip Distribution

Trip distribution determines the destination of the trips produced in each zone and how they are divided among all the other zones in the area. A relationship is developed between the number of trips produced by and attracted to zones and the accessibility of zones to other zones in terms of time and distance.

4. Mode Usage

This step in the development of the travel model estimates the distribution of previous trips to various alternative mode choices. Mode choices may include personal vehicle, transit, walking, bicycling, etc. Several factors affect a traveler's decision regarding the travel modes available. These include the characteristics of the person making the trip, the characteristics of the trip, and the characteristics of the transportation system.

5. Trip Assignment

Trip assignment is used to estimate the flow of traffic on a network. The trip assignment model takes as input a matrix of flows that indicate the volume of traffic between origin and destination pairs. The flows for each origin and destination pair are loaded on the network based upon the travel time or impedance of the alternative paths that could carry this traffic.

6. Forecasts

The preparation of a future year socioeconomic database is the last step in the travel demand forecast process. Forecasts of population and socioeconomic data as well as the attributes affecting travel are

used to determine the number of trips that will be made in the future. The estimates that forecasts provide are direct inputs in the travel demand forecasting model. Once travel demand is known and deficiencies identified, alternative transportation systems may be developed.

B. 2000 BASE YEAR MODEL

The regional travel demand model is made up of several major components: transportation network, transportation analysis zones, and socioeconomic data. Each of these components add a critical contribution to the development of a working simulation model. This model is scheduled to be updated to a 2010 Base Year using information from the 2010 Census as part of the Federal Fiscal Year 2012 Unified Planning Work Program for the Pioneer Valley Metropolitan Planning Organization.

1. Network

The transportation system in the region is represented in the regional model by roadway network. The highway network was developed based on the federal functional classification of roadways. All roadways in the region classified as interstate, principal arterial and collector are included in the highway network. Local roads carrying minimal through traffic are represented as centroid connectors to areas of traffic activity.

The characteristics of the roadway represented by each line are coded as attributes of the line. Speed and capacity attributes are based on the functional classification and determined from state roadway inventory files of the region. Adjustments were made to these attributes based on field observations, examination of aerial photographs, and review of regional and local traffic studies. Also, adjustments to these inputs were made to better replicate the overall simulation of regional travel activity.

2. Traffic Analysis Zones

Traffic Analysis Zones are the division of the region into analysis units that allow the linkage of data to physical location within the roadway network. The attributes of a TAZ include the region's socioeconomic data, which generates and attracts trips. TAZ size and location is based on the 2000 Census because it is the most comprehensive, current, and readily available source of socioeconomic and demographic information. The Pioneer Valley area is divided by the census into areas called block groups continuing the socioeconomic and demographic information. The region is represented by 450 internal TAZs, and external stations are represented by 62 TAZs in the model.

3. Socioeconomic Data

Socioeconomic data for the 2000 base year model was taken from the 2000 Census. This includes the number of housing units by block group, the average number of autos per household by block group; the number of retail and non-retail employment by block group; HBW and HBNW trip productions per housing unit; NHB trip productions per retail employee, non-retail employee and household; vehicle occupancy rates; and mode split.

The population statistics used in the model for each block group includes total population, total number of households, average household size, and average auto availability. This type of information is translated into household cross-classification matrices based on household size and auto availability.

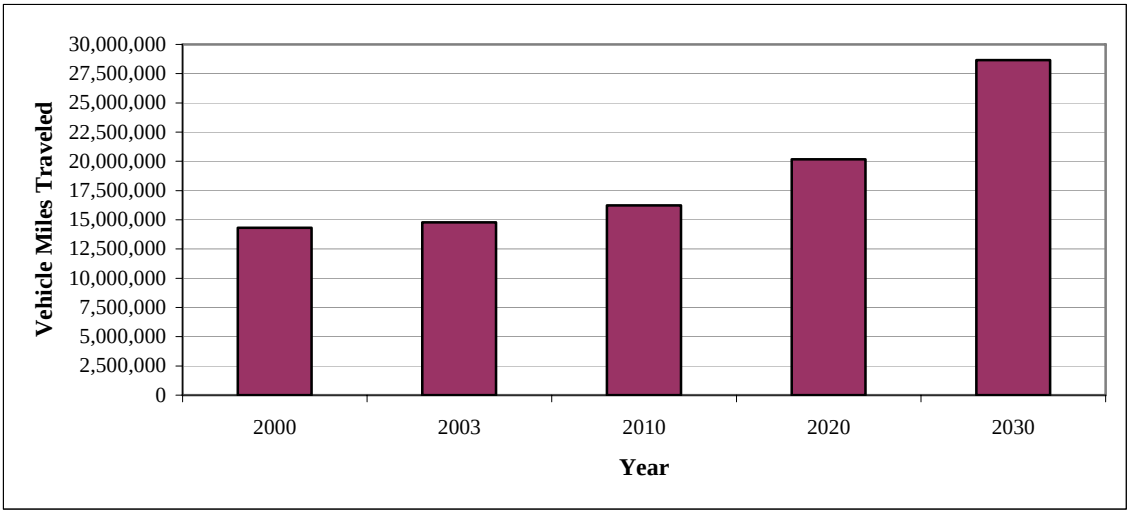
In addition, zonal employment data are also needed as input in identifying the distribution of employment to the TAZs. The zonal employment data categories were defined as:

- Retail
- Service
- Education
- Health
- Entertainment
- Manufacturing
- Other

4. Vehicle Miles Traveled and Daily Emissions

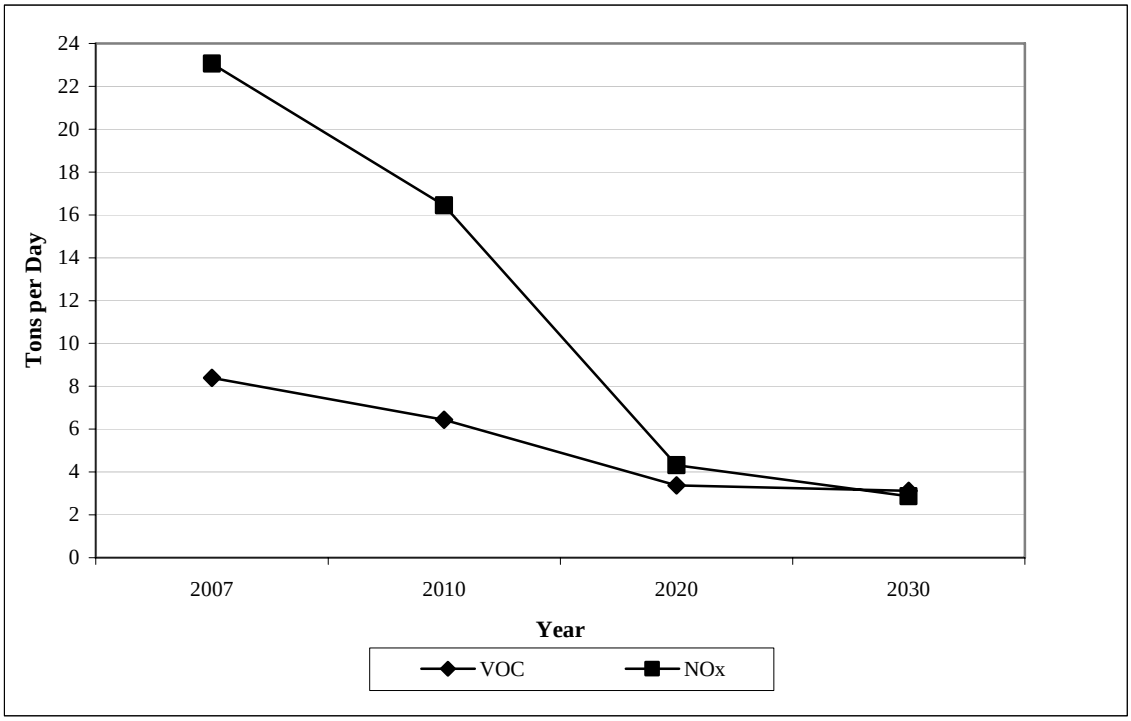
The total Vehicle Miles Traveled (VMT) was estimated for the model years of 2000, 2003, 2010, 2020, and 2030. The total VMT is shown in Figure 10-1. As shown in Figure 10-1, the total VMT is projected to increase by an average of 1.1% per year from 2000 to 2003 and 1.3% per year from 2003 to 2010. VMT increased by 2.2% per year from 2010 to 2020 and 3.6% per year from 2020 to 2030.

Figure 10-1 - Estimated Future VMT



The daily emissions for the Pioneer Valley Region were also calculated for the analysis years. This analysis evaluates the change in ozone precursor (VOC and NOx) emissions as a result of implementation of the recommendations of the RTP. The daily emissions output for the region is shown in Figure 10-2.

Figure 10-2 - Daily Emissions Output for the Pioneer Valley Region



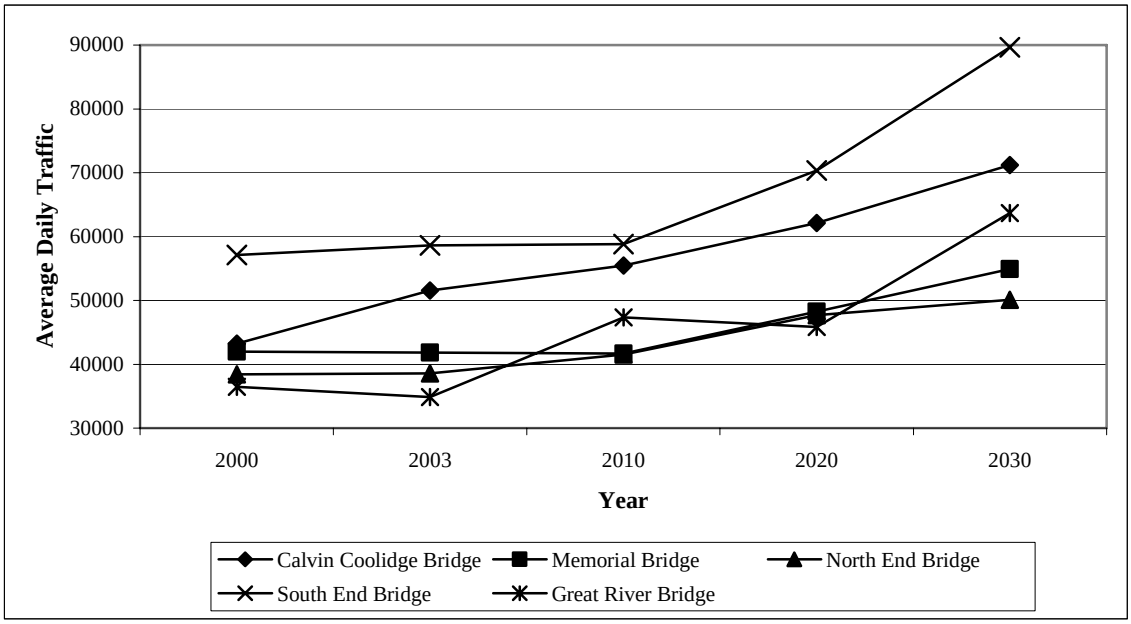
As shown in Figure 10-2, there is a significant reduction in VOC and NOx emissions for the Pioneer Valley Region from 2010 to 2020. This is likely due to the assumptions of turnover in vehicle fleet – older vehicles being replaced by newer lower emission vehicles.

5. Future Traffic Volume Projections

a) Bridges

The Average Daily Traffic (ADT) on some of the regions bridges was projected for all five model years. The area bridges include the South End Bridge, Calvin Coolidge Bridge, Memorial Bridge, and North End Bridge. This information is shown in Figure 10-3.

Figure 10-3 - Projected Average Daily Traffic on Area Bridges

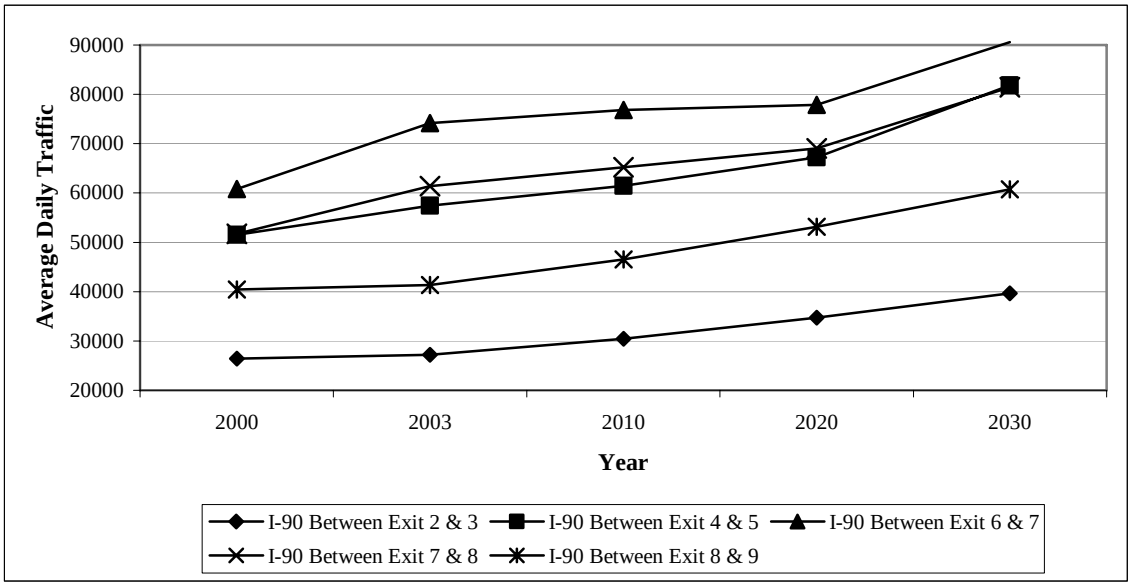


As shown in Figure 10-3, the ADT on South End Bridge is projected to significantly increase from 2020 to 2030. This is likely the result of the proposed improvements to the South End Bridge and Route 5/57 rotary project, currently in the 2020 and 2030 model analysis year.

b) Interstate 90 (Massachusetts Turnpike)

Traffic volumes for Interstate 90 (I-90) are shown in Figure 10-4. Volumes on I-90 within the PVPC region are projected to steadily increase between exits 4 and 8 from 2000 to 2030.

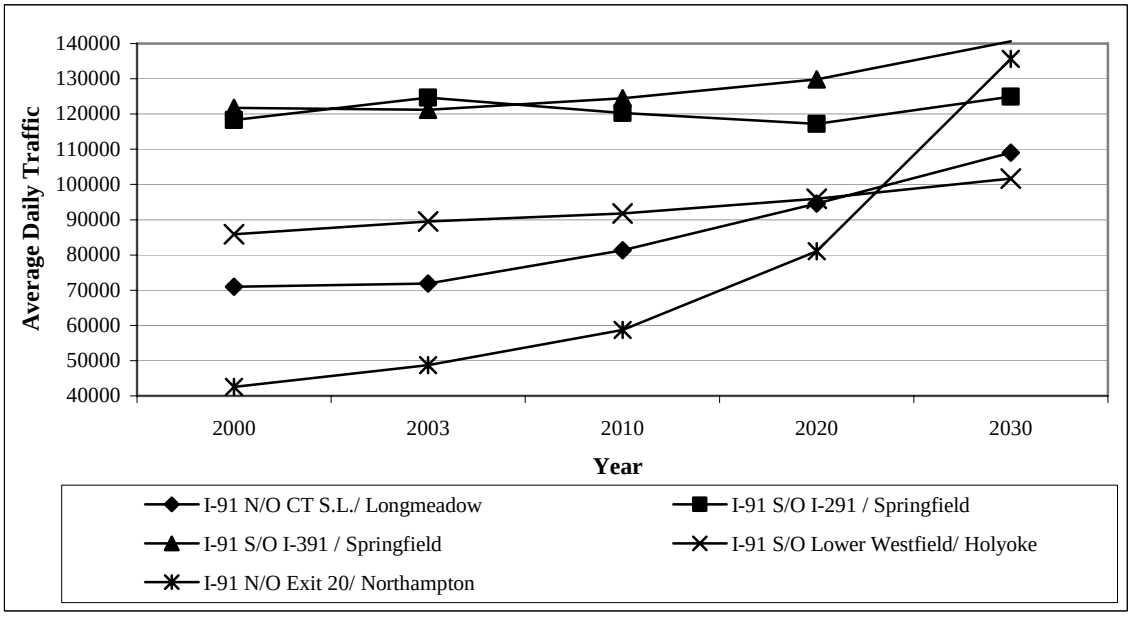
Figure 10-4 - Projected Average Daily Traffic on Interstate 90 (MassTurnpike)



c) Interstate 91 (I-91)

The ADTs on I-91 were projected for all five model years and are shown in Figure 10-5. Traffic volumes are projected to steadily increase north of exit 20 in Northampton and at the Connecticut State Line while volumes remain fairly steady south of I-391 and near Exit 16 in Holyoke. The most surprising trend occurs south of I-291 where traffic is projected to decrease from 2010 to 2020. This decrease is likely the result of improvements to East and West Columbus Avenue associated with the Basketball Hall of Fame expansion project.

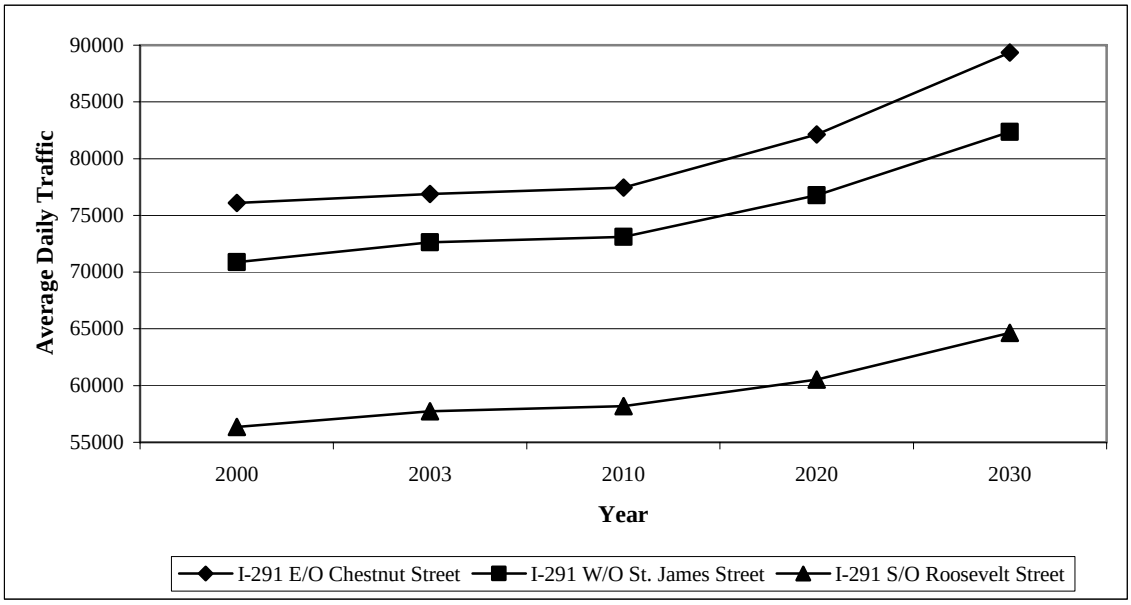
Figure 10-5 - Projected Average Daily Traffic on Interstate 91



d) Interstate 291 (I-291)

Figure 10-6 shows the projected traffic volumes for three locations on I-291 in Springfield. Steady increases in traffic volumes are projected for all three locations in this area.

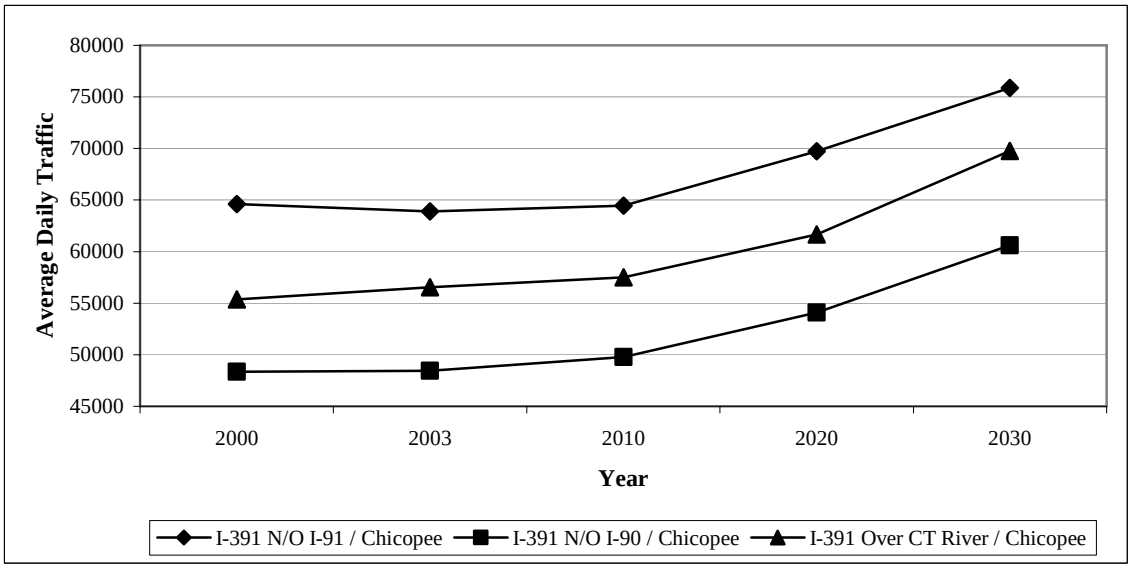
Figure 10-6 - Projected Average Daily Traffic on Interstate 291



e) Interstate 391

Traffic volumes for Interstate 391 (I-391) are shown in Figure 10-7. Moderate increases in traffic volumes are projected for this area with the except for north of its interchange with I-91.

Figure 10-7 - Average Daily Traffic on Interstate 391



CHAPTER 11

NEEDS, STRATEGIES, AND PROJECTS

The vision of the RTP focuses on the attainment of a safe and dependable transportation system. In a first step to achieve this vision and its associated goals, the system's present and future needs have been identified. The second step is to develop appropriate strategies to address these needs while adhering to the policies and objectives of the RTP. The third and final step is to advance planning studies and implement program improvement activities that will enhance the transportation system. This continual process will simultaneously alleviate problems in the regional transportation system and advance the goals of the RTP.

A total of five emphasis areas were identified to assist in the development of the regional transportation needs, strategies, and projects required to assist in the achievement of the RTP vision and goals. These emphasis areas are not intended to be a replacement for the regional transportation goals. Instead they were established with the recognition that many of the transportation improvement strategies included as part of the RTP Update can meet multiple regional transportation goals. The five emphasis areas are:

- Safety and Security
- The Movement of People
- The Movement of Goods
- The Movement of Information
- Sustainability

The transportation emphasis areas consist of broad topics related to transportation planning that are related to each of the thirteen Regional Transportation Goals. Regional Transportation Needs, Strategies, and Projects were developed for each emphasis area in this RTP Update to advance each of the thirteen goals without the need for repetitiveness.

A. SAFETY AND SECURITY

Safety is a principal concern in most transportation plans and designs. Highway Safety focuses on the reduction of crashes and resulting deaths, injuries and property damage occurring on public roads. Passenger vehicle movements, truck conflicts, pedestrian and bicycle travel, and bridge conditions are all included as part of Highway Safety.

The security of the regional transportation system is an ever increasing priority. It is critical to ensure that the highest levels of security are provided for the users of our regional transportation system and that appropriate measures are taken to restrict access to our critical transportation infrastructure.

1. Needs

A number of needs in the areas of Safety and Security have been identified for inclusion in the RTP. These needs have been summarized in Table 11-1. Each need has been prioritized as either "Immediate," "Future," or "Ongoing." Immediate needs are areas that are a high priority and must be addressed through the implementation of future planning studies and projects. Future needs are considered to be areas of a medium importance that should be addressed in the development of future

projects. Ongoing needs are areas that require routine attention and that are typically already included as part of the regional transportation planning process.

Table 11-1 - Summary of Safety and Security Needs

Reduce the number of fatal and personal injury crashes for both pedestrians and vehicles in the region.	Ongoing
Improve coordination and information exchange between emergency service providers and transportation agencies.	Ongoing
Examine the safety of at-grade railroad crossings.	Ongoing
Improve the safety and security of existing freight railyards and facilities.	Ongoing
Reduce the number of roadway departure crashes.	Ongoing
Improve knowledge and compliance with existing Emergency Evacuation plans.	Ongoing
Protect regional transportation choke points such as bridges, airports, railyards, bus terminals, etc.	Immediate
Ensure the safety and security of mass transit facilities and equipment.	Immediate
Provide for the safety and security of hazardous material transportation in and through the region.	Immediate
Improve access to driver, bicycle, and pedestrian education.	Immediate
Improve the ability to receive local crash information and access to local crash reports. Improve how crash locations are identified to ensure uniformity.	Future
Identify deficiencies to make major routes more suitable for non-motorized traffic and transit users.	Future

a) Reduce the number of fatal and personal injury crashes for both pedestrians and vehicles in the region.

Chapter 4 of this document summarizes recent safety trends in the Pioneer Valley region. In order to assist in the reduction of personal injury and fatal crashes, MassDOT developed a Strategic Highway Safety Plan (SHSP). The goal of the SHSP is to reduce the increasing trend of traffic-related fatalities and injuries. The two components of this goal are to achieve a 20% reduction in the 476 lives lost and 5,554 injuries sustained as a result of Massachusetts motor vehicle crashes during the 2004 calendar year by 2010. Information on the progress to date in meeting the goals of the SHSP is presented in Chapter 4.

b) Improve coordination and information exchange between emergency service providers and transportation agencies.

Emergency service providers rely on a safe and efficient transportation system in order to minimize their response time. It is important that advance notice be given to these agencies on ongoing construction projects and major incidents that could have negative impacts on their ability to serve the public. Similarly, it is also important to keep the emergency service providers closely involved in the transportation planning process to ensure that future transportation improvement projects can meet their needs.

c) Examine the safety of at-grade railroad crossings.

Many of the at-grade railroad crossings in the PVPC region do not have safety gates to separate motor vehicle traffic from railroad traffic. In addition, supplemental warning devices such as flashing lights, warning signs and pavement markings require routine maintenance in order to provide maximum effectiveness. It is important to maintain an inventory of these at-grade crossings in order to determine when increases in traffic and surrounding developments require the installation of safety gates and other appropriate devices.

d) Improve the safety and security of existing freight railyards and facilities.

Similar to air and bus transportation, rail transportation has several unique features that leave it vulnerable to attack. Passenger and freight rail serve dense urban areas with multiple points for access. Both also serve vast rural areas that can be difficult to secure. Additional security measures are required that do not result in increases to service time but improve the safety and security of both rail passengers and cargo in the region.

e) Reduce the number of roadway departure crashes.

More than half of the fatalities in the State during the calendar years of 2005, 2006, 2007, and 2009 involved roadway departure crashes. Roadway departure crashes were also responsible in causing nearly 60% of fatalities in the Pioneer Valley during the calendar years of 2006, 2007, and 2008. It is important to identify areas that have a history of roadway departure crashes and implement appropriate transportation improvement projects to improve safety in these areas.

f) Improve knowledge and compliance with existing Emergency Evacuation plans.

It is critical to educate residents about their community's emergency preparedness routine and resources. Residents should know who their municipalities' Emergency Management Director (EMD) is and where to find out:

- Emergency shelter locations
- Evacuation routes
- Sources for local emergency information

g) Protect regional transportation choke points such as bridges, airports, railyards, bus terminals, etc.

A key component of homeland security is the ability to work with federal, regional, local, and private partners to identify the critical infrastructure that is at the greatest risk and take the necessary steps to mitigate these risks. This begins through the identification of our critical links in the transportation infrastructure and the agencies responsible for the maintenance and security of these areas. This is an ongoing process that is defined in the State Homeland Security Strategy (SHSS) for the Commonwealth of Massachusetts. The following needs have been identified as part of the SHSS:

- Continue to establish a prioritized list of potential targets and potential methodologies of attack.
- Share target lists with key officials.
- Identify conditions that may facilitate the ability of a terrorist to carry out an attack.
- Disseminate important information to key entities, and support the development and implementation of risk mitigation efforts.
- Develop and track defined performance metrics that will allow for performance based management of risk mitigation efforts.

h) Ensure the safety and security of mass transit facilities and equipment.

There are several safety and security concerns related to the region's mass transit system. Foremost among these is personal safety of passengers and employees at the Springfield Bus Terminal, PVTA's major hub. In addition, PVTA's maintenance facility at 2840 Main Street in Springfield is increasingly overextended by the need to repair both buses and vans. This facility was initially constructed to service streetcars and, even with numerous expansions over the years, has limited space to service the large number of vehicles that PVTA operates. PVTA is now developing plans for a Level I maintenance and storage facility to serve its Springfield and Holyoke area routes and alleviate the overcrowding and security concerns at the Main Street facility. It will be important to ensure the safety and security of all of PVTA's facilities and equipment in order to maintain a safe and dependable transit system.

i) Provide for the safety and security of hazardous material transportation in and through the region.

The Hazardous Materials Transportation Act of 1975 (HMTA), as amended, regulates and enforces the authority of the Secretary of Transportation to protect the nation against risks associated with the transportation of hazardous materials. In 1990 Congress enacted the Hazardous Materials Transportation Uniform Safety Act (HMTUSA) to clarify conflicting state, local, and federal regulations on the transport of hazardous materials. While it is clear that the transportation of hazardous materials is strictly regulated, it is also important to ensure that the roadways designated for the transportation of hazardous materials are appropriately designed and maintained to facilitate the movement of vehicles used for transport.

j) Improve access to driver, bicycle, and pedestrian education.

In order to improve safety for all modes, it will be important to provide comprehensive education for all users of the regional transportation system. Enhanced driver, bicycle, and pedestrian education programs can assist in improving safety by providing an overview of traffic laws and the responsibilities of each user.

k) Improve the ability to receive local crash information and access to local crash reports. Improve how crash locations are identified to ensure uniformity.

Data compiled by local police departments is an important component in the tabulation of existing safety problems. Specifically, intersection crash data is a valuable tool to analyze historic trends and identify potential safety problems. This information can be difficult to obtain as it is often treated as classified information due to the sensitive nature of some of the information included in the crash reports. In addition, each community can have a different procedure on how crash data is summarized in their computer database. This results in discrepancies in format when performing planning studies to involve multiple communities and in some instances the inability to summarize crash data at the intersection level.

Additional problems are also created by the lack of a non-standardized process for identifying the location of the crash. A crash that occurs at the intersection of Main Street with Oak Street and River Street could be assigned to the intersection of Main Street with Oak Street, Main Street with River Street, or River Street with Oak Street. In addition, many crashes that could be attributed to an intersection are assigned to the closest street number, utility pole number, or mile marker. Finally, crashes that occur at rotaries are not assigned to the entire rotary, but to the specific leg of the rotary on which the crash occurred. This often results in the under-reporting of the total number of intersection crashes throughout the region.

l) Identify deficiencies to make major routes more suitable for non-motorized traffic and transit users.

The lack of connectivity of sidewalks and suitable shoulders for bicycle use reduce the safety of non-motorized traffic. Similarly, lack of bus shelters and adequate lighting can increase the perception that our transit system is unsafe. In order to improve these areas, a systematic inventory of the existing deficiencies is required. The PVPC routinely performs sidewalk inventories and bicycle Level of Service analyses that can help to identify these areas. A comprehensive inventory of all bus stops in the region was also completed by the PVPC. This information must be updated on a regular basis in order to have the most accurate information available for use in the development of future transportation improvement projects.

2. Strategies

Several different strategies have been developed to address the regional needs identified in the areas of Safety and Security. These strategies have been summarized in Table 11-2. Again, each strategy has been prioritized as either Immediate, Future or Ongoing. Immediate strategies are considered a high priority and must be advanced in the short term. Future strategies are considered to be areas of a medium importance that should be considered during the development of future projects. Ongoing strategies are typically already included as part of the regional transportation planning process.

Table 11-2 - Summary of Safety and Security Strategies

Develop a regional list of high crash locations.	Ongoing
Work with the State and local communities to standardize the way they archive their crash records.	Ongoing
Increase the deployment of cameras and other security devices and measures.	Ongoing
Provide accommodations for pedestrians, transit users, and bicyclists in roadway and bridge design and the maintenance of existing facilities.	Ongoing
Implement communications and ITS technologies to improve public transit safety, and security.	Ongoing
Develop an inventory of critical transportation choke points, haz-mat routes, and users.	Ongoing
Work with appropriate agencies to improve the transmittal of bike and pedestrian crashes to local police departments.	Ongoing
Promote the Safe Routes to School program.	Ongoing
Promote and advance the use of roadway safety audits in the Pioneer Valley.	Immediate
Identify and advocate for additional revenue sources to bring the regional transportation system into a state of good repair.	Immediate
Improve geometrics and upgrade traffic signal control equipment to improve safety.	Immediate
Develop appropriate educational resources to promote safety for drivers, bicyclists, transit users, and pedestrians.	Immediate
Limit opportunities to access freight rail facilities and infrastructure.	Immediate

a) Develop a regional list of high crash locations.

Based on this strategy in the 2007 RTP, the PVPC published a list of the Top 100 High Crash Intersections in the Pioneer Valley Region in March of 2008. This data was based on MassDOT crash data from 2003 - 2005. The report has been useful in identifying high crash locations that are eligible for funding under the Highway Safety Improvement Program (HSIP). This report is currently scheduled to be updated as part of the Federal Fiscal Year 2012 Unified Planning Work Program.

b) Work with the State and local communities to standardize the way they archive their crash records.

The new crash report forms implemented prior to 2003 greatly improved the amount of crash data included as part of the statewide database. In the Pioneer Valley region, however, additional efforts are necessary to increase the number and accuracy of the crash data submitted to the State by select communities. The Pioneer Valley MPO should work in consultation with the MassDOT, Governor's Highway Safety Bureau and other appropriate agencies to sponsor regional workshops on the proper procedures for completing crash report forms and distributing information to the state. These workshops should also focus on the existing procedures in which crash data is entered into local police department software to maximize the efficiency of this data for use in ongoing transportation planning activities. The development of a close relationship between the state, regional and local entities will greatly assist in the ability to obtain local crash data for planning purposes.

c) Increase the deployment of cameras and other security devices and measures.

The security of the critical elements of our regional transportation infrastructure is a daunting task. Monitoring of key locations such as bridges, transit centers, and rail and freight yards can often be supplemented by the installation of video cameras and other ITS devices. It will be important to continue to identify sensitive areas in the region and develop appropriate plans to increase security. The recent completion of the I-91 ITS project has resulted in the installation of a number of video cameras to assist in monitoring the I-91 corridor.

d) Provide accommodations for pedestrians, transit users, and bicyclists in roadway and bridge design and the maintenance of existing facilities.

The Pioneer Valley RTP promotes a balanced transportation system. In order to achieve this system it will be important to invest in increasing the safety of bicyclists, pedestrians, and transit users. The Pioneer Valley MPO should continue to utilize the Project Evaluation Criteria to identify and prioritize transportation improvement projects that promote the safety of bicyclists, pedestrians, and transit riders.

e) Implement communications and ITS technologies to improve public transit safety and security.

PVTA has an ongoing ITS program developed through its ITS Architecture, Implementation and Deployment Plan. One component of this plan will allow for vehicle monitoring and improved communications for both drivers and passengers. The UMass Regional Traveler Information System (RTIC) also has implemented a number of ITS devices to assist in providing travel information. The Pioneer Valley MPO should invest in the advancement of ITS equipment to improve operational efficiency, give passengers real time information about schedules, provide critical emergency information to first responders, and interface the transit ITS components with the other ITS infrastructure in the region.

f) Develop an inventory of critical transportation choke points, haz-mat routes, and users.

While it is clear that the transportation of hazardous materials is strictly regulated, it is also important to ensure that the roadways designated for the transportation of hazardous materials are inventoried on a regular basis to identify potential problems areas. This information can be collected as part of ongoing pavement management, bridge management, and congestion management programs conducted by the state and the region. It will also be important to share this information with transportation providers.

g) Work with appropriate agencies to improve the transmittal of bike and pedestrian crashes to local police departments.

The Pioneer Valley MPO in consultation with MassDOT, local police departments, and other interested agencies should develop a public awareness campaign to require bicyclist and pedestrians that are involved in crashes to fill out a crash report form. Currently, bicyclist and pedestrians that may be involved in a minor crash that did not involve an injury may not report the incident. In addition, crashes involving bicyclist and pedestrians along off-road facilities such as the Norwottuck Rail Trail are not reported. More outreach is required to emphasize the importance of this information in bicycle and pedestrian safety planning efforts.

h) Promote the Safe Routes to School program

The Massachusetts Safe Routes to Schools Program is coordinated through MassRides. The Pioneer Valley MPO should work in cooperation with MassRides to promote the Safe Routes to Schools Program and assist in identifying potential candidate communities and school districts for inclusion in the program.

i) Promote and advance the use of roadway safety audits in the Pioneer Valley.

Roadway Safety Audits (RSA) are a proactive, low-cost method to improve safety. A RSA uses a large team of analysts representing a variety of interests to perform a field review of high hazard locations and identify factors that may contribute to crashes. The PVPC should continue to work with MassDOT to use the RSA process to identify and advance recommendations for high crash locations in the Pioneer Valley.

j) Identify and advocate for additional revenue sources to bring the regional transportation system into a state of good repair.

Chapter 7 of this document identifies the existing and projected future condition of the region's federal aid eligible roadways. Based on existing funding levels, it will be difficult to maintain the existing roadway system at acceptable levels. The PVPC should continue to work with MassDOT and other appropriate agencies to identify alternative sources of revenue to assist in the maintenance of the regional transportation system.

k) Improve geometrics and upgrade traffic signal control equipment to improve safety.

Traffic signals require routine maintenance in order to operate at maximum efficiency. Inefficient signal timing plans can lead to driver frustration which often contributes to aggressive driving, road rage, and the running of red lights. The Pioneer Valley MPO should consider developing a regional program to invest in the physical upgrade of key intersections throughout the region. Under this program, traffic signal improvements would be restricted to the installation of new equipment such as overhead mast arms and traffic signal heads to bring the intersection in compliance with the Manual on Uniform Traffic Control Devices (MUTCD) and the development of new signal timing and phasing plans. Restricting the improvements to just equipment upgrades

would allow more efficient use of funds. In addition, these improvements would be eligible to be funded as part of the Congestion Mitigation and Air Quality (CMAQ) program.

l) Develop appropriate educational resources to promote safety for drivers, bicyclists, transit users and pedestrians.

The PVPC should continue to work in coordination with MassDOT, MassBike, local schools, and other appropriate agencies to develop educational materials that promote safety for all transportation users. An emphasis should be placed on the development of new video materials that could be distributed to local schools to assist in promoting bicycle and pedestrian safety.

m) Limit opportunities to access freight rail facilities and infrastructure.

The security of the regional rail facilities and infrastructure is an important security need for the region. It will be critical to maintain a close relationship with the existing owners of active rail lines to identify their needs and assist in the development and implementation of security planning activities. Railroads already have existing relationships with local officials with regards to hazardous materials response. These relationships are the logical starting point of discussing homeland security concerns with the region's rail carriers. Locations should also be identified for the installation of security fencing to both promote security and increase safety by restricting areas in which pedestrians can access active rail lines.

B. THE MOVEMENT OF PEOPLE

Efficient movement of people remains a top priority of the regional transportation system. Congestion typically occurs when the demands on a system surpass the actual handling capacity. These types of conditions are prevalent in areas where a number of roadways converge onto a single segment, like major bridge crossings. Due to limitations in lane capacity and alternate travel routes, bridges have a tendency to bottleneck traffic. Feasible alternatives to congestion relief through increases in roadway capacity without actual lane expansion are strongly encouraged. This approach requires that vehicle users, commuters, and travelers change their travel patterns and opt for more congestion friendly alternatives such as public transportation, ridesharing, bicycling, and walking.

It is important to develop balance in the regional transportation system. Improvements in the regional transit system and provisions for pedestrians and bicyclists in transportation design can help achieve balance and reduce our reliance on the automobile. Similarly, the development of transportation improvements that do not increase capacity will not induce more vehicle trips that can quickly develop into new areas of congestion.

The establishment and/or maintenance of adequate access to the natural, economic, social, historic, and cultural resources of the Pioneer Valley is also a key to economical vitality. The location of the crossroads of Interstates I-90 and I-91 within the Valley's boundaries makes inter-regional and interstate travel very accessible. Likewise, the region's proximity to Bradley International Airport, Northeast Corridor Amtrak service, the network of arterial and rural roads, transit systems, and bicycle and pedestrian ways ensure physical access to educational institutions, military installations, unique regional historic and cultural resources, beautiful recreational areas, and business and retail centers throughout the region.

1. Needs

A series of needs to enhance the movement of people in the Pioneer Valley region have been identified and are summarized in Table 11-3. These needs have been categorized as immediate, future and ongoing. Ongoing needs are areas that may already be considered as part of an existing program that will require to be updated as part of existing planning efforts or analyzed for inclusion as part of a transportation improvement project. Immediate needs will require attention in the short term to advance transportation planning studies and projects. Future needs are considered equally important but will be advanced over a slightly longer timeframe.

Table 11-3 - Summary of Needs to Enhance the Movement of People

Increase opportunities for non-motorized transportation use.	Ongoing
Monitor peak hour congestion in the region.	Ongoing
Incorporate traffic calming measures where appropriate.	Ongoing
Maintain and expand the regional bike network connectivity.	Ongoing
Maintain equity in providing transportation services and access throughout the region.	Ongoing
Maintain and increase access to national passenger rail service in the Pioneer Valley.	Ongoing
Increase opportunities for enhanced air passenger service in the Pioneer Valley.	Ongoing
Provide opportunities for bicycle access to other modes of transport.	Ongoing
Incorporate ITS technologies to improve traffic flow on major regional roadways.	Ongoing
Secure adequate funding for a balanced regional transportation system.	Immediate
Increase the number of riders using transit to commute to work and school.	Immediate
Enhance opportunities for inter-city, inter-regional passenger trips.	Immediate
Identify dependable and equitable funding sources for the Pioneer Valley transit system.	Immediate
Improve coordination and notification of the review of roadway improvement projects.	Future

a) Increase opportunities for non-motorized transportation use.

Bicycling and pedestrian needs in the region are assessed in the Pioneer Valley Bicycle and Pedestrian Plan. The Plan includes information and recommendations on incorporating bicycle and pedestrian features into road reconstruction projects using zoning and development tools to help create environments that support bicycling and walking, increasing bicycle and pedestrian safety, and promoting bicycling and pedestrian activities as alternative transportation choices.

The main purpose of the plan is to guide development in the Pioneer Valley region in ways that encourage and facilitate bicycling and walking as transportation options. Community interest in the Pioneer Valley Region has strongly supported the creation of off road, multi-use trails, bike lanes, and wide curb lanes for bicyclists. These off-road and on-street projects allow for easy access into residential neighborhoods and central business districts; are suitable for making short,

local trips; and can be incorporated into road resurfacing and reconstruction projects for cost savings.

Trail projects are seen by the riding public as a separate and distinct system from the existing transportation network and, therefore, are more popular than road and street facilities. Road and street facilities are seen as unsafe to novice cyclists because of the close proximity to traffic. The plan recommends improvements to roadways for bicyclists, expansion of the off-road network, and coordination with bicycle and pedestrian projects in surrounding regions and the State of Connecticut. By improving the safety of on road facilities, both on road and off road facilities can be viewed as a system and more of a viable commute alternative to driving.

b) Monitor peak hour congestion in the region.

The Pioneer Valley Congestion Management Process (CMP) is an ongoing, systematic process designed to improve transportation in the region by providing up to date information on the location, severity and extent of congested corridors and intersections. SAFETEA-LU requires that congestion management be addressed through a process that provides for safe and effective integrated management and operation of the multimodal transportation system. A complete summary of the CMP for the Pioneer Valley region is provided in Chapter 6.

c) Incorporate traffic calming measures where appropriate.

Traffic calming utilizes engineering devices to force traffic to both reduce speeds and physically prevent certain traffic movements. Traffic calming is typically implemented for residential streets to assist in increasing compliance with posted speed limits. In downtown and urban areas, traffic calming devices can be used to reduce the crossing distance and increase safety for pedestrians. It is important to conduct an engineering study prior to the installation of traffic calming devices. This study should document the extent of the existing problem and develop an extensive public participation process with local officials, residents and emergency service personnel prior to the installation of traffic calming devices.

d) Maintain and expand the regional bike network connectivity.

Creating a network of safe roads and shared use paths has been a central goal of the bicycle planning effort. The concept that you can bicycle “from here to just about anywhere” has universal appeal, and residents certainly want to be able to bike or walk to their favorite destinations. The Regional Bicycle and Pedestrian Plan identifies proposed bikepaths or shared use trails, road and bridge improvements that would enhance bicycle connectivity. Many on road and sidewalk improvements will be incorporated into larger roadway construction projects in the future. A 740-mile, seven-corridor Bay State Greenway (BSG) is recommended as part of the Massachusetts Bicycle Transportation Plan. In the Pioneer Valley this constitutes the Connecticut River Valley East Corridor, the Connecticut River Valley West Corridor, and the MassCentral Corridor. These routes include on road and off road facilities. PVPC continues to work with MassDOT on advancing projects associated with the Bay State Greenway.

e) Maintain equity in providing transportation services and access throughout the region.

It is important to provide and maintain equitable transportation services throughout the region. This requires that a thorough public participation process be developed and maintained in order to allow adequate opportunity for all parties to identify their unique needs and/or communicate any issues they may have with transportation planning and improvement projects. The Pioneer Valley MPO has developed a process for the identification of the locations of socio-economic groups, including low-income and minority populations as covered by the Executive Order on Environmental Justice and Title VI provisions. In 2007, the MPO created a public involvement

process that identifies a strategy for engaging minority and low-income populations in the transportation decision making process. It also developed methods to routinely evaluate this strategy to ensure its continued effectiveness. It is the responsibility of the MPO to institutionalize a planning process for assessing the regional benefits and burdens of transportation system investments for different socio-economic groups and to develop an on-going data collection process to support the effort and identify specific actions to correct imbalances.

f) Maintain and increase access to national passenger rail service in the Pioneer Valley.

The Pioneer Valley has quite a stake in the future of national passenger rail service because of the significant service that it provides in the region and the potential opportunities for future partnerships that are being actively considered. The need for some regional or state support for passenger rail services provided in the region is necessary to both retain the existing service as well as to exercise future options.

g) Increase opportunities for enhanced air passenger service in the Pioneer Valley.

The Connecticut Department of Transportation (ConnDOT) completed a Master Plan for Bradley International Airport. This plan projected growth in operations over a 20 year horizon and developed a long range strategy to leverage the strength of the airport and the Hartford/Springfield region to satisfy the air passenger needs of the region. Some of the goals of the plan, such as the implementation of international service, are already under implementation. It will be important to support the implementation of this master plan in order to maintain safe, efficient air passenger transportation opportunities for the Pioneer Valley region.

It is also important to support the expanding needs of other regional airports such as Westfield-Barnes Municipal Airport, Westover Metropolitan Airport, and the Northampton Airport. Improvements to both existing airport infrastructure and access to the airports must be maintained in order to realize continued growth in air transportation opportunities.

h) Provide opportunities for bicycle access to other modes of transport.

The PVPC has successfully managed a regional bicycle rack program for many years. This program purchases bicycle racks via a competitive grant process and then assists in the distribution and installation of the racks at key locations in local communities. The bicycle rack program supplements other ongoing efforts, such as the Rack N' Roll (bikes on bus) program on all PVTA routes, that link bicycles to other modes of transportation. It will be important to continue to expand upon these efforts to ensure that sufficient links exist to allow bicyclists to easily shift to other modes of transportation in the region.

i) Incorporate ITS technologies to improve traffic flow on major regional roadways.

It will be important for the MPO to advocate for additional ITS applications that could benefit local communities on major regional roadways. In addition, it will be important to identify future transportation improvement projects that could benefit from the integration of ITS technology to improve traffic flow without adding additional capacity.

j) Secure adequate funding for a balanced regional transportation system.

Travel in the Pioneer Valley region is dominated by automobile travel. Work trips are characterized by a high percentage of people that choose to drive alone to work, which contributes to both congestion and air quality issues. Lack of sufficient funding for public transit and a viable regional ridesharing program contribute to people choosing to rely on the automobile. Lack of

connectivity for bicycles and pedestrians require people to use their car for shorter trips that could otherwise be made by bike or on foot.

k) Increase the number of riders using transit to commute to work and school.

As living and employment patterns have changed over the past 25 years, transit systems have had difficulty reacting to the evolving needs of their passengers. The PVTA will need to introduce innovative new services that complement existing service and provide competitive travel options across the service area.

(i) Increased Cross-Town Service

Opportunities exist in Holyoke and Springfield to improve transit service by better matching the needs to get to and from jobs, education and childcare with the services provided. PVTA has considered extending the hours of service on the primary routes servicing these communities and seeks to convert to community routes to provide more responsive service as a FlexVan route. FlexVan service uses smaller transit vehicles that are able to provide more responsive and customer focused service to passengers.

(ii) Limited Stop Express and Commuter Routes

Limited stop express and commuter routes are an option for opening access to job and educational opportunities to all residents throughout the region. These services, when combined with the existing routes will provide for travel times that are competitive with cars. They will further provide new services to support PVTA's Transit Centers and ongoing regional development projects.

(iii) Northern Service Area

To further open employment and educational opportunities between the Urban Core and the academic institutions in the Five College area, PVTA has considered a direct connection between UMass in Amherst and Holyoke. In Northampton, the redevelopment of the former state hospital site and increasing development along King Street provides an opportunity to connect the vibrant retail areas of this community using a community route.

(iv) Springfield Union Station

The Springfield Union Station project will revitalize the long-vacant Springfield landmark into a comprehensive multimodal facility with business, entertainment, cultural and retail operations. The Union Station Project will consolidate the different transportation terminals of Springfield into one location. The Multimodal center will include the Springfield Hub for PVTA routes, Intercity Buses, and Amtrak.

(v) Transit Centers

A Regional Transit Center was recently opened in the City of Holyoke, and regional transit centers are currently proposed in the communities of Northampton and Westfield. These centers are an important need to improve the quality and integration of mass transportation in the Pioneer Valley and serve as a catalyst for downtown development and revitalization. They will also assist in the following areas:

- Consolidate downtown bus stops for existing PVTA service and provide simplified system transfers while providing a comfortable, safe and convenient waiting facility for passengers.
- Provide opportunities to integrate private intercity carrier service with regional PVTA service, paratransit service and bicycle and pedestrian trips.
- Encourage public/private cooperation and leverage development opportunities.

- Potentially provide a viable adaptive reuse for unused or underutilized civic and historic buildings.
- Contribute to the economic development and revitalization of downtown areas.

(vi) Intercity Bus Services

Intercity bus service to and from the Pioneer Valley is quite extensive. Companies like Peter Pan provide bus services to cities throughout New England and beyond. Peter Pan, for example, offers hourly service between the Pioneer Valley and Boston every day. As congestion increases and poses more of a problem for intercity travelers, it is in the best interest of the region to promote these services as a viable alternative to the automobile.

l) Enhance opportunities for inter-city, inter-regional passenger trips.

It is important to maintain efficient transportation options from the Pioneer Valley region to the Boston area. Similarly, there are gaps in service options from the Springfield area to both Bradley International Airport and the City of Hartford.

m) Identify dependable and equitable funding sources for the Pioneer Valley transit system.

Currently, operating funds for the PVTA come from six sources: 20% from the FTA, 44% from the Commonwealth, 18% from the farebox, 17% from their member communities, and less than one percent each from earned interest and advertising. Nearly all of these sources of revenue are shrinking or have been capped, and it is becoming increasingly difficult to expand transit. To add to an already difficult fiscal environment, PVTA is experiencing funding problems with the Commonwealth of Massachusetts. PVTA operates on what is called reverse funding. This means that PVTA operates all year long - basically going into the red to operate its service - and at the end of the year, submits a bill to the Commonwealth for reimbursement of monies owed for the previous years' service. Also, due to the poor fiscal climate at the state level PVTA has been forced to cut back on its budget, operating at FY 2001 levels. PVTA with the assistance of PVPC has become more creative in securing funding for new projects.

In areas like the Pioneer Valley, transit is deemed more of a public service for the transportation disadvantaged than an actual commute option. A greater commitment must be made to transit as a commute option if our goals of fewer vehicle miles, lower emissions, and improved environmental quality of our transportation system are to be achieved.

n) Improve coordination and notification of the review of roadway improvement projects.

As roadway improvement projects advance through the MassDOT design process, it is important to coordinate all review comments with both the local design consultant and the chief locally elected official. While this process can work quite well with some communities, it will be important to expand these coordination efforts to ensure that projects advance towards design in a timely and cost-effective manner.

2. Strategies

A series of strategies were developed to address the needs that restrict the efficient movement of people in the region. These strategies are summarized in Table 11-4. A summary of each strategy follows.

Table 11-4 - Strategies to Assist in the Movement of People

Seek innovative methods to increase transit ridership, including express routes and flex vans.	Ongoing
Monitor congested areas using the regional Congestion Management Process (CMP).	Ongoing
Develop a regional list of top congested locations.	Ongoing
Promote the implementation of bicycle lanes where practical.	Ongoing
Advance and promote the principles of pavement management.	Ongoing
Conduct parking studies for downtown areas.	Ongoing
Enhance directional and guide signs to/from the regional highway system.	Ongoing
Promote transit oriented development.	Ongoing
Develop a comprehensive Commuter Rail network.	Immediate
Identify locations for park and ride lots and supporting express transit service.	Immediate
Work with the State and local communities to implement the recommendations of regional transportation studies.	Immediate
Identify sources of revenue for local transportation projects.	Immediate
Encourage private connections to the regional bikeway network.	Future

a) Seek innovative methods to increase transit ridership, including express routes and flex vans.

The Pioneer Valley MPO should work in consultation with local communities and the PVTA to identify future transit studies to include as part of the UPWP. These studies should identify areas that could benefit from additional or improved transit service. A combination of transit surveys, existing ridership data, the regional transportation model, and other appropriate analysis techniques should be utilized to develop recommendations to increase transit ridership.

b) Monitor congested areas using the regional Congestion Management Process (CMP).

The SAFETEA-LU legislation directly addresses congestion mitigation as a planning activity. Areas of congestion or travel conditions that are no longer acceptable to the public must be identified as target areas for improvement. The improvement strategies must first consider maximizing the efficient use of existing facilities prior to the recommendation of expansion. A number of these strategies include actions other than roadway capacity expansion, such as travel demand management, traffic operations improvements, growth management, and alternate modes of travel.

Areas of congestion will be identified through the Congestion Management Process, the regional travel demand model, and local input. Performance measures are utilized to indicate the level of severity of congestion for each area. Routine monitoring of these areas will be conducted to determine if the conditions are “re-occurring” or “intermittent”. For those areas that are “re-occurring” they will be designated as a congested area or corridor. Priority attention will be given to the relief of those corridors designated as congested. Under the current TIP project priority process, projects that are designed to alleviate these congested areas receive higher priority than other projects.

Other methods of improvement or trip reduction must be analyzed and considered prior to the expansion of capacity. These activities should also be incorporated, if possible, with any capacity improvement in the congested areas. Regional congestion mitigation actions that improve travel flow efficiency or reduce single-occupant vehicle travel are also eligible for federal funds. These projects include traffic signal coordination projects, high occupancy vehicle lanes, car and van pool service, alternative mode of travel expansion, and intelligent transportation systems. The objective of these activities is to reduce congestion and in turn improve air quality throughout the Region.

c) Develop a regional list of top congested locations.

Continue to rank the top congested locations and bottlenecks in the Pioneer Valley Region as part of regular updates to the Regional Congestion Management Process (CMP). Utilize peak hour travel time information to identify congested corridors and intersections and develop a public participation process to assist in the prioritization of congested areas. Update the current status of ongoing studies and potential transportation improvement projects for each location. Advance new transportation planning studies as appropriate for locations with no pending improvements.

d) Promote the implementation of bicycle lanes where practical.

Utilize the criteria set forth in the MassDOT Project Development and Design Guide to identify areas where bicycle lanes could be included as part of ongoing transportation improvement projects. Develop recommendations as appropriate in transportation studies completed as part of the UPWP to install bicycle lanes.

e) Advance and promote the principles of pavement management.

The primary goal of any pavement management system is to provide decision-makers with a list of improvement projects that maximize the benefit of limited maintenance dollars. PVPC staff, under the direction of the Pioneer Valley MPO, should continue to refine the maintenance project prioritization process. This process will assist in the prioritization of roadway maintenance projects that are evaluated using the regional project prioritization system.

All federal-aid eligible roadways in the region will continue to be evaluated on a regular basis. This evaluation will consist of a pavement condition survey and a future benefit-cost analysis of various maintenance scenarios. A summary report will be generated for each community in the region. The ability to view various budget and scheduling scenarios will allow the local officials to forecast the needs and conditions of their federal-aid roadway system.

f) Conduct parking studies for downtown areas.

Work with local communities to identify areas for future parking studies for inclusion in the UPWP. Identify the existing parking supply and quantify existing demand through a weekday occupancy and turnover survey. Utilize the information collected in the parking survey to develop recommendations to efficiently manage the existing parking supply and address the need for potential future parking demands.

g) Enhance directional and guide signs to/from the regional highway system.

Incorporate appropriate tasks into future transportation planning studies to inventory and analyze the effectiveness of existing directional guide signs from/to the regional highway system. Develop recommendations and maps of preferred improvements to upgrade existing signage as appropriate.

h) Promote transit oriented development

The Pioneer Valley MPO should promote transit oriented development (TOD) and include TOD strategies and recommendations in future transportation planning studies as appropriate. Build out analysis should incorporate a TOD alternative that estimates the potential trip reduction impacts of mixed use development as well as improved pedestrian and transit access. The Pioneer Valley MPO should continue to work in coordination with the PVTA and local communities to identify opportunities to implement TOD in the Pioneer Valley.

i) Develop a comprehensive Commuter Rail network.

Interstate 91 in Connecticut faces daily congestion backups despite significant investments in new capacity such as a dedicated High Occupancy Vehicle (HOV) lane. The Pioneer Valley MPO should continue to work with officials from the Commonwealth of Massachusetts, the State of Connecticut, local communities, and other interested parties to advance the development of a viable Commuter Rail network. This network would provide a viable alternative to the single occupant vehicle for both commuting and trips to Bradley International Airport.

This strategy will consist of a detailed assessment of the operational and economic challenges associated with the dual use of the existing rail corridor by freight and passenger trains. Under this process all stakeholders must be identified and included as part of ongoing planning efforts. A series of development alternatives should be identified to define scalable estimates of capital and operating costs.

It will also be important to assess infrastructure (capital) needs and operating costs for passenger rail service connections to surrounding areas such as Boston, MA; Hartford, CT; New Haven, CT; and, other surrounding metropolitan areas. All studies should include the incremental implementation of passenger rail service over time and thoroughly assess the necessary parking requirements. In addition, a series of actions should be developed to provide an economic impact analysis for rail corridor as well an assessment of innovative funding strategies including the applicability of federal, state and local funding. This assessment should also include opportunities for transit oriented development and public/private partnerships.

j) Identify locations for park and ride lots and supporting express transit service.

The Pioneer Valley MPO should continue to monitor usage at existing park and ride lots in the region. In addition, feasibility studies for potential new park and ride lot locations should be advanced through the UPWP. Locations for new park and ride lots should be identified through consultation with MassDOT and local officials. In addition, supporting amenities and transit service should also be studied and implemented as appropriate to promote usage of these facilities.

k) Work with the State and local communities to implement the recommendations of regional transportation studies.

Continue to transmit copies of all transportation planning studies to the members of the Pioneer Valley MPO. Utilize the comments of MPO members and local communities to finalize all studies. Provide technical assistance as appropriate to advance the preferred recommendations and alternatives of regional transportation planning studies. Assist local communities in completing Project Needs Forms and Project Initiation Forms to advance project development as detailed in the MassDOT Project Development and Design Guide.

l) Identify sources of revenue for local transportation projects.

Many local communities are dependent on the Chapter 90 Program to fund transportation improvement projects on locally maintained roadways. As demonstrated in Chapter 7 of this document, this funding is not adequate to keep locally maintained roadways operating as acceptable levels. The Pioneer Valley MPO should continue to work with MassDOT and local communities to identify an equitable source of revenue for transportation improvements projects that address local needs.

m) Encourage private connections to the regional bikeway network.

Work with local communities and interested private developers to develop incentives to enhance connections to the regional bikeway network. Review Environmental Notification Forms and Environmental Impact Reports completed as part of the Massachusetts Environmental Policy Act (MEPA) to identify areas that could benefit from enhanced bicycle connections. Provide local assistance with communities to identify incentives and potential funding sources to encourage private bikeway connections.

C. THE 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 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. As a result, the goods movement network provides vital connections between producers and consumers within the state, nationally and internationally.

A large portion of the freight transportation system is privately owned and operated. As a result, it is critical to develop partnerships between state, regional and local agencies with the private sector to coordinate and maintain efficient freight planning and implementation.

1. Needs

A series of needs to enhance the movement of goods in the Pioneer Valley region have been identified and are summarized in Table 11-5. These needs have been categorized as immediate, future and ongoing. Ongoing needs are areas that may already be considered as part of an existing program that will require updating as part of existing planning efforts or analyzed for inclusion as part of a transportation improvement project. Immediate needs will require attention in the short term to advance transportation planning studies and projects. Future needs are considered equally important, but will be advanced over a slightly longer timeframe.

Table 11-5 - Summary of Needs to Enhance the Movement of Goods

Support the development and maintenance of short line and regional railroads in the Pioneer Valley.	Ongoing
Improve the communication between private carriers and state and local officials.	Ongoing
Increase opportunities for air cargo in the region.	Ongoing
Improve connections between different modes and the highway network.	Immediate
Improve coordination with class one carriers serving the Pioneer Valley Region.	Immediate
Improve and coordinate the logistics of freight movement in the Pioneer Valley.	Future
Reduce the regional reliance on trucking for the primary transportation of goods.	Future
Promote the efficient use of the highway network by freight carriers.	Future

a) Support the development and maintenance of short line and regional railroads in the Pioneer Valley.

The Pioneer Valley is served by five rail carriers. The short line and regional railroads often provide the pick up and delivery of cars from the national rail system on lines that the larger carriers could not compete with efficiently. In this role these carriers are often innovative and customer focused providing businesses with what they need for transportation services. These railroads are also aggressive in developing new customers to build their business. The Pioneer Valley MPO should support the growth, development, and maintenance of the shortline and regional railroads through programs intended to promote economic development as well as reduce congestion.

Currently Massachusetts has a Rail Freight Capital Funding Program for funding the implementation of rail improvements pursuant to the general provisions of Chapter 161C of the Massachusetts General Laws. The program will fund projects that demonstrate that the proposed freight rail project will provide a sustained public benefit warranting the use of public funds. Examples of eligible projects include new construction; reactivation and/or rehabilitation of public intermodal freight facilities, safety improvements, and rights-of-way provided there is a clear public benefit to any proposal. However, the current program is limited to projects on publicly owned property rather than any rail property that meets the public benefit. As almost the entire national and Massachusetts rail system is owned by private freight carriers, the number of opportunities for using the program is very limited. The Pioneer Valley MPO shall seek to expand the program to any rail improvement with a clear public benefit. This change would be in line with similar programs in other states.

b) Improve the communication between private carriers and state and local officials.

There is often miscommunication between freight carriers and local and state officials charged with maintaining the road and transportation systems that the carriers depend on. The Pioneer Valley MPO and Pioneer Valley Planning Commission should seek to open a useful dialogue between freight carriers and officials on areas of common concern.

c) Increase opportunities for air cargo in the region.

Air cargo entering the Pioneer Valley travels through the nearby Bradley International Airport in Windsor Locks, Connecticut. Bradley is the primary airport for the Pioneer Valley as well as for Connecticut. Efficient air cargo operations are critical for the region's businesses as they compete in an increasingly global economy. The region should support the improvements of air cargo operations if market forces and conditions warrant it at Bradley as well as Westover and Barnes Airports in Massachusetts.

d) Improve connections between different modes and the highway network.

Often called "the last mile," the link between freight, intermodal terminals, and the regional transportation system is a very important part of the multimodal transportation supply chain. In older cities such as those in Massachusetts, this last mile is often surrounded by conflicting land uses and competing travel demands. For this reason, the Pioneer Valley Region has been working to create dedicated haul roads and multimodal freight corridors. These facilities are special, limited-use connections created to ensure a stable connection between the intermodal terminals, freight facilities, and the regional transportation network and to buffer residential neighborhoods from truck traffic.

e) Improve coordination with class one carriers serving the Pioneer Valley Region..

Class 1 carriers take their designation from revenue standards set by the Association of American Railroads. Currently there are five U.S. and two Canadian Class 1 railroads. Class 1 carriers are the only railroad that can truly provide comprehensive, competitive, and integrated services on a national and international basis. The presence of a Class 1 carrier in the Pioneer Valley is critical to providing efficient transportation services. The Pioneer Valley should remain engaged with CSX, Pan Am Southern, and the Commonwealth to ensure the coordination of transportation improvement projects.

f) Improve and coordinate the logistics of freight movement in the Pioneer Valley.

The Pioneer Valley needs to work with businesses, state governments, and freight carriers to both improve and coordinate the logistics of freight movement. New and existing businesses need to be able to efficiently serve their markets from the Pioneer Valley. This may require investments in all types of infrastructure located both in and outside the region.

g) Reduce the regional reliance on trucking for the primary transportation of goods.

As much as 98 percent of the region's freight moves via trucks in the Knowledge Corridor which includes the Pioneer Valley. Increasing transportation alternatives for business will provide more market choices for freight as well as reduce the impacts of trucking on the region's infrastructure.

h) Promote the efficient use of the highway network by freight carriers.

As 98% of the region's freight movements take place via truck, the efficient use of the road and highway system is critical. The Pioneer Valley Region should consider the impacts to freight and trucking in making transportation investment decisions.

2. Strategies

A series of strategies were developed to address the needs that restrict the efficient movement of goods in the region. These strategies are summarized in Table 11-6. A summary of each strategy follows.

Table 11-6 - Strategies to Enhance the Movement of Goods

Improve directional signage from the national highway network to major freight centers and destinations.	Ongoing
Meet with class one carriers on a regular basis to enhance the regional freight rail network.	Ongoing
Incorporate appropriate design measures in roadway improvement projects to accommodate freight movements.	Ongoing
Improve the connections between the national highway network and air and rail intermodal terminals, transloading centers, freight yards, pipeline terminals and distribution centers.	Immediate
Develop incentives to encourage businesses to utilize a mix of freight transportation alternatives.	Immediate
Identify and mitigate vertical clearance issues at underpasses.	Immediate
Use the regional CMP to identify areas of freight congestion.	Future

a) Improve directional signage from the national highway network to major freight centers and destinations.

The directional signage between the National Highway System and major freight hubs should be improved through increased communication with local communities and MassDOT. Often this signage is obsolete or missing entirely which can cause freight traffic to get lost on local streets as well as caught by low clearance bridges.

b) Meet with class one carriers on a regular basis to enhance the regional freight rail network.

The Pioneer Valley MPO shall maintain an active relationship at all levels with the Region's Class 1 rail carriers; CSX and Pan Am Southern, where issues of singular and mutual concern are discussed and acted upon. This engagement shall include the Chair of the MPO, the Secretary of Transportation, other members, and the staff of the MPO.

c) Incorporate appropriate design measures in roadway improvement projects to accommodate freight movements.

Ensure that the unique concerns and challenges presented by freight movement are included in the design of roadway projects.

d) Improve the connections between the national highway network and air and rail intermodal terminals, transloading centers, freight yards, pipeline terminals and distribution centers.

Pioneer Valley, through its central location in New England and with its extensive transportation infrastructure hosts a number of Intermodal hubs where goods are transferred from one mode to another. These facilities which include rail intermodal terminals, transloading centers, freight yards, and pipeline terminals need good access to national highway network. Often, it is this connection which provides the greatest challenge for these facilities. Antiquated roadways,

bridges, and routes through neighborhoods negatively affect the efficiency and burden their host communities. The Pioneer Valley MPO shall seek to improve the connectivity between these intermodal hubs and the National Highway System.

e) Develop incentives to encourage businesses to utilize a mix of freight transportation alternatives.

The movement of goods in the Pioneer Valley Region is dominated by trucking, which has 98 percent of the market. In order to develop a more balanced transportation system, the Pioneer Valley MPO shall seek measures to encourage a wider mix of freight transportation by businesses.

f) Identify and mitigate vertical clearance issues at underpasses.

Low clearance underpasses restrict the efficient movement of freight in the Pioneer Valley region. The Pioneer Valley MPO should continue to identify locations with vertical clearance issues, identify appropriate truck travel routes and advance transportation improvements that enhance freight movement.

g) Use the regional CMP to identify areas of freight congestion.

The Pioneer Valley MPO shall use the regional CMP to identify specific areas which may have freight congestion. Over time, the movement of goods shall be incorporated into the CMP as a separate element to reflect the different challenges that create choke points for freight.

D. THE 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.

1. Needs

A series of needs to enhance the movement of information in the Pioneer Valley region have been identified and are summarized in Table 11-7. These needs have been categorized as immediate, future and ongoing. Ongoing needs are areas that may already be considered as part of an existing program that will require to be updated as part of existing planning efforts or analyzed for inclusion as part of a transportation improvement project. Immediate needs will require attention in the short term to advance transportation planning studies and projects. Future needs are considered equally important but will be advanced over a slightly longer timeframe.

Table 11-7 - Summary of Needs to Enhance the Movement of Information

Expansion of the existing ITS infrastructure in the region.	Ongoing
Improve distribution and access of real-time highway and transit information.	Ongoing
Coordinate efficient use of existing rights of way to house communication infrastructure.	Ongoing
Educate communities on the advantages of ITS and improve the use of ITS in the region.	Ongoing
Improve Incident Management on Major Routes.	Ongoing
Increase public and community involvement in the transportation planning process.	Ongoing
Improve the availability of high speed internet and wireless communication access in the region.	Immediate

a) Expansion of the existing ITS infrastructure in the region.

The Regional ITS Architecture for Western Massachusetts includes an Implementation Plan that addresses the planned components of the architecture and identifies key initiatives that are required to implement the expansion of the existing ITS infrastructure in the region. The guidance committee for Western Massachusetts recommended four short term needs to ensure expansion of the existing infrastructure.

- Event Reporting System: An internet based tool serving as a central depository of information on events that could negatively impact the regional transportation system.
- Expansion of the Massachusetts Interagency Video Integration System (MIVIS): Requires the expansion of the existing system of real-time video feeds. Additional equipment is necessary for implementation of this system which would improve the ability to identify and analyze transportation related incidents on major roadways.
- 511 Traveler Information System: Calls placed to 511 will provide current travel information on weather and road conditions, traffic updates, and ongoing construction projects free of charge.
- Planning Data Archive: This system coordinates the exchange of planning data archived through other existing ITS technology. Information on traffic volume and speed can be used in the development of regional transportation studies. Copies of past video feeds can be used to collect historical data on the impact and severity of areas of congestion. This information is extremely valuable to assist in the development of recommendations to decrease congestion and improve safety.
- PVTA ITS: In 2010 PVTA began installing a comprehensive automated vehicle location and communications system in its vehicles. When complete in 2012, this will provide the some of the most detailed and immediate travel data ever available. The data will be a tremendous benefit to customers seeking schedule and travel information, as well as to operations planners and public safety officials.

b) Improve distribution and access of real-time highway and transit information.

Modern technology continues to expand and become more affordable. As a result, the use of cell phone and in-vehicle navigation systems is becoming much more commonplace. On July 21,

2000 the Federal Communications Commission (FCC) designated 511 as the single travel information telephone number to be used across the United States. Calls placed to 511 provide real-time traffic updates for major Massachusetts roadways. In Massachusetts, this service is provided by a public-private partnership with Sendza at no cost to the state.

The University of Massachusetts Amherst (UMass) currently has an active traveler information system for the Pioneer Valley region. As technology continues to advance, information will become much more readily available. As a result, it will be extremely important to improve the exchange of information exchange between ITS users, stakeholders and providers.

c) Coordinate efficient use of existing rights of way to house communication infrastructure.

It is important to efficiently use existing rights of way along regional infrastructure such as major highways and bridges. The provision of additional conduit can facilitate the expansion of existing technology and foster the development of public/private partnerships to expand opportunities for economic development and data exchange.

d) Educate communities on the advantages of ITS and improve the use of ITS in the region.

ITS is not just the installation of cameras and message signs. The impacts of intelligent transportation system technology has a wide range of applications beyond data collection and the provision of real-time traffic information for the regional highway system. Local communities can benefit from ITS applications such as over-height vehicle detection systems to prevent large vehicles from striking low-clearance bridges and underpasses. Parking management systems can assist in the advance notification of the capacity of an existing garage. Remote weather sensing equipment can improve the efficiency of local roadway maintenance operations.

It will be important for the MPO to assist in the education on the types of ITS applications that could benefit local communities. In addition, it will be important to identify future transportation improvement projects that could benefit from the integration of ITS technology to improve the use of ITS in the region.

e) Improve Incident Management on Major Routes.

Incident management is the process of the response of multiple agencies to highway-related traffic disruptions. The development of an efficient and coordinated response to incidents reduces their adverse impacts on safety, congestion, and the regional economy. As a result of the wide range of agencies involved in emergency services, an incident management program can assist in identifying regional stakeholders, coordinating joint operations efforts and reducing overall response time to incidents. As incident response time is decreased, the likelihood of secondary incidents can also be decreased. It is not uncommon for MPO's to coordinate incident management programs as a method to assist in reducing congestion along major routes. Development and advancement of incident management in the Pioneer Valley supports the vision and goals of the RTP to reduce congestion and increase safety.

f) Increase public and community involvement in the transportation planning process.

Public participation is critical to the advancement of transportation studies and improvement projects that meets the needs of the Pioneer Valley Region. The Pioneer Valley MPO needs to continue to refine the regional public participation process to provide ample opportunity for all to provide input.

g) Improve the availability of high speed internet and wireless communication access in the region.

High speed internet is an important tool for expanding educational and economic opportunities for consumers in remote locations as it can help to efficiently access many resources, such as library and museum data bases and collections. High speed internet may also be required to best take advantage of many distance learning opportunities, like online college or university courses and continuing or senior education programs. High speed internet is also important for small business to allow for expansion of existing services through e-commerce opportunities.

2. Strategies

A series of strategies were developed to address the needs that restrict the efficient movement of information in the region. These strategies are summarized in Table 11-8. A summary of each strategy follows.

Table 11-8 - Strategies to Enhance the Movement of Information

Include ITS equipment as part of transit and roadway improvement projects.	Ongoing
Support ITS projects to foster deployment of ITS technology.	Ongoing
Provide training for local communities and stakeholders to increase their understanding of various ITS technologies and equipment.	Ongoing
Ensure consistency with the ITS Regional Architecture for Western Massachusetts.	Ongoing
Monitor emerging information and communications technologies to stay current with state-of-the-art information systems.	Ongoing
Expand efforts to incorporate more feedback into the regional transportation planning process.	Ongoing
Continue to refine and improve the regional project prioritization system as necessary.	Ongoing
Educate local communities on the project development process.	Ongoing
Encourage and promote telecommuting and video conferencing.	Ongoing
Implement real-time passenger and travel information systems.	Immediate
Pursue public/private partnerships to reduce costs and enhance information access.	Immediate

a) Include ITS equipment as part of transit and roadway improvement projects.

The Pioneer Valley MPO should work in cooperation with MassDOT and local communities to identify opportunities to include ITS equipment as part of future roadway and bridge improvement projects. Opportunities to enhance potential projects could be identified when a Project Needs Form (PNF) is submitted for review. The PNF should be compared to the recommendations of the Western Massachusetts ITS Architecture to identify potential ITS equipment that could compliment the project.

b) Support ITS projects to foster deployment of ITS technology.

The Pioneer Valley MPO should encourage the development of pilot projects to identify new and innovative uses of ITS equipment. Through partnerships with local colleges and universities

additional research can be conducted on the benefits of new technologies. In addition, new technology can enhance the way data is currently collected in the region, which in turn could develop new methods to analyze and improve existing transportation problems.

c) Provide training for local communities and stakeholders to increase their understanding of various ITS technologies and equipment.

The Pioneer Valley MPO should work in cooperation with the MassDOT and other interested agencies to develop educational products and workshops to increase local awareness of the benefits of ITS technology. It will be important to identify potential local uses for ITS technology as part of recommendations developed for studies included in the UPWP. In addition, local assistance should be provided after implementation of ITS equipment to perform case studies on the effectiveness of the equipment in improving the local transportation system.

d) Ensure consistency with the ITS Regional Architecture for Western Massachusetts.

It is a federal requirement for all ITS projects to be consistent with the regional architecture. As a result, it will be critical to identify if proposed projects do in fact demonstrate consistency early in the planning and design process. This will ensure compatibility with existing and future equipment and improve the efficiency of the design process.

e) Monitor emerging information and communications technologies to stay current with state-of-the-art information systems.

Technology is constantly changing and improving. It will be important to stay current with changes in ITS technology that could be beneficial to the regional transportation system. In addition, it is also important to identify new uses for existing technology that could benefit the regional transportation system.

f) Expand efforts to incorporate more feedback into the regional transportation planning process.

Utilize and enhance the existing public participation plan to expand efforts to increase the opportunity for public participation in ongoing transportation planning efforts. Identify existing regional and local groups of interest to consult with on a regular basis to identify potential transportation issues that may require further study. Develop surveys on current planning activities to solicit public comments and feedback.

g) Continue to refine and improve the regional project prioritization system as necessary.

Work with the Pioneer Valley MPO to identify enhancements to the regional project prioritization system. Specifically, develop a separate prioritization system for transit and freight improvement projects. Identify the regional measures of effectiveness and establish a weighted prioritization scheme to assist in the ranking of future transit and freight improvement projects.

h) Educate local communities on the project development process.

Develop a series of educational products, particularly for newly elected local officials, to provide information on how to properly advance transportation needs into viable transportation improvement projects. Utilize input from the Pioneer Valley MPO and Joint Transportation Committee to coordinate the development and distribution of this material. Attend local meetings and convene workshops as necessary to support these products.

i) Encourage and promote tele-commuting and video conferencing.

As computer equipment becomes more sophisticated and the cost of equipment becomes more affordable, it will be much more practical to develop initiatives to encourage major employers to offer options for tele-commuting either via a satellite office or their home. Improvements to technology also make video conferencing much more practical and reliable. The increase in use of both tele-commuting and video conferencing could greatly reduce the rise in vehicle miles traveled in the region.

j) Implement real-time passenger and travel information systems.

As the ITS infrastructure continues to expand in the Pioneer Valley, it will be important to develop a reliable process to share relevant data with appropriate agencies. The Pioneer Valley MPO should assist in the coordination of future efforts to enhance the distribution of real-time travel information in the PVPC region.

k) Pursue public/private partnerships to reduce costs and enhance information access.

The development of public/private partnerships is an excellent way to expand existing ITS infrastructure in a cost-effective manner. It will be important to identify and increase opportunities to utilize public rights of way to run conduit necessary for new communication links. It is also important to identify potential partnerships in the preliminary design stages of transportation improvement projects to help reduce construction costs and avoid the need to perform repetitive and costly maintenance work at a later date.

E. SUSTAINABILITY

Sustainability considers both the environmental and social costs of the transportation system. A sustainable transportation system improves access and mobility while reducing environmental impacts such as the production of greenhouse gas emissions and increased air pollution. Sustainable transportation projects also have a positive impact on society through a reduction in single occupant vehicle use, the promotion of fuel-efficiency, advancing healthy lifestyles, and supporting livable communities.

A balanced transportation system is more sustainable as it meets more people's needs while using resources efficiently to make it more likely that future transportation systems will meet future generation's needs. The goal of PVPC's sustainable transportation system is to consistently reduce the VMT per population. Efficient transportation options, especially public transportation, can maximize social equity, increase social connectivity, maximize safety, and maximize resource efficiency. Public transit and ridesharing reduce the number of vehicles on the road. Transportation efficiency benefits society and reduces its impacts on the environment.

1. Needs

A series of needs to enhance the advancement of sustainable transportation in the Pioneer Valley region have been identified and are summarized in Table 11-9. These needs have been categorized as immediate, future and ongoing. Ongoing needs are areas that may already be considered as part of an existing program that will require to be updated as part of existing planning efforts or analyzed for inclusion as part of a transportation improvement project. Immediate needs will require attention in the short term to advance transportation planning studies and projects. Future needs are considered equally important but will be advanced over a slightly longer timeframe.

Table 11-9 - Summary of Needs to Enhance Sustainability

Improve Air Quality.	Ongoing
Protect existing natural, historical, and cultural resources.	Ongoing
Improve the efficiency of the existing transportation system.	Ongoing
Reduce vehicle miles traveled in the region to minimize impacts on air quality, greenhouse gas emissions and energy consumption.	Ongoing
Improve opportunities for bicycle and vehicle parking.	Ongoing
Raise the average vehicle occupancy rate for the region.	Ongoing
Consider the impacts of large scale development on surrounding communities.	Ongoing
Look for opportunities to integrate enhancements into transportation improvement projects.	Ongoing
Reduce stormwater runoff from roads and highways.	Ongoing
Reduce land use/development impacts of new roads and transportation facilities.	Ongoing
Promote Complete Streets.	Immediate
Promote transit oriented development and pedestrian friendly development.	Immediate
Reduce impervious surfaces, which are a major source of water pollution.	Immediate
Reduce visual and light pollution.	Immediate
Incorporate renewable energy.	Future
Reduce sprawl and foster investment in existing urban areas.	Future
Provide for fish and wildlife migration and passage in transportation projects.	Future
Reduce energy use of transportation facilities.	Future
Improve greenways.	Future

a) Improve air quality.

The quality of the air we breathe is directly affected by individuals' personal transportation choices and by the kind of transportation infrastructure we plan, design, and build. Cars - especially SUVs pollute a lot more than do bicycles, buses, or people on foot. Ozone and carbon monoxide (CO) are harmful byproducts of automobile and other motorized transportation options. The pollutants, Volatile Organic Compounds (VOC), Nitrogen Oxides (NOx), and Carbon Monoxide (CO), react together in conjunction with warm temperatures, humidity, wind speed and sunlight to produce ozone (O_3). Ozone is bad for the environment. The Commonwealth of Massachusetts is classified as a serious non-attainment area for ozone. The City of Springfield is a CO non-attainment area. These non-attainment classifications require Massachusetts to conduct transportation planning activities that consider air quality pollution levels and target the reduction of vehicle emissions throughout the state.

VOC emissions originate from various sources such as fuel combustion processes, on and off road mobile sources, biogenic sources, and various solvent processes. CO and nitrogen dioxide (NO_2) emissions, key components of NOx, originate from fuel combustion by on and off road mobile sources as well as stationary sources. Emissions such as VOC are transferable depending on weather conditions and geography of the land. In Western Massachusetts, emissions generated in areas to the south, such as New York City and New Jersey, are transmitted via prevailing winds. This type of emissions displacement can intensify adverse conditions within a region of relatively

low emission levels. Similarly, areas to the north of Massachusetts experience the displacement of emissions generated in the Commonwealth.

b) Protect existing natural, historical, and cultural resources.

Sustainable development can be defined as the maintenance of development at a rate to meet existing needs while protecting the natural resources required for future generations to meet their development needs. It is important to incorporate the principles of sustainable development in regional planning to ensure that a wide range of improvement alternatives are considered prior to the construction of new roadways or the expansion of existing facilities.

The PVPC incorporates the tenets of sustainable development as part of its transportation planning process. Recent examples of our efforts in this area include the Northampton Transportation Plan which developed a municipal transportation planning process for the community. The Indian Orchard Master Plan: 20th Century Mill Town Plan, which developed a toolbox for sustainable development to revitalize the Indian Orchard section of the City of Springfield as well as redevelop the "Crane/Chapman Valve" Brownfield site within the context of the community's vision. The Merrick-Memorial Redevelopment Plan that focused on improving the efficiency of the transportation system in and around the neighborhood while reducing the environmental impacts of road and rail transportation and investments that support these goals.

Other ongoing efforts in the area of Sustainable Development include the Village at Hospital Hill project which consists of the redevelopment of the former Northampton State Hospital property off of Route 66 in Northampton. The goal of this project is to provide employment and residential opportunities that complement the needs of the surrounding community, protecting the quality and accessibility of open space and the adjacent Mill River riparian zone, and retaining the historic character of the Northampton area.

c) Improve the efficiency of the existing transportation system.

The current regional transportation system provides travelers with several options to choose from to meet their mobility needs. However, large differences in travel time and reliability of service may deter the majority of travelers from opting for alternative modes of transport apart from the private automobile. Improving the efficiency of the current system increases connectivity between various transportation modes and enhances current service. This will assist users to overcome some deterring factors. An example would be to synchronize bus route arrival and departure times to facilitate transfers between buses. This includes buses servicing the northern and southern tiers of our region as well as buses servicing the adjacent region of Franklin County. Coordination between the PVTA and FRTA agencies managing these routes would benefit the users and facilitate the efficient movement of people throughout the Pioneer Valley region. There also needs to be some coordination between the local, intercity, and interstate bus schedules to connect people with locations beyond their hometown. A review of local bus arrival times at or near train stations would allow travelers enough time to board departing trains.

Development of an integrated trip planning tool would be useful to identify connection opportunities between all modes of transport. A shared payment method such as a smart travel card could also facilitate efficient mobility. All transportation facilities need to provide amenities for users arriving by bicycle or foot such as bike racks, bike lockers, bus shelters, and sidewalks. A heavily traveled corridor between major activity centers may also benefit from enhanced bus service using Bus Rapid Transit or express buses.

d) Reduce vehicle miles traveled in the region to minimize impacts on air quality, greenhouse gas emissions and energy consumption.

Vehicle Miles Traveled (VMT) was chosen in the Clean Air Act Amendments (CAAA) as the principal travel measure for air quality planning in high ozone and carbon monoxide areas. While the region is in compliance with the requirements of the CAAA, this is mostly as a result of improvements to vehicle emissions and an advanced vehicle inspection and maintenance procedure implemented in the Commonwealth. VMT in the region has steadily increased each year and is projected to continue to increase into the future.

The Pioneer Valley should commit to working to a target of having VMT grow no faster than the population. This will require the development of regional strategies to encourage VMT reduction in the PVPC region. Roads and highways are often expanded under the assumption that the additional capacity created will have a positive impact on reducing congestion. It will also be important to address the potential impact of new capacity expansions on inducing more traffic. The Pioneer Valley MPO must balance the regional transportation system to insure that new expansions do not have a negative impact on existing transit ridership, the length of commuter and shopping trips, and daily traffic volumes.

e) Improve opportunities for bicycle and vehicle parking.

Lack of sufficient parking for both bicycles and vehicles can contribute to congestion and poor air quality as a result of illegal parking and idling. It is important to provide safe, efficient parking that is easily accessed. Parking spaces should be well marked and routinely enforced. A system should also be established to direct vehicles to designated overflow parking areas.

The region also requires more park and ride lots to encourage ridesharing and transit use. There are currently official park and ride lots in Ludlow and Northampton. Additional lots are proposed for Westfield and the Florence section of Northampton. The designation of official state park and ride lots is needed, particularly for commuters from Springfield to Hartford, CT in order to reduce single occupant vehicle trips in the region. Belchertown is another possible location for a future park and ride lot serving I-90 and the Five College area. This could be coordinated with enhancements to existing transit service.

f) Raise the average vehicle occupancy rate for the region.

The region is becoming increasingly auto-dependent because of the sprawling land use pattern. This in turn increases the likelihood that a person will drive alone to get to work. In addition, workers are commuting longer distances to work and increasing their time of commute. It will be important to identify incentives to entice drivers to shift from single occupant vehicles to alternative modes of transportation.

g) Consider the impacts of large scale development on surrounding communities.

Disruption to community character and loss of open space are some of the potential adverse effects of large scale development. Such development may pose additional demands on the existing water, sewer, and roadway network while increasing air pollution. It will be important to mitigate development impacts that adversely affect the region.

Form based zoning regulations could be considered to maintain community character. Traffic impact studies that incorporate the needs of pedestrians and cyclists should be required for new development. Communities are also encouraged to adopt flexible codes with regards to parking to help preserve the community character and reduce the impacts of large scale development.

h) Look for opportunities to integrate enhancements into transportation improvement projects.

Transportation improvement projects should include elements that enhance the travel experiences of all modes of transport. When space permits, standard roadway design should include bike lanes and sidewalks. Cross walks at major intersections and along business districts not only help pedestrians but also drivers who become pedestrians once they park. Street furniture and shade trees enhance the roadway for all users.

i) Reduce stormwater runoff from roads and highways.

Human activities related to the development and use of land can pollute water supplies through the intentional or accidental release or discharge of potential pollutants. Pollutants can run off the surface of the land and enter surface water supplies, lakes, streams, ponds, and rivers. Pollutants can also leach into the ground and contaminate ground water supplies. Transportation related land uses such as airports, highways, rail yards, and truck terminals take up a large portion of the region and have a significant impact on water quality.

(i) Major Roads Cross Water Supply Recharge Areas

Major roads and highways cross much of the Pioneer Valley's public water supply areas, placing these resources at risk of contamination from the salts, petroleum hydrocarbons, asbestos, solids and metals contained in highway stormwater run-off. Of the region's 298 public water supply wells, 144 have a highway or interstate passing within their interim wellhead protection areas. Where recreation facilities such as campgrounds, parklands, motels and restaurants are grouped, clusters of public wells appear directly along the highway. Sections of special note include Route 20 in Monson and Brimfield, Route 19 in Brimfield and Wales, and Route 202 in South Hadley and Granby. Several miles of major roadways pass through DEP Approved Zone II areas, including Route 10 in Southampton and Westfield, Route 202 in Westfield, I-91 in Hatfield, Route 9 in Amherst and Belchertown and Route 57 in Southwick.

(ii) Transportation Support Facilities Can be a Major Source of Pollutants

Transportation facilities, including bus terminals, and government and private fleet service areas, are a potential contributor of non-point source pollution since they are similar to general service gas stations or vehicle repair service shops. Routine engine and body maintenance activities produce solid and liquid wastes, which are carried off of the paved surfaces by stormwater run-off. Leaking underground storage tanks can also cause groundwater contamination and create a safety hazard. Stormwater can be contaminated by any of these wastes that are not stored properly.

(iii) Urban Run-off and Combined Sewer Overflows

Combined sewer overflows (essentially stormwater discharges to bodies of water containing raw sewage from sanitary sewer lines) are a serious problem in the lower Pioneer Valley, preventing the stretch of the Connecticut River south of the Holyoke Dam from reaching fishable/swimmable standards. Stormwater run-off from roads, parking lots, and buildings is greater than the capacity of the combined sanitary and stormwater sewer lines. Rather than have the waste water treatment plant overwhelmed and create flooding in basements and streets, combined systems have been designed to discharge this additional volume to the river.

Reductions to CSO outflow points are achieved primarily by separating tributary sewer lines. Combined sewer and storm systems run beneath local streets and under sections of several state highways, including I-90.

(iv) Road Salt and Sanding Practice

Highway maintenance requires numerous operations that can impact water quality. These include salting and sanding roads, inspecting and maintaining stormwater facilities, and other "housekeeping" practices. Proper maintenance of public and private stormwater facilities (catch basins, detention basins, swales, culverts, outfalls, etc.) is necessary to insure they serve their intended function. Without adequate maintenance, sediment and other debris can quickly clog these stormwater management structures, making them essentially useless. Rehabilitation of such facilities is expensive and, in the case of infiltration systems, may be impossible. Polluted water and sediments removed during the cleaning operation must be properly disposed. Non-structural management options that can significantly improve water quality are street sweeping and routine maintenance and cleaning of stormwater catch basins.

(v) Gravel Roads Require Proper Design, Maintenance and Repair to Prevent Erosion and Sedimentation

Heavy storms produce rapid water velocities which increase the potential for soil erosion especially on and around gravel roads. Pollutants such as oil and grease can also be washed from gravel roads along with exposed soil, and fine sands and silts. These roads, by nature of their topography and design, can, if not properly managed, contribute heavily to this significant water pollution problem. These sediments and pollutants are then carried away into nearby streams and ponds. Sediment loading is a major cause of water quality problems in both lakes and streams.

j) Reduce land use/development impacts of new roads and transportation facilities.

Minimize curb cuts resulting from new development that result from the new road construction to reduce disruption to traffic flow and increase safety. Preserve existing trees and replant any removed during the construction process. Provide a buffer of plants, shrubs, or trees for sidewalks and existing buildings to reduce visual, noise and air pollution.

k) Promote Complete Streets.

Complete streets are designed for everyone. They cater to the needs of all users, ages, and physical abilities. Roadway improvement projects need to incorporate elements that improve safety, accessibility, and ease of use to enhance livability in the Pioneer Valley region.

l) Promote transit oriented development and pedestrian friendly development.

Transit oriented and pedestrian friendly development is defined as a mixed use development with convenient access to public transit and non-motorized transportation to promote reduced automobile use and encourage transit ridership. The neighborhood has a center with a transit station surrounded by high-density development that transitions to lower-density uses. These neighborhoods are located with one-half mile of the nearest transit station. The following features are also commonly included as part of a transit and pedestrian friendly development project.

- Bicycle and pedestrian amenities should be included in the design of the neighborhood.
- Streets are well connected to the regional transportation system and can include traffic calming features to control vehicle traffic speeds.
- Neighborhood development consists of a mix of housing types and prices and should be combined with appropriate retail uses and other public services.
- An emphasis should be placed on reducing the amount of land devoted to parking to promote decreased automobile use.

m) Reduce impervious surfaces, which are a major source of water pollution.

Motor vehicles are the most widespread and difficult to manage non-point sources of pollution. The emissions from the internal combustion engine, at first absorbed into the atmosphere, are released through atmospheric deposition onto land and water surfaces. Fluids, used to lubricate and cool moving parts, leak out during the lifetime of a vehicle and are deposited on land surfaces. Other vehicle components such as brakes and tires wear away through friction, scattering hydrocarbon and metal elements across our region's highways and parking lots. The parking lot, road, and highway infrastructure required for automobiles increases the amount of impervious surface in a watershed, and contributes to increased storm water run-off. All of these vehicle related pollutants deposited on impervious surfaces may be deposited into the region's streams, lakes and rivers during storm events.

n) Reduce visual and light pollution.

Light pollution is an adverse effect of artificial light. It includes sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste. It damages the environment by disrupting ecosystems and health such as impacting visibility at night and changing natural sleep cycles. Care should be taken to identify opportunities to reduce the use of high power lighting, utilize less polluting sources of light, and buffer existing lighting when practical.

o) Incorporate renewable energy.

It is important to identify renewable energy sources to reduce the existing demand on fossil fuels. Solar powered street lights and alternatively fueled vehicles for transit, school, and local government fleets should be considered when practical.

p) Reduce sprawl and foster investment in existing urban areas.

The relationship between transportation and land use is one that shapes both the visual character and the function of communities and regions. The development and use of land is linked to its accessibility and resources. In general, better access increases the desirability of the land and enhances its development potential. Likewise, the use of land affects the transportation system. Land use and transportation planners in the Pioneer Valley and throughout the Commonwealth have accepted the interconnection of land use and transportation planning. MassDOT has also supported this perspective with transportation funds to implement projects designed to facilitate smart growth and encourage a diverse transportation system in the Pioneer Valley. This regional transportation plan update must be in sync with the region's land use plan, Valley Vision 2, and as Valley Vision 2 is updated it must be in sync with this and subsequent versions of the region's RTP.

As new roads are built, development becomes increasingly dispersed. Dispersed development, commonly referred to as sprawl, is generally agreed to be an inefficient use of land. Thus we see how a transportation system, and the planning that goes into creating such a system, actually promotes inefficient land use by encouraging sprawl.

Just as transportation facilities can encourage and perhaps even create land uses of varying efficiencies, so can land uses create or require different kinds of transportation facilities. Compact land uses encourage pedestrian, bicycling and transit traffic, thereby stimulating a need for different kinds of transportation facilities: bike paths, sidewalks, transit, and others.

q) Provide for fish and wildlife migration and passage in transportation projects.

The design and location of a transportation improvement project can impact people, wildlife, water, and habitat. Inadequate river crossings can cause washouts of the road during flood conditions, as well as impede the movement of wildlife. Well-designed crossings can provide safe passage for water and wildlife including large mammals, keeping all safely off the road.

r) Reduce energy use of transportation facilities.

Transportation facilities can use a significant amount of energy. The region should identify opportunities to include alternative and clean energy options in the redesign and construction of transportation facilities.

s) Improve greenways.

Identify gaps in urban forest connectivity and establish local tree stewardship programs and shade tree committees. Separate sewage from grey water collection to be reused in watering green buffers along roadways.

2. Strategies

A series of strategies were developed to address the needs that restrict the advancement of sustainable transportation in the region. These strategies are summarized in Table 11-10. A summary of each strategy follows.

a) Properly mitigate the adverse impact of sprawl by promoting development through the use of permitting and zoning measures.

The following strategies were developed to promote development and reduce sprawl in the region.

- Control sprawl outside existing town centers and growth centers by creating disincentives for development. Establish lower land use zoning intensities and restrict uses which are not appropriate for rural areas. Commercial development should be located in centers, not in auto-dependent, stand-alone buildings. Establish policies restricting extensions of public sewer, water and other infrastructure.
- Adopt commercial center zoning regulations to provide for intimate Main Street shopping districts, with stores lined up along sidewalks and parking to the rear and along the curb.
- Encourage mixed-use projects, which combine residential, retail, office, and public institutional uses in compact, pedestrian-friendly villages or clusters. Mixed-use projects provide opportunities for people to live in close proximity to work, or to walk from the office to shops or restaurants.
- Create use-based zoning incentives to encourage uses such as institutions, museums, schools, public buildings, and elderly and handicapped congregate housing to locate in growth centers rather than in outlying areas.
- Facilitate the redevelopment of Brownfields sites, and other underutilized urban lands, throughout the region. Brownfields are formerly useful industrial lands, which sit neglected and out of the industrial land market because of contamination and high clean-up costs, liability concerns, and lack of site information. More than 75% of these sites are located in urban communities where a majority of the region's minority and low-income population lives.
- Market Brownfields sites and other underutilized urban lands suitable for redevelopment, by making an inventory of sites available to potential developers.
- Consider reduced parking requirements to encourage business to locate in downtown areas.

Table 11-10 - Strategies that Enhance Sustainability

Properly mitigate the adverse impact of sprawl by promoting development through the use of permitting and zoning measures.	Ongoing
Create incentives for downtown revitalization.	Ongoing
Divert highway runoff to stormwater Best Management Practices, such as rain gardens and dry swales.	Ongoing
Restore or maintain connected habitats that allow for movement of fish, water, and wildlife.	Ongoing
Expand use of permeable pavements on sidewalks, paths, car-parks, and minor roads.	Ongoing
Encourage use of materials such as pervious concrete, porous asphalt, paving stone, brick, tile, and gravel where appropriate.	Ongoing
Utilize narrower road widths for local roads where appropriate.	Ongoing
Develop transportation facilities to support and promote smart growth in and around existing city and town centers.	Ongoing
Designate wild and scenic corridors along highways and streams of historic and natural significance.	Ongoing
Implement the Regional Clean Energy Plan.	Ongoing
Encourage local fleets to use clean fuel alternatives.	Ongoing
Promote energy efficient travel modes.	Ongoing
Implement the Hazard Mitigation Plan.	Ongoing
Invest in the repair and maintenance of existing transportation infrastructure.	Immediate
Advance and promote the use of alternatively fueled vehicles.	Immediate
Work with major employers to develop incentives to decrease single occupant vehicle use.	Immediate
Mitigate the impacts of roadway salt and chemical usage during snow season.	Immediate
Refer new projects to Valley Vision Toolbox resources.	Immediate
Support urban forestry initiatives.	Immediate
Utilize energy efficient lighting and solar panels in new facilities.	Immediate
Enforce idling reduction programs in major activity centers.	Immediate
Identify hazardous locations due to drought under major roadways.	Immediate
Identify potential flooding locations along major highways and rerouting alternatives.	Immediate
Develop ordinances and bylaws that encourage mixed use and high density forms of development where appropriate.	Future
Construct roads without curbing where practical to enable sheet flow.	Future
Screen lighting on highways.	Future
Prohibit billboards along highways.	Future
Explore energy generation through solar paving slabs for new sidewalk projects.	Future

b) Create incentives for downtown revitalization.

The following strategies were developed to assist communities in the revitalization of downtown areas.

- Streamline or update antiquated zoning regulations to promote mixed uses and infill development in downtown areas. Allow greater density downtown than in surrounding areas.
- Revise zoning to promote downtown residential uses and add people. Permit residential use of upper floors above street-level commercial uses. Provide density bonuses for downtown residential uses, or set aside downtown land for residential use only.
- Create public-private partnerships of civic leaders and property owners, such as Business Improvement Districts and downtown associations, to manage and market downtowns and to maintain or provide amenities. Identify businesses and industries that would make a good fit with the community and actively market the downtown to these companies.
- Work to restore downtowns through Economic Target Areas or Main Street programs or other public-private community development organizations which can obtain seed money from banks and corporations to make loans, provide gap financing, purchase properties for resale and development, and finance predevelopment market studies.
- Revise zoning to incorporate design, landscape, and streetscape standards to maintain community identity and historic character.
- Exploit opportunities for specialty retail and service businesses targeted toward underserved urban markets by providing grant assistance and tax incentives to businesses.
- Invest in upgrading physical infrastructure (i.e. transit shelters and stations, parking, sewer, water) and improving downtown access. Improve parking through creation of multi-level parking garages and fringe lots with shuttle buses. Facilitate pedestrian movement with walkways and other connections.
- Invest in creating and improving urban greenspace, such as parks and greenspaces, pedestrian walkways, plazas and commons, and amenities.
- Create zoning and tax incentives to rehabilitate and recycle all previously-developed, available, vacant or underutilized city land before promoting use of greenfields (undeveloped open land).
- Restructure zoning to channel commercial growth, especially offices, into downtowns, rather than into highway strip developments, by allowing certain uses only in downtowns. Require retail use of ground level floors of downtown buildings, including parking garages.
- Provide security and employ safe place design standards. Identify crime hot spots and unsafe places downtown and address them with lighting, activity, improved sightlines, and eliminating entrapment spots. Improve maintenance of downtown facilities to give the area a safe, well-cared-for appearance.
- Capitalize on the downtown's inherent capacity for street life and pedestrian activity. Implement a program of streetscape improvements, such as tree ways, lighting, furniture, paving, murals, tree lights, and banners. Coordinate special events programming, such as concert and festivals, to attract people to downtowns and activate public parks. Implement a signage program to direct visitors to key downtown destinations.
- Encourage government and private institutions, such as colleges, post offices, and museums, to retain or expand downtown offices and facilities.
- Promote revitalization of and public access to urban riverfronts. Promote sensitively designed riverfront development that is focused toward the river. Develop a network of riverfront walkways, trails and promenades.

c) Divert highway runoff to stormwater Best Management Practices, such as rain gardens and dry swales.

Rain gardens and dry swales help filter pollutants before water reaches underground aquifer. A multi-level filtration system can be applied with use of pebbles, aggregate, soil, and vegetation. Planters with dense, grassy vegetation that help absorb water can be placed near water collection areas to buffer crosswalks and sop up areas that tend to flood. An example of roadway design that facilitates water drainage includes no curb sidewalks bordered by green space.

d) Restore or maintain connected habitats that allow for movement of fish, water, and wildlife.

In an effort to determine where transportation projects can have the biggest positive or negative impact on the movement of wildlife and connectivity of habitat, the University of Massachusetts, The Nature Conservancy, and other partners have developed maps and data that may be useful for transportation planners.

- Points where roads cross a river using the Stream Continuity Database are available at: www.streamcontinuity.org.
- Locations where road improvements that allow for wildlife passage would provide the maximum benefits is available from the UMass Critical Linkages analysis. UMass CAPS GIS and other data is available at: www.masscaps.org.
- Data about important wildlife habitat and rare species that make up Biomap2 is available at: http://www.mass.gov/dfwele/dfw/nhesp/ land_protection/biomap/biomap_home.htm. Areas identified in Biomap2 represent priority areas for protection of wildlife habitat in light of the changing climate.

The interconnectedness of different parts of a stream or watershed is essential to animals. The combined effects of dams and poorly designed bridges and culvers impact wildlife by limiting access to coldwater habitat, access to feeding areas, access to breeding and spawning areas, and natural dispersal. It is important to identify and remediate locations that currently pose barriers to the movement of fish and riparian animals such as amphibians and reptiles. Replacement of culverts may be necessary to meet current stream crossing guidelines in core habitat areas. Permitting assistance and potential funding assistance is available from a range of groups working to re-connect stretches of river and other habitat.

Examples of effective crossings include bridges, open bottom arches, and culverts that are sunk into the stream bed. Optimum standards provide for fish passage, stream continuity, and wildlife passage. A good crossing spans the stream and banks, does not change water velocity, has a natural stream bed, and creates no noticeable change in the river. In many cases, transportation improvements that benefit wildlife also benefit people by reducing road washouts and animal-vehicle collisions.

The Pioneer Valley Regional Greenways Plan seeks to create a linked network of protected open spaces across the region to preserve special places such as the Upper Westfield River, the Upper Connecticut River Valley, the Holyoke Range, the Metacomet-Monadnock Trail, the Manhan River, the Mount Hitchcock area and the Scantic River. The plan establishes regional agreement on land conservation priorities, provides an analysis tool, fosters cooperative land protection efforts, preserves viable habitat areas and corridors for wildlife, provides recreational opportunity and spiritual sustenance for people, and maintains healthy waterways and water resources.

e) Expand use of permeable pavements on sidewalks, paths, car-parks, minor roads.

To help replenish the underground water reserves, surface material that allows precipitation to percolate through the surface and infiltrate storm water into the soil below is an important link in the life cycle of local clean water supplies. In addition, permeable pavements help reduce water volume carried through the sewage system making them more efficient. Although they should not replace existing storm water management techniques, they play a viable part in an overall storm water site management design. Using permeable paving materials on roadways decreases incidents of flooding and overflow often caused by sudden high volume of water from storms. On sidewalks, they reduce the occurrence of tree root damage that often happens when trees seek access to water and air.

f) Encourage use of materials such as pervious concrete, porous asphalt, paving stone, brick, tile, and gravel where appropriate.

Using a variety of materials is useful to both users and the environment as it provides visual interest, creates a distinguished character, and reduces the heat island effect generated by large asphalt surfaces. Parking lot design that incorporates landscaping with shade trees reduces the heat island effect that can raise the atmospheric temperature by as much as 9 degrees Fahrenheit.

g) Utilize narrower road widths for local roads where appropriate.

A road diet can have a calming effect that encourages reduced vehicular speeds. This in turn can also reduce noise and air pollution while improving safety and livability. Reducing the crossing distance, also makes walking safer for pedestrians of all ages and abilities.

h) Develop transportation facilities to support and promote smart growth in and around existing city and town centers.

Transportation hubs and multimodal centers that provide services such as showers, lockers, bike shelters, and information centers attract both residents and customers of surrounding neighborhoods. They can assist in increasing the viability of high density development initiatives for town centers.

i) Designate wild and scenic corridors along highways and streams of historic and natural significance.

Designation serves to protect significant corridors from development and signage encroachment and preserve their natural beauty and historic character. As a regional resource, it attracts visitors and supports the local economy through tourism. It also protects wildlife by maintaining habitat connectivity. An example is the Connecticut River national designation as an American Heritage River. It is the Pioneer Valley's most prominent natural asset and a source of regional identity and pride.

j) Implement the Regional Clean Energy Plan.

The goals of the Pioneer Valley Clean Energy Plan are to reduce 2000 levels of energy use by 15% by 2020, replace fossil fuels with clean energy, reduce green house gas emissions 80% below 2000 levels by 2050, and create local jobs in the clean energy sector. The plan identifies 30% of the reductions to come from the transportation sector through reduced driving, use of lighter-weight vehicles, expanded public transit service, improvements in aerodynamics, and more efficient propulsion systems, e.g. hybrid vehicles. Clean energy includes sources such as wind, solar, landfill gas co-generation, hydropower, solar electric photovoltaic, solar hot water, biomass, and biofuels.

k) Encourage local fleets to use clean fuel alternatives.

Fleets of local government, schools, businesses, transit, and the service industry would benefit from converting fleets to use clean energy and become less dependent on petro chemicals. Several benefits result from conversion such as fuel cost benefits, reduction in maintenance needs, and health improvements to operators with reduced exposure to volatile organic compounds associated with the use of gas and diesel.

l) Promote energy efficient travel modes.

In addition to walking, biking and transit, promoting energy efficient travel modes such as the use of hybrid electric vehicles, carpooling, and car sharing would help in reducing fuel consumption in the region.

m) Implement the Hazard Mitigation Plan.

The Pioneer Valley Regional Natural Hazard Mitigation Plan assesses risk and vulnerability and creates an action plan for adoption, implementation, and monitoring. Among the hazards identified are dam failures, flooding, severe snow/ice storms, tornado, hurricane, wildfires, drought, and earthquakes. Vulnerable sites include transportation networks, regional economy, and critical resources such as emergency operations centers, emergency shelters, hospitals, and hazardous materials sites. The main goal of the plan is to reduce the loss of or damage to life, property, infrastructure, and natural, cultural, and economic resources from natural disasters. The action plan objectives include improving communications between the State, the region, and the local governments in pre-disaster planning and continuous hazard mitigation implementation.

n) Invest in the repair and maintenance of existing transportation infrastructure.

Utilize the pavement management plan to identify roads in need of repair before reaching critical conditions that would require full reconstruction that is much more costly and disruptive to users. Maintaining a state of good repair on our roadways and bridges will result in more cost effective transportation improvement projects while enhancing the safety and efficiency of all transportation modes.

o) Advance and promote the use of alternatively fueled vehicles.

It will be important to reduce the reliance of the region on vehicles fueled with fossil fuels. The Pioneer Valley MPO should advance measures to promote alternatively fueled vehicles when appropriate as part of studies developed in the UPWP. Assistance should also be provided to local communities and other interested parties in the conversion of vehicle fleets to alternative fuel sources. Promote alternatively fueled vehicles with efforts such as identifying electric vehicle charging locations throughout the region and providing incentives for hybrid vehicles, such as free designated parking at major activity centers.

p) Work with major employers to develop incentives to decrease single occupant vehicle use.

Ridesharing services are provided in the Commonwealth of Massachusetts through MassRides. The University of Massachusetts Amherst also employs a ride share coordinator. The Pioneer Valley MPO should continue to work with MassRides to reduce the percentage of single occupant vehicles that commute to work. These strategies should also be incorporated into ongoing transportation planning studies completed as part of the UPWP.

q) Mitigate the impacts of roadway salt and chemical usage during snow season.

Road salt contaminates drinking water supplies as a result of poor storage, highway runoff, and snow removal. In turn this has adverse effects on human health. It also adversely impacts aquatic life in our rivers and streams by changing the ecosystem and survival potential for native species. Remediation measures have included highway drainage changes, reduction of salt use near water supplies, delivery of bottled water, and the connection of existing well users to public water systems. The use of salt substitutes such as sand and deicer premix may introduce other harmful chemicals to humans and the environment. High levels of salt also impacts food production in the region and the availability of local produce that may not tolerate high levels of salt in the soil.

r) Refer new projects to Valley Vision Toolbox resources.

It will be important to continue to work with local communities to advance the strategies and model bylaws of the most current version of the regional land use plan - Valley Vision 2. Transportation planning studies completed as part of the UPWP should include recommendations consistent with the Valley Vision Toolbox which includes smart growth strategies and model bylaws, design examples, and photo simulations of smart growth principles as appropriate.

s) Support urban forestry initiatives.

Promote a larger, healthier urban forest as part of the urban ecosystem through community planting, maintenance, and education. Encourage planting of shade trees in the urban center and along pedestrian paths to improve air quality and modulate extreme weather conditions. An urban forestry initiative would help protect existing trees and open space. It can work to reclaim abandoned space for use as community gardens and recreational space. An example of a local urban forestry initiative is the Amherst Public Shade Tree Committee that has created an inventory of existing trees for the town center. A map records trees removed due to disease or construction and identifies locations for replanting to recover lost shade trees.

t) Utilize energy efficient lighting and solar panels in new facilities.

Energy efficient lighting can be installed both in indoor and outdoor facilities along roadways and in parking lots using solar panels for electricity. Motion activated lights are useful along sidewalks in urban residential neighborhoods.

u) Enforce idling reduction programs in major activity centers.

Enforcement of idling reduction programs are most beneficial at transportation hubs and bus terminals as well as in any facility that operates a fleet of vehicles. It may be more difficult to enforce in the business district when users do not have regular travel patterns. Nevertheless an educational campaign about the adverse effects of idling to air quality is important for changing traveler behavior.

v) Identify hazardous locations due to drought under major roadways.

A deficiency in precipitation over an extended period of time causes drought. An inventory of soil conditions and the water table under major highways is a first step to identifying potential hazards caused by drought under major roadways. It is not unheard of to experience sinking holes and surface cracking during severe cases of drought. Severe drought occurred in Massachusetts in 1999. During this period the Massachusetts Emergency Management Agency developed the Massachusetts Drought Management Plan. The plan includes data on ground water, surface water, reservoir, precipitation, stream flow conditions and a report on fire danger and agricultural conditions.

w) Identify potential flooding locations along major highways and rerouting alternatives.

The 100 and 500 year flood zone maps help identify locations of potential impact to major highways during a flood incident. Local flood evacuation studies can be conducted to identify potential hazard sites, vulnerable receptors, impacted roads, and traffic flow patterns when certain roads become impassable. An example of such a study is the recent Springfield Flood Evacuation Study that also included a suggested sign message plan for traffic rerouting during an evacuation. Three flood scenarios were identified by the local emergency preparedness team as priority locations for analysis.

x) Develop ordinances and bylaws that encourage mixed use and high density forms of development where appropriate.

The following strategies were developed to assist communities in promoting mixed-use and high density development.

- Develop zoning regulations to promote cluster development, such as major residential development ordinances or open space community development ordinances, as an alternative to standard large-lot subdivisions.
- Incorporate limited mixed use development options into open space community bylaws, such as limited business or office uses.
- Seek state legislation to allow by-right cluster development. Relatively few cluster projects have been built in Massachusetts because it is easier and faster to get approval for standard subdivision plans or Agriculture and Natural Resources (ANR) lots, which do not require special permits.
- Provide incentives for urban infill, clustered residential and mixed-use villages within or immediately surrounding town centers or designated community growth areas.
- Create density-based zoning incentives to encourage development in growth centers, such as smaller lot sizes and setbacks (or no minimum lot size or frontage requirements), and increased heights.
- Retrofit suburban shopping centers to become community centers, by adopting zoning which requires new buildings at the street line.
- Adopt inclusionary zoning regulations to provide opportunities for development of a mix of housing types, including affordable housing, within neighborhoods. Typically, inclusionary housing bylaws promote private market development of affordable housing by offering developers residential density bonuses in return for some affordable dwelling units. The developer must set aside a percentage of affordable housing units, usually 10-25%, in the development for low and moderate-income residents.
- Adopt zoning for elderly and handicapped congregate housing. Congregate housing provides a range of housing opportunities for elderly and handicapped persons, including senior apartments for independent living, life care facilities allowing the progression from independent living to nursing home care, and congregate dwellings with support services for residents.
- Improve the quality of compact neighborhoods with the strategic placement of public amenities. Community centers, recreation facilities, schools, and libraries can all generate shared civic life, provide neighborhood meeting areas, and spur neighborhood investment.
- Provide accessible open space close to homes in compact neighborhoods. Open space, such as bikepaths, parks, play spaces, and commons, enhances the quality of life in neighborhoods, provides recreational opportunities, and improves community safety and desirability.
- Take advantage of existing state and federal programs which provide incentives for Brownfields redevelopment.
- Create Transit Oriented Development (TOD) zones within walking distance, about 2,000 feet, of major bus transit lines in urbanized areas, which allow for higher density and mixed

use. Each TOD should have a mixed use core commercial area located adjacent to the transit stop. Surrounding the core commercial area should be a mix of residential housing types, including small lot single-family, townhouse, condominiums, and apartments at a density of 10-26 dwelling units per acre. TODs should also include public uses, such as parks, plazas, greens, public buildings and public services.

y) Construct roads without curbing where practical to enable sheet flow.

On low-traffic speed streets without curbs pedestrians are given equal importance to drivers, providing for a pedestrian friendly environment by forcing drivers to become more conscious of other users of the roadway facility. This design is also inviting to cyclists as it reduces the potential of losing balance from a tire accidently striking the curb and reduces the accumulation of debris that often pose a safety hazard to cyclists driving on the right side of the road. It aids roadway drainage and eliminates puddles at curb's edge by allowing sheet flow of rain water onto a green buffer or permeable sidewalk.

z) Screen lighting on highways.

Light pollution from highway lighting impacts both humans and wildlife. Screening of highway lighting helps protect all species living within its proximity. Screening can be accomplished using indirect lighting fixtures or standard barriers such as fencing or dense foliage from trees. Use of *full cutoff* lighting fixtures when practical and appropriate spacing exists can assist in maximizing the efficiency of street lights.

aa) Prohibit billboards along highways.

Eliminating billboards on highways would reduce driving distraction as well as light pollution and visual clutter. It preserves community character and protects the natural scenery of our region. Visual clutter and the overpowering scale of billboards add to a driver's stress level.

bb) Explore energy generation through solar paving slabs for new sidewalk projects.

Identify prototype projects and partner with local communities to implement new strategies to save energy and power public spaces through solar paving slabs on sidewalks. The stones are made from renewable, durable materials (e.g., recycled glass or recycled rubber), in which are embedded high-efficiency solar panels.

F. PROJECTS

Projects for the 2012 Update to the Regional Transportation Plan for the Pioneer Valley Metropolitan Planning Organization were selected in part based on the transportation needs and strategies that were previously identified in this chapter. Past versions of the RTP and the results from the public participation component of the plan development were also instrumental in the selection of future transportation improvement projects. Each of the projects have been categorized based on the five emphasis areas. In addition, all projects have been prioritized as being of "High," "Medium," or "Low" importance. Projects of "Low" importance are still considered to be important needs for the region, but are considered a lower priority in comparison to other necessary transportation improvements.

All projects included as part of the FY2011 – FY2014 Transportation Improvement Program (TIP) were prioritized based on the evaluation criteria developed by MassDOT. Each project was jointly evaluated by a committee comprised of members of the MassDOT, MassDOT Highway Division District 1 and 2 offices, and the Pioneer Valley Planning Commission. Projects are given numerical scores ranging from -3 to 3 for a variety of categories. Longer range projects and strategies included as part of this RTP update were initially developed and evaluated by the transportation staff of the

Pioneer Valley Planning Commission. The MassDOT criteria were not used to evaluate RTP projects as many of the projects are not at a sufficient level of detail to conduct a thorough evaluation. After the initial evaluation and ranking by PVPC staff, the list of projects was distributed to the MassDOT, MassDOT Highway Division District 1 and 2 offices, Pioneer Valley Joint Transportation Committee members and discussed in detail at a transportation infrastructure focus group meeting. Input received from all of these sources was used to update the priority of each project.

The effects of future transportation improvement projects have been analyzed using the Pioneer Valley regional transportation model where applicable. Improvement alternatives with the proposed project in place were compared to existing conditions to identify the impact of the improvement on existing traffic volumes and travel times. Increases in traffic on the regional transportation model are often an indication of improved traffic flow and reduced travel times.

Information is provided for all High Priority projects included as part of the RTP. Additional information is provided for all regionally significant or "Non-Exempt" projects regardless of their priority. "Non-Exempt" projects add capacity to the existing transportation system and must be included as part of the air quality conformity determination for the RTP. These transportation projects are on facilities which serve regional transportation needs. Examples of "Non-Exempt" projects include the construction of new principal roadways, fixed guideway transit facilities that offer an alternative to regional highway travel, and projects that are expected to widen roadways for the purpose of providing additional travel lanes.

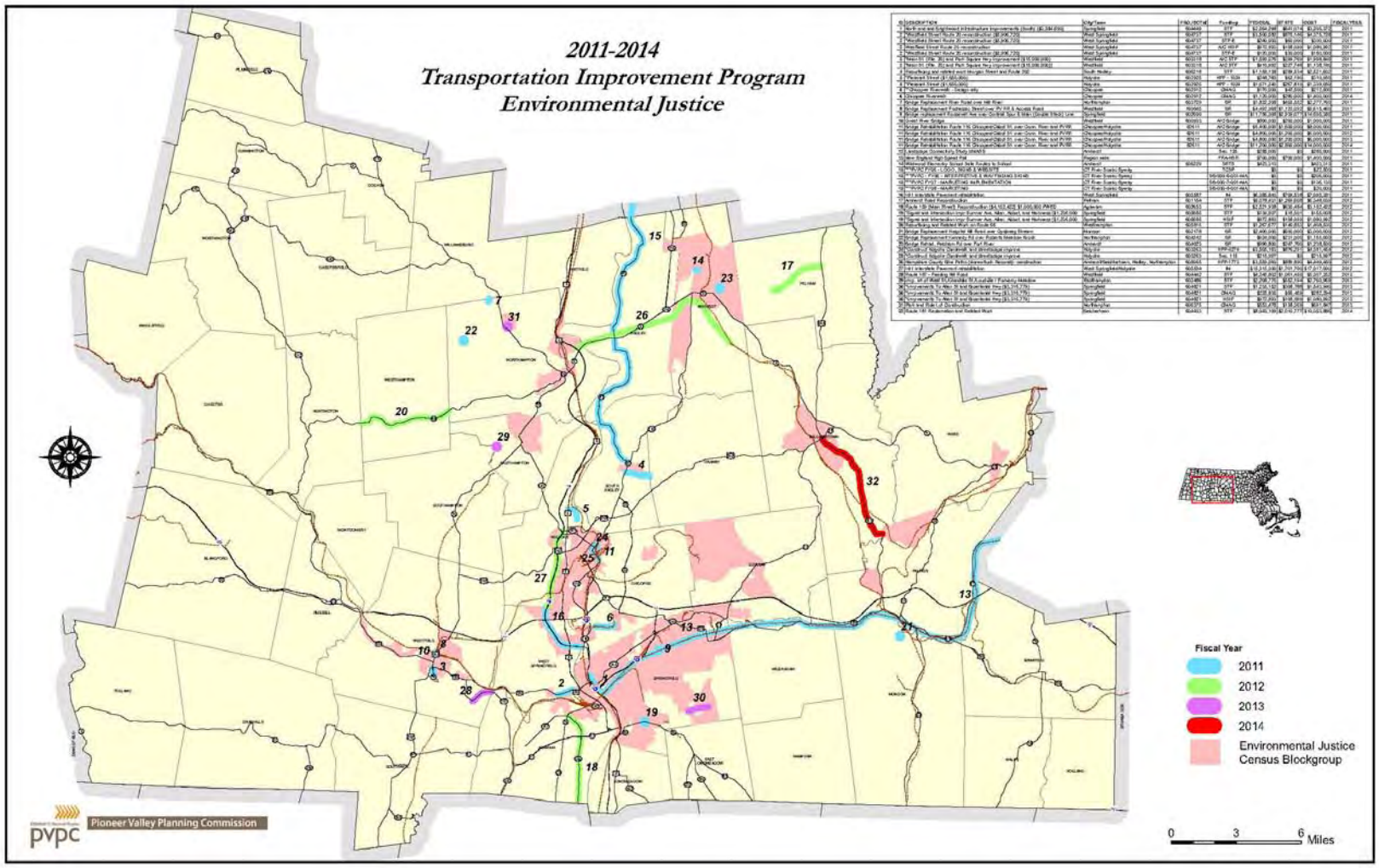
1. FY2011 – FY2014 TIP

Transportation improvement projects included as part of the FY2011 – FY2014 Transportation Improvement Program for the Pioneer Valley Metropolitan Planning Organization must come from a conforming regional transportation plan. Projects included in the FY2011 – FY2014 TIP conform to the 2007 Update the RTP and are presented in this plan for informational purposes. A summary of these projects is presented in Table 11-11 and Figure 11-1. Each project has been given a number for cross reference between the table and figure.

Table 11-11 - FY2011 – FY2014 Transportation Improvement Program

ID	Project Description	City/Town	Project ID	Funding	Fed. Funds	State Funds	Total Cost	FFY Year
1	North end and Brightwood Infrastructure Improvements (South) ($3,384,690)	Springfield	604449	STP	$2,564,298	$641,074	$3,205,372	2011
2	*Westfield Street Route 20 reconstruction ($5,906,720)	West Springfield	604737	STP	$3,500,582	$875,146	$4,375,728	2011
2	*Westfield Street Route 20 reconstruction ($5,906,720)	West Springfield	604737	STP-E	$240,000	$60,000	$300,000	2011
3	*Main St. (Rte. 20) and Park Square Hwy Improvement ($15,000,000)	Westfield	603318	A/C STP	$1,599,076	$399,769	$1,998,845	2011
4	Resurfacing and related work Morgan Street and Route 202	South Hadley	606218	STP	$1,158,138	$289,534	$2,521,602	2011
5	*Pleasant Street ($1,650,000)	Holyoke	602925	HPP - 1024	$248,760	$62,190	$310,950	2011
6	**Chicopee Riverwalk - Design only	Chicopee	602912	CMAQ	$170,000	$42,500	$212,500	2011
3	*Main St. (Rte. 20) and Park Square Hwy Improvement ($15,000,000))	Westfield	603318	A/C STP	$910,992	$227,748	$1,138,740	2011
2	Westfield Street Route 20 reconstruction	West Springfield	604737	A/C HSIP	$972,893	$108,099	$1,080,992	2011
2	*Westfield Street Route 20 reconstruction ($5,906,720)	West Springfield	604737	STP-E	$120,000	$30,000	$150,000	2011
7	Bridge Replacement River Road over Mill River	Northampton	603729	BR	$1,822,208	$455,552	$2,277,760	2011
8	Bridge Replacement Pochassic Street over PV RR & Access Road	Westfield	160045	BR	$4,492,368	$1,123,092	$5,615,460	2011
9	Bridge replacement Roosevelt Ave over Contrail Spur & Main (Double Stack) Line	Springfield	602600	BR	$11,756,308	$2,939,077	$14,695,385	2011
10	Great River Bridge	Westfield	600933	A/C Bridge	$800,000	$200,000	$1,000,000	2011
11	Bridge Rehabilitation Route 116 Chicopee/Cabot St. over Conn. River and PVRR	Chicopee/Holyoke	82611	A/C Bridge	$6,400,000	$1,600,000	$8,000,000	2011
12	Landscape Connectivity Study UMASS	Amherst		Sec. 125	$285,000	$0	$285,000	2011
13	New England High Speed Rail	Region wide		FRA-HSR	$700,000	$700,000	$1,400,000	2011
14	Wildwood Elementry School Safe Routes to School	Amherst	606229	SRTS	$423,313		$423,313	2011
5	*Pleasant Street ($1,650,000)	Holyoke	602925	HPP - 1024	$1,071,240	$267,810	$1,339,050	2011
15	***PVPC FY06 - LOGO, SIGNS & WEBSITE	CT River Scenic Byway		TCSP	$0	$0	$22,500	2011
15	***PVPC - FY06 - INTERPRETIVE & WAYFINDING SIGNS	CT River Scenic Byway		SB-000-6-001	$0	$0	$206,000	2011
15	***PVPC FY07 - MARKETING IMPLEMENTATION	CT River Scenic Byway		SB-000-7-001	$0	$0	$136,130	2011
15	***PVPC FY08 - MARKETING	CT River Scenic Byway		SB-000-8-001	$0	$0	$20,000	2011
16	I-91 Interstate Pavement rehabilitation	West Springfield	605587	IM	$6,385,843	$709,538	$7,095,381	2011
17	Amherst Road Reconstruction	Pelham	601154	STP	$5,078,431	$1,269,608	$6,348,039	2012
18	Route 159 (Main Street) Reconstruction ($4,152,422) $1,000,000 PWED	Agawam	602653	STP	$2,521,938	$630,484	$3,152,422	2012
19	*Signal and Intersection Impr Sumner Ave, Allen, Abbot, and Harkness ($1,236,0	Springfield	605685	STP	$139,507	$15,501	$155,008	2012
20	Resurfacing and Related Work on Route 66	Westhampton	605815	STP	$1,267,677	$140,853	$1,408,530	2012
19	*Signal and Intersection Impr Sumner Ave, Allen, Abbot, and Harkness ($1,236,0	Springfield	605685	HSIP	$972,893	$108,099	$1,080,992	2012
21	Bridge Replacement Hospital Hill Road over Qyaboag Stream	Monson	602178	BR	$2,400,000	$600,000	$3,000,000	2012
11	Bridge Rehabilitation Route 116 Chicopee/Cabot St. over Conn. River and PVRR	Chicopee/Holyoke	82611	A/C Bridge	$4,800,000	$1,200,000	$6,000,000	2012
22	Bridge Replacement Kennedy Rd over Roberts Meadow Brook	Northampton	604242	BR	$924,000	$231,000	$1,155,000	2012
23	Bridge Rehad, Peloham Rd over Fort River	Amherst	604023	BR	$990,800	$247,700	$1,238,500	2012
24	*Construct Holyoke Canalwalk and streetscape improve	Holyoke	603263	HPP-4274	$3,505,163	$876,291	$4,381,454	2012
25	*Construct Holyoke Canalwalk and streetscape improve	Holyoke	603263	Sec. 115	$215,997	$0	$215,997	2012
26	Hampshire County Bike Paths (Norwottuck Reconst)- construction	Amherst/Belchtertown, Hadley, Northampton	605065	HPP-1773	$3,559,560	$889,890	$4,449,450	2012
27	I-91 Interstate Pavement rehabilitation	West Springfield/Holyoke	605594	IM	$15,315,300	$1,701,700	$17,017,000	2012
28	Route 187 - Feeding Hill Road	Westfield	604442	STP	$4,245,802	$1,061,450	$5,307,252	2013
29	imrp. Int of West St./Glendale St./Loudville / Pomeroy Meadow	Easthampton	602486	STP	$2,208,775	$552,194	$2,760,969	2013
30	*Imrpvements To Allen St and Bicentenial Hwy ($3,316,779)	Springfield	604821	STP	$1,562,794.4	$390,698.6	$1,953,493	2013
31	Park and Ride Lot Construction	Northampton	606375	CMAQ	$553,478	$138,369	$691,847	2013
30	*Imrpvements To Allen St and Bicentenial Hwy ($3,316,779)	Springfield	604821	CMAQ	$225,835	$56,459	$282,294	2013
30	*Imrpvements To Allen St and Bicentenial Hwy ($3,316,779)	Springfield	604821	HSIP	$972,893	$108,099	$1,080,992	2013
11	Bridge Rehabilitation Route 116 Chicopee/Cabot St. over Conn. River and PVRR	Chicopee/Holyoke	82611	A/C Bridge	$4,800,000	$1,200,000	$6,000,000	2013
32	Route 181 Reclamation and Related Work	Belchertown	604433	STP	$8,043,109	$2,010,777	$10,053,886	2014
6	Chicopee Riverwalk	Chicopee	602912	CMAQ	$1,120,000	$280,000	$1,400,000	2014
11	Bridge Rehabilitation Route 116 Chicopee/Cabot St. over Conn. River and PVRR	Chicopee/Holyoke	82611	A/C Bridge	$11,200,000	$2,800,000	$14,000,000	2014

Figure 11-1 - Projects Included in the FY2011 – FY2014 TIP



2. High Priority Projects

A summary of the high priority transportation improvement projects is presented in Table 11-12 and Figure 11-2. Projects have been cross referenced between the Table and Figure via a numbering system when applicable. Projects designated as being "regionwide" in scope are often not able to be clearly mapped. As a result this information may not appear as part of Figure 11-2. A description of each of the high priority projects is also included as part of this section.

Table 11-12 - High Priority Projects

Map Key	Project Name	Project Description	Community	Area of Emphasis	Air Quality Conformity
1	Bridge Replacement and Bridge Rehabilitation	Replaced Route 116 over Chicopee River (Davitt Bridge) and Rehabilitate Route 116 over Dwight MFG Canal	Chicopee	Safety and Security	Exempt
2	Bridge Rehabilitation	Route 116 (Chicopee/Cabot Street) over CT River and PV RR (Willimansett Bridge)	Chicopee/Holyoke	Safety and Security	Exempt
3	Bridge Betterment	Route 9 and Route 112 over the Westfield River	Cummington	Safety and Security	Exempt
4	Bridge Replacement	Kennedy Road over Roberts Meadow Brook	Northampton	The Movement of People	Exempt
5	Bridge Replacement	Route 112 over Kearney Brook	Worthington	The Movement of People	Exempt
6	Resurfacing and Related Work	Route 57 from Route 187 to Route 75	Agawam	The Movement of People	Exempt
7	Massachusetts Turnpike Off Ramp Congestion Project	Massachusetts Turnpike off ramp congestion improvements	Regionwide	Safety and Security	Exempt
8	Union Street Underpass	Reconstruct Union Street Underpass	West Springfield	The Movement of Goods	Non Exempt
9	Rte 159 (Main Street) Improvements	Resurface and related work	Agawam	The Movement of People	Exempt
10	Main @ Maple and Jabish Intersection Improvements	Traffic signal and geometric improvements at the Main Street (Route 181), Maple Street (Route 202), and Jabish Street (Route 21) intersection	Belchertown	The Movement of People	Exempt
11	memorial Drive (Route 33) Traffic signal improvement	Improvement to 3 signals Memorial Dr. at Montgomery and Sheridan St., Broadway at Main St., and Broadway at Belcher St.	Chicopee	The Movement of People	Non Exempt
12	West St./Glendale St./Loudville/Pomeroy Meadow	Reconstruction: Intersection & signalization	Easthampton	The Movement of People	Exempt
13	Route 5 Reconstruction from Ashley Ave.	Reconstruct Route 5 from Ashley Ave to Main Street	Holyoke/West Springfield	The Movement of People	Non Exempt
14	Center Street (Route 21) reconstruction	Center street reconstruction	Ludlow	The Movement of People	Non Exempt
15	Improvements to Allen street and Bicentennial Highway	Intersection and roadway improvements	Springfield	The Movement of People	Exempt
16	Signal and Intersection Improvements	Improvements at Sumner Ave, Allen Street, Abbot Street, and Harkness Avenue	Springfield	Safety and Security	Exempt
17	Boston Rd Reconstruction (Route 20)	Reconstruction of Boston Rd and other infrastructure improvements	Springfield/Wilbraham	Safety and Security	Non Exempt
18	Bridge Reconstruction	Route 147 over Westfield River and intersection improvements at 3 locations	Agawam / West Springfield	Safety and Security	Exempt
19	Superstructure Replacement	Memorial Avenue over Riverdale Road (Route 5)	West Springfield	Safety and Security	Exempt
20	I-91 Ramps at Exit 19	This study is reviewing alternatives to relieve congestion and improve safety in the transportation network near Interchange 19	Northampton	The Movement of People	Exempt
21	I-291 congestion improvements		Regionwide	Safety and Security	Exempt
22	Connector, Rte 5 to Rte 57/rotary	Construction of interchange improvements at Rt 5/Rt 57 Rotary	Agawam	The Movement of People	Non Exempt
23	Norwottuck Improvements	Rail Trail Improvements	Amherst / Northampton / Hadley / Belchertown	Sustainability	Exempt
24	Signal Upgrades on Route 33	From Abbey Street to Fuller Road	Chicopee/South Hadley	The Movement of People	Non Exempt
25	Damon Rd. Safety Improvement	Reconstruction: Rte. 9 to King St. (Rte. 5)	Northampton	The Movement of People	Non Exempt

Table 11-12 - High Priority Projects (Cont.)

Map Key	Project Name	Project Description	Community	Area of Emphasis	Air Quality Conformity
26	Northend / Brightwood Infrastructure Improvements (North)	From Osgood Street to Chicopee City Line	Springfield	The Movement of People	Exempt
27	Signal and Intersection Improvements	Pleasant Street (Route 5) at Conz Street	Northampton	Safety and Security	Exempt
28	Traffic Signal Coordination	Traffic signal coordination projects	Regionwide	The Movement of Information	Non Exempt
29	At Grade Rail Crossing Improvements	Regional Railroad Grade crossing improvements	Regionwide	Safety and Security	Exempt
30	Park and Ride	Regional Park and Ride Lot improvements	Regionwide	The Movement of People	Exempt
31	Intersection Improvements	Allen Street and Cooley Street intersection improvements	Springfield	Safety and Security	Exempt
32	Rte 5 Reconstruction	Rte 5 Reconstruction from East Elm to Highland Ave. including intersection improvements	West Springfield	The Movement of People	Exempt
33	Bridge Replacement	South End Bridge (includes bikepath link)	Agawam/Springfield	Safety and Security	Non Exempt
34 Not Mapped	Truck Access Impr Route 5 to Merrick Neighborhood	Aceess improvements	Agawam / West Springfield	The Movement of Goods	Non Exempt
35 Not Mapped	Commuter Rail	Commuter Rail - Springfield to New Haven	Regionwide	The Movement of People	Non Exempt
36 Not Mapped	Freight Congestion	Freight congestion improvements	Regionwide	The Movement of Goods	Exempt
37 Not Mapped	Passenger Rail Operating Cost	Connecticut State Line to Northampton	Regionwide	The Movement of People	Non Exempt
38 Not Mapped	Springfield Union Station Transportation Center	Rehabilitate former Springfield train station for bus, rail and transit related uses	Regionwide	Movement of People	Exempt
39 Not Mapped	Springfield Bus Maintenance and Storage facility	Multi-phase, multi-facility project to upgrade outdated Springfield area bus facility	Regionwide	Movement of People	Exempt
40 Not Mapped	PVTA Fleet Renewal	Replacement of buses, vans and support vehicles that have reached the end of their rated lifespan	Regionwide	Movement of People	Exempt
41 Not Mapped	Vehicle maintenance	Necessary on-going maintenance of all PVTA-owned vehicles	Regionwide	Movement of People	Exempt
42 Not Mapped	PVTA Facility maintenance	Necessary on-going maintenance and rehabilitation of PVTA-owned facilities	Regionwide	Movement of People	Exempt
43 Not Mapped	Bus shelters	Replacement, maintenance and new installations of bus shelters	Regionwide	Movement of People	Exempt
44 Not Mapped	Bus stop sign replacement	Replacement, maintenance and new installations of bus stop signs	Regionwide	Movement of People	Exempt
45 Not Mapped	ITS/AVL and communications equipment	Installation, testing and operation of systemwide transit vehicle locator system	Regionwide	Movement of People, Movement of Information	Exempt
46 Not Mapped	Intelligent fareboxes	Replace outdated fareboxes with industry standard 'smart card' fare system	Regionwide	Movement of People	Exempt
47 Not Mapped	Westfield Intermodal Center	Design and construct intermodal facility in downtown Westfield	Regionwide	Movement of People	Exempt
48 Not Mapped	Northampton garage rehabilitation	Rehabilitate 1970s-era bus garage, add space for transit-related uses, add parking for paratransit	Regionwide	Movement of People	Exempt
49 Not Mapped	MAP van program	Assistance to area councils on aging and other community transportation providers for vans	Regionwide	Movement of People	Exempt

a) Bridge Replacement Chicopee Route 116 (Springfield Street) over the Chicopee River (Davitt Memorial Bridge) and Bridge Rehabilitation Route 116 (Springfield Street) over Dwight MFG Canal

The purpose of the proposed project is to replace the existing Route 116 bridge over the Chicopee River and rehabilitate the adjacent Route 116 bridge over the Dwight Manufacturer's Canal. For the replacement project, the existing concrete arch structure will be replaced with a steel girder bridge superstructure on new concrete piers and rehabilitated abutments. For the rehabilitation project, deteriorating concrete T-Beams shall be replaced, and the existing cross-section for both structures will be retained. Traffic will be detoured to expedite the construction phase. New sidewalks will be provided. Minimal approach roadway work will be performed to meet the existing cross section. Additional improvements include new pavement markings, historic street lighting, and new signage.

b) Bridge Rehabilitation Chicopee Route 116 (Chicopee/Cabot Street) over Connecticut River & PV RR 9 Willimansett Bridge

The purpose of this project is to rehabilitate the existing bridge through the replacement of the bridge deck, sidewalks, and historic metal bridge railings. The existing bridge support structure will be repaired and strengthened and all structural steel will be repainted. A detour will be required during construction. The highway work will be limited to approach roadway work.

c) Bridge Betterment Cummington Route 9 and 112 over Westfield River

The work for the bridge carrying Routes 9 & 112 over the Westfield River in Cummington shall consist of reconstructing the bridge sidewalk; replacing the reinforced concrete deck slab; reconstructing the approach wearing surface; refurbishing the existing bridge railing on the sidewalk side; replacing the bridge railing on the safety curb side; stripping and painting structural steel; and performing various other substructure repairs.

d) Bridge Replacement Northampton River Road over Mill River

The proposed River Road over the Mill River bridge replacement project consists of replacing the existing two-span structurally deficient concrete arch bridge with a new single span pre-stressed concrete beam bridge on the same general alignment. The work will extend approximately 300 feet south of the bridge and 200 feet north of the bridge. This approach roadway work will consist of reconstruction of the existing pavement, minor vertical and horizontal alignment improvements, and safety improvements such as proper guardrail transition to the bridge, pavement markings, and signage. The project will be constructed in one phase using a complete roadway closure with detour around the project site.

e) Bridge Replacement Northampton Kennedy Road over Roberts Meadow Brook

The proposed work includes replacing the bridge carrying Kennedy Road over Roberts Meadow Brook in Northampton. The existing city-owned bridge, constructed in 1925 and reconstructed in 1955, is a single span steel stringer structure with a reinforced concrete deck on corrugated galvanized steel forms with a curb to curb width of 16.0 feet and no sidewalk. The proposed bridge width is 24.0 feet curb to curb and no sidewalks. The existing structure will be closed to traffic during construction and a detour will be in place.

f) Bridge Replacement Springfield Roosevelt Ave over Conrail spur and Main (Double Stack) Line

The work under this project consists of the replacement of the Roosevelt Avenue Bridges over the Conrail Main Line and over the Conrail Spur Line. The proposed structure over the Main Line

(near Bay Street) will be a three-span steel beam superstructure with a reinforced concrete deck. The approach roadways will be fully reconstructed and the profile will be slightly raised to achieve the required minimum vertical railroad clearance. The proposed structure over the Spur Line (near Cottage Street) will be a single span steel beam superstructure with a reinforced concrete deck. The bridge widths and the horizontal alignments of both bridges will remain essentially the same. Both bridges will be constructed in phases in order to maintain one lane of traffic in each direction. The addition of a sidewalk is proposed for the west side of the bridges on Roosevelt Avenue as a result of the recent private development in the area.

g) Bridge Replacement Worthington Route 112 over Kearney Brook

The proposed work for the bridge carrying Route 112 over Kearney Brook in Worthington consists of replacing the existing structurally deficient bridge with a new single span pre-stressed concrete NEXT beam bridge supported on reinforced concrete cantilever abutments behind the existing abutments, which will remain in place for scour protection. The structure will be closed during construction.

h) Route 57 resurfacing from Route 187 to Route 75 in Agawam

Work for the Route 57 Resurfacing project in Agawam will consist of milling the existing paved surface and resurfacing with hot mix asphalt pavement course modified top. Work will also include replacing signs as needed, repairing hot mix asphalt berm, and new pavement markings. The project limits are as follows: Route 57 from Route 187 to Route 75 (MM 40.35 to MM 43.28), for a project length of 2.93 miles.

i) Massachusetts Turnpike Off-Ramp Congestion Improvements

Peak hour congestion has become increasingly problematic for exiting traffic from the Massachusetts Turnpike in the PVPC region. Long delays experienced at the signalized intersection with Massachusetts Turnpike Exits 3, 6, 7 and 8 result in vehicle queues that interfere with the operation of the existing toll booths. It is recommended that additional studies be advanced to develop a series of improvement alternatives to reduce congestion and long vehicle queues in these areas.

j) Improvements to the Union Street Railroad Underpass

Vanasse Hangen Brustlin, Inc., working in conjunction with the Pioneer Valley Planning Commission and the Town of West Springfield, has prepared this report to assist efforts aimed at developing a redevelopment strategy for the West Springfield CSX rail yard and surrounding neighborhood. The report includes the following:

- A summary of existing conditions including transportation system (roadway, rail, pedestrian, bicycle and transit), safety and security procedures, real estate market conditions, and land use patterns.
- A redevelopment plan including identification of targeted areas for economic development and a series of transportation and rail yard infrastructure improvements aimed at enhancing the viability of the existing rail yard. The plan also identifies a neighborhood improvement strategy including actions aimed at preserving and reinforcing the quality of life within the surrounding residential areas.
- A comprehensive economic analysis of the various redevelopment plans in terms of available market support, private sector financial feasibility and public sector fiscal impact.

- A summary of anticipated environmental benefits and impacts associated with area redevelopment.
- Identification of public improvements and cost estimates associated with the redevelopment plans.
- An implementation strategy including prioritized actions, phasing, responsible parties, and schedule for action.

PVPC identified redevelopment of the Merrick-Memorial Neighborhood as one of its top regional priorities. The neighborhood is home to the CSX rail yard which is a major component to the regional transportation system. The PVPC allocated funding as part of its FY 2002 Unified Planning Work Program to perform initial data collection and identify potential alternatives to improve access to the rail yard. With the support of Congressman John Olver, the PVPC received a Transportation and Community and System Preservation (TCSP) grant to fund the neighborhood redevelopment planning effort.

The Merrick-Memorial Neighborhood Redevelopment Plan seeks to identify ways to enhance the longstanding relationship between the rail yard and the neighborhood's various constituencies including residents, industrial users and commercial businesses. The plan, currently being administered by the Pioneer Valley Planning Commission through a grant from the federal government, is focused on identifying transportation improvements, economic development options, and appropriate neighborhood linkages between the yard and the surrounding neighborhoods.

A major recommendation of the study was the upgrade of the existing Union Street railroad underpass. This underpass currently provides only 12-feet of vertical clearance, restricting access to larger vehicles to the area. As a result, larger trucks are required to travel through areas that are highly residential in nature in order to access local businesses.

The CSX Union Street Bridge, located over Union Street at the southerly boundary of the Merrick Industrial Area, currently supports six active railroad tracks. Two of these six tracks are main-line tracks for the CSX Boston line, which is the major rail freight corridor servicing New England, operating with as many as 30 trains per day. Two additional tracks on either side of the main-line tracks serve as the lead tracks into both the carload and intermodal portions of the West Springfield freight rail yard. Due to the extensive distance that would be necessary to make the vertical changes necessary in a way to minimize grade change for rail car use, raising the railroad tracks to achieve the necessary clearance is not physically and financially feasible.

Given its current configuration, the Union Street Underpass significantly limits the number of entry points for heavy-vehicle traffic serving the existing industrial areas in the Merrick and Memorial neighborhoods and in particular the Merrick Industrial Area, which is home to more than 169 industries, including the CSX freight rail operations. The Union Street Underpass serves as a major entry point into the Merrick Industrial Area from the south via Memorial Avenue connecting with Interstate 91. Due to the height limitation of the underpass, trucks cannot utilize this entry point and are forced to access the industrial area using either Union Street or Western Ave via Route 20 along Park Street/Park Avenue.

This northerly access point via the boulevard configuration at this section of Route 20 (Park Street/Park Avenue) between Main Street on the east and Western Avenue on the west creates difficulties for larger vehicles attempting to turn south to access the industrial area due to pockets of on-street parking and intersection radii that are substandard for use by most trucks. Larger vehicles also interfere with the operation of the complex intersection of Park Street with Elm Street, Park Avenue and Union Street. There is less than 100 feet of queuing capacity for vehicles between Park Street and Park Avenue, and this contributes to significant congestion in this area. This situation can be further complicated when larger vehicles queue between the two roadways,

often causing the line of vehicles to extend into the intersection and block opposing traffic. The use of Route 20 (Park Street/Park Avenue) by trucks servicing the Merrick Industrial Area creates inferior traffic conditions. Diversion of larger vehicles to an alternative route via Route 147 (Memorial Avenue) to Union Street from the south, through an upgraded underpass, would reduce congestion as well as the impact of larger vehicles on the historic common/park area defined by Park Street and Park Avenue.

Land uses along Memorial Avenue are almost entirely commercial in nature. Similar to Park Street, Memorial Avenue provides four travel lanes; however, on-street parking is not permitted. The intersection of Memorial Avenue with Union Street is configured to allow for greater maneuverability of larger vehicles, and has more capacity than the intersection of Park Street with Elm Street, Park Avenue and Union Street. Union Street serves a mixture of commercial and residential land uses between Park Avenue and the underpass; however, the many side streets connecting Union Street with Main Street in this area are entirely residential. Providing an access point into the Merrick Industrial Area from the south side of the Union Street Underpass, which serves only commercial uses and is significantly wider, would dramatically reduce the impact of current truck traffic on the Merrick neighborhood, resolving what has been an ongoing concern to neighborhood residents for many years. In short, the Union Street Underpass improvements will provide significantly enhanced access and improved traffic flow for trucks utilizing the active Merrick Industrial Area.

The upgrade of the Union Street Underpass will create a new truck route into the Merrick Industrial Area using Route 147 (Memorial Avenue). This would allow trucks to enter the industrial area from Interstate 91 via the Memorial Bridge and Route 5/147 rotary, as opposed to the North End Bridge and Route 5/20 rotary. The Memorial Bridge was completely reconstructed in the 1990s. Therefore, this new truck route would divert commercial and industrial traffic through an existing commercial area over an upgraded bridge with lower traffic volumes.

k) Route 159 (Main Street) Reconstruction in Agawam

The project begins at Route 75 and proceeds southerly to the Connecticut State Line. Intersection improvements will include redesigned turning lanes at Elm/Elbert St and at School Street. Work also includes signal upgrades, improved crosswalks, minor shoulder widening, ornamental lighting in the historic district, gateway landscaping and signage in the vicinity of the Route 57 interchange, cold planing, paving, adjustment of, or repairs to, existing drainage structures, thermoplastic pavement markings, sidewalk reconstruction, removal and resetting of existing granite curb, removal and resetting of existing guardrail, erosion/sedimentation control measures, and other incidental items.

l) Signal and Intersection Improvements at Main Street (Route 181), Maple Street (Route 202), and Jabish Street (Route 21) in Belchertown

This intersection currently provides a good Level of Service (LOS) for 2 of the 3 major approaches but experiences long delays on the Route 202 (Maple Street) eastbound approach and the Route 21 (Jabish Street) westbound minor approach. The overall intersection LOS is F at the PM peak hour. The crash rate (1.1 2003-2005) is above the statewide and District 2 average for a signalized intersection. LOS can be improved throughout the intersection by providing an exclusive left turn lane to the South Main Street NB approach and reconfiguring lane assignments on Maple Street EB. The project will include new signal equipment, minor widening of South Main and Maple Streets, new sidewalks and wheelchair ramps, new and reset granite curb, cold plane-overlay, and new striping and signage.

m) Signal and Intersection Improvements at Memorial Drive (Route 33) and Broadway in Chicopee

This project involves city-owned signalized intersection improvements at one location on Memorial Drive (Route 33) at Montgomery/Sheridan Streets; and two locations on Broadway Road at Main/East Main/Church Streets, and on Broadway Road at East/Belcher Streets.

These three intersection improvements complete the safety improvements recommended as part of a MassDOT study of the Deady Memorial Bridge corridor. The critical deficiencies identified at these locations are: unacceptable levels of peak period delay, queuing, and congestion; inefficient signal control; and lack of adequate or outdated vehicle detection, signal coordination and emergency vehicle preemption, and pedestrian crossing controls

n) Intersection Improvements Glendale Street /West Street /Loudville Road/Pomeroy Meadow Road in Easthampton

This project begins on Pomeroy Meadow Road in Easthampton and extends in a northeasterly direction along Pomeroy Meadow Road, crossing the intersection of Glendale Road and Loudville Road, and continuing along West Street. This project also includes a portion of Loudville Road in a generally southeasterly direction. There will improvements to alignments, roadway sight distance, and grading with a minimal impact to driveways for existing homes in the area. The City of Easthampton would like to see this intersection improvement project completed before the Route 10 bridge project over the Manhan River due to the detour and increased traffic to this unsafe intersection.

o) Rehabilitation of Route 5 (Riverdale Road) in Holyoke and West Springfield

The project consists of rehabilitating a section of concrete pavement on Route 5 in Holyoke and West Springfield. The current project limit begins in West Springfield immediately to the north of the I-91 Exit 13 Interchange and extends northerly to the intersection with Main Street in Holyoke. Total project length is 1.9 miles. (Field investigation is ongoing, and the projects limits are subject to change, based on the method chosen for the pavement rehabilitation.) The project also includes modification to the intersection with Ashley Avenue to add a dedicated left turn lane. Other work includes traffic signal updates at several locations, drainage system improvements, guardrail improvements, and reconstructed sidewalks.

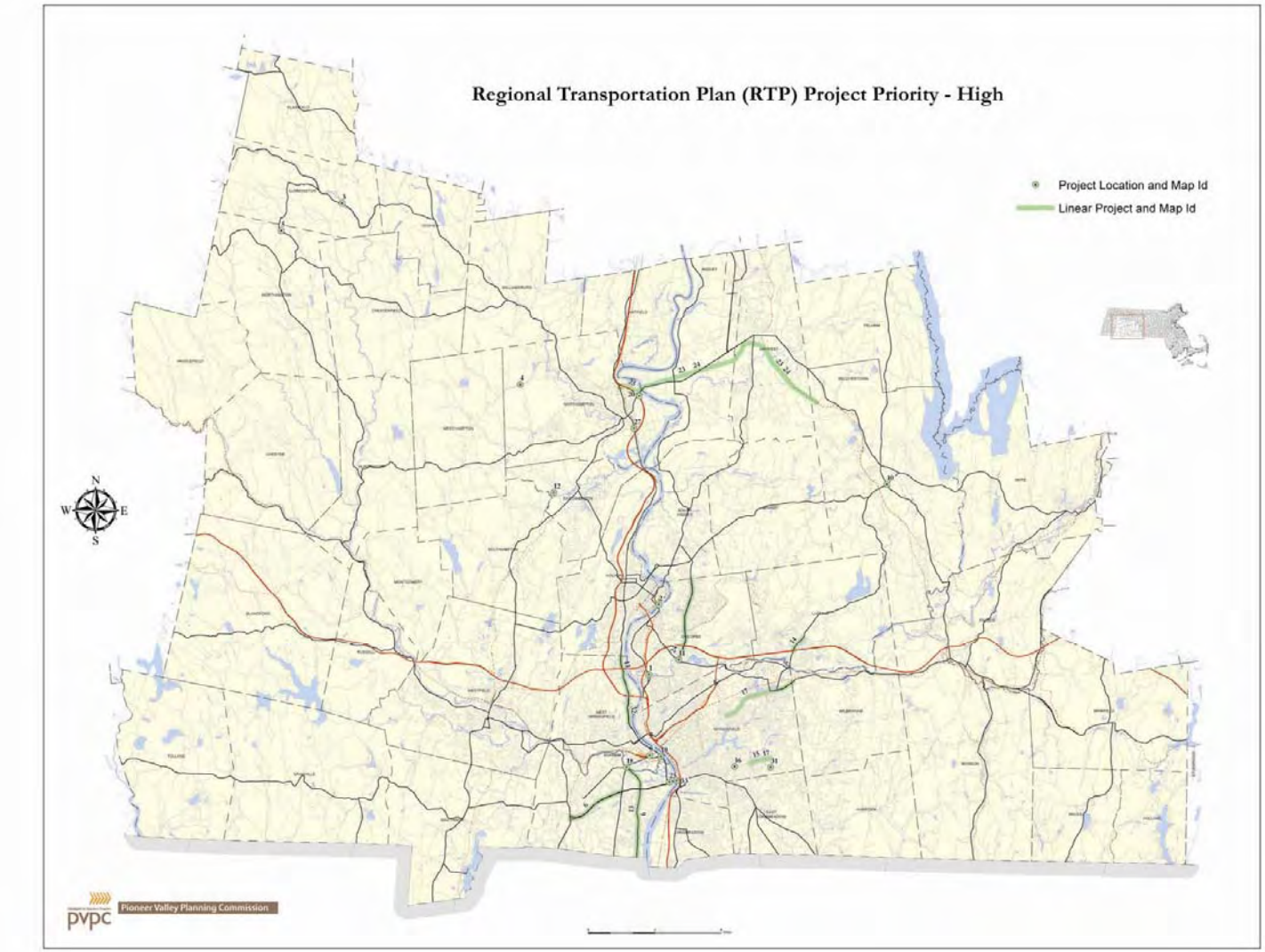
p) Reconstruction of Center Street in Ludlow

The proposed project will reconstruct a portion of Center Street (Route 21) from just south of North Street to Beachside Drive. The project length is approximately 4,300 feet (0.81 miles). The work includes roadway reconstruction, a continuous sidewalk on both sides of Center Street, granite curb installation, ADA compliant wheelchair ramps and driveway reconstruction, loam and seed, drainage system improvements, and other incidentals to complete the project.

q) Intersection improvements Allen Street at Bicentennial Highway in Springfield

This location was identified in the "Outer Belt" study as a location in need of improvements. The project involves roadway reconstruction and intersection improvements on city-owned Allen Street in the City of Springfield. The work will include full depth reconstruction, hot mix asphalt pavement, traffic signal improvements, new left turn lanes, re-alignment of Bicentennial Highway, and other incidental work. The project begins at the intersection of Allen Street and Bradley Road and extends to the intersection of Allen Street and Bicentennial Highway.

Figure 11-2 - High Priority Projects



r) Intersection improvements Sumner, Allen, Abbot, and Harkness Avenue in Springfield

This intersection is poorly aligned and confusing to motorists. The Level of Service for Sumner Ave turning to Harkness Ave is poor and the queue causes safety issues. Pedestrian accommodations are poor. This project will realign the intersection and replace the outdated signal equipment to relieve congestion and improve traffic flow and safety. It will also improve pedestrian access and safety by bringing the sidewalks, ramps and crosswalks up to AAB/ADA standard.

s) Northend and Brightwood Infrastructure Improvement From Amtrak Overpass to Osgood Street (Southerly Segment) in Springfield

The project will include Main Street north of the AMTRAK underpass, Arch Street, and Huntington Avenue between Main Street and Bernie Avenue, Bernie Avenue between I-91 Exits 9 and 10, the existing pedestrian connection pathway and tunnel under I-91 to the Gerena School, and new pedestrian connections between Bernie Avenue and Plainfield Street. The proposed project is needed to rehabilitate and improve the road and pedestrian infrastructure in the north area neighborhoods of Springfield, which were split by the construction of I-91. The project will include road rehabilitation, sidewalk reconstruction, streetscape amenities and pedestrian connections. The project has been advertised for construction as of June 2011.

t) Boston Road Reconstruction Springfield/Wilbraham

Route 20 will be reconstructed from Pasco Road in Springfield to Dumaine Street in Wilbraham for a total of 1.33 miles. The project will consist of full depth reconstruction of the pavement at widening areas, at intersections where severe rutting has occurred, and where concrete pavement has failed (Pasco Road intersection). Raised/planted medians and turning lanes will be extended/modified as required and curb cuts will be consolidated/relocated where possible to improve safety. Signal equipment will be replaced at four intersections and new signals installed at one or two locations. Protected pedestrian phases and crosswalks will be added as well as low priority bus preemption and high priority emergency vehicle preemption. Sidewalks/wheelchair ramps requiring repair will be reconstructed, with new sidewalks/wheelchair ramps constructed to fill gaps in the existing sidewalk network. Low retaining walls are expected at a few of the new sidewalk locations. New bus stop(s) bays and shelters will be constructed where needed. Landscape buffers and median plantings will be included.

u) Reconstruction of Westfield Road (Route 20) in West Springfield

The project limits are on town-owned Westfield Street (Route 20) from upper Church Street easterly 1400 feet to North/South Boulevard then continuing easterly for 2700 feet to Elm Street, for a total length of 4100 feet (0.78 miles). Work will include the construction of a new signalized intersection (with Route 20 Eastbound right turn lanes) at Van Deene Street and the upgrade signals at North/South Boulevard. Also included will be the reclamation and widening of the pavement (from approximately 42 feet to 54 feet wide) for the westerly four lane section (1400 feet) and the cold planing and overlay of the easterly 40 foot wide 2 lane section (2700 feet). New cement concrete sidewalks are proposed for both sides of Route 20. Existing granite curb will be reset and new granite curb will be installed where needed. Isolated drainage repairs and upgrades will be included. Minor land takings will be required at the Van Deene and North/South Boulevard intersections for the addition of turn lanes and signal equipment. Coordination of the proposed signalized intersection at Van Deene Street with the existing signalized intersection at Elm Street will be considered.

v) Bridge Reconstruction Route 147 over Westfield River West Springfield/Agawam

The purpose of this project is to reconstruct/widen the Route 147 Bridge over the Westfield River along with intersection reconstruction and new traffic signals at 3 adjacent locations (including connecting roadway) is required to relieve congestion.

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

This location was identified as one of the top congestion bottlenecks in the region.

w) Superstructure replacement (Memorial Ave) over Riverdale Street (Route 5) in West Springfield

Scope of Work includes evaluation of replacing existing single span steel superstructures with new steel stringer spans within the existing rotary. Additionally, the feasibility of continuing Memorial Drive through the rotary will also be evaluated and compared to the rotary bridge superstructure replacements. Accelerated Bridge Construction techniques will be investigated for each of the alternatives.

x) Interstate 91 Exit 19 Improvements

The Connecticut River Crossing Study, completed in February 2004,. recommended the reconfiguration of I-91 Interchange19 to provide full access to the highway in order to mitigate congestion and safety issues in the vicinity of the intersection of Route 9 with Damon Road and the I-91 northbound Exit 19 off ramp. A private consultant has since been hired to review the intersection and the recommendations of the 2004 Study. One of the outcomes of the public participation process of the current study has resulted in the elimination of the proposed Exit 19 reconfiguration alternative due to a lack of community support. Potential new improvement alternatives focus on the analysis of upgrading the existing traffic control equipment at the Route 9/Damon Road/Exit 19 off ramp intersection and replacement of the signal with a modern roundabout.

y) Interstate 291 Congestion Improvements

The Interstate 291 corridor experiences severe afternoon peak hour congestion at several exits in the City of Springfield. It is not unusual for traffic to queue back onto the highway as a result of the long delays experienced by traffic attempting to merge off of the existing exit ramps. The highway reduces from three travel lanes to two travel lanes north of Exit 4. This creates conflicts with existing northbound traffic on the highway and merging traffic from the Exit 4 on-ramp. During the morning peak hours, delays and safety problems are created by the short merger lanes for southbound traffic entering the highway from Exit 5. It is recommended that the entire Interstate 291 corridor be studied to identify potential improvement alternatives to increase safety and reduce congestion for this highway.

z) South End Bridge Improvements, Connector, Route 5 to Route 57 (over Route 5/57 rotary), South End Bridge Pedestrian Link

The South End Bridge (Julia Buxton Bridge) connects the communities of Agawam and Springfield and serves as the fundamental link between Route 5, Route 57 and I-91. The traffic along these main corridors has increased dramatically, causing congestion along the bridge and highway. In the vicinity of the bridge, Interstate 91 reduces from three lanes of travel in each direction to two. A number of difficult weaving movements also exist in this area, which when combined with the high traffic volumes contribute to congestion and safety problems in this area. Traffic from the exit ramp from the South End Bridge to the Route 5/57 rotary experiences severe peak hour congestion and long delays. The intersection of this ramp and the Route 5/57 rotary is also listed as one of the Top 1000 Crash Locations in Massachusetts.

A study for Route 5/57 rotary was commissioned by MassDOT and recommends construction of a new slip ramp off of the bridge to create direct access from the bridge to Route 57 westbound. This would result in the elimination of the existing rotary. Access to existing businesses and residences in the vicinity of the rotary would be maintained through the installation of a traffic signal.

Southbound traffic on Route 5 would now be required to stop as part of this improvement alternative. This would enhance the ability of eastbound traffic on Route 57 to merge onto the South End Bridge.

An additional study is recommended for both the South End Bridge and the I-91 corridor between Exits 1 and 4 to address the feasibility of maintaining three lanes of travel along I-91 and improving the existing weaving movements for traffic entering and exiting the roadway. An important component of this study will be to identify the need for additional capacity on the South End Bridge and the ability to provide a pedestrian connection between the existing Agawam and Springfield Riverwalks.

This improvement alternative was studied using the Pioneer Valley regional transportation model. The projected daily traffic volume after improvements to the South End Bridge is approximately 70,559 vehicles. This represents a 19% increase relative to volumes on the existing South End Bridge. Traffic volumes also increased along Route 5 and Route 57 by 19% and 12% respectively. Projected travel times in this area decreased by 3%, while travel speed increased 3%. The model clearly shows that the restructuring of I-91, the bridge and the on and off ramp system located along this corridor increases travel speeds and decreases travel time.

aa) Norwottuck Rail Trail Improvements in Amherst, Belchertown, Hadley, and Northampton

The trail serves a variety of recreational users and commuters, all vying for limited space on the existing eight-foot wide paved trail. Deterioration of the pavement surface as well as sight distance limitations have resulted in safety concerns. Under this project the trail is anticipated to be resurfaced along with other minor improvements to increase the life of the trail.

bb) Memorial Ave (Route 33) signal upgrades Chicopee/South Hadley

Memorial drive experiences heavy traffic, especially during peak hours travel periods. Under this improvement project traffic signals along Route 33 from Abbey Street to Fuller Road will be upgraded. These upgrades are anticipated to reduce congestion while increasing safety along the corridor.

cc) Damon Road Reconstruction: Route 9 to King Street

Damon Road in Northampton connects traffic from Route 9 to King Street. The King Street intersection with Damon Road serves as access to traffic from downtown Northampton to points north of the city, retail uses along King Street, and residential neighborhoods to the west. Traffic queues with significant delays occur in all directions. At the I–91/Route 9 interchange with Damon Road recent improvements include the construction of additional exclusive turn lanes and upgrades to the existing traffic signals.

Widening and resurfacing of Damon Road would also include additional dedicated turning lanes along the roadway and at the intersection with King Street. The signal at this interchange would be re-timed to reduce congestion at this signal. This project should aid in reducing congestion along Damon Road by reducing travel time in the northbound and southbound direction, the additional lanes at the King Street interchange should also aid in reducing congestion at this interchange.

dd) Northend and Bridghtwood Infrastructure Improvements from Osgood Street to the Chicopee City Line (Northerly Segment)

This project will rehabilitate and improve the road and pedestrian infrastructure in the north-end area neighborhoods of Springfield. Work will include road rehabilitation, sidewalk repairs/improvements, streetscape amenities and pedestrian connections on Main Street north of Osgood Street to the Chicopee line (1.3 miles); Arch Street and Huntington Avenue between Main Street and Birnie Avenue (.25 miles); and, Birnie Avenue between I-91 Exits 9 & 10 (.5 miles).

ee) Pleasant Street with Conz Street Intersection Improvements

A safety study was recommended for the intersection of Pleasant Street with Conz Street in the City of Northampton as part of the 2003 RTP. Completed in 2005, the study identified two alternatives to improve traffic flow and increase safety at this unsignalized intersection. The first alternative consisted of the installation of a traffic signal and the improvement of the existing intersection geometry. A second alternative considered the installation of a modern roundabout at the intersection to reduce travel speeds and minimize conflict points at the intersection. It is recommended that one of the two alternatives be advanced for this intersection to address the existing safety problems experienced in this area.

ff) Traffic Signal Coordination Projects

By coordinating signals along heavily traveled corridors, traffic flow can be regulated thereby reducing congestion along the corridor. Signal coordination projects are proposed on Route 20 in

Westfield from Union Street to Mainline Drive, Route 33 (Memorial Drive) in South Hadley/Chicopee from Route 202 to Fuller Road and Broadway in Chicopee from East Street to the Deady Bridge. Transportation planning studies should be advanced as appropriate to identify the feasibility of developing coordinating signal systems along these and other corridors in the region.

gg) Regional Railroad Grade Crossing Improvements

A number of at-grade railroad crossings in the Pioneer Valley region do not provide safety gates to prohibit vehicle traffic from conflicting with railroad operations. While an inventory of existing active crossings was recently completed for the region, additional data collection is required for each location to update the daily traffic for each crossing and to update the status of the existing safety equipment provided for each at-grade crossing. Equipment upgrades should be developed for all at-grade crossings that have experienced significant increases in traffic.

hh) Regional Park and Ride Lot Improvements

A new park and ride lot is under design by MassDOT for the Leeds section of Northampton in the vicinity of the Veteran's hospital. Another lot is proposed by a private developer in the vicinity of Massachusetts Turnpike Exit 3 in Westfield. It is recommended that additional Park and Ride Lots be advanced for each Massachusetts Turnpike Exit in the Pioneer Valley Region. This includes the re-establishment of a Park and Ride Lot off of Exit 8 in Palmer that was recently closed. The development of Park and Ride Lots in close proximity to major highways should continue to be advanced to reduce single occupant vehicle travel in the region. Park and Ride Lots should also be developed in conjunction with existing transit service when practical.

ii) Allen Street with Cooley Street Intersection Improvement Project

The intersection of Allen Street with Cooley Street in the City of Springfield currently experiences severe peak hour congestion and a number of existing safety problems. The intersection is surrounded by existing gas stations on each corner of the intersection. The existing driveway configuration of the four gas stations combined with high traffic volumes contributes to congestion and safety problems in the area. In the Outer Belt Traffic Study, the PVPC identified a number of improvement alternatives to improve traffic flow and safety in this area. Implementation of improvements to the existing intersection geometry and signal timing and phasing is a high priority to address traffic and safety concerns at this intersection.

jj) Route 5 Signal Coordination

Recent expansion and renovations to the businesses located along the heavily traveled Route 5 corridor has required traffic mitigation measures. Previous signal work has been completed along Route 5 at the I-91 Exit 13B interchange in an effort to channel vehicles from the highway to the main business location known as the Riverdale Shops. This location continues to undergo retail and business growth and has been identified by the Pioneer Valley CMP as a congested area. To aid in relieving congestion along this corridor, an additional traffic signal was constructed on Route 5 between Elm Street and Monterey Drive to allow vehicles to make a left turn from Route 5 northbound into the Showcase Cinemas site. Traffic signals are also proposed to be coordinated along Route 5 from Elm Street to Ashley Avenue. It is also recommended to study the feasibility of extending signal coordination to the north along Route 5 into the City of Holyoke.

kk) Bridge Replacement Springfield South end Bridge including Bike Path Link

Replacement of the South End Bridge (Julia Buxton Bridge) The bridge connects the communities of Agawam and Springfield and serves as the fundamental link between Route 5, Route 57 and I-

91. The project would include a link between the Springfield Riverwalk and the Agawam Riverwalk.

ll) Truck Access Improvements Route 5 Merrick Neighborhood

A major recommendation of the Merrick-Memorial Neighborhood Redevelopment Plan was to upgrade an existing roadway to allow truck access from Route 5 into the industrial areas of West Springfield. Large trucks currently must negotiate either the Route 5/20 rotary or the Route 5/147 rotary to access the industrial areas. While traffic volumes on the Route 5/147 rotary are lower than volumes on the Route 5/20 rotary, the exiting rotary geometry does not allow larger trucks to maintain two travel lanes through the rotary.

Service ramps on Route 5 in Agawam immediately south of the West Springfield Town Line provide access to "M" Street which serves the Bondi's Island Wastewater Treatment Plant and the Springfield Landfill. A long range recommendation of the plan is to pursue the enhancement of these existing ramps and improve the connection of Agawam Avenue in West Springfield to "M" Street. This would allow large trucks to enter and exit the industrial areas of West Springfield via Union Street Extension to Agawam Avenue to Route 5. The advantage of this improvement is this new truck route would eliminate the need for large trucks to negotiate the Route 5 rotaries while reducing the number of turning movements required to access the industrial area. Union Street Extension and Agawam Avenue are lower volume roadways serving only commercial and industrial land uses. Both roadways could easily accommodate the increase in truck traffic with no negative impacts on local residences.

mm) Passenger Rail – Springfield, MA to Hew Haven, CT

Since 1999, the Pioneer Valley Region and Connecticut have been working toward the implementation of passenger rail service between Springfield, Hartford, and New Haven. In 2009 and 2010, ConnDOT applied for and received federal funds to complete the necessary track and station improvements between New Haven and Hartford. In 2011, ConnDOT applied for $227 million in federal funds and authorized an additional $97.3 million in state bonds to complete the line from Hartford to Springfield. In May, 2011 the FRA awarded the project $30 million, leaving a funding gap of $196.7 million.

The project is included in the 2017 analysis year of the RTP. The service would operate on the existing 62 mile Amtrak owned Springfield Line connecting the three cities. The rail corridor crosses the MA/CT border in Longmeadow and continues to Union Station in Springfield. Union Station would be the primary station located in Massachusetts with the possibility of another station located in Downtown Springfield

Intercity Rail service is expected to have a significant impact on the 13 railroad station areas serving the 17 communities along the rail corridor. The service will connect the third, forth and fifth largest metropolitan areas in New England and provide a connection to both Amtrak and Metro North Service into the New York Region. When the project is complete, service will expand from the existing six trips daily between New Haven and Springfield, to 25 trips per day.

In Springfield, the project should have a direct and significant impact on the Union Station Redevelopment and the surrounding downtown area. The rail service will bring a large number of commuters through the station and increase housing and business opportunities for people looking to live or work in any of the three cities or outlying communities.

nn) Freight Congestion Improvements

Additional data collection is necessary to incorporate freight congestion into the regional CMP. The Pioneer Valley MPO will continue to work with local freight providers to identify specific areas that may have freight congestion. Appropriate improvements should be incorporated into the design on ongoing transportation improvement projects to address the specific needs surrounding freight congestion in the region. CSX has recently completed large scale improvements to the West Springfield yard which expand capacity for both freight and intermodal traffic in and out of the important inland port.

oo) Operating Cost for Passenger Rail Service between Northampton to Connecticut

The Vermont Department of Transportation provides one train a day service through Massachusetts. In order to increase the frequency of service, Massachusetts will be responsible for funding their portion of the additional trips. PVPC anticipates an increase in the frequency of Passenger Rail Service from Northampton to Connecticut starting in 2016.

pp) Springfield Union Station Redevelopment

The redevelopment of Union Station in downtown Springfield has long been an important regional project to enhance the mobility of residents throughout the Pioneer Valley region. The goal of the station redevelopment is to consolidate regional and local transit services, passenger rail, parking and approved transit-related uses. The project is being managed by the Springfield Redevelopment Authority, which owns the property and has engaged consultants to complete a revised redevelopment plan. Proposed tenants include PVTA, Peter Pan Bus Lines, Amtrak, Pioneer Valley Planning Commission, and a private day care provider. There would also be shops and commercial development consistent with the facility's transit focus.

qq) Springfield Bus Storage and Maintenance Facility

PVTA's existing Springfield area bus storage and maintenance facility at 2840 Main Street is nearly 100 years old, originally designed for Springfield's street railway system. The property is simply too small for PVTA's current fleet. The site lacks sufficient storage areas for the 110 buses that are based there; does not have adequate employee parking; is not well configured for fleet maintenance (the only PVTA Level III facility); and cannot be expanded. PVTA is developing plans for a new storage and Level I maintenance facility at a new location in Springfield that would meet modern transit fleet maintenance standards. The existing Main Street facility would be rehabilitated to provide an appropriately sized storage area and Level II maintenance.

rr) PVTA Fleet Replacement Program

PVTA's Fleet Replacement Program is an ongoing effort to ensure that the authority's vehicles are safe, in good repair, and using the most energy-efficient and GHG-limiting propulsion technologies. The authority is replacing 12-15 of its 170 standard 40-foot diesel buses each year with clean diesel and diesel/electric hybrids, depending on available funding. Currently, PVTA has 50 standard buses that have exceed their 12-year rated lifespan, a result of underfunding of the fleet replacement program prior to 2006. In the fall of 2011, PVTA will take delivery of 28 new GM Flyer buses, 10 of which will have diesel-electric propulsion. PVTA is also pursuing funds to purchase diesel/electric 60-foot articulated buses with higher passenger capacity for heavily used routes. PVTA also owns 12 mini-buses with 18-passenger capacity that are operated on shuttle routes; these are replaced at the rate of 2 vehicles per year. PVTA has 144 vans for paratransit service, replaced at the rate of 12-15 vehicle per year. PVTA's support vehicles include maintenance vehicles and supervisor cruisers are replaced at the rate of 3 vehicles per year.

ss) Vehicle Maintenance

This is PVTA's program to maintain all vehicles in its fleet, from routine preventative maintenance to major overhauls and vehicle repairs from accidents and unplanned events.

tt) PVTA Facility Maintenance

This is PVTA's program to maintain the buildings owned by the authority, which include the Springfield and Northampton garages and Administration Building.

uu) Bus Shelter

PVTA owns 120 bus shelters systemwide. This program provides funds to maintain and replace these shelters as vandalism and routine wear-and-tear require. PVTA is also prioritizing installation locations for new shelters on high passenger volume routes, pending available funds.

vv) Bus Stop Sign Replacement

PVTA is in the process of upgrading signs at all of its 1,800 bus stops in the region. The signs will include route destinations and have space for additional information that will help customers make use of new ITS-related technologies, such as text messaging for next bus arrival times. This program includes capital and installation costs for the new signs, as well as ongoing maintenance and replacement.

ww) ITS/AVL and Communications Equipment

PVTA is in the midst of installing one of the most comprehensive and advanced customer and vehicle information technology systems in Massachusetts. Expected to be fully operational within one years, this system includes GPS tracking, passenger counting devices, onboard cameras, audio, digital radios, customer information displays and other technologies. The system will provide customers with real-time bus arrival information via internet websites, smart phones, cell phone texts, digital displays at high-volume stops, and other services. The system represents a tremendous advance in service with the capacity to increase ridership by providing customers with greater confidence about when their bus will arrive.

xx) Intelligent Fare boxes

PVTA is now replacing fareboxes on all Springfield and Northampton buses with more reliable equipment that will be able to read the newer generation of "smart cards" that are now typically being used for fare payment on larger transit systems. This will eventually allow interoperability with MBTA and other regional transit systems. Greater customer convenience will be achieved with online fare purchase and card re-loading. Additional revenue options may be realized through related marketing.

yy) Westfield Intermodal Center

PVTA and the City of Westfield are collaborating on the development of an intermodal transportation center to be located on Elm Street between Church and Arnold Streets in downtown Westfield. The facility will include bus berths for local and intercity buses, bicycle facilities and a connection to the Columbia Bikeway, as well as space for shops and transit-related uses inside. The project will support additional transit ridership that is expected to accompany the growth of Westfield State University's downtown campus and student housing. It will also help anchor new urban and commercial redevelopment in the vicinity.

zz) Northampton Garage Rehabilitation

Built in 1978, PVTA's Northampton Garage will soon be in need of major rehabilitation. The facility is not able to accommodate all standard buses, mini-buses and paratransit vans that must be based there. Some maintenance facilities at the garage are inadequate. The facility also include a transit-related use (day care) that needs to expand. PVTA is now developing a plan to rehabilitate the garage to meet the expected needs of the future.

aaa) MAP Van Program

The Mobility Assistance Program provides capital assistance for purchase of vehicles for transportation for the elderly, persons with disabilities, and families transitioning from public assistance to employment. Funds are distributed on a competitive grant basis regional transit authorities serving the region (PVTA and FRTA) as well as municipal councils on aging.

3. Medium Priority Projects

This section provides a summary of the "Medium" priority projects included in the RTP. A complete summary of all "Medium" priority projects is included in Table 11-13 and Figure 11-3. Where applicable, projects have been cross referenced between the table and figure through a numbering system. Description of all regionally significant "Non-Exempt" projects are also included as part of this section.

Table 11-13 - Medium Priority Projects

Map Key	Project Name	Project Description	Community	Area of Emphasis	Air Quality Conformity
1	Bridge Replacement	Route 10 (Northampton Street) over Manhan River	Easthampton	Safety and Security	Exempt
2	Bridge Replacement	Hospital Hill Road over Quaboag Street	Monson	The Movement of People	Exempt
3	Bridge Replacement	South Road over Loudis Brook	Westhampton	The Movement of People	Exempt
4	Resurfacing and Related Work	I-91 Interstate Maintenance	Holyoke/West Springfield	The Movement of People	Exempt
5	Structural Signing	I-91 Guide & Traffic Sign Replacement	Longmeadow to West Springfield	The Movement of People	Exempt
6	Route 116 (Notch) reconstruction	Reconstruction of roadway from Granby T.L. 1.1 miles north	Amherst	Safety and Security	Exempt
7	Resurfacing Route 23	Resurfacing and Related work on Route 23 from Otis TL to Route 20 in Russell	Blandford / Russell	The Movement of People	Exempt
8	Route 9 Pavement Preservation	Route 9 Pavement Preservation from Windsor TL to Goshen TL	Cummington	The Movement of People	Exempt
9	Route 5 resurfacing	Resurfacing and related work on route 5	Easthampton / Holyoke	The Movement of People	Exempt
10	Route 9 reconstruction	Reconstruction of Route 9 near Hampshire Mall	Hadley	The Movement of People	Non Exempt
11	Route 9 at Route 47 intersection improvements	Traffic signal, safety improvements, geometry	Hadley	Safety and Security	Exempt
12	Homestead Ave @ Lower Westfield Rd improvements	Signal and intersection improvements	Holyoke	The Movement of People	Exempt
13	Canal Walk Extension	2nd Level Canal from Appleton to Dwight	Holyoke	Sustainability	Exempt
14	Route 112 Resurfacing	Route 112 Resurfacing and Related Work from MM.011 to MM 8.52	Huntington	Safety and Security	Exempt
15	Morgan Street rehab	Rehabilitation	South Hadley	The Movement of People	Exempt
16	Highway Reconstruction	Edwards, Spring & Elliot Streets	Springfield	The Movement of People	Exempt
17	Route 187 - Feeding Hills Road reconstruction	Reconstruct Route 187 from 800ft east of Pontoosic Rd to Agawam T.L..	Westfield	Safety and Security	Exempt
18	Bridge Replacement	Route 141 (Appleton Street) over First and Second Level Canals	Holyoke	Safety and Security	Exempt
19	Bridge Replacement	Route 202 (Beech Street) over B & M Rail Road	Holyoke	Safety and Security	Exempt
20	Bridge	S-24-016, HWY ARMORY ST OVER RR CSX	Springfield	Safety and Security	Exempt
21	Bridge Replacement	Route 10/202 Southwick Street over Little River	Westfield	Safety and Security	Exempt
22	Resurfacing and Related Work	I-90 (MM 60 to MM 69.6)	Brimfield/Palmer/ Warren	The Movement of People	Exempt
23	N. Westfield St. / S. Westfield St. (Rte. 187)	Reconstruction: Pine Street to Westfield TL	Agawam	The Movement of People	Exempt

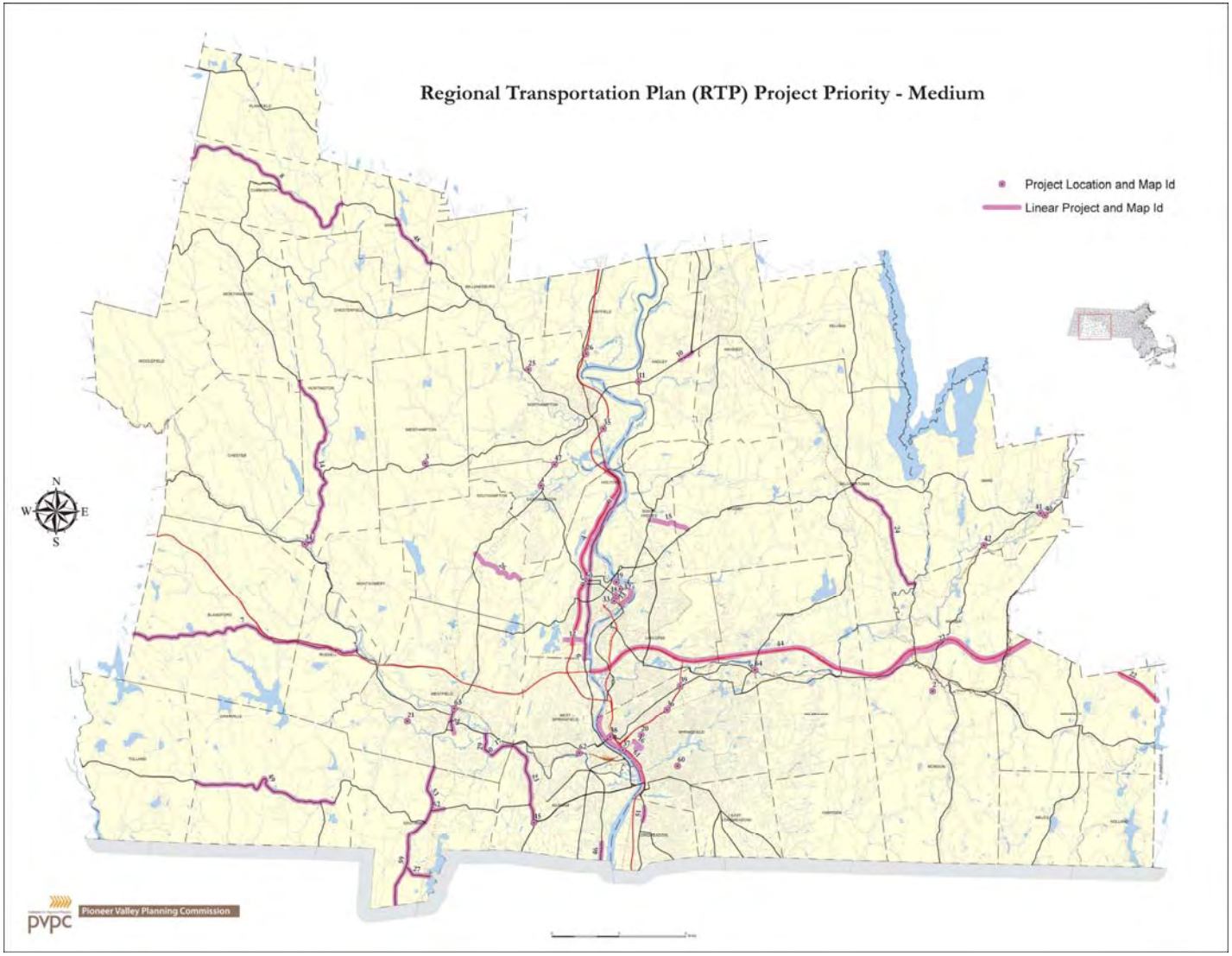
Table 11-13 - Medium Priority Projects (Cont.)

Map Key	Project Name	Project Description	Community	Area of Emphasis	Air Quality Conformity
24	Route 181 (Footprint)	Rehabilitate Route 181 from South Main St., includes South Main, Mill Valley, Franklin, and Depot	Belchertown	The Movement of People	Exempt
25	Park and Ride	Construction a Park and Ride lot on Route 9 in Leeds	Northampton	The Movement of People	Exempt
26	East St. (Design Exception)	Reconstruction: Rte. 10 to Holyoke TL	Southampton	The Movement of People	Exempt
27	Congamond Rd. (Rte. 168) Reconstruction	Roadway reconstruction: From Route 202 to 250 ft before state line (before culvert)	Southwick	The Movement of People	Exempt
28	Columbia Greenway Rail trail and River Walk Phase I (Middle)	1.25 miles in length and extends from the Columbia Manufacturing Company to the Cowles Court and Sibley Ave access paths in the north and includes replacement of 5 bridges, rehab of a 6th	Westfield	The Movement of People	Exempt
29	Route 187 - Little River Road reconstruction	Reconstruct Route 187 from 300 ft south of Route 20 to 260 ft North of Sherman Bridge	Westfield	Safety and Security	Exempt
30	Route 187 - Sherman's Mill Bridge reconstruction	Reconstruct Route 187 from 260ft north on Sherman Bridge to 800ft east of Pontoosic rd.	Westfield	Safety and Security	Exempt
31	Bridge Betterment	Elm Street over B & M Rail Road	Hatfield	The Movement of People	Exempt
32	Bridge Replacement	Lyman Street over First Level Canal	Holyoke	Safety and Security	Exempt
33	Superstructure Replacement	Cabot Street/2nd Level Canal	Holyoke	Safety and Security	Exempt
34	Bridge Replacement	Route 112 over Westfield River and CSX Rail Road	Huntington	Safety and Security	Exempt
35	Bridge Preservation	I-91 NB/SB over Route 5, BM RR, and Hockanum Road	Northampton	Safety and Security	Exempt
36	Bridge	S-24-028, HWY ST JAMES AVE OVER RR CONRAIL (ABANDNED)	Springfield	Safety and Security	Exempt
37	Bridge Reconstruction	I-91 Viaduct	Springfield	Safety and Security	Exempt
38	Bridge	S-24-043, I 91 RAMP C OVER I 91 & RMP A TO US 5 NB	Springfield	Safety and Security	Exempt
39	Bridge Rehabilitation	I-291 over Page Boulevard	Springfield	Safety and Security	Exempt
40	Bridge Replacement	Mass Central RR over Route 9/32 East Main Street	Ware	Safety and Security	Exempt
41	Bridge Replacement	Route 9 (East Street) over the Ware River	Ware	Safety and Security	Exempt
42	Deck Replacement	Route 32 (Palmer Road) over the Ware River	Ware	Safety and Security	Exempt
43	Full Deck Replacement/Full Steel Painting	Route 32 (Palmer Road) over the Ware River	Ware	Safety and Security	Exempt
44	Resurfacing and Related Work	I-90 (MM 50 to MM 60)	Chicopee/Ludlow/Palmer/Wilbraham	The Movement of People	Exempt
45	Route 187/ 57 Intersection Improvements	Intersection Improvement	Agawam	Safety and Security	Exempt
46	Sidewalk Construction	Route 159 (Main Street) from CT S.L.. to South Street	Agawam	The Movement of People	Exempt
47	Intersection Improvements	Reconstruct intersection of Northampton Street and O'Neill Street	Easthampton	The Movement of People	Exempt
48	Route 9 reconstruction	Resurface: Rte. 112 to Williamsburg TL	Goshen	Movement of People	Exempt
49	Resurfacing Route 57	Resurface 8 miles from Sodum Street to Tolland TL	Granville	The Movement of People	Exempt

Table 11-13 - Medium Priority Projects (Cont.)

Map Key	Project Name	Project Description	Community	Area of Emphasis	Air Quality Conformity
50	I-91 exit 17 at Route 141 intersection improvements	I-91 exit 17 at Route 141 intersection improvements	Holyoke	Safety and Security	Exempt
51	Resurfacing/Structures Maintenance	Route 5 Resurfacing & Culvert work	Longmeadow	Safety and Security	Exempt
52	Route 57 Reconstruction	Reconstruction Rt. 57 (Feeding Hills Road) from Route 10/202 to Powder Mill Road	Southwick	Safety and Security	Exempt
53	Routes 10/202 resurfacing (northerly)	Routes 10/202 resurfacing (northerly)	Southwick	Safety and Security	Exempt
54	Routes 10/202 resurfacing (southerly)	Routes 10/202 resurfacing (southerly)	Southwick	Safety and Security	Exempt
55	Roosevelt Ave. @ Island Pond Rd and Roosevelt Ave @ Alden Street	Realign Island Pond Road and Roosevelt Avenue to create a three way signalized intersection signal upgrade	Springfield	The Movement of People	Exempt
56	Connecticut Riverwalk	CT Riverwalk pedestrian access improvements	Springfield	Safety and Security	Exempt
57	At Grade Rail Crossing Improvements	Improvements to 1st and 2nd St/Bridge St Railroad crossing	West Springfield	Safety and Security	Exempt
58	Rte. 10/202 CBD Traffic Improvements	Elm Street, N. Elm Street	Westfield	The Movement of People	Non Exempt
59	Bridge Rehabilitation	Route 21 (Center Street) over Chicopee River (Putts Bridge)	Ludlow/Springfield	Safety and Security	Exempt
60	Route 9 @ Old Ferry Road and Day Ave	Intersection Improvements and Signalization	Northampton	Movement of People	Exempt
61	Main Street (Route 9) Downtown Improvments	Roadway, Pedestrian, and Intersection Improvements at Main, Pleasant, King, and State Street	Northampton	Movement of People	Exempt
62	King Street Reconstruction	Sidewalk, Pedestrian, Bicycle, and Intersection Improvements: Damond At King, King at Summer and North, and North and King at Finn	Northampton	Movement of People	Exempt
63	Hatfield Street @ Route 5 and 10	Intersection Improvements (Round about or Signalization $1,000,000)	Northampton	Movement of People	Exempt
64 Not Mapped	I-91 Viaduct	The work for the project involves the replacement of the superstructure of Bridge No. S-24-061 (10J, 10K & 10L).	Springfield	Safety and Security	Exempt
65 Not Mapped	I-91 Exit 15 improvements	Improvements to Exit 15 at Lower Westfield Road	Holyoke	Movement of Pe	Exempt
66 Not Mapped	Track Expansion	Track Expansion Palmer Ind Park	Palmer	The Movement of Goods	Exempt
67 Not Mapped	High Speed Rail	East/West high speed rail	Regionwide	The Movement of People	To be Determined
68 Not Mapped	Double Stack	Double stack improvements	Regionwide	The Movement of Goods	Exempt
69 Not Mapped	Westfield Industrial Park Track Expansion	Track Expansion Westfield Ind Park	Westfield	The Movement of Goods	Exempt
70 Not Mapped	Northampton Intermodal Center	Downtown bus, rail, intermodal station	Northampton	The Movement of People	Exempt
71 Not Mapped	Route 9 BRT additional enhancements	Add selected features of bus rapid transit to complement signal priority capability	Amherst-Hadley-Northampton	The Movement of People	Exempt
72 Not Mapped	Other BRT routes/enhancements	Add selected features of bus rapid transit, including signal priority, boarding platforms, queue jump lanes on selected high-volume PVTA bus routes	Region	The Movement of People	Exempt
73 Not Mapped	Transfer facilities and canopies	Improve waiting areas at high-volume transfer points with shelters and customer information services	Region	The Movement of People	Exempt

Figure 11-3 - Medium Priority Projects



a) Route 9 Reconstruction between the Lowe's and Home Depot Site Drives in Hadley

The proposed roadway design widens Russell Street through full depth reconstruction to provide two travel lanes in each direction with a minimum lane width of 11 feet and a shoulder width of 4 feet. The proposed pavement width will vary from 52 to 82 feet wide curb-to-curb. The proposed shoulder width of 4 feet will be an improvement over the existing shoulders which are as narrow as 2 feet wide. The widening of the roadway from one travel lane in each direction to two travel lanes in each direction will add additional capacity and improved traffic progression. Other improvements to Russell Street include the following: increasing roadway vertical grades to improve surface drainage; upgrading the existing storm system drainage; new traffic signage; extending or replacing existing cross culverts; installing raised pavement markers; new granite curbs; new 6.5-foot wide concrete sidewalks along both sides of the roadway.

b) Reconstruction Elm Street/North Elm Street (Route 10/202) in Westfield

The project is a follow up to the Great River Bridge Project designed to relieve congestion in the downtown by establishing four lanes of travel (two in each direction) from the Mass Turnpike Interchange to the town center. To achieve this on street parking will be relocated to proposed off street facilities. The project will include minor widening of Elm Street from Franklin Street (Route 20) to the southern limits of the Great River Bridge Project and from the northern limits to Notre Dame Street. Traffic signal upgrades with center turning lane installation at Notre Dame Street. Sidewalk, streetscape, and off street parking facilities are included.

c) East/West High Speed Rail

In the 2005 transportation appropriation Congress designated the Boston – Springfield to New Haven as well as the Springfield to Albany corridors as part of the Northern New England High Speed Rail Corridor. Congress further provided funds to study the feasibility of High Speed Rail Service in the Boston – Springfield - New Haven Corridor.

With partial funding from the Federal Railroad Administration (FRA), MassDOT is advancing a study of the corridor. MassDOT has recently hired HDR Consultants to conduct the study of this route between Boston and New Haven as well as the route between Boston and Montreal via Springfield. This planning effort provides an opportunity to develop a long term master plan for Passenger Rail in Southern New England. It is the intention that this plan will explore opportunities for passenger rail service and provide a scalable, incremental plan for implementation of new or expanded services. Particular emphasis will be placed on developing an innovative funding strategy as well as looking at the economic impacts that rail service would have on affected communities.

d) Double Stack Improvements

Double-stack rail transport has become increasingly common to improve productivity of rail freight by increasing the capacity of the freight cars. The unique design of this rail car reduces the amount of damage experienced in transit while providing greater cargo security by restricting access to the cargo doors. Double stack transportation is limited by the horizontal and vertical clearance of existing railroad bridges and underpasses. Clearances in the Pioneer Valley have already been raised to accommodate rail cars with 17 feet of stacked containers. In the future, 19 feet of clearance will be required to accommodate trains with two nine foot containers.

e) Northampton Intermodal Center

The City of Northampton is in the conceptual planning stages for an intermodal facility for public transportation located in downtown. The facility would include PVTA buses, Amtrak passenger rail, bicycles, pedestrians, commercial development, and transit-related uses.

f) Route 9 Bus Rapid Transit Enhancements

Transit stakeholders in the Northampton/Hadley/Amherst corridor have regularly expressed support for higher capacity bus service between downtown Northampton and Amherst/UMass. Implementing some or all the elements of a bus rapid transit (BRT) system have frequently been mentioned as a long range goal. In 2011, MassDOT activated signal priority equipment at 10 intersections on Route 9 between University Drive and Exit 19, which PVTA buses are able to use to reduce waiting times at traffic signals. Additional signal priority intersections are to be added west of Exit 19 in the coming year. Additional BRT enhancements that could be added include queue jump lanes, simplified routing, and level boarding platforms.

g) Additional Bus Rapid Transit

As a long term goal in addition to BRT in the Route 9 corridor discussed above, PVTA is interested in improving passenger carrying capacity in other high-volume corridors in the region. These could include routes between Holyoke and Springfield on which existing express bus services are popular.

h) Transfer Facilities

As part of its shelter improvement program, PVTA is seeking to improve conditions for customers waiting at high-volume bus transfer locations in the region. This would include higher quality and larger shelters, electronic customer information displays, and canopies for shelter.

4. Low Priority Projects

This section provides a summary of the "Low" priority projects included in the RTP. A complete summary of all "Low" priority projects is included in Table 11-14 and Figure 11-4. Where applicable, projects have been cross referenced between the table and figure through a numbering system. Description of all regionally significant "Non-Exempt" projects are also included as part of this section.

Table 11-14 - Low Priority Projects

Map Key	Project Name	Project Description	Community	Area of Emphasis	Air Quality Conformity
1	Bridge Rehabilitation	Pelham Road over Fort River	Amherst	The Movement of Information	Exempt
2	Resurfacing and Related Work	Route 66	Westhampton	The Movement of People	Exempt
3	Bridge Replacement	George Miller Road over the Middle Branch of the Westfield River	Chester	Safety and Security	Exempt
4	Bridge Replacement	Meetinghouse Road over Amethyst Brook	Pelham	The Movement of People	Exempt
5	Bridge Rehabilitation	Bridge Street over Westfield River	Russell	The Movement of People	Exempt
6	N. Washington Street Reconstruction	Reconstruction: S. Main St. to North Liberty Street	Belchertown 2021	The Movement of People	Exempt
7 Not Mapped	Landscape/Roadside Development	Wildflower Bed Establishment	Bernardston/Deerfield/Hatfield/Northampton/Holyoke	Sustainability	Exempt
8	Fuller Rd. Corridor Improvements	Reconstruction: From Rte. 33 to Shawinigan Drive	Chicopee	The Movement of People	Exempt
9	Chicopee Riverwalk	Construction: From Chicopee Center, 2.5 mi.	Chicopee	The Movement of People	Exempt
10	Elm Street Reconstruction	Reconstruction: Springfield CL to Center Sq.	East Longmeadow	The Movement of People	Exempt
11	Route 9 reconstruction	Reconstruction form Middle St to E/O Mill Valley Rd (Lowes)	Hadley	The Movement of People	Non Exempt
12	Amherst Rd. Reconstruction	Reconstruction: W/O Rte. 202 to Amherst TL	Pelham	The Movement of People	Exempt
13	CT Riverwalk and Bikeway	Dike Segment	West Springfield	The Movement of People	Exempt
14	Columbia Greenway Rail Trail Phase III (North)	Construction of the North Section - Cowles Court to Westfield River Bridge	Westfield	The Movement of People	Exempt
15	Bridge Replacement	Route 20 over Cushman Brook and Walker Brook	Becket / Chester	Safety and Security	Exempt
16 Not Mapped	Bridge Demolitions	B-05-023; W-07-012; W-21-011	Belchertown/Warren/West Springfield	Safety and Security	Exempt
17	Bridge Replacment	Glendale Street over Manhan River BR#E-05-005	Easthampton	The Movement of People	Exempt
18	Bridge Replacement	North Hadley road over Route 116	Hadley	The Movement of People	Exempt
19	Bridge Rehabilitation	East Street over Chicopee River	Ludlow / Wilbraham	The Movement of People	Exempt
20	Bridge Replacement	State Avenue over the Quaboag River	Monson / Palmer	The Movement of People	Exempt
21	Bridge Rehabilitation	Clement Street over Mill River	Northampton	The Movement of Goods	Exempt
22	Bridge	WATER ST OVER ROBERTS MEADOW BRK	Northampton	The Movement of People	Exempt
23	Bridge Replacement	Valley Road over Moose Brook	Southampton	The Movement of People	Exempt

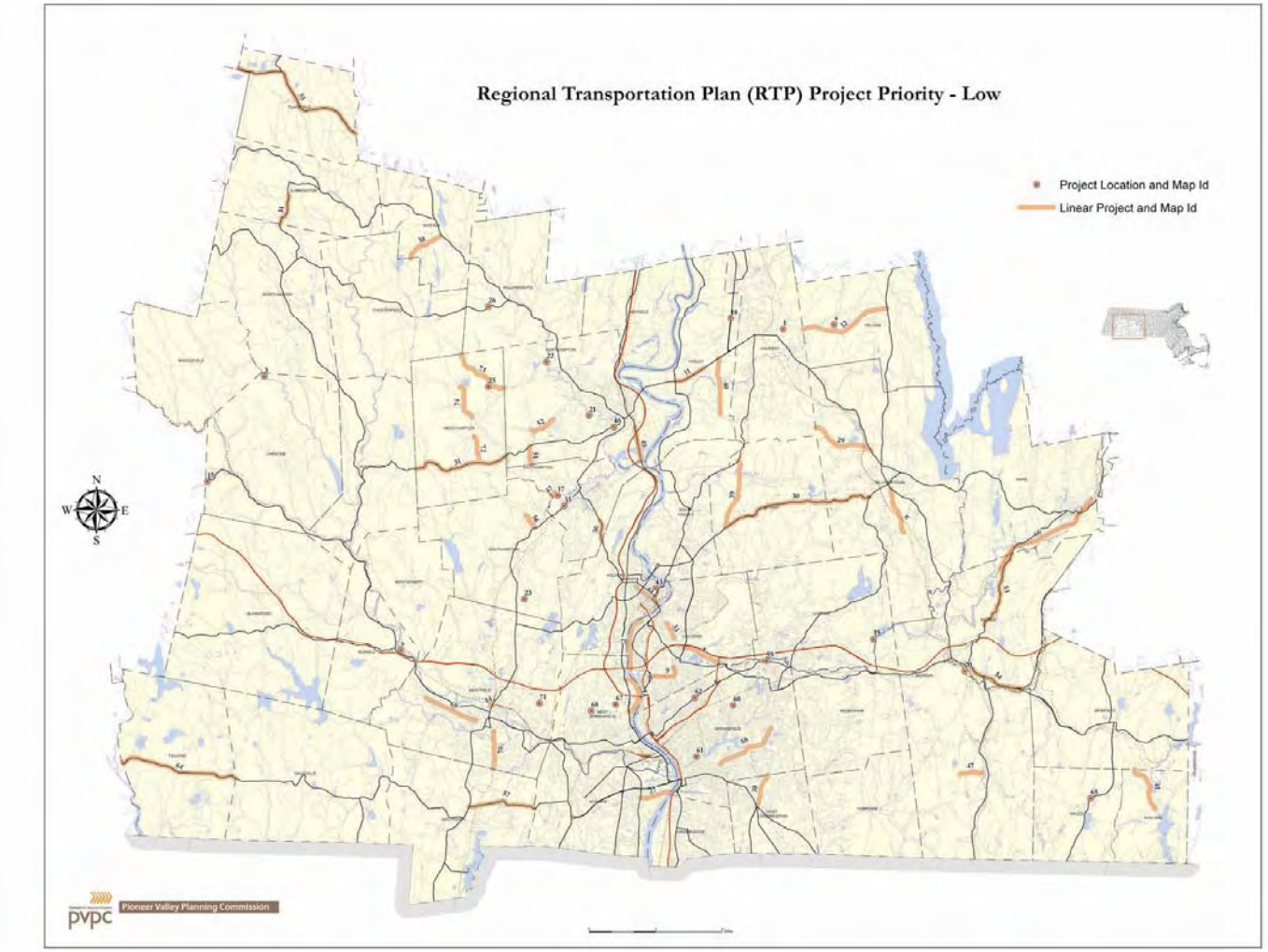
Table 11-14 - Low Priority Projects (Cont.)

Map Key	Project Name	Project Description	Community	Area of Emphasis	Air Quality Conformity
24 Not Mapped	Bridge Betterment/Structures Maintenance	SCOUR COUNTERMEASURES, ROUTE 20 (PARK AVENUE) OVER CT RIVER	Springfield/West Springfield	Safety and Security	Exempt
25	Bridge Rehabilitation	North Road over Roberts Meadow Brook	Westhampton	The Movement of People	Exempt
26	Bridge Replacement	Geer Hill Road over Meekin Brook	Williamsburg	The Movement of People	Exempt
27	Bikeway Loop	Bikeway loop from River Walk to Main Street	Agawam	The Movement of People	Exempt
28 Not Mapped	Bikeway Loop	Main Street to Robinson State Park Via Water works ROW	Agawam	The Movement of People	Exempt
29	Bay Road Improvements	Resurfacing and related work on section of Bay Rd	Belchertown	The Movement of People	Exempt
30	Route 202 Resurfacing	Resurfacing and related work on Route 202	Belchertown / Granby	The Movement of People	Exempt
31	Resurfacing and Related Work on Route 143	From Worthington TL to Williamsburg TL	Chesterfield	The Movement of People	Exempt
32	Connecticut Riverwalk	Construction: Plainfield St. to Nash Fld.	Chicopee	The Movement of People	Exempt
33	Montgomery Road improvements	Resurfacing and related work on Montgomery Street from Granby Rd to Dale Street	Chicopee	The Movement of People	Exempt
34	Rte. 112	Rehabilitation: Worthington TL north 1.5 miles	Cummington	The Movement of People	Exempt
35	Intersection Improvements	Reconstruct and signalized intersection of Main and South Street	Easthampton	The Movement of People	Exempt
36	Mountain Rd (Route 141)	Automated closure of Mountain Rd - Easthampton	Easthampton	The Movement of Information	Exempt
37	Roadway Reconstruction	Pomeroy Meadow Road Southampton TL to Loudville Road	Easthampton	The Movement of People	Exempt
38	West Street Reclamation	Resurfacing and related work on West Street from South Maple Street to Chesterfield TL 1.8 miles	Goshen	The Movement of People	Exempt
39	Amherst Street improvements	Resurfacing and related work	Granby	The Movement of People	Exempt
40	South Maple Street	Reconstruction: South of Rte. 9 to Bay Rd.	Hadley	The Movement of People	Exempt
41	Brimfield Road improvements	Resurfacing and related work from Brimfield Town Line to Stafford Road	Holland	The Movement of People	Exempt
42 Not Mapped	Intersection Improvements	Linden Street improvements to 5 intersections signal coordination	Holyoke	The Movement of People	Non Exempt
43	Bikeway/Bike path Construction	Canalwalk, Phase 3 (from Dwight St to Lyman St)	Holyoke	Sustainability	Exempt
44	Cabot Street Reconstruction	Reconstruct from Main Street to South Canal Street	Holyoke	The Movement of People	Exempt
45 Not Mapped	Northampton Street Rehabilitation	Northampton Street Rehabilitation	Holyoke	The Movement of People	Exempt
46 Not Mapped	Route 5 Traffic Improvements	Route 5 Traffic Signal Improvements	Longmeadow	Safety and Security	Non Exempt
47	Lower Hampden Rd Phase 2	Reconstruction from 3/4 miles south of Ely Road easterly to the intersection of Elm Street and Bridge Street	Monson	The Movement of People	Exempt
48	Route 66 (West St.) at Earle Street intersection improvements	Intersection improvement: installation of Signal to mitigate peak hour congestion	Northampton	The Movement of People	Exempt
49	Mountain Rd (Route 5) improvements	Improvements to Mt. Tom Rd	Northampton	The Movement of People	Exempt

Table 11-14 - Low Priority Projects (Cont.)

Map Key	Project Name	Project Description	Community	Area of Emphasis	Air Quality Conformity
50 Not Mapped	Landscape/Roadside Development	Drainage Repairs & Slope Stabilization at Old Water Street	Northampton	Sustainability	Exempt
51	Glendale Raod Reconstruction	From Route 66 to Easthampton TL	Northampton	The Movement of People	Exempt
52	Ryan Road Reconstruction	From West Farms Road to Brookside Circle	Northampton	The Movement of People	Exempt
53	Rte. 32 (Ware Road)	Reconstruction: Stimson St. to Ware TL	Palmer	Safety and Security	Exempt
54	Route 20 improvements	Resurfacing and related work	Palmer	The Movement of People	Exempt
55	Route 116 (Main St)	Resurfacing and Related work	Plainfield	The Movement of People	Exempt
56	Glendale Rd. (Phase II)	Reconstruction: Pomeroy Meadow Road to Route 10.	Southampton	The Movement of People	Exempt
57	Highway Reconstruction	FEEDING HILLS ROAD (ROUTE 57) FROM COLLEGE HIGHWAY TO THE AGAWAM TOWN LINE	Southwick	The Movement of People	Exempt
58	Plumtree Rd improvements	Resurfacing and related work from Allen St to Wilbraham Rd	Springfield	The Movement of People	Exempt
59	Main St, Front, Route 141 Improvements (Indian Orchard)	Traffic signal and related work Main Street, Front Street., Myrtle Street (Route 141) Indian Orchard	Springfield	Safety and Security	Exempt
60	Intersection Improvements	Bay St @ Berkshire Ave intersection improvements	Springfield	Safety and Security	Exempt
61	Intersection Improvements	Central Street at Hancock Street intersection improvements	Springfield	Safety and Security	Exempt
62	Intersection Improvements	St James @ St James blvd intersection improvements	Springfield	Safety and Security	Exempt
64	Resurfacing Route 57	From Granville TL to Sandisfield TL	Tolland	The Movement of People	Exempt
65	Sidewalk improvements	Sidewalk reconstruction and resurfacing at various locations on Route 119	Wales	The Movement of People	Exempt
66	Ware River Valley Preservation Project	Ware River Valley Greenway Trail & Covered Bridge Preservation Project	Ware	The Movement of People	Exempt
67	Intersection Improvements	Morgan Road at Piper Cross Intersection Improvements	West Springfield	The Movement of People	Exempt
68	Intersection Improvements	Intersection improvements - Amostown Road at Dewey Street	West Springfield	Safety and Security	Exempt
69	Western Avenue Highway Improvement	Reconstruct and improvements From Bates Rd to Court St, and Court until Mill Street	Westfield	The Movement of People	Exempt
70	Columbia Greenway Rail trail and River Walk Phase II (South)	Southwick town line north to 1,200 ft south East Silver Street, 1.66M	Westfield	The Movement of People	Exempt
71	Safe Routes to School	Paper Mill School	Westfield	The Movement of People	Exempt
72	Southampton Rd.	Reconstruction: Rte. 66 to Stage Rd	Westhampton	The Movement of People	Exempt
73	Chesterfield Rd.	Reconstruction: Northampton TL to Chesterfield TL	Westhampton	The Movement of People	Exempt
74	Kings Highway and Reservoir Rd	Reconstruction: Kings Highway from Perryhill Road to Reservoir Rd, and Reservoir Rd from Kings Highway to Pine Island Lake Dam	Westhampton	The Movement of People	Exempt
75	Keystone Arch Bridge Project	Restoration of two historic Keystone Arch Bridges to a condition suitable for public access	Chester	The Movement	Exempt
76 Not Mapped	Central Corridor Passenger Rail Study	Central Corridor Passenger Rail Study	Regionwide	The Movement of People	Exempt

Figure 11-4 - Low Priority Projects



a) Reconstruction of Route 9 Reconstruction from Middle Street to E/O Mill Valley Road (Lowes)

With adjacent roadway expansion and continued development, this 1.27 mile segment of Route 9 is a two-lane bottleneck in a major regional corridor. This project will widen the roadway to 4 through lanes with 4 foot shoulders on both sides between Middle Street (Route 47) and the Lowe's mitigation project, creating a uniform 4-lane highway. Work will consist of resurfacing the existing pavement (level and overlay or mill and overlay) along with widening. Drainage improvements, culvert replacements/extensions, sidewalk construction, guardrail, curbing, loam and seed, striping and signage, silt fence hay bales, and traffic management will be included.

b) Linden Street Intersection Improvements Holyoke

The proposed project would consist of intersection improvements along with signal coordination and upgrades between Hamden Street and Beech Street.

c) Route 5 Traffic Signal Improvements

A study completed by the PVPC for the Town of Longmeadow recommended a series of improvements to the existing traffic signals along both the Route 5 and Laurel Street corridors. The existing traffic volumes along the Route 5 corridor will likely require the installation of a new through traffic lane from its intersection with Forest Glenn Road to Converse Street. In addition, it is recommended that all traffic signals be upgraded in this area to provide a coordinated signal system for both Route 5 and Laurel Street traffic.

d) Central Corridor Freight Service Improvements

The New England Central Railroad (NECR), locally known as the Central Corridor, is owned by RailAmerica and offers freight service between St. Albans, Vermont near the Canadian border, and New London, Connecticut via the eastern portion of the Pioneer Valley region. The NECR is a Class III railroad that operates 54 miles of ROW between Monson and Northfield, Massachusetts, which is NECR's Main Line. Its major Massachusetts facility is located at Palmer, where it interchanges with CSX (a Class I railroad).

As detailed in the Massachusetts State Rail Plan, The NECR's - Central Corridor, in partnership with CSX and various shortline carriers, has become an expanding through route for freight terminating and originating in Massachusetts and Western New England. Given the large number of connections with other short lines, the NECR Line maintains an important link in providing competitive access to the national rail system. While the current line provides for first generation double-stack intermodal operation, improvements to the line to support 2nd generation double-stack clearance and 286k weight are important and should be subject to further study.

5. Visionary Projects

Visionary Projects are defined as projects that would likely result in an improvement to the regional transportation system but do not have an identified source of construction funding. Visionary projects are not included as part of the Financial or Air Quality Conformity components of the RTP. The RTP will need to be amended to include any identified visionary projects as funding becomes available in order to demonstrate financial constraint and conformance with the requirements of the Clean Air Act Amendments.

a) Route 57 Phase II - Route 187 to Southwick Town Line

Route 57 currently runs from the South End Bridge in Springfield to the west, providing access to and from Springfield for many southwestern communities. The roadway is a limited access highway from the Route 5/57 rotary to its interchange with Route 187 in Agawam. This heavily traveled corridor has recently experienced economic growth. Residential and retail development has continually increased along this corridor thereby increasing congestion.

The relocation project of Route 57 in Agawam and Southwick is to be implemented in two phases. The first phase included the relocation of Route 57 from Mill Street to Route 187 (South Westfield Street) and was completed in 1996. The second phase includes the extension of the new Route 57 from Route 187 west to the Agawam/Southwick line reconnecting to the original roadway. Phase two of the proposed project is intended to reduce traffic volume along the original Route 57 and Route 187. These streets presently serve as the main connections to routes extending both north and west from the Phase One completed portion of the project.

The Phase Two portion of the project has a projected average traffic volume of 17,601 vehicles with an average congested travel speed of 55 mph. Traffic volumes along the existing original portion of Route 57 decrease by 27%. Additionally, Route 187 from the interchange of Route 57 to the interchange with North Westfield Street and the original Route 57 experienced a 59% decrease in projected traffic volume an a 11% increase in travel speed. In addition, projected traffic volumes along the Phase One portion of Route 57 are estimated to increase over 51% as a result of the project.

b) Expanded Passenger Rail Service on the Vermonter Line to Springfield.

The Massachusetts State Rail Plan identifies expanded passenger rail service along the Connecticut River line as a cost-effective improvement. Seven additional daily round-trips are forecast for the newly realigned Vermonter service in the Knowledge Corridor, one additional round-trip between St. Albans, Vermont, and Springfield, Massachusetts, and six round trips between Greenfield and Springfield are recommended. Track improvements allowing increased speed along the corridor are currently under construction.

Expanded passenger rail service results in increased ridership, a travel time savings for existing users based on the infrastructure improvements, a reduction in emissions, the potential for reduced highway maintenance costs, and improved highway safety. Track improvements to accommodate expanded passenger rail service in Massachusetts along the Connecticut River line are 100% funded. The Pioneer Valley MPO will continue to work with MassDOT to identify operational funding to provide expanded passenger rail service along this line.

c) Passenger Rail Service on the Central Corridor

The Central Corridor has the potential to link state universities in Vermont, Massachusetts, and Connecticut. Further study of this line would address the feasibility of advancing improvements to accommodate passenger rail service in the future. Any study should include an estimate of the cost to upgrade and operate the line to meet passenger rail service requirements, identify the location of potential stations, and determine the feasibility of expanding passenger rail service to this line.

6. Projects Removed from the RTP.

The following projects were included as part of the 2007 Regional Transportation Plan but have not been included in the 2012 RTP. The following sections provide more information on each project.

a) Interstate 291 Slip Ramp Project

In order to access the Memorial Bridge from Interstate 291 westbound, vehicles must perform a weave across three lanes of traffic on Interstate 91 southbound in a span of a few hundred feet. This is a dangerous movement and causes a safety hazard at this location. In order to improve the access to the Memorial Bridge from Interstate 291, the 2007 RTP proposed a project to add an additional ramp from Interstate 291 westbound to connect directly with Exit 7 of I-91 allowing direct access from I-291 to West Columbus Avenue and subsequently the Memorial Bridge. This project has been removed from the RTP as it has not advanced beyond the conceptual stage into the design stage.

b) Interstate 91 Exit 19 Improvements

This alternative was a recommendation of the 2004 Connecticut River Crossing Study of the existing Route 9 Calvin Coolidge Bridge between Hadley and Northampton. Interstate 91 currently provides a partial interchange at Exit 19, consisting of a northbound off ramp and a southbound on ramp. In order to access I-91 in the northbound direction or exit I-91 in the southbound direction vehicles must utilize another exit, driving a somewhat congested and circuitous route. A traffic signal is provided at the intersection of Route 9 with Damon Road and the I-91 northbound Exit 19 off ramp. This intersection experiences severe congestion and queues on the Exit 19 off ramp can extend back onto the highway during peak periods and special events.

The preferred alternative from the Connecticut River Crossing Study consisted of the reconfiguration of this interchange to provide full access to Interstate 91. This would be achieved through the construction of two new ramps immediately north of Route 9 to provide on and off ramps to Damon Road. In addition, the existing on ramp from Route 9 to I-91 southbound would be modified to provide an enhanced merging lane onto the highway as well as a new southbound off ramp. The existing northbound off ramp would be enhanced to allow for longer vehicle queues for exiting traffic to Route 9 in the eastbound direction. A coordinated traffic signal system would be designed for the new ramp system. The public participation process associated with a current study of this area indicated there is not sufficient community support to advance this alternative. As a result it has been removed from the 2012 RTP.

CHAPTER 12

FINANCIAL ELEMENT

Title 23 CFR Section 450.322 and 310 CMR 60.03(9) requires the RTP to be financially constrained. The financial element must demonstrate which projects can be implemented using current revenue sources and which are to be implemented using proposed revenue sources while the existing transportation system is being adequately operated and maintained. Projects can only be programmed up to the congressionally authorized spending amounts in any individual fiscal year.

The estimate of revenue for the region will be highly dependent upon the funding allocated to Massachusetts as part of future transportation bills. Estimates of the projected revenue sources for highway and transit projects have been made based on past historical trends and information available from the estimated apportionment of the federal authorizations contained in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) bill. Financial constraint will be maintained in the 2012 RTP Update.

A. REVENUE

The overall RTP, and each fiscal year contained herein, is financially constrained to the annual federal apportionment and projections of state resources reasonably expected to be available during the appropriate time-frame. Projections of federal resources are based upon the estimated apportionment of the federal authorizations contained in SAFTEA-LU, as allocated to the region by the State or as allocated among the various MPOs according to federal formulae or MPO agreement. Estimates used to develop the highway component of the financial plan were developed by MassDOT. A summary of the projected highway revenue from 2012 – 2036 is presented in Table 12-1.

Table 12-1 - Projected Highway Revenue 2012 - 2036

	2012 - 2016	2017 - 2021	2022 - 2026	2027 - 2031	2032-2036	GRAND TOTAL
Total Available for Programming in the Pioneer Valley RTP	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**
	$339,286,000	$402,127,000	$559,457,000	$682,197,000	$790,754,000	$2,773,821,000
Major Infrastructure Projects	$17,593,000	$23,645,000	$35,722,000	$43,648,000	$50,600,000	$171,208,000
Federal Aid Bridge Projects	$83,520,000	$92,020,000	$137,690,000	$167,964,000	$194,716,000	$675,910,000
NHS/IM Projects	$44,597,000	$47,792,000	$71,737,000	$87,557,000	$101,503,000	$353,186,000
Statewide Maintenance	$116,673,000	$119,016,000	$144,834,000	$170,450,000	$197,499,000	$748,472,000
Regional Discretionary Funding	$76,903,000	$119,654,000	$169,474,000	$212,578,000	$246,436,000	$825,045,000
Total of Regional Discretionary and Major Infrastructure	**$94,496,000**	**$143,299,000**	**$205,196,000**	**$256,226,000**	**$297,036,000**	**$996,253,000**

- Federal and state matching funds for the period of 2012 reflect current allocations and are inflated 3% per year thereafter, beginning in 2013.
- All figures provided are based upon an assumed obligation amount of 85%.
- Consistent with FHWA STIP guidance, $40 million in redistributed obligation authority is assumed each year beginning in 2012. This figure is increased by 3% per year beginning in 2013.
- Deductions for statewide items that cannot be allocated individually to the MPOs - Central Artery GANs repayment, Planning, and Extra Work Orders/Cost Adjustments, and the Accelerated Bridge Program - are taken from total available funding, leaving an amount for the available federal funding to be allocated in the regional plans.

- Bridges, IM, and other state category funding are attributed to each region based upon formula such as the region's % of the total number of bridges or a region's % of the total lanes miles of IM/NHS.
- In FFY2022 it is assumed that GANs payments for the Central Artery and Accelerated Bridge Program are complete. The additional revenue was equally split between Statewide line items (Bridge, NHS/IM, Statewide Maintenance) and Regional Discretionary funds beginning in 2022.
- Funding availability for bridges is based upon the Commonwealth's commitment to a Statewide Bridge Program. The bridge program has two components: federal aid and non-federal aid.
- With the exception of funds for the IM and Bridge Programs, the estimated funding is allocated among the MPOs based upon the existing MARPA TIP targets.

The estimates of available transit revenue shown in this RTP were provided by MassDOT on August 22, 2011. Information on anticipated farebox and local revenue was developed using the funding total from the most recent data and based on historical data from the PVTA, then aggregated through the life of the RTP. A summary of estimated transit revenue during the 2012-2036 period is presented in Table 12-2.

Table 12-2 - Estimated Transit Operating Revenue 2012 - 2036

Table 12-2 Pioneer Valley MPO Region Estimated Transit Operating Revenue						
	2012-2016	**2017-2021**	**2022-2026**	**2027-2031**	**2032-2036**	**TOTAL**
State Contract Assistance	$86,740,473	$100,551,000	$116,551,000	$164,601,000	$156,606,000	$625,049,473
Local Assessments	$36,233,817	$40,995,238	$46,382,349	$52,477,371	$59,373,329	$235,462,104
5307 Federal Urbanized Area Formu	$60,423,930	$70,047,895	$81,204,709	$94,138,514	$109,132,338	$414,947,386
5310 Federal Elderly & Disabled	$2,241,520	$2,596,747	$3,005,991	$3,481,331	$4,032,407	$15,357,996
5311 Federal InterCity Bus Program	$3,832,915	$4,440,550	$5,143,370	$5,958,004	$6,902,350	$26,277,189
5316 Federal JARC Program	$1,875,643	$2,166,000	$2,496,000	$2,878,000	$3,322,000	$12,737,643
5317 Federal New Freedom Program	$1,243,108	$1,435,000	$1,651,000	$1,901,000	$2,193,000	$8,423,108
Farebox	$34,140,525	$38,626,871	$43,702,759	$49,445,660	$55,943,226	$221,859,040
Advertising, other revenue	$5,525,631	$7,052,261	$9,000,671	$11,487,391	$14,661,145	$47,727,099
Available for Programming in Pioneer Valley RTP	**$232,257,563**	**$267,911,562**	**$309,137,849**	**$386,368,270**	**$412,165,794**	**$1,607,841,039**

- State Contract Assistance per MassDOT estimate provided August 22, 2011 increased 1% for FY12, then escalated 3% annually.
- Local assessments escalated 2.5% annually as allowed by statute.
- Federal grant program contributions (5307, 5310, 5311, 5316 and 5317) escalated 3% annually per MassDOT forecast provided August 22, 2011.
- Farebox revenue estimate based on actual FY12 amount of $6.4 million and escalated 2.5% annually consistent with average Consumer Price Index 2000-2010.
- Advertising and other revenue assumed to be $1 million per year in FY12 and escalated 5% annually per PVTA comment received August 24, 2011.

Table 12-3 - Estimated Transit Operating Need 2012 – 2036

	2012-2016	**2017-2021**	**2022-2026**	**2027-2031**	**2032-2036**	**TOTAL**
PVTA Fixed Routes	$139,847,127	$170,145,413	$207,007,911	$251,856,776	$306,422,277	$1,075,279,504
PVTA Paratransit	$41,487,101	$50,475,402	$61,411,044	$74,715,925	$90,903,347	$318,992,818
PVTA Administration	$18,871,746	$22,960,365	$27,934,795	$33,986,949	$41,350,320	$145,104,176
FRTA paratransit	$695,943	$846,721	$1,030,165	$1,253,354	$1,524,896	$5,351,079
Total Operating Need (4% annual escalation)	**$200,901,917**	**$246,305,227**	**$297,383,915**	**$364,591,904**	**$440,200,841**	**$1,549,383,804**

- Uses FY12 TIP approved amounts as basis and escalated 4% annually per FHWA guidance.

Table 12-4 - Estimated Transit Capital Need 2012 – 2036

	2012-2016	2017-2021	2022-2026	2027-2031	2032-2036	TOTAL
Springfield Union Station Redevelop	$74,000,000	$0	$0	$0	$0	$74,000,000
Springfield Bus Maint/Storage facilit	$61,000,000	$6,000,000	$0	$0	$0	$67,000,000
PVTA Fleet Replacement Program	$40,679,903	$44,916,297	$48,653,279	$59,194,153	$72,018,738	$265,462,369
Vehicle maintenance	$32,671,258	$39,749,580	$48,361,442	$58,839,089	$71,586,749	$251,208,119
PVTA Facility maintenance	$2,816,488	$4,878,466	$8,338,181	$10,144,672	$12,342,545	$38,520,351
Bus shelters	$1,126,595	$1,370,675	$1,667,636	$2,028,934	$2,468,509	$8,662,349
Bus stop sign replacement	$402,517	$532,037	$140,824	$171,334	$208,454	$1,455,167
ITS/AVL and communications equip	$5,154,173	$6,270,839	$7,629,434	$9,282,374	$11,293,427	$39,630,246
Intelligent fareboxes	$0	$4,269,935	$0	$6,320,547	$0	$10,590,482
Westfield Intermodal Center	$8,000,000	$0	$0	$0	$0	$8,000,000
Northampton garage rehabilitation	$5,000,000	$0	$0	$0	$0	$5,000,000
MAP van program	$5,155,857	$5,977,051	$6,929,041	$8,032,657	$9,312,051	$35,406,658
Northampton Intermodal Center	$14,000,000	$0	$0	$0	$0	$14,000,000
Route 9 BRT additional enhancemen	$0	$20,000,000	$0	$0	$0	$20,000,000
Other BRT routes/enhancements	$0	$20,000,000	$0	$0	$0	$20,000,000
Transfer facilities and canopies	$0	$5,000,000	$0	$0	$0	$5,000,000
Total ALL Capital Projects	**$250,006,790**	**$158,964,881**	**$121,719,838**	**$154,013,760**	**$179,230,472**	**$863,935,741**
Total HIGH PRIORITY Capital Projects only	**$236,006,790**	**$113,964,881**	**$121,719,838**	**$154,013,760**	**$179,230,472**	**$804,935,741**

- All PVTA project cost estimates by PVTA, August 2011.
- MAP van program need estimate per MassDOT forecast estimate of revenue available received August 22, 2011.

Table 12-5 - Estimated Transit Capital Revenues 2012 – 2036

	2012-2016	2017-2021	2022-2026	2027-2031	2032-2036	TOTAL
RTACAP & RTAFCAP Programs	$11,412,595	$14,864,628	$16,351,091	$17,986,200	$19,784,821	$80,399,336
RTA Fleet Acquisition Program	$0	$545,292	$749,777	$824,754	$907,230	$3,027,052
ITC CAP Program	$600,000	$0	$0	$0	$0	$600,000
Federal matching grants (80% of proj	$48,050,380	$61,639,682	$68,403,471	$75,243,818	$82,768,200	$336,105,552
TOTAL Transit Capital Funds Available for Programming in Pioneer Valley RTP	**$60,062,975**	**$77,049,602**	**$85,504,339**	**$94,054,773**	**$103,460,250**	**$420,131,940**

The estimated revenue from both highway and transit sources is summarized in Table 12-6.

Table 12-6 - Total Estimated Revenue

Total Estimated Highway Revenue	$ 2,773,821,000
Total Estimated Transit Capital Revenue	$420,131,940
Total Estimated Transit Operating Revenue	$1,416,886,088
Grand Total	**$4,610,839,028.00**

EXPENDITURES

1. Operating and Maintenance

Operating and Maintenance expenditures were developed separately for the areas of Highway and Transit planning. Cost estimates for each of the priority projects included as recommendations of the RTP were assigned a construction year for planning purposes. An inflation factor of 4% per year was applied to each project to reflect anticipated increases in construction materials over the life of the plan. Inflation factors were not applied to projects included as part of the current TIP as all of these projects have a 25% contingency applied to their current cost estimate. Each project was assigned to the appropriate federal funding category to correspond with the revenues estimated in Table 12-1. The total cost estimates for each category were then compared to the recommended minimum investment as developed by MassDOT. Major Infrastructure Projects are defined as projects that are expected to cost more than the regional target for the MPO to construct. For the purposes of this plan, a project was assumed to qualify as a major infrastructure project if the estimated construction cost exceeded $12,000,000.

a) Funding Categories

- Federal Aid Bridge Projects – Funding provided for MassDOT bridge program, this funding can not be used for any other program.
- NHS/IM Projects – Funding used for any Interstate or National Highway System improvement project.
- Major Infrastructure Projects – Any transportation improvement project with a cost that exceeds $12,000,000.
- Regional Discretionary Projects – Pioneer Valley MPO target to program any non-bridge or non Interstate Maintenance project.
- Statewide Maintenance – Estimated routine maintenance target for the existing state maintained transportation system.

b) Highway Needs

The Pioneer Valley MPO used the following methodology to populate the Operating and Maintenance Expenditure Tables. Projects were assigned to an estimated construction year based on project readiness, TEC Score, RTP Priority, and project cost unless otherwise specified.

- The Statewide bridge listing was used to populate the bridge funding category.
- The MassDOT project information database was used to populate IM/NHS.
- Based on MassDOT guidance, no projects were programmed into Statewide Maintenance as this category is intended for general transportation maintenance.
- The Major Infrastructure and Regional Discretionary Categories were at times used to supplement other categories as necessary to maintain fiscal constraint.
- Federal Earmarks where applicable were added to the Regional Discretionary Targets.

It is estimated it will take 10-15 years to fund all of the current projects included in the TIP backlog for the Pioneer Valley. This is a growing concern as regional targets have not increased significantly while project costs continue to rise. This is illustrated in Figures 12-1 and 12-2

Figure 12-1 - Pioneer Valley Project Backlog History

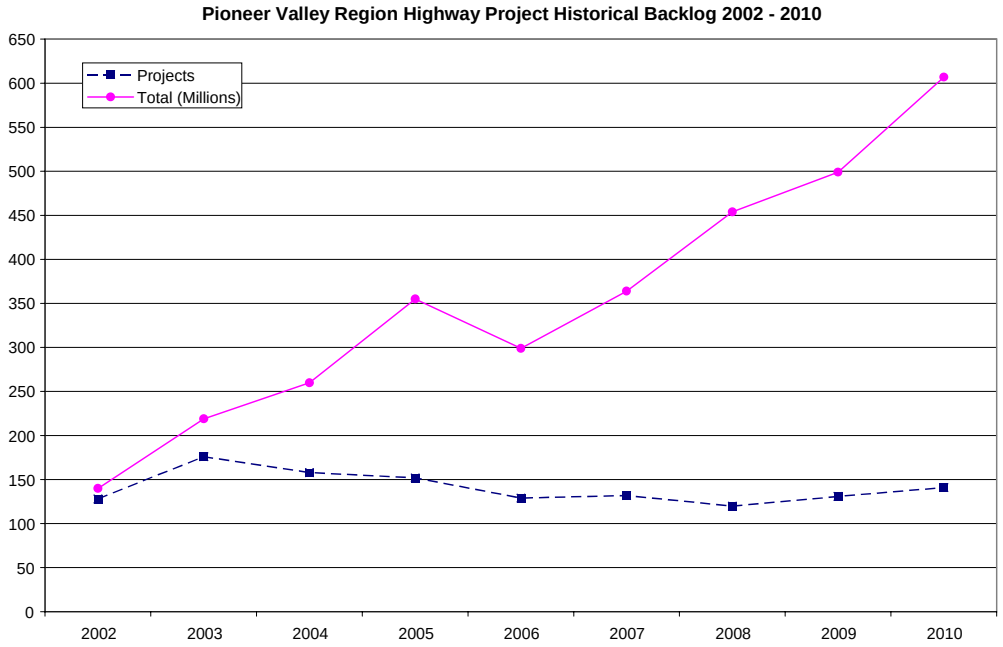
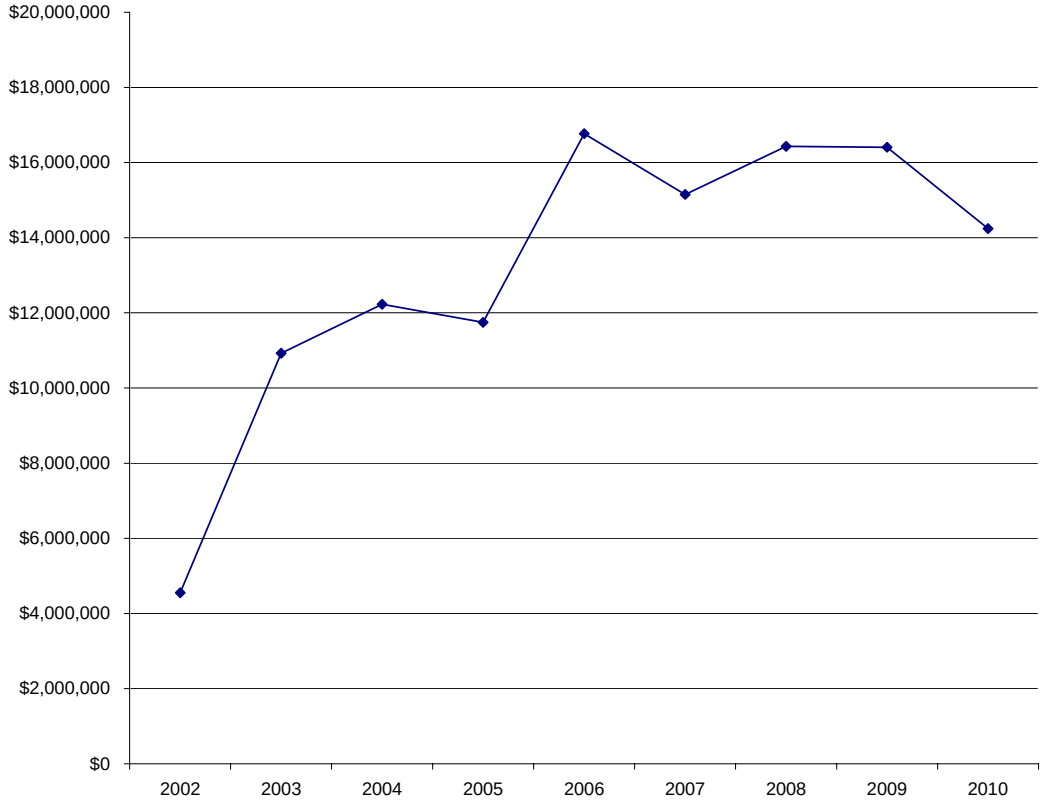


Figure 12-2 - Historic TIP Targets



After 2022 the GANS repayment of the Central Artery and Accelerated Bridge Program is anticipated to be complete. This results in an increase in available transportation revenue. The MassDOT and MARPA agreed to allocate this additional revenue equally between statewide needs and regional discretionary funds. The PVPC reviewed historic spending by project type to assist in the identifying future regional transportation needs. This information is summarized in Table 12-7.

Table 12-7 - Summary of Transportation Spending by Project Type

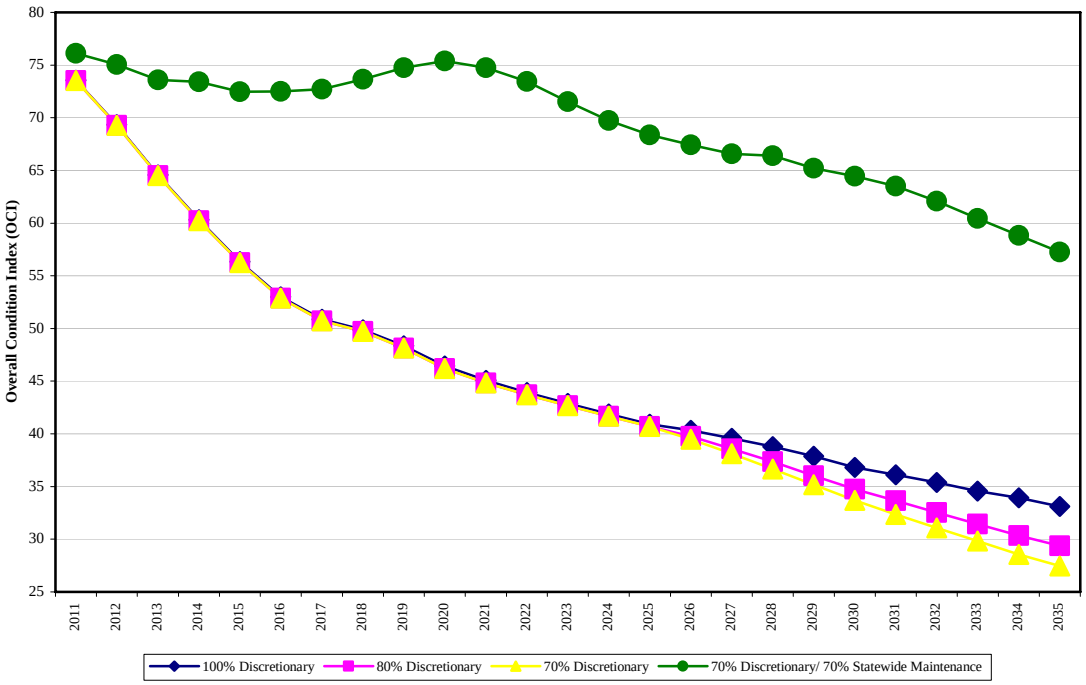
Type	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Average
Congestion	3%	0%	13%	3%	0%	3%	0%	0%	4%	0%	3%
Maintenance	67%	48%	73%	64%	65%	39%	20%	83%	70%	32%	56%
*CMAQ	0%	0%	0%	0%	0%	0%	9%	6%	5%	0%	2%
Safety	14%	0%	6%	1%	6%	4%	0%	11%	3%	2%	5%
Bike	13%	0%	0%	1%	18%	10%	7%	0%	5%	0%	6%
Transit	2%	0%	0%	0%	0%	5%	0%	0%	0%	0%	1%
Bridge	0%	52%	7%	31%	11%	39%	63%	0%	14%	66%	28%
	100%	48%	93%	69%	89%	61%	37%	100%	86%	34%	100%

*CMAQ funding does not include funds which were Allocated to Bike, Congestion, Safety, or Transit projects

Over the last 10 years on average the region has spent less than 60% of its transportation improvement dollars on roadway maintenance projects. It is critical to invest in the maintenance of the regional transportation system. The Cartegraph software was used to forecast the regional Overall Condition Index (OCI) based on the anticipated Highway Revenue over the life of the RTP under four different investment scenarios. Three of the scenarios assume an investment of 70%, 80%, and 100% of Regional Discretionary funding and all Major Investment funding over the life of the plan on pavement maintenance. The fourth scenario identified all projects

anticipated to contribute to pavement maintenance as well as an investment of 70% of all unallocated future Regional Discretionary funds, 70% of all Statewide Maintenance funds, and 100% of Major Investment funds. This information is shown in Figure 12-3

Figure 12-3 - Regional OCI Forecast



Based on the first three scenarios, which assume funding pavement maintenance at varying levels of Major Investment and Regional Discretionary Funds, the regional OCI is anticipated to deteriorate significantly over the life of the plan. Allocation of a portion of Statewide Maintenance funds under the fourth scenario maintains a steady OCI over the first ten years of the RTP, but eventually results in a decrease in OCI over the life of the RTP.

No projects have been allocated to the Major Infrastructure category for the FY 2026-2030 and FY 2031-2035 funding periods. Instead this category was used to supplement the Regional Discretionary Funding category to assist in addressing anticipated regional maintenance needs.

The Pioneer Valley MPO assumed the following breakdown to allocate Regional Discretionary dollars for the FY2026-2030 and FY2031-2035 funding periods. This breakdown was developed using the historical spending data, Cartegraph analysis, and through consultation with the JTC.

Table 12-8 - Regional Discretionary Funding Allocation

70%	Roadway Maintenance
12.5%	Congestion Mitigation
12.5%	Safety Improvements
2.5%	CMAQ Projects
2.5%	Bicycle and Pedestrian Improvements

c) Transit Need

Secure funding for transit operations and projects in the region is a key concern.

With respect to operations, PVTA was forced to cut service 21% in 2003-2004 due to operating funding shortfalls, and ridership fell approximately 20% as a result. Since then, State Contract Assistance (SCA), which is now 44% of PVTA's $37 million annual operating budget, has essentially been level-funded. Transit operating costs during the past decade have been higher than the CPI average because the cost of petroleum has quadrupled since 2003, effectively reducing operating resources.

The short term (2012-2016) transit operations outlook is of critical concern. During FY2011, PVTA initially faced a $1.8 million operating budget shortfall due to rising fuel costs and continued level funding of SCA and federal support. Fortunately, the authority was able to use one-time cost shifts to eliminate the deficit. However, these funding options are not available in FY2012-16, and PVTA must address severe operating budget constraints beginning in FY2012.

In addition, operating funding needs also include $123,000 per year (escalated 4% annually) for FRTA paratransit in 14 outlying towns in the PVPC region that are not served by PVTA. FRTA anticipates that the cost of providing paratransit van service in the 14 PVMPO municipalities not served by PVTA will increase at a rate greater than 4% in the 2012-2016 timeframe due to the growing need to replace volunteer drivers with professional drivers in many communities.

The funding outlook with respect to capital project needs is also a significant concern. The following chart shows the anticipated transit capital project needs versus estimated revenues (2012-2036) for the region. It shows that over the life of this plan, the gap between capital needs and anticipated revenue would be $443,803,802. This amount is only $20 million more than the total estimated amount ($420,131, 490) that will be available for all capital projects during the 25 years of the entire plan. Therefore, transit capital needs are more than double the amount of funds that are expected to be available.

Figure 12-4 - Pioneer Valley MPO
Transit Capital Needs vs. Estimated Revenue

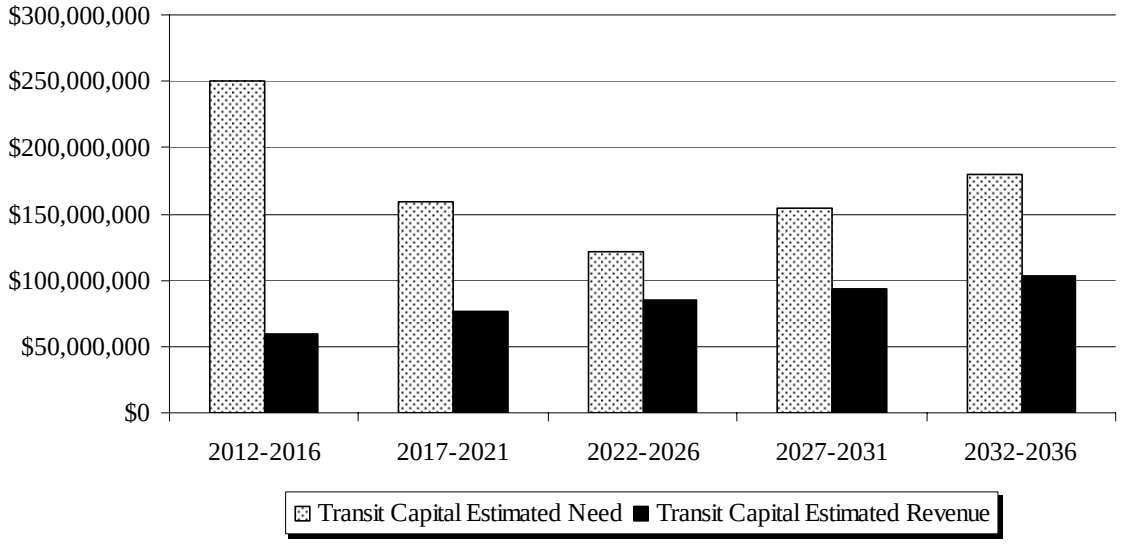


Table 12-9 - Operating and Maintenance Expenditures FY2012 - 2016

Project Name	Project Description	Community	Area of Emphasis	Total Cost
Bridge Projects				
Bridge Rehabilitation	Pelham Road over Fort River	Amherst	The Movement of Information	$1,238,500
Bridge Rehabilitation	Route 116 (Chicopee/Cabot Street) over CT River and PV RR (Willimansett Bridge)	Chicopee/Holyoke	Safety and Security	$11,000,000
Bridge Betterment	Route 9 and Route 112 over the Westfield River	Cummington	Safety and Security	$3,500,000
Bridge Replacement	Route 10 (Northampton Street) over Manhan River	Easthampton	Safety and Security	$2,249,728
Bridge Replacement	Hospital Hill Road over Quaboag Street	Monson	The Movement of People	$3,120,000
Bridge Replacement	Kennedy Road over Roberts Meadow Brook	Northampton	The Movement of People	$1,406,156
Bridge Replacement	South Road over Loudis Brook	Westhampton	The Movement of People	$807,666
Bridge Replacement	Route 112 over Kearney Brook	Worthington	The Movement of People	$1,085,438
Bridge Replacement	George Miller Road over the Middle Branch of the Westfield River	Chester	Safety and Security	$2,091,707
Bridge	S-24-016, HWY ARMORY ST OVER RR CSX	Springfield	Safety and Security	$3,169,839
Bridge Replacement	Route 10/202 Southwick Street over Little River	Westfield	Safety and Security	$21,632,000
Bridge Replacement	Route 141 (Appleton Street) over 1st and 2nd Level Canals	Holyoke	Safety and Security	$9,994,613
Bridge Reconstruction	Route 147 over Westfield River and intersection improvements at 3 locations	Agawam / West Springfield	Safety and Security	$15,601,234
Superstructure Replacement	Memorial Avenue over Riverdale Road (Route 5)	West Springfield	Safety and Security	$5,667,733
Bridge Improvement	Other Bridge Improvement Projects	Regionwide		$955,386
MPO Recommended Investment				**$83,520,000**
Recommended Minimum for Bridge Projects				**$83,520,000**
Interstate Maintenance				
Resurfacing and Related Work	Route 57 from Route 187 to Route 75	Agawam	The Movement of People	$3,466,279
Resurfacing and Related Work	I-91 Interstate Maintenance	Easthampton/Northampton		$6,489,600
Resurfacing and Related Work	I-91 Interstate Maintenance	Holyoke/West Springfield	The Movement of People	$18,925,593
Structural Signing	I-91 Guide & Traffic Sign Replacement	Longmeadow to West Springfield	The Movement of People	$6,478,328
Massachusetts Turnpike Off Ramp Congestion Project	Massachusetts Turnpike off ramp congestion improvements	Regionwide	Safety and Security	Further Study
I&M Projects	Other Interstate Maintenance Projects	Regionwide		$9,237,200
MPO Recommended Investment				**$44,597,000**
Recommended Minimum for Interstate Maintenance				**$44,597,000**
Major Infrastructure Projects				
Union Street Underpass	Reconstruct Union Street Underpass	West Springfield	The Movement of Goods	$17,547,878
MPO Recommended Investment				**$17,547,878**
Recommended Maximum for Major Infrastructure Projects				**$17,593,000**
Additional Revenue Moved to Regional Discretionary				**$45,122**
Actual Investment in Major Infrastructure Projects				**$17,547,878**
Regional Discretionary Funding				
Rte 159 (Main Street) Improvements	Resurface and related work	Agawam	The Movement of People	$4,152,442
Route 116 (Notch) reconstruction	Reconstruction of roadway from Granby T.L. 1.1 miles north	Amherst	Safety and Security	$4,752,800

Table 12-9 - Operating and Maintenance Expenditures FY2012 – 2016 (cont.)

Project Name	Project Description	Community	Area of Emphasis	Total Cost
Main @ Maple and Jabish Intersection Improvements	Traffic signal and geometric improvements at the Main Street (Route 181), Maple Street (Route 202), and Jabish Street (Route 21)	Belchertown	The Movement of People	$746,304
Resurfacing Route 23	Resurfacing and Related work on Route 23 from Otis TL to Route 20 in Russell	Blandford / Russell	The Movement of People	$6,668,194
memorial Drive (Route 33) Traffic signal improvement	Improvement to 3 signals Memorial Dr. at Montgomery and Sheridan St., Broadway at Main St., and Broadway at Belcher St.	Chicopee	The Movement of People	$865,280
Route 9 Pavement Preservation	Route 9 Pavement Preservation from Windsor TL to Goshen TL	Cummington	The Movement of People	$5,508,300
West St./Glendale St./Loudville/Pomeroy Meadow	Reconstruction: Intersection & signalization	Easthampton	The Movement of People	$2,760,969
Route 5 resurfacing	Resurfacing and related work on route 5	Easthampton / Holyoke	The Movement of People	$3,071,690
Route 9 reconstruction	Reconstruction of Route 9 near Hampshire Mall	Hadley	The Movement of People	$2,556,672
Route 9 at Route 47 intersection improvements	Traffic signal, safety improvements, geometry	Hadley	Safety and Security	$3,037,133
Homestead Ave @ Lower Westfield Rd improvements	Signal and intersection improvements	Holyoke	The Movement of People	$1,189,760
Canal Walk Extension	2nd Level Canal from Appleton to Dwight	Holyoke	Sustainability	$3,000,000
Route 5 Reconstruction from Ashley Ave.	Reconstruct Route 5 from Ashley Ave to Main Street	Holyoke/West Springfield	The Movement of People	$3,509,576
Route 112 Resurfacing	Route 112 Resurfacing and Related Work from MM.011 to MM 8.52	Huntington	Safety and Security	$4,562,448
Center Street (Route 21) reconstruction	Center street reconstruction	Ludlow	The Movement of People	$5,153,456
Morgan Street rehab	Rehabilitation	South Hadley	The Movement of People	$1,226,170
Improvements to Allen street and Bicentennial Highway	Intersection and roadway improvements	Springfield	The Movement of People	$2,163,200
Signal and Intersection Improvements	Improvements at Sumner Ave, Allen Street, Abbot Street, and Harkness Avenue	Springfield	Safety and Security	$1,285,440
Highway Reconstruction	Edwards, Spring & Elliot Streets	Springfield	The Movement of People	$1,895,396
Boston Rd Reconstruction (Route 20)	Reconstruction of Boston Rd and other infrastructure improvements	Springfield/Wilbraham	Safety and Security	$10,416,241
Route 187 - Feeding Hills Road reconstruction	Reconstruct Route 187 from 800ft east of Pontoosic Rd to Agawam T.L..	Westfield	Safety and Security	$4,844,757
Resurfacing and Related Work	Route 66	Westhampton	The Movement of People	$1,750,260
Damon Rd. Safety Improvement	Reconstruction: Rte. 9 to King St. (Rte. 5)	Northampton	The Movement of People	$4,758,000
Elm Street Reconstruction	Reconstruction: Springfield CL to Center Sq.	East Longmeadow	The Movement of People	$4,094,505
Other Rgional Projects				$599,633
Total of Recommended Projects				**$84,568,626**
Remaining 2011-2015 Major Investment Revenue				**$45,122**
Regional Discretionary Funding Guideline				**$76,903,000**
Springfield Spring Street at Elliot Sec. 125 and 129 funds				**$1,685,000**
Holyoke Pleasant Street Reconstruction HPP-1998 funds				**$1,339,050**
Canal Walk Extension (HPP-4274)				**$4,381,454**
Canal Walk Extension (Sec. 115)				**$215,000**
Total Investment in Regional Discretionary Projects				**$84,568,626**

Table 12-9 - Operating and Maintenance Expenditures FY2012 – 2016 (cont.)

Statewide Maintenance				
Recommended Minimum Statewide Maintenance Investment				**$116,673,000.00**
Rail				
High Speed Rail	East/West high speed rail	Regionwide	The Movement of People	Further Study
Connecticut River Line: Springfield to Northfield Realignment (passenger & freight)	Regional Passenger Rail from Springfield to White River Junction - Federal Rail Stimulus Funds Awarded in 2010 - Implementation	Regionwide	Movement of People/Goods	$72,800,000
Transit				
Capital Projects		**Community**	**Area of Emphasis**	**Total Cost**
Springfield Union Station Redevelopment		Regionwide	The Movement of People	$74,000,000
Springfield Bus Maint/Storage facility		Regionwide	The Movement of People	$61,000,000
PVTA Fleet Replacement Program		Regionwide	The Movement of People	$40,679,903
Vehicle maintenance		Regionwide	The Movement of People	$32,671,258
PVTA Facility maintenance		Regionwide	The Movement of People	$2,816,488
Bus shelters		Regionwide	The Movement of People	$1,126,595
Bus stop sign replacement		Regionwide	The Movement of People	$402,517
ITS/AVL and communications equipment		Regionwide	The Movement of People	$5,154,173
Westfield Intermodal Center		Regionwide	The Movement of People	$8,000,000
Northampton garage rehabilitation		Regionwide	The Movement of People	$5,000,000
MAP van program		Regionwide	The Movement of People	$5,155,857
Northampton Intermodal Center		Regionwide	The Movement of People	$14,000,000
Total Capital Investment				**$250,006,790**
Operating Revenue		**Transit Agency**		**Total Cost**
State Contract Assistance		PVTA		$86,740,473
Local Assessments		PVTA		$36,233,817
5307 Federal Urbanized Area Formula		PVTA		$60,423,930
5310 Federal Elderly & Disabled		PVTA		$2,241,520
5311 Federal InterCity Bus Program		PVTA		$3,832,915
5316 Federal JARC Program		PVTA		$1,875,643
5317 Federal New Freedom Program		PVTA		$1,243,108
Farebox		PVTA		$34,140,525
Advertising, other revenue		PVTA		$5,525,631
Total Operating Revenue				**$232,257,562**

Table 12-10 - Operating and Maintenance Expenditures FY2017 – 2021

Project Name	Project Description	Community	Area of Emphasis	Total Cost
Bridge Projects				
Bridge Replacement	Route 20 over Cushman Brook and Walker Brook	Becket / Chester	Safety and Security	$3,636,989
Bridge Replacement	North Hadley road over Route 116	Hadley	The Movement of People	$5,490,112
Bridge Replacement	Lyman Street over First Level Canal	Holyoke	Safety and Security	$3,665,028
Bridge Replacement	Route 202 (Beech Street) over B & M Rail Road	Holyoke	Safety and Security	$6,237,352
Bridge Replacement	Meetinghouse Road over Amethyst Brook	Pelham	The Movement of People	$4,370,290
Bridge Rehabilitation	Bridge Street over Westfield River	Russell	The Movement of People	$12,850,316
Bridge Rehabilitation	North Road over Roberts Meadow Brook	Westhampton	The Movement of People	$711,656
Bridge	S-24-028, HWY ST JAMES AVE OVER RR CONRAIL (ABANDNED)	Springfield	Safety and Security	$5,038,059
Bridge Reconstruction	I-91 Viaduct	Springfield	Safety and Security	$4,866,612
Bridge	S-24-043, I 91 RAMP C OVER I 91 & RMP A TO US 5 NB	Springfield	Safety and Security	$11,649,301
Bridge Rehabilitation	I-291 over Page Boulevard	Springfield	Safety and Security	$4,074,454
Bridge Preservation	I-91 NB/SB over Route 5, BM RR, and Hockanum Road	Northampton	Safety and Security	$15,889,876
Superstructure Replacement	Cabot Street/2nd Level Canal	Holyoke	Safety and Security	$6,083,265
Bridge Replacement	Route 112 over Westfield River and CSX Rail Road	Huntington	Safety and Security	$6,617,375
Bridge Betterment	Elm Street over B & M Rail Road	Hatfield	The Movement of People	$615,895
				$223,421
MPO Recommended Investment				**$92,020,000**
Recommended Minimum for Bridge Projects				**$92,020,000**
Interstate Maintenance				
Resurfacing and Related Work	I-90 (MM 60 to MM 69.6)	Brimfield/Palmer/Warren	The Movement of People	$34,118,629
I-91 Ramps at Exit 19	This study is reviewing alternatives to relieve congestion and improve safety in the transportation network near Interchange 19	Northampton	The Movement of People	$5,849,293
I-291 congestion improvements		Regionwide	Safety and Security	Further Study
SUPERSTRUCTURE REPLACEMENT, S-24-061, ROUTE I-91 VIADUCT	The work for the project involves the replacement of the superstructure of Bridge No. S-24-061	Regionwide	The Movement of People	Further Study
I-91 Exit 15 improvements	Improvements to Exit 15 at Lower Westfield Road	Holyoke	Movement of People	Further Study
Other Interstate Maintenance Projects				$7,824,078
MPO Recommended Investment				**$47,792,000**
Recommended Minimum Interstate Maintenance Investment				**$47,792,000**

Table 12-10 - Operating and Maintenance Expenditures FY2017 – 2021 (cont.)

Project Name	Project Description	Community	Area of Emphasis	Total Cost
Major Infrastructure Projects				
Rte 5 to Rte 57/rotary	Construction of interchange improvements at Route 5/Route 57 Rotary	Agawam	The Movement of People	$13,651,080
MPO Recommended Investment				**$14,379,619**
Recommended Maximum for Major Infrastructure Projects				**$23,645,000**
Move to Regional Discretionary				**$9,265,381**
Regional Discretionary Funding				
N. Westfield St. / S. Westfield St. (Rte. 187)	Reconstruction: Pine Street to Westfield TL	Agawam	The Movement of People	$15,664,500
Safe Routes to School	Wildwood Elementary School	Amherst	The Movement of Information	$545,123
Norwottuck Improvements	Rail Trail Improvements	Amherst / Northampton / Hadley / Belchertown	Sustainability	$7,549,958
Route 181 (Footprint)	Rehabilitate Route 181 from South Main St., includes South Main, Mill Valley, Franklin, and Depot	Belchertown	The Movement of People	$12,020,531
N. Washington Street Reconstruction	Reconstruction: S. Main St. to North Liberty Street	Belchertown 2021	The Movement of People	$4,379,421
Landscape/Roadside Development	Wildflower Bed Establishment	Bernardston/Deerfield/Hatfield/Northampton/Holyoke	Sustainability	$1,456,756
Fuller Rd. Corridor Improvements	Reconstruction: From Rte. 33 to Shawinigan Drive	Chicopee	The Movement of People	$7,543,248
Chicopee Riverwalk	Construction: From Chicopee Center, 2.5 mi.	Chicopee	The Movement of People	$1,842,304
Signal Upgrades on Route 33	From Abbey Street to Fuller Road	Chicopee/South Hadley	The Movement of People	$370,061
Route 9 reconstruction	Reconstruction form Middle St to E/O Mill Valley Rd (Lowes)	Hadley	The Movement of People	$7,019,151
Park and Ride	Construction a Park and Ride lot on Route 9 in Leeds	Northampton	The Movement of People	$841,738
Amherst Rd. Reconstruction	Reconstruction: W/O Rte. 202 to Amherst TL	Pelham	The Movement of People	$7,750,990
East St. (Design Exception)	Reconstruction: Rte. 10 to Holyoke TL	Southampton	The Movement of People	$5,575,251
Congamond Rd. (Rte. 168) Reconstruction	Roadway reconstruction: From Route 202 to 250 ft before state line (before culvert)	Southwick	The Movement of People	$5,693,936
North end and Brightwood Infrastructure Improvements (North)	From Osgood Street to Chicopee City Line	Springfield	The Movement of People	$6,069,802
CT Riverwalk and Bikeway	Dike Segment	West Springfield	The Movement of People	$3,421,423
Route 187 - Little River Road reconstruction	Reconstruct Route 187 from 300 ft south of Route 20 to 260 ft North of Sherman Bridge	Westfield	Safety and Security	$7,147,589

Table 12-10 - Operating and Maintenance Expenditures FY2017 – 2021 (cont.)

Project Name	Project Description	Community	Area of Emphasis	Total Cost
Columbia Greenway Rail trail and River Walk Phase I (Middle)	1.25 miles in length and extends from the Columbia Manufacturing Company to the Cowles Court and Sibley Ave access paths in the north and includes replacement of 5 bridges, rehab of a 6th	Westfield	The Movement of People	$8,521,952
Columbia Greenway Rail Trail Phase III (North)	Construction of the North Section - Cowles Court to Westfield River Bridge	Westfield	The Movement of People	$2,598,570
Route 187 - Sherman's Mill Bridge reconstruction	Reconstruct Route 187 from 260ft north of Bridge to 800ft east of Pontoosic rd.	Westfield	Safety and Security	$9,114,420
Keystone Arch Bridge Project	Restoration of two historic Keystone Arch Bridges to a condition for public access	Chester	The Movement of People	$2,052,854
Rte 5 Reconstruction	Rte 5 Reconstruction from East Elm to Highland Ave. including intersection improvements	West Springfield	The Movement of People	$6,831,897
Columbia Greenway Rail trail and River Walk Phase II (South)	Southwick town line north to 1,200 ft south East Silver Street, 1.66M (PHASE II)	Westfield	The Movement of People	$6,458,277
Other Rgional Projects				$771,513
MPO Recommended Investment				**$131,241,264**
Regional Discretionary Funding Guideline				**$119,654,000**
Move from Major Infrastructure				**$9,265,381**
Columbia Greenway Rail trail (1656)				**$2,321,883**
Total Investment in Regional Discretionary Projects				**$131,241,264**
Statewide Maintenance				
Regional Statewide Maintenance				**$119,016,000**
Rail				
Passenger Rail Operating Cost	Connecticut State Line to Northampton	Regionwide	The Movement of People	Further Study
Commuter Rail	Commuter Rail - Springfield to New Haven	Regionwide	The Movement of People	$30,000,000
Transit				
Capital Projects		**Community**	**Area of Emphasis**	**Total Cost**
Springfield Bus Maint/Storage facility		Regionwide	The Movement of People	$6,000,000
PVTA Fleet Replacement Program		Regionwide	The Movement of People	$44,916,297
Vehicle maintenance		Regionwide	The Movement of People	$39,749,580
PVTA Facility maintenance		Regionwide	The Movement of People	$4,878,466
Bus shelters		Regionwide	The Movement of People	$1,370,675
Bus stop sign replacement		Regionwide	The Movement of People	$532,037
ITS/AVL and communications equipment		Regionwide	The Movement of People	$6,270,839
Intelligent fareboxes		Regionwide	The Movement of People	$4,269,935
MAP van program		Regionwide	The Movement of People	$5,977,051

Table 12-10 - Operating and Maintenance Expenditures FY2017 – 2021 (cont.)

Capital Projects	Community	Area of Emphasis	Total Cost
Route 9 BRT additional enhancements	Regionwide	The Movement of People	$20,000,000
Other BRT routes/enhancements	Regionwide	The Movement of People	$20,000,000
Transfer facilities and canopies	Regionwide	The Movement of People	$5,000,000
Total Capital Investment			$158,964,880

Operating Revenue	Transit Agency	Total Cost
State Contract Assistance	PVTA	$82,703,345
Local Assessments	PVTA	$40,995,238
5307 Federal Urbanized Area Formula	PVTA	$70,047,895
5310 Federal Elderly & Disabled	PVTA	$2,596,747
5311 Federal InterCity Bus Program	PVTA	$4,440,550
5316 Federal JARC Program	PVTA	$2,166,000
5317 Federal New Freedom Program	PVTA	$1,435,000
Farebox	PVTA	$38,626,871
Advertising, other revenue	PVTA	$7,052,261
Total Operating Revenue		**$250,063,907**

Table 12-11 - Operating and Maintenance Expenditures FY2022 – 2026

Project Name	Project Description	Community	Area of Emphasis	Total Cost
Bridge Projects				
Bridge Demolitions	B-05-023; W-07-012; W-21-011	Belchertown/Warren/ West Springfield	Safety and Security	$1,332,059
Bridge Replacment	Glendale Street over Manhan River BR#E-05-005	Easthampton	The Movement of People	$1,298,757
Superstructure Replacement	Cabot Street/2nd Level Canal	Holyoke	Safety and Security	$8,005,161
Bridge Replacement	Route 112 over Westfield River and CSX Rail Road	Huntington	Safety and Security	$8,373,091
Bridge Rehabilitation	East Street over Chicopee River	Ludlow / Wilbraham	The Movement of People	$1,581,820
Bridge Replacement	State Avenue over the Quaboag River	Monson / Palmer	The Movement of People	$6,952,285
Bridge Rehabilitation	Clement Street over Mill River	Northampton	The Movement of Goods	$0
Bridge	WATER ST OVER ROBERTS MEADOW BRK	Northampton	The Movement of People	$1,322,911
Bridge Replacement	Valley Road over Moose Brook	Southampton	The Movement of People	$416,268
Bridge Betterment/Structures Maintenance	SCOUR COUNTERMEASURES, S-24-003=W-21-002, ROUTE 20 (PARK AVENUE) OVER CT RIVER	Springfield/West Springfield	Safety and Security	$832,537
Bridge Replacement	Mass Central RR over Route 9/32 East Main Street	Ware	Safety and Security	$7,053,068
Bridge Replacement	Route 9 (East Street) over the Ware River	Ware	Safety and Security	$1,539,454
Deck Replacement	Route 32 (Palmer Road) over the Ware River	Ware	Safety and Security	$5,363,754
Full Deck Replacement/Full Steel Painting	Route 32 (Palmer Road) over the Ware River	Ware	Safety and Security	$3,078,908
Bridge Replacement	Geer Hill Road over Meekin Brook	Williamsburg	The Movement of People	$241,280
Other Regional Bridge Projects		Regionwide		$90,298,647
MPO Recommended Investment				**$137,690,000**
Recommended Minimum for Bridge Projects				**$137,690,000**
Interstate Maintenance				
Resurfacing and Related Work	I-90 (MM 50 to MM 60)	Chicopee/Ludlow/Palmer/Wilbraham	The Movement of People	$25,975,147
I&M Projects	Other Interstate Maintenance Projects	Regionwide		$45,761,853
MPO Recommended Investment				**$71,737,000**
Recommended Minimum for Interstate Maintenance				**$71,737,000**
Major Infrastructure Projects				
Move to Regional Discretionary Funding				$35,722,000
Recommended Maximum for Major Infrastructure Projects				**$0**
Regional Discretionary Funding				
Bikeway Loop	Bikeway loop from River Walk to Main Street	Agawam	The Movement of People	$3,718,844
Route 187/ 57 Intersection Improvements	Intersection Improvement	Agawam	Safety and Security	$2,497,610
Bikeway Loop	Main Street to Robinson State Park Via Water works ROW	Agawam	The Movement of People	$1,057,322
Sidewalk Construction	Route 159 (Main Street) from CT S.L.. to South Street	Agawam	The Movement of People	$508,020
Bay Road Improvements	Resurfacing and related work on section of Bay Rd	Belchertown	The Movement of People	$1,165,551
Route 202 Resurfacing	Resurfacing and related work on Route 202	Belchertown / Granby	The Movement of People	$2,881,858

Table 12-11 - Operating and Maintenance Expenditures FY2022 – 2026 (cont.)

Project Name	Project Description	Community	Area of Emphasis	Total Cost
Resurfacing and Related Work on Route 143	From Worthington TL to Williamsburg TL	Chesterfield	The Movement of People	$9,990,441
Connecticut Riverwalk	Construction: Plainfield St. to Nash Fld.	Chicopee	The Movement of People	$2,480,445
Montgomery Road improvements	Resurfacing and related work on Montgomery Street from Granby Rd to Dale Street	Chicopee	The Movement of People	$959,028
Rte. 112	Rehabilitation: Worthington TL north 1.5 miles	Cummington	The Movement of People	$960,619
Intersection Improvements	Reconstruct and signalized intersection of Main and South Street	Easthampton	The Movement of People	$416,268
Mountain Rd (Route 141)	Automated closure of Mountain Rd - Easthampton	Easthampton	The Movement of Information	$900,472
Roadway Reconstruction	Pomeroy Meadow Road Southampton TL to Loudville Road	Easthampton	The Movement of People	$1,555,297
Intersection Improvements	Reconstruct intersection of Northampton Street and O'Neill Street	Easthampton 2011??	The Movement of People	$416,268
West Street Reclamation	Resurfacing and related work on West Street from South Maple Street to Chesterfield TL 1.8 miles	Goshen	The Movement of People	$3,404,562
Route 9 reconstruction	Resurface: Rte. 112 to Williamsburg TL	Goshen	Movement of People	$6,661,099
Amherst Street improvements	Resurfacing and related work	Granby	The Movement of People	$2,081,342
Resurfacing Route 57	Resurface 8 miles from Sodum Street to Tolland TL	Granville	The Movement of People	$2,463,126
South Maple Street	Reconstruction: South of Rte. 9 to Bay Rd.	Hadley	The Movement of People	$4,402,839
Brimfield Road improvements	Resurfacing and related work from Brimfield Town Line to Stafford Road	Holland	The Movement of People	$1,924,318
Intersection Improvements	Linden Street improvements to 5 intersections signal coordination	Holyoke	The Movement of People	$666,029
Bikeway/Bike path Construction	Canalwalk, Phase 3 (from Dwight St to Lyman St)	Holyoke	Sustainability	$4,662,206
Cabot Street Reconstruction	Reconstruct from Main Street to South Canal Street	Holyoke	The Movement of People	$532,824
Northampton Street Rehabilitation	Northampton Street Rehabilitation	Holyoke	The Movement of People	$2,960,489
I-91 exit 17 at Route 141 intersection improvements	I-91 exit 17 at Route 141 intersection improvements	Holyoke	Safety and Security	$1,872,981
Resurfacing/Structures Maintenance	Route 5 Resurfacing & Culvert work	Longmeadow	Safety and Security	$1,200,774
Route 5 Traffic Improvements	Route 5 Traffic Signal Improvements	Longmeadow	Safety and Security	$7,090,358
Lower Hampden Rd Phase 2	Reconstruction from 3/4 miles south of Ely Road easterly to the intersection of Elm Street and Bridge Street	Monson	The Movement of People	$7,312,407
Route 66 (West St.) at Earle Street intersection improvements	Intersection improvement: installation of Signal to mitigate peak hour congestion	Northampton	The Movement of People	$240,155
Mountain Rd (Route 5) improvements	Improvements to Mt. Tom Rd	Northampton	The Movement of People	$1,998,088
Landscape/Roadside Development	Drainage Repairs & Slope Stabilization at Old Water Street	Northampton	Sustainability	$857,513
Glendale Raod Reconstruction	From Route 66 to Easthampton TL	Northampton	The Movement of People	$1,601,032

Table 12-11 - Operating and Maintenance Expenditures FY2022 – 2026 (cont.)

Project Name	Project Description	Community	Area of Emphasis	Total Cost
Ryan Road Reconstruction	From West Farms Road to Brookside Circle	Northampton	The Movement of People	$1,761,135
Signal and Intersection Improvements	Pleasant Street (Route 5) at Conz Street	Northampton	Safety and Security	$1,287,813
Rte. 32 (Ware Road)	Reconstruction: Stimson St. to Ware TL	Palmer	Safety and Security	$36,591,351
Route 20 improvements	Resurfacing and related work	Palmer	The Movement of People	$790,910
Route 116 (Main St)	Resurfacing and Related work	Plainfield	The Movement of People	$3,830,872
Traffic Signal Coordination	Traffic signal coordination projects	Regionwide	The Movement of Information	Further Study
At Grade Rail Crossing Improvements	Regional Railroad Grade crossing improvements	Regionwide	Safety and Security	Further Study
Park and Ride	Regional Park and Ride Lot improvements	Regionwide	The Movement of People	$1,731,676
Glendale Rd. (Phase II)	Reconstruction: Pomeroy Meadow Road to Route 10.	Southampton	The Movement of People	$2,924,963
Route 57 Reconstruction	Reconstruction Rt. 57 (Feeding Hills Road) from Route 10/202 to Powder Mill Road	Southwick	Safety and Security	$3,202,064
Routes 10/202 resurfacing (northerly)	Routes 10/202 resurfacing (northerly)	Southwick	Safety and Security	$3,078,908
Routes 10/202 resurfacing (southerly)	Routes 10/202 resurfacing (southerly)	Southwick	Safety and Security	$3,848,635
Highway Reconstruction	FEEDING HILLS ROAD (ROUTE 57) FROM COLLEGE HIGHWAY TO THE AGAWAM TOWN LINE	Southwick	The Movement of People	$5,661,250
Plumtree Rd improvements	Resurfacing and related work from Allen St to Wilbraham Rd	Springfield	The Movement of People	$3,078,908
Main St, Front, Route 141 Improvements (Indian Orchard)	Traffic signal and related work Main Street, Front Street., Myrtle Street (Route 141) Indian Orchard	Springfield	Safety and Security	$1,256,810
Roosevelt Ave. @ Island Pond Rd and Roosevelt Ave @ Alden Street	Realign Island Pond Road and Roosevelt Avenue to create a three way signalized intersection signal upgrade	Springfield	The Movement of People	$2,547,258
Intersection Improvements	Allen Street and Cooley Street intersection improvements	Springfield	Safety and Security	$1,665,074
Connecticut Riverwalk	CT Riverwalk pedestrian access improvements	Springfield	Safety and Security	$3,061,604
Intersection Improvements	Bay St @ Berkshire Ave intersection improvements	Springfield	Safety and Security	$1,519,362
Intersection Improvements	Central Street at Hancock Street intersection improvements	Springfield	Safety and Security	$973,950
Intersection Improvements	St James @ St James blvd intersection improvements	Springfield	Safety and Security	$2,369,919
Resurfacing Route 57	From Granville TL to Sandisfield TL	Tolland	The Movement of People	$0
Sidewalk improvements	Sidewalk reconstruction and resurfacing at various locations on Route 119	Wales	The Movement of People	$494,719
Ware River Valley Preservation Project	Ware River Valley Greenway Trail & Covered Bridge Preservation Project	Ware	The Movement of People	$2,155,236
Intersection Improvements	Morgan Road at Piper Cross Intersection Improvements	West Springfield	The Movement of People	$1,095,562

Table 12-11 - Operating and Maintenance Expenditures FY2022 – 2026 (cont.)

Project Name	Project Description	Community	Area of Emphasis	Total Cost
Intersection Improvements	Intersection improvements - Amostown Road at Dewey Street	West Springfield	Safety and Security	$1,519,362
At Grade Rail Crossing Improvements	Improvements to 1st and 2nd St/Bridge St Railroad crossing	West Springfield	Safety and Security	$666,029
Rte. 10/202 CBD Traffic Improvements	Elm Street, N. Elm Street	Westfield	The Movement of People	$4,440,733
Western Avenue Highway Improvement	Reconstruct and improvements From Bates Rd to Court St, and Court until Mill Street	Westfield	The Movement of People	$5,180,855
Safe Routes to School	Paper Mill School	Westfield	The Movement of People	$625,235
Southampton Rd.	Reconstruction: Rte. 66 to Stage Rd	Westhampton	The Movement of People	$2,331,103
Chesterfield Rd.	Reconstruction: Northampton TL to Chesterfield TL	Westhampton	The Movement of People	$3,694,690
Kings Highway and Reservoir Rd	Reconstruction: Kings Highway from Perryhill Road to Reservoir Rd, and Reservoir Rd from Kings Highway to Pine Island Lake Dam	Westhampton	The Movement of People	$2,177,404
Route 9 @ Old Ferry Road and Day Ave	Intersection Improvements and Signalization	Northampton	Movement of People	$2,561,961
Main Street (Route 9) Downtown Improvments	Roadway, Pedestrian, and Intersection Improvements at Main, Pleasant, King, and State Street	Northampton	Movement of People	$8,005,161
Hatfield Street @ Route 5 and 10	Intersection Improvements (Round about or Signalization $1,000,000)	Northampton	Movement of People	$3,463,353
Other Regional Discretionary Projects				$ 7,041,630
Total of Recommended Projects				**$208,075,680**
Regional Discretionary Funding Guideline				**$169,474,000**
Move from Major Infrastructure				**$35,722,000**
Palmer Rte. 32 (Ware Road) (HPP-4287)				**$2,879,680**
Total Investment in Regional Discretionary Projects				**$208,075,680**
Statewide Maintenance				
Recommended Minimum for Statewide Maintenance Projects				**$ 144,834,000**
Rail				
Passenger Rail Operating Cost	Connecticut State Line to Northampton	Regionwide	The Movement of People	Further Study
Freight Congestion	Freight congestion improvements	Regionwide	The Movement of Goods	Further Study
Double Stack	Double stack improvements	Regionwide	The Movement of Goods	$36,464,697

Table 12-11 - Operating and Maintenance Expenditures FY2022 – 2026 (cont.)

Transit			
Capital Projects	**Community**	**Area of Emphasis**	**Total Cost**
PVTA Fleet Replacement Program	Regionwide	The Movement of People	$48,653,279
Vehicle maintenance	Regionwide	The Movement of People	$48,361,442
PVTA Facility maintenance	Regionwide	The Movement of People	$8,338,181
Bus shelters	Regionwide	The Movement of People	$1,667,636
Bus stop sign replacement	Regionwide	The Movement of People	$140,824
ITS/AVL and communications equipment	Regionwide	The Movement of People	$7,629,434
MAP van program	Regionwide	The Movement of People	$6,929,041
Total Capital Investment			**$121,719,838**
Operating Revenue	**Transit Agency**		**Total Cost**
State Contract Assistance	PVTA		$82,703,345
Local Assessments	PVTA		$46,382,349
5307 Federal Urbanized Area Formula	PVTA		$81,204,709
5310 Federal Elderly & Disabled	PVTA		$3,005,991
5311 Federal InterCity Bus Program	PVTA		$5,143,370
5316 Federal JARC Program	PVTA		$2,496,000
5317 Federal New Freedom Program	PVTA		$1,651,000
Farebox	PVTA		$43,702,759
Advertising, other revenue	PVTA		$9,000,671
Total Operating Revenue			**$275,290,194**

Table 12-12 - Operating and Maintenance Expenditures FY2027 – 2031

	Project Name	Project Description	Community	Area of Emphasis	Total Cost
Bridge Projects					
	Bridge Rehabilitation	Route 21 (Center Street) over Chicopee River (Putts Bridge)	Ludlow/Springfield	Safety and Security	$38,122,372
	Other Regional Bridge Projects		Regionwide		$129,841,628
	Total of Recommended Projects				**$167,964,000**
	Recommended Minimum for Bridge Projects				**$167,964,000**
Interstate Maintenance					
	I&M Projects	Other Interstate Maintenance Projects	Regionwide		$87,557,000
	MPO Recommended Investment				**$87,557,000**
	Recommended Minimum for Interstate Maintenance				**$87,557,000**
Major Infrastructure Projects					
	Other Projects	Other Major Infrastructure Projects	Regionwide		$43,648,000
	Recommended Maximum for Major Infrastructure Projects				**$43,648,000**
Regional Discretionary Funding					
	Truck Access Improvements	Rt 5 to Merrick Neighborhood Access improvements	Agawam/West Springfiel	The Movement of Goods	Further Study
	King Street Reconstruction and Related Improvements	Improvements: Damond At King, King at Summer and North, and North and King at Finn	Northampton	Movement of People	$16,208,492
70%	Roadway Maintenance Projects		Regionwide		$137,458,656
12.5%	Congestion Improvement Projects		Regionwide		$24,546,189
12.5%	Safety Improvement Projects		Regionwide		$24,546,189
2.5%	Bicycle/Pedestrian Improvement Projects		Regionwide		$4,909,238
2.5%	CMAQ Projects		Regionwide		$4,909,238
	Total of Recommended Projects				**$212,578,000**
	Regional Discretionary Funding Guideline				**$212,578,000**
Statewide Maintenance					
	Recommended Minimum for Statewide Maintenance Projects				**$170,450,000**
Rail					
	Passenger Rail Operating Cost	Connecticut State Line to Northampton	Regionwide	The Movement of People	Further Study
	Track Expansion	Track Expansion Palmer Ind Park	Palmer	The Movement of Goods	$540,800
	Westfield Industrial Park Track Expansion	Track Expansion Westfield Ind Park	Westfield	The Movement of Goods	Further Study
Transit					
	Capital Projects		**Community**	**Area of Emphasis**	**Total Cost**
	PVTA Fleet Replacement Program		Regionwide	The Movement of People	$59,194,153
	Vehicle maintenance		Regionwide	The Movement of People	$58,839,089
	PVTA Facility maintenance		Regionwide	The Movement of People	$10,144,672
	Bus shelters		Regionwide	The Movement of People	$2,028,934
	Bus stop sign replacement		Regionwide	The Movement of People	$171,334
	ITS/AVL and communications equipment		Regionwide	The Movement of People	$9,282,374
	Intelligent fareboxes		Regionwide	The Movement of People	$6,320,547
	MAP van program		Regionwide	The Movement of People	$8,032,657
	Total Capital Investment				$154,013,760

Table 12-12 - Operating and Maintenance Expenditures FY2027 – 2031 (Cont.)

Transit	Operating Revenue	Transit Agency	Total Cost
	State Contract Assistance	PVTA	$99,244,014
	Local Assessments	PVTA	$52,477,371
	5307 Federal Urbanized Area Formula	PVTA	$94,138,514
	5310 Federal Elderly & Disabled	PVTA	$3,481,331
	5311 Federal InterCity Bus Program	PVTA	$5,958,004
	5316 Federal JARC Program	PVTA	$2,878,000
	5317 Federal New Freedom Program	PVTA	$1,901,000
	Farebox	PVTA	$49,445,660
	Advertising, other revenue	PVTA	$11,487,391
Total Operating Revenue			**$321,011,285**

Table 12-13 - Operating and Maintenance Expenditures FY2032 – 2036

	Project Name	Project Description	Community	Area of Emphasis	TotalCost
Bridge Projects					
	Bridge Replacement	South End Bridge (includes bikepath link)	Agawam/Springfield	Safety and Security	$131,467,389
	Other Projects	Other Regional Bridge Projects			$63,248,611
	Total of Recommended Projects				**$194,716,000**
	Recommended Minimum for Bridge Projects				**$194,716,000**
Interstate Maintenance					
	I&M Projects	Other Interstate Maintenance Projects	Regionwide		$101,503,000
	MPO Recommended Investment				**$101,503,000**
	Recommended Minimum for Interstate Maintenance				**$101,503,000**
Major Infrastructure Projects					
	Other Projects	Other Major Infraustructure Projects	Regionwide		$50,600,000
	Recommended Maximum for Major Infrastructure Projects				**$50,600,000**
Regional Discretionary Funding					
70%	Roadway Maintenance Projects		Regionwide		$172,505,200
12.5%	Congestion Improvement Projects		Regionwide		$30,804,500
12.5%	Safety Improvement Projects		Regionwide		$30,804,500
2.5%	Bicycle/Pedestrian Improvement Projects		Regionwide		$6,160,900
2.5%	CMAQ Projects		Regionwide		$6,160,900
	Total of Recommended Projects				**$246,436,000**
	Regional Discretionary Funding Guideline				**$246,436,000**
Statewide Maintenance					
	Recommended Minimum for Statewide Maintenance Projects				**$197,499,000**
Rail					
	Passenger Rail Operating Cost	Connecticut State Line to Northampton	Regionwide	The Movement of People	Further Study
	Central Corridor Passenger Rail Study	Central Corridor Passenger Rail Study	Regionwide	The Movement of People	Further Study

Transit Capital Projects	Community	Area of Emphasis	Total Cost
PVTA Fleet Replacement Program	Regionwide	The Movement of People	$72,018,738
Vehicle maintenance	Regionwide	The Movement of People	$71,586,749
PVTA Facility maintenance	Regionwide	The Movement of People	$12,342,545
Bus shelters	Regionwide	The Movement of People	$2,468,509
Bus stop sign replacement	Regionwide	The Movement of People	$208,454
ITS/AVL and communications equipment	Regionwide	The Movement of People	$11,293,427
MAP van program	Regionwide	The Movement of People	$9,312,051
Total Capital Investment			$179,230,472

Transit Operating Revenue	Transit Agency	Total Cost
State Contract Assistance	PVTA	$82,703,345
Local Assessments	PVTA	$59,373,329
5307 Federal Urbanized Area Formula	PVTA	$109,132,338
5310 Federal Elderly & Disabled	PVTA	$4,032,407
5311 Federal InterCity Bus Program	PVTA	$6,902,350
5316 Federal JARC Program	PVTA	$3,322,000
5317 Federal New Freedom Program	PVTA	$2,193,000
Farebox	PVTA	$55,943,226
Advertising, other revenue	PVTA	$14,661,145
Total Operating Revenue		**$338,263,140**

B. FINANCIAL CONSTRAINT

Cost estimates for construction of transportation improvement projects included as part of the Regional Transportation Plan for the Pioneer Valley Metropolitan Planning Organization are developed in consultation with the local community, MassDOT and MassDOT Highway Divisions 1 and 2. Through this consultation process, the most up to date estimates are used in the development of the financial component of the RTP. Estimates for longer range projects that have not yet entered the design process are estimated based on the type of project and overall extent of proposed work. Estimates of future transportation revenue for the Pioneer Valley MPO were developed by MassDOT. This revenue was allocated towards various maintenance projects through consultation with MPO members.

The estimated available funds for the region must be greater than or equal to the financial needs of the region over the life of the plan in order to maintain financial constraint. As can be seen from Table 12-14, the Pioneer Valley Regional Transportation Plan is financially constrained over the life of the plan.

Table 12-14 – Financial Constraint Summary

	2012 - 2016	2017 - 2021	2022 - 2026	2027 - 2031	2032-2036	GRAND TOTAL
Total Estimated Highway Revenue	$339,286,000	$402,127,000	$559,457,000	$682,197,000	$790,754,000	**$2,773,821,000**
Total Estimated Transit Capital	$60,062,975	$77,049,602	$85,504,339	$94,054,773	$103,460,250	**$420,131,939**
Total Estimated Transit Operating Revenue	$232,257,563	$250,063,907	$275,290,194	$321,011,284	$338,263,139	**$1,416,886,087**
Total Estimated Remaining Earmark Funds	$7,620,504	$2,321,883	$2,879,680	$0	$0	**$12,822,067**
Grand Total	$639,227,042	$731,562,392	$923,131,213	$1,097,263,057	$1,232,477,389	**$4,623,661,093**
Total of Programmed Projects in the 2012 RTP	$639,227,042	$731,562,392	$923,131,213	$1,097,263,057	$1,232,477,389	**$4,623,661,093**
Difference	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

CHAPTER 13

CONFORMITY

2012 PIONEER VALLEY MPO REGIONAL TRANSPORTATION PLAN

DETERMINATION OF AIR QUALITY CONFORMITY

A. INTRODUCTION

The 1990 Clean Air Act Amendments (CAAA) require Metropolitan Planning Organizations within ozone nonattainment areas to perform air quality conformity determinations prior to the approval of Regional Transportation Plans (RTPs) and Transportation Improvement Programs (TIPs). Conformity is a way to ensure that federal funding and approval goes to those transportation activities that are consistent with air quality goals. This section presents information and analyses for the air quality conformity determination for the 2012 Regional Transportation Plan of the Pioneer Valley MPO, as required by Federal Regulations 40 CFR Parts 51 and 93, and the Massachusetts Conformity Regulations (310 CMR 60.03). This information and analyses include: regulatory framework, conformity requirements, planning assumptions, emissions budgets, and conformity consultation procedures.

B. BACKGROUND

The Commonwealth of Massachusetts is classified as serious nonattainment for ozone, and is divided into two nonattainment areas. The Eastern Massachusetts ozone nonattainment area includes Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Suffolk, and Worcester counties. Berkshire, Franklin, Hampden, and Hampshire counties comprise the Western Massachusetts ozone nonattainment area. With these classifications, the 1990 Clean Air Act Amendments (CAAA) required the Commonwealth to reduce its emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx), the two major precursors to ozone formation to achieve attainment of the ozone standard.

In April 2002, the City of Springfield was re-designated attainment for carbon monoxide (CO) with an EPA-approved limited maintenance plan. In areas with approved limited maintenance plans, federal actions requiring conformity determinations under the transportation conformity rule are considered to satisfy the "budget test" (as budgets are treated as not constraining in these areas for the length of the initial maintenance period). Any future required "project level" conformity determinations for projects located within this community will continue to use a "hot-spot" analysis to assure that any new transportation projects in this CO attainment area do not cause or contribute to carbon monoxide nonattainment.

A prior conformity determination for all RTPs occurred in 2007, when the Federal Highway Administration (FHWA) – in consultation with the Environmental Protection Agency (EPA New England) and the Massachusetts Department of Environmental Protection (DEP) – confirmed that all 13 of the RTPs for the year 2007 in Massachusetts were in conformity with the Massachusetts State Implementation Plan (SIP). A summary of major conformity milestones in recent years is as follows:

- Between 2003 and 2006, several new conformity determinations were made that were triggered by various events, including: the 2003 regional transportation plans, a change in designation from the one-

hour ozone standard to an eight-hour ozone standard, and various changes to regional TIPs that involved reprogramming transportation projects across analysis years.

- In 2007, air quality analyses were conducted on behalf of all the 2007 Regional Transportation Plans (RTPs), the purposes of which were to evaluate the RTPs' air quality impacts on the SIP. Conformity determinations were performed to ensure that all regionally significant projects were included in the RTPs. The Massachusetts Department of Transportation found the emission levels from the 2007 Regional Transportation Plans to be in conformance with the SIP.

- On April 2, 2008, EPA found that the 2008 and 2009 motor vehicle emissions budgets (MVEBs) in the January 31, 2008 Massachusetts 8-hour ozone State Implementation Plan revision were adequate for transportation conformity purposes. The submittal included 2008 and 2009 MVEBs for the Boston-Lawrence-Worcester (Eastern Massachusetts) and Springfield (Western Massachusetts) 8-hour ozone nonattainment areas. Massachusetts submitted these budgets as part of the 8-hour ozone attainment demonstration and reasonable further progress plan for both nonattainment areas, and as a result of EPA's adequacy finding, these budgets were required to be used for conformity determinations. EPA later determined (in 2010) that only the most recent MVEBs - 2009 - be used for future conformity determinations.

- In 2010, air quality analyses were conducted on behalf of all the 2011-2014 Regional Transportation Improvement Programs (TIPs), the purposes of which were to evaluate the TIPs' air quality impacts on the SIP. Conformity determinations were performed to ensure that all regionally significant projects were included in the TIPs. The Massachusetts Department of Transportation found the emission levels from the 2011-2014 TIPs to be in conformance with the SIP. On November 15, 2010, EPA confirmed that both the Eastern and Western Massachusetts Non-Attainment areas collectively demonstrated transportation conformity, with concurrence from Massachusetts DEP on 11/23/10. On December 22, 2010, FHWA and FTA determined that the TIPs were in conformity with the Clean Air Act and the EPA conformity regulations (40 CFR Part 51).

1. Conformity Regulations

The CAAA revised the requirements for designated MPOs to perform conformity determinations by ozone non-attainment area for their RTPs and TIPs. Section 176 of the CAAA defines conformity to a State Implementation Plan to mean conformity to the plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of the standards. The Pioneer Valley MPO must certify that all activities outlined in the 2012 Pioneer Valley Regional Transportation Plan:

- will not cause or contribute to any new violation of any standard in any area
- will not increase the frequency or severity of any existing violation of any standard in any area
- will not delay the timely attainment of any standard or any required interim emission reductions or other milestones in any area

The federal conformity regulations from EPA set forth requirements for determining conformity of Transportation Plans, Transportation Improvement Programs, and individual projects. The requirements of the conformity analysis are summarized below and will be explained in detail in this conformity determination:

a) Conformity Criteria

- Horizon Years
- Latest planning assumptions

- Latest emission model used
- Timely implementation of transportation control measures (TCMs)
- Conformity in accordance with the consultation procedures and SIP revisions
- Public Participation Procedures
- Financially Constrained Document

b) Procedures for Determining Regional Transportation Emissions

c) The Conformity Test

- Consistent with emission budgets set forth in SIP
- Contribute to reductions in CO nonattainment areas

In addition, the regulations set specific requirements for different time periods depending on the timeframe of the Commonwealth's SIP submittals to EPA. These periods are defined as follows:

Control Strategy Period: Once a control strategy SIP has been submitted to EPA, EPA has to make a positive adequacy determination of the mobile source emission budget before such budget can be used for conformity purposes. The conformity test in this period is consistency with the mobile source emission budget.

Maintenance Period: The period of time beginning when the Commonwealth submits and EPA approves a request for redesignation to an attainment area, and lasting for 20 years. The conformity test in this period is consistency with the mobile source emission budget.

2. Horizon Year Requirements

Horizon years for regional and state model analyses have been established following 40 CFR 93.106(a) of the Federal Conformity Regulations. The years for which the regional and state transportation models were run for ozone precursor emission estimates are shown below:

- 2010: Milestone Year – This year is now being used by the statewide travel demand model as the new base year for calculation of emission reductions of VOCs and NOx.
- 2016: Milestone Year and Analysis Year: This year is used to show conformity with the existing emission budgets for ozone precursors in Western Massachusetts.
- 2020: Analysis Year
- 2025: Analysis Year
- 2035: Horizon Year – last forecast year of the regional transportation plan

3. Latest Planning Assumptions

Section 93.110 of the Federal Conformity Regulations outlines the requirements for the most recent planning assumptions that must be in place at the time of the conformity determination. Assumptions must be derived from the estimates of current and future population, households, employment, travel, and congestion most recently developed by the MPO. For the 2012 Pioneer Valley Regional Transportation Plan and other regional plans, the MassDOT developed a series of forecasts – in cooperation with all the MPOs – that represent the most recent planning assumptions for all of Massachusetts.

4. Transit Operating Policy Assumptions

For the Pioneer Valley MPO, the transit operating policies are the continued primary responsibility of the Pioneer Valley Transit Authority (PVTA), and estimates of present and future ridership are developed by the PVTA using similar methods in place at the time of the last conformity determination.

5. Latest Emissions Model

Emission factors used for calculating emission changes were determined using MOBILE 6.2, the model used by DEP in determining motor vehicle emission budgets. Emission factors for motor vehicles are specific to each model year, pollutant type, temperature, and travel speed. MOBILE 6.2 requires a wide range of input parameters including inspection and maintenance program information and other data such as anti-tampering rates, hot/cold start mix, emission failure rates, vehicle fleet mix, fleet age distribution, etc. The input variables used in this conformity determination were received from DEP and approved by EPA.

6. Timely Implementation of Transportation Control Measures

Transportation Control Measures (TCMs) have been required in the SIP in revisions submitted to EPA in 1979 and 1982. All SIP TCMs have been accomplished through construction or through implementation of ongoing programs. All of the projects have been included in the Region's Transportation Plan (present or past) as recommended projects or projects requiring further study.

DEP submitted to EPA its strategy of programs to show Reasonable Further Progress of a 15% reduction of VOCs in 1996 and the further 9% reduction of NOx toward attainment of the National Ambient Air Quality Standards (NAAQS) for ozone in 1999. Within that strategy there are no specific TCM projects. The strategy does call for traffic flow improvements to reduce congestion and, therefore, improve air quality. Other transportation-related projects that have been included in the SIP control strategy are listed below:

- Enhanced Inspection and Maintenance Program
- California Low Emission Vehicle Program
- Reformulated Gasoline for On and Off Road Vehicles
- Stage II Vapor Recovery at Gasoline Refueling Stations
- Tier I Federal Vehicle Standards

7. Consultation Procedures

The final conformity regulations require that the MPO make a conformity determination according to consultation procedures set out in the federal and state regulations, and the MPO must also follow public involvement procedures established under federal metropolitan transportation planning regulations. The consultation requirements of both the state and federal regulations require that the Pioneer Valley MPO (and all other MPOs), MassDOT, Mass. DEP, US EPA - Region 1, and FHWA – Massachusetts Division consult on the following issues:

- Selection of regional emissions analysis models including model development and assessment of project design factors for modeling
- Selection of inputs to the most recent EPA-approved emissions factor model
- Selection of CO hotspot modeling procedures, as necessary

- Identification of regionally significant projects to be included in the regional emissions analysis
- Identification of projects which have changed in design and scope
- Identification of exempt projects
- Identification of exempt projects that should be treated as non-exempt because of adverse air quality impacts
- Identification of the latest planning assumptions and determination of consistency with SIP assumptions

These issues have all been addressed through consultation among the agencies listed above.

8. Public Participation Procedures

Title 23 CFR Section 450.322 and 310 CMR 60.03(6)(h) require that the development of the Regional Transportation Plan, TIP, and related certification documents provide an adequate opportunity for public review and comment. Section 450.316(b) also establishes the outline for MPO public participation programs. The Pioneer Valley MPO developed a Public Participation Process that provides complete information, timely public notice, full public access to key decisions, and opportunities for early and continuing involvement. The development and adoption of this program conforms to the requirements of the section. It guarantees public access to the RTP and all supporting documentation, provides for public notification of the availability of the RTP and the public's right to review the document and comment thereon, and provides a 30-day public review and comment period prior to the adoption of the RTP and related certification documents by the MPO.

On July 29, 2011, public notices were advertised in local newspapers informing the public of its right to attend a series of public hearings on the document, and of its right to comment on the document. On June 30, 2011, the Pioneer Valley Executive Committee recommended that the MPO endorse the RTP and conformity determination. Consequently, on August 30, 2011, the Pioneer Valley MPO voted to approve the 2012 RTP and its conformity determination. This allowed ample opportunity for public comment and MPO review of the draft document. These procedures comply with the associated federal requirements.

9. Financial Consistency

Title 23 CFR Section 450.322 and 40 CFR 93.108 require the 2012 Pioneer Valley Regional Transportation Plan to "be financially constrained by year and include a financial plan that demonstrates which projects can be implemented using current revenue sources and which projects are to be implemented using proposed revenue sources."

The 2012 Plan is financially constrained to projections of federal and state resources reasonably expected to be available during the appropriate time frame. Projections of federal resources are based upon the estimated apportionment of the most recent federal authorizations, as allocated to the region by the state or as allocated among the various MPOs according to federal formulae or MPO agreement. Projections of state resources are based upon the allocations contained in the current Transportation Bond Bill and historic trends. Therefore, the 2012 Plan substantially complies with the federal requirements relating to financial planning.

10. Model Specific Information

40 CFR Part 93.111 of the federal regulations outlines requirements to be used in the network-based transportation demand models. These requirements include modeling methods and functional

relationships to be used in accordance with acceptable professional practice and reasonable for purposes of emission estimation. MassDOT, on behalf of the Pioneer Valley MPO, has used the methods described in the conformity regulations in the analysis of this 2012 Regional Transportation Plan.

11. Highway Performance Monitoring System Adjustments

As stated in EPA guidance, all areas of serious ozone and carbon monoxide nonattainment must use FHWA's Performance Monitoring System (HPMS) to track daily vehicle miles of travel (VMT) prior to attainment to ensure that the state is in line with commitments made in reaching attainment of the ambient air quality standards by the required attainment dates. MassDOT provided HPMS information to DEP. DEP used this information in setting mobile-source budgets for VOC, NOx, and CO in all SIP revisions prior to 1997. DEP has since revised its VOC and NOx budgets using transportation-demand model runs. However, the models must still be compared to HPMS data, since HPMS remains the accepted tracking procedure as outlined in the regulations.

The conformity regulations require that all model-based VMT be compared with the HPMS VMT to ensure that the region is in line with VMT and emission projections made by DEP. An adjustment factor that compares the 2010 HPMS VMT to the 2010 transportation model VMT has been developed. This adjustment factor is then applied to all modeled VOC and NOx emissions for the years 2016 through 2035 to ensure consistency with EPA-accepted procedures.

$$\frac{\text{2010 HPMS VMT}}{\text{2010 Modeled VMT}} = \text{Adjustment factor} = 1.510 \text{ for the Pioneer Valley for VOC and NOx}$$

HPMS adjustment factors, calculated on a regional basis, are applied to the model output of future scenarios, and they change as base-year models are updated or improved, or as HPMS data is revised or updated. The latest factors for Western Massachusetts are as follows:

Table 13-1 - Western Massachusetts Non-Attainment Area Conversion Factors

REGION	2010 HPMS VMT (miles)	Travel Demand Model VMT (miles)	HPMS/Model Conversion Factor
Berkshire	5,168,000	2,150,783	2.403
Franklin	3,541,000	1,454,902	2.434
Pioneer Valley	15,229,000	10,085,310	1.510
Western MA	23,938,000	13,690,995	1.749
State Total	149,481,000	142,159,733	1.052

12. Changes in Project Design since the Last Conformity Determination Analysis

The Commonwealth requires that any change in project design from the previous conformity determination for the region is identified. Changes that have occurred since the last conformity determination in 2010 are as follows:

- The modeled base year has changed from 2007 to 2010.

- A new analysis year has been included in the conformity determination. An air quality analysis has been completed for 2016. This complies with EPA's Transportation Conformity Rule Restructuring Amendments (40 CFR Part 93.118, expected to become effective August 2011) which states that "if the attainment date has not yet been established, the first analysis year must be no more than five years beyond the year in which the conformity determination is being made." (2011 base to 2016 analysis year).
- Emission factors have been developed for 2010, 2016, 2020, 2025, and 2035 using Mobile 6.2 with inputs approved by MassDEP and US EPA.
- New HPMS adjustment factors have been developed for the new 2010 base year.

C. PROCEDURES FOR DETERMINING REGIONAL TRANSPORTATION EMISSIONS

The federal conformity regulations set specific requirements for determining transportation emissions, which are estimated from a combination of emission rates, HPMS volume data, and travel demand model projections. Travel demand models use estimates of population, households, and employment to project future travel volumes and patterns. Chapter 10 of the Plan presents these estimates as part of the existing and future regional transportation system.

Only "regionally significant" projects are required to be included in the travel demand modeling efforts. The final federal conformity regulations define regionally significant as follows:

> **Regionally significant:** a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sport complexes, etc., or transportation terminals as well as most terminals themselves) and would be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

In addition, specific classes of projects have been exempted from regional modeling emissions analysis. The categories of exempt projects include:

- Intersection channelization projects
- Intersection signalization projects at individual intersections
- Interchange reconfiguration projects
- Changes in vertical and horizontal alignment
- Truck size and weight inspection stations
- Bus terminals and transfer points

Previous conformity amendments now allow traffic signal synchronization projects to be exempt from conformity determinations prior to their funding, approval, or implementation. However, once they are implemented they must be included in conformity determinations for future plans and TIPs.

The milestone and analysis year transportation model networks are composed of projects proposed in this RTP. Projects in these networks consist of all in-place regionally significant projects that can reasonably be expected to be completed by a given analysis/horizon year with consideration of available funding commitments. This project group would include, but not be limited to, regionally significant projects where at least one of the following steps has occurred within the past three years:

- Comes from the first year of a previously conforming TIP,
- Completed the NEPA process, or

- Currently under construction or are undergoing right-of-way acquisition

A complete listing of future regionally significant projects for the entire Western Massachusetts Ozone Non-Attainment Area is provided below:

Table 13-2 - Regionally Significant Projects Included in the Conformity Analysis for the Western Massachusetts Ozone Non-Attainment Area

Analysis Year	Community	Project Description – Pioneer Valley Region
2016	Chicopee	Deady Bridge signal coordination: Broadway/Montgomery, Main, and Belcher Streets
2016	Hadley	Route 9 widening Home Depot to Lowes.
2016	Holyoke, W.Springfield	Route 5 signal coordination from Ashley Ave. to Main St.
2016	Springfield,Wilbraham	Boston Rd. signal coordination Pasco Rd. to Stony Hill Rd.
2016	Westfield	Route 10/202 Great River Bridge - two bridges acting as one-way pairs.
2016	West Springfield	Improve the Union Street Railroad Underpass. Construct a truck bypass road.
2016	Through Region	Additional "Vermonter" passenger rail service
2020	Chicopee/South Hadley	Route 33 signal coordination and upgrades from Abbey St. to Fuller Rd.
2020	Hadley	Route 9 widening Middle Street to Lowes.
2020	Ludlow	Route 21 Center Street reconstruction and widening with center turn lane
2020	Northampton	Damon Rd. widening, improvements from Rte 9 to King St.
2020	Through Region	New Commuter Rail Service: Hartford, CT to Greenfield, MA
2025	Agawam	Connector, Route 5 to Route 57, eliminate rotary.
2025	Holyoke	Linden St. signal coordination and improvements at 5 intersections.
2025	Longmeadow	Route 5 signal coordination, improvements Converse St to Springfield city line.
2025	Westfield	Route 10/202 Elm Street, North Elm Street signal coordination.
2035	Agawam, Longmeadow, Springfield	South End Bridge improvements, including related work on I-91 between Exits 1-3.
2035	Agawam, West Springfield	Improvement to Route 5 access ramps for truck routing, route into CSX railyard.
Analysis Year	**Community**	**Project Description – Berkshire Region**
2016	Great Barrington	Main St .intersection improvements, signalization upgrades and add turning lanes
2020	Pittsfield	Intersection widening, turning lane improvements First/Tyler & Tyler/Stoddard Ave
2025	Great Barrington	Realign & widen State Rd., including new bridge to replace the current Brown Bridge
2025	Lanesboro/Cheshire	Construct passing lanes on Route 8 between Mall Road and truck weighing station
2025	Pittsfield	Safety and capacity improvements on East St. between Elm St. and Merrill Road
2035	Pittsfield	Construct connector street from W. Housatonic St. to West St. near CSX yard
Analysis Year	**Community**	**Project Description - Franklin Region**
2016	Through Region	Additional "Vermonter" passenger rail service
2020	Greenfield, Deerfield, Whately	New Commuter Rail Service: Hartford, CT to Greenfield, MA

1. Air Quality Conformity Analysis

The emissions from the following MPOs have been combined to show conformity with the SIP for the Western Massachusetts Nonattainment Area:

- Berkshire Region MPO
- Franklin Regional Council of Governments*

- Pioneer Valley MPO

* This region does not contain any official urbanized areas, but is considered to be an MPO for planning purposes.

Using the latest planning assumptions, the Massachusetts Department of Transportation, Office of Transportation Planning, estimated the emissions for VOC and NOx for all areas and all MPOs through a combination of the statewide and selected regional travel demand models (and with assistance from MPO staff). The VOC mobile source emission budget for 2009 for the Western Massachusetts Nonattainment Area has been set at 10.73 tons per summer day and the 2009 mobile source budget for NOx is 27.73 tons per summer day. As shown in Tables 1 and 2, the results of the air quality analysis demonstrate that the VOC and NOx emissions from all Action scenarios are less than the VOC and NOx emissions budgets for the Western Massachusetts Nonattainment Area:

Table 13-3 - VOC Emissions Estimates for the Western Massachusetts Ozone Nonattainment Area

(all emissions in tons per summer day)

Year	Pioneer Valley MPO Action Emissions	Western MA Action Emissions	Budget	Difference (Action – Budget)
2010	n/a	10.947	n/a	n/a
2016	4.362	6.832	10.73	-3.898
2020	3.835	5.979	10.73	-4.751
2025	3.557	5.534	10.73	-5.196
2035	3.589	5.602	10.73	-5.128

Table 13-4 - NOx Emissions Estimates for the Western Massachusetts Ozone Nonattainment Area

(all emissions in tons per summer day)

Year	Pioneer Valley MPO Action Emissions	Western MA Action Emissions	Budget	Difference (Action – Budget)
2010	n/a	27.736	n/a	n/a
2016	7.555	11.751	27.73	-15.979
2020	4.890	7.732	27.73	-19.998
2025	3.658	5.774	27.73	-21.956
2035	3.106	5.018	27.73	-22.712

The Pioneer Valley MPO has conducted an air quality analysis of the 2012 Pioneer Valley Regional Transportation Plan and its latest conformity determination. The purpose of the analysis is to evaluate the air quality impacts of the Plan on the SIP. The analysis evaluates the change in ozone precursor emissions (VOCs and NOx) due to the implementation of the 2012 Pioneer Valley Regional Transportation Plan. The modeling procedures and assumptions used in this air quality analysis follow guidance from EPA and the Commonwealth and are consistent with all present and past procedures used by the Massachusetts DEP to develop and amend the SIP.

MassDOT has found the emission levels from all MPOs in Western Massachusetts – including from the 2012 Pioneer Valley Regional Transportation Plan – to be in conformance with the SIP according to conformity criteria. Specifically, the following conditions are met:

- The VOC emissions for the Action (build) scenarios are less than the 2009 VOC motor vehicle emission budget for analysis years 2016 through 2035.

- The NOx emissions for the Action (build) scenario are less than the 2009 NOx motor vehicle emission budget for analysis years 2016 through 2035.

In accordance with Section 176(c)(4) of the Clean Air Act as amended in 1990, the MPO for the Pioneer Valley Region has completed its review and hereby certifies that the 2012 Pioneer Valley Regional Transportation Plan and its latest conformity determination satisfies the conformity criteria where applicable, and therefore conditionally conforms with 40 CFR Parts 51 and 93, and 310 CMR 60.03, and is consistent with the air quality goals in the Massachusetts State Implementation Plan.

CHAPTER 14

ENVIRONMENTAL JUSTICE AND TITLE VI CERTIFICATION

A. BACKGROUND

The Pioneer Valley Planning Commission (MPO) is required to certify to the Federal Highway Administration and the Federal Transit Administration that their planning process addresses the major transportation issues facing region. This certification assures that planning is conducted in accordance with Title VI of the Civil Rights Act of 1964, and requirements of Executive Order 12898 (Environmental Justice). Under the provisions of Title VI and Environmental Justice PVPC works to assess and address the following:

> **Civil Rights Act of 1964, Title VI** " No person in the United States shall, on the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."
>
> **Executive Order 12898, Environmental Justice** "Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing as appropriate disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

The U.S. Department of Transportation (USDOT) issued a DOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations in 1997. It identifies environmental justice as an "undeniable mission of the agency" along with safety and mobility. USDOT stresses three principles of environmental justice:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of reduction in or significant delay in the receipt of benefits by minority and low-income populations.

B. GOALS OF THE PIONEER VALLEY ENVIRONMENTAL JUSTICE PLAN

The Pioneer Valley Planning Commission has been working together with Pioneer Valley Transit Authority (PVTA), MassDOT, Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) on addressing the principles of Title VI and Environmental Justice in the transportation planning process for the Region. The primary goals of the plan include:

Goals related to identifying the Region's Minority and Low-Income Populations:

- Develop a demographic profile of the Pioneer Valley Region that includes identification of the locations of socio-economic groups, including low-income and minority populations as covered by the Executive Order on Environmental Justice and Title VI provisions.

Goals related to public involvement:

- Create a public involvement process that identifies a strategy for engaging minority and low-income populations in transportation decision making, and routinely evaluate this strategy for its effectiveness at reducing barriers for these populations.

Goals related to service equity:

- Institutionalize a planning process for assessing the regional benefits and burdens of transportation system investments for different socio-economic groups. Develop an on-going data collection process to support the effort and identify specific actions to correct imbalances in the RTP, TIP and Transit funding.

C. IDENTIFICATION OF MINORITY AND LOW INCOME POPULATIONS AND TARGET POPULATIONS

Strategy - *Identifying minority and low-income populations using 2000 Census data. Review EJ population thresholds and assessment methods from other regions and select a definition that provides the best representation for minority and low-income populations in the Pioneer Valley.*

The equity performance measures developed in subsequent sections of the plan are dependent on an accurate definition of the "target population." The 43 communities of the Pioneer Valley Region are diverse in incomes and ethnicity. The region's urban cores of 14 communities comprise the majority of the population and nearly 90 percent of the jobs. To establish the most effective measure of equity, PVPC staff reviewed EJ plans from similar Metropolitan Planning Organizations in other parts of the country. The definition used to define "target populations" in each of these plans was scrutinized and evaluated based on its applicability to our region. From these plans, 8 different population definitions for low income and minority populations were singled out for review in Pioneer Valley. While 2010 Census data was not available at the time of this update to the plan, PVPC actively solicited additional feedback and input from stakeholders in the region.

1. Minority Populations

Minority persons comprise 21.9 percent of the region's population as a whole. The racial or ethnic groups used in the 2002 census include; White Non-Hispanic, African-American or Black, Hispanic or Latino (of any race), Asian (including Native Hawaiian, & other) American Indian (& Alaska Native), Some other race, and Two or More Races. For the EJ tasks minority was defined as **"the population that is not identified by the census as "White-Non-Hispanic."** Of the region's 608,479 residents, 132,982 fall within this definition of minority. (A breakdown of these populations is included in Tables 14 -1 – 8-3.)

Table 14-1 - Pioneer Valley Population by Race

Race	Population	Percent
White alone	499,593	82.11%
Black or African American alone	39,915	6.56%
American Indian and Alaska Native alone	1,493	0.25%
Asian alone	11,095	1.82%
Native Hawaiian and Other Pacific Islander alone	390	0.06%
Some other race alone	42,650	7.01%
Two or more races	13,343	2.19%
Total:	608,479	100.00%

Table 14-2 - Pioneer Valley Non-Hispanic or Latino Population Breakdown

	Population	Percent
Not Hispanic or Latino:	534,070	87.77%
White alone	475,944	78.22%
Black or African American alone	36,774	6.04%
American Indian and Alaska Native alone	1009	0.17%
Asian alone	10,993	1.81%
Native Hawaiian and Other Pacific Islander alone	210	0.03%
Some other race alone	797	0.13%
Two or more races	8,343	1.37%

Table 14-3 - Pioneer Valley Hispanic or Latino Population Breakdown

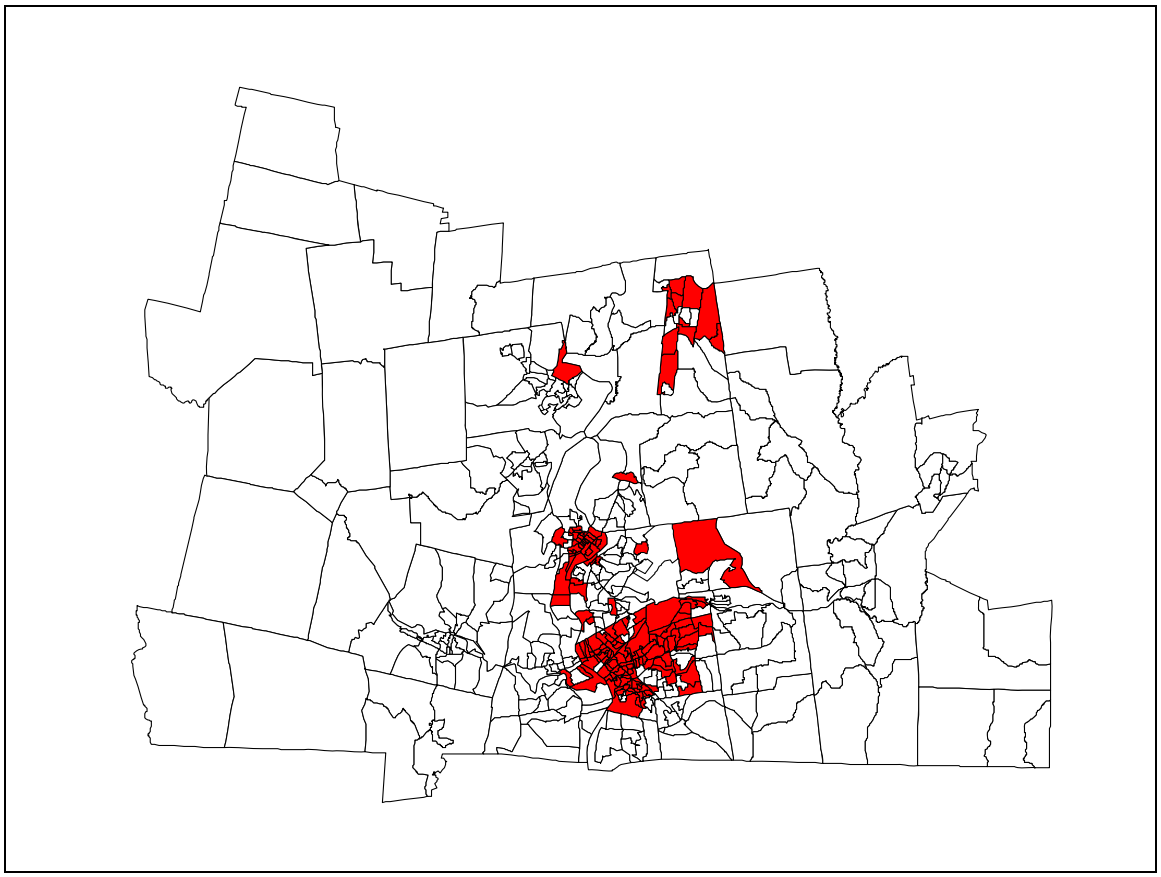
	Population	Percent
Hispanic or Latino:	74,409	12.23%
White alone	23,649	3.89%
Black or African American alone	3,141	0.52%
American Indian and Alaska Native alone	484	0.08%
Asian alone	102	0.02%
Native Hawaiian and Other Pacific Islander alone	180	0.03%
Some other race alone	41,853	6.88%
Two or more races	5,000	0.82%

After reviewing three different scenarios, the Environmental Justice target population for minorities was defined by using census block group data: “in which the percentage of minorities is greater than the percentage of minorities in the entire region (21.9%).” Other definitions that were explored included: "Any census block group with a minority population greater than 10% above the average for the entire region (any above 31.9%)" and "any census block group with greater than 50% minority population."

Maps of each of these definitions for minority populations in the region were mapped and further evaluated. The data was reviewed at meetings of the Joint Transportation Committee. The "over 50% minority" definition was determined not to be inclusive of minority student populations and areas of strong minority influence. The "10% above the regional average" minority definition was more inclusive but fell short of another goal of creating an analysis that would be clear to explain to both the public at large and decision makers using the data for assessment. The "above the regional average"

definition was unique in that outlying block groups were included without creating a large geographic area that would render subsequent assessments inadequate. The Pioneer Valley Planning Commission's Joint Transportation Committee formally voted on and approved the "greater than average" definition in January, 2003.

Figure 14-1 - Census Block Groups with Minority Populations above the Regional Average (21.9%)



2. Identification of Low Income Populations

In defining "low income" target populations, PVPC examined six different thresholds used by similar MPOs. While the term "minority" is clearly defined under the U.S. Census, the term "Low income" is not defined. The definition of "low income" for this purpose is referenced through official federal definitions as "poverty."

Table 14-4 – Low Income Definitions

Household Size	Federal Poverty Level
1 person	$8,500
2 persons	$10,800
3 persons	$13,290
4 persons	$17,000
5 persons	$20,000

The six "low income" definitions evaluated for the Pioneer Valley Region included a broad range of classifications. Each was mapped and reviewed for accuracy and presented to the Joint Transportation Committee for recommendations. The six definitions include:

(i) Any census block group where the poverty rate is 10% or more higher than that of the region (above 23.5%).

(ii) Any census block group where more than half the population lives below the poverty line.

(iii) Any census block group where the percentage of persons below 150% of the poverty line is more than for the region as a whole (21.3%).

(iv) Any census block group where the percent of persons below 150% of the poverty line is more than 10% over the average for the region as a whole (above 31.3%).

(v) Any census block group where more that half the population lives below 150% of the poverty line.

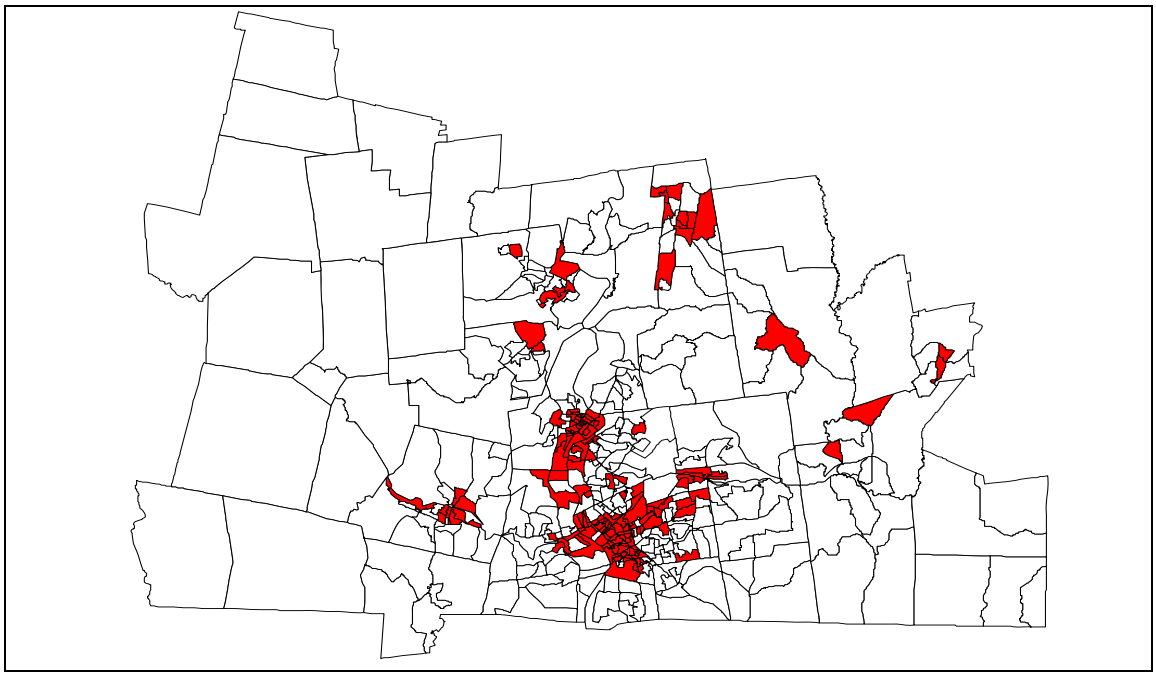
(vi) Any census block group where the poverty rate is higher than that of the region (13.5%).

The last definition (#6) provided the best representation of the region. The six definitions were mapped and evaluated based on the distribution of the target population and the inclusion of low-income neighborhoods. Of the six only #4 and #6 include low income neighborhoods outside of the region's urban core. To keep the definition of "low income" easy to explain and understand, definition #6 was selected by the JTC:

Low-income block group = any block group in which the poverty rate (percent of persons living below the Federal poverty line) is higher than that of the region as a whole (13.5%).

The definition is inclusive of 57,217 people living in 162 block groups and represents 73.7% of the low-income population. The 162 included block groups comprise 36% of the region's total (450). The geography of the low-income population includes the larger urban centers as well as smaller neighborhoods in Westfield and Ware.

Figure 14-2 - 2000 Census Block Groups with a Poverty Rate Above that of the Region (13.5%)



D. CONSULTATION AND ACTIVE SOLICITATION OF PUBLIC PARTICIPATION

Strategy: *Make a concerted effort to engage and involve representatives of minority and low-income groups to hear their views regarding performance of the transportation planning process.*

The Environmental Justice program was developed around a public participation process that includes outreach to representatives of the target populations. The Pioneer Valley Planning Commission has an ongoing working relationship with representatives of minority and low-income populations. The Plan for Progress, the Urban Investment Strategy Team, and the Welfare to Work Program and Regional Comprehensive Land Use Plan have created relationships with opened lines of communication into the needs and issues of minority and low-income populations.

In developing the EJ program PVPC started with a review of the existing public participation program. With this document serving as a foundation, staff began actively soliciting participation from representatives of minority and low-income population that had previously not participated in the planning process. Following the guidelines of SAFETEA-LU, PVPC reorganized the public participation process to focus more staff resources towards consultation with organizations representing low income and minority populations and coordinated the transportation outreach into the meetings and schedules of these stakeholders. The goal was to examine all aspects of the transportation planning process and allow PVPC to be actively involved in creating programs and projects that directly addressed the need of these groups that actively serve the populations. The issues and needs identified in this ongoing process are incorporated into projects, programs, and specific tasks through the Unified Planning Work Program, Transportation Improvement Program, and the Regional Transportation Plan. The Transportation Consultation Stakeholders to date include:

a) Springfield Education Institutions

Representative from the Massachusetts Career Development Institute (MCDI), Springfield Technical Community College, and American International College participated in a transportation stakeholder's assessment of the needs and issues of their students and faculty. The issues included the need for transit service that would allow recent graduates with access to jobs, on-campus parking issues, neighborhood access to transit, and issues related to childcare and trip chaining. The group came up with several short term recommendations and agreed to meet again bi-annually.

b) The Springfield Health Coalition

The mission of the Springfield Health Coalition is to identify and implement policy and environmental changes to prevent and reduce obesity and early deaths from heart disease, stroke, and diabetes in the Greater Springfield area. The Coalition assists in statewide efforts to make the "healthy behavior the easy behavior" in school, worksite, healthcare and community settings. The coalition's efforts target the reduction of risk factors related to chronic diseases mentioned above, which are affecting the residents of Springfield. The Pioneer Valley Planning Commission completed a user survey of the Springfield Riverwalk that identified obstacles and barriers to using the facility.

c) The Springfield Walks/ Mason Square Partners

Springfield Walks is a collaborative project including Rails-to-Trails Conservancy, Massachusetts Department of Public Health, City of Springfield, Pioneer Valley Planning Commission, Springfield Health Coalition, and neighborhood organizations such as the Mason Square Neighborhood Health Center. More than one half of Massachusetts residents are overweight and

nearly one in five are obese. Heart disease and stroke are the leading causes of death in Springfield. These alarming statistics led to the formation of Springfield Walks, an initiative to work with community leaders to encourage a more active lifestyle. Walking can significantly reduce the risk of heart disease and stroke. Springfield Walks has been working with residents and organizations on ways to make Mason Square a safe and easy place for walking. The Pioneer Valley Planning Commission's Unified Planning Work Program facilitated this effort with assistance in public outreach to Mason Square residents, review and comments on the State Street reconstruction project, data collection and mapping of cycling routes, presentation materials for public forums, mapping for the State Street Art Walk and ongoing assistance with funding for related activities.

d) Food Bank of Western Massachusetts

The Food Bank in collaboration with dozens of community partners is working toward the goal of implementing new solutions to the problems of hunger (which affects 9% of local residents) and creating a sustainable model of community food security. Transportation has been identified as a major obstacle in accessing healthy food.

e) Holyoke Food and Fitness Collaborative

This partnership of organizations is working toward a Kellogg Grant that would incorporate a variety of transportation projects as they relate to public health and safety. Nuestras Raíces, a leader in the Collaborative, is a grass-roots organization that promotes economic, human, and community development in Holyoke, Massachusetts through projects relating to food and agriculture.

Table 14-5 - Pioneer Valley Environmental Justice and Title VI Transportation Consultation

Transportation Stakeholder	Meeting Dates	Transportation Issues Identified	Recommendations	MPO Action /Activities included in the UPWP, TIP and RTP
Springfield Partners for a Healthier Community, Live Well Springfield Springfield Planning Dept, Baystate/Brightwood Health Center, Community Health Action Network, Concerned Citizens of Mason Square, Martin Luther King Center, Mason Square Community Health Center, Mason Square Senior Center, Springfield Parks Department, Mass Public Health Association, Massachusetts Career Development Institute, DPH Promotion and Disease Prevention, MA Department of Transitional Assistance, McKnight Neighborhood Council, New North Citizen Council (NNCC), Salvation Army.	2010 - ongoing monthly meetings	• Need for an improved built environment and the creation of vibrant neighborhoods for walking bicycling. Improved accessibility to transit and greater participation on the part of the community in planning for the future.	• Work with community leaders to establish a "complete streets" policy that is effective and influential in creating walkable/bikeable neighborhoods. • Implement a "Try Transit" program that may expand transit ridership and increase awareness for the health aspects of bus ridership. • Encourage use of Springfield's Connecticut Riverwalk and Bikeway and work with Springfield to improve maintenance and security on the Riverwalk. • Review options to expand connections to the Riverwalk, improve access, and increase use of the facility.	• Hosted webinars and distributed information on effective "complete streets" policy. • Received CMAQ funds through the TDM program to install directional signs to the Springfield Riverwalk and to re-sign the existing facility. • Coordinated with PVTA and a local community service organization on a "pilot" for a "Try Transit" program. • Assisted the Rails to Trails Conservancy and community organizations in Springfield's North End in hosting a "Fun on the Riverwalk Event." This event targeted residents of Springfield's Brightwood Neighborhood with the goal of introducing the healthy lifestyle benefits of the Riverwalk. • PVPC hosted Connecticut Riverwalk meetings for Planners, City Engineers, and Community Development staff for Agawam, Springfield, West Springfield, Chicopee, and Holyoke to define and discuss proposals for expanding the Riverwalk.
Holyoke YMCA Holyoke Pedestrian /Bicycle Task Force	2011- ongoing monthly meetings	• Need to improve safety and security • Need to create streets that are bicycle friendly. • Need to encourage bicycling and walking. • Need to explore options for adopting a complete streets policy for Holyoke.	• Expand training, education and awareness of the Complete Streets policies and initiatives. • Assisted in the review and study of bike lanes and other "shared use" option for street in Holyoke. • Incorporated a child care center in the Intermodal Center in Holyoke • Inventoried sidewalks in the central business district. • Explore student perception/acceptance of ridesharing. • Expand participation to include Springfield College and WNEC. • Modify TIP priority scoring for transit.	• MCDI student transportation survey. • Request sent to PVTA review of transit routes to campus.

Table 14-5 - Pioneer Valley Environmental Justice and Title VI Transportation Consultation (cont.)

Transportation Stakeholder	Meeting Dates	Transportation Issues Identified	Recommendations	MPO Action /Activities included in the UPWP, TIP and RTP
Springfield Health Coalition Mass Dept of Public Health, Community Health Action Network, New England Farm Workers Council, Springfield Dept of Health & Human Services, Mason Square Community Health Center	09/24/04 11/12/04 12/10/04	• Walking and transit barriers that impact personal health.	• Solicit input from neighborhood organizations. • Identify safe bicycling routes. • Create a "Springfield Walks Coalition."	• Survey of walkers/bicyclists on CT Riverwalk/Forest Park/YMCA. • Springfield Bike Commute Week. • Assisted in grant application for the "Springfield Walks" initiative. • Pioneer Valley Bike Map (TDM).
Holyoke Food and Fitness Collaborative Nuestras Raices, Holyoke Health Center, Valley Opportunity Council, Center for Healthy Communities, Salvation Army YMCA, Mass Public Health Association	11/21/06	• Transportation access issues affecting lifestyle decision of Holyoke residents. • Safe walking environments. • Transit efficiencies that impact nutrition and exercise. • Safety of transit shelters.	• Assess barriers to walking and identify high injury locations for pedestrians.	• PVPC will add a FFY-08 UPWP task to evaluate walkability (this work would be completed as a local match for a Kellogg Grant Application and is contingent on success of the applicant.

Table 14-5 - Pioneer Valley Environmental Justice and Title VI Transportation Consultation (cont.)

Transportation Stakeholder	Transportation Issues Identified	Recommendations	MPO Action /Activities included in the UPWP, TIP and RTP
Target Hunger Food Bank of Western Mass Greater Springfield Senior Services, King Street Family Life Center, Martin Luther King Jr. Com. Center, Mason Square Senior Center, Mass Career Development Institute, Mount Zion Baptist Church, Old Hill Neighborhood Council, Open Pantry Community Services, Open Pantry Loaves and Fishes Kitchen, Partners for a Healthier Com., Project Bread, Save Our Kids, Springfield Partners for Community Action	• Transit access to local grocery stores (Big Y and Stop and Shop) in Springfield. • Need for information displays on transit for food stamp program. • Need for more information on transit.	• Solicit feedback from Neighborhood Councils through Weed and Seed.	• Provided transit system map for Mason square neighborhoods. • Springfield Weed and Seed outreach ongoing.
Springfield Walks McKnight Senior Center, Springfield Dept. of Health and Human Services, McKnight Neighborhood Council, Springfield Planning Dept, Rails to Trails Conservancy National Park Service, Mason Square Neighborhood Health Center	• Barriers exist to walking in the Bay, McKnight, and Old Hill neighborhoods. • Need for more opportunities for walking. • Need for walking programs. • Need educational outreach on benefits of walking. • Reduce pedestrian fatalities/injuries. • Encourage economic development that includes pedestrian amenities. • Improve walking culture in Springfield.	• Streetscape improvements (benches, flowers, and lighting) on State Street/Mason Square. • Upgrade crosswalks at intersection on State, Catherine and Bay, State and Myrtle, Bay and Thompson, St. James, St. James and State and Magazine St, State and Terrance, Quincy Street, Astor off Bay Street, Alden Street, difficult to cross at Astor Street off Bay (short cut to school). • Install bike racks on PVTA buses. • Add/improve walking trails at Blunt Park. • Mason Square Interpretive Trail (Art Walk). • Create Mason Square Linear Park (Rail Trail). • Many Streetlights out. • Missing or damaged signs along State Street. • Winter snow removal on sidewalks. • Increase connectivity of existing trails; create a pedestrian circulation system. • Install bike racks.	• Interpretive mapping for walking routes in Mason Square. • Display material and public outreach. • State Street reconstruction project (TIP). • Purchased bike racks for Springfield (CMAQ). • “Speak Out” event at Mason Square Senior Center. • “Springfield Walks” event at AIC.

1. Consultation and Public Participation Action Items for Environmental Justice and Title VI

The PVPC will continue to solicit input from minority and low income stakeholder groups and organizations regarding transportation planning efforts, including the Regional Transportation Plan and Transportation Improvement Plan and the Unified Planning Work Program.

a) Previous work:

PVPC has continued to solicit input from minority and low income stakeholder groups and organizations regarding transportation planning efforts, including the Regional Transportation Plan and Transportation Improvement Plan and the Unified Planning Work Program. Public participation efforts related to the RTP and TIP have been expanded to include local presentations at special group meetings, neighborhood council meetings, and community activities. PVPC established a central file to document ongoing public outreach efforts to minority and low income populations. A protocol was developed for responding to issues and concerns regarding Title VI. PVPC gave a presentation to MPO members regarding Title VI and Environmental Justice and continues to improve on coordination of efforts on Title VI and Environmental Justice between PVPC, FRCOG, and CRCOG. PVPC revised the Public Participation Plan to include bilingual outreach for all public participation efforts that impact target populations. This effort includes public notices for major planning documents (RTP, TIP, and UPWP) and transit surveys. In 2002 staff attended training workshops sponsored by FHWA and obtained copies of EJ plans from MPOs of similar size. FHWA's Environmental Justice staff gave a presentation of the EJ program to the Joint Transportation Committee and videotaped a show for web broadcasting on the PVPC's local cable access show "REGION." In the months that followed, PVPC developed a draft scope of work pulling "best practices" from each of the programs reviewed. The Joint Transportation Committee approved the scope of work and reviewed many of the products. PVPC staff presented an overview of transportation planning to the Pioneer Valley Plan for Progress, and Urban Investment Strategy Team and followed up on inquiries from local communities on transportation issues and needs in their communities. Demographic data on EJ target populations was used to schedule public outreach efforts in minority and low-income neighborhoods. Public hearings for the Regional Transportation Plans were held in Springfield, Westfield, Amherst, Northampton, Chesterfield, and Ware. With the exception of Chesterfield (a rural community), each RTP public hearing was held in an EJ community.

As a member of the PVMPO, the PVTA is an active participant in the metropolitan planning process. The PVTA Advisory Board Chair (or, in his or her absence, the PVTA Administrator) is a permanent PVMPO board member; PVTA participates in the activities of the Joint Transportation Committee (JTC), the principal advisory body to the PVMPO, as an ex-officio member; PVTA submits specific comments on projects in the Transportation Improvement Program (TIP) as they are brought forward; and PVTA coordinates planning activities and services through direct and frequent meetings with PVMPO staff. PVTA, in coordination with PVMPO, places transit projects on the TIP and Regional Transportation Plan (RTP).

PVTA's principal goals for the PIP are to seek out and integrate the needs and views of all transit customers, especially those of minority, low income, and Limited English Proficiency (LEP) populations—people who may have comparatively fewer resources to present their concerns about transit. PVTA's PIP is structured to offer regular and continuous opportunities for the public to be involved in the agency's planning and operational decisions. Multiple channels of communication are available to PVTA customers, businesses served by PVTA, and non-riders of the region. PVTA staff is accessible by telephone, e-mail, and in person. Agency contact information is posted on the website (www.pvta.com), on transit vehicles, on route schedules, and in all

publications. Public meetings are held in transit accessible locations, with notices posted on vehicles and the agency's website. PVTA also utilizes local media (i.e., newspapers, television stations, websites) to publicize public meetings and events.

The activities outlined in the PIP are geared to provide meaningful opportunities for the residents of PVTA's service region to participate in aspects of transit planning and service for which the authority is responsible. These activities include:

- Facilitation of the monthly PVTA Advisory Board.
- Operation of the PVTA Information Center.
- Providing service information and reports.
- Responding to media inquiries.
- Fostering community participation in bus rider forums and paratransit rider committees.
- Conducting outreach to transit stakeholders, including employers, businesses and community based organizations.
- Conducting regular surveys of transit customers and potential transit markets.
- Facilitating the participation of municipal governments and state and local agencies in PVTA planning activities.
- Meetings with the Directors of municipal councils on aging.
- Outreach workshops or tabling events about PVTA services at social service and elder care agencies (approximately 8 per year).
- Monthly meetings with City of Northampton Public Transportation Committee.
- System wide bus rider forums (May 13 and 20, 2009).
- Public hearings for July 1, 2008 fare increase.
- Public hearing for service modification (Belchertown Shuttle).
- Media releases.
- Meetings with stakeholders.
- Public events to publicize PVTA service improvements and capital projects.
- Strategic planning meetings with representatives of the University of Massachusetts and Holyoke Community College.

The specific actions that PVTA has taken during the last three years to ensure that minority and low-income people of the service region had meaningful access to transit services include:

- Development and implementation of the PVTA Limited English Proficiency (LEP) Plan.
- Recruiting and hiring of bilingual call center staff (English and Spanish).
- Production and distribution of systemwide route maps in Spanish and English.
- Spanish radio and print advertisements for Sumner Express and All-day pass services.
- Web site multi-language translation feature added.
- Biannual bus rider forums with bilingual staff and translators available.
- Quarterly paratransit rider meetings.
- Spanish versions of paratransit services guide and manual.
- Spanish and sign language interpreters at public meetings upon request.
- Onboard rider surveys available in Spanish from bilingual surveyors.

E. EQUITY ASSESSMENT MEASURES

1. Equity Assessment Strategies

A total of four equity assessment strategies were developed under this task.

(i) Identify the distribution of transportation investments in the region. Evaluate past and proposed funding allocations for TIP/RTP projects for minority neighborhoods vs. non-minority neighborhoods.

(ii) Quantify the frequency of transit service for low-income and minority populations. PVPC will evaluate the level of service (LOS) for transit routes in minority and low-income neighborhoods and compare these to regional averages.

(iii) Identify and evaluate the availability of bus shelters for transit routes in minority and low-income neighborhoods and compare these to regional average (including shelter availability)

(iv) Travel times to major service centers. PVPC will use the regional transportation model to forecast travel times to hospitals, colleges, and universities from minority and low-income populations and compare these travel times to regional averages.

Title VI and the executive orders of Environmental Justice call for programs that quantify the benefits and burdens of the transportation investments and evaluate the impacts for different socio-economic groups. To accomplish this task PVPC worked with the JTC to establish "measures of effectiveness" that would reflect quantifiable transportation expenditures in the Region. These measures were used to evaluate capital expenditures in the Regional Transportation Plan and Transportation Improvement Program and to evaluate transit service. The evaluations provide a barometer of past spending and also assist decision-makers in achieving an equitable balance of funding in future years.

2. Equity Distribution Analysis

Information collected from census data, GIS, transit route inventory, and regional models was used to identify and assess transportation deficiencies, benefits, and burdens. The evaluation of each measure of effectiveness included the following:

a) Distribution of transportation investments in the region.

Past and proposed funding allocations for TIP projects were calculated for EJ target populations vs. non-EJ populations. PVPC completed an inventory of projects included on the TIP and mapped these projects. GIS tools were used to determine the amount of transportation funds programmed in TIP and allocated to projects that fall in the target population and compared those allocations to projects funded in census block groups outside of the target populations. See Figures 14-3 - 14-5.

Figure 14-3 - Low Income and Minority Population and High Priority Transportation Projects

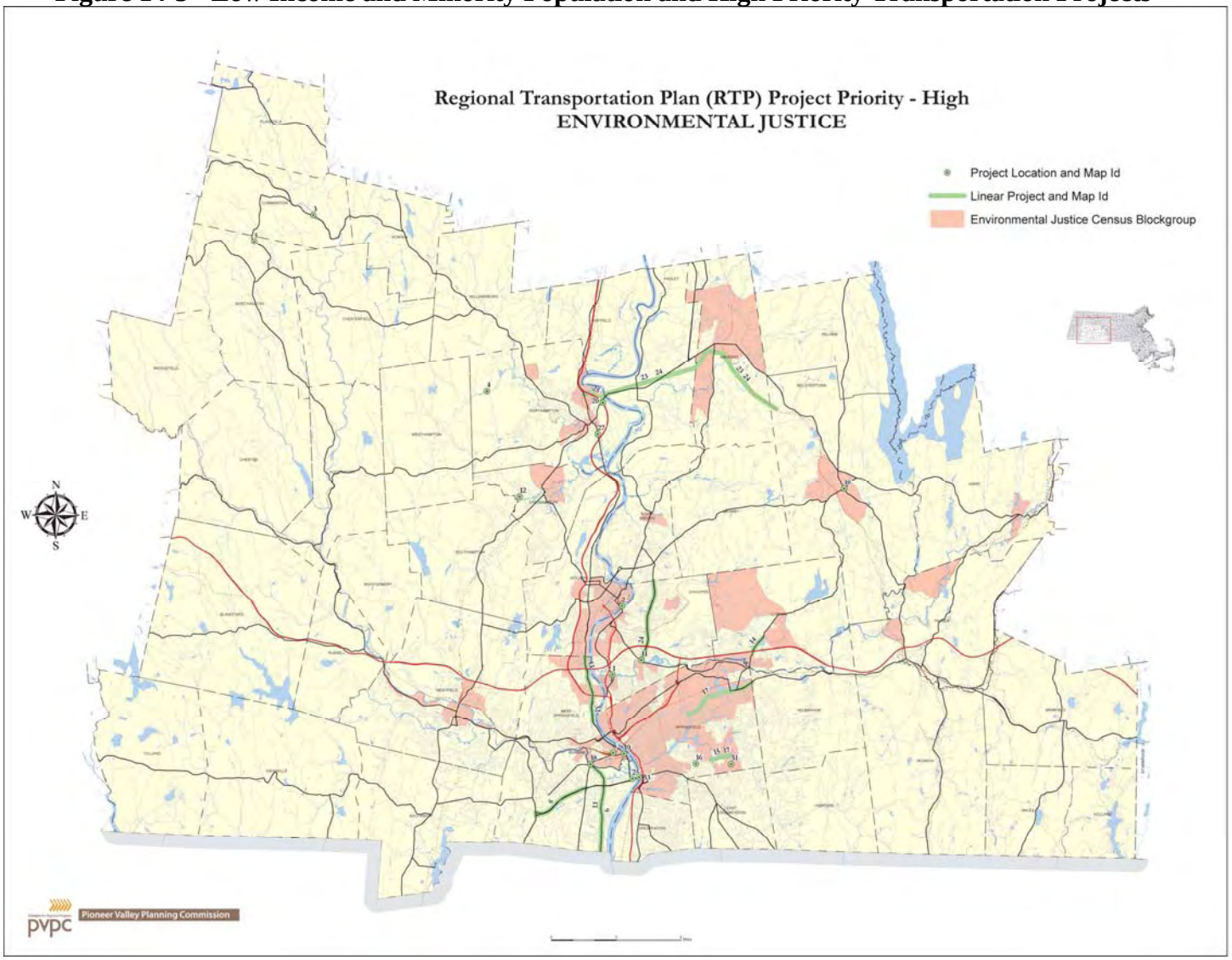


Figure 14-4 - Low Income and Minority Population and Medium Priority Transportation Projects

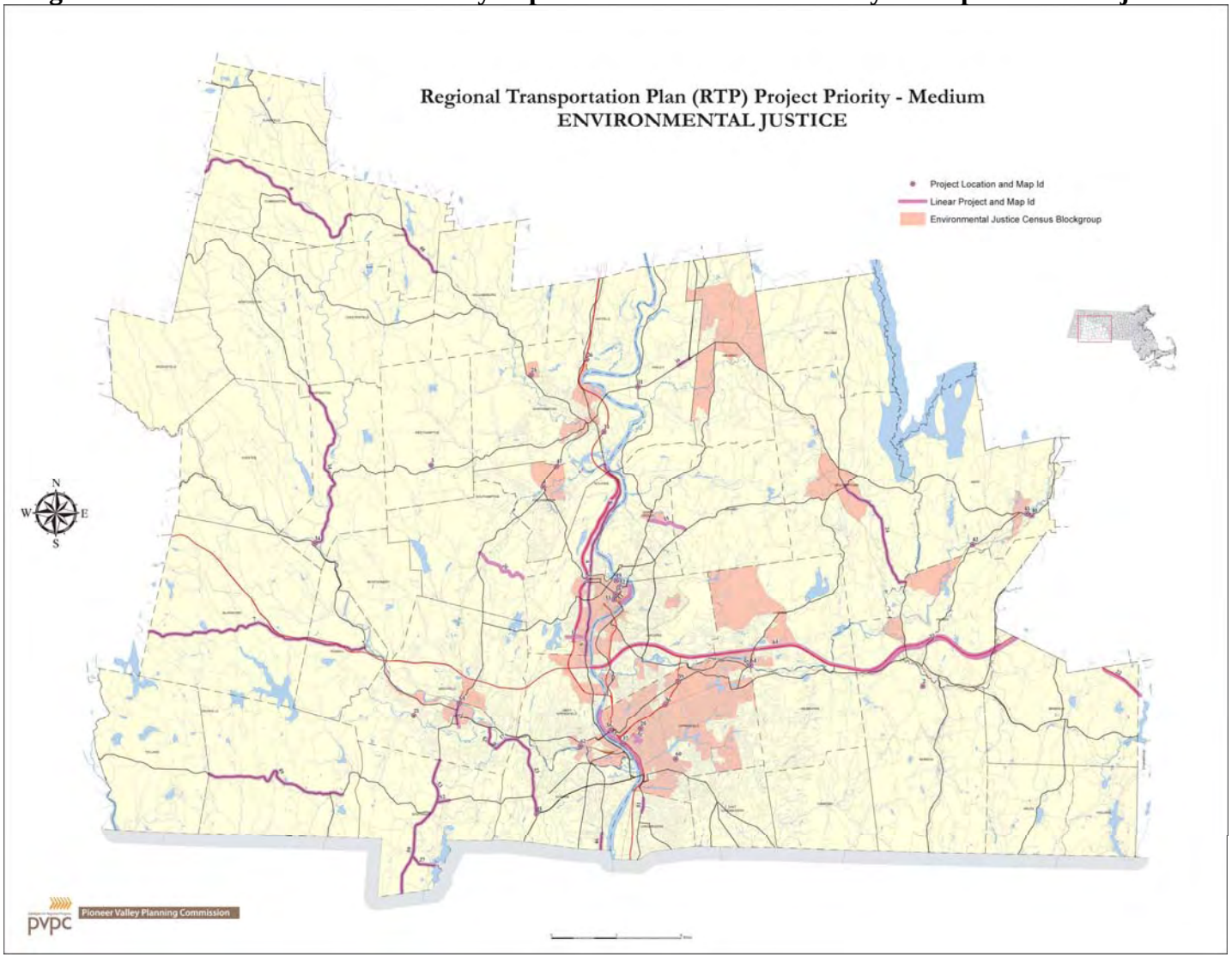
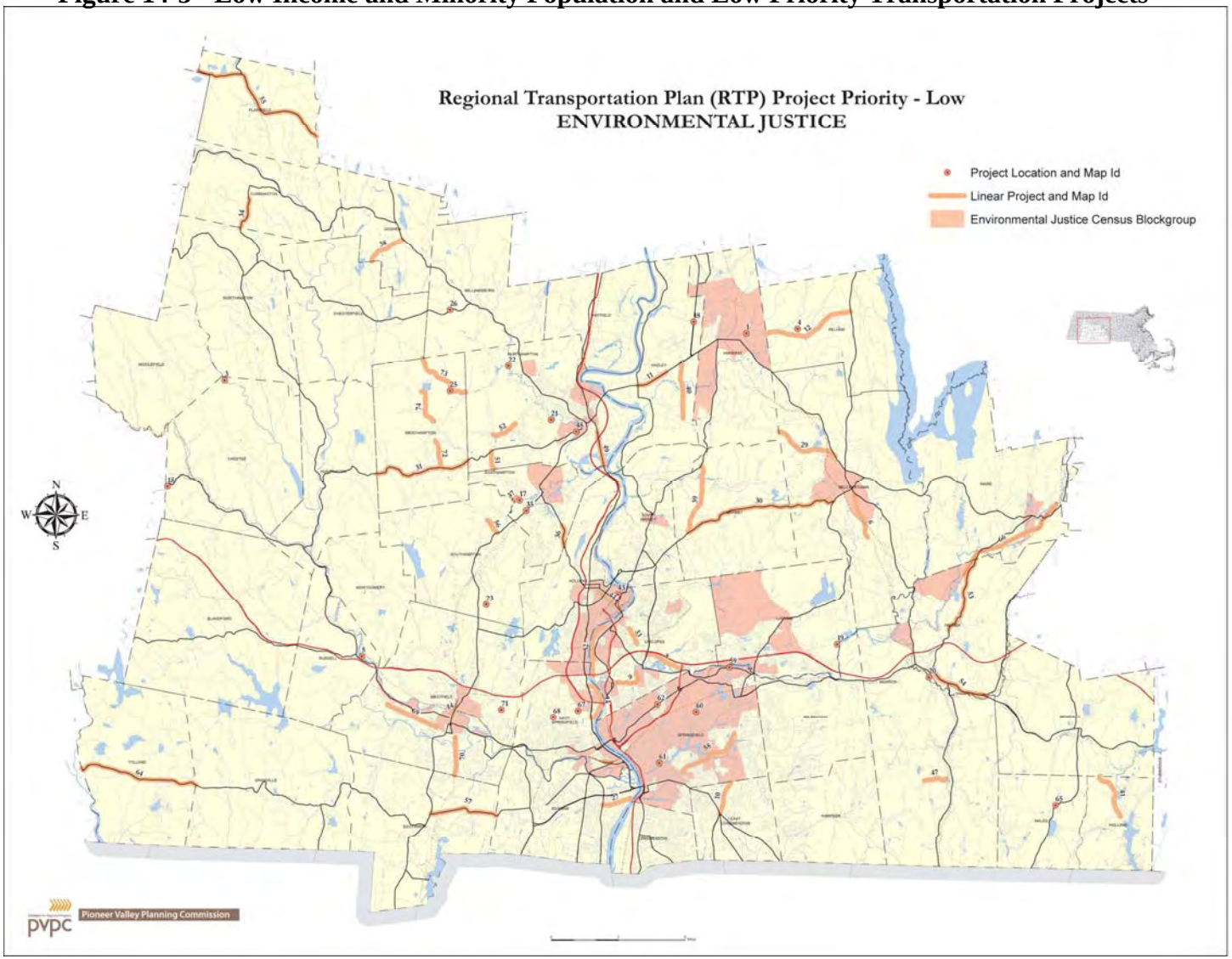


Figure 14-5 - Low Income and Minority Population and Low Priority Transportation Projects



b) Attainability by transit

The goal of this analysis is to investigate regional accessibility of the low income, minority, and immigrant populations of the Pioneer Valley. These populations are dependent on local public transit to connect them to necessary regional amenities such as health care, food stores, education, employment, and housing.

To conduct this analysis, activity centers are identified so that travel times can be estimated between activity centers and residential locations for the populations under study. Using census data, transportation analysis zones with percentages higher than that of the regional average for minority and low-income populations were identified. The location of major employers was mapped throughout the Pioneer Valley region (Figure 14-6). Major employers were identified as businesses which have 50 or more employees. Accessibility to transit was identified as being within a quarter of a mile from a bus route. The map shows transit connectivity in our region between major employers and residential locations of low-income and minority zones.

A comparison between transit and auto-vehicle travel times will give an indication of attainability of goods and services for the low-income and minority groups. Almost all zones with a high percentage of minority groups included a high percentage of low-income groups. These were located in Amherst, Northampton, Holyoke, Chicopee, Springfield, and West Springfield. Major employers were concentrated in Springfield, Holyoke, Amherst, and Northampton respectively. For this reason, the following three scenarios were selected to analyze transit attainability of individuals living in low-income and minority zones. These scenarios show examples of the regional travel needs of our low-income and minority groups and their associated travel time expenditures. The examples are not exhaustive of all regional travel needs. The Pioneer Valley MPO will continue to assess transit travel needs in the region and update the analyses and revise travel times due to changes in bus service times and frequencies.

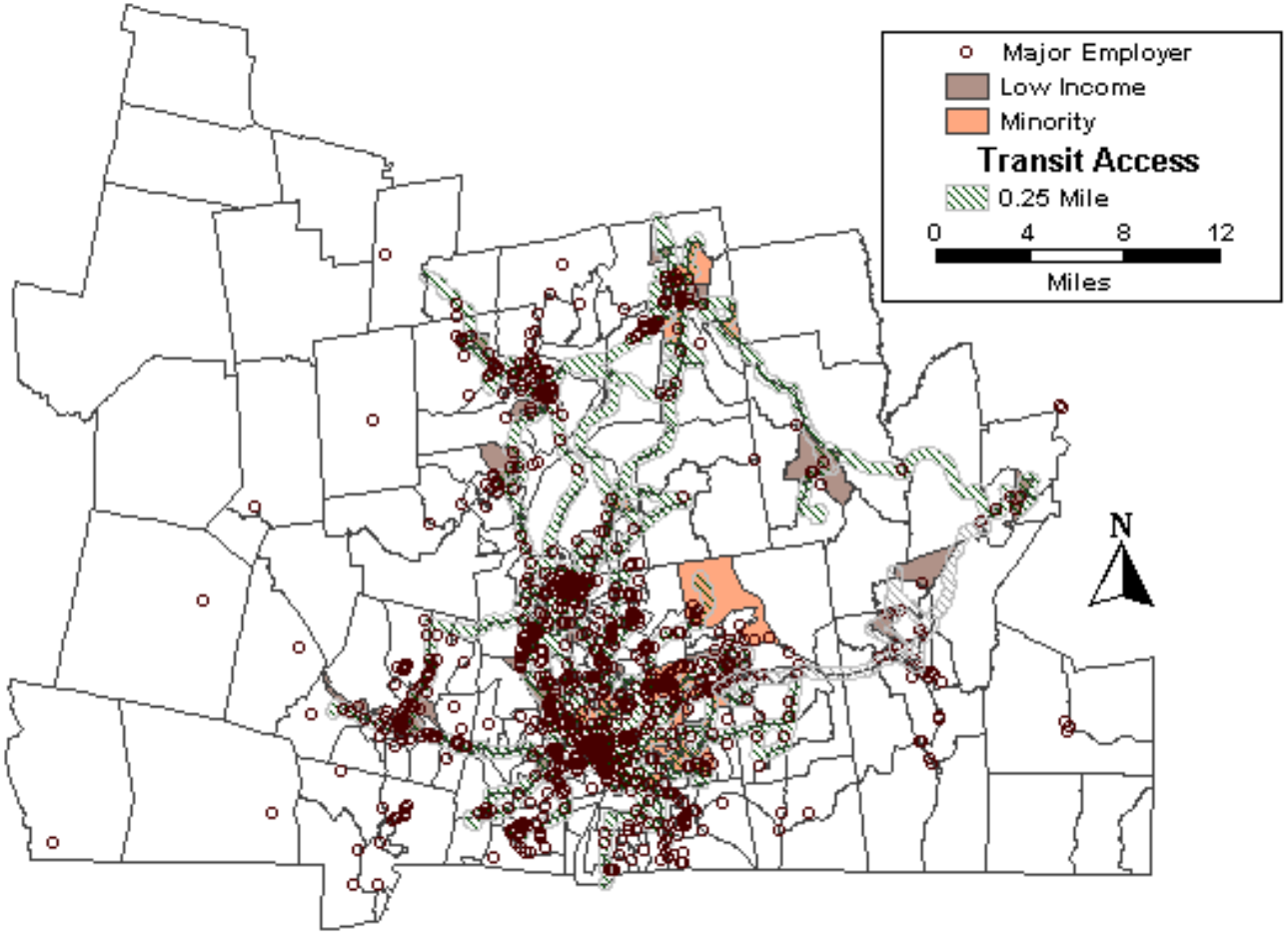
(i) Travel between Amherst and Springfield represents the furthest destination in the region for the high minority and low-income zones. These two locations are important activity centers in our region providing opportunities for education and employment in Amherst, as well as health, education, employment, and other state aid services in Springfield. Depending on time of day, a transit traveler between the two locations will spend an average of two hours each way using three different buses: B43, B48, and P20/21. So, a two hour appointment at Baystate Medical Center would necessitate at least a four hour round trip by public transit. In comparison, the same trip by private auto may take 40 minutes each way, which is almost one third of the time it takes to travel by bus. This is mostly due to the number of stops en route and the associated wait time between bus connections. In this case, public transit still provides an alternative at the higher cost of time expenditures. This is the only alternative available for low-income and minority groups who cannot afford auto ownership or are unable to drive for other reasons.

(ii) Travel between low-income housing in Northampton and state health service providers or employment centers in Holyoke represents a medium length regional travel trip for the population under study. Depending on time of day, a trip between these two locations takes about an hour on average using two buses: R44 and B48. This is twice as long as it takes to travel by car. In this case, a two-hour appointment would necessitate an additional one-hour time expenditure for travel by bus compared to auto.

(iii) Travel between Springfield and major employers in the Holyoke Mall and the adjacent industrial park in Holyoke represent short length travel trips in the region. A Springfield resident seeking employment in the service and retail industry in Holyoke would spend 45 minute on average to commute. Due to the short distance traveled between the two locations, travel time is lower between the two activity centers in this scenario compared to the previous two scenarios. Yet, travel time by bus is three times as long as travel by car.

Public transit provides a very important connecting service between major activity centers and low-income and minority population locations in the Pioneer Valley. The various bus routes connecting these zones have different levels of service ranging from regular to limited on

Figure 14-6 - Transit Access between Zones of High Percentages of Minority and Low-Income Populations and Major Employers in the Region



weekdays, weekends, and during the academic seasons. Several of the bus routes run on reduced schedule during the summer and the colleges' No School periods. The complexity of the system requires further in-depth analysis to identify transit connection challenges due to schedule and service availability between all identified zones. Transit attainability also needs to be further analyzed in conjunction with Level of Service for all bus routes. Updates to the analysis are required whenever major changes occur along bus routes. Level of Service categories identified for each of the bus routes in the Pioneer Valley service area ranged from 5 being best to 1 being worst (Table 14-6). A description of the methodology devised to arrive at the current ranking system follows.

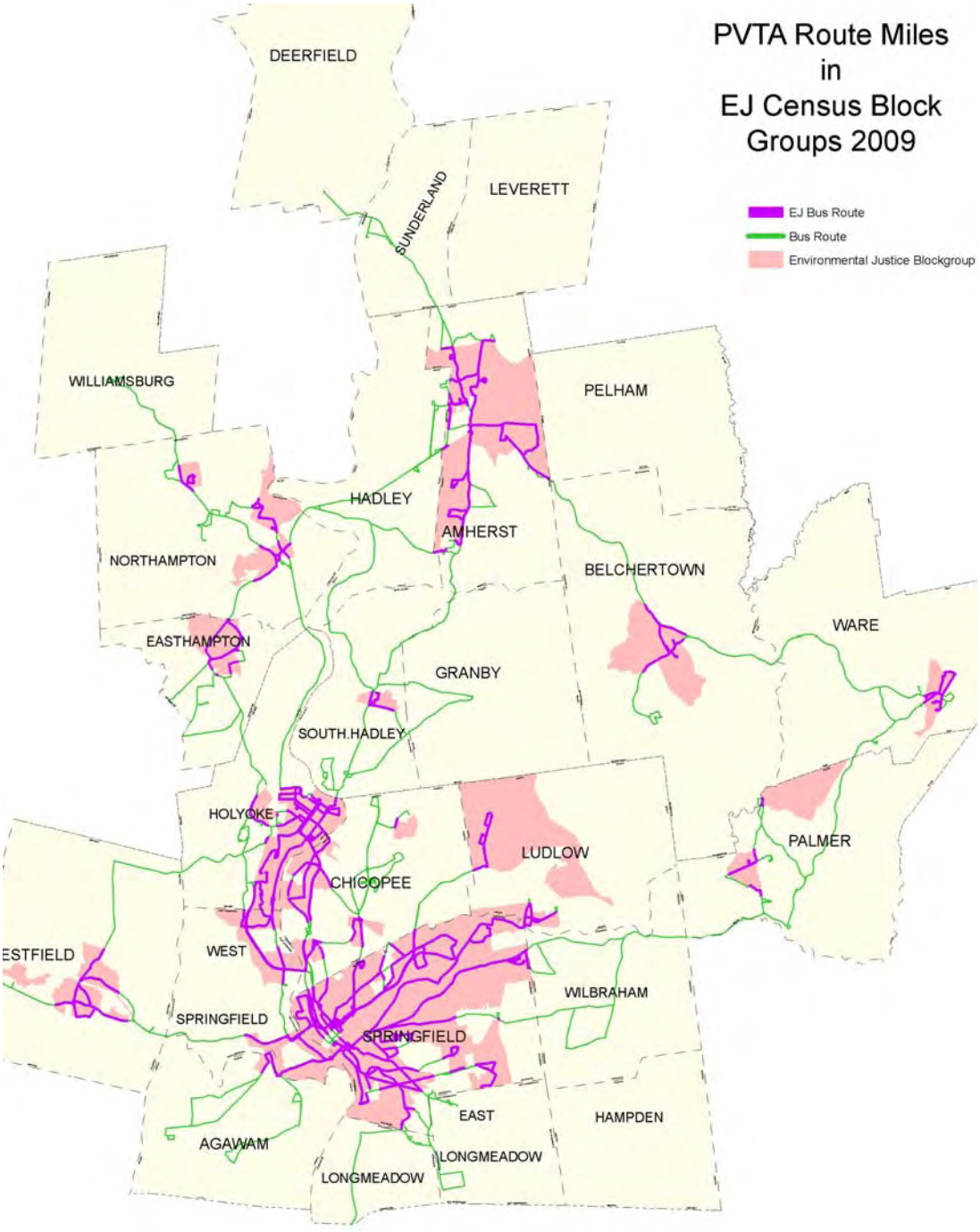
The methodology used to rank the level of service of each of the bus routes includes an analysis of the frequency of trips provided by each bus route during weekdays and weekends. Most bus routes offer service during regular business hours and provide service coverage for 12 hours on weekdays. Some routes provide limited weekend service as well. Regular business hour service is assumed to be from 6am to 6pm. The number of service trips provided by a bus leaving its starting point towards its main destination is divided by 12 to calculate the bus route's service rate (number of trips per hour). The trip rate is then adjusted to incorporate any additional service provided after regular business hours. An adjustment factor is calculated by counting the number of trips occurring at 6pm and beyond then dividing that number by 12. Some bus routes offer service on Saturdays while others offer service on both Saturdays and Sundays. Therefore, another adjustment factor is required for the trip rate. An addition of bus service for one day out of the seven days of the week is factored as 1/7 = 0.14. This factor is added to represent each Saturday or Sunday service. The total bus route trip rate includes the sum of all four measures: business hours weekday trip rate, after business hours weekday trip rate, Saturday service factor, and Sunday service factor. The majority of bus routes provided by the Regional Transit Authority service were analyzed according to this methodology. The calculated total trip rates ranged from 0.5 to 4.5. A constant value of 0.5 was added to all totals to arrive at the current ranking integers ranging from 5 best to 1 lowest Level of Service (Table 14-6).

The six previously identified communities that contain a high percentage of low-income and minority populations in our region are serviced by transit routes of varying levels of service. In general, shorter trips between two adjacent locations can maintain a high level of service throughout the day. On the other hand, longer trips connecting three or more locations are subject to a combination of levels of service from each of the connecting transit routes. This can result in a lower overall level of service due to travel constraints posed by the lowest level of service category of a trip segment. Whenever a bus route schedule includes variations in frequency and coverage during summer or no school season the reduced schedule is entered into the analysis because most transit users continue to travel to work and services year round regardless of season. This is an important factor to keep in mind when analyzing the overall transit attainability of individuals living in these locations because it affects their ability to engage in activities, acquire services, or seek employment.

Table 14-6 - Evaluation of Transit Service by Route

Rank Level of Service (5-1) Highest to Lowest	**Route Number**	**Service Area**
5	**B7**	Springfield
5	**G1**	Springfield
4	**B6**	Springfield
4	**G2**	Springfield
4	**P21**	Holyoke/Chicopee/Springfield
3	**B4**	Springfield
3	**B43**	Northampton/Amherst
3	**G3**	Springfield
3	**P20**	Holyoke/Springfield
3	**P31**	Amherst
3	**G30**	Amherst
2	**B13**	Springfield
2	**B15**	Springfield
2	**B17**	Springfield
2	**B23**	Holyoke/Westfield
2	**B48**	Northampton/Holyoke
2	**G5**	Springfield
2	**G8**	Springfield
2	**R22**	Chicopee/Holyoke
2	**R10**	Westfield/Springfield
2	**R14**	Agawam/Springfield
2	**R24**	Holyoke
2	**R44**	Northampton
2	**37**	Amherst
1	**B12**	Ludlow/Springfield
1	**G19**	Chicopee/Springfield
1	**M40**	Northampton/Amherst
1	**P11**	Holyoke/Springfield
1	**R25**	South Hadley/Holyoke
1	**R27**	Wilbraham/Springfield
1	**R41**	Easthampton/Northampton
1	**R42**	Northampton/Williamsburg

Figure 14-7 - Attainability by Transit



The following tables analyze the effects of various levels of service on transit trips between the five identified locations: Amherst, Northampton, Holyoke, Chicopee, Springfield, and West Springfield (Table 14-7 – 14-12). Each table looks at all transit options, including local and express routes, connecting each location as an origin of a trip with the other five destinations.

While this information is indicative of the overall accessibility via transit, calculating the average travel time spent on each route to make the trip is equally important. Due to a variety of schedules throughout the day, travel times may fluctuate at varying times of the day or days of the week. This variety in scheduling can result in an increase in wait time between bus connections or an increase in travel time due to traffic congestion on certain portions of the route during lunch time, Friday afternoon, and other traditional rush hour times. This makes taking a bus trip more time efficient during certain times of the day or on certain days of the week. While this complexity is difficult to analyze, calculating an average travel time between the identified origins and destinations will help reveal the need for schedule or service changes to improve attainability by transit.

Table 14-7 - Travel Service between Origins and Destinations for Amherst

Origin	Destination	Bus Number	Routes Level of Service	Trip Level of Service
Amherst	Northampton	B43	3	3
Amherst	Holyoke	B43/B48	3,2	2
Amherst	Chicopee	B43/B48/P20/G19	3,2,3,1	1
		B43/B48/P21/G19	3,2,4,1	1
		B43/B48/R22/G19	3,2,2,1	1
Amherst	Springfield	B43/B48/P20	3,2,3	2
		B43/B48/P21	3,2,4	2
Amherst	West Springfield	B43/B48/P20	3,2,3	2

Table 14-8 - Travel Service between Origin and Destinations for Northampton

Origin	Destination	Bus Number	Routes Level of Service	Trip Level of Service
Northampton	Amherst	B43	3	3
Northampton	Holyoke	B48	2	2
Northampton	Chicopee	B48/P20/G19	2,3,1	1
		B48/P21/G19	2,4,1	1
		B48/R22/G19	2,2,1	1
Northampton	Springfield	B48/P20	2,3	2
		B48/P21	2,4	2
Northampton	West Springfield	B48/P20	2,3	2

Table 14-9 - Travel Service between Origins and Destinations for Holyoke

Origin	Destination	Bus Number	Routes Level of Service	Trip Level of Service
Holyoke	Amherst	B48/B43	2,3	2
Holyoke	Northampton	B48	2	2
Holyoke	Chicopee	P20/G19	3,1	1
		P21/G19	4,1	1
		R22/G19	2,1	1
Holyoke	Springfield	P20	3	3
		P21	4	4
Holyoke	West Springfield	P20	3	3

Table 14-10 - Travel Service between Origins and Destinations for Chicopee

Origin	Destination	Bus Number	Routes Level of Service	Trip Level of Service
Chicopee	Amherst	G19/P20/B48/B43	1,3,2,3	1
		G19/P21/B48/B43	1,4,2,3	1
		G19/R22/B48/B43	1,2,2,3	1
Chicopee	Northampton	G19/B48	1,2	1
Chicopee	Holyoke	G19/P20	1,3	1
		G19/P21	1,4	1
		G19/R22	1,2	1
Chicopee	Springfield	G19	1	1
Chicopee	West Springfield	G19/P20	1,3	1

Table 14-11 - Travel Service between Origins and Destinations for Springfield

Origin	Destination	Bus Number	Routes Level of Service	Trip Level of Service
Springfield	Amherst	P20/B48/B43	3,2,3	2
		P21/B48/B43	4,2,3	2
Springfield	Northampton	P20/B48	3,2	2
		P21/B48	4,2	2
Springfield	Holyoke	P20	3	3
		P21	4	4
Springfield	Chicopee	G19	1	1
Springfield	West Springfield	P20	3	3

Table 14-12 - Travel Service between Origins and Destinations for West Springfield

Origin	Destination	Bus Number	Routes Level of Service	Trip Level of Service
West Springfield	Amherst	P20/B48/B43	3,2,3	2
West Springfield	Northampton	P20/B48	3,2	2
West Springfield	Holyoke	P20	3	3
West Springfield	Chicopee	P20/G19	3,1	1
West Springfield	Springfield	P20	3	3

c) Brookings Institute study on job access via transit for communities in the Pioneer Valley and Franklin County Council of Governments regions.

The Brookings Institute issued a report in May, 2011 about the status of job access using public transit. The report analyzed the frequency of service and transit coverage for the 100 largest metropolitan areas in the nation. The report was titled "Missed Opportunity: Transit and Jobs in Metropolitan America". Each identified area was ranked in terms of job access and transit travel time durations. The report assumed that the Springfield Metropolitan area includes the three Massachusetts counties of Hampden, Hampshire, and Franklin. Although results of their analysis indicate the general state of transit and job access in the Pioneer Valley Region, the addition of Franklin County skews the results by aggregating data from two distinct regions into one. The two regions have marked differences in the extent of their transit systems as well as their community characteristics. For example, transit service tends to be less frequent in Franklin County as opposed to Hampden and Hampshire counties.

Nevertheless, the data displays interesting findings for our region and provides analysis details for the major urban cities with a population greater than 100,000. The City of Springfield joins other large cities by providing transit coverage to inhabitants of working age at all income levels. Its transit frequency of service is ranked 56 out of the 100 cities reviewed with an average median wait for any rush hour transit service of 12 minutes for the entire city. A total of 40.3% of all jobs are reachable by transit, which places the city at a rank of 44 compared to the other major cities in the nation. It is interesting to note that transit service is more frequent in census block groups of low income jobs (11.4 minute intervals) versus high income jobs (19.5 minute intervals) for jobs reachable within a 90 minute bus trip.

The suburban areas in the three-county region offer transit service coverage to 64.8% of its working age residents and ranks 32nd in the nation in terms of coverage. Access is provided to 97.1% of low paying jobs, 97% of medium paying jobs, and 40.9% of the high paying jobs. The average wait time for a bus in suburban areas during rush hour was 25.4 minutes. The general trend though is that higher paying jobs are less accessible by transit in suburban areas than lower paying jobs. All total, only 20% of all jobs in the suburban areas are accessible by transit.

Over a quarter of all jobs (26.8%) in the three counties are reachable by transit within 90 minutes. However, only 12.7% and 7.6% are reachable by transit within 60 minutes and 45 minutes respectively. This analysis relies on transit data gathered from the two transit agencies servicing this area, PVTA and FRTA. It does not include bus access provided by the private intercity carrier PeterPan Bus Lines.

In conclusion, the study demonstrates that the potential for transit use for job access has yet to reach its full potential in connecting employees to employers in the Pioneer Valley region. There are many barriers to overcome that still limit transit usage to access higher paying jobs. Providing a frequent and reliable express bus service may provide a viable option for riders who place a higher value on their time.

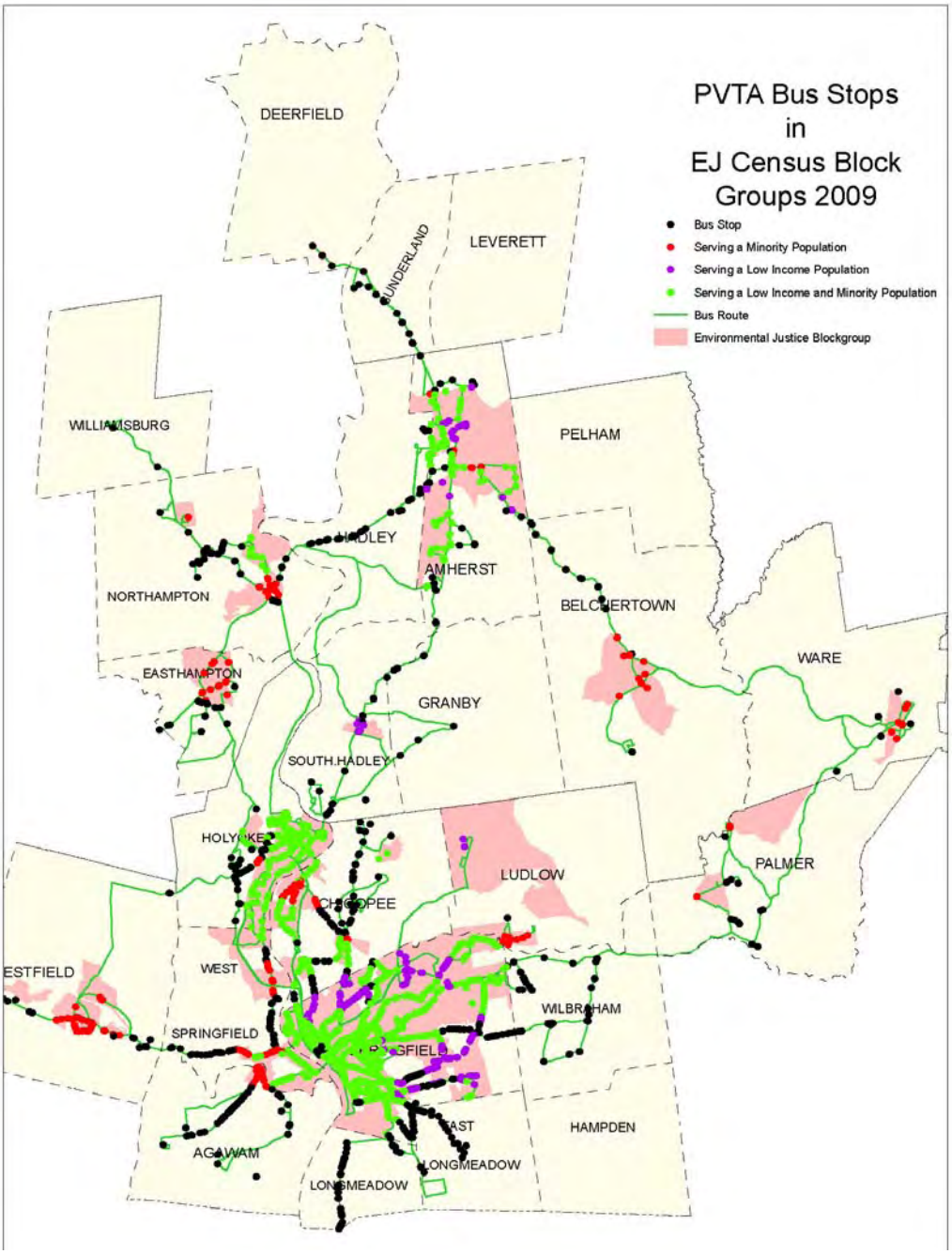
d) Transit amenities (including shelter availability).

To assess the equity of PVTA passenger amenities, the ratio of total bus stops and shelters to those located in minority and/or low-income census blocks was calculated. PVTA bus stops and shelter locations were overlaid on the 162 minority and low-income census blocks in the region.

Figure 14-8 on the next page shows that 70% of PVTA bus stops serve minority and/or low-income census block groups, even though only 36% of the region's block groups have proportions of minority or low-income populations that exceed the regional average. The proportion of shelters serving minority and/or low-income census blocks was 93%.

Therefore, it is reasonable to conclude that PVTA amenities are at least equally, if not even more accessible, in areas with greater than average Title VI populations than in other service areas.

Figure 14-8 - PVTA Bus Stops and Shelters in Minority and Low-income Census Block Groups



Total PVTA bus stops (2009)	1,924	100%
Bus stops in minority and/or low-income census blocks	1,344	70%
Total PVTA shelters (2009)	183	100%
Shelters in minority and/or low-income census blocks	170	93%
Census blocks with greater than average minority and/or low-income populations	162	36%

e) Travel times to major service centers.

PVPC will use the regional transportation model to forecast travel times to hospitals, colleges and universities from minority and low-income populations and compare these travel times to regional averages. PVPC has developed a new transit layer to the regional transportation model and this work is ongoing.

3. Equity Assessment Action Items

In 2003 the Pioneer Valley MPO identified specific action items for equity assessment identified under the Environmental Planning task. These equity assessment action items include:

(i) Expand the ability to model existing transit routes into PVPC's existing regional transportation model. PVPC has incorporated a transit layer into the existing model. In 2006 PVPC incorporated service evaluation classifications to provide measures of transit service to routes serving low income and minority populations.

(ii) Annually update TIP expenditures by census block group and report findings to the Joint Transportation Committee. PVPC has provided updates to the TIP expenditures and reported to the JTC.

(iii) Develop a process for evaluating transit service hour changes and impacts of future reductions in funding. PVPC has created a model for the classification of transit service and has begun the process of modeling an evaluation of the impact of changes to transit service.

(iv) Review and update the measures of effectiveness on a regular basis, incorporating new spending on projects listed in the TIP. Continue to refine the measures used to assess the distribution of impacts on different socio-economic groups.

(v) Expand analysis of transportation spending to include expenditures for planning studies included in the Unified Planning Work Program. The UPWP includes major investment studies such as corridor studies and local transportation plans that identify specific improvements. If these studies are not balanced among the populations, spending imbalances could follow.

(vi) Work with PVTA to update transit shelter locations. While the existing inventory is current, future additions should be incorporated.

F. RECOMMENDATIONS AND STATUS REPORT

The PVPC staff will continue to implement recommendations identified through analysis and the public participation process with the assistance of the Joint Transportation Committee and the Pioneer Valley Transit Administration. PVPC intends to take actions necessary to assure that the all affected communities are included in the decision making process and that the information needed to make decisions is available. As the EJ planning process develops, practices being tested today may be institutionalized as policy depending on their success.

Examples include:

- Review and update the measures of effectiveness on a regular basis, incorporating new spending on projects listed in the TIP.
- Expand public participation efforts related to the RTP and TIP to include local presentations at special group meetings, neighborhood council meetings, and community activities.
- Develop a protocol for responding to issues and concerns regarding Title VI.
- Create a central file to document on-going public outreach efforts to minority and low-income populations.

G. EVALUATION OF TITLE VI AND EJ PLANNING EFFORTS

To assess the plan's success in achieving the goals (outlined in section B) an action item evaluation was developed. This list will be used as an ongoing review of the effectiveness of policies and practices related to EJ and Title VI.

(i) Has a demographic profile of the metropolitan planning area been developed that identifies low-income and minority populations? Has this data been updated to reflect revised census data?

(ii) Has the regional transportation model been upgraded to include existing transit operations?

(iii) Have PVTA and PVPC responded to requests for new and expanded transit service when requested? Has the region sought funds to offer these services over the past three years?

(iv) Have Title VI reporting requirements been supplemented with a report to the JTC identifying concerns, issues and actions?

(v) Does the planning process use demographic information to examine the benefits and burdens of the transportation investments included in the plan and TIP?

(vi) Does the planning process have an analytical process in place for assessing the regional benefits and burdens of transportation system investments for different socio-economic groups?

(vii) To what extent has PVPC made proactive efforts to engage and involve representatives of minority and low-income groups through public involvement programs? Does the public involvement process have a strategy for engaging minority and low-income populations in transportation decision making?

(viii) What issues were raised, how are their concerns documented, and how do they reflect on the performance of the planning process?

(ix) What mechanisms are in place to ensure that issues and concerns raised by low-income and minority populations are appropriately considered in the decision making process?

(x) What corrective action should be put into the process regarding existing requirements and prepare it for future regulatory requirements?

H. CERTIFICATION

The Pioneer Valley MPO has conducted an analysis of the 2007 Pioneer Valley Regional Transportation Plan with regard to Title VI and EJ conformity. The purpose of the analysis is to evaluate the impacts of the transportation planning process on minority and low-income populations. The analysis evaluates efforts to identify minority and low-income populations, develop public participation inclusive of these populations, and to identify imbalances that impact these populations. The procedures and assumptions used in this analysis follow FHWA guidance, are consistent with the procedures used by MPOs in Massachusetts, and are consistent with Title VI of the 1964 Civil Rights Act, National Environmental Policy Act, Section 109(h) of Title 23, Dot Title VI Regulations, DOT and CEQ NEPA Regulations, Section 1202 of TEA-21, DOT and CEQ NEPA Regulations, Section 1203 of TEA-21, DOT Planning Regulations, Executive Order 12898, USDOT Order 5610.2, and FHWA Order 6640.23.

Accordingly, PVPC has found the Pioneer Valley Regional Transportation Plan to be in conformance with Title VI of the Civil Rights Act of 1964, and requirements of Executive Order 12898 (Environmental Justice). Specifically, the following conditions are met:

Conditions Related to Public Involvement:

PVPC has identified a strategy for engaging minority and low-income populations in transportation decision making and to reduce participation barriers for these populations. Efforts have been undertaken to improve performance, especially with regard to low-income and minority populations and organizations representing low-income and minority populations.

Conditions Related to Equity Assessment:

The Pioneer Valley planning process has an analytical process in place for assessing the regional benefits and burdens of transportation system investments for different socio-economic groups. A data collection process is used to assess the benefit and impact distributions of the investments, and specific strategies are identified for responding to imbalances.

I. CONCLUSION

This section outlines and evaluates how the PVPC addresses environmental justice and social equity issues as part of its transportation planning process. It includes goals to enhance the existing public participation process, a methodology to identify low income and minority populations, and measures of effectiveness to evaluate transportation deficiencies, benefits, and burdens. The PVPC will continue to improve its public participation and planning process to ensure that it is conducted in accordance with Title VI of the Civil Right Act of 1964, FHWA/FTA guidance on LEP and requirements of Executive order 12898 (Environmental Justice) to give full and fair consideration to minority and low income residents in the region. The region's outreach and efforts to engage the public in meaningful discussion around transportation issues has made great strides and will continue to be a priority of the MPO.

CHAPTER 15

ENVIRONMENTAL CONSULTATION AND MITIGATION

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) included a number of new provisions that relate to environmental planning. Regional Transportation Plans must provide information on the efforts to consult with state and local agencies responsible for environmental, land use, and preservation in the development of the RTP. In addition, the RTP must include a discussion of the types of potential environmental mitigation activities and potential areas to carry out these activities. The following sections demonstrate how the SAFETEA-LU requirements have been integrated into the RTP for the Pioneer Valley Metropolitan Planning Organization.

A. ENVIRONMENTAL CONSULTATION

The Pioneer Valley Metropolitan Planning Organization must consult "as appropriate" with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation to develop the long range transportation plan. This environmental consultation is intended to be completed during the public involvement process in July, 2011. To comply with this requirement of SAFETEA-LU, draft copies of the RTP will be sent to a variety of state and local agencies. A complete list of these agencies in shown in Table 15-1.

Table 15-1 - Environmental Consultation on the Draft RTP

Massachusetts Historical Commission	Massachusetts Department of Public Health
Massachusetts Division of Fisheries and Wildlife	Connecticut River Watershed Council
Route 9 Transportation Management Association	Department of Conservation and Recreation
Massachusetts Audubon Society	Rails-to-Trails Conservancy
The Kestrel Trust	American Heart/Stroke Association
United States Fish & Wildlife Department	Massachusetts Public Health Association
Parks for People New England - Trust for Public Land	International Council for Local Environmental Initiatives (ICLEI)
MassBike Pioneer Valley	Army Corp of Engineers
Norwottuck Rail Trail Advisory Committee	Barnes Aquifer Protection Advisory Committee
Westfield River Wild and Scenic Committee	Appalachian Mountain Club
Local Planning Departments	Local Departments of Public Works

Each of the above agencies was sent one copy of the Draft RTP. An offer was also extended to meet with each agency to discuss the Draft RTP in greater detail. Existing relationships with many of the above agencies were in the development of the regional transportation needs and strategies included in Chapter II of this document. Other ongoing public participation initiatives such as the ongoing I-91 Exit 19 study were included in the RTP as appropriate.

B. MASSACHUSETTS ENVIRONMENTAL MITIGATION

Throughout the region, the Pioneer Valley Planning Commission is leading a wide array of policies, programs and actions geared towards preserving this region's high quality of life, a large portion of which is attributable to the health of the local environment. In addition to State and Federal

protections given to the natural community, PVPC is working through several programs in the Commonwealth to preserve the region's environmental quality.

1. Regulatory Protection for Habitat and Wildlife in Massachusetts

Massachusetts has a long track record of passing progressive, forward thinking environmental policies. The protections given to Massachusetts' endangered species, wetlands, and rivers are among some of the nation's most effective rules and regulations. All construction and transportation projects that take place within PVPC's jurisdiction will comply with the regulations listed below. This will result in mitigation measures that are built into the project from the earliest phase.

a) National Heritage Endangered Species Program

The National Heritage Endangered Species Program protects crucial habitat for terrestrial and aquatic plants, vertebrates, and invertebrates. In Massachusetts, the Massachusetts Endangered Species Act (MESA; M.G.L. c 131A) serves as the regulatory framework for promoting the conservation of rare species habitat. On July 1, 2006, delineated boundaries of rare and endangered species habitat were redrawn to incorporate current scientific data about the extent, occurrence, and range of habitat.

Massachusetts National Heritage Endangered Species Program staff evaluate projects when they fall within an area that has been identified as priority habitat for a rare animal or plant species. This process is initiated when a proponent files documentation with NHESP detailing work proposed within a NHESP habitat area. Within 30 days, staff from NHESP respond, indicating whether or not the submission is complete; 60 days after that, NHESP determines whether or not a project, as proposed, will result in the "take" of a rare species. Should that be the case, NHESP might require a redesign of the project to avoid a "take." If a project cannot be amended to avoid a "take," the proponent can only be issued a Conservation and Management Permit. To qualify for a Conservation and Management Permit, a proponent must submit alternative assessments of temporary and permanent impacts to species, demonstrate that a proposed project will impact only an insignificant portion of the local population of a state-listed species, and design and implement a conservation management plan that provides for the long term net benefit of the affected state-listed species. This net-benefit mitigates adverse impacts on species through on or off-site permanent habitat protection, management or restoration of state-listed species habitat, or conservation research designed to benefit the species affected by a given project.

For issues relating to transportation projects, there are some key exemptions granted: utility repairs within 10 feet of existing paved roads; maintenance, repair or replacement (but not widening of) existing paved roads; shoulder repair up to 4 feet; and paved parking areas, excluding actions that would change stormwater drainage.

b) Army Corps of Engineers Stream Crossing Standards

The Massachusetts River & Stream Crossing Standards seek to achieve, through varying degrees, three goals:

- Facilitate movement of fish and other aquatic organisms.
- Maintain continuity of the aquatic and benthic elements of river and stream ecosystems.
- Facilitate movement of wildlife species including those primarily associated with river and stream ecosystems and others that may utilize riparian areas as movement corridors.

The standards are intended for new permanent crossings and, when possible, for replacing existing permanent crossings. A complete copy of the standards is located at: http://www.nae.usace.army.mil/reg/Stream/MA_RiverStreamCrossingStandards.pdf

c) Design of Bridges and Culverts for Wildlife Passage at Freshwater Streams

This document, developed by MassDOT, requires the development of transportation facilities that fit the environmental resources setting, while maintaining safety and mobility for all users. This guidance document assists project designers and planners in complying with regulatory standards for structures to address wildlife passage standards. A complete copy of the document is located at:
http://www.mhd.state.ma.us/downloads/projDev/Design_Bridges_Culverts_Wildlife_Passage_122710.pdf

2. Wetlands Protection Act (WPA)

If it is alleged that a project is located within a wetland, a proponent must go before the appropriate local Conservation Commission to request a wetlands delineation. If a project occurs within the mandatory 100 foot protective buffer established through the WPA, a proponent must file a Notice of Intent (NOI) detailing the proposed alterations to the site. Thirty days after this letter is received NHESP will respond to the NOI. If the project is determined to have an impact on a wetland(s), the NHESP requires conditions for approval. The Order of Conditions, as these conditions are formally known, outline necessary steps for preserving any affected wetlands. These terms are enforced by the local conservation commission and *must* be complied with during and after the construction process. The Massachusetts WPA has been nationally acknowledged as one of the nation's most effective regulatory approaches to wetlands conservation.

Exemptions listed above for the NHESP also apply to the Wetlands Protection Act (M.G.L. c. 131, s.40 and 310 CMR 10.00). In addition to regulating wetlands, the WPA also regulates intermittent streams.

3. The River Protection Act

Chapter 258 of the Acts of 1996 restricts development within 200 feet of the annual mean high water mark for Massachusetts' 9,600 miles of rivers. In some urban areas, including Springfield, this buffer is reduced to 25 feet. This act accomplishes the goal of:

> …the protection of public and private water supply, protection of groundwater supply, protection of land containing shellfish, protection of wildlife habitat, flood control, storm damage prevention, prevention of pollution, and protection of fisheries…. [and to] protect the natural integrity of rivers and to encourage and establish open space along rivers.

Transportation infrastructure that was in existence, or in the process of being permitted, at the time of the passage of the Rivers Act are exempt, but new construction is not. For this reason, project proponents operating within PVPC's member communities must work with DEP to ensure that no encroachment on the 200 foot or 25 foot buffer occurs.

In addition to protecting this resource area, the Commonwealth has also issued Stormwater Management standards and guidelines to complement the Wetlands Protection Act and the Rivers Act. Project proponents must work with the local Conservation Commission and the Department of Environmental Protection to ensure that there is no net change in stormwater discharge between pre-development and post-development runoff conditions and to minimize pollutant loading in the affected waterbodies. This process commences with the filing of a Notice of Intent; mitigating measures are issued as part of the Order of Conditions that a project proponent must comply with throughout and after the development process.

4. Massachusetts Environmental Policy Act (MEPA)

The Massachusetts Environmental Policy Act (MEPA) requires that state agencies study the environmental consequences of their actions and take all feasible measures to avoid, minimize, and mitigate damage to the environment. MEPA applies to projects that trigger predefined thresholds and that involve some state agency action. This includes projects that are proposed by a state, municipal, or non-profit agency, or are proposed by a private party and require a permit, financial assistance, or land transfer from a state agency.

The MEPA process requires public study, disclosure, and development of feasible mitigation for proposed projects. It does not make decisions on the environmental benefits of projects or determine if a project can or should receive a particular permit. Those decisions are left to the respective permitting agencies. MEPA review occurs before permitting agencies act to ensure that they know the environmental consequences of their actions. Table 15-2 summarizes transportation improvement projects in the Pioneer Valley that have gone through the MEPA process over the last 5 years.

Table 15-2 - Transportation Projects Reviewed by MEPA

Community	Project	Date Sent to Sections	Community	Project	Date Sent to Sections
Easthampton	South Street Reconstruction Project	Jan-11	Springfield	North End and Brightwood Area Transportation Improvement Project	Jul-10
Holyoke	Holoyke Community College South Access Road	Jan-11	West Springfield	Route 20 Corridor Improvement Project	Jun-10
West Springfield	Rehabilitation of Pleasant Street	Dec-10	Amherst, Belchertown	Norwottuck Rail Trail Rehabilitation Project	Jun-10
Westfield	Roadway Improvement Project - Main Street/Broad Street	Aug-09	Southwick	Route 10/202 Construction	May-10
Belchertown	Route 181 Improvements	Apr-09	Chesterfield	East Street Roadway Improvement Project	Mar-09
Amherst	West Street (Route 116) Reconstruction and Related Work	Mar-09	Palmer	Reconstruction of Springfield Street	Apr-08
Westfield	Improvements at Westfield-Barnes Airport	Mar-08	Ludlow	Intersection of East Street at Chapin Street	Jun-07
Springfield	State Street Reconstruction	Aug-06	Northampton	I-91 at Route 9 (Interchange 19) Interchange Improvement Project	Jan-07
Agawam	Agawam Rotary Interchange Project	Aug-06			

C. REGIONAL ENVIRONMENTAL MITIGATION EFFORTS

Regional planning agencies have no regulatory authority or other implementation powers in Massachusetts. Consequently, the Pioneer Valley Planning Commission has relied upon its connections with the region's municipalities, non-profit sector, academic institutions, businesses, and informed citizenry to incorporate environmental quality enhancements across a wide range of planning topic areas. This section details the ways in which PVPC has taken a leadership role in mitigating the environmental problems and challenges the region is facing.

The Pioneer Valley Planning Commission is a leader in promoting land use policies—in the form of zoning bylaws, general bylaws, amendments to subdivision regulations, and regional planning—that encourage development practices that are *both* environmentally sustainable and sensitive to the needs of the local business community. This has resulted in a series of programs and policies that seek to address environmental issues on a regional scale. The mitigation measures PVPC has successfully developed and implemented are listed below.

1. Valley Vision 2

In 2007, the Pioneer Valley Planning Commission (PVPC) completed and adopted a national award-winning regional land use and smart growth plan, Valley Vision. This plan lays out a detailed strategy to promote compact, mixed use growth in and around urban, town, and village centers, while promoting protection of open space and natural resources outside developed centers. Adopted by 40 out of 43 communities in the Pioneer Valley region through an intergovernmental compact, PVPC has been working with municipalities over the past several years in the region to meet the requirements of the compact and make local plans and zoning regulations consistent with the recommendations of the plan.

PVPC updated the Valley Vision plan in 2011 with funding received by the Commonwealth's Executive Office of Housing and Economic Development. This update will ensure regional consistency with the Commonwealth's Sustainability Principles, as well as with proposed zoning reform legislation currently under consideration by the State Legislature. One of the Commonwealth's Sustainability Principles is to advance equity and promote the equitable sharing of benefits and burdens of development. Past Valley Vision planning efforts have failed to incorporate low income and traditionally marginalized communities into the overall planning process. This funding will be used to further update the plan and provide specific tools or actions to address these issues and empower local governments to deal with environmental justice more effectively through land use planning and zoning.

With the plan for expanded transit along the Knowledge Corridor, there are opportunities to identify and implement innovative smart growth strategies and actions that will encourage higher density, transit-oriented development in identified locations. These strategies will also consider ways to maintain these dense neighborhoods as mixed-income, as successful transit oriented developments often escalate rental housing prices making it difficult for existing low income residents to stay in the neighborhood. This project will also develop a process to better integrate the Regional Land Use plan and the Regional Transportation Plan and focus future actions on high density, transit-oriented development.

The goal of Valley Vision 3 is to develop and implement new innovative strategies for the Knowledge Corridor to encourage higher density, transit-oriented development, advance equity, and address environmental justice issues previously not identified in the regional land use planning process.

Objectives:

- Achieve a coordinated bi-state land use vision and smart growth plan for the Knowledge Corridor and determine strategies for multi-jurisdictional land use planning efforts;
- Provide better coordination between the Regional Land Use Plan and the Regional Transportation Plan, with a particular focus on actions to encourage transit oriented development;
- Work to advance equity and address environmental justice in the implementation of the Regional Land Use plan and locally through land use and zoning strategies;
- Ensure consistency between the regional land use plan, local plans, and zoning regulations through implementation of smart growth strategies at the municipal level.

Major Activities:

- Work with the Capital Region Council of Governments to **review land use recommendations** between the two regional land use plans, **identify potential land use conflicts** for communities that share a boundary between the two states, and **develop recommendations** for implementation.

- Identify areas of intersection between the Regional Land Use Plan and the Regional Transportation Plan and **develop processes to better integrate land use and transportation priorities** to encourage high density, transit oriented development.

- Identify **specific actions that will advance equity and address environmental justice** through the Civic Engagement process and **meetings with targeted existing environmental justice groups** in the region.

- Develop **innovative smart growth strategies to promote higher density, transit oriented development** at locations identified along the Knowledge Corridor.

- Using the web-based, interactive Valley Vision Toolbox as an outreach and education tool, **develop new fact sheets, model bylaws, and identify case studies** on identified innovative smart growth strategies that encourage higher density, transit oriented development and advance equity and environmental justice.

- Provide **local technical assistance** to communities to assist in the adoption and implementation of zoning bylaws to promote higher density, transit oriented development and advance equity and environmental justice.

- Increase membership of the **Valley Development Council**, the implementation committee of the Valley Vision plan, to include **representatives from groups that represent low income / traditionally marginalized populations**.

Products/Outcomes:

- Recommendations to resolve land use conflicts across the state boundary between PVPC and CRCOG;

- Develop and implement process to better integrate land use and transportation priorities to encourage higher density, transit oriented development in identified locations;

- Three to five meetings with existing environmental justice organizations to better understand and develop solutions to advance equity and environmental justice in neighborhoods with identified environmental justice population groups, specifically in the urban core;

- New innovative smart growth strategies plus accompanying fact sheets, case studies, and model bylaws for the web-based Valley Vision Toolbox to encourage higher density, transit-oriented development, and advance equity and environmental justice;

- Adopted zoning regulations in 3-5 communities in the Pioneer Valley region that promote higher density, transit-oriented development and advance equity and environmental justice;

- Increased membership of the Valley Development Council to include representatives from groups that represent low income and traditionally marginalized populations.

2. Westfield River Wild and Scenic River and Advisory Committee

In 1993, the Westfield River, located in the western Hampshire and Hampden Counties, received Federal Wild and Scenic River Designation for its remarkable and unique geological features, fish populations, scenic vistas, and cultural resources. When a project either receives federal funding or requires a permit from a federal agency *and* is located within a quarter mile of the mean high water

mark of sections of the Wild and Scenic Sections of the Westfield River, the proponent must obtain comments and conditions from the National Park Service (NPS). The NPS is one of several federal and state agencies that sign off during the review process of a proposed project's plans. This process is designed to ensure that the river's remarkable wild and scenic qualities are considered during the planning stages of a project. The NPS is the designated federal administering agency for the Westfield River.

In addition to the federal protections granted to the Westfield River, a regional committee has been formed to promote policies that preserve the Westfield River. This committee is known as the Westfield River Wild and Scenic Advisory Committee, and it is composed of appointed representatives from Huntington, Cummington, Chester, Chesterfield, Middlefield, Worthington, Savoy, Becket, Washington, Windsor, the Pioneer Valley Planning Commission, the Trustees of Reservations, the Commonwealth of Massachusetts, National Park Service, and the Berkshire Regional Planning Commission.

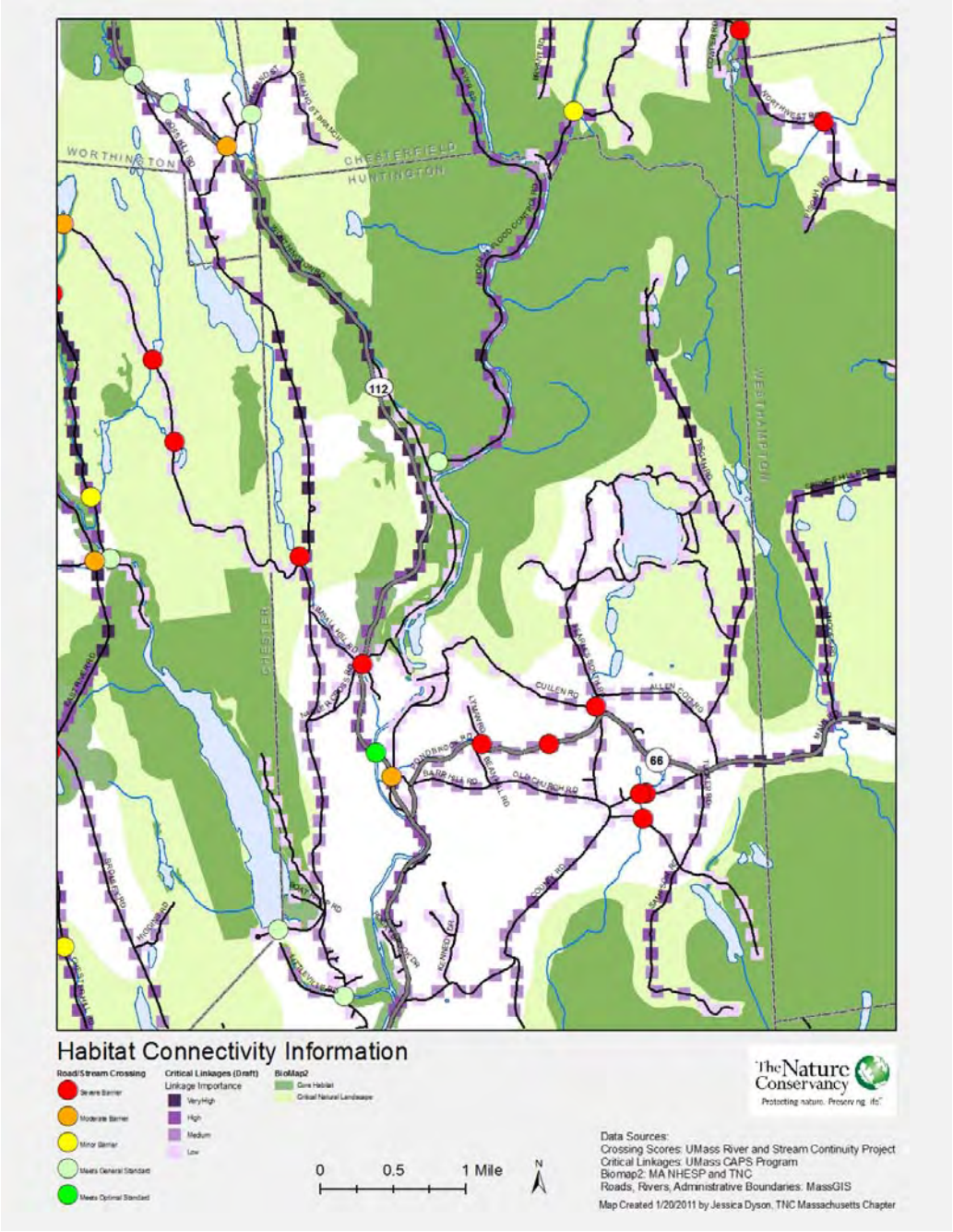
At this time, five communities have adopted some version of the Westfield River Wild and Scenic Bylaw. This bylaw restricts industrial and commercial uses within 100 feet of the water line (150 in Huntington) and regulates land use types to prevent pollutants from entering the river. The Pioneer Valley Planning Commission is currently in the process of leading the effort to update this bylaw to set aside a 200 foot buffer and restrict the accumulation of trash and parked cars along the shoreline. Once PVPC has helped the member communities adopt and implement this bylaw, surface water contamination will be mitigated by further increasing the scenic and physical protections granted to the Westfield River.

3. Habitat Continuity Partnership

The design and location of a transportation improvement project can impact people, wildlife, water, and habitat. Inadequate river crossings can cause washouts of the road during flood conditions, as well as impede the movement of wildlife including brook trout, salamanders, turtles, and mink. Well-designed crossings can provide safe passage for water and wildlife including large mammals, keeping all safely off the road. The U.S. Army Corps of Engineers website provides guidance and standards for complying with the stream crossing requirements that should result in enhanced aquatic passage and stream continuity. In an effort to determine where transportation projects can have the biggest positive or negative impact on movement of wildlife and connectivity of habitat, the University of Massachusetts, The Nature Conservancy, and many other partners have developed maps and data that may be useful for transportation planners.

Figure 15-1 shows points where roads cross a river (from the stream continuity database; raw data available at: www.streamcontinuity.org) and where road improvements that allowed for wildlife passage would provide the maximum benefits (from the UMass Critical Linkages analysis; raw UMass CAPS GIS and other data available at: www.masscaps.org). The background of the map represents a range of data about important wildlife habitat and rare species that make up Biomap2 (http://www.mass.gov/dfwele/dfw/nhesp/land_protection/biomap/biomap_home.htm). Areas identified in Biomap2 represent priority areas for protection of wildlife habitat in light of the changing climate.

Figure 15-1 - Habitat Connectivity Information for Huntington



A map of Huntington and surrounding towns showing road stream crossings (circles) and road segments (squares) with the greatest potential to either connect or fragment wildlife habitat (green land in background).

Regional and town planners can use three data sets to help decide whether habitat connectivity is an important consideration in a road improvement project, and make the best use of scarce financial resources, by answering the following questions:

- Does the road bisect important habitat as defined by BioMap2?
- Does the road represent a significant barrier as defined by Critical Linkages?

- Does current road/stream crossing represent a significant barrier as defined by the stream continuity data?

If the answer to any of these questions is yes, towns or other project proponents can get advice, permitting assistance, and potential funding assistance from a range of groups working to re-connect stretches of river and other habitat. In many cases, transportation improvements that benefit wildlife also benefit people by reducing road washouts and reducing animal-vehicle collisions. For more information, contact PVPC's planning staff or visit the websites listed above.

Figure 15-2 - Photos of Stream Crossings Re-designed to Connect Habitat

McNearney Road crossing of Shaker Brook, Becket, before. (Credit: Carrie Banks)

McNearney Road crossing of Shaker Brook, Becket, after. (Credit: Carrie Banks)

Dingle Road crossing of Bronson Brook, Worthington, before. (Credit: Carrie Banks)

Dingle Road crossing of Bronson Brook, Worthington, after. (Credit: Carrie Banks)

4. Regulatory Framework for Promoting Ecologically Sound Landscapes

Throughout the region, PVPC has led efforts to reform the outdated 1950s era zoning regulations of many of the region's cities and towns. This promotes development that is more in keeping with the historical character of New England and has occurred through funding received from the Commonwealth's Smart Growth Technical Assistance Program (FY 05, 06 & 07). PVPC has been a leader in the passage and implementation of cluster development bylaws, mixed use bylaws, low impact development standards, transfer of development rights programs, steep slope and open space overlay districts, as well as revising subdivision regulations. In concert, these policies support a regional response to promoting development that preserves open space, encourages sustainability, and is environmentally friendly.

5. Regional Planning For Open Space

a) Farmland

PVPC has worked with stakeholder groups, non-profits, municipalities and private citizens to develop long range visions for preserving the Pioneer Valley's most important environmental assets. In 2001, PVPC released *Growing Together: a Strategic Plan for Integrating Agriculture and Growth Management in the Connecticut River Valley of Massachusetts*. This document contained key actions steps for using economic development, zoning and public awareness to preserve the region's farmland.

PVPC has assisted four communities: Hadley; Hatfield; Easthampton; and Westfield to adopt Transfer of Development Rights bylaws or ordinances. These bylaws can help to mitigate the impacts of development on farmland by using private development funds to purchase development rights on farmland in return for high density development projects elsewhere in these communities. Hadley has also received contributions to its Route 9 mitigation fund from commercial developers along the Route 9 corridor; these funds have been used to preserve farmland.

b) Greenways and Habitat Corridors

In 2011, PVPC completed a regional trails map to encourage the use of alternative (non-automobile) modes of transportation by providing the public with a high quality map of bicycle, walking, and hiking trails across the Pioneer Valley region. These maps also contain a narrative to encourages the public to use alternative modes of transportation, with descriptions and photographs of the regional trails. A website linked with the PVPC website will be provided in the future. This website will further increase public access to the regional trails map and detailed hiking trail data. PVPC has also prepared a regional map and plan for preserving the Pioneer Valley's greenways focus areas. This plan identified the Holyoke Range, the Metacomet-Manadnock-Metabessett (MMM) Trail, the Upper Westfield River, the Manhan River, the Upper Connecticut River Valley, the Scantic River and Mount Hitchcock are target areas.

To accomplish these goals and preserve the region's environmental legacy, PVPC has completed the following tasks:

- Completed and distributed the Pioneer Valley Trails Map.
- Worked with the National Park Service on a recent feasibility study for designating the MMM Trail as a National Scenic Trail.
- Crafted new regulatory protections for key sections of the Westfield River.
- Promoted the passage of local funding mechanisms (the Massachusetts Community Preservation Act, chiefly) to secure local funding for land preservation efforts.

6. Water Quality Mitigation

PVPC has been a key collaborator and project leader on several water quality efforts within the region. The regional nature of water quality issues has required PVPC to straddle political boundaries and form coalitions that are capable of working towards the long term goal of high quality surface and groundwater supplies throughout the region. These projects and programs listed below detail the extent of PVPC's mitigation efforts.

7. Source Water Protection Plans

PVPC has written and drafted Source Water Protection Plans for several member communities. A Source Water Protection Plan is a guidance document for the protection of municipal water supplies. A Source Water Protection Plan examines all the factors that affect the watershed of a water supply including existing land uses and potential land uses allowed under current zoning, protected open space, public access and recreation, wildlife, and any other concerns of the community related in reference to the water supply. These plans make recommendations on the best practices for addressing any problems identified during the course of the assessment and protecting the quality and quantity of the water supply. The towns of Cummington, Easthampton, Hatfield, Huntington, Russell, and the Granville Reservoir have worked with PVPC to develop action plans for preserving their water supplies.

8. Combined Sewer Overflow Clean-Up

One hundred thirty four combined sewer overflows (CSOs) were identified in the seven communities located in the southern reach of the Connecticut River below the Holyoke Dam, in a 1988 engineering study completed for the Massachusetts Division of Water Pollution Control. This study, the Lower Connecticut River Phase II Combined Sewer Overflow Study (Metcalf & Eddy, Inc.), identified CSO locations, water quality issues associated with CSOs, and steps and costs for addressing the problem. CSO issues in seven communities–Agawam, Chicopee, Holyoke, Ludlow, South Hadley, Springfield, and West Springfield–were addressed in this study. The study determined that ninety percent of existing CSO discharges would need to be eliminated within the seven communities to achieve the goal of attaining Class B fishable/swimmable goal, at a cost of $377 million. In 2005, 72 CSOs in six communities remained. Agawam has eliminated all of its CSOs. This constitutes a forty percent reduction in the number of CSOs between 1988 and 2002. Dry weather overflows were reduced from thirty one in 1988 to zero in 2005.

Table 15-3 - CSO Historic Data

	Combined Sewer Overflows				Dry Weather Overflows		
Community	1988	2001	2005	2009	1988	2001	2005
Agawam	14	0	0	0	4	0	0
Chicopee	39	33	30	29	19	2	0
Holyoke	20	15	14	14	1	1	0
Ludlow	10	1	1	1	0	0	0
South Hadley	11	3	3	0	2	0	0
Springfield	32	25	24	23	5	0	0
West Springfield	8	1	0	0	0	0	0
Total	134	78	72	67	31	3	0

Area communities are continuing to work to control the CSO problem using a number of solutions, including:

- Long term control plans - Chicopee, Holyoke, and Springfield have developed plans to identify and prioritize appropriate abatement measures.
- Sewer separation - Separate storm drain and sewer lines can be installed to separate combined flows in the existing system and to allow for more capacity in the collection system.
- In-line storage - Holding tanks or enlarged storage pipes can be installed to hold combined flows until a storm has passed and the flows in the system have peaked. Those flows would then be returned to sewers instead of the river.

- Increased treatment capacity - Pump stations and wastewater treatment facilities can be upgraded to increase their capacity to handle additional storm flow, thereby decreasing flows to the river.
- Reduced infiltration and inflow - Sewer pipes can be improved to reduce inflow of groundwater and to separate streams from combined systems.
- Reducing stormwater at the source - Directing stormwater from impervious surfaces such as rooftops, driveways, and parking lots towards rain gardens, rain barrels, and other LID or infiltration systems.

9. Barnes Aquifer Protection Advisory Committee

The Barnes Aquifer is a sole-source aquifer west of the Connecticut River that serves as the municipal drinking water supply for four growing communities. The natural interdependence that results from sharing and directly impacting this regionally significant water supply gave rise to a collaborative effort, facilitated by PVPC, that is designed to protect and safeguard the Barnes Aquifer.

The Barnes Aquifer Protection Advisory Committee (BAPAC) is a coalition of four communities - Westfield, Holyoke, Easthampton, and Southampton - and the PVPC, which work together to protect the Barnes Aquifer, an important regional groundwater resource. The chief elected official of each member community appoints three representatives to the committee. These municipal members currently represent water, planning, conservation, and community development departments. PVPC designates one representative for the committee.

BAPAC educates and advises local governments, citizen groups, and small businesses about groundwater protection and effects on the aquifer. The committee reviews Developments of Regional Impact (DRI) within the aquifer and provides comments to approval authorities. DRI reviews evaluate both the proposed use and its potential for aquifer contamination and provisions within the site plan for treatment and infiltration of clean stormwater. DRI comments evaluate the proposed project's level of compliance with the local aquifer protection zoning bylaw, and it recommends Best Management Practices for aquifer protection that may have been overlooked by the proponent.

BAPAC is a truly regional response to an environmental issue of regional significance.

D. REGIONAL AIR QUALITY PLANNING ACTIVITIES

PVPC has formed partnerships with non-profits and municipalities to develop an action step for improving the region's air quality, specifically in relation to pollution that is a by-product of daily transportation uses. The following activities listed below detail the extent of PVPC's commitment to improving air quality.

1. International Council of Local Environmental Initiatives – Interstate 91 Assessment

In 2006, PVPC began a partnership with the International Council of Local Environmental Initiatives (ICLEI) and the Cities of Holyoke, Northampton, and Chicopee to assess the greenhouse gasses and other air pollution emissions coming from the region's transportation sectors. This assessment will provide local elected officials with a baseline analysis of the region's emissions profile, giving local elected officials a detailed understanding of steps that can be locally implemented to reduce greenhouse gasses. This analysis will provide decision makers with a clear picture of where green house gasses originate from within the region and enable clear, practical approaches to reducing emissions in an incremental, cost-effective manner.

2. Voluntary Vehicle Recycling Program

The Massachusetts Department of Environmental Protection and PVPC have partnered in a pilot program that has successfully removed older polluting cars from the region's streets and ways. The Voluntary Vehicle Recycling Program pays owners of cars that are legally operable a maximum of $500 towards the trade-in value of a car that was built before 1994. Recycled vehicles are dismantled at a licensed scrap yard and the components are sold on the open market for their raw value. To date, PVPC has purchased 64 cars throughout the region, and an estimated 319,000 pounds of Carbon Dioxide have been removed from the region's emissions stream.

3. Idling Reduction

In 2006, PVPC worked with DEP to reduce idling vehicles in Amherst, Northampton, and Easthampton. This involved a public awareness campaign that extended to municipal fleets, municipal signage, and the distribution of fliers and stickers within the school systems. Citizens were made aware of the five minute idling limit that exists in Massachusetts (M.G.L. Chapter 90 Section 16 A, Chapter 111, Section 142A, 310 CMR 7.11), and signs were posted to encourage citizens to comply with this five minute limit. This was designed to improve air quality and reduce the amount of air pollutants within the region's air column.

4. Regional Clean Energy Plan

Beginning in 2004, PVPC initiated a two year partnership with the Massachusetts Technology Collaborative to involve citizens of the region in a long term, sustained collaborative planning effort, the main focus of which was the development of a regional clean energy plan. Throughout the process, it became clear that the region wants to support the growing alternative energy economy while reaping the positive environmental benefits that would result from using cleaner electricity generating energy sources. PVPC will be evaluating and quantifying the action steps set forth in the Clean Energy plan to monitor strategy effectiveness. These strategies and measures from the Clean Energy Plan will be continued to be integrated and referenced for ongoing planning efforts.

E. ENVIRONMENTAL REVIEW OF PROJECTS INCLUDED IN THE RTP

All of the projects included as part of the Regional Transportation Plan for the Pioneer Valley Metropolitan Planning Organization were reviewed to assess their potential environmental impacts. This preliminary analysis was conducted using overlays of the following resource data:

- Registered Wetlands in the Pioneer Valley Region
- Registered Historic Districts in the Pioneer Valley Region
- National Heritage Endangered Species Program Priority Habitat Areas
- Valley Vision 2 Land Suitability Map for Development and Open Space

The projects identified in Chapter 5 and in Figure 5-9 were overlaid on the above referenced data to provide a review of their potential environmental impacts. Table 12-2 summarizes the potential impacts of each project. The "Construction" column identifies projects that have the potential to add to the existing highway system through the construction of a new roadway or bikeway, expansion of existing right of way, or other associated development.

The National Heritage Endangered Species Program (NHESP) Habitat column identifies projects that could potentially impact priority habitat areas under this program. The National Heritage Endangered Species Program (NHESP) Bio Core 2 Habitat column identifies projects that could impact specific areas necessary to promote the long term persistence of Species of Conservation Concern (those listed under the Massachusetts Endangered Species Act as well as additional species identified in the State

Wildlife Action Plan), exemplary natural communities, and intact ecosystems. Projects in areas identified in BioMap2 deserve careful thought as to their environmental impact. Depending on their design, projects in Core Habitat can have a particularly large positive or negative impact on natural lands.

Projects that were found to impact "Historical Resources" could have potential impacts on registered Historic Districts. Projects identified as having potential "Water Supply" impacts lie in close proximity to existing wetlands or aquifer protection areas. Air Quality (AQ) and Greenhouse Gas (GHG) identifies projects that may require air quality conformity.

Table 15-4 - Potential Environmental Impacts of High Priority Projects

Map Key	Project Name	Community	Expand Treansportation System	Prop. 2011 RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
1	Bridge Replacement and Bridge Rehabilitation	Chicopee	no	High	yes	yes	no	yes-wetland	No
2	Bridge Rehabilitation	Chicopee/Holyoke	no	High	yes	yes	yes	yes-both	No
3	Bridge Betterment	Cummington	no	High	yes	yes	no	yes-wetland	No
4	Bridge Replacement	Northampton	no	High	no	no	no	yes-wetland	No
5	Bridge Replacement	Worthington	no	High	n/a	n/a	n/a	n/a	No
6	Resurfacing and Related Work	Agawam	no	High	yes	yes	no	yes-wetland	No
7	Massachusetts Turnpike Off Ramp Congestion Project	Regionwide		High					No
8	Union Street Underpass	West Springfield	yes	High	no	no	no	yes-aquifer	Yes
9	Rte 159 (Main Street) Improvements	Agawam	no	High	no	no	no	yes-both	No
10	Main @ Maple and Jabish Intersection Improvements	Belchertown	no	High	no	no	yes	no	No
11	memorial Drive (Route 33) Traffic signal improvement	Chicopee	yes	High	no	no	no	yes-wetland	Yes
12	West St./Glendale St./Loudville/Pomeroy Meadow	Easthampton	no	High	yes	yes	no	yes-both	No
13	Route 5 Reconstruction from Ashley Ave.	Holyoke/West Springfield	yes	High	no	no	no	yes-both	Yes
14	Center Street (Route 21) reconstruction	Ludlow	yes	High	no	no	no	yes-both	Yes
15	Improvements to Allen street and Bicentennial Highway	Springfield	no	High	no	no	no	yes-aquifer	No
16	Signal and Intersection Improvements	Springfield	no	High	no	no	no	yes-aquifer	No
17	Boston Rd Reconstruction (Route 20)	Springfield/Wilbraham	yes	High	no	no	no	yes-both	Yes

Table 15-4 - Potential Environmental Impacts of High Priority Projects (cont.)

Map Key	Project Name	Community	Expand Treansportation System	Prop. 2011 RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
18	Bridge Reconstruction	Agawam / West Springfield	no	High	yes	yes	no	yes-wetland	No
19	Superstructure Replacement	West Springfield	no	High	yes	yes	no	yes-aquifer	No
20	I-91 Ramps at Exit 19	Northampton	no	High	no	no	no	yes-aquifer	No
21	I-291 congestion improvements	Regionwide	no	High					No
22	Connector, Rte 5 to Rte 57/rotary	Agawam	yes	High	no	no	no	yes-aquifer	Yes
23	Norwottuck Improvements	Amherst / Northampton / Hadley / Belchertown	no	High	yes	yes	yes	yes-both	No
24	Signal Upgrades on Route 33	Chicopee/South Hadley	no	High	no	no	no	yes-both	Yes
25	Damon Rd. Safety Improvement	Northampton	yes	High	yes	yes	no	yes-both	Yes
26	North end and Brightwood Infrastructure Improvements (North)	Springfield	no	High	no	no	no	yes-aquifer	No
27	Signal and Intersection Improvements	Northampton	no	High	no	no	no	yes-both	No
28	Traffic Signal Coordination	Regionwide	yes	High					Yes
29	At Grade Rail Crossing Improvements	Regionwide	no	High					No
30	Park and Ride	Regionwide	no	High					No
31	Intersection Improvements	Springfield	no	High	no	no	no	yes-aquifer	No
32	Rte 5 Reconstruction	West Springfield	no	High	no	no	no	yes-both	No
33	Bridge Replacement	Agawam/Springfield	yes	High	yes	yes	yes	yes-wetlands	Yes
34 Not Mapped	Truck Access Impr Route 5 to Merrick Neighborhood	Agawam/West Springfield	Yes	High	no	no	no	yes-aquifer	Yes
35 Not Mapped	Commuter Rail	Regionwide	Yes	High					Yes
36 Not Mapped	Freight Congestion	Regionwide	no	High					No
37 Not Mapped	Passenger Rail Operating Cost	Regionwide	Yes	High					Yes

Table 15-4 - Potential Environmental Impacts of High Priority Projects (cont.)

Map Key	Project Name	Community	Expand Treansportation System	Prop. 2011 RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
38 Not Mapped	Springfield Union Station Transportation Center	Regionwide	no	High					No
39 Not Mapped	Springfield Bus Maintenance and Storage Facility	Regionwide	no	High					No
40 Not Mapped	PVTA Fleet Renewal	Regionwide	no	High					No
41 Not Mapped	Vehicle Maintenance	Regionwide	no	High					No
42 Not Mapped	PVTA Facility Maintenance	Regionwide	no	High					No
43 Not Mapped	Bus Shelters	Regionwide	no	High					No
44 Not Mapped	Bus Stop Sign Replacement	Regionwide	no	High					No
45 Not Mapped	ITS/AVL and Communications Equipment	Regionwide	no	High					No
46 Not Mapped	Intelligent Farebox	Regionwide	no	High					No
47 Not Mapped	Westfield Intermodal Center	Regionwide	no	High					No
48 Not Mapped	Northampton Garage Rehabilitation	Regionwide	no	High					No
49 Not Mapped	MAP Van Program	Regionwide	no	High					No

Table 15-5 - Potential Environmental Impacts of Medium Priority Projects

Map Key	Project Name	Community	Expand Treansportation System	Prop. 2011 RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
1	Bridge Replacement	Easthampton	no	Medium	yes	yes	yes	yes-both	No
2	Bridge Replacement	Monson	no	Medium	no	no	yes	no	No
3	Bridge Replacement	Westhampton	no	Medium	no	yes	no	yes-wetland	No
4	Resurfacing and Related Work	Holyoke/West Springfield	no	Medium	yes	yes	no	yes-both	No
5	Structural Signing	Longmeadow to West Springfield	no	Medium					No
6	Route 116 (Notch) reconstruction	Amherst	no	Medium	yes	yes	no	yes-wetland	No
7	Resurfacing Route 23	Blandford / Russell	no	Medium	no	yes	no	yes-wetland	No
8	Route 9 Pavement Preservation	Cummington	no	Medium	yes	yes	no	yes-wetland	No
9	Route 5 resurfacing	Easthampton / Holyoke	no	Medium	yes	yes	no	yes-wetland	No
10	Route 9 reconstruction	Hadley	Yes	Medium	yes	yes	no	yes-both	Yes
11	Route 9 at Route 47 intersection improvements	Hadley	no	Medium	no	no	no	yes-both	No
12	Homestead Ave @ Lower Westfield Rd improvements	Holyoke	no	Medium	no	no	no	yes-wetland	No
13	Canal Walk Extension	Holyoke	no	Medium	no	yes	yes	yes-aquifer	No
14	Route 112 Resurfacing	Huntington	no	Medium	yes	yes	no	yes-wetland	No
15	Morgan Street rehab	South Hadley	no	Medium	yes	no	no	yes-wetland	No
16	Highway Reconstruction	Springfield	no	Medium	no	no	yes	yes-aquifer	No
17	Route 187 - Feeding Hills Road reconstruction	Westfield	no	Medium	yes	yes	no	no	No
18	Bridge Replacement	Holyoke	no	Medium	no	yes	yes	yes-aquifer	No
19	Bridge Replacement	Holyoke	no	Medium	yes	yes	yes	yes-aquifer	No
20	Bridge	Springfield	no	Medium	no	no	no	no	No
21	Bridge Replacement	Westfield	no	Medium	yes	no	no	yes-wetland	No
22	Resurfacing and Related Work	Brimfield/Palmer/Warren	no	Medium	no	no	no	yes-wetlands	No
23	N. Westfield St. / S. Westfield St. (Rte. 187)	Agawam	no	Medium	yes	yes	no	no	No

Table 15-5 - Potential Environmental Impacts of Medium Priority Projects (cont.)

Map Key	Project Name	Community	Expand Treansportation System	Prop. 2011 RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
24	Route 181 (Footprint)	Belchertown	no	Medium	yes	no	no	yes-both	No
25	Park and Ride	Northampton	no	Medium	yes	yes	yes	no	No
26	East St. (Design Exception)	Southampton	no	Medium	yes	yes	no	yes-wetland	No
27	Congamond Rd. (Rte. 168) Reconstruction	Southwick	no	Medium	no	no	no	yes-both	No
28	Columbia Greenway Rail trail and River Walk Phase I (Middle)	Westfield	no	Medium	yes	yes	no	no	No
29	Route 187 - Little River Road reconstruction	Westfield	no	Medium	yes	yes	no	yes-both	No
30	Route 187 - Sherman's Mill Bridge reconstruction	Westfield	no	Medium	yes	yes	no	yes-both	No
31	Bridge Betterment	Hatfield	no	Medium	no	no	no	yes-aquifer	No
32	Bridge Replacement	Holyoke	n/a	Medium	n/a	n/a	n/a	n/a	No
33	Superstructure Replacement	Holyoke	no	Medium	no	yes	no	yes-aquifer	No
34	Bridge Replacement	Huntington	no	Medium	yes	yes	no	yes-wetland	No
35	Bridge Preservation	Northampton	no	Medium	yes	yes	no	yes-both	No
36	Bridge	Springfield	no	Medium	no	no	no	yes-aquifer	No
37	Bridge Reconstruction	Springfield	no	Medium	no	yes	no	yes-aquifer	No
38	Bridge	Springfield	no	Medium	no	no	no	yes-aquifer	No
39	Bridge Rehabilitation	Springfield	no	Medium	no	no	no	no	No
40	Bridge Replacement	Ware	no	Medium	no	no	yes	no	No
41	Bridge Replacement	Ware	no	Medium	yes	yes	yes	yes-wetland	No
42	Deck Replacement	Ware	no	Medium	yes	yes	no	yes-wetland	No
43	Full Deck Replacement/Full Steel Painting	Ware	n/a	Medium	n/a	n/a	n/a	n/a	No
44	Resurfacing and Related Work	Chicopee/Ludlow/Palmer/Wilbraham	no	Medium	yes	yes	no	yes-both	No
45	Route 187/ 57 Intersection Improvements	Agawam	no	Medium	no	no	no	no	No
46	Sidewalk Construction	Agawam	n/a	Medium	n/a	n/a	n/a	n/a	No
47	Intersection Improvements	Easthampton 2011??	no	Medium	no	no	no	yes-wetland	No

Table 15-5 - Potential Environmental Impacts of Medium Priority Projects (cont.)

Map Key	Project Name	Community	Expand Treansportation System	Prop. 2011 RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
48	Route 9 reconstruction	Goshen	no	Medium	no	no	no	yes-wetland	No
49	Resurfacing Route 57	Granville	no	Medium	yes	yes	yes	yes-wetland	No
50	I-91 exit 17 at Route 141 intersection improvements	Holyoke	no	Medium	no	no	no	no	No
51	Resurfacing/Structures Maintenance	Longmeadow	no	Medium	no	no	yes	no	No
52	Route 57 Reconstruction	Southwick	no	Medium	no	no	no	no	No
53	Routes 10/202 resurfacing (northerly)	Southwick	no	Medium	no	no	no	yes-wetland	No
54	Routes 10/202 resurfacing (southerly)	Southwick	no	Medium	no	no	no	yes-wetland	No
55	Roosevelt Ave. @ Island Pond Rd and Roosevelt Ave @ Alden Street	Springfield	no	Medium	no	no	no	no	No
56	Connecticut Riverwalk	Springfield	no	Medium	no	no	no	yes-aquifer	No
57	At Grade Rail Crossing Improvements	West Springfield	no	Medium	yes	yes	no	yes-wetland	No
58	Rte. 10/202 CBD Traffic Improvements	Westfield	yes	Medium	yes	yes	no	yes-wetland	Yes
59	Bridge Rehabilitation	Ludlow/Springfield	no	Medium	yes	yes	yes	yes-wetland	No
60	Route 9 @ Old Ferry Road and Day Ave	Northampton	no	Medium	no	no	no	yes-aquifer	No
61	Main Street (Route 9) Downtown Impovments	Northampton	no	Medium	no	no	yes	yes-aquifer	No
62	King Street Reconstruction	Northampton	no	Medium	no	no	no	yes-aquifer	
63	Hatfield Street @ Route 5 and 10	Northampton	no	Medium	no	no	no	yes-aquifer	No
64 Not Mapped	I-91 Viaduct	Springfield	no	Medium	no	no	no	yes-aquifer	No
65 Not Mapped	I-91 Exit 15 Improvments	Holyoke	no	Medium	no	no	no	no	No

Table 15-5 - Potential Environmental Impacts of Medium Priority Projects (cont.)

Map Key	Project Name	Community	Expand Treansportation System	Prop. 2011 RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
66 Not Mapped	Track Expansion	Palmer	no	Medium	n/a	n/a	n/a	n/a	No
67 Not Mapped	High Speed Rail	Regionwide	n/a	Medium					TBD
68 Not Mapped	Double Stack	Regionwide	no	Medium					No
69 Not Mapped	Westfield Industrial Park Track Expansion	Westfield	no	Medium	n/a	n/a	n/a	n/a	No
70 Not Mapped	Northampton Intermodal Center	Northampton	no	Medium	n/a	n/a	n/a	n/a	No
71 Not Mapped	Route 9 BRT additional enhancements	Amherst-Hadley-Northampton	no	Medium	n/a	n/a	n/a	n/a	No
72 Not Mapped	Other BRT routes/enhancements	Regionwide	no	Medium					No
73 Not Mapped	Transfer facilities and canopies	Regionwide	no	Medium					No

Table 15-6 - Potential Environmental Impacts of Low Priority Projects

Map Key	Project Name	Community	Expand Transportation System	RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
1	Bridge Rehabilitation	Amherst	no	Low	yes	yes	no	yes-wetland	No
2	Resurfacing and Related Work	Westhampton	no	Low	n/a	n/a	n/a	n/a	No
3	Bridge Replacement	Chester	no	Low	yes	yes	no	yes-wetland	No
4	Bridge Replacement	Pelham	no	Low	no	no	no	yes-wetland	No
5	Bridge Rehabilitation	Russell	no	Low	yes	yes	no	yes-wetland	No

Table 15-6 - Potential Environmental Impacts of Low Priority Projects (cont.)

Map Key	Project Name	Community	Expand Transportation System	RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
6	N. Washington Street Reconstruction	Belchertown 2021	no	Low	yes	no	no	yes-wetland	No
7	Landscape/Roadside Development	Bernardston/Deerfield/ Hatfield/Northampton/ Holyoke	no	Low	n/a	n/a	n/a	n/a	No
8	Fuller Rd. Corridor Improvements	Chicopee	no	Low	no	no	no	yes-wetland	No
9	Chicopee Riverwalk	Chicopee	no	Low	no	no	no	yes-wetland	No
10	Elm Street Reconstruction	East Longmeadow	no	Low	no	no	no	yes-wetland	No
11	Route 9 reconstruction	Hadley	yes	Low	no	no	yes	yes-both	Yes
12	Amherst Rd. Reconstruction	Pelham	no	Low	yes	yes	no	yes-both	No
13	CT Riverwalk and Bikeway	West Springfield	no	Low	yes	yes	no	yes-both	No
14	Columbia Greenway Rail Trail Phase III (North)	Westfield	no	Low	yes	yes	no	yes-wetland	No
15	Bridge Replacement	Becket / Chester	no	Low	no	no	no	yes-wetland	No
16	Bridge Demolitions	Belchertown/Warren/ West Springfield	no	Low	n/a	n/a	n/a	n/a	No
17	Bridge Replacment	Easthampton	no	Low	yes	yes	no	yes-both	No
18	Bridge Replacement	Hadley	no	Low	yes	yes	no	yes-both	No
19	Bridge Rehabilitation	Ludlow / Wilbraham	no	Low	yes	yes	yes	yes-wetland	No
20	Bridge Replacement	Monson / Palmer	no	Low	yes	no	no	yes-both	No
21	Bridge Rehabilitation	Northampton	no	Low	yes	no	no	yes-both	No
22	Bridge	Northampton	no	Low	no	no	no	yes-both	No
23	Bridge Replacement	Southampton	no	Low	no	no	no	yes-aquifer	No
24	Bridge Betterment/Structures Maintenance	Springfield/West Springfield	no	Low	n/a	n/a	n/a	n/a	No
25	Bridge Rehabilitation	Westhampton	no	Low	no	yes	no	yes-aquifer	No
26	Bridge Replacement	Williamsburg	no	Low	no	no	no	yes-wetland	No

Table 15-6 - Potential Environmental Impacts of Low Priority Projects (cont.)

Map Key	Project Name	Community	Expand Transportation System	RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
27	Bikeway Loop	Agawam	no	Low	no	no	no	yes-both	No
28	Bikeway Loop	Agawam	no	Low	yes	yes	no	yes-both	No
29	Bay Road Improvements	Belchertown	no	Low	yes	yes	no	yes-both	No
30	Route 202 Resurfacing	Belchertown / Granby	no	Low	no	no	no	yes-both	No
31	Resurfacing and Related Work on Route 143	Chesterfield	no	Low	no	yes	no	yes-both	No
32	Connecticut Riverwalk	Chicopee	no	Low	yes	yes	no	yes-both	No
33	Montgomery Road improvements	Chicopee	no	Low	no	no	no	no	No
34	Rte. 112	Cummington	no	Low	yes	yes	no	yes-wetland	No
35	Intersection Improvements	Easthampton	no	Low	no	no	no	yes-aquifer	No
36	Mountain Rd (Route 141)	Easthampton	no	Low	yes	yes	no	yes-both	No
37	Roadway Reconstruction	Easthampton	no	Low	yes	yes	no	yes-both	No
38	West Street Reclamation	Goshen	no	Low	no	no	no	yes-wetland	No
39	Amherst Street improvements	Granby	no	Low	no	no	no	yes-wetland	No
40	South Maple Street	Hadley	no	Low	yes	yes	no	yes-both	No
41	Brimfield Road improvements	Holland	no	Low	yes	yes	no	yes-wetland	No
42	Intersection Improvements	Holyoke	yes	Low	n/a	n/a	n/a	n/a	Yes
43	Bikeway/Bike path Construction	Holyoke	no	Low	yes	yes	yes	yes-both	No
44	Cabot Street Reconstruction	Holyoke	no	Low	yes	yes	yes	yes-aquifer	No
45	Northampton Street Rehabilitation	Holyoke	no	Low	n/a	n/a	n/a	n/a	No
46	Route 5 Traffic Improvements	Longmeadow	yes	Low	n/a	n/a	n/a	n/a	Yes
47	Lower Hampden Rd Phase 2	Monson	no	Low	yes	yes	no	yes-wetland	No
48	Route 66 (West St.) at Earle Street intersection improvements	Northampton	no	Low	yes	yes	yes	yes-both	No
49	Mountain Rd (Route 5) improvements	Northampton	no	Low	yes	yes	no	yes-both	No
	Landscape/Roadside Development	Northampton	no	Low	n/a	n/a	n/a	n/a	No

Table 15-6 - Potential Environmental Impacts of Low Priority Projects (cont.)

Map Key	Project Name	Community	Expand Transportation System	RTP Priority	NHESP Habitat	NHESP Bio Core 2 Habitat	Historic Resources	Water Supplies	AQ/GHG Review
51	Glendale Road Reconstruction	Northampton	no	Low	yes	no	no	yes-both	No
52	Ryan Road Reconstruction	Northampton	no	Low	no	yes	no	yes-both	No
53	Rte. 32 (Ware Road)	Palmer	no	Low	no	no	no	yes-both	No
54	Route 20 improvements	Palmer	no	Low	no	no	no	yes-both	No
55	Route 116 (Main St)	Plainfield	no	Low	yes	yes	no	yes-wetland	No
56	Glendale Rd. (Phase II)	Southampton	no	Low	no	no	no	yes-aquifer	No
57	Highway Reconstruction	Southwick	no	Low	no	yes	no	yes-wetland	No
58	Plumtree Rd improvements	Springfield	no	Low	no	no	no	yes-both	No
59	Main St, Front, Route 141 Improvements (Indian Orchard)	Springfield	no	Low	no	no	no	no	No
60	Intersection Improvements	Springfield	no	Low	no	no	no	no	No
61	Intersection Improvements	Springfield	no	Low	no	no	no	yes-aquifer	No
62	Intersection Improvements	Springfield	no	Low	no	no	no	no	No
64	Resurfacing Route 57	Tolland	no	Low	no	no	no	yes-wetland	No
65	Sidewalk improvements	Wales	no	Low	yes	no	no	yes-wetland	No
66	Ware River Valley Preservation Project	Ware	no	Low	yes	yes	no	yes-both	No
67	Intersection Improvements	West Springfield	no	Low	no	no	no	no	No
68	Intersection Improvements	West Springfield	no	Low	no	no	no	no	No
69	Western Avenue Highway Improvement	Westfield	no	Low	no	no	no	no	No
70	Columbia Greenway Rail Trail and River Walk Phase II (South)	Westfield	no	Low	no	no	no	no	No
71	Safe Routes to School	Westfield	no	Low	no	no	no	yes-aquifer	No
72	Southampton Rd.	Westhampton	no	Low	no	no	no	no	No
73	Chesterfield Rd.	Westhampton	no	Low	no	no	no	no	No
74	Kings Highway and Reservoir Rd	Westhampton	no	Low	no	no	no	no	No

Figure 15-3 - Regional Transportation Plan High Priority Projects with Natural Environment Constraints

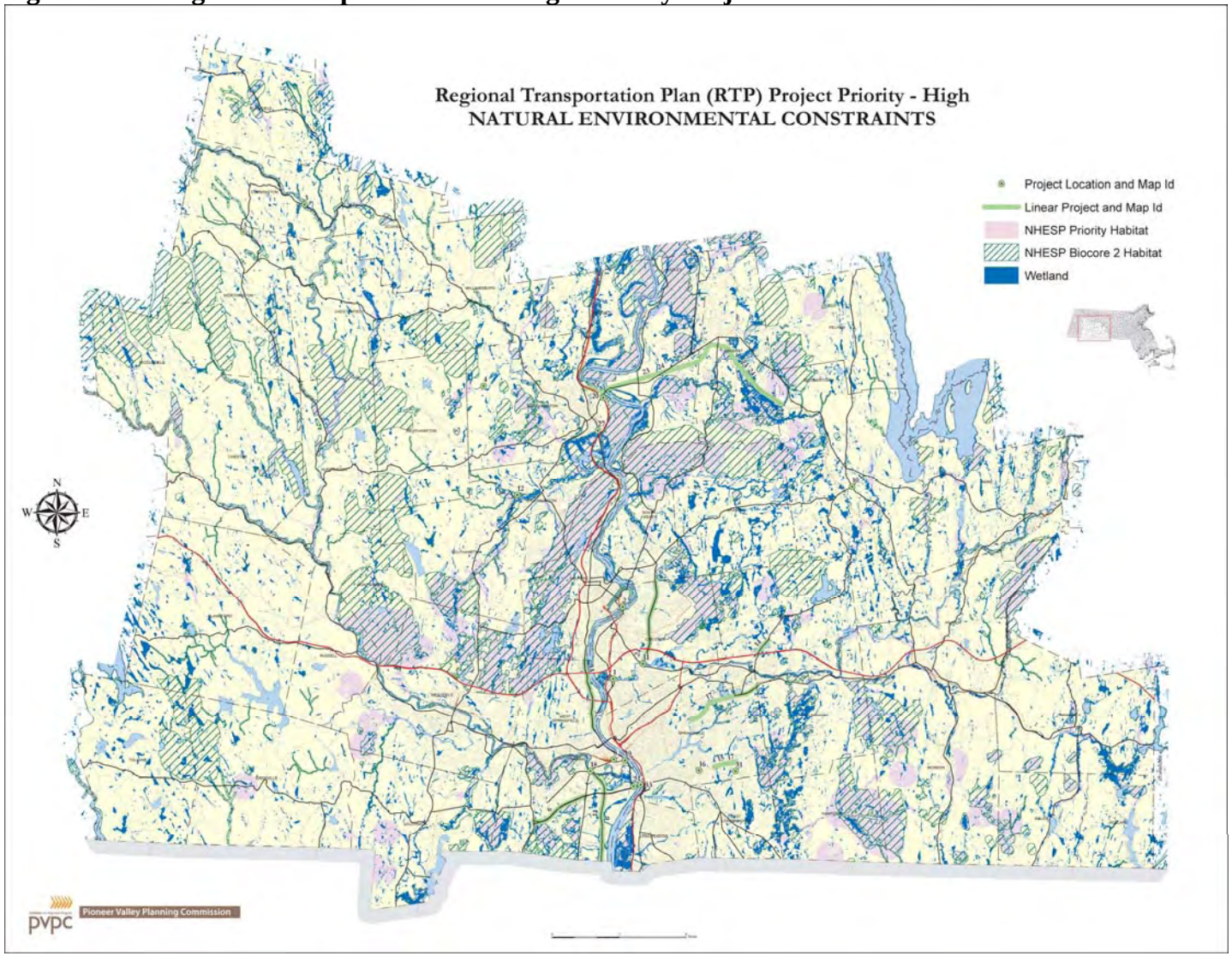


Figure 15-4 - Regional Transportation Plan Medium Priority Projects with Natural Environment Constraints

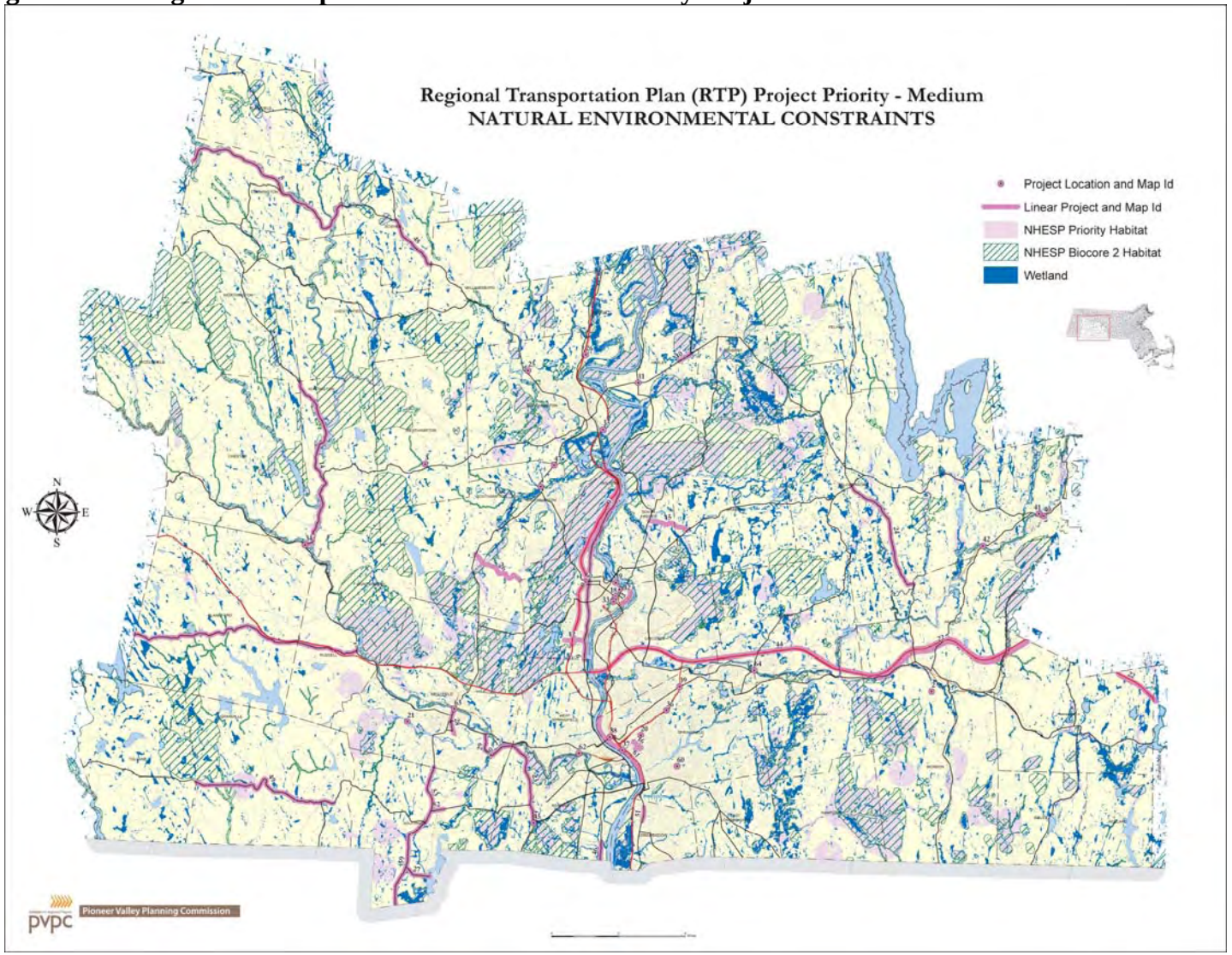
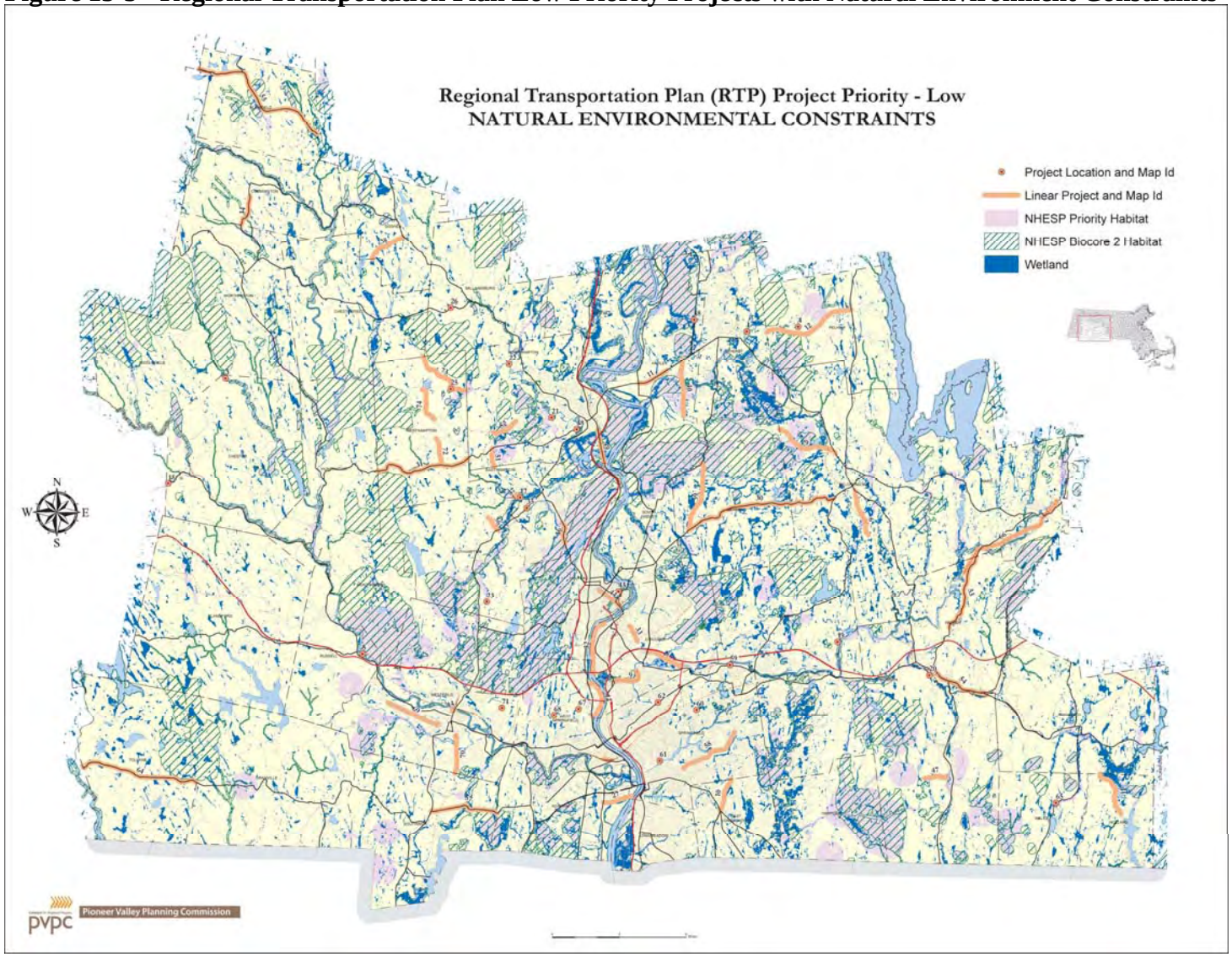


Figure 15-5 - Regional Transportation Plan Low Priority Projects with Natural Environment Constraints



CHAPTER 16

PUBLIC PARTICIPATION SUMMARY

The Draft Regional Transportation Plan for the Pioneer Valley (RTP) underwent a public review and comment period consistent with the Pioneer Valley Region Public Participation Process. A series of public meetings were held to present an overview of the RTP process and solicit comments on regional transportation needs and issues to be included in the 2012 Update to the Regional Transportation Plan for the Pioneer Valley. A total of six meetings were scheduled for 7:00 PM at the following locations:

- Tuesday May 4, 2010 – Pioneer Valley Planning Commission, Springfield, 60 Congress Street
- Thursday, May 6, 2010 - Northampton City Hall Hearing Room, 210 Main Street
- Tuesday, May 11, 2010 – Davenport Town Offices, Chesterfield, Main Road
- Tuesday, May 18, 2010 – Bangs Community Center, Amherst, South Meeting Room 101
- Thursday, May 20, 2010 - Ware Town Hall, Selectman's Meeting Room, 126 Main Street
- Monday, May 24, 2010 - Westfield City Hall, Room 201, 59 Court Street

The PVPC also gave an overview of the RTP and regional transportation planning process at a number of meetings of regional organizations in the Pioneer Valley. This allowed staff the opportunity to extend outreach efforts to a higher level and address specific questions regarding the development of the RTP. The following presents a summary of these additional outreach efforts:

- Thursday, May 6, 2010 – Springfield Renaissance High School, 9:15 AM, 1170 Carew Street
- Thursday, October 14, 2010 – PVPC Commissioner's Meeting, 6:30 PM, Pioneer Valley Planning Commission, Springfield, 60 Congress Street
- Saturday, October 24, 2010 – Massachusetts Climate Action Network Annual Conference, 1:00 PM, Clark University, Worcester, MA

A total of four focus group meetings were held at the PVPC to discuss issues surrounding the regional transportation plan development. Focus groups discussed the transportation needs and issues of the region, identified potential strategies to address these needs, and also discussed the future transportation projects that should move forward to address the existing needs.

- Wednesday, September 8, 2010 – Infrastructure Focus Group
- Tuesday, September 14, 2010 – Transit Focus Group
- Tuesday, September 21, 2010 – Bicycle and Pedestrian Focus Group
- Wednesday, September 29, 2010 – Environment, Sustainability and Climate Change Focus Group

A. DRAFT RTP

The PVPC utilized existing committees such as the Joint Transportation Committee, Pioneer Valley Executive Committee, and Pioneer Valley Metropolitan Planning Organization to provide routine status updates in the development of the Draft RTP. A brief presentation on the RTP was given, and comments received as part of the meeting were incorporated into the Draft RTP. The monthly JTC meetings were particularly useful to receive feedback from local communities on the content of the RTP.

An environmental consultation day was scheduled to allow the opportunity for discussion and comment on the potential environmental impacts of transportation projects included in the regional transportation plan. PVPC created larger scale maps of many of the figures presented in the RTP and invited a number of special interest groups to comment on the Draft RTP.

- Wednesday, July 13, 2011 – Environmental Consultation Day, 9:00 AM – 4:00 PM, PVPC Office

Two public meetings to solicit public comments on the Draft Regional Transportation Plan were scheduled for 7:00 PM at the following locations:

- August 9, 2011 - Northampton City Hall City Council Chambers, 210 Main Street
- August 18, 2011 - Pioneer Valley Planning Commission, Springfield, 60 Congress Street

Copies of the Draft RTP were made available for public review at: the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, University of Massachusetts (Du Bois Library), Ware and Westfield libraries; the Springfield office of PVPC; and, on-line from PVPC's web page at www.pvpc.org.

A summary of all comments received on the Draft RTP is presented in Table 16-1.

Table 16-1 - Comments Received on the Draft RTP

No.	Name	Organization	Comment	PVPC Response
1	James Lowenthal	MassBike	Bike Lanes reduce VMT because no one drives to bike lanes There is no net gain of VMT from car travel to rail trails	Verbal comments from Environmental Consultation Day. Comments Noted
2	George Reichert	Email Comment	Question Regarding van or other transportation to and from Blandford, Huntington, Granville and Russell	Emailed Back for more details and clarity on question. No response to PVPC's Email from Mr. Reichert
3	John Sargent	U.S. Army Corp Of Engineers. Email Comment	Link to the organization's website which has details regarding permits issued under section 404 of Clean Water Act for discharge of dredge or fill materials in Waters of the U.S. and section 10 of Rivers and Harbors Act for work in Navigable Waters. Contact information of Paul Sneeringer who leads the program for US Army Corp of Engineers permitting the MassDOT projects.	PVPC reviewed the link which had details regarding the latest MassDOT projects that were issued the permits under the mentioned acts. Comment was noted and the details were found to be pertaining to individual projects more than to the plan as a whole.
7.	Jonathan Tucker	Amherst Planning Department Email Comment	Recommended the addition of the Central Corridor (NECR) railroad line into the RTP. (Full comments and supporting materials attached.)	PVPC recommends adding the Freight Rail project as described in the State Rail Plan into the RTP. It is also recommended to add the Passenger Rail component as a Visionary project.
8.	Andy Finton	The Nature Conservancy	Recommendations to consolidate some key RTP strategies, relocate the section on Habitat Connectivity, add a reference to the Army Corps of Engineers stream crossing standards, and add additional information to projects in Chapter 15 that are identified as having potential BioMap2 impacts (see attached letter).	PVPC recommends amending all of the Nature Conservancy's comments into the Final RTP.
9.	Teri Anderson	Director of Community and Economic Development, Northampton, MA	Add additional information into the RTP to describe the planned enhancements to passenger rail service from Vermont to New Haven, CT. Include an additional four priority transportation improvement projects in the Final RTP (see attached letter).	PVPC recommends amending all of the City of Northampton's comments into the Final RTP.
10.	Bob Frey	Director of Planning Systems Information – MassDOT	Add additional language to Chapter 8 – Sustainability on the implementation of Massachusetts Statewide CO2 Emissions Estimates (see attached text)	PVPC recommends the addition of the suggested language to the Final RTP.
11.	Patricia Appelbaum	Amherst Resident	Recommends establishing: a dedicated travel lane on Route 9 for express bus service; free shuttle service for the shopping areas along Route 9 in Hadley, MA; and, a dedicated shuttle bus or rail spur from Amherst to Northampton if rail service is moved.	Comments Noted.
12.	Justin Cascio	Northampton resident	Advocates that changes in transportation infrastructure encourage more people to choose methods others than cars for their daily travel.	Comments Noted.
13.	Judith Fine	Northampton resident	Need for additional bicycle and pedestrian amenities along Damn Road in Northampton.	The proposed Damon Road improvement project in Northampton is included as part of the RTP.

Table 16-1 - Comments Received on the Draft RTP (cont.)

No.	Name	Organization	Comment	PVPC Response
14.	John Bennett	Massachusetts Senior Action Council – Comments at 8/18/2011 public meeting	The fare/cost for the senior dial a ride service is disproportionate to the senior population. This cost is unfair to many of the senior population who mostly have a strict budget. Senior population and transportation access is not being addressed properly. The population growth of the senior population is considerable and this growth will impact the needs of the senior population. Many seniors can not drive but do not have appropriate services provided to them and the current service is not adequate. Alternative means are not considered and money needs to be invested into a study to identify those alternatives. Senior dial a ride service is used primarily for traveling to medical appointments and shopping trips. The senior dial a ride service does not operate late enough. It would be great if the service could be used for recreational and social trips. Without transportation services senior populations can feel socially isolated and are dependent on family, friends and strangers to travel.	Mr. Bennett's comments are consists with the goals of the RTP to provide a complete choice of adequate travel options that are accessible to all residents, visitors, and businesses. PVPC has committed to meet with the Springfield division of the Massachusetts Senior Action Council in the near future to discuss their comments in greater detail.
15.	Mary MacInnes	Pioneer Valley Transit Authority	Major PVTA comments: 1. Pages 185, 252, and 257-8: Update the financial forecast on using revised farebox, advertising and state/federal grant revenue estimates. Delete references to service cuts, modify to state that PVTA will need to accumulate a deficit in order to maintain existing service, and fares will need to be increased on a regular basis.	Will update using new info provided.
			2. Page 42: Correct FY2011 annual operating budget amount and delete reference to forward funding.	Will update using info provided.
			3. Page 44: Update fleet information to include 10 hybrid and 18 clean-diesel buses arriving fall 2011.	Will update.
			4. Pages 110 and 174: Cite Springfield Bus Terminal as a system security concern.	Will update.
			5. Page 181: Raise priority of increasing number of bus riders to school to "Immediate."	Recommend raising priority as suggested.
			6. Page 186: Raise priority of park and ride lots for express service to "Immediate.	Recommend raising priority as suggested.
			7. Page 20: Belchertown transit center proposal should be reconsidered.	Belchertown Transit Center proposal was part of state school redevelopment plan. Recommend retaining it, with appropriate scale to be determined by transit needs of the development and community.

Table 16-1 - Comments Received on the Draft RTP (cont.)

No.	Name	Organization	Comment	PVPC Response
			8. General comment: reduce emphasis on express bus services.	Noted.
			9. Numerous minor recommendations to clarify text and correct errors.	Will update.
16.	Michael Ohl	Town of Hatfield	1. Proposed infrastructure improvements along Route 5 in the Town of Hatfield will support and promote economic development consists with the goals of the RTP.	Comment noted.
			2. Chapter 3 of the Draft RTP identifies locations that could see increases in future truck traffic. The Town of Hatfield expects to see increases in truck traffic along Route 5 as well.	PVPC recommends included this section in Chapter 3 of the RTP.
			3. This section of Route 5 does not appear as part of the congested roadways identified in Chapter 6. Congestion could increase along Route 5 in the future as a result of this project.	PVPC recommends monitoring this section of Route 5 as part of the CMP.
			4. The future forecasts for employment and trip generation for the Town of Hatfield in Chapter 10 need to account for the anticipated economic development along Route 5.	Employment forecasts included in the RTP are constrained by a regional target. PVPC is in the process of updating the regional transportation model. Additional project specific information can be included as it becomes available.
17.	Rob Kusner	Town of Amherst	Support for the Norwottuck Rail Trail and Central Corridor freight/passenger rail projects.	PVPC recommends adding the Freight Rail project as described in the State Rail Plan into the RTP. It is also recommended to add the Passenger Rail component as a Visionary project.
18.	Amy Singler	American Rivers	1. Recommendation to strengthen the sections of the RTP on stream crossings to specifically reference the U.S. Army Corps of Engineers regulations.	PVPC recommends adding this reference into the Final RTP.
			2. It would be useful to note in Chapter 4 that safety and liability issues at dams can be solved by removal as well as repair.	PVPC recommends adding this additional language to Chapter 4 of the RTP.
19.	Richard A. Cohen, Mayor Fred B. Arnold, Chair – Board of Selectmen	Town of Agawam Town of Southwick	Requests the completion of the Route 57 Phase II extension project from South Westfield Street in Agawam to the Town of Southwick.	PVPC has included this project as a "Visionary" project in the Draft RTP.
20.	Robert Thompson	Westfield River Wild & Scenic Advisory Comm.	1. Water Quality is not included as an indicator in Tables 8-1 and 8-2.	PVPC recommends adding this indicator into the two tables.
			2. Include the impact of gravel roads maintenance on water quality in Chapter 8.	PVPC recommends adding this language as requested.
			3. Link the three Sustainability strategies that relate to fish and wildlife passage.	PVPC recommends making this change.
			4. Make changes to the Westfield River Wild & Scenic Advisory Committee write up in Chapter 15.	PVPC recommends making these changes.

Table 16-1 - Comments Received on the Draft RTP (cont.)

No.	Name	Organization	Comment	PVPC Response
			5. Provide a list of structurally deficient and functionally obsolete bridges to the Westfield River Wild & Scenic Advisory Committee to allow for feedback on projects that might consider Section 7 review.	Bridge list to be sent as requested.
			6. Support for the Keystone Arch Bridge project.	Project is included as part of the financially constrained portion of the RTP.
21.	Michael Chong	Federal Highway Administration	1. Page 66 - Air Quality Conformity Determination There are projects in the transportation model that do not appear to be recommended for construction in the RTP Financial Plan. FHWA/FTA had previously commented that only financially viable projects should be modeled and included in the conformity analysis. The Additional "Vermonter" passenger rail service and the New Commuter Rail Service: Hartford, CT to Greenfield, MA were not included in the financial plan and therefore are not viable projects. Also, the Boston Region MPO has a good example that highlights regionally significant projects under construction and those recommended in the financial constrained section of the RTP. Only projects that fall into those two categories should be included in the model.	Comment noted. Construction of the relocation of the Vermonter Rail Service is completely funded. This information has been included as part of the Financial Plan. Improvements required as part of expanded Springfield/ Hartford/New Haven Rail Service lie entirely in the State of Connecticut and will be funded by ConnDOT. Additional information on the expanded passenger rail service has been included in the "Visionary" section of Chapter 11.
			2. The staff's work on the pavement management system is thorough and is a good example for other MPOs. FHWA would like to see a connection with the financial plan in terms of the condition of pavements based on the recommendation of projects. A backlog of repair work by community was identified on Table 7-3, and it would be insightful to see a connection with the financial plan.	Figure 12-3 uses the PVPC pavement management database to show the impact of the Financial Plan on the regional OCI over the life of the RTP. Additional text has been added to Chapter 12 to clarify this analysis.
			3. Table 10-4, The list of projects in this table does not appear to be consistent with the conformity determination in the TIP.	To avoid confusion, Table 10-4 was removed from the RTP. Table 13-2 is the correct version of the regionally significant projects and is consistent with the FFY2012 – 2016 TIP..

Table 16-1 - Comments Received on the Draft RTP (cont.)

No.	Name	Organization	Comment	PVPC Response
			4. Table 11-12 (High Priority Projects), Table 11-13 (Medium Priority), Table 11-14 (Low Priority). It is unclear the connection between those projects and the RTP financial plan. Are those project costs inflated to Year of Expenditure, and included in one of timeframes recommended by MassDOT? (2012-2015, 2016-2020, 2021-2025, 2026-2030 or 2031-2035). Also, there are tables in the RTP where the revenue from FY 2011 is used to fund projects, whereas the timeframe of the RTP begins in FY 2012. Revenue from FY 2011 cannot be used to fund highway projects (see table 12-1, 12-7 etc). Please highlight the total costs of projects recommended in the timeframes (2012-2015, 2016-2020 etc), so that a comparison of the revenue can be made for financial constraint.	"High," "Medium," and "Low" priority projects are identified in Chapter 11 to recognize the priority the MPO gives to recommended transportation improvements included in the RTP. All projects have been inflated by 4% per year and are included as part of the financial element of the RTP. To avoid confusion all regional project priorities are included in Chapter 11 and all project cost information is included in Chapter 12.
			5. Table 12-1, Projected Highway Revenue - As previously commented, the RTP cannot use revenue from FY 2011 to fund projects in the RTP. Please include a summation of the highway projects recommended in Tables 12-7, 12-8, 12-9, 12-10 and 12-11, so that a determination on financial constraint can be made.	FY2011 was included for the sole purpose of providing information on projects that appeared in the FY2011 year of the TIP. No FY2011 money was used to fund projects beyond this year. All FY2011 projects have been removed from the RTP.
			6. The Year of Expenditure inflation factor will need to be applied to all projects, including the projects that are in the timeframe of the TIP.	All project cost estimates reflect a 4% per year inflation factor.
			7. All projects over $10M will need to be in the RTP financial plan prior to any FHWA action including the Springfield I-91 Viaduct.	Comment noted.
22.	David Mohler	MassDOT	1. Update the title of the MassDOT Highway Division Administrator	Change made as requested.
			2. Grammatical changes to pages 49 and 179.	Changes made as requested.
			3. Include the text provided by the Office of Transportation Planning for green house gas emissions reduction for GreenDOT implementation.	Text will be included in the Final RTP as requested.
			4. Table 9-1 appears to have been cut off.	This is a formatting error and will be corrected in the Final RTP.
			5. The Draft RTP refers to FY2011 – 2015 in Chapter 12. This should be changed to FY 2012 – 2015.	Change made as requested.
			6. Bridge projects and non-major infrastructure projects do not need to be itemized in the RTP.	Comment noted.
			7. Add a reference to the Bay State Greenway under the "Maintain and Expand the Regional Bike Network Connectivity" Need.	Additional information will be added as requested.

CHAPTER 17

PIONEER VALLEY MPO ENDORSEMENT

The signatures below signify that all members of the Pioneer Valley Region's Metropolitan Planning Organization, or their designees, have met on August 30, 2011 and discussed the following item for endorsement: The Pioneer Valley Region's Federal Fiscal Year 2012 Regional Transportation Plan (RTP)

Massachusetts Department of Transportation (Mass DOT)
I, Secretary of the Massachusetts Department of Transportation, hereby
☒ Endorse ☐ Do Not Endorse the above referenced item.

Jeffrey Mullan — 30 Aug 11
Secretary &CEO Mass DOT — Date

Massachusetts Department of Transportation Highway Division
I, Acting Administrator of the Highway Division of MassDOT, hereby
☑ Endorse ☐ Do Not Endorse the above referenced item.

for Frank DePaola — 08/30/11
Acting Highway Administrator, Mass DOT — Date

Pioneer Valley Planning Commission (PVPC)
I, Chair of the Pioneer Valley Planning Commission, hereby
☐ Endorse ☐ Do Not Endorse the above referenced item.

Richard Butler — 8/30/11
Chair - PVPC — Date

Pioneer Valley Transit Authority (PVTA)
I, Administrator of the Pioneer Valley Transit Authority, hereby
☑ Endorse ☐ Do Not Endorse the above referenced item.

Mary MacInnes — 8/30/11
Administrator - PVTA — Date

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

Domenic Sarno — Date
Mayor-Springfield

City of Chicopee
I, Mayor of the City of Chicopee, hereby
☑ Endorse ❑ Do Not Endorse the above referenced item.

Michael Bissonnette — 8/30/11 Date
Mayor-Chicopee

City of Northampton
I, Mayor of the City of Northampton, hereby
❑ Endorse ❑ Do Not Endorse the above referenced item.

Mary Clare Higgins — Date
Mayor-Northampton

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

Edward J. Gibson — Aug 30, 2011 Date
Mayor-West Springfield

Town of East Longmeadow
I, Board of Selectmen member of the Town of East Longmeadow, hereby
❑ Endorse ❑ Do Not Endorse the above referenced item.

Enrico Villamaino — Date
Selectman-East Longmeadow

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

Marcus Boyle — 30 Aug 11 Date
Selectman-Hatfield