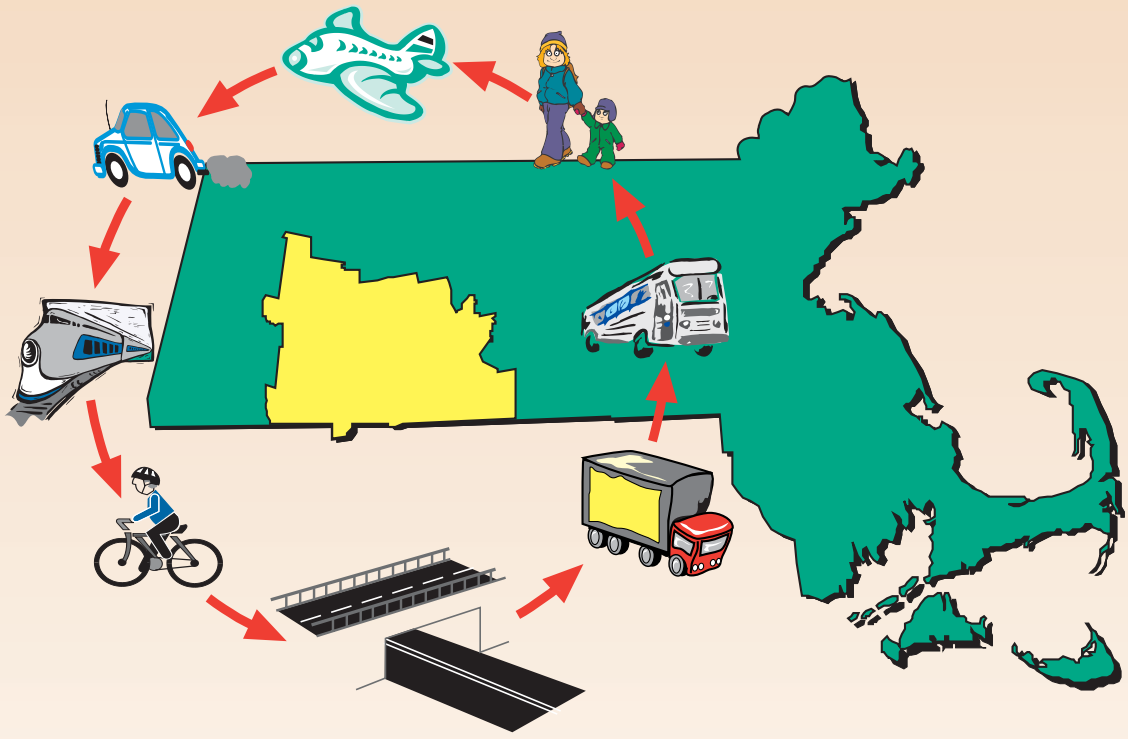
RTP

REGIONAL TRANSPORTATION PLAN

for the Pioneer Valley Metropolitan Planing Organization

2003 Update



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2003 Update to the Regional Transportation Plan

Final Report – September, 2003

Prepared by the
Pioneer Valley Planning Commission

For the Pioneer Valley
Metropolitan Planning Organization

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Prepared in cooperation with the Massachusetts Highway Department, the U.S. Department of Transportation - Federal Highway Administration and Federal Transit Administration, and the Pioneer Valley Transit Authority.

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CHAPTER 1

2003 Update To The Pioneer Valley Regional Transportation Plan

The Pioneer Valley Regional Transportation Plan (RTP) outlines the direction of transportation planning and improvements for the Pioneer Valley through the year 2025. 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 2000) 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 Transportation Equity Act for the 21st Century (TEA-21) 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 2025.

CHAPTER 2

Transportation Planning Process

A. Requirements

1. Transportation Equity Act for the 21st Century (TEA-21)

a) Transportation Equity Act for the 21st Century

On June 9, 1998, the President signed into law PL 105-178, the Transportation Equity Act for the 21st Century (TEA-21) authorizing highway, highway safety, transit and other surface transportation programs for the next 6 years. TEA-21 builds on the initiatives established in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), which was the last major authorizing legislation for surface transportation. This new Act combines the continuation and improvement of current programs with new initiatives to meet the challenges of improving safety as traffic continues to increase at record levels, protecting and enhancing communities and the natural environment as we provide transportation, and advancing America's economic growth and competitiveness domestically and internationally through efficient and flexible transportation.

TEA-21 will expire at the end of FY 2003 (October 1, 2003). New versions of the next transportation bill are currently under development.

Significant features of TEA 21 include:

- Assurance of a guaranteed level of Federal funds for surface transportation through FY 2003. The annual floor for highway funding is keyed to receipts of the Highway Account of the Highway Trust Fund (HTF). Transit funding is guaranteed at a selected fixed amount. All highway user taxes are extended at the same rates as when the legislation was enacted.

- Extension of the Disadvantaged Business Enterprises (DBE) program, providing a flexible national 10 percent goal for the participation of disadvantaged business enterprises, including small firms owned and controlled by women and minorities, in highway and transit contracting undertaken with Federal funding.

- Strengthening safety programs across the Department of Transportation (DOT). New incentive programs, with great potential for savings to life and property, are aimed at increasing the use of safety belts and promoting the enactment and enforcement of 0.08 percent blood alcohol concentration standards for drunk driving. These new incentive funds also offer added flexibility to States since the grants can be used for any Title 23 U.S.C. activity.

- Investing in research and its application to maximize the performance of the transportation system. Special emphasis is placed on deployment of Intelligent Transportation Systems to help improve operations and management of transportation systems and vehicle safety.

- Continuation of the proven and effective program structure established for highways and transit under the landmark ISTEA legislation. Flexibility in the use of funds, emphasis on measures to improve the environment, focus on a strong planning process as the foundation of good transportation decisions-all ISTEA hallmarks-are continued and enhanced by TEA 21.

- Consolidating the 16 factors from ISTEA into the 7 general issue areas that were originally included in the Administrative NEXTEA proposal. None of the new factors explicitly requires coordination of Transportation and Land Use. Only issues that involve "quality of life" should include such coordination.

- The 7 issue areas "shall be considered", however, a failure to consider any specific factor in formulating plans, projects, programs, strategies and certification processes is not reviewable in court.

- The expansion or designation of existing or new MPO boundaries due to the imposition of any new air quality standards will not automatically occur. Changes in MPO boundaries will be determined by an agreement between the Governor and the affected local governments.

- The states are given flexibility to move projects within a three year Transportation Improvement Program without separate approval or action by the USDOT, provided the MPO concurs.

- Freight shippers, providers of freight transportation services, and representatives of users of public transit are added to the list of persons and groups to be given opportunity to comment on long-range plans and TIPs.

- The states and MPOs can include an illustrative list of projects that would have been included in the plan or TIP if additional resources were to become available. This provision, however, was not intended to affect, in any way, the fiscal constraint requirements or conformity requirements of the plan or TIP.

- The state or MPO may select projects for implementation from the list of "illustrative" projects, but the approval of the secretary of the USDOT is required and conformity would subsequently have to be determined.

- Bicycle and pedestrian projects must be given special consideration in developing the plan and TIP.

- The states and MPOs must cooperatively develop estimates of funds available to support plan implementation.

- USDOT must encourage each MPO to coordinate in the design and delivery of transportation services with governmental agencies and non-profit organizations that receive federal assistance from other than USDOT.

- TEA 21 creates a $750 million Access to Jobs Program and a Reverse Commute Program which was not provided for under ISTEA. Of the total, $10 million per year is for the Reverse Commute Program. The Access to Jobs component is funded by a combination of Highway Trust Funds and General Funds. The Access to Jobs Program provides competitive grants to local governmental entities and non-profit organizations to develop

transportation services to connect welfare recipients and low income persons to employment and needed support services. Among the criteria (but not limited to these) for grant awards are coordination with and the use of existing transportation providers, coordination with state welfare agencies, the presence of a regional plan and long term financing strategies, and consultation with the community to be served. Projects must be part of a coordinated public transit/human service planning process and must be coordinated with and approved by affected transit operators. In areas over 200,000 populations, grant applications are selected by the chief executive officer of the state.

- TEA 21 also establishes two programs totaling $700 million to support trade and improve security at borders, and to design and construct corridors of national significance. Under the Trade Corridor program, states and MPOs are eligible for allocations from USDOT to fund feasibility studies, comprehensive corridor planning and design, location and routing studies, multi-state and interstate coordination, and environmental review and construction. Under the Border Crossing Program, states and MPOs are eligible for allocations from USDOT to fund improvements to existing or new transportation and supporting infrastructure, operational improvements, modifications to regulatory procedures, international coordination, and activities of federal inspection agencies.

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 MassHighway 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 the analytical capabilities to ensure that the long-range transportation plan and the transportation improvement program (TIP) comply with Title VI. Integrated 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 in the certification review 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; and,
- 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.
- 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 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 September of 1998 to increase the role of the local communities in the transportation planning process. The number of voting members was increased from four to eight and consists of the following officials or their designee or alternate.

- The Secretary of the Executive Office of Transportation and Construction
- The Commissioner of the Massachusetts Highway Department
- The Chairman of the Pioneer Valley Planning Commission
- The Chairman of the Pioneer Valley Transit Authority
- The Mayor of one of the following three urban core cities within the Pioneer Valley region:

Chicopee	Holyoke	Springfield

- The Mayor or Selectman of one of the following six urban centers outside of the three core cities within the Pioneer Valley region:

Agawam	Amherst	Easthampton
Northampton	Westfield	West Springfield

- A Selectman of one of the following twelve suburban towns within the Pioneer Valley region:

Belchertown	East Longmeadow	Granby
Hadley	Longmeadow	Ludlow
Palmer	South Hadley	Southampton
Southwick	Ware	Wilbraham

- A Selectman of one of the following twenty-two rural towns within the Pioneer Valley region:

BlandfordBrimfield	Chester	
Chesterfield	Cummington	Goshen
Granville	Hampden	Hatfield
Holland	Huntington	Middlefield
Montgomery	Monson	Pelham
Plainfield	Russell	Tolland
Wales	Westhampton	Williamsburg
Worthington		

In addition, the Joint Transportation Committee (JTC) Chairman, and one representative each from both the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), the four alternate community representatives, and one representative each from both the Massachusetts Highway Department District One and District Two Offices shall be considered ex-officio, non-voting members of the Pioneer Valley MPO.

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 Highway Department, the Massachusetts Executive Office of Transportation and Construction, 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 transit services and some special paratransit services to 24 cities and towns in the region through contracts with two operators (UMass Transit, and First Transit) and multiple paratransit operators.

The PVPC provides a significant amount of planning support to the PVTA through a contractual agreement. 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 Executive Office of Transportation and Construction, its member communities and passenger fares.

c) Executive Office of Transportation and Construction (EOTC)

This state agency is, in general, responsible for coordinating all state transportation planning and construction. The EOTC is one of the two state signatories to the Pioneer Valley MPO. Housed within the EOTC are a number of state agencies, including the Massachusetts Highway Department and the Massachusetts Aeronautics Commission, that plan and implement actual transportation improvements.

d) Massachusetts Highway Department (MassHighway)

The Massachusetts Highway Department is one of the two state signatories to the Pioneer Valley MPO. This department is directly involved with the Commonwealth's highway system and is responsible for engineering and implementing highway-related projects. In addition, MassHighway prepares the annual State Program of Transportation Projects, which is submitted to the Federal Highway Administration for approval and funding.

MassHighway has a total of five district offices representing distinct areas of the state. The majority of the Pioneer Valley region is located MassHighway District Two, with the westernmost portion of the region falling in MassHighway District One

e) 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 the 33 action items defined in the Bike and Ped Plan provides recommendations to the Joint Transportation Committee on work tasks included in the Unified Planning Work Program. Members on the subcommittee are appointed by the Joint Transportation Committee 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, and JTC representatives from Westfield, Springfield, Wilbraham, East Longmeadow, South Hadley and Northampton.

3. Other State Agencies

In addition to federal funds made available by TEA-21, the state 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). The state also provides assistance to municipalities for some local street improvements, as well as providing funding assistance for mass transit, school transportation, and special paratransit services. In order to provide these funds, the Commonwealth's Legislature enacts a transportation

bond bill periodically. 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 percent), employment figures (20.83 percent) and population estimates (20.83 percent). 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.

b) Massachusetts Turnpike Authority

Funded entirely through tolls administered by the Massachusetts Turnpike Authority, the Massachusetts Turnpike is aligned along the entire width of the Pioneer Valley from east to west. Passenger vehicles are not charged a toll when travelling between Exits 1-6. This enables passenger vehicles travelling between Springfield and Westfield to utilize the turnpike for free in the Pioneer Valley region.

c) Metropolitan District Commission (MDC)

The state's Metropolitan District Commission owns and maintains roads on its lands, which in this region lie primarily in the vicinity of the Quabbin Reservoir.

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 accidents. 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 TEA-21, transportation planning in the Pioneer Valley has been very successful in involving business leaders, environmentalists and developers. Efforts like the Plan for Progress and the Regional Land Use Plan bring these new partners to the transportation planning table.

C. Key Products

1. Regional Transportation Plan

The TEA-21 legislation builds on the Intermodal Surface Transportation Efficiency Act of 1991 which emphasized the development and use of the Regional Transportation Plan (RTP) in the planning process. TEA-21 encourages the involvement of public officials and private citizens in the development of the RTP. The RTP is envisioned to be the central mechanism for structuring effective investments to enhance overall transportation efficiency. This provides for the development, management, and operation of transportation systems and facilities for the region.

The RTP is required to address both long range and short range needs. Each element is to identify transportation systems conditions such as demand, capacity, deficiencies, improvement alternatives, financial constraints and environmental benefits. The long-range element is to address at least a twenty-year planning horizon while the short-range element addresses a three to five year horizon.

The RTP is scheduled to be updated at least every three years in non-attainment areas and every five years in attainment areas. This schedule ensures that the plans maintain validity and consistency with current and forecasted transportation and land use conditions and trends.

2. 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 six 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 MHD. 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.

3. 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 TEA-21, the CAAA, and the Americans with Disabilities Act (ADA).

4. 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 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 are of greater than 200,000) to determine if the process meets the requirements. The review must take place at least once every three 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.

During certification process, the MPO is asked to respond to questions related to overall strategies and goals, service equity and public involvement. Questions that the MPO must be prepared to answer include the following:

Questions related to overall strategies and goals:

- What strategies and efforts has the planning process developed for ensuring, demonstrating, and substantiating compliance with Title VI? What measures have been used to verify that the multi-modal system access and mobility performance improvements included in the plan and Transportation Improvement Program (TIP) or STIP, and the underlying planning process, comply with Title VI?

- Has the planning process developed 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?

- Does the planning process seek to identify the needs of low-income and minority populations? Does the planning process seek to utilize demographic information to examine the distributions across these groups of the benefits and burdens of the transportation investments included in the plan and TIP? What methods are used to identify imbalances?

Questions related to service equity:

- 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? Does it have a data collection process to support the analysis effort? Does this analytical process seek to assess the benefit and impact distributions of the investments included in the plan and TIP?

- How does the planning process respond to the analyses produced? Imbalances identified?

Question related to public involvement:

- Does the public involvement process have an identified strategy for engaging minority and low-income populations in transportation decision making? What strategies, if any, have been implemented to reduce participation barriers for such populations? Has their effectiveness been evaluated? Has public involvement in the planning process been routinely evaluated as required by regulation? Have efforts been undertaken to improve performance, especially with regard to low-income and minority populations? Have organizations representing low-income and minority populations been consulted as part of this evaluation? Have their concerns been considered?

- What efforts have been made to engage low-income and minority populations in the certification review public outreach effort? Does the public outreach effort utilize media (such as print, television, radio, etc.) targeted to low-income or minority populations? What issues were raised, how are their concerns documented, and how do they reflect on the performance of the planning process in relation to Title VI requirements?

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? Is there evidence that these concerns have been appropriately considered? Has the metropolitan planning organization (MPO) made funds available to local organizations that represent low-income and minority populations to enable their participation in planning processes?

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. It is the fourth largest metropolitan area in New England, covering 1,178 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.

The Pioneer Valley Region is comprised of the 43 communities from Hampden and Hampshire counties. 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.

Springfield, the third largest city in Massachusetts, is the Region's cultural and economic center. Springfield is home to half of the region's twenty largest employers, including Massachusetts Mutual Life Insurance Company, Solutia (formerly the Monsanto Chemical Company) and Smith & Wesson Company. Major cultural institutions include the Springfield Symphony, City Stage (formerly Stage West), Springfield Civic Center, Springfield Library and Museums Association, and the Basketball Hall of Fame.

The cities of Holyoke and Chicopee 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 of the historic mills and industries are now gone, many 19th and 20th Century structures are maintained.

The Pioneer Valley Region is unique within the Commonwealth of Massachusetts, containing 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. The variety of lifestyles contributes to the diversity and appeal of the region. The Pioneer Valley provides an exceptional environment in which to live and work, due to its unique combination of natural beauty, cultural amenities, and historical character.

1. Roadway Network

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 is a block grant type program that includes NHS roadways which primarily consist of Interstate routes and a large percentage of urban and rural principal arterials. The Federal-Aid highway system consists of any roadway that is not functionally classified as a rural minor collector or local roadway. Local roads constitute approximately 70% of the total roadway system.

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. Transit Routes

The Pioneer Valley Transit Authority (PVTA) operates a fleet of 190 buses, all of which are wheel chair lift equipped. Comprehensive transit service is provided on a network of 42 fixed routes and 4 community shuttles in the regions major urban centers, as well as outlying suburban areas. Thanks to recent service additions riders can now travel to all areas in the Pioneer Valley serviced by PVTA by transferring from one bus to another. The PVTA was formed on August 20, 1974 with the purpose of rebuilding and expanding the region's transit fleet and services. Today, the PVTA offers cost-effective service to the members of its 24 cities and towns, 22 located in Hampden and Hampshire County and two in Franklin County. Service is also available on a limited basis to Enfield Connecticut.

PVTA's service area is quite substantial. It encompasses 590 square miles. The communities that comprise PVTA's service area can be divided into three basic locals: the northern region, the southern region and the eastern region. The northern tier is predominantly suburban and is composed of the communities of Amherst, Easthampton, Hadley, Leverett, Northampton, Pelham, Sunderland, and Williamsburg. The southern tier may be divided into an urban core, composed of Springfield, Chicopee, and Holyoke, and a suburban area composed of Agawam, East Longmeadow, Granby, Hampden, Longmeadow, Ludlow, South Hadley, West Springfield, Westfield, and Wilbraham. The eastern tier is composed of the communities of Ware, Palmer, and Belchertown.

3. Bicycle and Pedestrian Facilities

In the Pioneer Valley 5.4 percent of workers bicycle or walk to work while 79.3 drive alone.[1] Development patterns in the region are characterized as sprawl with vehicle ownership increasing. Between 1990 and 2000 vehicle ownership has increased 26% to an average of .81 vehicles per person.[1] While these trend may be disturbing, there are many areas in the region such as downtown Springfield that are very "walkable" as well as communities like Amherst where cyclists will find bike lanes, bike racks, and multi-use paths.

There are many reasons why people might choose to walk or to ride a bicycle to work, school, or play in the Pioneer Valley. Walking and riding bicycles instead of driving promotes individual health and well being. Walking and bicycling help to prevent traffic congestion and a commitment to bicycling and walking can help to prevent downtown deterioration and discourage sprawl.

[1] Census Transportation Planning Package (CTPP 2000) U.S. Census Bureau

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 Non-Motorized Sub-Committee of the Pioneer Valley Planning Commission's (PVPC) Joint Transportation Committee as the bicycle and pedestrian component to the Regional Transportation Plan.

4. Passenger Rail

Passenger rail service is available to Pioneer Valley residents through Amtrak, the National Railroad Passenger Corporation. The region's main train station is located in the City of Springfield, on Lyman Street near the northern edge of downtown Springfield. Amtrak uses the station tracks of the former Union Station and has a station at track level on the south side of the tracks facing downtown Springfield.

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.

5. 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. The 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 MassHighway 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. The RTOC monitors traffic flow in the vicinity of the bridge and provides information to construction and emergency personnel via direct radio contact. Emergency vehicles enroute to the Cooley-Dickinson Hospital in Northampton via the Calvin Coolidge Bridge can pre-empt traffic signals to clear the bridge of traffic and . These three signals in turn will be linked to a Regional Traffic Operations Center to be staffed by MassHighway District 2 and the Massachusetts State Police. Operations center staff through radio contact with local police and fire departments can utilize the pre-emption phase to clear the bridge of traffic for approaching emergency vehicles. Variable message signs will be strategically placed in the vicinity of the project to provide project status information on existing delays and incidents, as well as proposed alternate routes.

The University of Massachusetts - Amherst and the Massachusetts Highway Department 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 tourism information. Currently, 6 cameras are positioned at key locations along the Route 9 corridor to provide information on actual travel conditions. Real-time travel time information is also collected along Route 9 between the Mountain Farms Mall and Damon Road. RTIC also provides information on commuting alternatives, upcoming events, and current construction projects in Amherst and Hadley. The RTIC website is: www.umass.edu/coolidgeinfo.

a) Franklin-Hampshire Connect

Franklin-Hampshire Connect is an initiative to bring advanced, affordable, reliable broadband to Franklin and Hampshire Counties through the creation of a competitive telecommunications marketplace. The Franklin and Hampshire County region has traditionally been confronted with several challenges regarding telecommunications services that had not been addressed in the marketplace as there are limited prospects for infrastructure investments in the region by the current provider and prices for service are two to three times higher than in other major areas.

Through Franklin-Hampshire Connect, businesses and organizations are working together to aggregate telecommunications demand to attract a service provider to not only offer services but to invest in infrastructure in the region as well. The Franklin-Hampshire Connect effort is guided by a Steering Committee consisting of community and business leaders from the two counties and staffed by the Franklin Regional Council of Governments and the Massachusetts Technology Collaborative.

B. Population

1. Trends

While the population in the Pioneer Valley region grew at a modest rate during the 1980s—increasing 3.6 percent 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 3-1 shows the region's population in the last five decades.

Table 3 - 2 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 classic 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 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).

Table 3-1 - Pioneer Valley Region Population Change

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

Source: U.S. Census Bureau

Table 3-2 - Rate of Population Change by Community

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

Source: U.S. Census Bureau

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 declined 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).

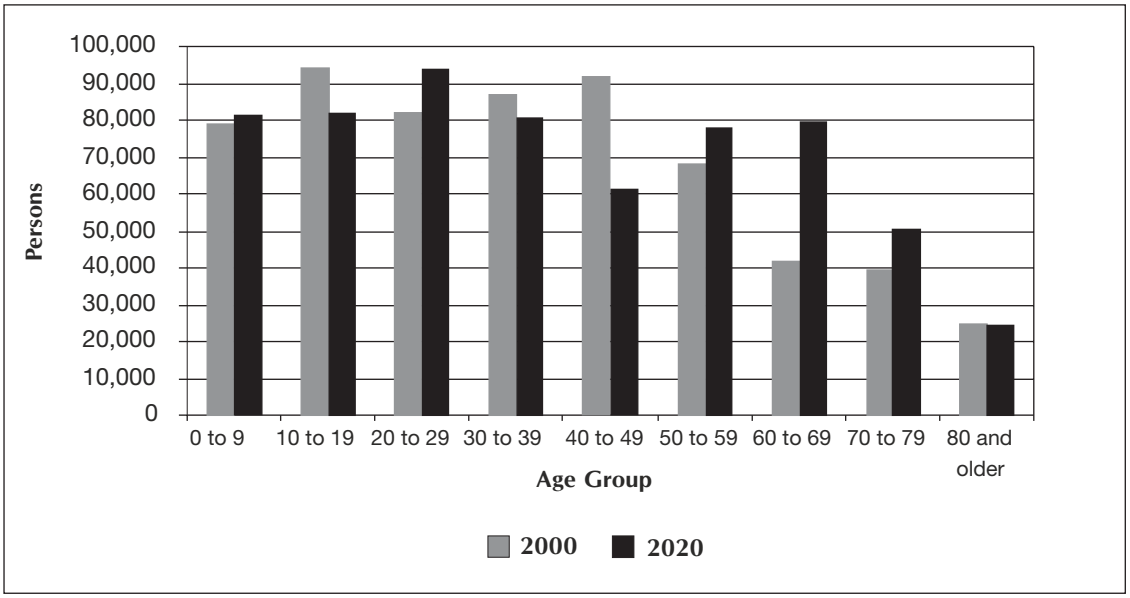
The region's people of color continue to be concentrated in either the urban core area or its surrounding communities. With the region's population increase attributed primarily to growth in minority groups, it can be inferred that the bulk of new residents are located in or around the Springfield-Chicopee-Holyoke 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 3-1 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.

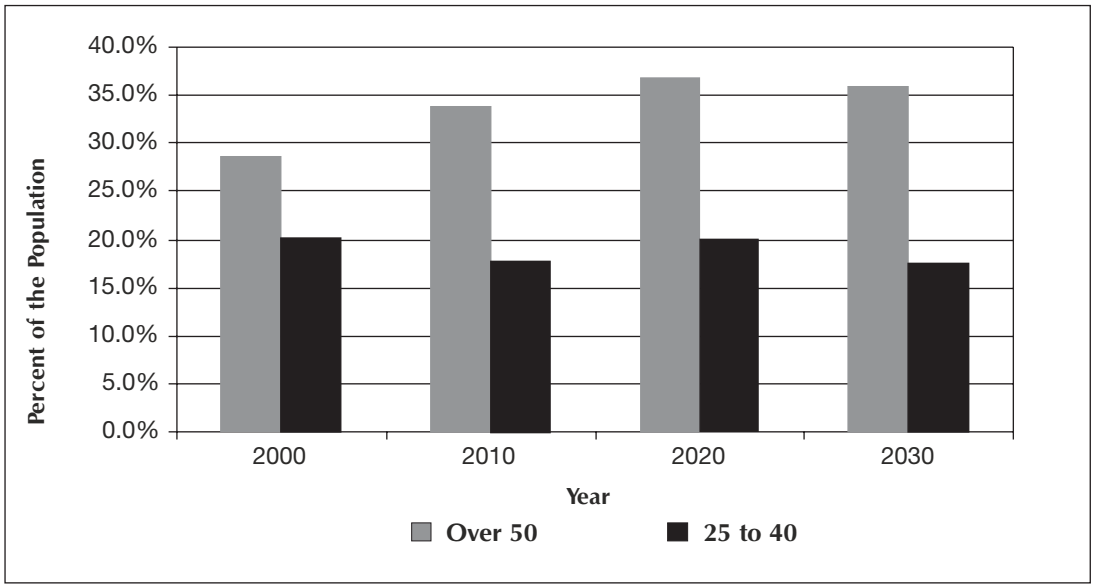
Decreases in the size of the region's young adult population are also expected to continue. Figure 3-2 contrasts the change in the elder population with that of the 25 to 40 year old population.

Figure 3-1- Projected Population by Age Group for the Pioneer Valley Region



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

Figure 3-2- Projected Percent of the Population in Select Age Groups



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

C. 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 3-3).

Table 3-3 - 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 3-4). 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 3-5shows 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 3-4 - Household Size, 1960 to 2000

	Number of Households						
Year	1 Person	2 People	3 People	4 people	5 Peoplw	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 3-5 - Number of Households by Type and Size, 2000

	Family Households by Size							Nonfamily Households by Size								
	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	5	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	222	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

D. 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 1990's 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, comprising 31.0 percent of total employment in 2001. Table 3-6 shows employment in the region's communities by employment sector, total payroll, and average wage for 2001. At $37,104, 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 3-6 - Pioneer Valley Regional Employment by Industrial Sector, 2001

	Government	Agriculture Forestry	Mining	Construction	Manufacturing	Trans., Communications and Utilities	Trade (Wholesale & Retail)	FIRE	Services	Total Employment	Establish-ments	Avg. Annual Wage
Agawam	1,098	114	0	529	1,928	863	2,887	257	4,197	11,873	706	$29,454
Amherst	5,717	184		109	164	133	2,148	305	4,275	13,044	686	$36,335
Belchertown	655	88	0	90	60	289	433	46	341	2,010	228	$25,051
Blandford		8	0						57	166	15	$16,119
Brimfield	122	14	0	38	98	78	69	25	54	498	74	$27,030
Chester	57		0	7					17	128	27	$20,060
Chesterfield	24		0	30					37	127	19	$24,636
Chicopee	3,224	216		1,137	5,389	1,220	4,731	493	4,159	20,571	1,060	$32,397
Cummington	37			6					109	245	23	$24,246
East Longmeadow	831	85	0	292	3,596	123	1,829	265	2,190	9,211	499	$33,922
Easthampton	551	9	0	362	1,555	47	822	200	1,104	4,650	342	$29,273
Goshen	29		0							91	15	$21,971
Granby	269	36	0	84		113	205	12	95	852	122	$26,569
Granville	89	6	0	5	28		23		15	166	26	$17,482
Hadley	510	224	0	159	34	69	2,052	267	1,022	4,337	288	$22,099
Hampden	177	22	0	62	5		146	28	284	727	106	$28,521
Hatfield	168	67	0	38	185	264	1,413		515	2,655	111	$35,787
Holland			0		8	8			14	128	23	$21,313
Holyoke	4,388	80	0	634	3,556	932	7,033	751	6,686	24,060	1,233	$29,069
Huntington	252	8		29	9	25			40	419	40	$27,913
Longmeadow	813	18	0	20	4	16	773	201	1,422	3,267	292	$27,342
Ludlow	1,794	33		713	885	112	1,276	135	989	5,940	453	$32,984
Middlefield			0						5	47	10	$22,077
Monson	368	46		140	276	86	261		161	1,379	164	$28,951
Montgomery	13			3					38	67	12	$18,915
Northampton	3,210	108	0	333	1,378	179	4,057	481	8,008	17,754	1,073	$30,241
Palmer	1,345	122	0	226	1,198	170	1,102	109	1,164	5,436	376	$31,596
Pelham	90		0	24					16	153	25	$22,160
Plainfield	23		0						17	127	25	$18,311
Russell	66		0	6		3			15	233	30	$41,811
South Hadley	724	30	0	221	830	46	1,187	134	1,732	4,904	299	$33,039
Southampton	158	43	0	141	42	4	451	15	213	1,067	131	$20,711
Southwick	466	103	0	121	388	26	1,033	99	389	2,599	251	$25,934
Springfield	13,537	272	0	1,979	7,264	3,650	13,693	8,297	31,256	79,948	4,316	$37,104
Tolland			0						33	49	6	$13,934
Wales	72		0				25		13	125	28	$19,696
Ware	397	21	0	61	513	7	936	182	581	2,698	212	$28,658
West Springfield	1,376	52	0	616	2,251	1,045	6,865	943	4,942	18,090	1,090	$31,033
Westfield	2,986	132	67	590	3,561	673	4,405	444	3,443	16,301	952	$32,093
Westhampton	193	7		18					15	253	26	$28,991
Wilbraham	762	65		139	785	157	886	104	1,081	3,979	333	$32,622
Williamsburg	89	23	0	101	59		166	15	107	564	90	$22,832
Worthington	41		0	24					68	207	29	$24,754
Pioneer Valley Region	**46,721**	**2,236**	**67**	**9,087**	**36,049**	**10,338**	**60,877**	**13,808**	**80,919**	**261,145**	**15,866**	**$32,776**

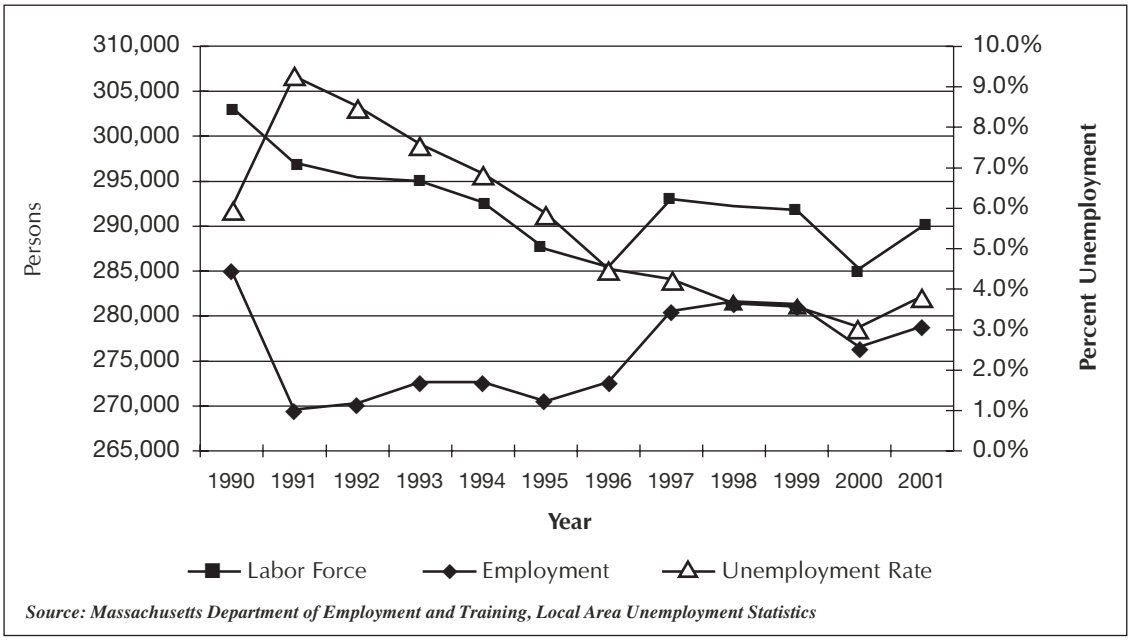
Source: U.S. Census Bureau

2. Growth

As Figure 3-3 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 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 appear to be sharply increasing. In spite of the return to economic recession in March of 2001, the Pioneer Valley region continues to add jobs and labor force participants. This bodes well for, and is a precursor to, future employment growth and economic expansion.

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. It is also anticipated that finance, insurance, and real estate as well as trade will grow in the near term. Manufacturing employment will most likely continue to decrease, though perhaps not as quickly as it has in the last two decades.

Figure 3-3- 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 3-4) in the Pioneer Valley region, except for slight losses between 1989 and 1993, has increased steadily since 1980. Declining household income coupled with rising average wages and per capita income is a likely

indication that there are fewer wage earners per household now than in the past. This conclusion is also supported by the trend of shrinking average household sizes.

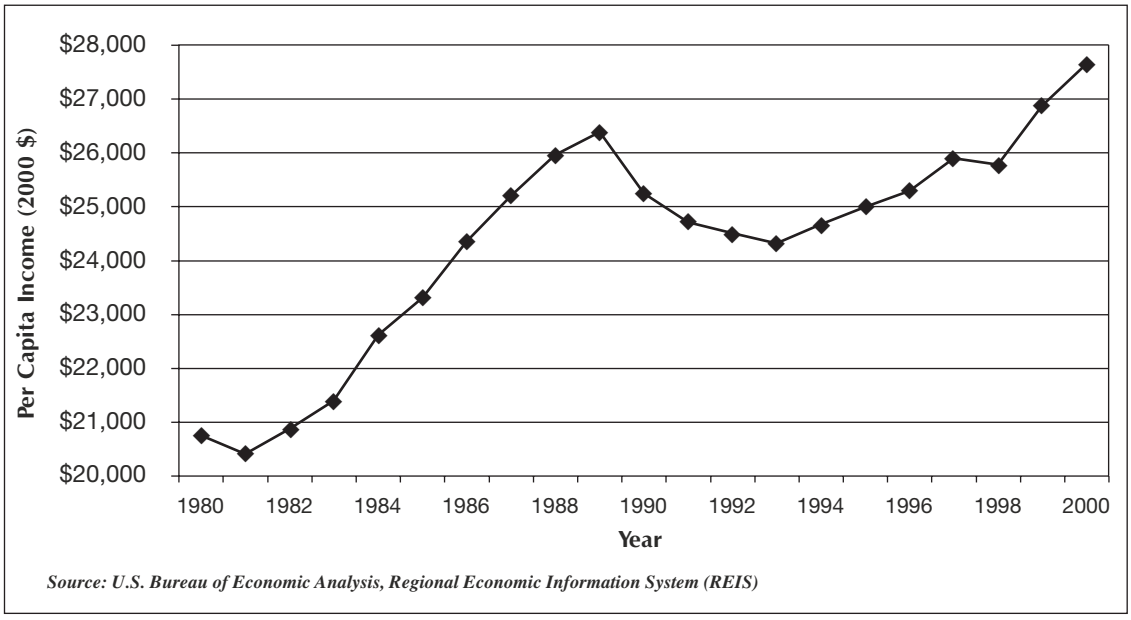
Table 3-7 - Median Household Income

	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 3-4- Per Capita Income, 1980-2000



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

CHAPTER 4

The Seven Factors of TEA-21

TEA-21 requires all metropolitan planning organizations to incorporate seven factors into their planning process. The Pioneer Valley MPO has taken great strides to incorporate these seven factors into the Pioneer Valley Regional Transportation Plan and the regional planning process. This Chapter 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 United States, the States, and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.

Enhancement of the existing transportation infrastructure is vital to providing a more stable economic base and creating new consumer and business opportunities in the Pioneer Valley region. 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. This document is currently in the process of being updated by the PVPC.

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 our likely to seek EDA financial assistance.

In September of 2000, the Hartford-Springfield Economic Partnership was formed. This partnership helps market the region north and south of the Connecticut-Massachusetts border along the I-91/Connecticut River Valley corridor. The group is dedicated to increasing cooperative efforts to more effectively position and advance the economic progress and livability of the interstate region by capitalizing on historic, economic, natural, and cultural ties. The region has also been 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.

In January of 2000, the PVPC completed There's No Place Like our Home: Windows of Opportunity to a Century of Regional Collaboration. This document coordinates the Pioneer Valley Regional Transportation Plan; Valley Vision: The Regional Land Use Plan for the Pioneer Valley; and, Pioneer Valley Plan for Progress: Economic Strategies for the Region. Each major report is summarized and specific areas are highlighted to spur interested citizens and local officials to take action and assist in the implementation of the regional strategies recommended in these documents.

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.

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

Safety and security, particularly in public transit systems, is fast becoming a major issue throughout the nation. New system design in the Pioneer Valley has placed a premium on security at newly implemented transfer centers. These centers are well lit, include amenities, and could include quick response incident management systems in the future. The PVTA is also in the process of implementing an automated vehicle location system that will allow the central dispatch to keep track of the entire service fleet in real time.

The Pioneer Valley Planning Commission consciously addresses the area of safety in all aspects of our transportation planning process. The PVPC completed the Route 20 Corridor Study for Westfield and West Springfield in June of 1999 and the Outer Belt transportation Study for Springfield in October of 2002. Both studies were recommended by the regional congestion management system and addressed many existing pedestrian and vehicular safety issues. Both short and long term recommendations were included as part of these studies to reduce congestion and improve safety.

The Municipal Transportation Plan for the City of Northampton was completed by the PVPC in May of 2002. This plan was a direct recommendation of the Safer Streets Committee formed by the City to assess the conditions "that impact the safety of bicycling, walking and driving throughout the city" and recommend a plan that would lead to measurable improvements. The plan identified problem areas and proposed recommendations to improve safety in the City. More importantly, an intensive public participation process was used to obtain local consensus on the content and recommendations of the plan, educate the public on the transportation planning process, and promote improved zoning and subdivision regulations to enhance livability and endorse bicycling, walking and transit.

c) Increase the accessibility and mobility options available to people and for freight.

Accessibility to the regional transportation system is a high priority in the Pioneer Valley. The Pioneer Valley Regional Congestion Management System proposes improvement alternatives to maintain convenient access to the regional highway system, and maintain the efficient mobility of vehicles in the region. The Pioneer Valley Transit Authority (PVTA) provides wheelchair lifts on all of their fixed route transit vehicles and provides bicycle racks on many buses in the Five College area. 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 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.

The PVPC recently was awarded a grant from the Federal Highway Administration's Transportation and Community and System Preservation Pilot Program (TCSP). The PVPC intends to use this grant to develop a plan for transportation improvements, economic development options and appropriate neighborhood linkages for the Merrick Neighborhood of West Springfield, MA. The existing CSX rail yard in the neighborhood will be studied to determine the potential to expand and enhance its existing operations and increase economic development opportunities for the Pioneer Valley region.

d) Protect and enhance the environment, promote energy conservation and improve the quality of life.

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 PVTA is currently in the process of purchasing alternative fuel vehicles and the regional long-range strategies include the continuation of these efforts.

Improvements in technology have been successful lowering the level of pollution emitted by individual vehicles. This in combination with projects to reduce traffic congestion, improve intersection levels of service, and reduce the number of single occupant vehicle trips can improve the air quality 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.

e) Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, 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 a perfect 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. Intermodal Transportation Centers on a smaller scale are also proposed for the communities of Belchertown, Holyoke, and Westfield.

The Pioneer Valley Planning Commission was part of the project Steering Committee on a study commissioned by the Capital Region Council of Governments to maintain efficient access to the Bradley International Airport in Windsor Locks, CT. A large component of this study is the ability for freight carriers to efficiently access the airport from the Pioneer Valley region.

The Pioneer Valley RTP in combination with the Pioneer Valley Non-Motorized 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, increasing the connectivity of the local sidewalk system between major activity centers, and expansion of the PVTA "Rack and Roll" bicycles on transit system.

A feasibility study for the implementation of commuter rail service between New Haven, CT and Springfield, MA was commissioned by the Connecticut Department of Transportation. The PVPC will serve as a member of the Steering Committee for this study.

f) 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.

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. Representatives from both CMRPC and CRCOG participated in the ITS Strategic Deployment Plan for the PVPC region. The PVPC was involved in a study of the Bradley International Airport in Windsor Locks, CT with CRCOG. The CRCOG will be a member of the project Steering Committee for the Merrick Neighborhood Transportation Study in West Springfield, MA.

g) 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.

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 Intelligent Transportation Systems Strategic Deployment Plan for Metropolitan Springfield and the Pioneer Valley Region identifies strategies to establish a regional architecture of intelligent transportation system (ITS) technology. It is hoped that future expansion of our regions highways will be minimized by the use of ITS technology in the region.

CHAPTER 5

Regional Vision and Goals

The Pioneer Valley Planning Commission developed a vision statement consistent with the seven areas of TEA-21 and which provided a framework for our RTP.

VISION STATEMENT

The Pioneer Valley region strives to create and maintain a safe, dependable, and environmentally sound transportation system that promotes livable communities, provides for the efficient movement of people and goods, advances the economic vitality of the region and supports the Commonwealth's core transportation policies of Fix It First, Communities First and the tenets of Sustainable Development.

A. Regional Goals

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 as detailed in the Commonwealth's Fix It First policy.
Environmental	To minimize the transportation related adverse impacts to air, land, and water quality and strive to improve environmental conditions at every opportunity. To incorporate the concepts of Sustainable Development in the regional transportationplanning process.
Coordination	To collaborate the efforts of the general public with local, state and federal planning activities and incorporate the aspects of the Commonwealth's Communities First policy with the affected community.
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.

CHAPTER 6

Development of the Plan

The development of a long-range transportation plan requires the involvement of many different people and agencies to consider all modes of transportation and their subsequent short and long range needs. Much of this work is performed through ongoing transportation planning tasks conducted as part of the Pioneer Valley Unified Planning Work Program. The following summarizes these activities and their role in the RTP.

A. Pioneer Valley Public Participation Process

The role of public participation should evolve into an avenue for working with residents and employers of the region to collaboratively build transportation programs. The Pioneer Valley is diverse in its demographics, economics and geography, resulting in varying transportation needs across the region. Finding effective avenues for reaching over 600,000 residents of forty-three communities in the Valley requires creativity and resources.

For the transportation planning process to be successful within the Pioneer Valley region, broad public involvement is needed. Traditionally, Pioneer Valley transportation plans and programs have been developed by involved agencies with community representation and then presented to the general public. The degree of public interaction and participation has been limited. Incorporating the ideas and interests of citizens has required a new approach to developing transportation plans. Citizens must be involved early on and continue participating throughout the process.

Much of the early participation for the RTP was accomplished through the development of other plans, programs, and studies. Corridor studies, management systems, land use plans and initiatives were all predicated upon the involvement of local elected officials and their constituencies. Public hearings and meetings for these activities are a prime source of ideas that are expanded while developing the RTP.

In addition to the outreach associated with these activities, the Pioneer Valley Joint Transportation Committee (JTC), the transportation advisory group for the region, plays a vital role in the development of the RTP. The JTC was established by the 3C Memorandum of Understanding, which emphasizes a comprehensive, cooperative and continuing process for transportation planning and programming. The JTC incorporates citizen participation into this commitment and was formed to represent both public and private interests in the region. It consists of individuals from local, regional and state government and private groups and individuals who provide transportation facilities, services or planning for the Pioneer Valley region. The JTC is also charged with the coordination of all transportation-related projects throughout the planning district. The planning program and the various functional elements of the planning process must be reviewed by the JTC prior to action by the Metropolitan Planning Organization (MPO).

The development of the 2003 Update to the RTP will continue to rely upon participation from the public. It is envisioned that six public forums will be held to discuss transportation issues with interested citizens, city councilors, local planners, and business leaders across the region. In addition, the PVPC will seek out other interested public organizations that might have interest in the development of the RTP. These forums and events will be used to obtain feedback on the existing and future transportation needs of the region.

B. Pioneer Valley Congestion Management System

The Congestion Management System (CMS) is an ongoing transportation planning activity directed at maximizing the mobility of people and goods. The CMS accomplishes this goal through a variety of tasks which identify existing and projected locations with traffic congestion and develops strategies to alleviate and better manage traffic operations in these problem areas. Congested locations are typically characterized by excessive travel delay, large vehicle queues and traffic bottlenecks causing driver frustration and poor traffic operations. The CMS evaluates the existing federal aid transportation system performance and proposed strategies to aid in project and strategy implementation. Products of the CMS are suggested projects and strategies that increase the mobility of people and goods through improvements to the transportation infrastructure and changes to travel behavior. The CMS serves as a guide and technical support for local, regional and state officials in making decisions related to investments in congestion relief projects and programs in a specific area.

C. Pioneer Valley 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 PMS is developed in cooperation with the Metropolitan Planning Organizations (MPO) and other entities (like communities) receiving federal highway or transit funds. The PVPC's regional PMS involves a comprehensive process for establishing the network inventory and project histories, collecting and storing the pavement distress data, analyzing the data, identifying the network maintenance activities and needs and integrating the PMS information into the metropolitan and statewide planning processes. 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. Once every three years, compatible with the three-year RTP update cycle, approximately one third of the region's federal-aid eligible roadways are surveyed and their pavement conditions are updated.

D. Valley Vision – Pioneer Valley Regional Land Use Plan

This RTP emphasizes the connection between transportation and land use, with substantial effort placed on a "land use management system." Valley Vision is the regional land use plan for the Pioneer Valley. It is designed to help communities plan effectively to control sprawling growth and promote a more compact development pattern in order to preserve the region's quality of life. Valley Vision consists of three key parts:

- A regional land use map.
- Detailed land use strategies and model bylaws.
- A "delivery system of technical assistance and services to help communities implement the plan.

Valley Vision is intended to provide meaningful guidance to the communities of the Pioneer Valley region in developing regionally-consistent local master plans and zoning bylaws, and in making other land use growth decisions. The plan includes an implementation strategy that provides communities with detailed guidance on how to put Valley Vision into action.

E. Pioneer Valley Regional Transportation Model

Developing a long-range transportation plan requires the foresight to forecast the future performance of the transportation system. This projection is best accomplished through the use of a transportation demand model. A network of all major roadways in the Pioneer Valley region is developed and traffic volumes are generated based on population and employment data for the region. Typically, this is done for a "base" year for which this information is readily available. Future networks are developed and

include scheduled roadway improvement projects and other projects designated as "regionally signifi cant." Projections are developed to estimate future population and employment data, and new traffic volumes generated for each future analysis year.

The regional transportation model is used as a tool in many aspects of RTP development, primarily, system deficiency identification, major improvement alternative analysis, and air quality conformity analysis. By simulating the effect of currently proposed improvement projects, the model indicates how the system performs after implementation. Potential new problem areas are identified and incorporated into the management systems and the RTP. Project priorities resulting from the management system analysis and local input are tested for viability with the regional transportation model. Once the effects of the newly planned improvements are simulated, the total vehicle miles of travel are calculated for the entire region and an estimate of vehicle emissions can be made.

F. Intelligent Transportation Systems Strategic Deployment Plan for the Metropolitan Springfield and Pioneer Valley Region

In January of 1997, MassHighway Planning with the cooperation of the PVPC, solicited the assistance of a consultant to conduct an Intelligent Transportation Systems (ITS) Early Deployment Plan (EDP). The project was completed in September of 1998 and consists of a plan of recommended ITS strategies and applications for the Pioneer Valley.

The strategic plan prioritizes 18 specific ITS projects for the Pioneer Valley. Top priority projects such as the installation of an Advanced Traffic Management System for the Calvin Coolidge Bridge and Route 9, the implementation of "smart-card" technology for PVTA buses, and the development of an Incident Management Coalition for the region are already underway. Additional projects and strategies will be incorporated into the 2003 update of the RTP as well as future updates to the RTP. The deployment of ITS will provide an integrated transportation management capability to enhance traveler safety, provide up to date travel information, mitigate traffic congestion, and achieve coordinated response to transportation operational problems in the Pioneer Valley region.

G. Access to Jobs Program for the Pioneer Valley

The Welfare Reform Act of 1996 mandated a concerted effort to move individuals off welfare and into work. This requires many major barriers to be addressed and overcome to assure the level of mobility required to transport welfare recipients to and from job opportunities which exist in urban, suburban and outlying rural areas in ways that are convenient, efficient, affordable and reliable. The specific needs and circumstances of the Pioneer Valley have been identified and are currently being implemented to respond to the needs of welfare recipients who live in the Pioneer Valley. In turn, it is hoped that the regional economy, the region's workforce, and its current and future workforce can be fortified.

H. Pioneer Valley Regional Bicycle and Pedestrian Transportation PLan

In February of 2000 the Pioneer Valley Metropolitan Planning Organization adopted and endorsed the Pioneer Valley Regional Bicycle and Pedestrian Transportation Plan. The strategic plan identifies a "vision statement" for bicycling and walking and outlines goals and objectives for achieving this vision. The "Bike and Ped Plan" includes 33 specific implementation action items that directly impact bicycling and walking. Each of these 33 action items identifies an implementation agent and a timetable for action. Where applicable, the action items are incorporated into specific work tasks in the PVPC Unified Planning Work Program (UPWP). Action items include; improving transit access for bicyclists, implementing traffic calming measures on neighborhood streets, encouraging bicycling

and walking through activities and programs like the "Pioneer Valley Bike to Work Week." The action items provide an integrated approach by addressing engineering, enforcement, and encouragement initiatives. (three E's)

As part of the recommendations included in the 2000 RTP, the Pioneer Valley Joint Transportation Committee (JTC) voted to create a subcommittee to oversee implementation of the plan. The subcommittee is comprised of both JTC members and representatives of the cycling community from local cities and towns. The subcommittee meets monthly and providing recommendations to the JTC, developing tasks under the Unified Planning Work Program and establishing priorities for implementing the 33 action items identified in the Regional Bicycle and Pedestrian Plan.

CHAPTER 7

Existing Transportation Systems

A. 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.

Table 7–1 - 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 7-2 - 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 Highway Department 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.

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 Highway Department (MHD), began the reclassification process to update the federal-aid network in the Pioneer Valley Region. The regions roadways were grouped into classes according to the service they are intended to provide.
The seven functional classifications adopted by Massachusetts are summarized below:

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

Rural Principal Arterials and Urban Extensions - Major highways that serve corridor movements having trip length and travel density characteristics that indicate substantial statewide or interstate travel. Principal Arterials include the Interstate system.

Rural Minor Arterial and Urban Extensions - 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 service access to and within the urbanized area. Connections to interstate and rural principle arterials is typical.

After local and state reviews, a final federal-aid network was completed for the Pioneer Valley Region. Table 7-3 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 MassHighway Planning for their approval. Once approved by MassHighway, the change requires endorsement by both the MPO and the FHWA before the functional classification can be officially changed.

Table 7-3 - Miles of Roadway by Community and Functional Classification

		Functional Classification					
	Total	Interstates	Principal Arterials	Minor Arterials	Major Collectors	Minor Collectors	Local Roads
Agawam	150.4	0.0	29.3	0.0	27.6	0.0	93.5
Amherst	135.6	0.0	34.0	2.9	5.0	6.9	86.7
Belchertown	155.4	0.0	0.0	23.8	0.0	27.7	103.8
Blandford	89.3	8.5	0.0	8.6	0.0	25.0	47.3
Brimfield	79.5	2.9	0.0	8.8	0.0	17.0	50.6
Chester	65.8	0.0	0.0	8.2	0.0	17.4	40.0
Chesterfield	58.2	0.0	0.0	7.8	0.0	15.6	34.9
Chicopee	260.4	11.2	39.6	0.0	15.5	0.0	194.1
Cummington	61.7	0.0	0.0	13.1	0.0	9.4	39.2
East Longmeadow	94.0	0.0	21.4	0.0	9.4	0.0	63.2
Easthampton	88.4	0.5	25.0	0.0	5.0	0.0	58.0
Goshen	43.9	0.0	0.0	5.4	0.0	8.3	30.2
Granby	67.5	0.0	11.1	5.6	1.3	17.1	32.4
Granville	73.8	0.0	0.0	9.0	0.0	20.3	44.3
Hadley	83.2	0.0	14.0	4.5	3.5	15.7	45.4
Hampden	53.7	0.0	5.8	0.0	2.5	7.2	38.1
Hatfield	59.0	3.7	0.0	0.0	0.0	14.5	40.7
Holland	37.1	0.1	0.0	0.0	0.0	11.6	25.4
Holyoke	173.5	9.9	38.1	0.0	19.7	0.0	105.8
Huntington	54.3	0.0	11.2	0.0	0.0	7.1	36.0
Longmeadow	98.6	3.3	14.2	0.0	5.0	0.0	76.2
Ludlow	129.4	5.9	21.3	0.0	8.0	7.5	86.8
Middlefield	38.4	0.0	0.0	0.0	0.0	7.5	30.9
Monson	113.1	0.0	0.0	8.7	0.0	25.5	78.9
Montgomery	30.8	0.1	0.0	0.0	0.0	8.3	22.4
Northampton	180.6	6.1	48.4	0.0	16.1	0.0	109.9
Palmer	114.4	7.6	0.0	16.5	0.0	32.2	58.1
Pelham	45.8	0.0	0.0	5.8	0.0	11.0	29.0
Plainfield	48.8	0.0	0.0	0.0	0.0	17.7	31.1
Russell	36.1	4.0	0.0	9.5	0.0	6.4	16.2
South Hadley	103.7	0.0	18.0	0.2	10.3	0.0	75.5
Southampton	74.1	0.0	10.9	0.0	4.2	4.4	54.7
Southwick	76.5	0.0	15.7	3.0	6.0	10.0	41.8
Springfield	497.8	9.6	102.2	0.0	47.7	0.0	338.4
Tolland	42.6	0.0	0.0	5.7	0.0	5.4	31.5
Wales	28.8	0.0	0.0	0.0	0.0	13.4	15.4
Ware	117.0	0.0	13.1	5.6	5.3	9.1	83.9
West Springfield	143.2	6.3	30.7	0.0	9.1	0.0	97.2
Westfield	247.2	6.7	46.2	0.0	20.4	0.0	174.0
Westhampton	47.7	0.0	0.0	0.0	0.0	22.4	25.3
Wilbraham	111.5	1.1	16.6	1.2	12.4	7.1	73.1
Williamsburg	50.1	0.0	2.8	6.9	0.0	12.9	27.5
Worthington	64.3	0.0	0.0	10.3	0.0	10.6	43.4
Pioneer Valley Region	**4,324.8**	**87.2**	**569.5**	**171.2**	**233.8**	**432.4**	**2,830.8**

Source: U.S. Census Bureau

3. Jurisdiction

There are over 4,300 miles of road in the region. As of 2001, city and town governments administered 80 percent of the road miles and the Massachusetts Highway Department (MassHighway) was responsible for seven percent. The Massachusetts Turnpike Authority, the Metropolitan District Commission, the Federal Government, various park systems and the state colleges and universities administered a small number of roadway miles. Table 7-4 gives an inventory of the region's roadway miles according to the governmental unit responsible for maintaining them.

Table 7-4 - Miles of Roadway by Community and Administrative Unit

Community	Total	MHD	City/ Town	MDC	MTA	Forest & Parks	Inst./ College	County	Private	Federal
Agawam	150.4	14.3	120.5	0.0	0.0	3.9	0.0	0.0	11.7	0.0
Amherst	135.6	9.1	96.1	0.0	0.0	0.0	7.7	0.0	22.6	0.0
Belchertown	155.4	15.4	119.0	7.6	0.0	0.0	2.7	0.0	10.7	0.0
Blandford	89.3	9.7	63.1	0.0	8.5	3.6	0.0	0.0	4.5	0.0
Brimfield	79.5	12.2	64.3	0.0	2.9	0.0	0.0	0.0	0.1	0.0
Chester	65.6	6.6	57.9	0.0	0.0	1.1	0.0	0.0	0.0	0.0
Chesterfield	58.2	0.1	53.3	0.0	0.0	0.2	0.0	0.0	4.7	0.0
Chicopee	260.4	10.2	153.4	0.0	6.7	1.2	0.0	0.0	73.0	15.9
Cummington	61.7	9.9	0.0	0.0	0.0	0.0	0.0	0.0	1.9	15.9
East Longmeadow	94.0	0.0	90.7	0.0	0.0	0.0	0.0	0.0	3.2	0.0
Easthampton	88.4	3.0	79.5	0.0	0.0	2.4	0.0	0.0	3.6	0.0
Goshen	43.9	7.2	26.0	0.0	0.0	5.0	0.0	0.0	5.7	0.0
Granby	67.5	7.7	56.7	0.0	0.0	0.0	0.0	0.0	2.9	0.2
Granville	73.8	0.0	64.6	0.0	0.0	1.2	0.0	0.0	7.9	0.0
Hadley	83.2	8.1	67.0	0.0	0.0	1.2	3.5	0.0	3.4	0.0
Hampden	53.7	0.0	52.1	0.0	0.0	0.0	0.0	0.0	1.6	0.0
Hatfield	59.0	7.4	50.7	0.0	0.0	0.0	0.0	0.1	1.0	0.0
Holland	37.1	0.9	35.1	0.0	0.0	0.0	0.0	0.0	1.9	0.0
Holyoke	173.5	17.0	130.3	0.0	0.0	5.1	1.8	0.0	19.3	0.0
Huntington	54.3	11.8	37.1	0.0	0.0	0.0	0.0	0.0	1.7	3.7
Longmeadow	98.6	3.3	84.9	0.0	0.0	0.0	0.0	0.0	10.5	0.0
Ludlow	129.4	0.0	110.8	0.1	6.1	0.3	0.0	0.0	12.1	0.0
Middlefield	38.4	0.0	38.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monson	113.1	7.1	101.1	1.2	0.0	0.0	0.6	0.0	2.8	0.3
Montgomery	30.8	0.0	30.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northampton	180.6	13.8	150.5	0.0	0.0	0.0	2.1	0.8	11.8	1.6
Palmer	114.4	15.6	86.7	0.0	7.6	0.0	0.0	0.0	4.5	0.0
Pelham	45.8	5.7	22.7	14.7	0.0	0.8	0.0	0.0	2.0	0.0
Plainfield	48.8	0.0	47.9	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Russell	36.1	9.5	22.6	0.0	4.0	0.0	0.0	0.0	0.0	0.0
South Hadley	103.7	9.5	83.7	0.0	0.0	0.6	0.0	0.0	9.9	0.0
Southampton	74.1	5.4	64.9	0.0	0.0	0.0	0.0	0.0	3.8	0.0
Southwick	76.5	7.2	61.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0
Springfireld	497.8	11.8	395.2	0.0	0.0	0.0	1.4	0.0	89.4	0.0
Tolland	42.6	0.2	40.2	0.0	0.0	2.3	0.0	0.0	0.0	0.0
Wales	28.8	5.1	23.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ware	117.0	11.3	84.4	17.1	0.0	0.0	0.0	0.0	4.3	0.0
West Springfield	143.2	11.7	116.6	0.0	3.4	0.0	0.0	0.0	11.5	0.0
Westfield	247.2	9.3	173.7	0.0	6.9	0.0	0.4	0.0	57.0	0.0
Westhampton	47.7	0.0	44.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0
Wilbraham	111.5	5.1	92.0	0.0	1.1	0.0	0.0	0.0	13.4	0.0
Williamsburg	50.1	5.7	41.4	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Worthington	64.3	5.9	58.1	0.0	0.0	0.2	0.0	0.0	0.1	0.0
Pioneer Valley Region	**4,324.47**	**293.5**	**3,441.2**	**40.6**	**47.1**	**29.3**	**20.2**	**0.9**	**430.1**	**22.5**

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

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 7-5 lists the bridges by community according to the governmental unit responsible for maintaining them.

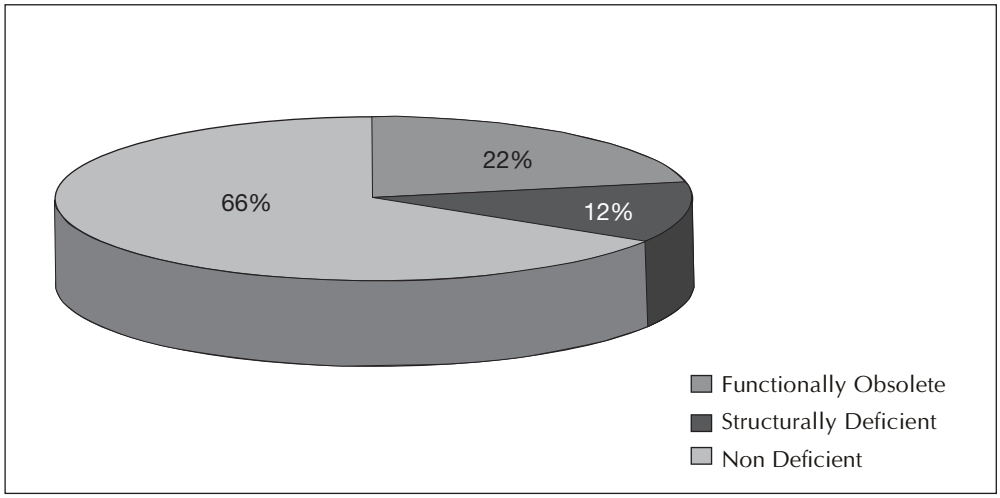
Table 7-5 - Number of Bridges by Community and by Administrative Unit

Community	Total	MHD	City/ Town	MTA	Parks and Forest	Private	Military	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	12	7	5					
East Longmeadow	1	1						
Easthampton	19	9	10					
Goshen	4	2	2					
Granby	8	1	7					
Granville	9	3	6					
Hadley	10	6	4					
Hampden	8		8					
Hatfield	15	10	5					
Holland	1		1					
Holyoke	49	40	9					
Huntington	6	5	1					
Longmeadow	4	4						
Ludlow	22	1	7	14				
Middlefield	8		8					
Monson	23	9	14					
Montgomery	5		4	1				
Northampton	44	23	21					
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	46	13		1			
Tolland	0							
Wales	1		1					
Ware	16	7	8					1
West Springfield	26	17	2	7				
Westfield	35	12	11	12				
Westhampton	14	1	13					
Wilbraham	4	1	2	1				
Williamsburg	16	7	9					
Worthington	14	5	9					
Pioneer Valley Region	**673**	**310**	**274**	**85**	**2**	**0**	**0**	**2**

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), MassHighway surveyed and rated the state bridges. This process identified bridges that are structurally sufficient, functionally obsolete and structurally deficient. Figure 7-1 summarizes the status of bridge conditions within the Pioneer Valley Region.

A bridge is classified 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 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. Twelve percent of the region's bridges were rated structurally deficient. This is a one percent increase from 2000 when eleven percent of the region's bridges were rated structurally deficient.

Figure 7-1 - Bridge Conditions Categories for the Pioneer Valley



5. Safety

MassHighway publishes a summary report which lists the top 1000 accident locations within the state. The most recent data available at the time of publishing was from the 1997-1999 MassHighway Report. The accident locations are ranked based on the number of accidents and weighted by the severity of the accident. Fatalities and accidents involving a personal injury are given more weight than accidents only involving property damage. Each year a number of Pioneer Valley Region locations are identified in the listing. Table 7-6 lists the highest accident locations in the Pioneer Valley compiled from a three-year state inventory of accidents. At least two locations in the region with a history of safety problems are not included on the MassHighway list. The Route 5/20 rotary in West Springfield averaged 109 crashes between 1999 and 2001 based on West Springfield Police Department records. Based on information provided in the East Longmeadow Rotary Study this seven leg intersection of Route 220, Route 186, Route 83, Maple Street, and Pleasant Street averaged 35 crashes per year between 1996 and 1998. It is possible that both locations do not appear on the MassHighway list because the crash data is summarized by the individual intersections that comprise the rotaries rather than the rotary itself.

Information on the location of all at-grade rail crossings in the Pioneer Valley Region is shown on Figure 7-2. 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.

Table 7-6 - High Crash Locations in the Pioneer Valley

Town	Intersection	Total Crashes	MassHighway Crash Rate Ranking
Springfield	West Columbus Ave./Interstate 91	163	57
Agawam	Agawam Rotary	165	63
Springfield	Springfield Expressway/Interstate 91	111	110
Hadley	Russell St./South Maple St.	82	156
Springfield	Page Boulevard/Springfield Expressway	51	199
Northampton	Bridge St./Interstate 91	71	207
Agawam	North Westfield St./Springfield St.	62	224
Westfield	East main St./Little River Rd.	48	226
Springfield	Route 5/Interstate 91	70	235
Chicopee	Springfield Expressway/MA Turnpike	48	237
Springfield	Armory Circle/Springfiled Expressway	44	237
Springfield	Main St./Interstate 91	43	254
Westfield	North Elm St./Pochassic St.	52	257
Hadley	Middle St./Russell St.	35	262
Northampton	Conz St./Pleasant St.	35	262
East Longmeadow	Harkness Ave./North Main St.	31	262
West Springfield	Riverdale St./Interstate 91	49	264
Westfield	Elm St./Main St.	49	264
Westfield	North Elm St./Union St.	41	264
Hadley	Bay rd./Russell St.	47	266
Westfield	Pleasant St./West Silver St.	33	272
Hadley	Russell St./Aqua Vita Rd.	32	273
Northampton	Damon Rd./King St.	38	275
Westfield	north Road/Southampton Road	28	277
Chicopee	Shawinigan Drive/Springfield Expressway	31	278
Holyoke	Hampden St./Pleasant St.	30	279
Westfield	Elm St./Franklin St.	39	282

6. Vehicle Miles Traveled

In general, traffic on the region's roadways has been increasing. Between 1980 and 1998 the estimated number of daily vehicle miles traveled (DVMT) in the Springfield-Chicopee-Holyoke urbanized area rose from 7.4 million to 10.7 million. The magnitude of increase is shared in the region's rural areas as well. Table 7-7 presents the Pioneer Valley's estimated urban VMT by functional class for the year 1980 through 1990. Information on the changes in total VMT from 1993 – 2000 is shown on Figure 7-3.

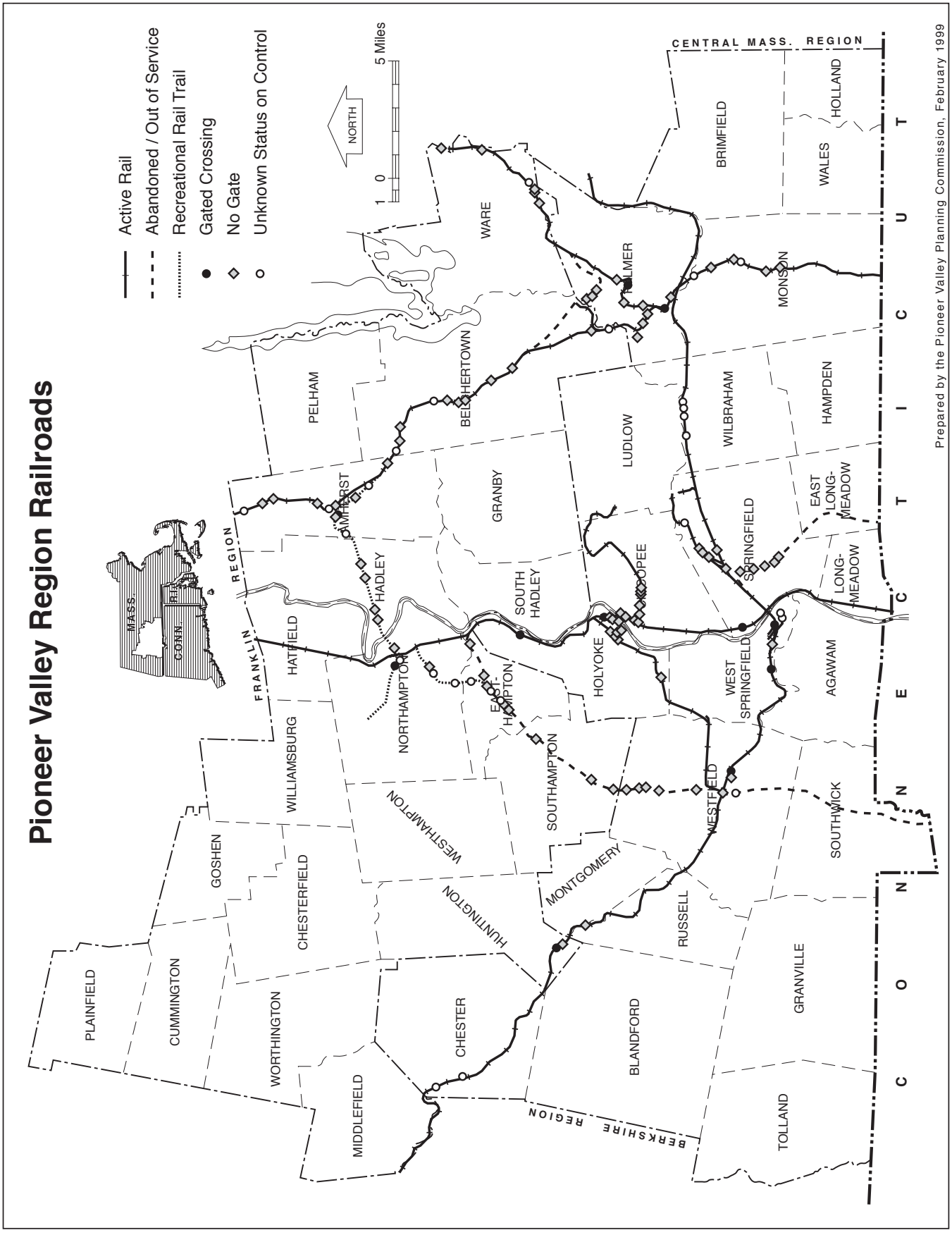


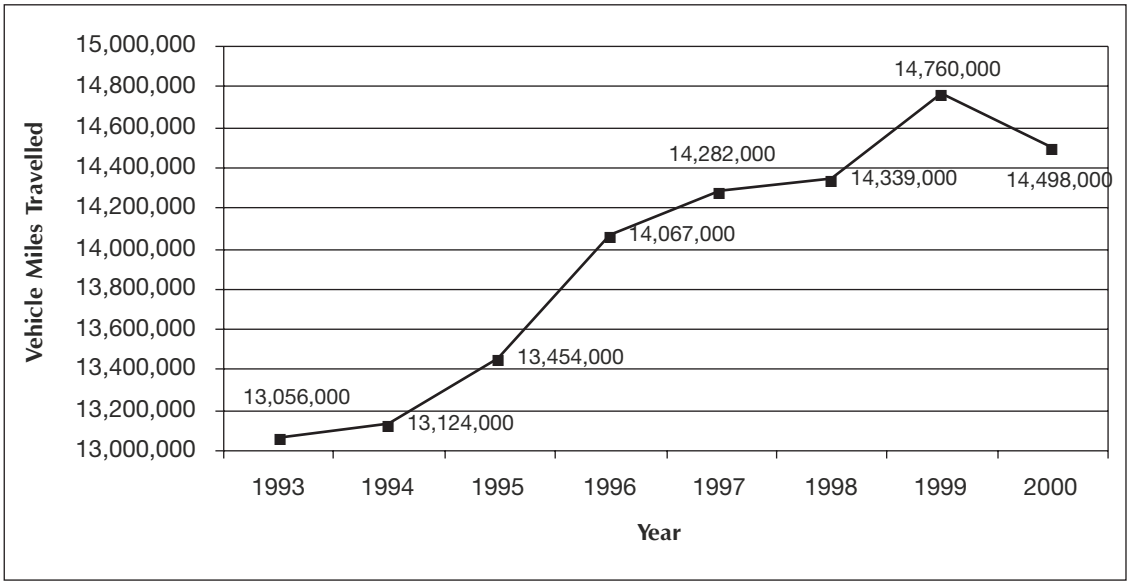
Figure 7-2- Rail Crossings Map

Table 7-7 - 1980 - 1998 Estimated Urban Vehicle Miles of Travel in the Pioneer Valley Urbanized Area

		Daily Vehicle Miles Traveled (DVMT in thousands)					
Year	Total	Interstate	Other Principal Arterial	Urban Minor Arterial	Urban Arterial	Urban Collector	Urban Local
1980	**7,466**	1,844	187	2,570	1,521	494	850
1981	**7,619**	1,893	176	2,642	1,547	513	848
1982	**7,801**	1,974	168	2,732	1,558	515	854
1983	**7,848**	1,912	190	2,819	1,557	515	855
1984	**8,060**	2,085	191	2,857	1,557	515	855
1985	**8,026**	2,024	192	2,868	1,569	518	855
1986	**8,126**	2,204	208	2,785	1,551	524	854
1987	**8,359**	2,279	227	2,916	1,553	530	854
1988	**8,760**	2,430	295	2,658	1,829	694	854
1989	**9,439**	2,531	301	2,746	1,852	711	1,298*
1990	**9,480**	2,429	295	2,774	1,979	688	1,315*

Note: The methodology for estimating travel on functional class Local roadways was changed in 1989. Comparisons with previous years are not valid.
Source: Massachusetts Highway Department, Highway Performance Monitoring System.

Figure 7-3- 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 decline in VMT from 1999-2000 will require monitoring to determine if it is a product of the economy or a change in trends such as a decrease in vehicle trips.

7. Average Daily Traffic Counts

The Pioneer Valley Planning Commission (PVPC) monitors traffic levels throughout the Region. Conducting close to 120 roadway segment counts annually as well as compiling counts from various local traffic studies; the PVPC continuously expands the data base. 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 eleven permanent monitoring stations maintained by MHD as well as four such stations maintained by PVPC. The MHD locations collect counts hourly, 365 days a year. The PVPC locations collect counts hourly, 7 days a month. These permanent count locations are shown in Table 7-8.

Table 7-8 - Mass Highway Permanent Count Stations in the Pioneer Valley

Community	Roadway	Location	Years Available
Longmeadow	I-91	S/O Springfield City Line	1994-1997,1999
Chicopee	I-391	S/O I-90 at Route 116	1995-2000
Chicopee	I-391	N/O I-90	1994, 1996,1997,2000
Northampton	Route 5/10	S/O Hatfield Town Line	1994-2000
Northampton	I-91	N/O King Street Interchange	1996,1997,1999,2000
Northampton	I-91	Btwn. Route 9 & Damon Rd.	1997-1999
Northampton	I-91	Btwn. Rtes. 5 & 9	1997-1999
West Springfield	Route 5	at the Holyoke City Line	1996, 1998-2000
West Springfield	I-91	N/O Route 5	1996,1998-2000
Huntington	Route 112	S/O Route 66/112	1995-2000
Goshen	Route 112	0.6 km S/O Ashfield T.L.	1997-2000

Source: MassHighway

Table 7-9 provides information on the percent change in traffic volumes at the above mentioned locations.

Table 7-9 - Percent Change in Arterial Traffic Volumes

Community	Roadway	Location	Years Available	% Change
Longmeadow	I-91	S/O Springfield City Line	1994 1997,1999	9.01%
Northampton	I-91	N/O King Street Interchange	1996,1997,1999,2000	7.51%
Northampton	I-91	Btwn. Route 9 & Damon Rd.	1997-1999	7.37%
Northampton	I-91	Btwn. Rtes. 5 & 9	1997-1999	10.95%
West Springfield	I-91	N/O Route 5	1996,1998-2000	13.80%
Chicopee	I-391	S/O I-90 at Route 116	1995-2000	14.50%
Chicopee	I-391	N/O I-90	1994, 1996-1997,2000	-10.10%

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 are shown in Figures 7-4 through 7-6. The functional classification of the roadway is an indication of the type and amount of traffic a roadway is expected to serve.

Figure 7-4 - Average Daily Traffic of Pioneer Valley Interstates

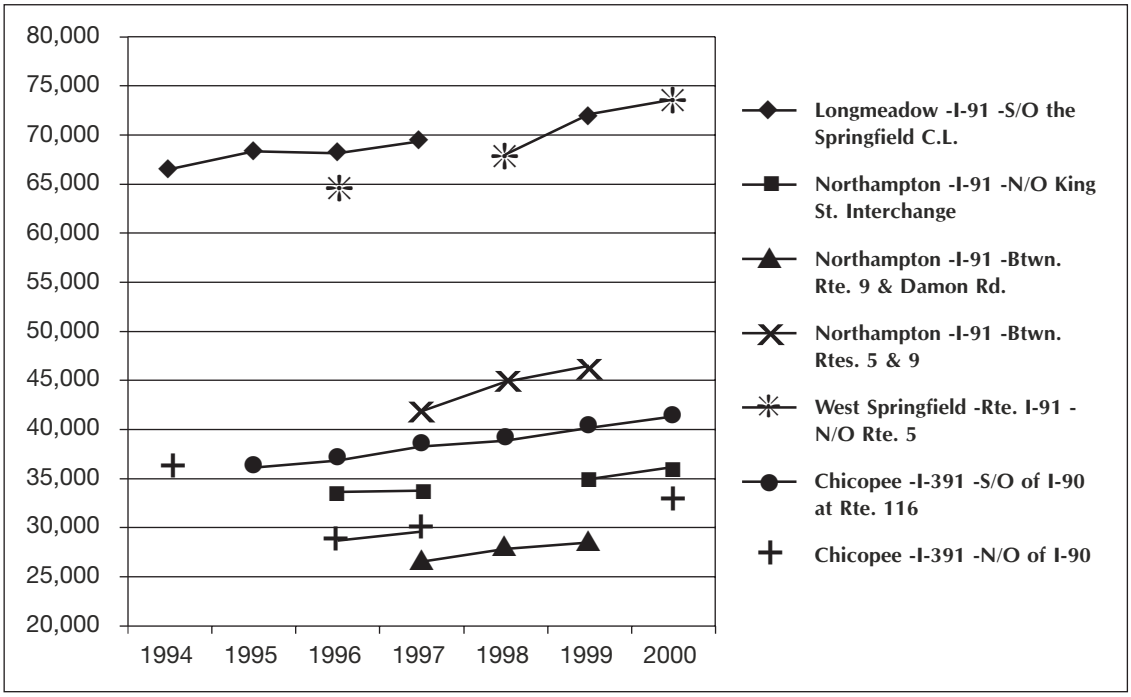


Figure 7-5 - Average Daily Traffic of Pioneer Valley Arterials

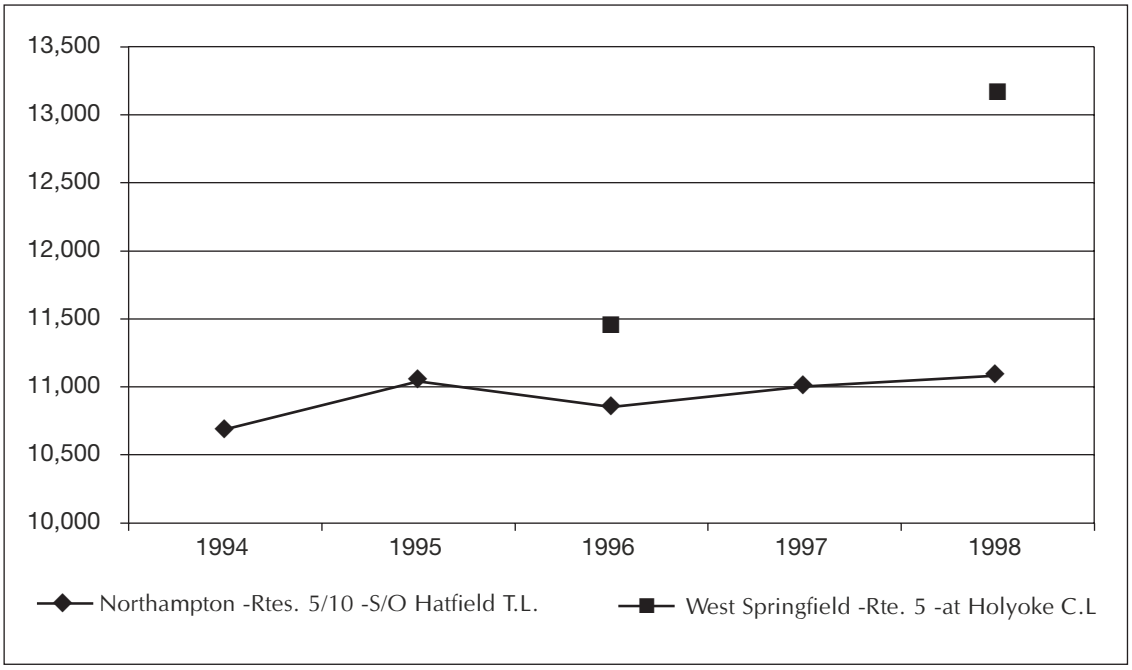
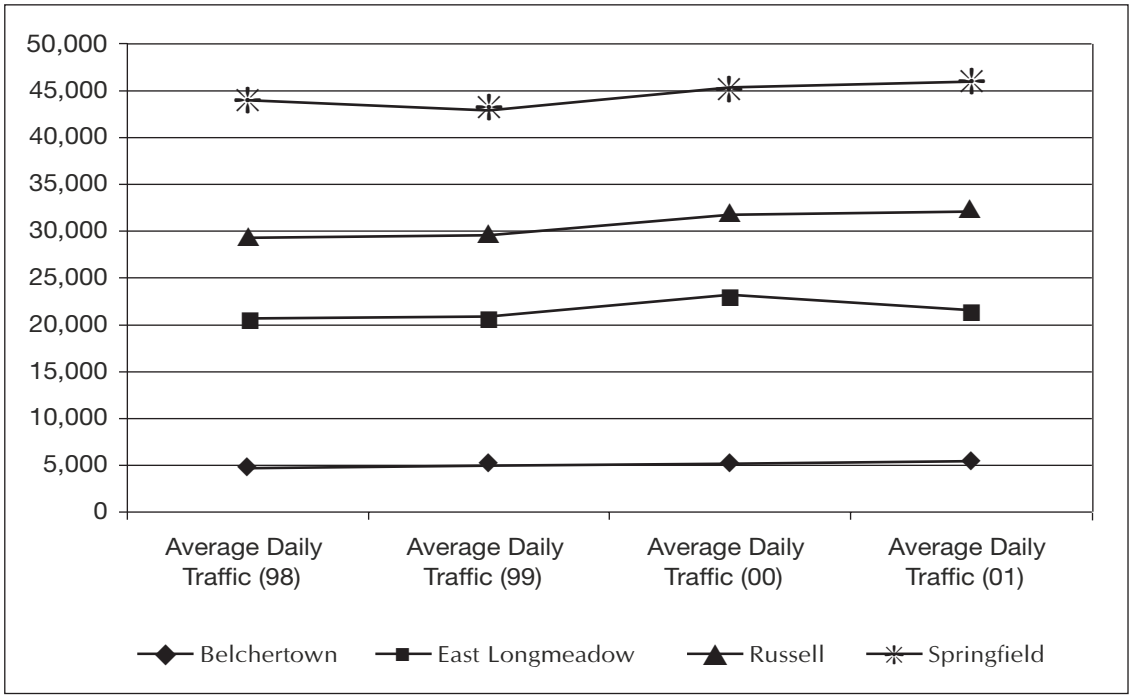


Figure 7-6 - Average Daily Traffic of Pioneer Valley Rural Roadways

The PVPC also maintain four of its own traffic count stations to collect information on seasonal variations in traffic count data. As more data becomes available from this program it is anticipated that regional adjustment factors and growth rates can be developed. This information is presented in Figure 7-7.

Figure 7-7 - Average Weekday Flow at Selected Locations in the Pioneer Valley



8. Vehicle Registration and Ownership

Based on information available from 2002, a total of 495,728 vehicles were registered in the Pioneer Valley region. This translates into approximately 0.81 vehicles per person and is an increase of 17.2 percent from 1996. Automobile ownership increased slightly, by 4.1 percent between 1996 and 2002. However, light truck and SUV registrations increased by 59.0 percent in that same span. This translates into an increase from 0.14 light trucks and SUVs per person in 1996 to 0.22 per person in 2002. Despite rising gasoline prices at the end of the 1990s, the rate of increase in light truck registrations appears to be rising. Between 1991 and 1996, light truck registrations increased by 7.5 percent on average annually, but between 1996 and 2002, light truck registrations increased by 8.4 percent on average annually.

The City of Springfield has the most registered vehicles with 105,583 recorded in 2002. This translates to 21.3 percent of registered vehicles in the region. Outlying communities—such as Brimfield, Chesterfield, Goshen, Holland, Plainfield, and Tolland—had the largest increase in registered vehicles between 1996 and 2002 (an increase of more than 30 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 98.9 percent (nearly doubling the number of light trucks and SUVs registered in Longmeadow at a time when the population increased by less than one percent). Tables 7-10 and 7-11 summarize the number of registered motor vehicles in the Pioneer Valley by community and type of vehicle for 1996 and 2002. Information on the ratio of vehicles to 2000 populations levels has also been added to Table 7-11. There are currently 8 registered vehicles for every 10 people living in the Pioneer Valley Region. Table 7-12 highlights the percent change in registrations between 1996 and 2002 by type of vehicle and community.

Table 7-10 - Registered Motor Vehicle in the Pioneer Valley – 1996

Community	Automobiles	Trailers	Light Trucks (& SUVs)	Heavy Trucks	Motorcycles	Other	Total
Agawam	16,476	1,060	4,609	488	277	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
Springfiefd	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	1,091	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**	**83,612**	**7,625**	**4,410**	**7,291**	**422,883**

Source: Massachusetts Registry of Motor Vehicles

Table 7-11 - Registered Motor Vehicles in the Pioneer Valley – 2002

Community	Automobile	Trailers	Light Trucks (& SUVs)	Heavy Trucks	Motorcycles	Other	Total	Vehicles/ Persons
Agawam	16,397	1,601	7,257	681	379	236	26,551	0.94
Amherst	12,521	542	3,420	147	164	238	17,032	0.49
Belchertown	6,713	1,023	4,092	213	255	162	12,458	0.96
Blandford	611	132	527	27	39	13	1,349	1.11
Brimfield	1,798	348	1,298	91	100	64	3,699	1.11
Chester	613	127	597	31	43	19	1,430	1.09
Chesterfield	511	113	532	24	29	21	1,230	1.02
Chicopee	29,926	2,273	11,250	826	689	440	45,404	0.83
Cummington	525	73	363	22	37	38	1,058	1.05
East Longmeadow	8,472	813	3,861	270	200	216	13,832	0.98
Easthampton	8,935	725	4,049	169	304	179	14,361	0.90
Goshen	452	97	387	37	34	16	1,013	1.12
Granby	3,165	612	2,138	130	140	95	6,280	1.02
Granville	810	167	642	64	61	25	1,769	1.16
Hadley	2,851	381	1,566	129	62	85	5,074	1.06
Hampden	2,789	468	1,701	132	108	65	5,262	1.02
Hatfield	1,983	464	1,158	234	62	72	3,973	1.22
Holland	1,249	211	919	23	80	30	2,512	1.04
Holyoke	18,491	768	5,899	268	342	288	26,056	0.65
Huntington	1,034	172	853	36	598	39	2,192	1.00
Longmeadow	9,394	384	3,170	41	100	71	13,160	0.84
Ludlow	10,683	1,207	5,347	472	332	187	18,228	0.86
Middlefield	235	44	229	12	24	14	558	0.96
Monson	4,129	767	2,962	204	247	124	8,433	1.01
Montgomery	370	92	331	18	26	11	848	1.29
Northampton	15,649	901	5,617	323	336	249	23,075	0.80
Palmer	6,788	856	3,779	329	278	152	12,182	0.97
Pelham	787	100	359	25	24	24	1,319	0.94
Plainfield	317	49	276	10	17	7	676	1.17
Russell	814	127	617	22	40	20	1,640	0.99
South Hadley	8,937	928	3,801	304	214	157	14,341	0.83
Southampton	2,879	568	1,960	116	128	101	5,752	1.07
Southwick	4,866	801	3,173	253	220	136	9,449	1.07
Springfield	75,038	3,004	22,932	1,736	1,308	1,565	105,583	0.69
Tolland	236	43	195	22	20	9	525	1.23
Wales	923	148	684	48	66	30	1,899	1.09
Ware	4,731	545	2,894	142	220	111	8,643	0.89
West Springfield	15,878	1,235	6,274	608	306	218	24,519	0.88
Westfield	19,865	2,192	10,199	690	520	386	33,852	0.84
Westhampton	687	127	595	28	36	17	1,490	1.01
Wilbraham	7,774	876	3,559	266	224	163	12,862	0.95
Williamsburg	1,474	202	962	66	47	33	2,784	1.15
Worthington	617	146	530	29	29	24	1,375	1.13
Pioneer Valley Region	**312,917**	**26,452**	**132,954**	**9,318**	**7,948**	**6,150**	**495,728**	**0.81**

Table 7-12 - Percent Change in Registered Motor Vehicles, 1996-2002

	Automobiles	Trailers	Light Trucks (& SUVs)	Heavy Trucks	Motorcycles	Other	Total
Agawam	(0.5%)	51.0%	57.5%	39.5%	67.0%	(23.9%)	14.6%
Amherst	4.2%	32.5%	51.6%	10.5%	19.7%	(13.1%)	11.9%
Belchertown	10.6%	53.6%	56.1%	25.3%	83.55	(15.6%)	26.4%
Blandford	(0.5%)	57.1%	32.1%	58.8%	85.7%	0.0%	17.5%
Brimfield	13.7%	88.1%	71.9%	13.8%	108.3%	(26.4%)	35.2%
Chester	(0.3%)	42.7%	32.1%	14.8%	87.0%	11.8%	16.9%
Chesterfield	6.2%	98.2%	52.9%	50.0%	222.2%	0.0%	32.0%
Chicopee	3.1%	31.9%	52.9%	(6.1%)	71.8%	(35.3%)	13.3%
Cummington	14.6%	28.1%	27.8%	83.3%	117.6%	58.3%	24.2%
East Longmeadow	0.8%	39.7%	73.0%	30.4%	112.8%	6.4%	18.0%
Easthampton	2.3%	50.4%	48.5%	45.7%	79.9%	(18.3%)	15.4%
Goshen	14.1%	125.6%	44.9%	54.2%	126.7%	33.3%	33.8%
Granby	(0.7%)	51.9%	45.7%	19.3%	118.8%	(4.0%)	17.9%
Granville	2.7%	54.6%	47.2%	45.5%	177.3%	(10.7%)	24.0%
Hadley	9.2%	44.9%	54.7%	17.3%	113.8%	3.7%	23.6%
Hampden	2.4%	36.4%	53.9%	59.0%	107.7%	(16.7%)	20.0%
Hatfield	1.1%	29.2%	31.1%	(14.9%)	72.2%	(2.7%)	10.7%
Holland	13.9%	106.9%	68.9%	(11.5%)	105.1%	15.4%	37.0%
Holyoke	4.0%	43.0%	66.3%	31.4%	75.4%	(3.0%)	15.5%
Huntington	8.4%	47.0%	42.9%	50.0%	114.8%	(9.3%)	24.4%
Longmeadow	(6.4%)	36.2%	98.9%	(4.7%)	56.3%	(26.8%)	8.6%
Ludlow	0.2%	57.8%	61.0%	49.4%	106.2%	(9.2%)	18.2%
Middlefield	6.3%	109.5%	32.4%	33.3%	84.6%	40.0%	24.8%
Monson	3.6%	72.0%	52.8%	30.8%	99.2%	(11.4%)	24.2%
Montgomery	(4.1%)	55.9%	39.7%	20.0%	116.7%	10.0%	17.9%
Northampton	3.1%	24.3%	42.5%	4.5%	65.5%	(15.0%)	11.8%
Palmer	3.2%	48.9%	52.4%	46.9%	69.5%	(22.1%)	19.3%
Pelham	(3.3%)	51.5%	38.6%	78.6%	140.0%	(11.1%)	10.8%
Plainfield	17.4%	58.1%	55.1%	42.9%	240.0%	(46.2%)	34.1%
Russell	4.9%	(17.0%)	45.5%	15.8%	150.0%	17.6%	16.7%
South Hadley	0.2%	45.2%	44.9%	46.2%	94.5%	(17.8%)	13.0%
Southampton	7.5%	50.7%	54.8%	30.3%	166.7%	(18.5%)	25.6%
Southwick	7.9%	52.3%	52.8%	54.3%	91.3%	(6.8%)	25.3%
Springfield	9.9%	4.5%	74.2%	17.8%	71.9%	(9.7%)	19.6%
Tolland	24.2%	8.7%	71.1%	83.3%	100.05	28.6%	47.5%
Wales	7.7%	72.1%	54.8%	100.0%	100.0%	(6.3%)	28.8%
Ware	1.2%	41.9%	52.2%	15.4%	80.3%	9.9%	18.3&
West Springfield	(0.6%)	19.1%	59.8%	15.8%	45.0%	(43.1%)	11.2%
Westfield	3.7%	40.2%	64.4%	29.2%	73.3%	(17.3%)	19.9%
Westhampton	(1.9%)	47.7%	45.1%	12.0%	125.0%	(34.6%)	18.0%
Wilbraham	(2.0%)	33.3%	75.7%	29.1%	101.8%	(18.9%)	15.5%
Williamsburg	7.2%	78.8%	41.7%	6.5%	135.0%	(31.3%)	21.2%
Worthington	3.4%	105.6%	48.9%	31.8%	70.6%	(45.5%)	24.2%
Pioneer Valley Region	**4.1%**	**37.6%**	**59.0%**	**22.2%**	**80.2%**	**(15.6%)**	**17.2%**

Source: U.S. Census Bureau

9. Travel Times

A series of travel time contours were developed for the Pioneer Valley region based on the location of centers of employment in the region. A total of six employment centers were selected because of their significance and to achieve geographic diversity. Many employment centers were not selected due to their close proximity to a site that was mapped. Travel contours are broken down into 15, 30 and 45 minute intervals. This information is shown on Figure 7-8.

10. Mode Split

Based on information from the 200 Census, nearly 80 percent of all work trips in the Pioneer Valley are made via the single occupant vehicle. Figure 7-9 shows the breakdown of the travel modes used to access employment. Of the remaining 20 percent of travelers which did not drive alone, almost half chose to carpool to work. Telecommuters or people that work from home consisted of only 2.7 percent of the total, however, this number could begin to increase in the future as the telecommunications network in the region continues to grow and improve.

Figure 7-9 - Pioneer Valley Travel Modes for Employment

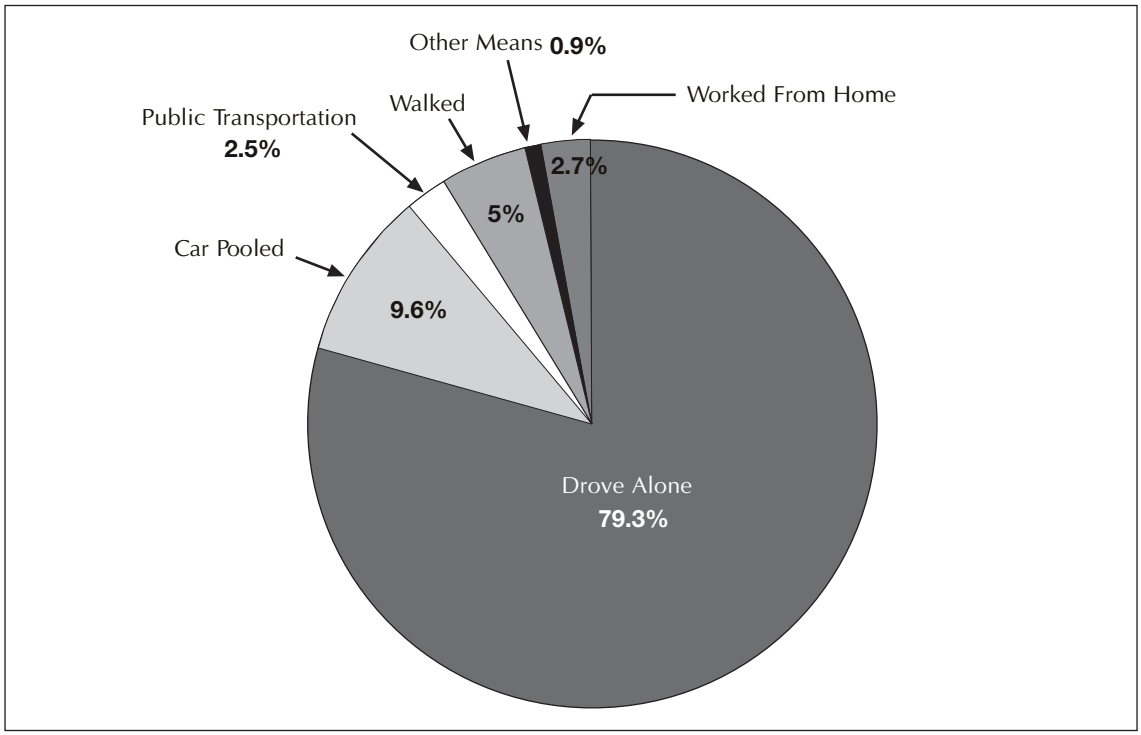


Figure 7-8 - Peak Hour Travel Time Contours

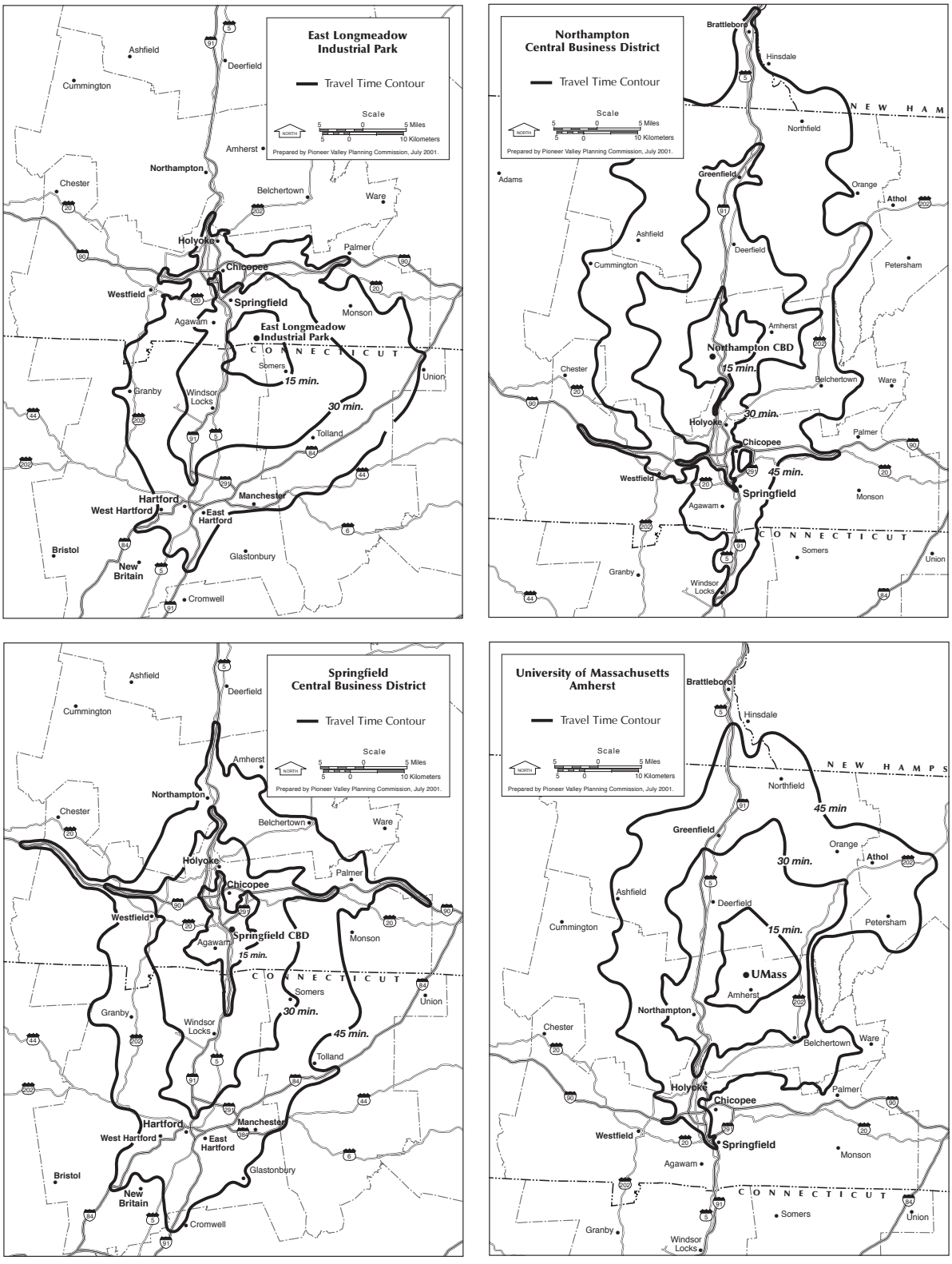
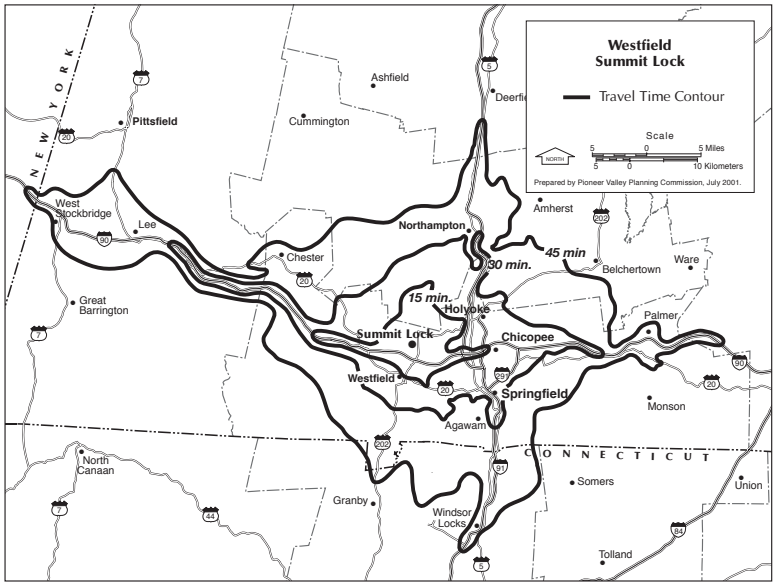
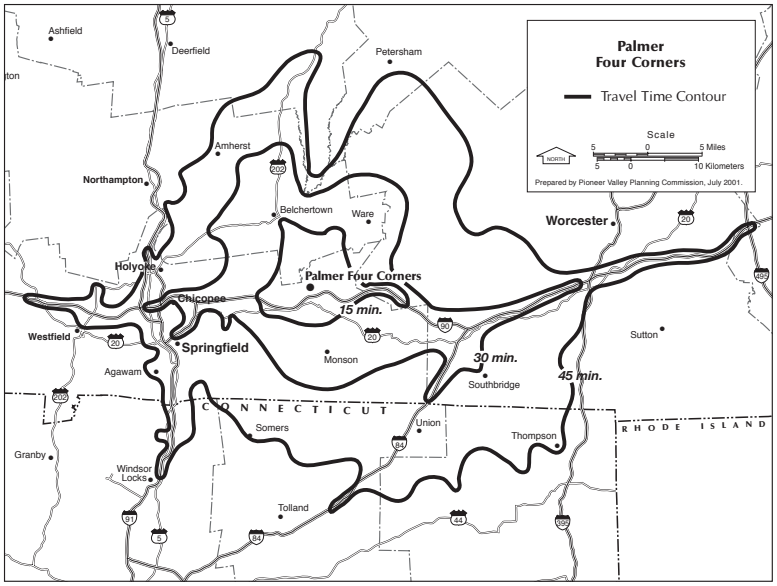


Figure 7-8 - Peak Hour Travel Time Contours cont.





B. Passenger Transportation

The Pioneer Valley is home to an extensive transit system that offers many different modes of public transportation. Intracounty and Intercity buses, paratransit, ridesharing and park and ride services are all vital parts in the mobility of the region's residents. What follows is a summary of these intermodal services. Amtrak and the commercial airlines are also public carriers on an intercity basis and are described in later sections.

1. PVTA

a) Fixed Route

The communities that compose the PVTA district can be divided into three basic regions: the northern region, the southern region and the eastern region. The northern region is predominantly suburban and is composed of the communities of Amherst, Easthampton, Hadley, Leverett, Northampton, Pelham, Sunderland, and Williamsburg. The southern region may be divided into an urban core, composed of Springfield, Chicopee, and Holyoke, and a suburban area composed of Agawam, East Longmeadow, Granby, Hampden, Longmeadow, Ludlow, South Hadley, West Springfield, Westfield, and Wilbraham. The eastern region is composed of the towns of Ware, Palmer, and Belchertown.

Since 1976, PVTA has pursued many state and federal grant programs with the purpose of providing passengers with improved levels and quality of service. These programs were designed by the federal government to encourage the implementation and development of mass transit.

The capital and service improvements implemented since PVTA's creation resulted in major ridership increases – peaking at nearly 13 million in 1985. In the years 1990 to 2001 overall ridership increased by 3.24%. However, ridership declined in 2002 – decreasing by almost 5%. See Table 7-13.

Table 7-13 - PVTA Fixed Route Ridership

Fiscal Year	Passenger Trips	% Change
1990	11,331,364	—
1991	10,996,908	-2.95%
1992	11,150,728	1.38%
1993	10,920,872	-2.06%
1994	11,058,756	1.25%
1995	11,060,508	0.02%
1996	11,266,796	1.83%
1997	11,564,052	2.57%
1998	11,771,729	1.76%
1999	11,569,772	-1.72%
2000	11,575,486	0.05%
2001	11,705,973	1.11%
2002	11,154,252	-4.71%

Source: PVTA Annual Reports

Under Massachusetts law, transit authorities may not directly operate transit service. Thus, transit authorities contract with outside operators. PVTA currently has contracts with First Transit Corp., University of Massachusetts Transit Service, and Hulmes Transportation Services, Inc. to provide fixed route service. UMASS Transit Service provides service to the University of Massachusetts at

Amherst and the Five College area. First Transit provides service to the remainder of the communities in the Pioneer Valley with the exception of Belchertown, Easthampton, Palmer and Ware which are served by Hulmes Transportation.

In 1999 service was instituted in Palmer leaving Hampden and Leverett as the only towns in the Pioneer Valley transit district not currently serviced by the PVTA's fixed route transit system. See Figure 7-10 showing PVTA's entire service area.

The PVTA operates a fleet of 195 buses. Service operated by SATCO and VATCO utilizes 155 buses and mini buses. Service operated by UMASS Transit utilizes 40 buses. The entire bus fleet has an average age of approximately 10 years. All of the buses operated in the PVTA system are wheel chair lift equipped.

The PVTA's 42-route network of fixed routes and 4 community shuttles provides comprehensive service in the regions major urban centers, as well as outlying suburban areas.

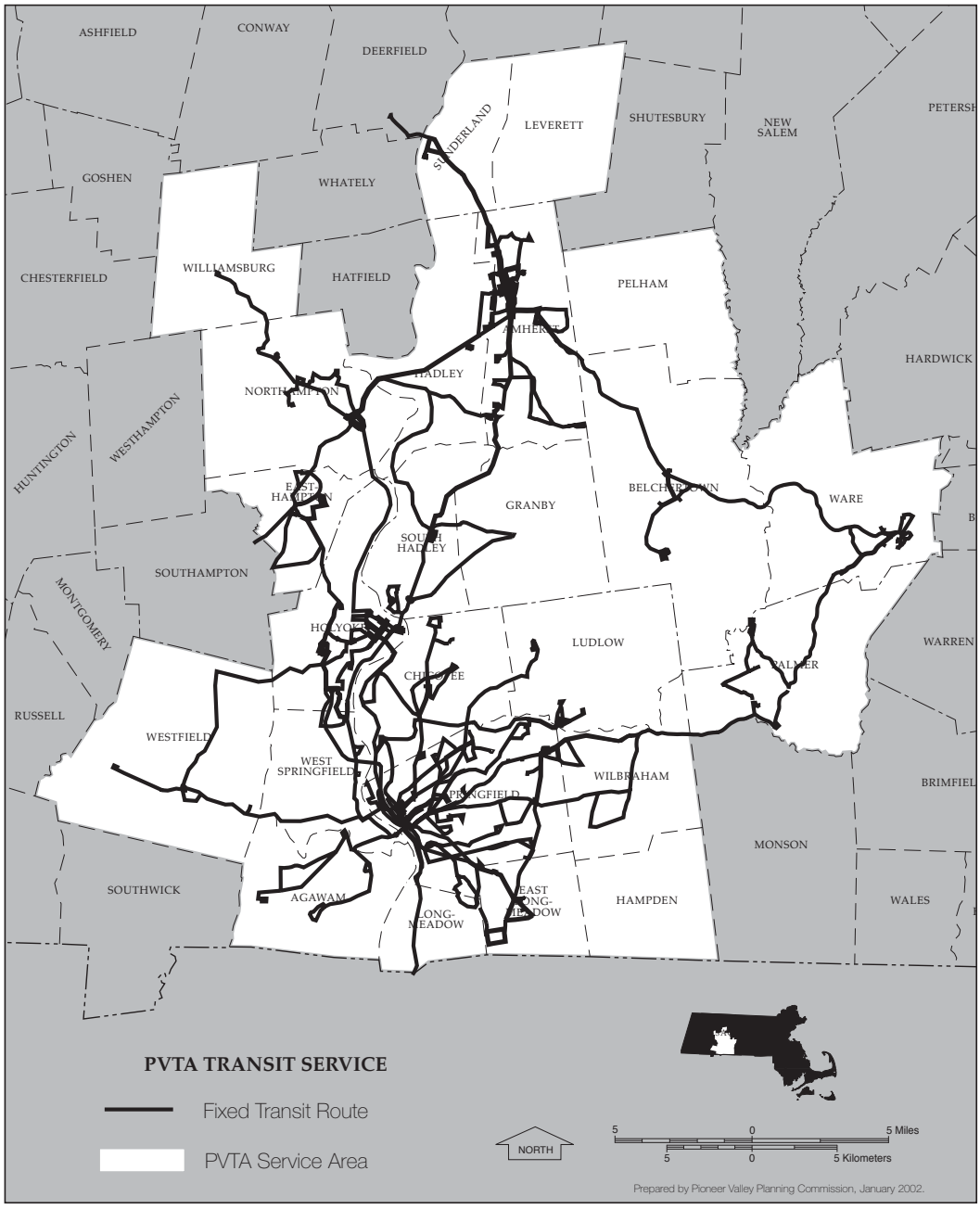
Route headways and hours of operation are revised as needed in response to ridership patterns and service requests.

PVTA's fixed-route fare structure is set up based on zones, with a base fare for the first zone and an extra charge for subsequent zones. The length of these zones varies from route to route. Transfers, when issued, are at no charge to the passengers. The adult base fare was raised in 1990 to 65 cents and it was increased to 75 cents in 1997. The PVTA also has reduced fare programs for the elderly, disabled, and Medicaid card holders.

PVTA's monthly commuter passes are available in four different types according to the zones in the fare structure. The elderly, disabled, and Medicaid card holders qualify for half fare one-zone passes at a cost of $13.00. The cost of a multi-zone pass for the elderly and or disabled is $18.00. The cost of a standard one-zone pass is $27.00. The cost of a standard multi-zone pass is $36.00.

Routes operated by UMASS Transit operate on a "pre-paid fare" basis. The University of Massachusetts, Five Colleges Inc., and the Town of Amherst subsidize the cost of this service.

Figure 7-10-PVTA Service Area



b) PVTA Paratransit Service

In addition to its regular fixed route service, the PVTA provides door-to-door accessible van service to the 22 member communities located in Hampden and Hampshire County and the two member communities in Franklin County. This service is generally available in a wider area than that which is served by the fixed route transit system available to the general public.

PVTA has three van operators utilizing approximately 128 vehicles. PVTA's service area is divided up into six areas or tiers. The tiers are as follows:

Northern Tier – Amherst, Hadley, Northampton, Easthampton, Leverett, Pelham, Sunderland, Williamsburg

Central Tier – Holyoke, South Hadley, Chicopee, Ludlow

Eastern Tier – Belchertown, Granby, Ware, Palmer

Southern Tier – Longmeadow, East Longmeadow, Wilbraham, Hampden

Western Tier – West Springfield, Agawam, Westfield

Springfield Tier – Springfield.

There are two programs operated under the Paratransit service umbrella: ADA complementary paratransit service and Dial-a-Ride service.

(i) ADA complementary paratransit

PVTA provides van service to passengers who are unable to access the bus system due to a disability. This form of transportation is comparable to regular bus service in the Pioneer Valley. Passengers must complete PVTA's ADA application to be eligible for ADA van service. Once certified, passengers receive service according to the following requirements:

- Trips can be scheduled the day before the trip is needed
- Service is provided on the same days and during the same hours as regular bus service in the area.
- In order for a trip to be ADA eligible it must fall within æ of a mile of existing bus service.

(ii) Dial-A-Ride Service

PVTA also provides van service to individuals over the age of 60 throughout the 24 communities. The service is operated on a space available basis and operates Monday through Friday 8:00 AM to 4:30 PM.

Fares for Dial-a-Ride program are 50 cents one way in town; $1.00 one way out of town, and $1.50 one way out of county. Table 7-14 shows the Para-Transit ridership from 1987 to 2001.

Table 7-14 - PVTA Annual Paratransit Service Ridership

Fiscal Year	Annual Ridership
1987	322,384
1988	282208
1989	370,230
1990	348,718
1991	305,129
1992	295,614
1993	325,032
1994	270,077
1995	282,013
1996	322,324
1997	308,171
1998	345,575
1999	371,658
2000	416,078
2001	462,683

Source: PVTA

c) Park and Ride

There are five Park and Ride lots in the PVPC region. The Massachusetts Turnpike Authority opened parking lots in Ludlow and Palmer. The parking lot at the Five-Town Plaza in the City of Springfield operates in conjunction with PVTA bus routes. The fourth Park and Ride lot was recently opened in Northampton at Sheldon Field and the Norwottuck Rail Trail Lot on Damon Road is also used as a Park and Ride lot. A summary of the existing Park and Ride lots is presented in Table 7-15.

Table 7-15 - Park and Ride Lot Locations

Community	Location	Spaces Available	Average Occupancy	Lot Conditions	Safety Problem	Services Available	Parking Cost
Ludlow - Turnpike Exit 7	Rte 21 (Center St) Rear of McDonalds	43	19	Paved, Striped, Fenced	No	Food, Bike Racks	No
Palmer- Turnpike Exit 8	Rte 32 (Thorndike St) Rear of McDonalds	34	15	Paved, Striped, Fenced	No	Peter Pan Bus, Food, Bike Racks	No
Springfield	Five Town Plaza- Allen and Cooley Streets	89	9	Paved, Striped	No	PVTA Bus	No
Northampton	Damon Road	28	16	Paved, Striped, Fenced	No	PVTA Bus Bike Path, Bike Racks	No
Northampton	Sheldon Field	59		Paved, Striped Fenced	No	PVTA Bus, Bike Path, Bike Racks	No

2. Private Carriers

The Pioneer Valley Region is served by an extensive intercity transportation network. Scheduled service is provided by four major privately owned companies. These companies provide a mix of local and express routes connecting points within and outside the region with nationwide connecting service. The companies are: Bonanza Bus lines of Providence, Rhode Island; Greyhound Lines of Dallas Texas; Peter Pan Bus Lines of Springfield Massachusetts; and Vermont Transit Lines of Burlington, Vermont. Several other carriers provide a variety of services including large and small bus charters, and packaged tours to a number of destinations within and outside the region.

Most of the intercity public transportation network in the region is concentrated in the City of Springfield. In the city, bus operations are conducted at the Springfield Bus Terminal which was opened in 1969. The terminal is operated by Springfield Bus Terminal Associates composed of Peter Pan, Greyhound, Vermont Transit, and Bonanza Bus Lines. It functions as the major bus station in Western Massachusetts and as an interchange point for all of the intercity bus lines.

The terminal operates 24 hours a day. There are 16 bays located at the rear of the terminal. Behind the terminal's parking lot is the Peter Pan garage and maintenance facility which houses eight maintenance stalls, a serving lane and indoor parking for 60 buses. The terminal serves as the base of operations for Peter Pan Bus Lines.

According to Peter Pan Officials, an average of 1,600 passengers use the terminal daily. The volume is the combined total of all the carriers using the facility. Approximately 150 scheduled line-haul bus trips operate at the terminal daily.

The Northampton Bus Terminal opened in 1984. The three-story building is a project of the Northampton Terminal Associates, a partnership created by the presidents of Peter Pan Bus Lines and Western Mass Bus Lines. The terminal is operated by Peter Pan and is also served by Vermont Transit. The terminal provides a one-way lane for buses to stop in front of the station. Major Peter Pan stops are located at the University of Massachusetts, Amherst Center, South Hadley, and Palmer.

In Massachusetts, bus companies must receive authorization to operate on specific roadways. Authorization is the responsibility of the Department of Telecommunications and Energy - Transportation Division (formerly Massachusetts Department of Public Utilities) and within the Pioneer Valley Region local routes are approved by the PVTA. In the region, Peter Pan holds the rights to most local (non-interstate) service. As such, the remaining three intercity bus companies are restricted to operating on interstate highways except to stop at the major bus terminals.

a) Greyhound Bus Lines

Greyhound Lines, a unit of Laidlaw Inc. is North America's largest bus company and the only nationwide provider of intercity bus transportation. Headquartered in Dallas Texas Greyhound has more than 3,700 destinations in the 48 contiguous United States and Canada. Due to a reciprocal agreement between Greyhound and Peter Pan Bus Lines riders are afforded travel to all points on an hourly basis. Tickets can be purchased from either carrier.

b) Vermont Transit Lines

Vermont Transit, a subsidiary of the Greyhound Lines, operates two routes from Springfield, one to Bellows Falls, Vermont and the other to Newport, Vermont. Stops are made in Northampton and Greenfield, Massachusetts.

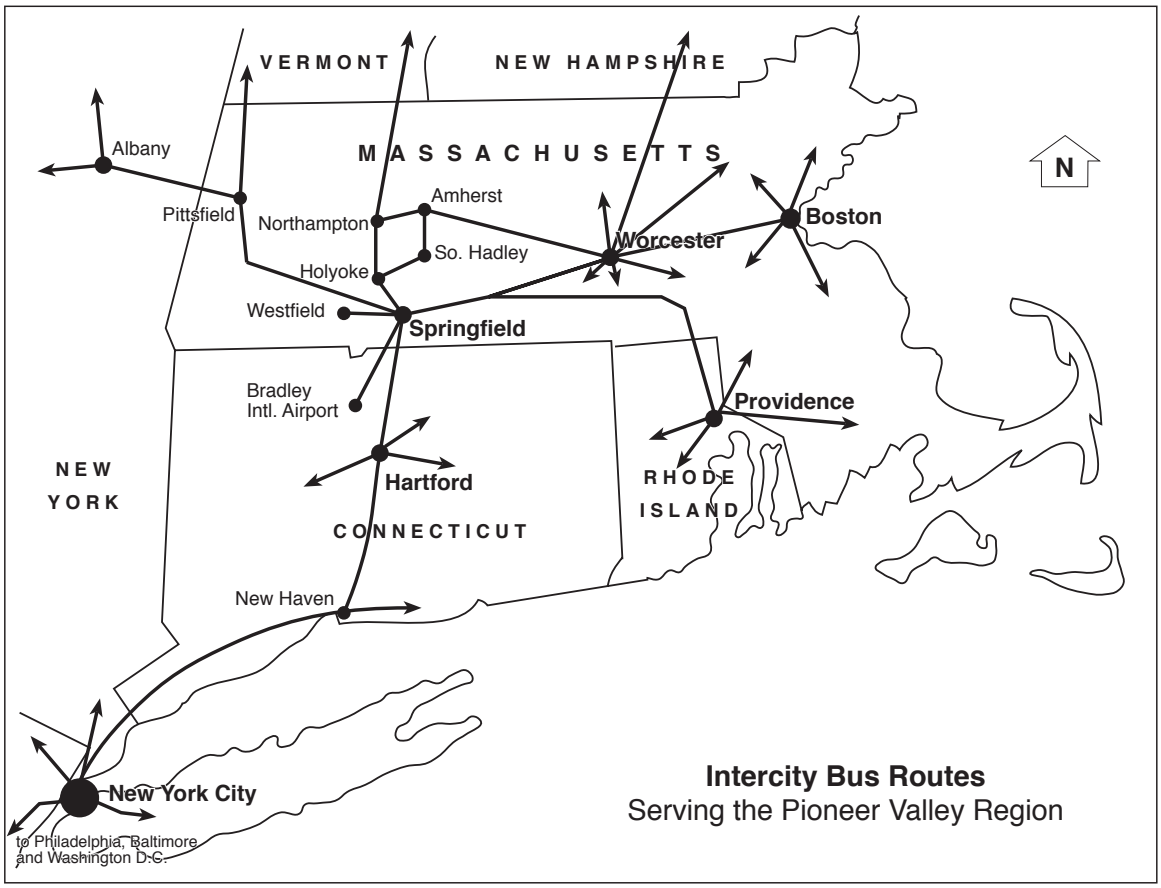
c) Peter Pan Bus Lines

In terms of cities and towns served and passengers carried, Peter Pan is the most significant intercity carrier in the region. Service to points within and outside the region is both extensive and frequent. In Peter Pan's two primary routes, Amherst to Boston via Springfield and Springfield to New York City, buses run hourly. There are about 23 buses running per day per direction in each route. Peter Pan operates major east-west lines between Albany, New York and Boston. Local east-west service connects Amherst, Northampton, Springfield, Worcester, and Boston. Peter Pan also operates hourly service between Springfield and Hartford, CT nonstop via I-91 sixteen schedules daily in each direction, with a travel time of 35 minutes. Six of these sixteen daily schedules continue south to New Haven, CT. Additional service is provided to Bradley International Airport in Windsor Locks, CT, Foxwoods Casino in Ledyard, CT, and New York City. Recently, Peter Pan announced plans to acquire five of Coach USA' affiliates; Arrow Lines, Bonanza Lines, the Main Line, Pawtuxet Valley Lines, and Boston. Bonanza's Boston-Providence-New York service and their service between Cape Cod and New York will be added to Peter Pan's line-run business. Arrow's leadership position in the Connecticut charter business and extensive contract services for Foxwoods Casio will extend Peter Pans charter business. As a result of this acquisition, Peter Pan Bus Lines will have a new presence in the Rhode Island charter market through Pawtuxet Valley as well as a charter and tour presence in northern New England with the Maine line. The sale will include all of the five companies 255 buses and bring Peter Pan's fleet size to over 400 motor coaches.

Many of Peter Pans fleet of buses are wheelchair lift equipped and accessible to disabled individuals. The Peter Pan's "Call-a-Lift" service allows an individual to call in advance to request a particular route to be accessible. Annually, over three and a half million passengers are carried by Peter Pan's buses in New England and the Northeast.

Figure 7-11 illustrates the intercity bus routes available to the Springfield area. Virtually any destination is accessible from Springfield.

Figure 7-11-Intercity Bus Routes



3. Charter and Tour Service

The Pioneer Valley Region is well served by motor coach charter and tour providers. In addition, many of the major tourism attractions in the region or on the periphery seek out charters and tours to their sites. These efforts should be encouraged as they provide an efficient means to increase tourism in the region without adding to congestion.

4. Ridesharing

The residents of the Pioneer Valley have the option of using the ridesharing services of Caravan, Inc., a private non-profit organization under contract with the Executive Office of Transportation and Construction (EOTC). Currently, all services provided are directed toward those commuters leaving the region.

The University of Massachusetts offers a rideshare program for the campus community. The UMASS Rideshare Program provides an alternative to driving alone by assisting UMASS employees and students with forming carpools and alternative modes of transportation. The goal of the program is to reduce the volume of UMASS commuter traffic. The campus currently has 11,000 parking spaces (not including metered spaces) with between 12,000 to 15,000 vehicles traveling to campus each day.

Ridesharing services are offered free to employees and students of the University. Services include a carpool matching service, reduced parking fees, preferred parking spaces, free one-day passes, guaranteed ride home, and information on alternative commuter options.

The Route 9 Corridor Transportation Management Association (TMA) ridesharing efforts are also expected to have a positive effect on traffic congestion on Route 9. The three charter members of the TMA are the University of Massachusetts, Cooley-Dickenson Hospital, and the City of Northampton. The TMA has worked with members on selling transportation and carpooling incentives to employees. The TMA recently completed a survey of employee travel characteristics.

5. 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.

b) Vermonter

One victim the early 90s Amtrak service cuts was the daily Washington to Montreal train the *Montrealer*, once the primary north/southbound train serving the Pioneer Valley. 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. The train was renamed the *Vermonter* and Amtrak made changes in both marketing and scheduling that resulted in significant ridership gains. The *Vermonter* is an example of a successful partnership between Amtrak and State and local governments.

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 fright 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.

C. 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 airports are privately owned and operated with much smaller and less sophisticated facilities. These airports serve 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 nine major airlines that currently serve Bradley Airport are America West, American, Continental, Delta, Delta Express, Northwest, Southwest, United, US Airways. There are also several regional airlines including Air Canada Jazz, American Eagle, Continental Express, Skyway, United Express and US Airways Express. Approximately 256 flights depart daily and in 2001 the airport served 6.8 million travelers. 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 5,000 people are employed in airport operations by various airport tenants with an annual payroll of more than $94 million.

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, on-airport 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, increased short and

long term parking, and reconstruction of the main runway. Due to the continued growth of the airport, the Connecticut Department of Transportation has proposed improvements that enhance aircraft operations, and passenger comfort and convenience

Bradley provides regular International service to two cities in Canada; Montreal and Toronto. Direct international charter flights are also 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 it is the home base for The Massachusetts Air National Guard 104th Tactical Fighter Group. 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, hangars, operations buildings and office space. An industrial park is also planned for this area of the airport. An army aviation support facility will be operating by middle to late spring 2003.

The Northeast quadrant is the home of General Dynamics Aviation Services, a subsidiary of General Dynamics, which caters corporate aircraft with its 3 hangars. The MANG has some leased land in this area which is used for storage.

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

c) Westover Air Force Base

Westover Metropolitan Airport is owned and managed under a "joint use" agreement with the Department of Defense by a non-profit industrial development corporation, Westover Metropolitan Development Corporation (WMDC). The WMDC was established in 1974 to develop property surpluses by the General Services Administration at the former Westover Air Force Base. WMDC

is charged with development of three Westover Industrial Parks, and the commercial aviation component of the Westover Metropolitan Airport. The Westover Metropolitan Airport operates in joint use with the Westover Air Force Base. The Air Force controls ground and air movements of all aircraft. Military aircraft have priority over civil aircraft for scheduled take-off and landings. Ninety-one acres of the property has been operated since that time as a public use, regional civilian airport.

Construction and activation of Westover Air Force Base (AFB) began in April 1940. Following World War II, the headquarters of the Military Airlift Command (MAC) were located at the airport. From 1955 until 1974 Westover Air Force Base was a major base of operations for the Strategic Air Command and the largest SAC facility in the eastern United States. The installation was deactivated in April 1, 1974, and since May 19, 1974 Westover has been an Air Force Reserve Base. In October 1987, the base assumed strategic airlift training missions with the redesignated 439th Military Airlift Wing. Tenants at the base include: The Marine Corps Reserve, Army Reserve, Navy Reserve, Army National Guard and the Army Reserve School.

Classified as a General Utility I airport providing comprehensive aviation services to commercial, business, private corporate, scheduled charter and scheduled commuter flights, Westover is the largest airport facility in the region. Located in the City of Chicopee and the Town of Ludlow within minutes of I-90 and I-91, Westover consists of 4,800 acres of land and two runways. The primary runway is the largest runway in Massachusetts at 11,600 feet long and 300 feet wide, with full Category 1 instrument approaches. This runway is capable of handling any size or type of aircraft in use today. The airport is currently planning on upgrading the instrument approaches to Category 2. The secondary runway is 7,075 feet long by 150 feet wide. Both runways are equipped with high intensity runway lighting with plans for improvements to all runway lighting by 2005. A new $4.1 million control tower was also recently constructed.

Buckeye Pipeline LLC supplies aircraft fuel to the airport via a pipeline. The airport is also connected to a rail spur.

During Operations Desert Shield and Desert Storm, Westover was the main east-bound staging area for the airlift of troops and cargo to the Persian Gulf. Between August 4, 1990 and July 15, 1991 Westover handled more than 1,800 C-5As and other aircraft bound to the Gulf and back, moving approximately 32,000 troops and 80,000 tons of cargo.

In 1987 a Master Plan was developed that had a two phase development program. The short range development program (0-5yrs.) included the construction of taxiway “P”, the beginning of a multiphase cargo facility, the construction of a new fixed base operators (FBO) facility area, continued upgrades to the WMDC aviation fuel facilities and improvements to the passenger terminal area. The long range development program (5-20 yrs.) includes the completion of taxiway “P”, long range cargo facilities, the expansion of existing aircraft aprons, rehabilitation of taxiways “S” and “A” and the expansion of the FBO site. Currently a new Master Plan is being developed and will be available in 2004.

In 2002 the largest taxiway for the airport was rebuilt at a cost of approximately $1.5 million. Another section of taxiway is planned on being reconstructed in 2003 at a cost of $500,000. The WMDC is in the process of securing funds for capital projects like these for the future. Just a few of these needs include soundproofing, snow removal equipment and building repairs. At the present time a Part 150 noise study is being conducted at Westover Metropolitan Airport. This study would quantify the impact of airport noise on the surrounding buildings and neighborhoods and recommend ways in which the airport can minimize its current noise level impacts.

For more info on the airport visit 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, is privately owned and operated. 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 3,500 feet long and 50 feet wide with variable high intensity, pilot operated runway lighting. The runway underwent a $1.2 million reconstruction approximately three years ago. It also offers 24 hour self service fueling. The airport offers 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 is the second busiest airport in the region, behind only Barnes Airport for jobs and income. The 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.

b) Palmer Metropolitan Airport

The airport, located in Palmer at the eastern section of the Pioneer Valley, is currently not operating. The state Aeronautics Commission had inspected the runway in December of 2002 to determine the feasibility and cost of rehabilitation. Currently the airport is for sale by its owner, Jenjill LLC of Wilbraham. The Town of Palmer has expressed interest in purchasing this facility.

c) Agawam-Springfield Seaplane Harbor

Located in Agawam on the Connecticut River, this seaport has been privately owned and operated. It serves general aviation uses both business and recreational. The seaport has a landing lane 8,000 feet long and 800 feet wide. At the time of publication, the position of owner/operator for the Seaplane Harbor was vacant. The past operator ran the Seaport from a private residence located along the Connecticut River near the landing strip. There are no immediate plans for the seaport.

D. Transportation 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. With the emergence of the European Economic Community and the Free Trade Agreement with neighboring Canada, the region is poised to take advantage of new ventures in international trade. The availability of an efficient, multimodal transportation network to move goods through the region is essential for this level of economic activity to be achieved.

A variety of goods are transported throughout the Pioneer Valley Region, including:

- Steel/Metal Products;
- Food Products;
- Paper Products;
- Textiles;
- Chemicals;
- Pharmaceuticals;
- Electrical Goods and Electronic Equipment;
- Fuel Oil;
- Household Products;
- Toys and Sporting Goods;
- Tools;
- Plastics;
- Recyclable Waste;
- Coal;

The region's economy is in transition. Manufacturing was once the mainstay of the region's economy, employing over 29 percent of the work force in 1980. By 1989 however, one-quarter of the region's manufacturing jobs had been lost. At the same time, service employment showed dramatic increases. Today, service industries employ more of the region's work force than manufacturing, a trend shared on state, national, and global levels. While industrialized countries have, over time, experienced a shift in employment from agriculture to manufacturing and on to services, until recently the Pioneer Valleys share of those employed in manufacturing had always exceeded that of the state and nation.

The region is in the midst of an important economic shift which affects both the employment climate (from a manufacturing to a service focus) and the type of commodities transported within the region (from predominantly durable goods to more paper and allied products and electronics). Ironically, though the number of people employed in manufacturing has declined; the volume of goods being produced and transported by active Pioneer Valley manufacturers has actually increased.

Several modes of transportation are available in the region to facilitate the movement of goods. These modes include truck, rail, air, and pipeline. The transportation of goods in to and out of the Pioneer Valley region is accomplished by the use of one of these modes, or a combination of several modes.

1. Trucking

This economic shift also affects the transportation of goods in the region. Trucking is currently the primary choice for moving goods throughout the Pioneer Valley. The types of commodities being transported are changing from predominantly durable goods to paper and its allied products and electronics. The mode choice for moving lightweight high-value goods, such as computers and other electronics, is often air rather than truck. In addition, the Free Trade Agreement with Canada and introduction of the international free market improves the ability of the region's businesses to import and export goods. These changes and opportunities affect the volume of goods being moved as well as their route and mode.

Overnight trucking service is available from the region to metropolitan centers throughout the Northeastern United States and Southeastern Canada. Approximately 130 for-hire-trucking companies serve the Pioneer Valley region, providing both full truckload and less than truckload (LTL) service. Many of these companies serve only local areas, but a large number of interstate motor carriers provide service to the towns in the area. In addition, there are numerous private truck fleets that carry freight for their owners. A tandem trailer terminal is located in Chicopee at Massachusetts Turnpike Interchange Number 6.

Many of New England's freight carriers are small, short haul carriers handling feeder and distribution traffic. In the Pioneer Valley, more than half of the trucking companies maintain operations in the Springfield/West Springfield area, and most of the urbanized area communities have at least one trucking firm or independent operator.

Carriers in the Pioneer Valley region serve numerous industries that are outside the region. For example, there are few trucking operations in Franklin County, and consequently some shippers there rely on Springfield-area carriers. Springfield-based trucking firms also provide nation-wide connections to points in Vermont, New Hampshire, Canada, New York State, and other parts of the Northeast. In this sense, the Pioneer Valley exports transportation services to other areas, producing regional income.

2. Rail

Five rail carriers provide freight service in the Pioneer Valley Region: CSX Transportation, Guilford Transportation Industries, 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 improvement would be needed to allow full double stack service (9'6"+ 9'6") in the region.

b) Guilford Transportation Industries

Guilford Transportation Industries is the owner of 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. Guilford 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. As a result of the Conrail merger Guilford has developed cooperative agreements with Norfolk Southern and Canadian Pacific Railroad to provide competition with CSX for New England Traffic.

c) New England Central

The New England Central Railroad (NEC) 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. The Westfield to Holyoke line was recently the recipient of a $1.5 million rehabilitation.

e) MassCentral Railroad

MassCentral (Massachusetts Central Railroad Corporation) is an independent firm headquarted 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 rialroad has operated the former Ware River secondary line, which runs 24 miles from Palmer, through Ware, to North Barre, Massachusetts. mass Central connects with CSX in Palmer. After abandonment by Conrail, the line was purchased and rehabilitated by the Commonwealth of Massachusetts. The Commonwealth maintains ownership, and leases the tracks to MassCentral. The Mass Central intermodal facility closed in September 0f 2003.

f) Yards Terminals

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

g) Services

Much of the freight moved in Massachusetts is interstate traffic with either Selkirk, New York (CSX) or Mechanicville, New York (B&M) 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 (Conrail and B&M) creates a strategic and attractive location for businesses and industry participating in the local or international marketplace.

3. Air Freight

Air cargo can be broken down into three specific groups: Air freight which includes all types of goods (generally over 70 pounds) transported by air and Express, which includes packages and documents (generally under 70 pounds) transported by air. Air express frequently offers comprehensive pick-up and delivery services, such as those provided by Federal Express; and U.S. and foreign mail travelling by air. The focus of this section will be on air freight and package express.

Air freight and package express services are readily available in the Pioneer Valley Region, and the transportation of air cargo is generally conducted in one of two ways. The first option would be to transport air freight by companies which own and maintain their own all-cargo aircraft fleet, such as Airborne Express, Burlington Air Express and Emissary Airways Inc. The second option, and the primary method for moving most of today's air freight, is via scheduled passenger aircraft for which the shipper places the cargo with a freight forwarding (pooling) company. And the forwarder contracts for blocks of space on commercial airlines for specific routes.

Air freight in the Pioneer Valley Region is predominantly moved through either Bradley International Airport in Windsor Locks, Connecticut, Logan Airport in Boston, or New York City's metropolitan airports. None of the airports located within the region's boundaries offer air cargo services at this time.

a) Bradley International Airport

Bradley International Airport is a medium-hub airport located 15 miles southwest of Springfield, MA, in Windsor Locks, CT. It is the major commercial airport serving the Pioneer Valley for both passenger travel and air cargo shipments. Bradley's convenient location near Interstate 91, and its

improved and expanded air cargo facilities, make it the primary choice for the regions shippers. 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.

Scheduled all-cargo flights are available at Bradley through a number of different carriers and there is a current listing available from the Connecticut Department of Transportation Bureau of Aviation and Ports. A current listing of passenger flights that make space available for freight forwarders can also be obtained from the Bureau.

b) Westover Metropolitan Airport

The Westover Metropolitan Airport provides access to a large joint military/civilian air facility which served exclusively as a military Strategic Air Command (SAC) base until 1974. At that time the base was deactivated and reclassified as an Air Force Reserve base. Today, in addition to the Air Force Reserve facilities, three industrial airparks are located at Westover.

4. Pipeline

There are presently three pipelines serving the Pioneer Valley. One provides natural gas, while the other two provide petroleum products.

a) Natural Gas

A natural gas pipeline, owned by Tennessee Gas Company (Tenneco), runs along the region's southern edge. The system's trunkline originates at the Gulf of Mexico in Southern Louisiana, travels northeast through the country and region, divides in Hopkinton, Massachusetts, and terminates in Gloucester, Massachusetts, and Concord, New Hampshire. The main line cuts through ten area communities from Tolland in the west to Holland in the east. In the region the line is 24-inches in diameter, and recently completed construction expanded the line's capacity with a parallel loop 30-inches in diameter.

A branch line also runs north from Southwick to Northampton. Construction, completed in 1990, replaced the existing pipeline with a larger, 12-inch diameter line which currently serves the area.

Construction of these improvements has increased the pipeline's capacity in the region. However, the Federal Energy Regulatory Commission (FERC) approves expansion plans based on a demonstrated increase in demand, with approval limited to only the work necessary to satisfy the increased demand. Therefore, despite the new improvements, the 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 Tenneco trunkline.

b) Jet Fuel

Jet Lines, Inc., (Jet Lines) is a common carrier of petroleum products within the states of Connecticut and Massachusetts. Jet Lines is controlled by Con Mass Pipeline Company, a subsidiary of Buckeye Pipeline Company, which in turn is a wholly owned subsidiary of Penn Central Corp. Jet Lines' general office is located in Bloomfield, Connecticut, but management control is directed from Emmaus, Pennsylvania.

The Jet Lines' system includes a trunkline 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 Jet Lines' New Haven Harbor receiving terminals. These products originate from refineries at various locations including the East and Gulf Coast of the United States, and the Virgin Islands. Some petroleum products are barged up the Connecticut River to East Hartford where they are transloaded into the pipeline for shipment further north. The trunkline terminates in Ludlow, Massachusetts.

The products can be taken off at any of the twenty delivery terminals in nine cities located along the line, plus two branch lines. The nine cities are (in order travelling northward along the trunkline) Portland, Cromwell, Rocky Hill, East Hartford, Hartford, Melrose, Scitico, (all in Connecticut) Springfield and Ludlow (both in Massachusetts). The branch lines extend to 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 Plainfield, New Jersey. The branch office has limited authority and the pipeline is primarily managed at the Mobil Pipeline Company's main headquarters, located in Dallas, Texas.

Most of the pipeline located in the Pioneer Valley is 6-inches in diameter with a few sections being 8-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 to Massachusetts. At Worcester, Massachusetts, the pipeline divides and products can be transported northward to Leominster, Massachusetts, or westward to Holyoke, Massachusetts. Mobil Chemical Company owns and operates a petrochemical plant in Holyoke.

The pipeline divides again approximately five miles east of Holyoke. This branch line goes southward through Springfield, into Connecticut, and terminates at Hartford, Connecticut. As of January 1, 1984, Hartford was eliminated as a destination, and pipeline flows now terminate at Springfield, MA

5. Other Modes

No barge transportation is provided on the Massachusetts portion of the Connecticut River, and few of the region's shippers make use of the barge services available south of Hartford. A 1985 study conducted by a private firm for the United States Army Corps of Engineers examined the economic feasibility of extending navigation on the Connecticut River north of Hartford to Holyoke, Massachusetts, a distance of 32.5 miles. It was concluded that the extension would be economically infeasible due to the prohibitive cost of the river dredging and raising of bridges that would be necessary to accommodate the barges.

E. Non-Motorized Transportation

In January of 2003, Massachusetts Governor Mitt Romney issued a policy statement regarding road and bridge design. The policy calls for highway designs that "use community-friendly solutions" and collaboration between state highway designers and local officials to create "context- sensitive" projects "protects and enhances the surrounding community and landscape while addressing mobility for all transportation modes. The specifically calls for enhanced mobility of "sustainable transportation modes and references walking, bicycling, and public transportation. The policy statement further directs the Secretary of Transportation to implement the policy. Through review and revisions to the highway design manual (to be completed in 2003) and appointment of an ombudsman to hear communities concerns and facilitate waiver requests.

In 1996 of 2003, Massachusetts Governor Mitt Romney issued a policy statement regarding road pedestrians in the Commonwealth, enacting Chapter 87 [MA ST 90E s 2A] of the Massachusetts General Laws. This legislation and the MassHighway Engineering Directives that followed influence the design and construction of public roadway project in the state. Engineering Directive E-98-003 defines recommended travel lane widths, and establishes a benchmark for reasonable bicycle and pedestrian accommodations. The benchmark for pedestrian accommodations is to, "provide one continuous paved surface or sidewalk along all roadways where pedestrian access is legally permitted." The design guidelines of the Directive apply to all full depth reconstruction projects funded through Chapter 90.

Since the passage of Chapter 87, many communities have expanded their sidewalk networks by incorporating sidewalk improvements in larger roadway construction projects and included additional shoulder width for bicyclists. While these efforts have provided new opportunities for thousands of people to walk and bike to destinations, many infrastructure needs still exist.

The popularity of bicycling in the Pioneer Valley has led to the creation of a several guidebooks specific to the region including a 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. On- Road Infrastructure

MassHighway Directive E-98-003 established a benchmark for reasonable on-road accommodation as a "continuous usable paved shoulder adjacent to the outside travel lane in each direction on roadways where bicycles are legally permitted. The desirable width of the outside travel lane plus the paved usable shoulder (curb lane) is at least 5 meters (plus 0.5 meter "guardrail" offset). When this width cannot be reasonable accommodated, the minimum width of the outside travel lane plus the paved usable shoulder (curb lane) for the accommodation of bicycles is 4.5 meters (plus 0.5 meter "guardrail" offset)." For roadways with low speeds of less than 45 mph combined with low volume of less than 2000 AADT, the minimum roadway widths is defined in the Highway Design Manual under the Low Speed / Low Volume standard. Using this, standard travel lanes may be as narrow as 2.75 meters with no shoulder.

Regardless of the standard used, bicyclists should be expected on the roadway, and should be accommodated. In 1997 PVPC began assisting cities and towns by collecting data on roadways and rating conditions using a Bicycle Level of Service (BLOS) evaluation system. Amherst, East Longmeadow, and Northampton have completed the Bicycle Level of Service evaluation with more communities expected to participate in the future.

A major concern for pedestrians and bicyclists are the 673 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.

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In 2001 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. The signs were distributed to communities participating in the "Bike Commute Week" activities including Holyoke, Westfield, Northampton, Amherst, and Springfield. In 2002 PVPC submitted a second application through the state's TDM program to expand the "Share the Road" campaign to the entire metropolitan urbanized area and produce a bicycling map of the Pioneer Valley.

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2. Bicycle Access to Transit

In 1997 the Pioneer Valley Transit Authority created the "Rack and Roll" program to improve access for bicyclists to transit. PVTA installed bicycle racks to the front of all buses in the in the five college area of Hampshire County. The program was funded by MassHighway's Transportation Demand Management Program and is designed to increase levels of bicycling. In addition to the bus racks, PVTA provided on-street bicycle parking racks for 400 bicycles.

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

Off-road facilities include multi-use trails and traditional bikepaths or rail trails. Four communities currently provide multi-use paths or "rail trails' totaling 17 miles in the region, while 14 others have similar projects under design with MassHighway. The five completed bikepaths in the region include the Norwottuck Rail Trail, Springfield Connecticut Riverwalk and Bikeway, the Amherst-UMass Connector Bikeway, the Amherst Bi-Walk and the Northampton Bikepath.

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.

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. And while recreation use dominates

trail activity many people 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 from 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.)

4. 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.

Sprawl continues to occur in the Pioneer Valley. The communities with the ten highest residential growth rates in the decade between 1980 and 1999 were all rural or suburban. This trend presents new challenges and opportunities for infrastructure improvements for pedestrians. Rural communities that previously lacked densities to justify sidewalks are now seeing residential subdivisions and commercial strip development that warrant sidewalks. Planning boards in these towns are reviewing subdivision rules and regulations that might require developers to pay for new sidewalks as demand outpaces minicipal budgets

CHAPTER 8

Needs and Issues

A. Highway

1. Safety

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. Included is passenger vehicle movement, truck conflicts, pedestrian and bicycle travel and bridge conditions.

The number of occurring incidents continues to increase as the vehicle miles traveled increases. Simply, the additional travel on our region's roadways provides more opportunity for conflict. The high crash locations identified annually by the Massachusetts Highway Department (MassHighway) typically include the intersections and interchanges that operate at or near the designed capacity. Other locations may also include those that have design or operational deficiencies unrelated to capacity such as sight distance, lighting, grade problems, and access management issues contributed to by unrestricted curb cuts.

The PVPC performs a crash history analysis as part of all short and long range transportation studies for the region. Improvements are recommended for all locations found to experience an above average rate of incidents. A high priority is also placed on the preservation and restoration of highway safety during the selection of project implementation. The unfortunate situation which exists is that this activity typically occurs after the problem has been identified and incidents have occurred.

2. Congestion

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. Limited by lane capacity and expensive to construct, bridges have a tendency to bottleneck traffic with few alternative routes of travel. 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 alike, change their travel patterns and opt for more congestion friendly alternatives such as public transportation, ridesharing, bicycling and walking.

Congestion problems are inventoried and analyzed using the Congestion Management System (CMS) and the input of communities. Pioneer Valley traffic congestion is localized but is very problematic in areas such as Route 9 in Hadley; Route 10/202 in Westfield; I-91 and Sumner Avenue in Springfield; and Route 66, Route 10 and Main Street in Northampton. The CMS prioritizes the deficient corridors, updates the status of current studies and improvement projects, and recommends improvement strategies for congested locations that do not have a planned improvement project. Table 8-1 outlines some of the current corridors with congestion in the region and the status any proposed improvements for the area.

Table 8-1- Pioneer Valley Region Congestion Management System - Problem Locations Identified

Community	Location	Status
Agawam	Route 147 and Route 159-Rowley Street to Federal Street	Intersection improvements proposed by the Town
Agawam	Route 75 - Mill Street to Route 159 and Route 147	Intersection improvements proposed by the Town
Agawam	Route 57- Poplar Street to Route 187	Route 57 Phase II Extension under design
Agawam/Springfield	Route 5 (South End Bridge)	Improvement alternative under study by MassHighway
Chicopee	Prospect Street- Route 116 to Buckley Boulevard	Intersection improvements under design
Chicopee	Memorial Dr/Broadway St- In vicinity of Deady Bridge	Deady Bridge Study complete-improvements under design
Easthampton	Route 10 and Route 141-Lyman Avenue to Chapel Street	Traffic and Parking Study completed by PVPC
East Longmeadow	Route 82-Harkness Avenue to Dearborn Street	Proposed new lane striping plan completed by PVPC
East Longmeadow	Downtown Rotary	East Longmeadow Rotary Study complete
Hadley/Northampton	Route 9 (Calvin Coolidge Bridge) -Bay Road to Damon Road	Bridge construction and widening project underway
Holyoke	Lower Westfield Rdand Homestead Ave -Whiting Farms Rd to Upland Rd	Traffic signal improvements awaiting construction
Longmeadow	Route 5- Forest Glen Road to William Street	Area currently under study by PVPC
Ludlow	Center Street- Cherry Street to Mass Turnpike Entrance	Improvements proposed but not yet implemented by MassPike
Ludlow/Springfield	Route 21- East Street to North Branch Parkway	Parker Street improvement project scheduled for FY 2003
Northampton	Damon Road and Bridge Street- Industrial Drive to King Street	Damon Road improvements under design
Northampton	Route 10- Old South Street to Main Street	City has upgraded the existing traffic signals at the Route 9/10/66 intersection
Northampton	Route 9- Hawley Street/Market Street to Prospect Street	City has upgraded the existing traffic signals at the Route 9/10/66 intersection
Springfield	Magazine Street and Armory Street to Armory Street/I-291 Rotary	Armory Street bridge improvements project on TIP
Springfield	Main Street and Locust Street- Carew Street to Fremont Street	
Springfield	Route 20A (Page Boulevard)- East Street to Oakdale Street	Page Boulevard/Robbins Road/Cadwell Drive intersection improvements
Springfield	Route 20- Route 20/Planifield Street/Avacado Street	City has upgraded the existing traffic signals
Springfield	Sumner Avenue- Forest park Avenue to White Street	Sumner Avenue Express Bus Service and signal improvement project
West Springfield	Route 5- Ashley Avenue to Morgan Road	MassHighway has plans for future traffic signal coordination
West Springfield	Route 20- Kings Highway to the Route 5 Rotary	Route 20 Corridor Study Complete
Westfield	Mechanic Street and Meadow Street- Route 20 to Route 10/202	Route 10/202 Bridge Project scheduled for FY 2004
Westfield	Route 10/202- Main Street to Sunset Drive	Route 10/202 Bridge Project scheduled for FY 2004
Westfield	Washington Street and Franklin Street- Court Street to Elm Street	Route 10/202 Bridge Project scheduled for FY 2004
Westfield	Route 20- E. Mountain Road to Westfield Shops Entrance	Route 20 bridge improvements underway- plans for future signal coordination
Wilbraham	Stony Hill Road- Springfield Street to River Road	Intersection improvement project complete

Source: PVPC

a) Route 9 Corridor

The Route 9 Corridor Study Area is aligned in a generally southwest to northeast direction for a distance of approximately five miles, from Damon Road in Northampton, across the Connecticut River, and through the Town of Hadley to University Drive in Amherst. Route 9 is the principal east/west arterial highway in the northern part of the Pioneer Valley region.

The Route 9 Corridor study began as a result of the increasing incapacity of Route 9 to handle the volumes of traffic that regularly utilize it between Northampton and Amherst. The study identifies both short term and long term improvements to the existing highway. Some recommendations made within the plan include:

- Installing continuous right-turn lanes where there is a high frequency of driveways joining Route 9;
- Improving transit passenger amenities such as providing bus shelters and increasing bus shelter size;
- Developing commuter alternatives such as discouraging single-occupant automobile; usage, encouraging employer-sponsored carpooling and vanpooling and instituting an alternative work hours program;
- Modifying the Calvin Coolidge Bridge by widening it to four lanes, adding a sidewalk, and building a shoulder/bike lane;
- Widening Route 9 to four lanes between Calvin Coolidge Bridge and West Street in Hadley;
- Developing either a two lane or four-lane diversion between the Calvin Coolidge Bridge and West Street; and,
- Investigating the feasibility of constructing rail transit parallel to Route 9.

b) Route 5 Corridor

From September 1990 to December 1991, the Pioneer Valley Planning Commission studied traffic and land use conditions along a segment of Route 5 that begins at the rotary intersection with Route 20 in West Springfield northerly through the West Springfield/Holyoke municipal boundary to the Beech Street intersection in Holyoke. Before the construction of interstate 91, Route 5 served as one of the main north-south routes through the Pioneer Valley. The corridor study area focused on land uses directly adjacent to the Route 5 corridor, and zoning districts whose primary access to the region was through Route 5.

Trends in land development and traffic growth were identified, and their impacts on the capacity of the roadway in the corridor were analyzed. In addition, projections of future development were made, and estimates of future traffic patterns were then derived, which were evaluated to determine if the corridor could accommodate future traffic. Some of the recommendations developed for this study include:

- Establish a Route 5 Corridor Planned Zone;
- Protect environmentally-significant land parcels in the Route 5 Corridor;
- Require traffic impact statements for larger developments and high-traffic volume generating uses;
- Control infill development in existing large commercial shopping centers;

- Adopt trip reduction plan requirements;
- Establish access standards;
- Upgrade local sign regulations;
- Improve municipal parking and landscaping regulations;
- Strengthen buffer requirements for buffers between commercial or industrial districts and residential districts;
- Upgrade parking lot landscaping requirements;
- Develop or improve pedestrian sidewalks and bicycle paths;
- Continue the operation of the Route 5 Corridor Advisory Committee;
- Provide for pedestrian safety in the Route 5 Corridor, and;
- Establish standardized development fees.

c) Route 20 Corridor

The Route 20 corridor was identified as a congested area by the Pioneer Valley Planning Commission's (PVPC) congestion management system. Completed in the fall of 1998, the Route 20 Corridor Study is the interdisciplinary approach agreed upon by the City of Westfield, the Town of West Springfield, and PVPC to identify and analyze alternatives geared towards reducing the current and anticipated future congestion in this area.

The Route 20 study area begins at the intersection of the North End Bridge (Route 20) with the Route 5/Route 20 rotary in West Springfield and continues west to the intersection of Main Street (Route 20) with Elm Street (Route 10/202) in Westfield. In addition, a small portion of Elm Street from Main Street to Meadow Street has been included in the study to account for the proposed new bridge over the Westfield River. The total study area covers a distance of approximately 8.5 miles.

A series of short and long term recommendations were developed to address the transportation, land use, and transit issues identified as part of the study. These recommendations are summarized in Table 8-2.

d) East Longmeadow Rotary

The Pioneer Valley Planning Commission (PVPC) as part of our regional congestion management system identified the rotary as one of the top congested areas in the region. East Longmeadow is home to a growing industrial area and two of the regions largest employer's: American Saw and the Milton Bradley Corp. It is anticipated that future traffic conditions will continue to deteriorate at this location as access to this area in the southern portion of East Longmeadow is provided mainly through the existing rotary.

The East Longmeadow Rotary Study was a joint effort by a private consulting team and the PVPC. The goal of the study was to identify and analyze potential improvement alternatives, including alternate routes of travel, to the existing rotary in the center of East Longmeadow. The focal point of this study is the intersection of Route 83 (North Main Street) with Route 83 (Somers Road), Route 220 (Shaker Road), Route 186 (Prospect Street), Maple Street, Elm Street and Pleasant Street in the center of town - commonly referred to as the East Longmeadow Rotary. A detailed analysis of existing traffic operations, safety issues, and pedestrian and bicycle concerns was conducted. Existing travel patterns through the town were identified and a series of concep-

tual improvement alternatives were proposed that could be implemented by the Town of East Longmeadow or the Massachusetts Highway Department (MassHighway).The preferred recommendations of the study included short-term changes to existing pavements markings and geometry and the eventual signalization by reconfiguring the rotary into a triangle shape controlled by three coordinated traffic signals.

Table 8-2 - Route 20 Corridor Study Recommendations

Recommendation	Location	Implementing Agency
Repainting of pavement markings	Rte 20 Corridor	Based on jurisdiction.
Elm Street improvements	West Springfield	Town of West Springfield
Park Street/Elm Street intersection improvements	West Springfield	Town of West Springfield
"No Parking" signs and construction of parking bay near	West Springfield	Town of West Springfield
Install "STOP" sign	Westgate Plaza	Westgate Plaza
Install curve warning signs near Sibley Avenue	West Springfield	MassHighway
Removal of "No U-turn" restriction at Route 20/Route 187 intersection	Westfield	MassHighway
Improvement and maintenance of roadway signs	Rte 20 Corridor	Based on jurisdiction.
Relocation of pedestrian crossing signal	West Springfield	MassHighway
Raised median to prohibit movements from Elmdale Street to Main Street	West Springfield	Town of West Springfield
Improvements to Route 20 viaduct and bridge between Union Street and Little River Road	Westfield	MassHighway
Traffic signal maintenance program	Rte. 20 Corridor	Based on jurisdiction.
Traffic volume monitoring program	Rte. 20 Corridor	PVPC
Shoulder and sidewalk construction (where feasible)	Rte. 20 Corridor	Based on jurisdiction.
Street light installation	Rte. 20 Corridor	Respective Community
Two-way left turn lane along Route 20 from North Boulevard to King's Highway	West Springfield	Town of West Springfield
Closed loop traffic signal system on Route 20 from Union Street to Mainline Drive	Westfield	MassHighway
Traffic impact study for reuse of H.B. Smith site.	Westfield	City of Westfield
Feasibility study on replacement of the Route 5/20 rotary with traffic signals	West Springfield	MassHighway
Land use recommendations	Rte. 20 Corridor	Respective Community
Increased marketing of Route Red 10	Rte. 20 Corridor	PVTA
Internal transit service for Westfield Shops and Westgate Center	Westfield	Westfield Shops, Westgate Plaza, PVTA
Red 10/Green 02 transfers	Springfield	PVTA
Transit safety recommendations	Rte. 20 Corridor	PVTA
Bus stop recommendations	Rte. 20 Corridor	PVTA
Transit service for Meadow St., Mechanic St., Montgomery St., and Union St.	Westfield	PVTA
Transportation Center at Park Square	Westfield	City of Westfield
Limited Stop/Express Bus Service along Route 20	Rte. 20 Corridor	City of Westfield

e) Outer Belt Transportation Study

The Pioneer Valley Planning Commission (PVPC) received a request from the City of Springfield in 2001 to perform a traffic study for the Outer Belt neighborhood. The conceptual design of this study evolved from the identification of congestion in this area through the PVPC Congestion Management System; input from the Springfield Department of Public Works and Planning Departments; and, the firsthand experience of residents of the Outer Belt Neighborhood and members of the Outer Belt Civic Association.

The goal of the Outer Belt Transportation Study is to provide a detailed analysis of the existing and anticipated traffic demands and assess the impacts of current and planned land use for a critical triangle bounded by Allen Street, Cooley Street, and the Bicentennial Highway in the City of Springfield. Comprehensive data collection activity was conducted for this study to identify existing deficiencies. This activity consisted of obtaining traffic volumes, accident information, and pedestrian facilities. PVPC staff collected a large portion of the data used in this report. Additional data was obtained from the Massachusetts Highway Department and the City of Springfield. Some of the recommendations developed for this study include:

- Creating exclusive left turn lanes for all side streets off of Allen Street between Bradley Road and Bicentennial Street.
- Upgrading the intersection of Allen Street with the Bicentennial Highway to increase the storage length of existing left turn lanes on Allen Street and to provide an exclusive left turn lane from the Bicentennial Highway.
- Upgrading the intersection of Allen Street with Parker Street to accommodate future traffic growth in this area
- Perform routine adjustments to the existing traffic signal timing and phasing plan at the intersection of Allen Street with Cooley Street.
- Address gaps in existing pedestrian facilities, particularly in providing access to local schools
- and shopping centers.
- Study the need for a traffic signal at the existing median break on the Bicentennial Highway.

f) Deady Memorial Bridge Traffic Study

The Massachusetts Highway Department's Bureau of Transportation Planning and Development (MassHighway Planning) and the PVPC initiated the Route 141 Deady Memorial Bridge Study in February of 2001, in response to transportation needs identified by the City of Chicopee. The bridge links Route 33 to Main and Broadway Streets in Chicopee and the corridor is identified as a congested location as part of the Pioneer Valley CMS.

The goal of the Deady Memorial Bridge Study was to examine whether the volumes of existing and future traffic warranted expansion of the existing bridge and if alternative improvements are necessary or could be implemented. Comprehensive data collection activity was conducted for this study to identify existing deficiencies. This activity consisted of obtaining traffic volumes, accident information, and existing traffic signal timing data. Traffic volumes were forecasted 20 years into the future for the study area and a variety of transportation improvement alternatives were analyzed. A summary of the recommendations of the study are shown in Table 8-3.

Table 8-3 - Deady Memorial Bridge Study Recommendations

Location	Improvement	Time Frame
Route 33/Montgomery	Update signal timing and phasing	Short
Street/Sheridan Street	Coordinate with 2 northern intersections	
Route 33/Route 141/	Update signal timing and phasing	Short
Deady Bridge	Coordinate with 2 northern intersections	
Deady Bridge	Reconstruct Bridge to provide a fifth lane Construct 250 foot left turn lanes up to northern and southern intersections	Medium

Table 8-3 - Deady Memorial Bridge Study Recommendations, cont.

Location	Improvement	Time Frame
Route 141/Main Street	Update signal timing and phasing	Short
Church Street/Broadway	Construct additional 120 foot eastbound turn lane	Medium
Deady Bridge	Construct additional 270 foot westbound turn lane	Medium
Broadway/East Street/ Belcher Street	Update signal timing and phasing	Short

g) Connecticut River Crossing Transportation Study

The Connecticut River Crossing Study was developed by the Massachusetts Highway Department to examine short and long range alternatives to existing traffic congestion along the Route 9 corridor between Amherst and Northampton. To date, the data collection, existing conditions, and future build-out sections of the study have been completed by a private consultant. Current activity is focused on the development and analysis of a variety of transportation alternatives to alleviate congestion in the study area. The study is guided by the input of an advisory group consisting of representatives of the Massachusetts Highway Department, local elected officials, the PVPC, the Franklin Regional Council of Governments, and the University of Massachusetts.

h) Other Regional and Local Highway Studies

(i) Boston Road Corridor Study

The Boston Road Corridor Study Area extends from the intersection of Breckwood Boulevard and Boston Road in Springfield easterly to the convergence of Route 20 (Boston Road) at the Boston Road and Pasco Road intersection through the Springfield-Wilbraham municipal boundary to the Wilbraham/Palmer town line. The Boston Road Corridor study began in June of 1994 in response to existing transportation and safety problems resulting from intense development along the corridor.

The corridor serves as a major retail resource for the region and provides many services to local residents in both municipalities. The proximity of the corridor to the major interstate transportation routes, Route 291 and Route 90 has recently encouraged development. This study examined the existing land use and traffic conditions and what impacts future development would have along the corridor. Recommendations suggested within this study pertain to the communities of Wilbraham and Springfield individually, as well as collectively and the:

- Creation of a planned mixed use development zone;
- Development of a network of bicycle/pedestrian circulation paths;
- Upgrade of local sign regulations;
- Refinement of municipal parking and landscaping regulations;
- Enhancement of performance standards for commercial and industrial uses;
- Encouragement of transit use;
- Identification of sites for urban infill redevelopment;
- Adoption of a site plan approval procedure;
- Expansion of sewer capacity; and,
- Creation of a river protection district.

(ii) State Street Signal Coordination Project

The goal of the State Street Signal Coordination Project was to develop a signal coordination plan to reduce congestion and improve mobility along a 1.5 mile segment of State Street in downtown Springfield. This segment of State Street includes eight signalized intersections and four unsignalized intersections. A total of four different signal coordination scenarios were developed as part of the study. The preferred scenario recommended coordinating five intersections along State Street from Dwight Street to Saint James Avenue. New traffic signal control equipment was purchased for two of the eight signalized intersections as part of this project.

(iii) Downtown Easthampton Traffic and Parking Study

This study updated a study performed in 1984 by the PVPC. The City had concerns regarding traffic congestion and queues at major intersections in downtown Easthampton as well as existing parking conditions and method of improvement. A summary of existing and future traffic and parking conditions, parking management alternatives, and recommendations to improve traffic and parking conditions were developed as part of the study. Preferred recommendations included the elimination of parking along one side of Cottage Street to improve travel lanes widths and reduce existing bottlenecks in this area.

3. Preservation

One of the greatest investments made by local communities, states and nations alike, is the transportation system. Each and everyday, highway investments are deteriorating at a rate greater than with which routine maintenance activities can keep pace. The result is an aging, distressed roadway and bridge system. In order to preserve this investment, strategic improvement applications need to be planned and applied in a timely fashion.

a) Statewide Road and Bridge Policy

In January, 2003 Massachusetts Governor Mitt Romney developed the Statewide Road and Bridge Policy. It states that it shall be the policy of the Commonwealth of Massachusetts, in all programs involving work on streets, roads and bridges, to:

(i) Fix It First: To give priority to the repair of existing streets, roads and bridges; and

(ii) Communities-First: Wherever a street, road or bridge needs to be re-designed and reconstructed, to plan and undertake, in collaboration with the affected community, a "context-sensitive" project — one that fully protects and enhances the surrounding community and landscape while addressing mobility for all transportation modes.

The purposes of this policy are to

- Prevent sprawl;
- Recognize all the Commonwealth's citizens and communities as its transportation agencies' customers;
- Avoid the costs associated with unnecessary road widening and the conflicts they entail, and thereby use available funding to complete more projects in more communities and to produce more construction jobs; and
- Provide enhanced mobility for sustainable transportation modes (walking, bicycling, and public transportation).

It will be the responsibility of the Chief of Commonwealth Development and Secretary of Transportation and Construction to take the following actions to implement this policy.

(i) The *Highway Design Manual* and any other relevant standards, guidelines and policies of MassHighway shall be reviewed and revised to incorporate the principles of context-sensitive design, traffic calming, and multi-modal accommodation. An advisory committee consisting of

representatives of municipalities, regional planning councils, and other affected interests shall be formed to help guide this process, and ample opportunity for input from the general public shall be provided. The process of revising the manual and any other standards, guidelines and policies shall be completed by October 1, 2003.

(ii) Projects with community-friendly design that can be undertaken immediately using existing funds shall be identified by MassHighway as quickly as possible, and no later thirty days from this date, and implemented immediately thereafter.

(iii) An ombudsman shall be appointed in the Executive Office of Transportation and Construction and have responsibility for hearing and facilitating the resolution of citizen and community concerns regarding project design. In addition, a process for expediting project review and requests for waivers from current design standards and guidelines, and requests for exercise of flexibility in applying current design standards and guidelines, shall be established within MassHighway and overseen by the Secretary of Transportation and Construction. All documentation regarding waivers shall be made available for public review.

(iv) All actions taken pursuant to this policy shall fully honor the letter and spirit of provisions in the Massachusetts General Laws requiring the accommodation of bicycle and pedestrian traffic, including chapter 90E, section 2A. Where there are differences of opinion concerning the necessity or desirability of widening pavement, eliminating curbside parking, or taking other measures to accommodate bicyclists and/or pedestrians, full use shall be made of creative design expertise and public involvement, facilitation or dispute resolution processes.

(v) A plan for repairing or reconstructing the state's structurally deficient bridges shall be developed and finalized, in consultation with the Commonwealth's municipalities and metropolitan planning organizations, by July 1, 2003. This plan shall address all the state's bridges, including in particular those owned or controlled by the Metropolitan District Commission, Department of Environmental Management, and Massachusetts Bay Transportation Authority as well as other agencies. It shall include a budget and a schedule for completing the bridge repair and reconstruction process.

The statewide bridge plan shall include a maintenance and management program designed to protect our assets, make them function better for motorists and other users, and minimize the need for future reconstruction or expansion projects. This maintenance and management program shall address basic maintenance issues (painting, de-icing practices, and so on). It shall also include (1) an improved pavement management system and (2) strategies for optimizing the operation of the system to avoid more costly capacity expansion projects. Such strategies shall include:

(i) Improving signage so that travelers can more easily tell where they are and where they are going;

(ii) Scheduling of construction to avoid peak travel periods on key roads whenever feasible;

(iii) Improving incident response systems; and

(iv) Using multimodal transportation strategies to the maximum extent feasible both to reduce traffic congestion and to enable more travelers to bypass congestion by using non-highway modes.

b) Bridges

A total of 96 bridges in the Pioneer Valley Region have a posted weight restriction and 12 are closed to motor vehicle traffic. This poses a serious impact to the movement of people and goods throughout the region. A complete listing of bridges with a weight restrictions in the Pioneer Valley is shown in Table 8-4.

Table 8-4 - Bridges with Weight Restrictions in the Pioneer Valley

Town	Br #	Over	Under	Weight Limit 2 Axle	3 Axle	5 Axle	Note
Agawam	A05001	HWY ROUTE 5	WATER CONNECTICUT RIVER	0	0	0	Closed
Amherst	A08001	HWY WOODSIDE AVE	OTHER BICYCLE PATH	0	0	0	Closed
Amherst	A08013	HWY MEADOW ST	WATER SWAMP BRK(ESTMN.BR	11	22	33	
Belchertown	B05002	HWY RIVER STREET	WATER SWIFT RIVER	7	10	15	
Belchertown	B05006	HWY BARDWELL ST	WATER JABISH BROOK	12	16	24	
Belchertown	B05023	HWY WILSON ST	RR NECRR MAINLINE	3	3	3	Closed
Belchertown	B05025	HWY COLD SPRN RD	WATER SWIFT RIVER	0	0	0	Closed
Belchertown	B05034	HWY ALDRICH ST	WATER JABISH BROOK	16	19	30	
Blandford	B14007	BLAIR RD	WHEELER BROOK	18	23	36	
Brimfield	B24009	HWY MONSON RD	WATER FOSKETT MILL STRM	7	10	15	
Brimfield	B24014	HWY W BR PLMR RD	WATER BLODGETT MILL BRK	17	25	39	
Brimfield	B24025	HWY HAYNS HILL RD	WATER MILL BROOK	18	23	36	
Brimfield	B24038	HWY DNHN PLMR RD	WATER BOTTLE BROOK	16	22	35	
Chester	C11004	HAMPDEN ST	WALKER BROOK	8	9	12	
Chester	C11020	GEORGE MILLER RD	MID BR WESTFIELD R	4	9	14	
Chester	C11023	SMITH ROAD	MID BR WESTFIELD R	5	5	5	
Chester	C11024	KINNE BK RD	MID BR WESTFIELD R	5	11	17	
Chester	C11026	OLD STATE RD	W BR WESTFIELD R	10	12	18	
Chester	C11045	BLANDFORD RD	WALKER BROOK	15	19	23	
Chesterfield	C12009	IRELAND ST	W BR WESTFIELD R	20	24	35	
Chicopee	C13012	ST116 CABOT ST	COMB CONN RIV & PVRR	14	16	23	
Cummington	C21006	RIVER RD	WESTFIELD BROOK	17	25	36	
Cummington	C21016	STAGE RD	MEADOW BROOK	15	21	31	
Easthampton	E05005	HWY GLENDALE ST	WATER MANHAN RIVER	12	15	23	
Easthampton	E05010	HWY TORREY ST	WATER NBR MANHAN RIVER	20	23	28	
Goshen	G06004	SHAW RD	SWIFT RIVER	15	17	23	
Granby	G09001	HWY BURNETT ST	WATER BACHELOR BROOK	15	17	27	
Granby	G09004	HWY ALDRICH ST	WATER BACHELOR BROOK	11	13	18	
Granby	G09008	HWY NORTH STREET	WATER BACHELOR BROOK	12	17	26	
Granville	G10006	SODOM ST	DICKINSON BROOK	13	15	23	
Hampden	H04001	HWY MILL ROAD	WATER SCANTIC RIVER	11	13	19	
Hampden	H04002	HWY SOMERS ROAD	WATER SCANTIC RIVER	10	11	15	
Hampden	H04003	HWY CHAPIN ROAD	WATER SCANTIC RIVER	12	14	20	
Hampden	H04010	HWY SCANTIC ROAD	WATER TEMPLE BROOK	15	18	29	
Hampden	H04011	HWY STAFFORD RD	WATER SCANTIC RIVER	16	21	33	
Hatfield	H11005	HWY CHESTNUT ST	WATER MILL RIVER	15	18	32	
Hatfield	H11028	HWY CHESTNUT ST	I-91	18	21	30	
Holland	H19009	HWY MARCY RD	WATER STEVENS BROOK	0	0	0	Closed
Holland	H19997	HWY OLD STFRD RD	WATER STEVENS BROOK	0	0	0	Closed
Holyoke	H21009	HWY APPLETON ST	WATER THIRD LEVEL CANAL	17	27	22	
Holyoke	H21012	HWY SARGEANT ST	WATER SECOND LEVEL CANAL	14	16	25	
Holyoke	H21013	HWY CABOT ST	WATER SECOND LEVEL CANAL	17	19	29	
Holyoke	H21014	ST141 APPLETON ST	WATER SECOND LEVEL CANAL	20	23	36	
Holyoke	H21018	HWY LYMAN ST	WATER FIRST LEVEL CANAL	12	20	26	
Holyoke	H21020	ST141 APPLETON ST	WATER FIRST LEVEL CANAL	20	23	36	
Holyoke	H21024	HWY LWR WSTFLD RD	RR R.V.R.R	16	22	34	
Huntington	H270078	ROUTE 112	POND BROOK	15	23	36	
Middlefield	M19003	TOWN HILL RD	FACTORY BROOK	14	16	23	
Middlefield	M19004	TOWN HILL RD	FACTORY BROOK	14	16	23	
Middlefield	M19005	BANCROFT ROAD	W BR WESTFIELD R	11	14	25	
Middlefield	M19008	CLARK WRIGHT RD	GLENDALE BROOK	12	16	24	
Monson	M27002	HWY CUSSHMAN ST	WATER CHICPEE BROOK	16	19	30	
Monson	M27010	HWY HOSPITAL RD	WATER CHICPEE BROOK	17	22	33	
Monson	M27011	HWY HOSPITAL RD	WATER QUABOAG STREAM	8	13	20	Closed
Monson	M27014	HWY HAMPDEN AVE	WATER CHICPEE BROOK	12	12	16	
Monson	M27015	HWY OLD WALES RD	WATER CONANT BROOK	16	22	33	

Table 8-4 Continued - Bridges with Weight Restrictions in the Pioneer Valley

Town	Br #	Over	Under	Weight Limit 2 Axle	3 Axle	5 Axle	Note
Monson	M27026	HWY STFRD HLLOW	RR NECRR MAINLINE	15	21	32	
Monson	M27137	HWY WALES RD EXT	WATER VINICA BROOK	0	0	0	Closed
Monson	M27138	HWY ABANDONED RD	WATER MONSON RESOVOIR	0	0	0	Closed
Montgomery	M30001	MAIN RD	ROARING BROOK	18	21	31	
Northampton	N19023	HWY BLISS ST	WATER MILL RIVER	10	12	18	
Northampton	N19026	HWY MAIN ST LEED	WATER SLUICEWAY	15	21	31	
Northampton	N19027	HWY OLD SHEPHD RD	WATER MILL RIVER	3	3	3	
Northampton	N19033	HWY CHESTFLD RD	WATER ROBERTS MEADOW BRK	9	22	34	Closed
Northampton	N19035	HWY KENNEDY RD	WATER ROBERTS MEADOW BRK	15	21	31	
Northampton	N19037	HWY PARK HILL RD	WATER BASSET BROOK	17	22	33	
Northampton	N19047	HWY CLEMENT ST	WATER MILL RIVER	17	19	29	
Palmer	P01014	HWY E MAIN ST	WATER WARE RIVER CANAL	15	19	30	
Palmer	P01016	HWY CHURCH ST	WATER WARE RIVER CANAL	16	21	31	
Palmer	P01024	US 20 PARK ST	RR CSX MAINLINE	14	16	21	
Palmer	P01024	US 20 PARK ST	ST 67	14	16	21	
Pelham	P04006	HWY MEETINGHSE R	WATER AMETHYST BROOK	11	24	36	
Pelham	P04007	HWY MEETINGHSE R	WATER HARRIS BROOK	11	24	36	
Russell	R13007	OLD WESTFIELD RD	BRADLEY BROOK	16	19	27	
Southampton	S19006	HWY RUSSLVLLE RD	WATER MANHAN RIVER	14	16	26	
Southampton	S19010	HWY EAST ST	WATER MANHAN RIVER	10	11	19	
Southampton	S19011	HWY GUNN RD	WATER MANHAN RIVER	17	21	32	
Southampton	S19024	HWY VALLEY RD	WATER MOOSE BROOK	13	16	23	
Southwick	S22001	HWY LOOMIS ST	WATER MUNN BROOK	14	17	23	
Southwick	S22005	US202 & ST10	WATER JOHNSON BROOK	12	23	36	
Springfield	S24028	HWY ST JMES AVE	RR CONRAIL(ABANDONED)	14	19	29	
Springfield	S24066	HWY CHESTNUT ST	i291 CONN A B C D RAMP F	20	25	36	
Springfield	S24090	HWY ROOSEVELT AVE	RR CONRAIL SPURLINE	12	13	18	
Springfield	S24091	HWY ROOSEVELT AVE	RR CONRAIL MAINLINE	10	10	10	
Ware	W05006	HWY SOUTH ST	RR NECRR(SPUR)	16	18	26	Closed
Ware	W05008	HWY MALBOUEF RD	WATER FLAT BROOK	15	20	30	
Ware	W05011	HWY HARDWICK PND	WATER MUDDY BROOK	8	12	19	
West Springfield	W21011	HWY PROSPECT AVE	RR PVRR	11	15	22	
Westfield	W25006	US202 SOUTHWICK RD	WATER LITTLE RIVER	12	16	29	
Westfield	W25007	HWY GRANVILLE RD	WATER LITTLE RIVER	13	22	36	Closed
Westfield	W25009	HWY NORTHWEST RD	WATER LITTLE RIVER	0	0	0	Closed
Westfield	W25011	HWY POCHASSIC ST	COMB PVRR & ACCESS RD	6	6	6	
Westfield	W25021	HWY LOCKHOUSE RD	RR PIONEER VALLEY RR	8	8	8	
Westfield	W25032	HWY POCHASSIC ST	WATER MOOSE MEADOW BROOK	17	22	33	
Westhampton	W27002	HWY EASTHAMPTN RD	WATER NBR MANHAN RIVER	16	20	25	
Westhampton	W27004	HWY NORTH RD	WATER NBR MANHAN RIVER	14	19	33	
Westhampton	W27005	HWY KINGS HWY	WATER NBR MANHAN RIVER	8	11	16	
Westhampton	W27006	HWY KINGS HWY	WATER NBR MANHAN RIVER	8	11	16	
Westhampton	W27010	ST 66 MAIN RD	WATER SODOM BROOK	12	18	29	
Westhampton	W27018	HWY CHESTFLD RD	WATER BREWER BROOK	10	18	24	
Williamsburg	W36003	HEMENWAY RD	BANDFORD BROOK	11	15	24	
Williamsburg	W36011	BRIDGE ST	MILL RIVER	20	25	25	
Williamsburg	W36017	S MAIN ST	MILL RIVER	16	18	25	
Williamsburg	W36018	SKINNERVILLE RD	MILL RIVER	7	17	27	
Worthington	W45011	RIVER ROAD	MID BR WESTFIELD R	17	24	35	
Worthington	W45012	RIVER ROAD	MID BR WESTFIELD R	15	22	34	
Worthington	W45013	RIVER ROAD	MID BR WESTFIELD R	10	12	19	
Worthington	W45015	ROUTE 112	WARDS STREAM	19	23	36	

The Massachusetts Highway Department has committed to $75 million in bridge improvements for FY 2003. Approximately $22 million in bridge improvements are scheduled for the Pioneer Valley region in FY 2003.

c) Regional Pavement Management System

Routine maintenance activities have not kept pace with the deterioration of our transportation investments. Public dollars must be directed at the preservation of the existing infrastructure now more than ever. Priority for maintaining the existing system requires a more efficient use of capacity, enhanced safety and travel conditions and efficient use of limited funds.

Figures 8-1, 8-2, and 8-3 show the percentages of federal aid roadways in the Pioneer Valley for each condition category for the entire region, roadways inventoried in the 2001 calendar year, and roadways inventoried in the 2002 calendar year respectively. Roads in "Poor" condition have a pavement condition index (PCI) of below 65. Roads with a PCI of 65 to 85 and 86 to 100 fall into the "Fair" and "Good" categories respectively. Best management practices suggest that roadways be refurbished before they reach poor condition because it is the most cost effective way to maintain pavement. It requires far more money to stabilize the overall condition of a road network, when even a small portion of the road reaches a condition of major investment (reconstruction or rehabilitation) than to attend to preventive and routine maintenance. Priorities arising out of the pavement management system target roads in poor condition for obvious reasons, but it also recommends significant outlays for roads in the fair category. The usable lifespan of a roadway is maximized if refurbishment occurs at this stage of deterioration.

Figure 8-1 - Pavement Condition of Federal-Aid Roadways in the Region

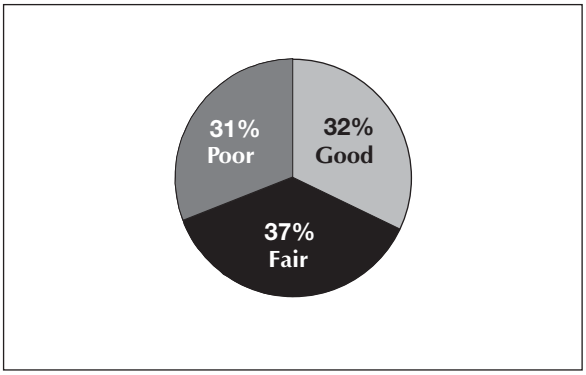


Figure 8-2 - Pavement Condition of Surveyed Federal-Aid Roadways in 2001

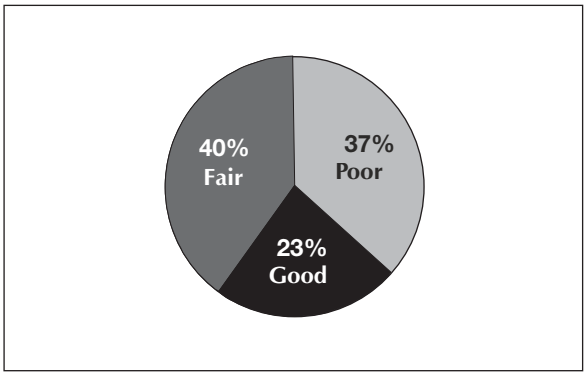
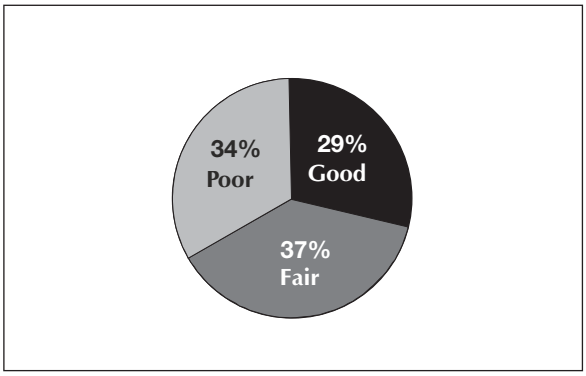


Figure 8-3 - Pavement Condition of Surveyed Federal-Aid Roadways in 2002



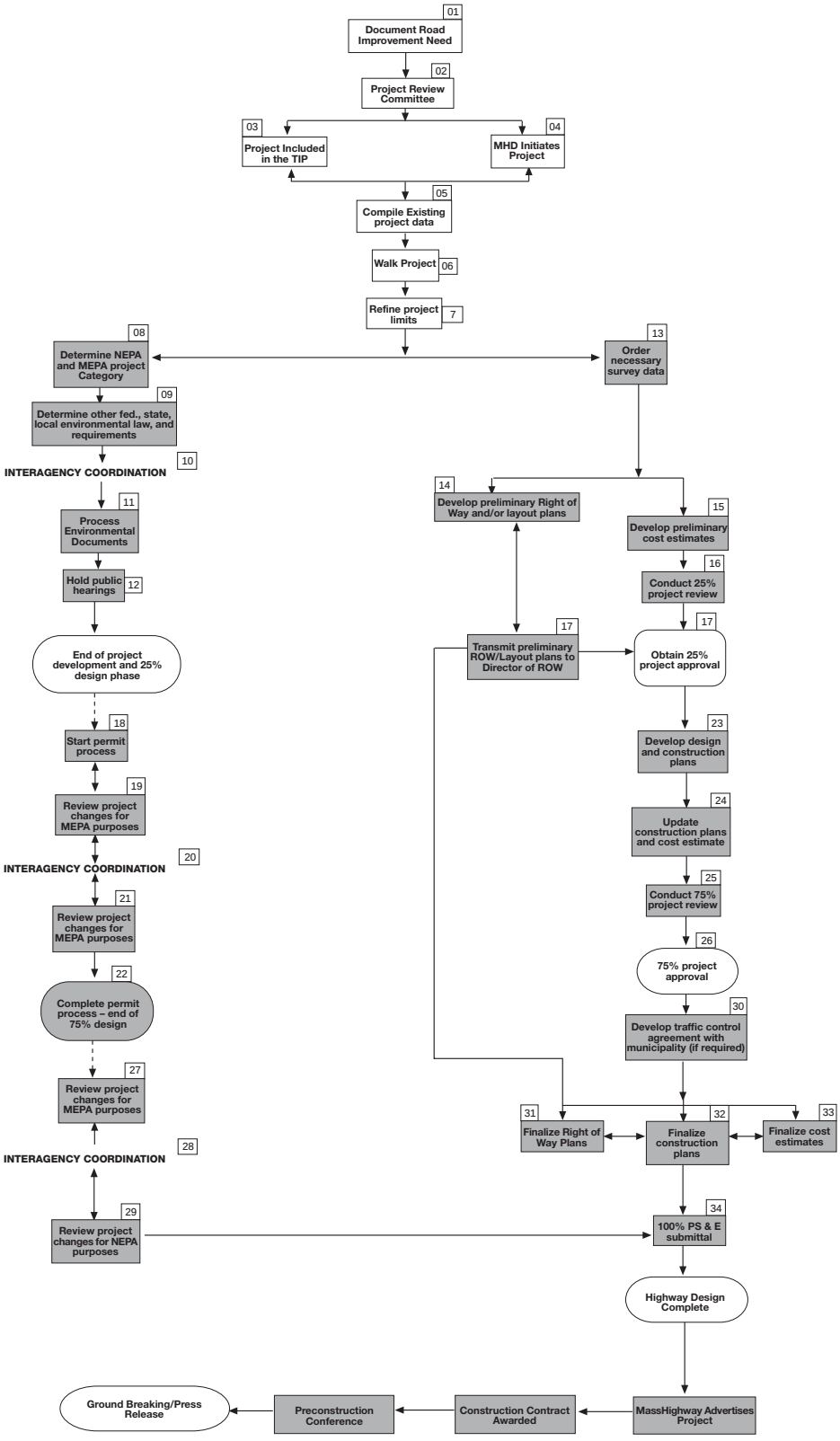
4. Design Standards

Design standardization is an effective way to ensure that highways have adequate capacity levels compatible with the service they provide. The highway functional classification system was developed so that all federal-aid roadways would be consistently classified based on serviceability. Using this classification system, FHWA and MassHighway adopted standard roadway designs that suit the capacity and safety needs of each roadway class.

For infrastructure that is presently substandard, standardization is expected to be achieved when reconstruction or rehabilitation improvement is scheduled. Communities that prefer deviations from the accepted design standards may request a waiver from the state and/or federal agencies. Typically, this results in minor adjustments to the roadway design if justified. The local communities also have the option to forgo funding assistance and improve the facility through local funding sources. Also, in instances where a corridor is designated a scenic byway, design standardization may be less stringent to maintain the scenic character of the area as long as safety conditions are not sacrificed.

Figure 8-4 shows the steps in the design process as set forth by the Massachusetts Highway Department.

Figure 8-4 - MassHighway Design Process



The current standard for the design of urban and rural roads along with guidelines for pedestrian and bicycle use is the 1997 Massachusetts Highway Design Manual. MassHighway has committed to an update of the Highway Design Manual and other relevant standards, guidelines and policies beginning this year.

a) Footprint Roads Program

Many projects on existing roadways are initiated for reasons other than geometric design deficiencies (e.g. pavement deterioration), and, many of these projects are also located within limited rights of way, on main streets in city or town centers, or adjacent to natural resources, public lands or historic resources. Often, projects on existing roadways are initiated in communities where land use and cultural characteristics are already well established. For projects like this, project proponents should consider applying the Footprint Roads Program guidelines to accomplish identified project goals.

The Footprint Roads Program guidelines allow project proponents to preserve and enhance historic and community character, extend the service life of the existing facility, enhance safety for all users, reduce maintenance costs, and protect the environment. Work under this program should consist primarily of roadway improvements that follow the existing horizontal and vertical alignments of the project roadways, generally within the existing "footprints" of the project roadways. Additional work may also include elements such as drainage improvements, signing, pavement markings, roadside improvements, guardrail installation or improvements, pedestrian and bicycle improvements, edging installation or adjustment, ADA/AAB elements, and other incidental improvements.

The Footprint Roads Program is not intended as a replacement or expansion of the Local Aid (Chapter 90) program or as a replacement program for state highway resurfacing and maintenance projects. It is intended to improve and protect roads that contain one or more of the following assets:

(i) Serve as a main street in city or town centers
- Located in a mixed use community, village, neighborhood, downtown or government service center

(ii) Contain historic assets
- Listed on State or National Register
- Eligible for inclusion in the National Register by the Massachusetts Historic Commission
- Identified by the local historic commission as an area containing historic resources

(iii) Pass through or adjacent to public lands
- Conservation lands
- Recreational lands
- Other public lands

(iv) Pass through or adjacent to natural resources
- Wetlands
- Coastal resources
- Bodies of water
- Trees of 14" dbh (diameter at breast height) or larger

(v) Are designated as a scenic road or byway
- State or federally designated scenic byway or highway
- Proposed scenic byway that has a completed corridor management plan or a corridor management plan underway
- Locally designated scenic road

(vi) Pass through or adjacent to agricultural lands
- Prime
- Unique
- Other than prime or unique that is of statewide importance
- Other than prime or unique that is of local importance

Qualified projects under this program are exempt from all of the 13 AASHTO controlling criteria.

5. Vehicle Emissions

The Clean Air Act Amendments (CAAA) of 1990 require that all areas that fail to meet the National Ambient Air Quality Standards (NAAQS) for Ozone develop a plan that will reduce overall emissions levels. Dependency on automobiles in the region has hit an all-time high. Nearly 80% of all work trips and a greater percentage of other trips are now performed with automobiles. Urban sprawl, low gas prices, and the increase in "*two worker households" are* three of the main reasons for this trend. It will be critical for air quality and the overall health of the residents of the region, to use both direct and indirect methods to reduce the dependency on automobiles. It has become necessary to emphasize planning better developments, increased use of alternative modes and increased education on the drawbacks of driving if we are going to be successful in reducing emissions.

6. Access

The key to being economically successful is establishing and/or maintaining adequate access to the natural, economic, social, historic, and cultural resources of the Pioneer Valley. As the location of the crossroads of Interstates I-90 and I-91 within the Valley's boundaries makes inter-regional and inter-state 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.

Providing adequate physical access to the region's resources does not, however, necessarily guarantee that they will be recognized and/or used to their full potential by the residents of, or visitors to, the region. Informational access is also important in moving people throughout the region and assisting them in accessing the resources available in the Pioneer Valley. Chambers of Commerce, tourist information organizations and brochures all enhance access to Pioneer Valley sites and activities.

7. Intelligent Transportation Systems

The Intelligent Transportation Systems (ITS) Strategic Deployment Plan for the Metropolitan Springfield and Pioneer Valley Region was completed in 1998. The 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. A regional architecture is vital to insure future ITS applications for the Pioneer Valley are compatible with the National Architecture for ITS as developed by the U.S. Department of Transportation.

A total of 17 different projects are identified and prioritized as part of the Strategic Deployment Plan. These projects are summoned in Table 8-5.

Table 8-5 - ITS Strategic Deployment Plan Projects for the Pioneer Valley Region

Proposed Project Name	Objective	Lead Agency
Route 9 Corridor Advanced Traveler Information System	Traffic management and incident management during construction	MassHighway
PVTA Transit Information System	Gather and provide real time transit information	PVTA
Incident Management Coalition	Provide interagency coordination to support incident management requirements	MassHighway Mass State Police
Regional Traffic Operations Center	Provide focus for management, coordinate operations and communications	MassHighway
Regional Bridge Monitoring and Incident Management System	Provide traffic and incident management capabilities for bridges	MassHighway
Intertstate 91 Corridor Incident Management System	Provide ITS capabilities for management of incidents along I-91	MassHighway
Real-Time Regional Traffic Control Signal Systems	Mitigate pockets of congestion through improved coordination of traffic signals	MassHighway/ municipal agencies
Traffic and Transit Stop Video Surveillance	Provide video surveillance in urban areas for traffic management and security	PVTA/municipal agencies
PVTA Transit Stop Information System	Provide transit users with information about the bus network and estimate time of arrival of the bus	PVTA
Multi-modal Regional Traveler Information System	Allow Springfield area travelers access to traffic and transit information	MassHighway
PVTA Automatic Vehicle	Optimize the use of available parking spaces	Municipal agencies
Regional Integrated Fare Collection System	Automate and integrate fare and fee collection mechanisms to reduce cost and capture lost revenue	MassPike,PVTA and others
Rail Crossing Management and Control System	Improve safety at all rail crossings	To be determined
Wide Area Traffic and Transit Management	To use ITS applications for purposes other than their main intent, i.e. use AVL data to estimate travel times	MassHighway
Commercial Vehicle Preclearance and Control-Interstate Crossings	Provide electronic credentials and clearances for checked vehicles	Multi-Agency
Advanced Mayday System and Rural Incident Management System	Detect and respond to rural incidents	MassHighway

Source: Intelligent Transportation Systems Strategic Deployment Plan for the Metropolitan Springfield and Pioneer Valley Region.

Traffic control and management and traveler information were prioritized in the Strategic Deployment Plan as the top needs in the PVPC region. The Regional Traffic Operations Center (RTOC) is maintained by MassHighway District 2 in their Northampton office. The RTOC serves as the nucleus for all incoming and outgoing traffic information. MassHighway supervises all components of existing ITS traffic control and management in the region.

Traveler information is dispersed through the Regional Traveler Information Center (RTIC) for the Pioneer Valley at the UMass Transit Operations Facility. This federally funded project is run by the University of Massachusetts - Amherst with cooperation from the Massachusetts Highway Department. RTIC is responsible for the collection and dissemination of traffic, public transportation and tourism information.

While designed initially for the Coolidge Bridge Reconstruction Project, the RTOC and RTIC will form the core of a regional traffic management system for the entire Pioneer Valley region. The traffic monitoring cameras, electronic signs, and other high-technology infrastructure developed for this project are designed for continuing use even after the reconstruction project is completed.

a) Incident Management

In 1998, a Regional Incident Management Coalition was established for the Pioneer Valley Region. One of the goals of this coalition was to develop an Incident Management Handbook for Interstate 91. Draft diversion plans were developed; however, the project was never completed. The I-91 Incident Management Handbook is a product of the FY2003 Pioneer Valley Unified Planning Work Program. Diversion plans will be developed for all 22 exits along the I-91 corridor. Each plan will detail the primary diversion route, locations of existing ITS equipment, contact information for emergency and local personnel, and potential locations for local traffic details.

b) Route 2 Western Massachusetts Travel and Tourism

The Massachusetts Highway Department in conjunction with the Federal Highway Administration, the Office of Representative John Olver, the Franklin County Chamber of Commerce, and the Franklin County Regional Council of Governments contracted with a private partner to develop, operate and maintain a Traveler Information Service for the Route 2 Corridor of Central and Western Massachusetts. The two principal goals of this project are to increase tourism and enhance motor safety through the provision of traveler information.

As part of the project a website is under construction to provide travel and tourism information for the study area. The website will have information on existing businesses in the study area, provide current travel information, provide links for Coolidge Bridge information, and allow for advance bookings of hotels and local bed and breakfasts. In addition, several informational kiosks linked to the website will be constructed at key locations in the study area. The PVPC is involved with the working committee for this project as the study area extends into the northern half of Hampshire County.

c) Telecommunications

A comprehensive telecommunications network is critical to the expansion of ITS technology in the PVPC region. Telecommunications links along the I-91 corridor and to the University of Massachusetts will be required in order to link future ITS equipment to the RTOC, RTIC, the State of Connecticut, and across Massachusetts. It will also be important to identify secure, cost effective locations for infrastructure and provide sufficient conduit for fiber along major highways and at key river crossings that can provide the data capacity necessary for future expansion.

d) I-91 Intelligent Transportation System

An ITS study for the I-91 Corridor into Springfield was recently commissioned by the Massachusetts Highway Department. The study examines the feasibility of expanding the existing system for Route 9 and the Calvin Coolidge Bridge to include key points along the southern I-91 corridor. The system would also be linked to the existing system for I-91 in Connecticut.

Potential ITS elements for the southern I-91 corridor include dynamic message signs, closed circuit television cameras, remote traffic microwave sensors, highway advisory radio, and a dedicated fiber optic communications system. Placement of ITS technology could occur at critical points such as the 3 Springfield bridges, the I-91/I-291 interchange, MassPike exits 4 and 6, and at the ramps leading to major employers off of I-91 such as the Baystate Medical Center.

e) Update to Regional Architecture

The National ITS Architecture will be a constant "work in progress". As ITS technology continues to evolve the National Architecture will be updated to remain current. Federal regulations require that the regional ITS architecture also allow for procedures for maintenance as needs change in the region.

Since the completion of the Strategic Deployment Plan for the Pioneer Valley in 1998 there have been many changes in ITS technology and terminology that are not reflected in the Plan. The development of the RTIC at UMass to provide traveler information and regional architecture developed for the PVTA are also not reflected in the plan. The Strategic Deployment Plan for the Pioneer Valley should be updated to incorporate these changes and remain consist with the ITS projects, programs, and strategies for the region.

f) Homeland Security

Intelligent Transportation System technology can be a key component in carrying out the mission of the Homeland Security Act of 2002. Closed circuit television cameras can be used to monitor vital links in the regional transportation system such as major river crossings and the Interstate Highway System. Variable message signs can alert motorists of current conditions and detour traffic to alternate routes. An incident management plan can assist in the quick implementation of a detour route and ensure that appropriate personnel is deployed. It will be important to coordinate the responsibilities of federal, state and local agencies; identify the existing technology available for the purpose of Homeland Security; and, develop a plan to ensure that the system continues to evolve with changes in society.

g) Management, Operations, and Technology Task Force

As ITS technology continues to advance and expand in the PVPC region, it will be important to have a task force to coordinate the sharing of information and services. Potential members of this task force include: MassHighway, PVPC, FRCOG, PVTA, UMass RTIC, the Economic Development Commission (EDC), representatives from local government, and representatives from the tourism industry. Establishment of a regional task force will improve existing coordination among ITS proponents, insure against unnecessary duplication of services, and provide a forum to prioritize the future needs of the region.

B. Transit and Passenger Transportation

1. Fixed Route Service

After showing modest declines in ridership from 1985 to 1990, the public transit system in the Pioneer Valley has rebounded with ridership improvements over the past few years. However, ridership declined by almost 5% in 2002. Numerous studies conducted by PVPC have shown that the majority of PVTA riders are what we call "captive" riders. Meaning that they do not have any other means of transportation. PVTA ridership is contingent upon other factors as well; one being the student enrollment at the Five Colleges in the Amherst area, and another being the enrollment in the Springfield Public School System. For ridership to increase in the PVTA system programs must be initiated that bring in new riders. We must make riding the bus a viable alternative to driving a car. In the 90's the entire PVTA bus fleet was replaced with new buses. The PVTA went from having one of the oldest fleets in the country to having one of the newest. A new farebox system was installed on all PVTA buses, improving headways (decreasing the time between buses on a specific route), and re-routing to better serve major trips generators have been priorities. In response to numerous requests by the riding public service has been expanded to both late night and Sundays. This expanded service will enable PVTA to meet its goal of providing service seven days a week covering three work shifts. To compete successfully with automobile transportation, it will be necessary to sustain these efforts and implement new innovations, as they become available.

2. Limited Stop Express and Commuter Routes

Increasing demographic, employment and other changes have shifted the travel needs and patterns of the region's residents. To respond PVTA will need to introduce innovative new services that complement the existing service and provide competitive travel options across the service area. To open job and educational opportunities to all residents throughout the region PVTA sees a need to add a number of limited stop express and commuter routes. 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 Multimodal centers and different development projects including an expansion of the Springfield Civic Center.

3. Urban Core Services

As living and employment patterns have changed over the past 20 years transit systems have had difficulty reacting to the new evolving needs of their passengers. One of these needs is for more cross-town service that better reflects current passenger needs.

Holyoke presents an opportunity for improved service from transit by better matching the needs to get to and from jobs and education with the services provided. PVTA has considered extending the hours of service on the primary routes servicing Holyoke and seeks to convert another community route 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. A further community based FlexVan route has been proposed for Westfield.

4. 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 PVTA has long sought to address increased requests for more service on the local Florence heights R44 route. This route connects senior and other housing units with shopping centers and downtown Northampton. In addition 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.

5. Financial Constraints

Currently, operating funds for the PVTA come from six sources: 5% from the FTA, 48% from the Commonwealth, 27% from the farebox, 19% 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 State of Massachusetts. PVTA operates on what is called reverse funding. That means that PVTA operates all year long – basically going into the red to operate it's service and at the end of the year, submits a bill to the Commonwealth for reimbursement of monies owed for the previous years service. For the last three years the Commonwealth has withheld it's reimbursement to PVTA. Toward the end of FY 2002, PVTA received most of the monies it was owed by the Commonwealth. This does not however, cover the added interest expenses that PVTA incurred as a result of having to borrow money to keep the buses running. 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.

6. ADA Accessibility

The Americans with Disabilities Act of 1990 (ADA) was enacted on July 26, 1990 and it provides a comprehensive framework and approach for ending discrimination against disabled individuals. As of July 1995, PVTA entered full compliance with the ADA law meaning that they have adhered to all accessibility regulations required of them. PVTA's bus fleet is 100% ADA accessible.

The PVTA, the largest paratransit provider in the region, makes every effort to accommodate non-ADA eligible seniors, but capacity is limited because PVTA, by law, must first use its fleet of vehicles to satisfy the transportation needs of its ADA eligible users. The overriding problem in this issue is the sheer expense of providing "door to door" paratransit service. The average paratransit trip (per unit) can cost between $10 and $15.00 depending on trip distance. That is five to ten times more expensive than providing these trips on the fixed route transit system. Efforts to accommodate more non-disabled elderly are continuing through more efficient use of the current paratransit fleet, computerized scheduling and greater use and coordination of the fixed and community routes.

7. Multimodal Transportation Centers

a) Springfield Union Station

The Springfield Union Station will revitalize the long-vacant Springfield landmark into a comprehensive multimodal facility with business entertainment, cultural and retail operations. PVTA as the project overseer is working with the Springfield Redevelopment Authority and the developer Telesis/Jones Lang La Salle to undertake the 115 million dollar redevelopment.

The Union Station Project will consolidate the different transportation terminals of Springfield into one-location. The Multimodal center will include the Springfield Hub for 19 PVTA routes, Intercity Buses, and Amtrak. Site preparation and initial work has already begun with major construction beginning in the fall of 2002 and the expected opening in 2004.

The proposed project also addresses the goals of significant job creation, the coordination redevelopment of Union Station and the adjacent former Hotel Charles Parcel, and reconnection of the station to the downtown and the North End.

b) Westfield Multimodal Facility

The Multimodal Transportation Center for Westfield brings together a variety of transportation modes. The center is an important element of a regional strategy to improve the quality and integration of mass transportation in the Pioneer Valley, and also is designed to serve as a catalyst for downtown development and revitalization in Westfield. This facility is sited on Elm Street in downtown Westfield, between Church and Arnold Streets.

The transportation and economic development program consists of 3,600 square feet of exterior bus berths and boarding platforms; a 2,500 square foot transit concourse located within the 3,500 square foot transportation center; and a 1,600 square foot police substation.

The goals of the Westfield Intermodal center include:

- Consolidate downtown bus stops for the 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 the Columbia bikeway
- Encourage public/private cooperation and leverage development opportunities.

c) Holyoke Multimodal Transportation Center

PVTA in conjunction with the City of Holyoke has initiated a combined transportation and economic development project involving the conversion of a historic fire station into a Multimodal Transportation Center. This project combines the need for a downtown facility with the opportunity to preserve a historic structure and to contribute to the revitalization of downtown Holyoke.

The Central Fire Station, constructed in 1913, is located at 206 Maple Street across the street from Veteran's Park. The building has recently become vacant, the Holyoke Fire Department has moved to a new facility.

The major PVTA downtown Holyoke transfer location is located on the perimeter of Veteran's Park. The high level of service at this location makes this pulse point a transit gateway for passengers traveling to and from Holyoke. This location offers only basic passengers amenities, a limited number of benches, simple bus shelters and limited street lighting. The transfer and waiting areas are exposed, congested and do not offer the basic level of service that would encourage people to take transit.

The goal of the Holyoke Multimodal Transportation Center project is to create a multimodal transportation center for downtown Holyoke preserving and renovating the historic fire station building, and increasing the level of service and the quality of service for the PVTA ridership.

The objectives are as follows:

- To provide improved transportation access and facilities for persons traveling to, from, and through downtown Holyoke;
- To provide enhanced passenger amenities and operations support facilities for PVTA in and around the City;
- To provide intermodal connections in downtown Holyoke between transit, pedestrians, taxis, automobiles, bicycles, and a potential future intercity service;
- To provide a viable adaptive reuse for this important civic and historic landmark in downtown Holyoke that is sensitive to its historic character, and
- To contribute to the economic development and revitalization of downtown Holyoke in a manner that is consistent with the goals and objectives of the Holyoke Master Plan.

d) Belchertown Multimodal Transportation Center

PVTA has begun work with the Belchertown Redevelopment Authority to develop a Multimodal transportation center on the former Belchertown State Hospital Site. The Multimodal center will be integrated with a new regional judicial complex and other developments.

Belchertown has been one of the fastest growing communities in the Pioneer Valley and this growth has increased the need for improved transportation options. The Belchertown Multimodal Center will serve existing PVTA services and allow opportunities for new Intercity Bus Services.

Intercity bus service to and from the Pioneer Valley is quite extensive. Companies like Peter Pan, Greyhound and Vermont Transit, 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.

8. Welfare Reform Transportation

The Pioneer Valley Region has been engaged in two separate transportation programs to assist people making the transition from welfare to work. PVTA has received Federal Job Access Revise Commute (JARC) Program funds to extend late night transit service and fund a portion of the Northampton to Holyoke B48 Route.

Until February of 2003 PVTA participated in the "Access to Jobs" program which was a collaborative effort between the Executive Office of Transportation and Construction (EOTC) and the Department of Transitional Assistance (DTA). State funds allocated to the DTA's emergency Support Program were transferred through an Interagency Service agreement to 13 Regional Transit Authorities (RTAs) including PVTA. The program provides a coordinated system of information, transportation problem solving, training on how to access the fixed route system, and immediate transportation services to DTA clients moving into the labor force. This program was discontinued in February of 2003 as part of the Commonwealth efforts to close a widening budget gap.

Both of these programs allowed PVTA to expand service to individuals transitioning from welfare to work as well as the general public. While meeting budget limitations are understandable transportation remains one of the critical elements for the successful transition from welfare. Transit service remains the most efficient and cost effective means to provide transportation for individuals entering the work force.

9. Intelligent Transportation Systems (ITS)

The Pioneer Valley Transit Authority (PVTA) faces the challenge of meeting an increasing demand for transit service in the Pioneer Valley Region under the pressure of limited budgetary resources. On the operational side, the PVTA must continue to meet its objective of serving its customers by providing comprehensive transit service, both fixed route and paratransit. On the policy side, the PVTA has the goals of increasing transit usage in the region and responding to and influencing regional growth and development. To achieve these goals the PVTA must maintain and improve the efficiency and cost effectiveness of its current operations and plan for the future. The use of Intelligent Transportation Systems (ITS) is a way to achieve this.

The PVTA has recently developed an agency-wide ITS architecture to develop a consistent approach to ITS deployment and integration, leveraging existing communications and infrastructure as well as anticipated ITS deployments in the future. PVTA's vision of an Integrated Transit Management System (ITMS) is one in which the day to day operation and maintenance of the region's transit fleet is automated and integrated to the greatest extend possible. An ITMS would integrate separate elements

of the systems such as: scheduling, dispatching, fare collection, vehicle monitoring and surveillance, and would interface these components with the Intelligent Transportation Systems infrastructure in the region.

The recently completed ITS Architecture and Deployment Study proposes a core ITS Program consisting of the following elements and components:

- Fixed Route and Paratransit operations, scheduling and management software,
- New Voice and Data Communications System,
- Automatic Vehicle Location (AVL) System using GPS on all fixed route buses that includes these futures:
    - ADA Annunciation System
    - Automatic Passenger Counters
    - Transit Security

The Fixed Route and Paratransit operations, scheduling and management software will automate much of the scheduling and reporting functions that currently manually done by PVTA's operators. The scheduling software will provide a single unified database of schedule information that will be used both in operation and customer information.

The Communications and Data System Upgrade is an urgently needed upgrade to the existing infrastructure due to concerns with reliability, support and bandwidth. This project must be deployed before any other advanced applications because most applications are dependent on the completion of the Communications and Data System before they can be implemented and fully functional. This upgrade will allow PVTA to implement the full integration of all the planned or anticipated transit advanced applications.

10. Capital Improvements

a) Fleet Replacement

In the 1990s PVTA replaced its entire bus fleet with new vehicles. Up to that point PVTA had one of the oldest bus fleets in the nation. Over the next 6 years PVTA will have to replace many of vehicles purchased in the 1990s. Transit Buses are built with 12-year useful life with the expectations that they will be replaced every 12 years. In making the bus replacements PVTA is actively considering a number of new features including low floors and low-emission propulsion systems. PVTA further expects that new bus orders will be equipped with ITS components that will integrate with the Communications/AVL system.

11. Improvements to PVTA Facilities

a) Van Maintenance Facility

As demand for ADA and dial-a-ride paratransit service has increased so has the size of PVTA fleet of specialized vehicles for the service. Vehicle maintenance for the paratransit fleet is done at the Springfield Garage which is increasingly cramped. PVTA is considering the development of a separate facility for the maintenance of paratransit vehicle. A location or further details of this facility have not been determined yet.

b) Parking at the Springfield Facility

Parking for employees and visitors at the PVTA Administration building and Springfield Garage has been a long-standing issue. The supply of parking spaces is significantly less than the demand. PVTA is in the beginning stages of considering alternatives to improve the supply of parking.

12. Springfield-Hartford-New Haven Commuter Rail

The Pioneer Valley expects to participate in the extension of Commuter rail service between Springfield and New Haven. Initially proposed as part of Hartford's Regional Transit Strategy the commuter rail service is currently under study by the Connecticut Department of Transportation. The project envisions commuter rail service on the existing 62 mile Amtrak owned Springfield Line connecting New Haven with Hartford and Springfield. Rush hour and mid day trips would provide bi-directional service for commuters and passengers for each city.

The existing 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 location between the Basketball Hall of Fame and the Springfield Riverfront.

13. Passenger Rail

Amtrak is currently in a new round of uncertainty with vital operating and capital funding provided by the federal government under review by both the administration and congress. New management at Amtrak has universally rejected many of the reforms, new initiatives and the drive to operational self-sufficiency that was discussed in the last update of the regional transportation plan. Amtrak's new president has made it clear that financial self sufficiency is virtually impossible and further that if the nation wants a diverse transportation network that Amtrak needs to be funded at a sufficient level to maintain service. It is important to point out that no passenger railroad in the industrialized world makes a profit on passenger operations when capital and operating costs are considered.

To improve its financial situation, Amtrak over the past year has ended it's unprofitable move into Mail and Express freight movement, made significant cuts in management and continued to cut or modify routes and services. Mail operations in Springfield are in the process of being closed down. Checked baggage service for long distance trains out of Springfield ended in 2002. Future reductions of services to Springfield and the region are possible as Amtrak continues to review its operations.

The Bush Administration last year released an Amtrak reform proposal that included a provision to begin the process of shifting the responsibilities for funding operational losses from the federal government to the states. This provision as well as much of the Administration's Amtrak proposals were widely criticized by both parities in congress and a final decision on Amtrak policy has been put aside temporarily as Amtrak did receive funding for FY03 at a level that provides for continued operation.

The Department of Transportation has recently proposed a national rail plan that would drastically restructure Amtrak, making it a for-profit corporation. The Plan proposes that Amtrak's money-losing long-distance routes become less dependent on federal sources and more dependent on a combination of federal, state, and private funding. The DOT also suggested establishing a federal-state Northeast Corridor Compact to split off and oversee the Northeast Rail Corridor.

The Compact would be funded by federal grants and have the authority to fund capital projects along the rail corridor stretching from Washington, D.C. to Boston. Amtrak would be recreated as a for-profit corporation and would contract with the Compact to run trains on the corridor. A separate company would be formed for maintenance and capital projects in the Northeast.

The Pioneer Valley has quite a stake in Amtrak's future 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 Amtrak services provided in the region may be inevitable to both retain the existing service as well as to exercise future options.

C. Transportation of Goods

1. Trucking

Maintaining the efficient movement of goods is critical to economic stability and trucking plays a major role. A delicate balance must be maintained between economic vitality through the movement of goods, free enterprise, damage to the highway infrastructure, governmental regulation and truck safety. Two specific items that need further study are:

- There are numerous exits along I-91 that are half-interchanges with Route 5/Route 10. These half interchanges cause trucks to detour through residential and business areas, adding to roadway congestion, and increasing transportation costs.
- The need for a better connection between the Palmer Intermodal Terminal and the Mass Pike. If an improved connection were built, trucks coming from New York State could follow the Mass Pike to the new connection rather than exiting the New York Thruway in New York and traveling along local roads to Pittsfield.
- Currently the CSX intermodal Yard in West Springfield is only accessible from the north side of the CSX mainline in West Springfield. There are three underpasses under the main line that would allow for access from the south but all have restrictive 12' foot clearances. Improving the clearances on one or more of these underpasses would allow for improved access from the southern parts of the region as well as from Connecticut.

2. Railroads

In preparing this section for the freight carriers a short survey covering the perceived major issues for railroad in this region was sent out to the different carriers. Their comments and input was used to develop the needs and issues items for the region's rail carriers.

a) Accessibility

As the region's railroad provide multimodal services to customers both along their tracks and off the tracks access to railroad yards and facilities is important. Truck access to railroad facilities is important to maintain and improve as needs warrant.

There are a number of railroad bridges that had low clearances over roadways below them. Trucks periodically strike some of these bridges which damages the trucks and has the potential to damage the bridges. The low bridges further limit the routes that trucks can travel through the region. The railroads and municipalities have identified a number of these bridges that have been repeatedly struck. While major improvements to increase the clearances are the preferable long-term solution, short-term measures such as improved signage should be actively considered.

b) Railroad Clearances

Low clearances along railroad rights of way are not perceived as a priority by the region's railroads. None of the region's railroads have the clearance to enable full double stack containers in the region. the region's largest intermodal facility, the CSX West Springfield Yard, does not provide containerized (COFC) service.

c) Economic Development

The representatives from different railroads expressed an interest in being more involved in regional economic development activities. The railroads seek to add new customers and are able to provide needed transportation services to new businesses seeking to locate in the region.

d) Safety at Grade Crossings

One of the most pressing safety issues facing railroads on the national level is eliminating grade crossing accidents. Nationally, the largest cause of fatal accidents are collisions between trains and automobiles at grade crossing. Lucky for our region this is not a significant issue, the busiest rail corridor in the region has only five public grade crossings of which only one is on a through street. This one location, at Prospect Street in West Springfield has been suggested to be the subject of future study as drivers are often observed going around lowered crossing gates. Other railroad lines in the region do not have the same level of grade separation and efforts should be made to determine problem areas and foster improvements if the need warrants.

One other area of concern is the public's lack of understanding of the danger of crossing or traveling along railroad tracks were there are no grade crossings. The danger posed to the public real as the stopping distance for trains can be quite significant and the results of people being hit is often fatal.

The railroad industry has established and actively supports Operation Lifesaver, the national public education campaign on the importance of grade crossing safety. Operation Lifesaver programs are aimed at both the general public as well as educating school children about the dangers at grade crossings and crossing railroad tracks.

e) Homeland Security

The recent rise to importance of security at all transportation facilities has raised official and public awareness of railroad infrastructure and equipment with regard to Homeland Security. The rail carriers themselves will be at the forefront of securing their own facilities. 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 regions rail carriers.

f) Infrastructure

One of the largest infrastructure issues facing railroads is the need to improve tracks and structures to handle increasingly heavier railcars. Many railroad customers would like to use cars that can carry more than 286,000 pounds per axle, which often requires the railroad to make track improvements. This can be more difficult for the smaller carriers, which do not have the same level of resources as the large carriers.

Many of the region's carriers expressed an interest in programs which are common in other states that provide grants for infrastructure improvements. A number of states including some in New England, provide railroad infrastructure loans or grants for economic development. Massachusetts has had a limited program that may be used to fund improvements in commonwealth or municipally owned tracks. There is a real opportunity to expand this program to any railroad in the commonwealth on the basis of need and economic benefit to surrounding community.

3. Air Freight Access

Air cargo can be broken down into three specific groups: Air freight which includes all types of goods (generally over 70 pounds) transported by air and Express, which includes packages and documents (generally under 70 pounds) transported by air. Air express frequently offers comprehensive pick-up and delivery services, such as those provided by Federal Express; and U.S. and foreign mail travelling by air. The focus of this section will be on air freight and package express.

Air freight and package express services are readily available in the Pioneer Valley Region, and the transportation of air cargo is generally conducted in one of two ways. The first option would be to transport air freight by companies which own and maintain their own all-cargo aircraft fleet, such as Airborne Express, Burlington Air Express and Emissary Airways Inc. The second option, and the primary method for moving most of today's air freight, is via scheduled passenger aircraft for which the shipper places the cargo with a freight forwarding (pooling) company. And the forwarder contracts for blocks of space on commercial airlines for specific routes.

Air freight in the Pioneer Valley Region is predominantly moved through either Bradley International Airport in Windsor Locks, Connecticut, Logan Airport in Boston, or New York City's metropolitan airports. None of the airports located within the region's boundaries offer air cargo services at this time.

a) Bradley International Airport

Bradley International Airport is a medium-hub airport located 15 miles southwest of Springfield, MA, in Windsor Locks, CT. It is the major commercial airport serving the Pioneer Valley for both passenger travel and air cargo shipments. Bradley's convenient location near Interstate 91, and its improved and expanded air cargo facilities, make it the primary choice for the regions shippers. 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.

Scheduled all-cargo flights are available at Bradley through a number of different carriers and there is a current listing available from the Connecticut Department of Transportation Bureau of Aviation and Ports. A current listing of passenger flights that make space available for freight forwarders can also be obtained from the Bureau.

b) Westover Metropolitan Airport

The Westover Metropolitan Airport provides access to a large joint military/civilian air facility which served exclusively as a military Strategic Air Command (SAC) base until 1974. At that time the base was deactivated and reclassified as an Air Force Reserve base. Today, in addition to the Air Force Reserve facilities, three industrial airparks are located at Westover.

D. Air Passenger Service

1. Bradley International Airport

Since 1982, funds for improvements to Bradley Airport have been provided through the Bradley Enterprise Fund. No state tax receipts are used in the operation of Bradley Airport. Operating revenues are obtained from airline landing, parking and facility fees, on-airport 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,

increased short and long term parking, and reconstruction of the main runway.
Bradley airport is in the process of completing major construction to its infrastructure and facilities. Because the airport is in the process of developing these areas, the needs of the airport are being addressed during this current phase of construction. A new terminal is nearing completion and construction to surrounding roadways is currently underway. More parking is being planned in addition to the new parking garage opposite the new terminal. Due to the continued growth of the airport, the Connecticut Department of Transportation has proposed improvements that enhance aircraft operations, and passenger comfort and convenience. Just a few of these improvements include food concessions stands occupying 11,545 square feet throughout the new terminal as well as a full-size restaurant. More prominent merchandising establishments such as a bookstore and newsstands are also being constructed. Possible future amenities include televisions and wireless network connections in the new terminal.

The airport would like to develop a larger international presence and become an international hub for the surrounding regions. The improved roadway system and airport capacity will make this easier as the airport can handle increased passenger traffic as well as more airline traffic.

For current updates on improvements to the airport, please visit their website at
http://www.bradleyairport.com/index.shtml

2. Westfield-Barnes Municipal Airport

Westfield-Barnes Municipal Airport is interested in making several improvements to the airport in the coming years. One issue that is currently being looked at is the main entrance to the airport (Apremont Way) from Routes 10/202. From a northbound direction there are no access issues. Traveling south-bound, large vehicles such as tractor trailers currently have difficulties maneuvering the sharp corner on the turn into the main entrance. Creating an easier interchange for these types of vehicles at this entrance is a possibility that the airport is investigating.

Another issue is on the north side of the airport. Char Drive and Elise Streets are in need of repair and possible widening. These streets are the access roadways for the General Dynamics workers on the airport grounds. Future land acquisitions may be necessary to alleviate some of the problems with these access points. General Dynamics is one of the largest companies that currently resides on airport property.

The airport also holds considerable land which is available for development and is trying to attract non-aviation industry into the area. Light manufacturing and office space are just two of the options available for alternate forms of business opportunities at the airport.

A new Airport Master Plan is currently being developed and should be ready sometime in 2004. The priority phase, the terminal area development, consists of the expansion of the commercial, transient, and based aircraft parking aprons; the combination of a new administration/terminal building; automobile parking lots; and hangar facilities for aircraft maintenance and storage purposes.

3. Westover Metropolitan Airport

The airport is currently in the process of using a PWED grant to improve the intersection of Padgette Street and Sheridan Street, which is the main intersection on the access road to the airport. Improvements to this intersection will make access to the airport easier for vehicles of all types.

Another section of taxiway is planned on being redone in 2004 at a cost of $500,000. The WMDC is in the process of securing funds for capital projects like these for the future. Just a few of these needs include soundproofing, snow removal equipment and building repairs.

At the present time a Part 150 noise study is being conducted at Westover Metropolitan Airport. This study would quantify the impact of airport noise on the surrounding buildings and neighborhoods and recommend ways in which the airport can minimize its current noise level impacts. The findings to this study may allow for improvements to the surrounding neighborhood through the use of grants

4. Northampton Airport

The Northampton airport is currently investigating options for a feasibility study for commuter flights to Boston and New York. Two flights would be scheduled both during the morning and afternoon hours on a set schedule. The infrastructure is already in place for this type of operation. All that is currently required would be FAA approval to do so. The Department of Transportation would also require standard inspections and minor improvements. A feasibility study would give the airport a better understanding of what the client base would be for such an undertaking as well as the economic benefits for the city of Northampton in general.

Another issue for the airport is the current condition of the access road (Old Ferry Road). Although the maintenance of the roadway is better than it has been in the past, it is in need of repair. During the winter months the roadway condition makes it difficult to maintain properly and is an issue for both employees and clients of the airport.

E. Non-Motorized Transportation

1. Public Support

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; 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 roadway 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 on-road facilities, both on-road and of-road facilities can be viewed as a system and more of a viable commute alternative to driving.

2. Funding

a) Legislature

Since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, the federal government has played a historically unprecedented role in promoting walking and bicycling. In his introduction to the National Bicycling and Walking Study, then-Secretary of Transportation Federico Pena stated, “We (The United States Department of Transportation) want to improve mobility by promoting strategies that give people more choices through improved

connections to public transit and by providing safer ways to bicycle and walk. The goals of the National study are: to double the current percentage (from 7.9 percent to 15.8 percent) of total trips made by bicycling and walking, and to simultaneously reduce by 10 percent the number of bicyclists and pedestrians killed or injured in traffic crashes." Federal regulations, plans, policy statements and planning guidelines issued since 1991— including the latest transportation law, the Transportation Equity Act (TEA 21) — continue to support walking and bicycling as important transportation choices that should be available to all Americans who want them. The reality of TEA-21 is that pedestrian and bicycle projects can be funded with almost all sources of federal transportation dollars (see the Appendix for an explanation of the mechanics of the final funding loop for MassHighway federal aid projects).

Federally funded transportation projects (including bicycle and pedestrian projects) are prioritized in the region through the Transportation Improvement Program (TIP). This annually updated document matches available federal funds with local projects. The Region's Joint Transportation Committee prioritizes projects for TIP. Since the beginning of ISTEA the JTC has programmed $12,178,279 for bicycle and pedestrian projects. This amount is in addition to the sidewalks, roadway shoulders, crosswalks and transit shelters constructed as part of regular roadway and transit improvement projects.

23USC 217 (e): In any case where a highway bridge deck is being replaced or rehabilitated with Federal financial participation that is located on a highway, other than a highway access to which is fully controlled, on which bicycles are permitted to operate at each end of such bridge, and the Secretary determines that a safe accommodation of bicycles can be provided at reasonable cost as part of such replacement or rehabilitation, then such bridge shall be so replaced or rehabilitated as to provide such safe accommodations.

b) Potential Funding Assistance For Bicycle and Pedestrian Facilities

The following is an outline of potential federal and state funding sources for bicycle and pedestrian activities. They are presented by activity and eligible source of funding and are followed by a description of each funding source. *Sources marked with an asterisk (i.e. STP*) are part of the Transportation Equity Act for the 21st Century (TEA-21) of 1997. Only bicycle and pedestrian facilities principally used for transportation rather than recreation purposes are eligible for TEA-21 funds.*

According to the Metropolitan Planning regulations, projects seeking state or federal funding must be included in the Regional Transportation Plan (RTP) and the Transportation Improvement Program (TIP) to be considered for funding.

Table 8-6 - Funding Sources for Bicycle and Pedestrian Activities

Activity Assistance	Source of Funding
Brochures related to safe bicycle use	STP*, CMAQ*
Construction	NHS*, CMAQ*, STP*, STP/E*, DCS- Urban Self Help, L&WCF
Easement acquisition	DCS - Urban Self Help, L&WCF
Land acquisition	DCS - Urban Self Help, L&WCF, STP/E*
Planning or design	DCS - Self Help, DEM Greenways
Public service announcements related to safe bicycle use	STP*, CMAQ*
Route maps related to safe bicycle use	STP*, CMAQ*
Transit access and other facilities (lockers and racks)	Federal Transit Section 5309*

c) Description of Funding Sources and Other Areas of Assistance:

Congestion Mitigation and Air Quality (CMAQ)* Program Funds - "may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or non-construction projects (such as brochures, public service announcements and route maps) related to safe bicycle use."

Massachusetts New and Innovative Transportation Demand Management Program (TDM) Funded under the Congestion Mitigation and Air Quality program, the TDM program is a $1.0 million statewide program that provides funds for low-cost, new and innovative TDM projects. The goals of the program are to help the Commonwealth achieve its air quality and traffic congestion objectives (State Implementation Plan) by changing the behavior of motorists, encouraging them to use alternatives to driving alone and supporting strategies that promote the use of these alternatives. Bicycle and pedestrian projects previously funded under this program include; PVTA's Rack & Roll Program (includes bicycle lockers, bicycle racks on buses, and bicycle parking racks) and Northampton's Sheldon Field Park & Ride Project (includes bicycle lockers and parking racks). Other examples of bicycle and pedestrian strategies that may be eligible for funding under this program include:

- Developing new shared ride services, including bike and ride services;
- Making transit more attractive through operational improvements;
- Developing programs that encourage the use of alternative modes, or reduce psychological impediments to their use;
- Devising alternative work hours;
- Implementing parking management strategies;
- Disseminating information and marketing alternatives.

Section 5307 Transit Funds- The funds are channeled through the regional transit agencies and are used for capital expenditures. Transit authorities can work with their member communities to develop pedestrian and bicycle friendly transit stops or add bicycle racks to buses.

Department of Environmental Management (DEM) - has the ability to acquire abandoned rights-of-way.

Department of Environmental Management Greenways Program (DEM Greenways) - has a small grants program for the planning and development of non-bike related trails.

Division of Conservation Services Self Help Program (DCS - Self Help) - reimburses up to 70% of the total project cost for the acquisition of land for conservation and passive recreation purposes.

Division of Conservation Services, Urban Self Help (DCS - Urban Self Help) Program - reimburses up to 70% of allowable costs towards the acquisition of land, undertaking of new construction or rehabilitation of land for park or outdoor recreation purposes.

Federal Lands Highway Funds - "may be used to construct pedestrian walkways and bicycle facilities in conjunction with roads, highways and parkways at the discretion of the department charged with administration of such funds."

Federal Land and Water Conservation Fund (L&WCF) - reimburses projects up to 50% of the total project cost, up to $150,000 for the acquisition, development or renovation of park, recreation and conservation areas.

Federal Transit Title III, Section 25* Funds - "allows transit funds to be used for bicycle and pedestrian access to transit facilities, to provide shelters and parking facilities in or around transit facilities, or to install racks or other equipment for transporting bicycles on transit vehicles."

Governor's Highway Safety Bureau (GHSB) Funds - "can be used for small scale physical improvements and bicycle safety programs."

Massachusetts Highway Department (MHD)* - can fund projects designed primarily for transportation. Priority is given to projects that have engineering design completed and all permits acquired by the impacted community(s).

National Highway System (NHS)* Funds - "may be used to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the National Highway System (other than the Interstate System)."

National Park Service (NPS) Rivers and Trails Assistance Program - provides staff services to groups for organization building, education, planning and technical assistance. There are no direct funds available.

National Recreational Trails Funds (NRTF)* - may be used to create trails for use by motorized and/or non-motorized users. Funds under this category are very limited.

Surface Transportation Program (STP)* Funds - " may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or non-construction projects (such as brochures, public service announcements and route maps) related to safe bicycle use."

Transportation Enhancements (STP/E)* Funds - may be used for " provision of facilities for bicyclists and pedestrians" and "preservation of abandon railway corridors (including the conversion and use thereof for pedestrian or bicycle trails)."

(i) Local Funding Sources

Bicycle Registration Fees - Communities can establish a bicycle registration program which charges a fee for each bicycle registered. The revenue from the fees can be earmarked for bicycle-related projects and services.

Sidewalk Accounts - Communities can obtain funding for sidewalks using municipal bonds or special accounts established to hold contributions from developers of new developments. Rather than requiring sidewalks in places that may not need them, a developer can be asked **to donate** what would have been spent to the special municipal account for sidewalks. The community can then use the funds for sidewalks where the are needed.

Environmental Impact Review Measures- Localities can ask project proponents whose projects have environmental impacts to consider bicycle and pedestrian improvements as mitigation measures.

Local Support through Volunteers, Schools, Business Groups- Although not a funding source, volunteerism is one of the greatest resources available to cities and town. There are civic clubs, schools, police departments, bike shops, bike accessory manufacturers, medical professionals, youth groups, service organizations, bicycling clubs, and business groups who are willing to take on projects to improve community public space or assist in injury prevention programs. Success in bringing volunteers together is witnessed through adopt a trail groups, local bicycle advisory committees, and bicycle safety programs. (Resource: Community Bike Safety Idea Bank, MA Department of Public Health, Western MA Safe Kids, Kawanis Pediatric Trauma Institute (Guide to Bicycle Rodeos)

Baystate Roads Program- Not a funding source, The Baystate Roads Program provides public works and engineering staff of local governments and municipalities with information and training on current design practices, and technologies for managing public investments in local roads, bridges, sidewalks, and structures. The Baystate Roads Workshops are provided through a cooperative effort of the Federal Highway Administration, Massachusetts Highway Department, and the University of Massachusetts. (Baystate Roads Program 413-545-5403)

(ii) Other State Funding Programs

Community Development Block Grants (CDBG) - The Executive Office of Communities and Development (EOCD) awards CDBG funds that are appropriated by the federal government. Communities must apply for the grant. The CDBG funds can be used for many different projects and can be used as incentives to property owners and developers if approved by the municipality.

Municipal Incentive Grants- The Commonwealth of Massachusetts Executive Office of Communities and Development offers grants to communities for planning projects.

Public Works Economic Development Program Grants (PWED) - The State established this fund for assistance to communities in the design and construction/reconstruction of roadways, sidewalks, lighting systems, bridges, traffic control and service facilities, drainage systems, and other transportation related projects deemed by a municipality to be necessary for economic development. Municipalities must petition the Executive Office of Transportation and Construction (EOTC) which reviews projects according to set criteria.

3. Safety

Clearly people do walk and bicycle in the Pioneer Valley, and unfortunately they are also injured and killed in crashes with motor vehicles. Analyzing crash data as a way of documenting pedestrian and safety concerns can be misleading. Areas with very low crash rates may simply be places where it is so dangerous (or perceived to be so) to walk or ride a bike that no one does it. This is not the case throughout the Pioneer Valley, but it may be true in some neighborhoods and communities.

Raw numbers of crash victims help to document a problem. To prevent crashes, one needs to understand what causes pedestrian and bicycle crashes. We do not know this at the regional level, but individual municipalities can create an understanding of their bicycle and pedestrian crash problems by analyzing police accident report forms and hospital records. Police accident report forms include crashes between motor vehicles and bicyclists and pedestrians. Hospital records supplement a community's understanding of their bicycle crash problem as they include crashes that do not involve motor vehicles. Nationally, most bicyclists are injured in events that do not involve motor vehicles; however, the most severe injuries generally occur in crashes with motor vehicles.

There are four ways to make pedestrians and bicyclists safer:

- Change the physical environment in which they function, by adding crosswalks, bikelanes, signs, and other physical improvements;
- Provide them with protective gear, such as bicycle helmets, so if they are involved in a crash, they will be less likely to be injured;
- Educate bicyclists, pedestrians and motorists about sharing the road with each other;
- Enforce traffic laws that require motorists to yield to pedestrians and require bicyclists and motorists to share the road safely.

F. Environmental and Land Use

The connection between transportation planning and land use and environmental planning is so tight and compelling as to be almost inseparable. One could argue that transportation planning is land use/ environmental planning. Where there are roads, bike ways, transit stops—there will be human-directed uses of land directly affecting the natural and built environment. Motor vehicles are a major cause of air quality concerns, and yet there are a range of transportation options available which are more or less detrimental to air quality. Water quality is also significantly linked to transportation planning. Paved roads are a major contributor to non point source pollution via storm water run-off. Transportation infrastructure in the United State dictates in large part how land is used and transportation choices made by consumers and their representative government dramatically affects the environment.

1. Air Quality

The quality of 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. In Massachusetts excessive O_3 levels have occurred in the summer months, thereby, requiring emission inventories for these compounds in tons per summer day (TPSD). Similarly, excessive CO emissions have occurred in the winter at various locations during the months November through March, requiring an emission inventory for CO in tons per winter day (TPWD). These emissions are at their highest during the winter due to vehicle cold starts. During a cold start the engine temperature affects its combustion efficiency. Incomplete combustion of fuel causes compounds such as CO to be emitted into the air.

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.

The State 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. Good sense supports this requirement.

The Pioneer Valley Planning Commissions works to improve air quality via transportation planning by promoting a balanced transportation infrastructure, by implementing strategies to reduce congestion and by promoting alternatives to motorized transportation, especially by promoting walking and bicycling.

2. Water Quality

Water quality and land use are closely related. 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.

a) Non-Point Source 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. Gasoline and service stations for these vehicles potentially become sources of greater pollution when fluids are accumulated in greater quantities and spills occur. Commercial establishments that rely on heavy automobile access, such as fast food franchises, become "hot spots" of vehicle related pollution. The parking lot, road and highway infrastructure required for automobiles increases the amount of impervious surface in a watershed, and contributes to increased stormwater runoff. The associated maintenance practices of salting and sanding parking lots and roads also contribute to pollution. All of these vehicle related pollutants deposited on impervious surfaces may be deposited into the region's streams, lakes and rivers during storm events.

b) 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 runoff. 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.

c) 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. In addition to engine and body maintenance, maintenance shops wash and fuel the vehicles on-site. These activities produce solid and liquid wastes, which are carried off of the paved surfaces by stormwater runoff. Transportation related wastes include: used oils, oil filters, gasoline and diesel fuels, antifreeze, solvents, brake fluid, batteries, sulfuric acid, battery acid sludges, empty contaminated containers and soiled rags. Leaking underground storage tanks can cause groundwater contamination and create a safety hazard. Stormwater can be contaminated by any of these wastes that are not stored properly.

d) 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 runoff 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 basement and streets, combined systems have been designed to discharge this additional volume to the river.

A 1988 study identified 134 CSOs outflow points and provided recommendations for achieving needed reductions, primarily by separating tributary sewer lines, in the seven communities of Agawam, Chicopee, Holyoke, Ludlow, South Hadley, Springfield and West Springfield. Combined sewer and storm systems run beneath local streets and under sections of several state highways, including I-90. Therefore, a cost-effective strategy to separate storm and sewer systems is during road repair and reconstruction work, to reduce the expense of removing and then repaving roadways to access the storm and sewer infrastructure. There are currently 81 CSO's remaining in the seven communities; work is ongoing to completely eliminate combined storm and sewer systems.

Direct discharges of stormwater can also contaminate water resources. Stormwater conveys pollutants on the land surface, such as oil and grease, fertilizers and pesticides, and road salt and sand into stream, lakes and ponds. Runoff from urban areas contains many different types of pollutants, depending on the land uses and activities that occur within the watershed. Road and parking lot run-off is frequently contaminated with oil and grease, lead, cadmium, and other pollutants. Uncontrolled runoff from industrial sites may contain PCBs, heavy metals, high pH concrete dust, and many other toxic chemicals. Residential areas contribute herbicides, pesticides, fertilizers and animal waste to runoff. All of these contaminants can seriously impair beneficial uses of receiving waters. The Massachusetts Department of Environmental Protection has developed Stormwater Management Policy that identifies land uses and mitigation strategies to manage stormwater and nonpoint source pollution. The policy provides standards and guidelines for controlling run-off and should be consulted for all stormwater mitigation projects.

These stormwater discharges, particularly from impervious surfaces such as roadways and parking lots and denuded roadsides, also contribute to stream erosion and flooding which can affect biodiversity in streams and riparian corridors. Habitats are drastically altered when a stream changes its configuration and deposits its sediment load in response to huge stormwater surges. Run-off also tends to cause an increase in water temperature from heated surface runoff and as vegetation which shades the water is removed. This increase in water temperature may cause algae blooms, which reduces the amount of dissolved oxygen in the water. The lack of dissolved oxygen can kill fish and other aquatic organisms. Increased levels of total suspended solids (TSS) also clog fish gills, cover spawning areas in stream and river-beds and contribute to the infill of all types of water resources.

e) 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.

f) 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.

3. Land Use - Sprawl

I've been driving from one meeting about sprawl to the other for the last fifteen years, and the only thing that's changed is that it now takes longer to get there.

Rob Melnick, Arizona State University

a) Land Use/Transportation Nexus

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. Reflecting on the interconnection of the relationship between a region's transportation system and the region's land use reveals the chicken and egg-like nature of this relationship. Does a transportation system create sprawl? Or do existing land use practices, rules and regulations create auto-dependent transportation systems?

Moving from problem-based to solution-oriented thinking one is left with the questions: can land use planning create a transportation system that is not overly dependent on the single automobile? Can a transportation plan facilitate efficient land use?

Clearly land use and transportation planners in the Pioneer Valley and throughout the Commonwealth have accepted the interconnection of land use and transportation planning. The Massachusetts Highway Department has supported this enlightened 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, and, as Valley Vision is up-dated, it must be in sync with this and subsequent versions of the region's RTP.

The interconnection of land use and transportation planning is manifest in concrete ways; i.e. the demand placed on a transportation system is linked to the distribution, density, and types of land uses. Commercial retail centers generate more traffic than a professional office building, while a professional office building draws more daily trips than a low-density residential neighborhood. And it is manifest in the value system planners and other government officials bring to their work. As we face the new millennium, it is time for transportation planners to question the old methods they have used to evaluate existing transportation systems.

Transportation planning and the resulting transportation systems affect how land is used. At the same time, land use affects transportation planning. Transportation planning is mostly concerned with the design, creation, and maintenance of the transportation system, which in the United States means mostly roads. Roads are evaluated based on their ability to serve the existing demand. A traditional means of evaluating a road is to evaluate its 'level of service', i.e. how quickly can cars move on it. Level of service is a proxy for speed. (Ewing, p. 72) To make it possible for people to move faster. Roads are built and widened, resulting in the un-planned (but certainly not un-anticipated) consequence that people can now drive further. 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.

The inter-dependence of the land use-transportation system has implications for the choice of transportation performance measures. Ideally, measures will reflect the efficiency of both land use patterns and transportation networks; they will acknowledge the multimodal nature of the system; and they will treat the links and nodes as part of the system.

Alternative means of evaluating transportation systems, something other than level of service, do a better job of factoring land use into the overall-planning picture. They recognize the effect of the transportation system on land use. In his excellent book, *Transportation and Land Use Innovations: when you can't pave your way out of congestion*, Reid Ewing suggests a number of alternatives to level of service.

One approach, vehicle miles traveled (VMT) is already used in the Pioneer Valley, but not as a broad-based means of evaluating the transportation system. Instead, VMT is used as a way of measuring air quality. Ewing suggests regions take on a goal of striving to reduce vehicle miles traveled (VMT) over time throughout the region. VMT was chosen in the Clean Air Act as the principal travel measure for air quality planning in high ozone and carbon monoxide areas. It makes sense that the Pioneer Valley is using VMT to measure air quality.

"VMT has a simple elegance for growth management as well. If development is compact, VMT will be low. If land uses are mixed, VMT will be low. If the road network provides direct connections, VMT will be low. If transit and ride sharing are well utilized, VMT will be low.
" (Ewing, p. 75)

Another approach to evaluating transportation systems is to look at vehicle hours of travel (VHT). This measure achieves similar ends as VMT, but also gets at the problem of congestion. The more time people spend in their cars, the more they are polluting the environment. A system-wide goal of reduced VHT would move the region toward a more balanced transportation system which facilitated more efficient land use. Again, the more compact the development, the less time people will spend in their cars.

Ewing suggests the following formula for VHT:

$$\text{VHT/person} = \frac{\text{average trip frequency x average trip length x (1-avg bike/walk share)}}{\text{Average vehicle occupancy x average vehicle operating speed}}$$ (p. 76)

The Pioneer Valley needs to consider modifying the way it evaluates its transportation system. If average vehicle operating speed, or as it is more commonly called, level of service, is maintained as the primary performance measure to evaluate the region's roadways, then the region should institute a variable standard of level of service that permits more congestion in central areas. If not, level of service will continue to promote sprawl by driving development to outlying areas where excess capacity exists. (Ewing, p. 79)

An example of a transportation system performance measure that integrates land use considerations exists in Orlando, Florida. The city uses an area-wide level of service measure to judge roadway performance in the downtown area. Specifically the percentage of total lane miles operating at or above a certain service standard is monitored and judged against a goal of 85 percent at or above. While not as useful as average travel speed, a 'percent of lane miles' measure at least allows some localized congestion as long as the network as a whole is performing adequately. (Ewing, p. 81)

b) Goals:

- The Pioneer Valley should commit to working to a target of having VMT grow no faster than population.

- The Pioneer Valley should factor land use data into its regional transportation-planning model.

c) Land Use in the Pioneer Valley

Low-density urban sprawl has become the Pioneer Valley's dominant form of growth. Within the lifetime of many residents, between 1952 and 1999, 53,000 acres of land in the Pioneer Valley region have been developed for urban uses, an average of 1,100 acres per year for nearly half a century. The development of land for urban uses is accelerating in the Pioneer Valley. In the fourteen years between 1971 and 1985, a total of 15,542 acres of open land was converted to urban use in the region, a rate of 1,110 acres per year. Between 1985 and 1999, an additional 19,540 acres of land were developed for urban use, an average of nearly 1,400 acres per year.

Table 8-7 - Top Communities with Increases in Developed Land

Rank	Community	New acres of developed land (non-farm), 1971 to 1999	Changes in population 1970-2000	New acres per new residents, 1970/1971 to 1999/2000
1	Westfield	3,367	8,639	0.39
2	Belchertown	3,205	7,032	0.46
3	Agawam	2,392	6,427	0.37
4	Southwick	1,909	2,505	0.76
5	Ludlow	1,521	3,629	0.42
6	Northampton	1,427	(686)	NA
7	Monson	1,418	1,004	1.41
8	Amherst	1,368	8,543	0.16
9	Palmer	1,306	817	1.60
10	Ware	1,202	1,520	0.79

The highest rates of land development are occurring in suburban and ex-urban communities. While the region's total population only grew by 4.4 percent between 1970 and 2000, the region experienced a 35.7 percent increase in developed land. Between 1985 and 1999, the region's suburban and rural communities experienced the sharpest increases in acres of land developed for residential uses. For example, the communities of Belchertown, Middlefield, and Plainfield each saw increases in acres of residential land exceeding 50 percent.

As discussed, there is clearly a connection between sprawling land use in the Valley and an increase in traffic. Which came first is not our concern here—but rather we seek to document the problem.

d) Traffic Congestion

No one likes to sit in traffic. Both land use and transportation planners appeal to the public to support planning initiatives designed to reduce traffic congestion. It would appear that commercial sprawl, particularly in the form of commercial developments, is choking our region's highways, such as Route 9 between Amherst and Northampton, Route 20 in Westfield and Springfield, Route

5 between West Springfield and Holyoke, and Route 10 between Southwick and Easthampton. Commercial development consumed nearly 2,00 acres in the Pioneer Valley between 1971 and 1999.

Route 9 between Amherst and Northampton, through the town of Hadley, is a perfect example of the problem of sprawl and transportation. In the late 1980s 32 new businesses were completed or proposed. Today the region faces a major construction project along Route 9 which is an attempt to retro-fit the road to handle the huge increase in traffic that has been caused by sprawling development.

Just as commercial development along roadways is causing inefficient use of land, industrial growth is harming the long-term potential of land use in the region. The industrial growth of the region has occurred primarily on 'greenfields' sites, undeveloped land in suburban locations. Industrial development consumed more than 2,500 acres from 1971 to 1999. A more efficient use of land for industrial development is converting brownfields, abandoned industrial sites, usually located in urban centers for contemporary industrial and perhaps commercial or even residential uses. This type of conversion has begun to take place with positive results in several old mill structures in Holyoke.

The region is becoming increasingly auto-dependent because of the sprawling land use pattern. Or, perhaps it is the region's over-dependence on a single mode of transportation, the automobile that is encouraging sprawl?

- Workers are commuting longer distances to work. Total VMT in the Springfield-Chicopee-Holyoke area increased 11% from 1994 to 2000.
- Commuting times are also increasing. Between 1990 and 2000, the average commute time increased by 14.2 percent and 18.7 percent for Hampden and Hampshire county residents respectively.
- There is an increase in single occupancy vehicle trips. From 1990 to 2000, carpooling declined from 11% to 9.6% of all work trips.

e) Increased Auto Use Contributes to Declining Air Quality

Land use has had a significant impact on air quality in the Pioneer Valley over the past few decades. A cornerstone of the Regional Land Use plan, Valley Vision, was a series of three alternative build-out scenarios designed to assess the impacts of sprawl versus compact forms of growth and development in the Pioneer Valley. The three alternative land use patterns examined were: 1) dispersed development scenario—what is happening now, 2) compact development scenario, and 3) satellite development scenario. The transportation impacts of the three alternatives are summarized as follows:

- dispersed development: single occupancy automobiles remain dominant
- compact development: greater reliance on mass transit and non-motorized transportation, and
- satellite growth center development: transit and bicycle/pedestrian networks linking satellites and urban/village centers.

Table 8-8 summarizes the projected impact, by the year 2020, of the dispersed versus the satellite growth scenarios on the VMT and air quality emissions in the Pioneer Valley. It is impossible to

disconnect transportation planning from land use planning. The most conservative estimates indicate that the satellite scenario can reduce VMT by at least 4 percent in 2020, over the current pattern of dispersed growth. The impact on air quality from vehicle-relayed emissions is similar.

The satellite scenario results in a four to five percent reduction in emissions of air pollutants. Less conservative estimates show a reduction of as much as fifteen percent in vehicle miles traveled and a similar impact on vehicle-related emissions.

Table 8-8 - Dispersed Vs. Satellite Growth Scenarios on VMT

	Year 2020 Impacts Dispersed Scenario	Year 2020 Impacts Compact Scenario	Percent Reduction with Compact Growth Scenario
VMT	12,668,130	12,116,915	-4.4%
Hydrocarbon Emissions (Grams per summer day)	6,608,778	6,357,130	-3.8%
Carbon Monixide Emissions (Grams per summer day)	52,156,338	49,323,799	-5.4%
Nitrogen Oxide Emissions (Grams per summer day)	14,004,242	13,497,391	-3.6%

f) The Big Picture

What is happening in the Pioneer Valley, transportation facilities affect land use and vice versa, is happening all over the country.

- Motor vehicle use in America went from 1.5 trillion miles per year in 1980 to 2.8 trillion miles per year in 2001.
- In 2001 there were 0.75 registered passenger cars and motorcycles for every licensed driver in the United States doubled from one to two trillion miles per year between 1970 and 1990;
- Per capita Americans travel 43 miles per day by car taking an average of 4.3 trips.
- In 2001, 19% of an average household's expenditures went to transportation.
- The evidence is substantial and growing to the effect that people in spread-out locations drive more, and people in compact locations drive less.
- Research suggests that as neighborhoods become more compact, more trips are made by walking, bicycle, and public transit (Once there were greenfields-p. 31, 32, 36, 37)
- The fuel efficiency of cars and light trucks has not noticeably improved since 1990. Indeed—transportation and land use planners concerned about air quality have been caught completely off guard by the immense popularity of SUVs in the United States.

Longstanding research on the relationship between transit and land use suggests the following relationship between land use and transportation as shown in Table 8-9.

Table 8-9 - Land Use/Transportation Relationships

Density (per residential acre)	Transit service supported
4-5 households	Hourly bus service
7-8 households	Half-hour interval service
15+ households	Service every 10 minutes

Most reviewers agree that the body of research on density and travel, notwithstanding some differences in methodologies and variations in the details among the findings, is generally consistent in its overall conclusions: as population and employment density decline, travel distances lengthen, vehicle trips and usage increase, and transit and walking decline. (Once there were greenfields, p. 39)

Many new suburban developments are being built at densities that are intrinsically dysfunctional from a transportation standpoint. (Once There Were Greenfields, p. 40)

Resources Used:
Once There Were Greenfields
Transportation and Land Use Innovations: when you can't pave your way out of congestion
The Pedestrian, Transit, and Bicycling Workbook
Valley Vision

G. U.S. DOT National Transportation Title VI Requirements in Metropolitan Planning

Title VI of the 1964 Civil Rights Act (42 U.S.C. 2000d-1) states that "No person in the United States shall, on the ground 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." The Environmental Justice Orders further amplify Title VI by providing the "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."

Title VI and Environmental Justice concerns are typically raised during project development, it is important to recognize that the law applies directly to the planning process. As a result, the following measures should be undertaken in the Pioneer Valley region to ensure conformity to this law.

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

- Develop a process to assess the distribution of impacts on different socio-economic groups for the investments identified in the Pioneer Valley Regional Transportation Plan and Pioneer Valley Transportation Improvement Program. One possible method could utilize income information available from U.S. Census data. Information could be obtained for each Traffic Analysis Zone in the regional transportation model and information on past construction activity overlaid to determine previous areas of investment.

- Ensure that the needs of low-income and minority populations are identified in the regional planning process for the Pioneer Valley. Amend the Public Participation Plan for the region to include strategies for engaging minority and low-income populations in transportation decision making. Possible changes could include increased use of the media to alert interested parties of upcoming public meeting for the TIP and RTP.

- Develop a standard format to document and respond to issues raised by citizens and advocacy groups with regard to transportation investment patterns in the PVPC region.

- Develop a methodology to determine if proposed transportation investments and strategies are appropriate for low-income and minority areas. This process should include the social, economic and environmental effects of the proposed alternative. In the event a proposed improvement is found to have a negative impacts, mitigation should be developed to offset and adverse effects.

H. Executive Order 418

In January of 2000, Governor Argeo Paul Cellucci issued Executive Order 418 for the State of Massachusetts. This initiative was developed to assist communities in addressing the housing needs of the state. Under this program, communities are eligible for up to $30,000 in technical assistance and planning services to assist in the development of Community Development Plans. The plans must focus on the development of housing for a broad range of incomes and include measures to promote economic development, improvements to transportation and infrastructure, and the preservation of open space in the community.

The Pioneer Valley Planning Commission began working with the Executive Office of Environmental Affairs in February of 1999 to complete a build out map and analysis for every community in the region. This work consisted of a series of GIS maps to illustrate the maximum possible development scenario for each community under its existing zoning regulations. To date, the PVPC has completed the build out process for 14 of our 43 communities. Completion of the community build out process is anticipated in June of 2001.

As the regional planning agency for the Pioneer Valley, PVPC is responsible for the administration of Executive Order 418 funds for each community. In addition, the PVPC will:

- Develop agreements with each community and identify specific tasks and responsibilities.

- Manage and distribute the planning funds allocated to the community for their Community Development Plan.

- Assist each community in the development of the Scope of Services for their Community Development Plan.

- Perform the transportation planning component of the Community Development Plan or contract with an appropriate consulting firm to perform the transportation planning activities.

- Work with MassHighway and the local communities to develop regional or subregional transportation components of their Community Development Plan.

I. Sustainable Development

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 planing to ensure that a wide range of improvement alternatives are considered prior to the construction of new roadways or the expansion of existing facilities. These principles in turn are reflected in Governor Romney's "Fix It First" policy, the Community Road Program, and PVPC's Pavement Management System.

1. Northampton Transportation Plan

The PVPC received a request from the City of Northampton in the spring of 2000 to conduct a municipal transportation planning process for the community. The concept of this plan evolved from the work performed by the Mayor's Task Force on Safer Streets that was formed to identify measures to improve transportation safety in the City.

A key component of the Plan was the development of an extensive public participation process. A Transportation Committee was organized by the City of Northampton to oversee the planning process and work towards the goal of the development of a safe, balanced transportation system. The PVPC conducted a review of past planning efforts and performed extensive data collection including a survey of all of the Northampton bus routes.

The Northampton Transportation Plan consists of a series of recommendations to improve both the existing transportation system as well as draft policies to guide the implementation of the Plan and improve the efficiency of the local planning process. Some of the recommendations included in this plan are:

- Institutionalization of transportation issues within city government
- Creation of a traffic calming program—which includes a citizen action component
- Expanded bicycle and pedestrian facilities—including routes, paths, lanes and parking facilities
- Expanded transit service
- Enhanced traffic safety public education
- Develop an annual traffic counting program
- Improve safety at dangerous intersections
- Development of an in-house pavement and sign management system
- Improved traffic crash data collection and reporting

This plan is understood to be a work in progress. It includes proposed mechanisms for institutionalizing transportation concerns into Northampton's municipal government, as well as numerous other proposals designed to enhance both the safety and the efficiency of Northampton's transportation system.

2. Indian Orchard Master Plan: 20th Century Mill Town

The City of Springfield in conjunction with the Indian Orchard Citizens Council and the East Springfield Neighborhood Council, have developed a toolbox for sustainable development. This project was funded as part of the Transportation and Community and System Preservation Pilot Program (TCSP) through the Federal Highway Administration. This toolbox will be used 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 Master Plan focused on the identification and refinement of the community's vision for the area and the barriers that prevent the area's employees from living closer to work. Existing transportation, transit, land use, and environmental links in the study area were examined tied to the existing development. The costs and benefits of the current development patterns were identified and compared to

more traditional sustainable development patterns. From this a series of alternative development scenarios were analyzed and prioritized based on extensive public input. One major goal of the study is the education of the public and policy makers on sustainable development concepts to seek local commitment to implement regulatory changes in the future. The transportation related recommendations of the study include:

- Increase safety and reduce speeds along Main Street, Parker Street, Worcester Street, and Page Boulevard.
- Improve traffic flow at the Parker and Main Street intersection
- Install a traffic signal at the intersection of Worcester, Myrtle, Front and River Streets
- Coordinate the traffic signals at both ends of the Route 21 (Putts) bridge.
- Continue the design and implementation of improvements to the Route 21 (Putts) bridge with MassHighway.
- Implement planned improvements to the Parker Street corridor between Main Street and Boston Road.
- Improve guide signs to I-90 and I-291 and improve signage for truck routes through the study area.
- Study the potential to develop a multi-use trail along the former Chapman/Crane property to provide a connection to Main Street.
- Work with the PVTA to improve transit service to the study area.
- Study the feasibility of establishing a pedestrian/bike path abutting the abandoned rail bed along the Chicopee River.
- Consider creating a Transportation Management Association with major employers to increase ridesharing and develop carpooling programs.

3. 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. PVPC will perform data collection and use both the regional transportation model and regional economic development model to determine the effects of a variety of improvement and development alternatives on the study area. Upon completion of the study, a second phase will involve an in-depth implementation plan and program for the Merrick Neighborhood.

4. The Village at Hospital Hill

The Village at Hospital Hill consists of the redevelopment of the former Northampton State Hospital property off of Route 66 in Northampton. At its peak the Northampton State Hospital consisted of 538 acres of land and 970,000 square feet of building space. In 1994, legislation conveyed a large portion

of the land to third parties for agricultural, recreational, conservation, affordable housing, and municipal uses. The remaining 124 acres and 880,000 square feet of building space were transferred from the Division of Capital Asset Management (DCAM) to MassDevelopment and their preferred developer – The Community Builders.

The redevelopment is guided by a Citizens Advisory Committee (CAC) with a goal of providing employment & 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. Major components include: an office and light industrial zone; a hotel with conference and banquet facilities; civic uses such as a new mental health educational center, and child & elder care; and a diverse range of residential uses tied together by a connective pedestrian environment tied into a "main street" within the mixed-use village center. It is expected that the redevelopment project could require a series of short and long range improvements to the existing transportation system. These improvements are expected to be identified as part of the full build out plans for the site.

5. Redevelopment of the Belchertown State School

The former Belchertown State School is a 272 acre property off of Route 202 owned by the Town of Belchertown. The Town's Economic Development and Industrial Corporation manages the property, but many road, sewer and water upgrades are required prior to the land being sold for development purposes. One potential development option includes the construction of a new district courthouse and an intermodal transportation center.

J. Transportation Improvement Program

The Transportation Improvement Program (TIP) is the programming connection between regional needs and expenditures. The TIP is a prioritized, financially constrained, multi-year program for the implementation of transportation improvement projects in this region. The TIP is important for a number of reasons. First, a transportation project which is to receive funding assistance must be listed in the TIP. Second, the TIP is a federal requirement. This five-year program must be adopted and amended by the eight-members of the Pioneer Valley region's Metropolitan Planning Organization (MPO).

1. Project Activity

While the TIP projects how future transportation and transit funds are expected to be spent, it is also important to keep track of what was actually constructed. In FFY 1999, the amended TIP included less than $3 million in federally funded road and bridge projects. By FFY 2000, we experienced a more positive investment in our regional infrastructure. Table 8-10 outlines $28.9 million in highway, CMAQ and Other Federal Aid projects that were advertised and awarded in our region during FFY 2002, in accordance with the FFY 2002 TIP.

Table 8-10 - Federal Fiscal Year 2002 Highway Projects Awarded

Community	Project Name	Project Description	Amount Awarded
Agawam	Connecticut Riverwalk	Construction: Agawam	$1,549,373.18
Amherst	Main St. & Amity	Reconstruction: Intersection/signals	$315,494.55
Amherst	Rte 9 @S. Pleasant St.,	Revise: Signals. land acq., left turn lane	$429,463.50
Amherst	Rte 9@ Old farm Rd.	Install: Signals & reconfigure	$240,189.50
Chester/Beckett	Rte 20	Resurface: Beckett TL to Baystate Rd.	$1,535,047.40
Chesterfield	Sugar Hill/Old Chesterfield Rds	Reconstruction: Rte 143 to Goshen TL	$1,118,250.15
Goshen	S. Chesterfield Rd.	Chesterfield T.L.	$1,940,090.00
Hadley	Rte 9 Mt. Farms to University Dr.	Resurface & 5 signal improvements	$1,102,410.85
Northampton	Rte. 66	Reconstruction: Rte 66	$4,845,855.50
Palmer/Wilbraham	Rte 20 resurfacing	Rte 20	$939,036.20
Southhampton	Pomeroy Meadow Rd	Reconstruction: Rte 10 to Easthampton TL	$1,998,730.00
Springfield	I-91/I-291 Interchange	Ramp relocation/safety improvements	$13,388,382.87
Springfield	Page Blvd/Robbins/Cadwell	Install; Signals	$567,873.90
		Totals	**$28,970,197.60**

Table 8-11 outlines the bridge projects that MassHighway has prioritized for construction. These projects fall outside the current regional federal aid targets and are constrained by the money pledged statewide by MassHighway for bridge improvements (currently $75 million/year).

Table 8-11 - Federal Fiscal Year 2002 Bridge Projects Awarded

Community	Project Name	Project Description	Amount Awarded
Belchertown	Cold Spring Road B05025, W05014	Rehabilitation: over Swift River	$883,771.00
Brimfield	Washington St Bridge	Replace: BR# B-24-018 over Conrail	$928,982.00
Chester	Rte 20	Replace: BR# C-11-029 over Sanderson Brook	$742,830.00
Easthampton	Rte 5 Bridge	Replace: BR# E-05-004 over the Manhan River	$3,125,633.25
Westfield	Granville Rd	Replace: BR# W-25-007 over Little River	$2,777,586.43
Westfield	Rte 20 Bridges	Replace: BR#W-25-003 & W-25-004	$13,196,961.00
		Totals	**$20,770,992.68**

The financial future of the region, in terms of available funding for transportation infrastructure shows regional needs far outpacing available funds. There are currently over $400 million in road and bridge projects currently in some phase of design for the Pioneer Valley Region. Table 8-12 summarizes the total cost of all projects in the Pioneer Valley TIP database by project categories. Many of these projects are listed in Appendix Z of the TIP or as a "Future Element" in the PVPC database. These projects will be moved into the appropriate funding year of the TIP as they advance through the design process. Information on specific projects may be obtained at any time from the PVPC.

Table 8-12 - Summary of Transportation Projects in the PVPC TIP Database

Project Type	Number of Projects	Total Cost
Highway Projects	214	$260,816,297
Bridge Projects	60	$152,047,982
Interstate Maintenance	1	$1,500,000
High Priority Projects	4	$24,162,376
Bike Trail/Enhancement Projects	14	$210,549,696
Transit	102	$210,549,696
TDM/TMA	1	$459,100
Congestion Mitigation and Air Quality	1	$200,000
Totals	**397**	**$665,808,055**

K. Regionally Significant Short Range Projects

1. Proposed FY2004 Safety Studies

The Federal Highway Administration has requested that the 2003 RTP Update address safety issues in the region through the identification of the three highest crash locations for the purpose of developing recommendations for improvement. Chapter 7, Section A, Part 5 list the top crash locations in the PVPC region between 1997 and 2000. Many locations on this list have projects that could address existing safety issues on the TIP or have recommended safety improvements from a recently completed study. The PVPC proposes to study the following three high crash locations as part of its FY2004 UPWP.

Town	Intersection	Total Crashes
Hadley	Route 9 (Russell Street) at North and South Maple Streets	82
Chicopee	Massachusetts Turnpike Exit 6 at I-291	48
Northampton	Route 5 (Pleasant Street) at Conz Street	35

A crash history will be established for the most recent 3 year period through local police department records. Collision diagrams will be developed for each intersection to determine crash patterns and the predominant collision type. Data on the existing traffic signals at each intersection will be collected and analyzed to determine potential improvements to the traffic signal timing and phasing sequence. Finally, a series of recommendations will be developed to improve the safety at each location.

2. Proposed FY2004 Congestion Studies

The Federal Highway Administration has requested that the 2003 RTP Update address congestion issues in the region through the identification of the three high priority areas to be analyzed for the purpose of developing recommendations for improvement. The PVPC has identified the following three locations for future study as part of the FY 2004 UPWP.

a) I-91 Corridor between Exit 16 and Exit 22

Interstate 91 changes from a six lane highway (three in each direction) to a four lane highway (two in each direction) north of Exit 16. The average daily traffic on I-91 north of Exit 16 was 63,800 vehicles in 1999. As this volume continues to grow, congestion can be expected to increase and contribute to safety problems. The PVPC will use the regional transportation model to project the

future volume of traffic along the I-91 corridor. Recommendations to improve traffic flow along I-91 and the adjacent Route 5 corridor will be developed in cooperation with the Massachusetts Highway Department District 2 Office.

b) Route 32 Corridor, Ware

The Route 32 corridor in the Town of Ware has experienced increases in congestion and safety problems as a result of new development. There is a high potential for future development along the Route 32 corridor. The Towns of Palmer and Ware have proposed a Planned Business Development District for the corridor and a safety improvement project is proposed for the Palmer section of the roadway that accesses the Massachusetts Turnpike. The PVPC will perform data collection to analyze existing traffic conditions in the study area. Future traffic projections will be made using the regional transportation model, and a series of recommendations will be developed to reduce congestion in this area.

c) McKnight and Bay Neighborhood, Springfield

A combination of a high volume of commuter traffic as well as a number of land uses with high trip generating characteristics contribute to strains on the existing transportation infrastructure in the McKnight neighborhood. Bay Street is the major corridor through the neighborhoods and serves the largest High School in the city, the Smith and Wesson company – a major employer for the region, and as an access route to I-291. The focal points of this study include: traffic operations, safety issues, transit service efficiency, land use concerns, growth management strategies, and pedestrian and bicycle concerns. Existing and future deficiencies will be identified and a wide range of multi-modal conceptual solutions will be developed that could be implemented by the City of Springfield, MassHighway, or the PVTA.

3. Transportation Improvement Projects

a) Widening, Reconstruction and Signal Coordination of Route 9 and the Expansion of the Calvin Coolidge Bridge in Hadley

Severe congestion problems exist along Route 9 from Northampton to Hadley including the Calvin Coolidge Bridge. The bridge, which spans the Connecticut River between Hadley and Northampton is currently under construction and restricted to one lane of traffic in each direction. Construction is expected to be completed in 2004 at which point the bridge will provide two lanes of traffic in each direction.

Existing traffic signals in the vicinity of the bridge will be coordinated and Route 9 will be widened from two to four lanes from the Bridge to West Street, Hadley beginning in 2004. Intelligent Transportation System technology introduced as part of bridge widening project will remain in the area to provide real time information to motorists. A separate project will coordinate traffic signals along Route 9 from Mill Valley Road in Hadley to University Drive in Amherst.

Traffic flow is expected to improve in this area in both directions by increasing the number of lanes along the bridge and the section of Route 9 directly east of the Bridge. Signal coordination will further ease congestion along the entire corridor and should provide easier access for businesses located along Route 9.

Based on results from the regional transportation model, the proposed improvements reduced the congested travel time from the Calvin Coolidge Bridge to West Street in Hadley by 65%. The projected traffic flow increased by 24% and congested travel speeds increased from 13mph to 29mph. The model showed that this is a beneficial project for the region by increasing vehicle access while reducing congestion and travel time.

b) Corridor Signal Coordination Projects in Chicopee and Westfield

Three different traffic signal coordination projects were analyzed using the regional transportation model. By coordinating signals along heavily traveled corridors, traffic flow can be regulated thereby reducing congestion along the corridor. All three locations experience severe congestion during the peak travel hours. Signal coordination projects are proposed on Route 20 in Westfield from Union Street to Mainline Drive, and Memorial Drive in Chicopee from Massachusetts Turnpike Exit 5 to Granby Road.

The model projected a reduction in congested travel time along these corridors, which was analyzed with the congested travel time of the base year model. Table 8-13 shows the percentage decrease for each of the locations.

Table 8-13 - Signal Coordination Model Results

Corridor Location	Results
Route 20, Westfield	18% reduction in travel time
Memorial Drive, Chicopee	2% reduction in travel tim

c) Route I-91 Ramp Reversal

Interstate 91 Exits 5 and 6 are currently under construction to increase safety and ease congestion along East and West Columbus Avenue due to economic expansion in downtown Springfield. The area has experienced much new development including the expansion of the Basketball Hall of Fame, construction of a new tourist information center and a new hotel and restaurant. The existing I-91 on and off ramps will be reversed as detailed in Table 8-14.

Model results for this project show an increase in traffic flow along East and West Columbus

Table 8-14 - I-91 Ramp Reversals in Springfield

Existing Ramp	Proposed Replacement Ramp
Northbound off ramp to East Columbus Avenue between State Street and Union Street	Northbound on ramp from East Columbus Avenue between State Street and Union Street
Southbound on ramp from West Columbus Avenue between State Street and Union Street	Southbound off ramp to West Columbus Avenue between State Street and Union Street
Northbound on ramp from East Columbus Avenue between Broad Street and Union Street	Northbound off ramp to East Columbus Avenue between Broad Street and Union Street
Southbound off ramp to West Columbus Avenue between Broad Street and Union Street	Southbound on ramp from West Columbus Avenue between Broad Street and Union Street

Avenues. Projected traffic along East Columbus Avenue increased from approximately 9400 to 11400 vehicles per day and along West Columbus Avenue the projected volumes increased from 9500 to 26400. Corresponding to the increase along East and West Columbus Avenues a 24-29% reduction in traffic volume occurred along I-91 between Broad and Union Streets, northbound and southbound, respectively. The increased traffic flow along these routes would be beneficial to any additional business development in these locations. The proposed ramp system would eliminate the short distance between on and off ramps traveling both north and south on I-91. This would aid in alleviating confusion of motorists along East and West Columbus Avenues thus increasing congested travel speed by 11%. The increase in congested travel speed also decreases travel time along these corridors.

d) 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-91Exit 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 CMS 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.

The model shows projected congested travel speeds traveling both north and south along Route 5 will increase by 7%. Additionally the travel time along this corridor will be reduced by 8-18%. The new signal that will now allow north bound traffic a left turn between Elm Street and Monterey Drive reduces the congested travel time north of this location by 5%.

e) Union Station Intermodal Redevelopment Project

Redevelopment of Union Station in downtown Springfield is an important regional project to enhance the mobility of residents in the Pioneer Valley region. The vacant building is currently owned by the Springfield Redevelopment Authority, who in cooperation with the PVTA have begun efforts to fund a project to rehabilitate and redevelop Union Station into an intermodal transit center. Funding for a full-scale feasibility study of the reuse of Union Station was provided in the 1998 TIP using FTA Section 5309 money. The project has also received approval from NEPA and MEPA.

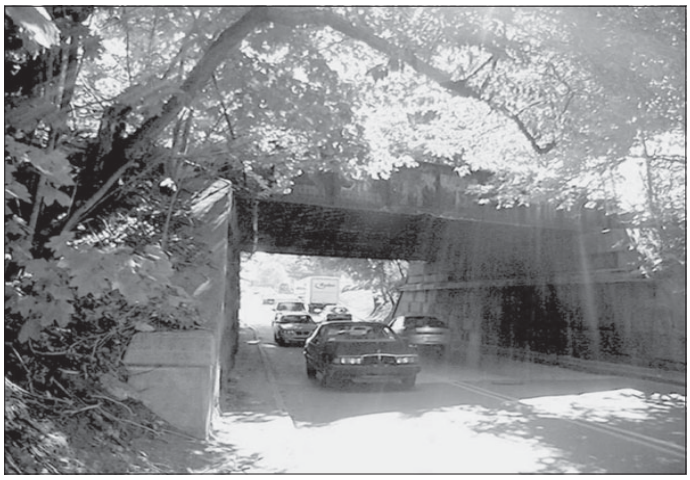
Rehabilitation of the facility is funded with a combination of federal, state, and private funds. A total of $14.5 million is earmarked for the project in TEA-21, and $10 million in State funds has been appropriated for the project as part of the 1997 Transportation Bond Bill.

The Union Station project provides PVTA transit, intercity bus carrier, Amtrak and local taxi services at one location in downtown Springfield. Office, retail and restaurant spaces are also proposed to be included as part of the redevelopment of the site. The redevelopment of Union Station will ensure the region of a state of the art intermodal transportation facility and revitalize a historic landmark in the City of Springfield. Most importantly, the project will improve air quality and reduce VMT by greatly improving the connectivity between several different modes of transportation.

f) Parker Street, Springfield Reconstruction and Widening

Parker Street, Springfield connects Boston Road with Main Street, Ludlow and serves as a connection to Oak Street and Verge Road. Oak Street is a well traveled roadway serving both residential and through traffic to Route 20 while Verge Road accesses a retail shopping center.

This heavily traveled corridor currently has one travel lane in each direction from the Parker Street/Boston Road intersection through to Main Street, Ludlow. The proposed improvements would increase the lanes to two travel lanes in each direction from Boston Road to Oak Street, providing turning lanes at the intersection of Oak and Verge Streets, and the coordination of signals along the entire corridor.



The additional lane along Parker Street from Boston Road to Oak Street decreased travel time by approximately 14% through this corridor. The decrease in congestion also increased the travel speed by 14-17% in both directions. North of Oak Street, along Parker Traffic volume increased by 15% while time decreased by 6%. Volume along Oak Street, decreased directly responding to increased traffic volumes and decreased travel time north of Oak Street. Improvements to the Parker Street Corridor significantly decreased the amount of cut through traffic travel in the surrounding neighborhood.

g) ITS

The expansion of the existing ITS system in the Pioneer Valley region is a high priority for the region. Deployment of ITS technology can be an effective method to address existing and future transportation needs without having to add additional capacity to the regional transportation system. A strong telecommunications network linked to the regional traffic operation center at MassHighway District will be required to ensure the expansion of the existing system as detailed in the Strategic Deployment Plan and recent study conducted for the southern I-91 corridor.

In addition, the Regional ITS Architecture should be updated to address changes in nomenclature and technology since the completion of the Strategic Deployment Plan for the Pioneer Valley. The architecture should also develop an updated prioritization list of improvement projects, an implementation schedule, and incorporate the current efforts of other regional ITS partners such as the PVTA and the University of Massachusetts RTIC.

The region would also benefit from a Management, Operations and Technology Taskforce to assist in coordinating existing efforts, prioritizing regional needs, and advancing planned improvements. This taskforce will also be of assistance in developing construction mitigation plans for future projects such as the proposed improvements to the South End Bridge and the reconstruction of Route 5.

h) Alternative Fuels

The City of Springfield is a member of the Massachusetts Clean Cities Coalition. The Clean Cities Program supports public and private partnerships that deploy alternative fuel vehicles and build supporting infrastructure. As alternative fuel technology continues to gain in popularity and become more affordable, demand for these vehicles is likely to increase in the region. A feasibility study should be conducted for the region to the benefits of providing alternative fueling stations in the Pioneer Valley. This study would identify the most appropriate type of fueling station (i.e.: electric, compressed natural gas, etc.) and most efficient location of proposed stations. Alternative fuel stations should then be constructed in the region based on the recommendations of the feasibility study. The study should also explore the current technology types for alternative fuel vehicles and document the pros and cons of the various options (i.e. hybrid vs. fuel cell).

i) Parking Expansion and Enhancements for the Norwottuck Rail Trail

The PVPC completed a parking study for the Norwottuck Rail Trail in the fall of 2000. This study focused on the existing parking supply problems experienced at the Damon Road parking lot for the Norwottuck Rail Trail. Additional parking capacity is required in this area and improvements and amenities are needed to attract more trail users to the other four parking locations along the trail.

j) Deady Memorial Bridge

MassHighway completed a traffic study for the Deady Memorial Bridge in Chicopee in 2003. The study recommended replacing the existing two lane (driven as four) bridge with a new five lane bridge that would allow for exclusive left turn lanes at its intersections with Grattan Street and Broadway. This in combination with signal timing and coordination projects at the intersections of Route 33 with Sheridan Street and Montgomery Street; Route 33 with Grattan Street and the Deady Bridge; Broadway with East Main Street, the Deady Bridge, Main Street, and Church Street; and, Broadway with East Street and Belcher Street is expected to greatly the severe peak hour traffic congestion along this corridor.
The projected congested travel time was reduced by 4%. Travel speeds along the corridor experienced an in increase of 6-7%. The addition of the turning lane onto Grattan Street increased traffic volumes by 9%.

k) Great River Bridge

The Great River Bridge spans the Westfield River in Westfield and is part of Route 10/202. This bridge serves as the main corridor to the Massachusetts Turnpike and points north of the city. The Pioneer Valley CMS has identified the segment of 10/202 through Westfield, from the Route 20 exchange to the Massachusetts Turnpike entrance, as one of the congested corridors in this area. This corridor currently has one travel lane in each direction, on street parking for local business and heavy traffic volumes accessing 10/202 from side streets. Traffic can queue and fill this 0.5 mile long roadway in both directions while drivers often wait two traffic signal cycles to gain access to the Great River Bridge. Traveling south on 10/202 vehicles may queue through two traffic lights blocking access to 10/202 from Montgomery and Union Street which serves many residential communities in Westfield and also serves as the main route to Westfield High School.

The project will include reconstruction and widening of the existing bridge, with the addition of a sister span along the east side of the existing bridge. The existing bridge will contain three one-way southbound travel lanes and the sister span will contain three one-way northbound travel lanes. Redesign of the roadways north of the bridge is also included in the project. Two additional lanes will be added to Route 10/202 from the intersection of Route 10/202 with Montgomery Street. These three lanes will be one-way traveling south to the bridge. The existing portion of Union Street from the Great River Bridge to the intersection of Route 10/202 will also contain

three northbound one way lanes. Signals located at the intersection of Route 10/202 with Montgomery and Union Streets will also redesigned to allow access to both Montgomery and Union Streets setting up a rotary effect. Signal coordination is also expected along the Route 10/202 corridor, from the bridge to the Massachusetts Turnpike Entrance.
The project is expected to improve traffic flow throughout this corridor. By increasing the travel lanes for each approach to the bridge, traffic queues should be reduced thereby reducing congestion throughout the downtown area. Travel time should also decrease due to a reduction in congestion and the increase in travel speed. The redesign of the intersections north of the bridge should also allow easier access to Union Street and Montgomery Ave.

Projected traffic volume increased along the bridge by 36-39%. Volume increased as a direct result of decreased congested travel time. Travel time along the entire corridor from Franklin Avenue to the entrance of the Massachusetts Turnpike, decreased by 30% relative to the 2003 base model network projected travel time. Travel speed increased along the entire corridor by approximately 33%. The 2010 projected traffic volume along the Greater Westfield Bridge was 24,463 vehicles Southbound, while the Sister span traveling northbound had a projected volume of 23,664 vehicles. With the addition of the Sister span, travel speed along the Greater Westfield Bridge and the Sister span increased by approximately 92%. The model did show a decrease in travel speed by 12% southbound from the Greater Westfield Bridge to Franklin Ave.

l) East Longmeadow Rotary

The East Longmeadow Rotary is a seven-legged rotary merging three heavily traveled routes with four local roads. The proposed recommendation of a traffic study recently completed for the rotary was to install three traffic signals to create a triangle-shaped center green area. The three traffic signals would operate as a coordinated system and two-way traffic would be permitted on the southern leg of the triangle. This alternative improves the safety of the existing rotary, improves the operation of the rotary, and minimizes construction impacts on surrounding land uses and residential streets.

Signal coordination decreased congested travel time on the rotary by 50%. This allowed for the congested travel speed to increase by 58% along the rotary. Volumes increased along six of the legs by 24%, except Prospect Street, which had a decrease in volume and congested travel time.

4. Transit Improvement Projects

a) Fleet Replacement

PVTA will begin to replace 42 buses purchased in 1992 and 1993 in the next few years. They become eligible for replacement after 12 years under Federal Transit Administration Guidelines. PVTA is actively considering a number of new features for these new buses including low floors, low emissions propulsion systems, and the integration of Intelligent Transportation System (ITS) components built into the buses as delivered.

b) ITS

PVTA recently completed a year long study to develop an ITS Architecture, Implementation and Deployment Plan. This plan when implemented will allow the automation and integration of the day to day operation and maintenance of the region's transit fleet to the greatest extent possible. The ITS implementation will integrate separate elements of transit operations such as: scheduling, dispatching, fare collection, and vehicle monitoring. The ITS implementation will allow PVTA 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.

Initial Phase: Creation of a Core ITS for PVTA

The Implementation Plan is broken up into three separate phases. The initial phase included 4 interconnected projects:

- New operational management and scheduling software for both fixed route and paratransit
- New Voice and Data Communications System
- Computer Aided Dispatch/Automatic Vehicle Location (CAD/AVL) System using GPS for PVTA vehicles that includes these features:
    - Emergency Alarms installed on all buses with a provision to provide real-time stills or video in cases of emergencies
    - Auto Announcement of Stops (Talking Buses)
    - Automatic Passenger Counters on Buses
- Data system that integrates the dispatch and scheduling software with the AVL, communications system, and with any other systems as required

PVTA has begun working on implementing elements of the Core System and is currently (in 2003) developing the functional specification of the Communication and CAD/AVL system.

c) Follow On Phase: Building on the Core ITS for Passenger Information

The second phase of PVTA's ITS deployment will build on and add value to the core system. The operational information and data generated and integrated by the New Communications System and CAD/AVL system will power real time passenger information to PVTA's bus stops, intermodal centers and passengers wireless devices. Projects in this phase include the deployment of real-time passenger information, full deployment of automatic passenger counters, installation of Mobile Data Terminals(MTD)s on the paratransit vehicles, and further traffic signal priority pilots.

d) Summer Ave Express

The City of Springfield and PVTA were awarded a TDM grant to implement a new service along the Summer Ave Corridor of Springfield. This new limited stop express service will feature the use of signal priority by PVTA's buses to speed up the travel time along the corridor. This project is the result of a cooperative agreement between the City of Springfield and PVTA that allowed PVTA to gain some signal priority in exchange for assisting the city in upgrading traffic signals. When implemented it will be the first example of transit traffic signal priority in the region and will hopefully be a model for future partnerships.

e) Movement of Operations into Union Station

The opening of Union Station will require significant changes in operating patterns of PVTA Springfield centered routes. Changes to many of the routes may be required to maintain headways, limit added operational costs, and to maintain or improve the pulsing of routes to facilitate transfers.

CHAPTER 9

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 Bureau of Transportation Planning and Development (MassHighway Planning) 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. The final estimates have been used in this update to the RTP.

A. Population

MassHighway Planning utilized several sources, such as the
Massachusetts Institute for Social and Economic Research (MISER), Woods & Poole Economics (WPE), and the U.S. Census to forecast population for the state. MISER was used as the source because their population projections were found to come closest to the actual 2000 Census population. A non-linear growth function was developed based on historical Census data from 1970 through 2000 and used to develop a population estimate for each region.

Census data from 1990 and 2000 was used to determine the historical shares of regional population by municipality. A linear trend was applied to predict share values for 2010, 2020, and 2030. A share value was then calculated for each municipality (for 2010, 2020, and 2030) based on the linear trend value for the projection year (counted once) and the actual share value in 2000 (counted twice). This weighting towards the actual share in 2000 was implemented to reduce drastic changes predicted with a simple linear trend. Projection share values were multiplied by the projected regional total to calculate totals for each municipality. The estimated population forecast for the Pioneer Valley Region by municipality is shown in Table 9-1.

B. Households

To determine the number of households at the state and regional level, population in households is divided by average household size which is forecast by tapering a non-linear growth regression based on historical trends. This yielded dramatic drops in the future (average household sizes below 2.0 in some cases) and the results were tapered back by 30 percent. Household data was estimated for each municipality using the same share values developed for the regional population forecasts. The estimated household forecast for the Pioneer Valley Region by municipality is shown in Table 9-2.

Table 9-1 - Population Forecast for the Pioneer Valley Region

	2000	2005	2010	2015	2020	2025
Pioneer Valley Region	**608,479**	**620,100**	**625,500**	**630,800**	**636,200**	**641,400**
Agawam	28,144	28,778	29,126	29,470	29,822	30,165
Amherst	34,874	35,424	35,616	35,800	35,988	36,162
Belchertown	12,968	13,605	14,116	14,631	15,156	15,682
Blandford	1,214	1,240	1,253	1,267	1,280	1,294
Brimfield	3,339	3,455	3,539	3,622	3,707	3,792
Chester	1,308	1,336	1,350	1,364	1,379	1,393
Chesterfield	1,201	1,248	1,284	1,319	1,356	1,392
Chicopee	54,653	55,271	55,323	55,359	55,397	55,409
Cummington	978	1,028	1,069	1,110	1,152	1,194
East Longmeadow	14,100	14,473	14,703	14,933	15,167	15,398
Easthampton	15,994	16,353	16,549	16,743	16,941	17,134
Goshen	921	953	975	998	1,021	1,044
Granby	6,132	6,337	6,480	6,624	6,771	6,916
Granville	1,521	1,568	1,600	1,631	1,663	1,695
Hadley	4,793	4,973	5,106	5,240	5,376	5,511
Hampden	5,171	5,341	5,459	5,577	5,698	5,818
Hatfield	3,249	3,317	3,352	3,352	3,422	3,456
Holland	2,407	2,487	2,543	2,600	2,657	2,714
Holyoke	39,838	39,873	39,489	39,085	38,675	38,241
Huntington	2,174	2,244	2,293	2,341	2,391	2,440
Longmeadow	15,633	15,935	16,078	16,218	16,361	16,498
Ludlow	21,209	21,990	22,561	23,135	23,719	24,301
Middlefield	542	577	607	638	669	700
Monson	8,359	8,605	8,768	8,930	9,096	9,260
Montgomery	654	647	634	620	606	591
Northampton	28,978	29,432	29,589	29,739	29,892	30,034
Palmer	12,497	12,792	12,960	13,127	13,297	13,464
Pelham	1,403	1,433	1,448	1,463	1,479	1,494
Plainfield	589	602	610	617	625	632
Russell	1,657	1,697	1,720	1,743	1,766	1,789
South Hadley	17,196	17,585	17,799	18,011	18,228	18,439
Southampton	5,387	5,637	5,835	6,034	6,237	6,440
Southwick	8,835	9,190	9,458	9,728	10,002	10,276
Springfield	152,082	153,906	154,157	154,365	154,578	154,724
Tolland	426	457	484	511	539	567
Wales	1,737	1,797	1,839	1,882	1,925	1,968
Ware	9,707	9,680	9,913	9,964	10,015	10,063
West Springfield	27,899	28,450	28,716	28,977	29,244	29,502
Westfield	40,072	41,066	41,653	42,238	42,834	43,420
Westhampton	1,468	1,518	1,553	1,589	1,625	1,660
Wilbraham	13,473	13,853	14,097	14,341	14,589	14,835
Williamsburg	2,427	2,454	2,457	2,458	2,460	2,460
Worthington	1,270	1,312	1,341	1,370	1,400	1,429

Table 9-2 - Household Forecast for the Pioneer Valley Region

	2000	2005	2010	2015	2020	2025
Pioneer Valley Region	**231,279**	**239,500**	**243,900**	**248,400**	**252,800**	**257,200**
Agawam	11,260	11,639	11,832	12,029	12,220	12,411
Amherst	9,174	9,898	10,484	11,090	11,706	12,337
Belchertown	4,886	5,177	5,391	5,612	5,836	6,063
Blandford	456	462	460	458	456	453
Brimfield	1,250	1,292	1,314	1,336	1,358	1,380
Chester	500	510	511	513	514	514
Chesterfield	447	465	476	487	499	510
Chicopee	23,117	23,885	24,270	24,662	25,043	25,421
Cummington	382	406	425	444	463	482
East Longmeadow	5,248	5,348	5,359	5,369	5,373	5,374
Easthampton	6,854	7,180	7,396	7,618	7,840	8,065
Goshen	365	382	394	406	412	429
Granby	2,247	2,306	2,328	2,350	2,370	2,389
Granville	556	566	567	568	568	568
Hadley	1,895	1,997	2,069	2,143	2,217	2,293
Hampden	1,818	1,850	1,850	1,850	1,848	1,845
Hatfield	1,381	1,435	1,466	1,498	1,530	1,561
Holland	898	925	936	948	959	970
Holyoke	14,967	15,246	15,269	15,288	15,292	15,287
Huntington	809	829	835	841	846	851
Longmeadow	5,734	5,759	5,683	5,602	5,513	5,417
Ludlow	7,659	7,844	7,899	7,954	8,003	8,048
Middlefield	213	229	242	256	270	284
Monson	3,095	3,209	3,272	3,337	3,401	3,464
Montgomery	253	251	244	237	230	222
Northampton	11,880	12,762	13,465	14,191	14,928	15,682
Palmer	5,078	5,256	5,349	5,445	5,538	5,632
Pelham	545	561	568	575	582	589
Plainfield	243	251	255	258	262	266
Russell	611	622	623	624	624	624
South Hadley	6,586	6,861	7,029	7,201	7,372	7,544
Southampton	1,985	2,068	2,118	2,170	2,222	2,274
Southwick	3,318	3,465	3,558	3,654	3,749	3,845
Springfield	57,130	58,844	59,602	60,372	61,107	61,830
Tolland	169	181	191	201	211	221
Wales	660	685	699	714	728	743
Ware	4,027	4,155	4,216	4,279	4,339	4,398
West Springfield	11,823	12,352	12,689	13,036	13,382	13,731
Westfield	14,797	15,262	15,480	15,702	15,916	16,128
Westhampton	542	555	558	562	565	567
Wilbraham	4,891	4,942	4,908	4,871	4,827	4,779
Williamsburg	1,027	1,064	1,084	1,105	1,125	1,145
Worthington	503	522	532	542	553	563

C. Employment

Total employment is defined as the number of employed residents plus non-residents who commute into the state to work minus residents who commute out of the state to work. State employed residents are forecast by multiplying persons 16 years and over by the labor force participation rate. The share that each region has of the state's total employment is forecast by regressing past decades with a non-linear growth function. Then the regional share forecasts are multiplied by the state employment forecast to complete the region employment forecasts. Finally, the proportion of jobs to population is examined as a check for reasonableness.

In recent decades, the close link between population and employment growth has been stretched by more women entering the labor force and an increase in non-resident commuting. The MassHighway forecasts highlight further increases in non-resident commuting offset in later decades by the retirement of the "baby-boom" generation. Between now and 2010 increases in the number of employed residents and non-resident commuters are expected to equal the rate of employment growth. After 2010, a significant decline in labor force participation, due to "baby boomers" retiring, results in projected decreases in employment for the region.

Covered Employment and Wage data from 1985, 1990, 1995, and 2000 was used to determine municipal shares of total regional employment. A linear trend was applied to each municipality's share of total employment and projected through 2025. Weighted shares for each municipality and each projection period were then calculated. The weighted shares incorporated the actual 2000 share twice and the share indicated by the linear trend once. This had the effect of reducing radical shifts predicted by a strictly linear trend. Weighted shares for each municipality and projection period were multiplied by the total regional projected employment to yield projected employment by municipality. The estimated employment forecast for the Pioneer Valley Region by municipality is shown in Table 9-3.

D. 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 TransCAD software to perform the traditional 4-step process for forecasting near and future conditions.

Table 9-3 - Employment Forecast for the Pioneer Valley Region

	2000	2005	2010	2015	2020	2025
Agawam	13,714	14,267	15,052	15,461	15,852	16,168
Amherst	12,753	13,040	13,283	13,193	13,097	12,950
Belchertown	2,221	2,075	1,991	1,856	1,724	1,588
Blandford	129	147	157	163	168	173
Brimfield	159	170	147	120	94	67
Chester	126	130	134	135	136	135
Chesterfield	137	136	139	139	139	138
Chicopee	23,434	24,309	25,027	25,118	25,192	25,161
Cummington	232	256	276	289	302	313
East Longmeadow	10,088	10,516	10,868	10,948	11,020	11,045
Easthampton	5,289	5,206	5,210	5,083	4,955	4,811
Goshen	101	102	105	104	104	103
Granby	980	1,036	1,094	1,124	1,154	1,177
Granville	167	182	184	181	178	175
Hadley	4,918	5,046	5,246	5,314	5,378	5,418
Hampden	841	893	923	930	937	939
Hatfield	3,279	3,660	4,023	4,286	4,541	4,771
Holland	145	149	152	151	150	148
Holyoke	26,691	26,694	26,868	26,366	25,861	25,262
Huntington	442	451	461	459	457	453
Longmeadow	3,656	3,682	3,747	3,718	3,687	3,642
Ludlow	6,513	6,862	7,201	7,361	7,512	7,629
Middlefield	44	47	52	55	58	61
Monson	1,519	1,531	1,568	1,566	1,562	1,553
Montgomery	57	60	60	58	57	55
Northampton	19,554	20,069	20,307	20,035	19,757	19,406
Palmer	6,038	6,060	5,955	5,700	5,447	5,178
Pelham	194	202	214	220	227	232
Plainfield	122	129	142	151	160	168
Russell	295	291	246	195	145	95
South Hadley	5,352	5,374	5,416	5,321	5,226	5,111
Southampton	1,159	1,252	1,330	1,375	1,418	1,454
Southwick	2,804	2,970	3,138	3,228	3,314	3,384
Springfield	86,822	86,350	86,097	83,679	81,265	78,581
Tolland	57	63	68	71	75	78
Wales	152	160	172	179	187	193
Ware	3,042	3,140	3,228	3,235	3,241	3,233
West Springfield	20,434	20,610	21,063	20,987	20,901	20,732
Westfield	17,987	17,758	17,795	17,385	16,974	16,504
Westhampton	263	259	261	257	253	248
Wilbraham	4,598	4,682	4,815	4,827	4,836	4,825
Williamsburg	562	560	559	544	529	512
Worthington	218	221	228	229	230	230
Pioneer Valley Region	**287,288**	**290,800**	**295,000**	**291,800**	**288,500**	**284,100**

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.

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 effected 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.

E. 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 adds a critical contribution to the development of a working simulation model.

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

Transportation 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 regions socioeconomic data, which generate and attract 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. Regionally Significant Projects

Improvements identified in the Short and Long Range Elements of the Regional Transportation Plan were incorporated into the model. The roadway projects for forecast years are listed in Table 9-4.

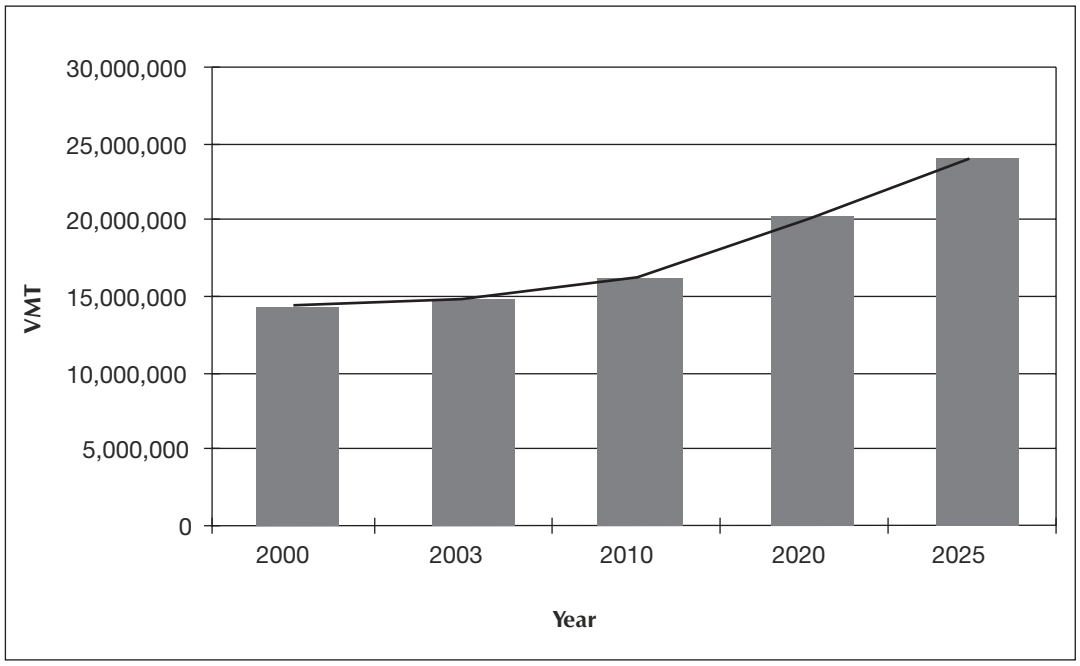
Table 9-4 - Projects Included in the Regional Transportation Model

Analysis Year	Community	Project Description
2003	Hadley, Northampton	Calvin Coolidge Bridge widening from 3 lanes to 4 lanes
2003	Hadley	Route 9 widening to four lanes - from Calvin Coolidge Bridge to West Street
2003	Springfield	Reversal of 4 existing I-91 ramps
2003	Chicopee	Memorial Drive signal coordination
2003	Hadley	Route 9 signal coordination
2003	Westfield	Route 20 signal coordination
2003	Springfield	Reconstruction, widening, and signal coordination on Parker Street
2003	Holyoke, W.Springfield	Route 5 signal coordination. Construct a new collector road to cinema.
2010	Chicopee	Deady Memorial Bridge – widen to 5 lanes.
2010	Chicopee	Traffic coordination and improvements along Broadway
2010	Holyoke	Improvements to Commercial Street corridor
2010	Westfield	Route 10/202 Great River Bridge - two bridges acting as one-way pairs.
2010	Springfield	New slip ramp from I-291 to East Columbus Avenue
2010	Northampton	Road widening on Damon Road from Rte 9 to King St.
2010	Chester	Maple Street bridge restoration as a one-way bridge.
2010	E. Longmeadow	Improvements to the East Longmeadow Rotary.
2020	Agawam	Route 57 Phase II new limited access highway from Route 187 to Southwick Line.
2020	Holyoke	Elmwood Bypass - new roadway from I-391 to Lower Westfield Road, Holyoke
2020	Agawam, Longmeadow, Springfield	Improve the South End Bridge, construct a direct ramp from the South End Bridge to Route 57, fix existing lane reduction problem on I-91 between Exits 1-3.
2025	Northampton	Connector roadway between Route 10 and Route 66 from Old South Street.
2025	Ludlow, Springfield	Route 21 bridge reconstruction (possible to be widened as well)

5. Vehicle Miles Traveled and Daily Emissions

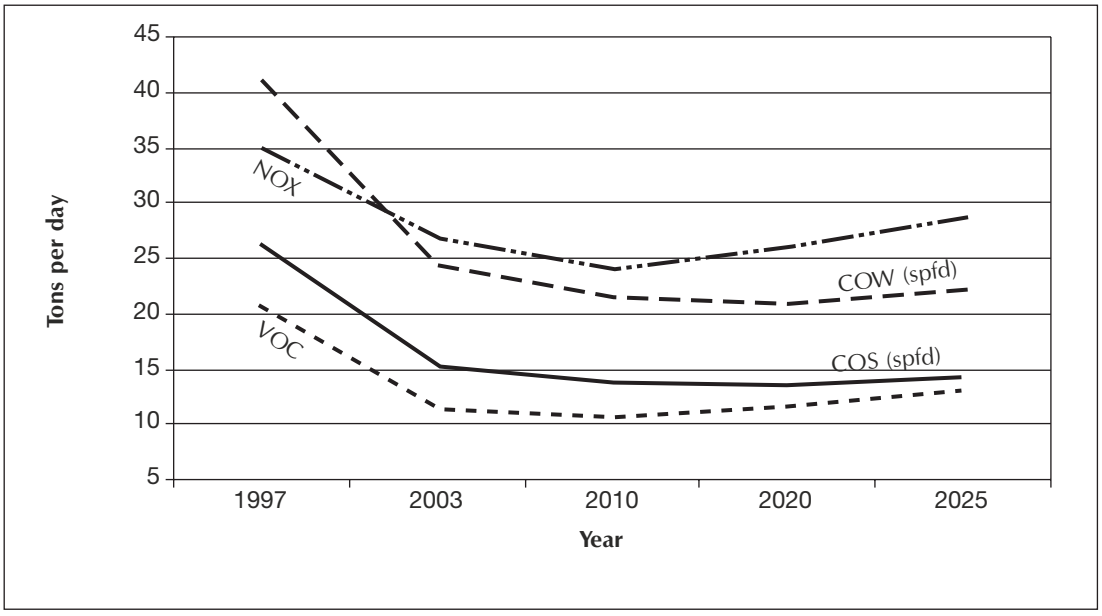
The total Vehicle Miles Traveled (VMT) was estimated for the model years of 2000, 2003, 2010, 2020, and 2025. The total VMT is shown in Figure 9-1. As shown in Figure 9-1, the total VMT is projected to increase by an average of 1.1% per year from 2000 to 2003 and 1.3% per year from 2003 to 2010. VMT increased by 2.2% per year from 2010 to 2020 and 3.6% per year from 2020 to 2025.

Figure 9-1- Estimated Future VMT



The daily emissions for the Pioneer Valley Region were also calculated for each of the five analysis years. This analysis evaluates the change in ozone precursor (VOC and NOx) emissions and carbon monoxide summer (COS) and winter (COW) emissions in Springfield as a result of implementation of the recommendations of the RTP. The daily emissions output for the region is shown in Figure 9-2.

Figure 9-2 – Daily Emissions Output for the Pioneer Valley Region



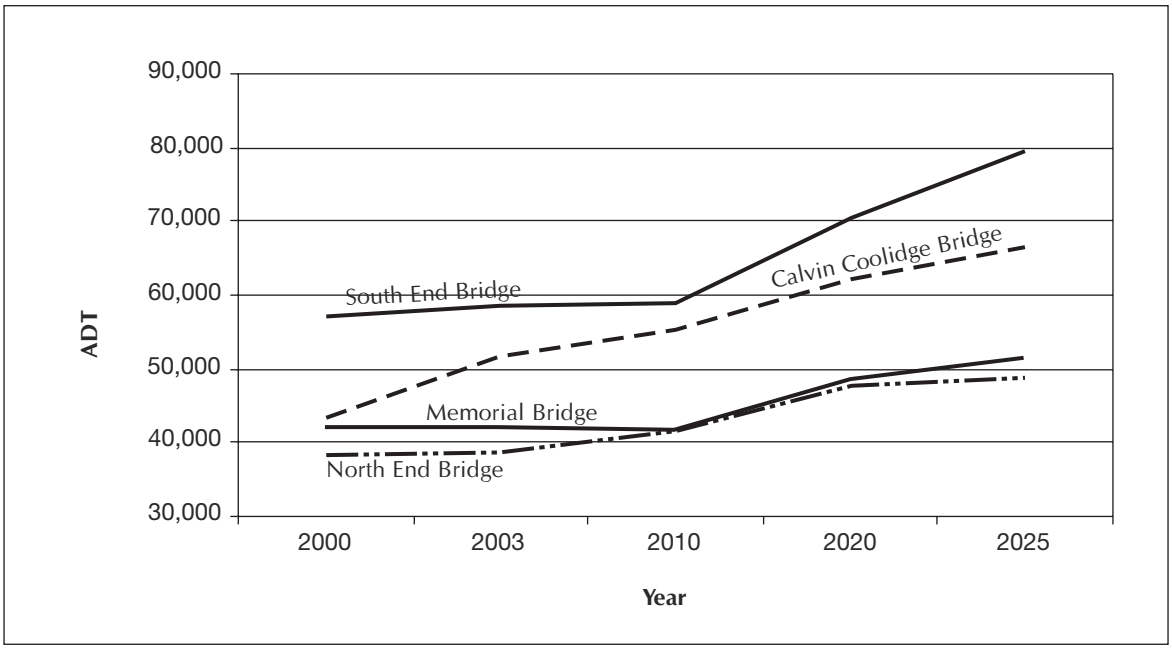
As shown in Figure 9-2, there is a significant reduction in VOC and NOx emissions for the Pioneer Valley Region, as well as COS and COW emissions for the Springfield area from 2000 to 2010. Emissions begin to increase slightly from 2010 to 2025, however they remain within the parameters of the established budget for the non-attainment area.

6. 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 9-3.

Figure 9-3 – Projected Average Daily Traffic on Area Bridges

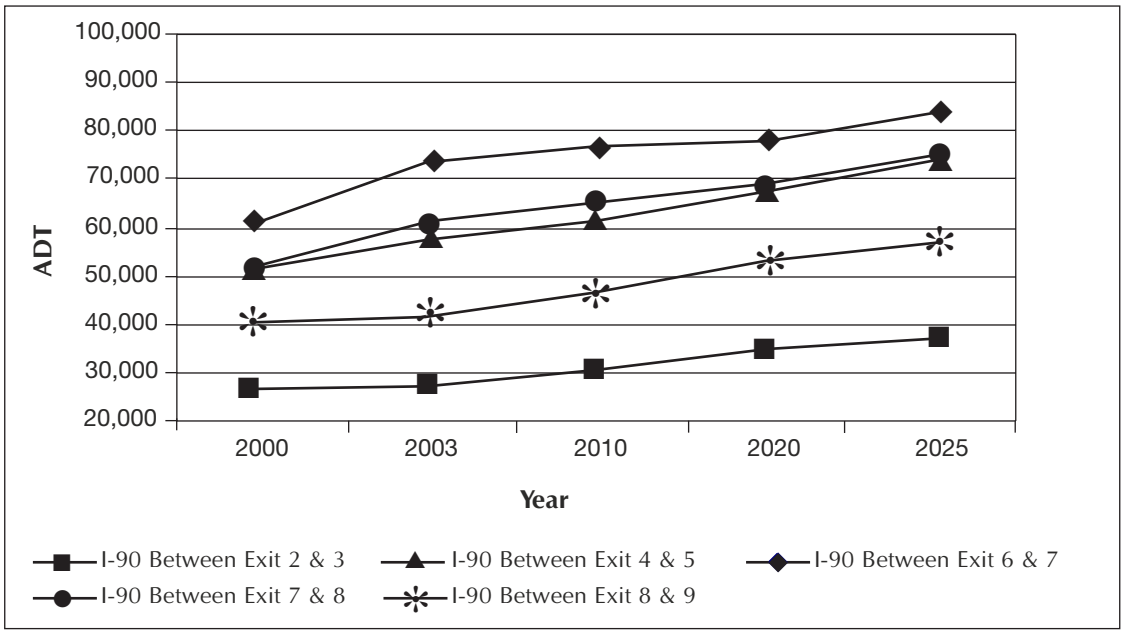


As shown in Figure 9-3, the ADT on South End Bridge is projected to significantly increase from 2010 to 2020. This is likely the result of the proposed improvements to the South End bridge and Route 5/57 rotary project, currently in the 2020 model analysis year. The West Columbus Avenue Urban Revitalization Project, which includes the expansion of the Basketball Hall of Fame, also impacts traffic volumes on the Springfield area bridges.

b) Interstate 90 (Massachusetts Turnpike)

Traffic volumes for Interstate 90 (I-90) are shown in Figure 9-4. Volumes on I-90 within the PVPC region are projected to steadily increase between exits 4 and 8 from 2000 to 2025.

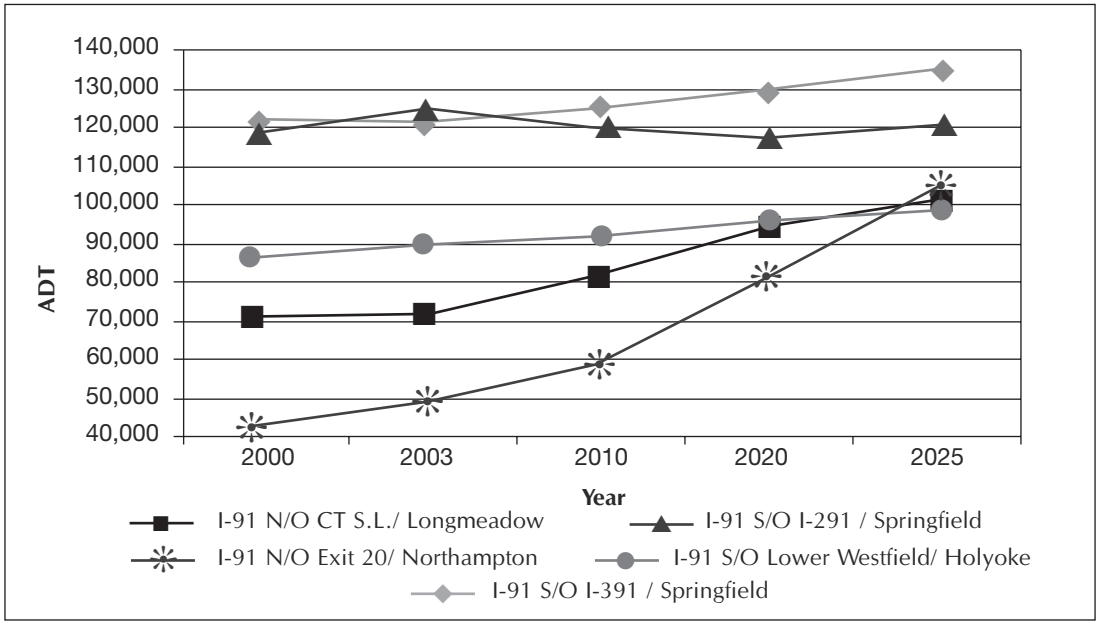
Figure 9-4 – Projected Average Daily Traffic on Interstate 90 (MassTurnpike)



c) Interstate 91 (I-91)

The ADTs on I-91 were projected for all five model years and are shown in Figure 9-5. 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.

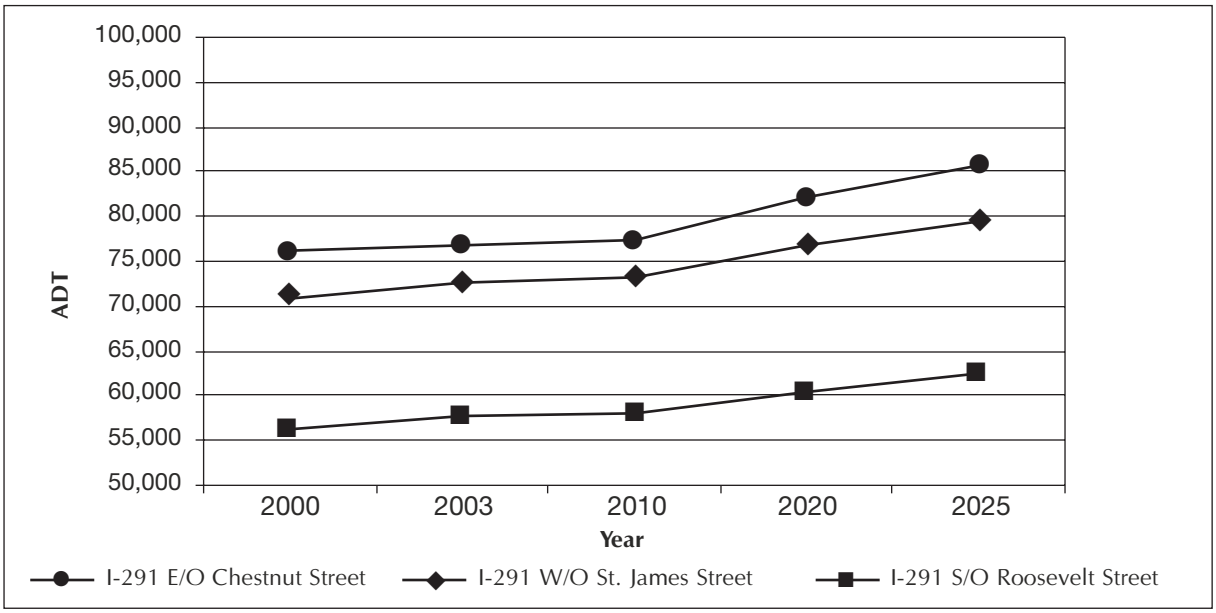
Figure 9-5 – Projected Average Daily Traffic on Interstate 91



d) Interstate 291 (I-291)

Figure 9-6 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.

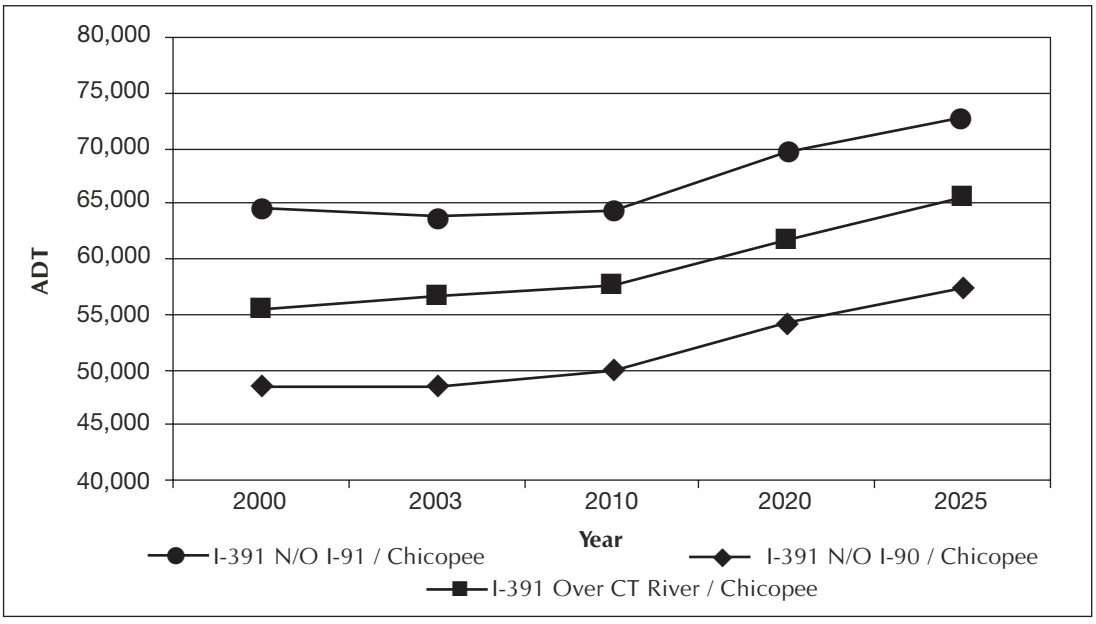
Figure 9-6 – Projected Average Daily Traffic on Interstate 291



e) Interstate 391

Traffic volumes for Interstate 391 (I-391) are shown in Figure 9-7. Moderate increases in traffic volumes are projected for this area with the except for north of its interchange with I-91

Figure 9-7 - Average Daily Traffic on Interstate 391



f) Arterial Roadways in the Pioneer Valley Region

Average Daily traffic volumes were projected for some of the major arterial roadways in the region for all five analysis years. This information was summarized for each geographical sector (Northeast, Northwest, Southeast, Southwest) of the region on is shown in Figures 9-8 – 9-11. Traffic volumes increase on three of the four roadways in the northeast section of the region with a slight decrease occurring on Route 9 at the Amherst/Hadley line in 2020. Conversely, slight to moderate increases are projected for the northwestern section of the region with the largest increases occurring on Route 5 in Northampton from 2003 to 2020.

The ADT on arterial roads in the southeast of the region shows slight increases and decreases between each analysis year for all four roadways. These peaks and valleys likely mirror the projected increases and decreases in population and employment for these areas. Traffic volumes on Route 10/202 in Westfield are projected to increase dramatically from 2003 to 2010. This is likely due to the reconstruction of the Little River Bridge. Route 57 is also projected to experience large increases in traffic volume west of Route 75 from 2010 to 2025 as a result of the Route 57 Phase II expansion project which would extend the limited access highway in this area.

Figure 9-8 – Projected Average Daily Traffic on Arterial Roads in the Northeast

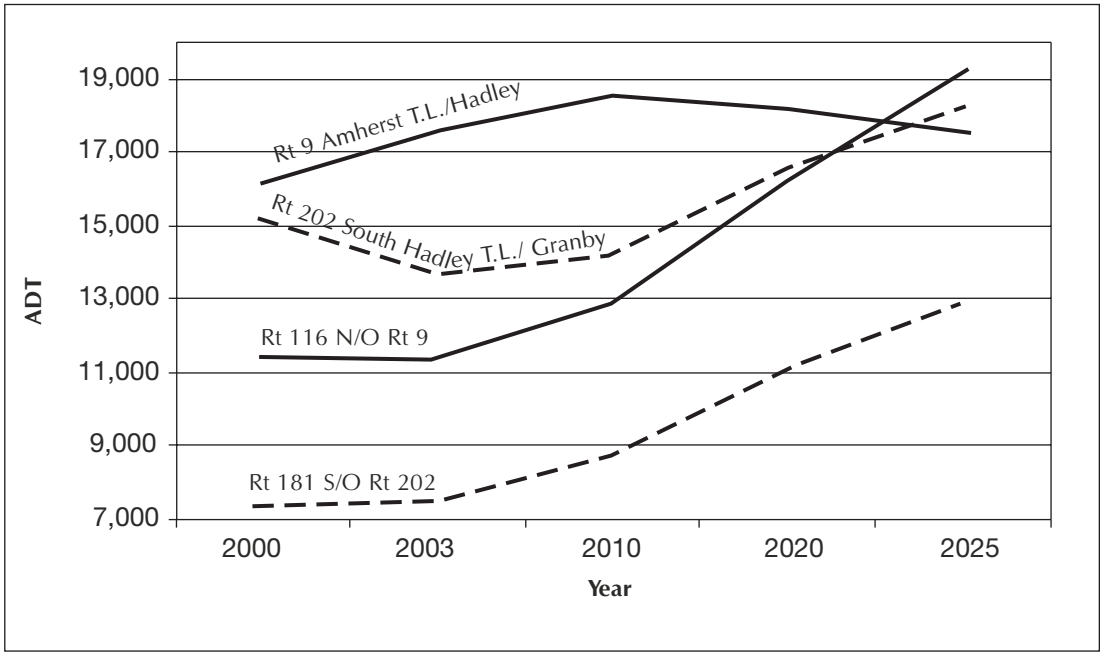


Figure 9-9 – Projected Average Daily Traffic on Arterial Roads in the Northwest

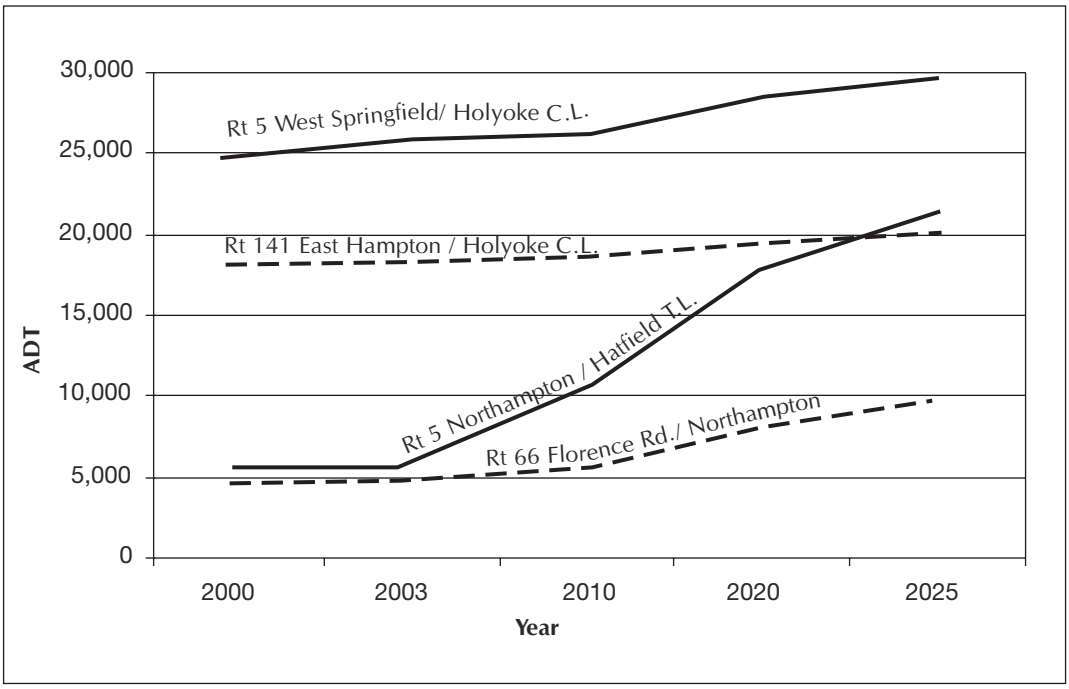


Figure 9-10 – Projected Average Daily Traffic on Arterial Roads in the Southeast

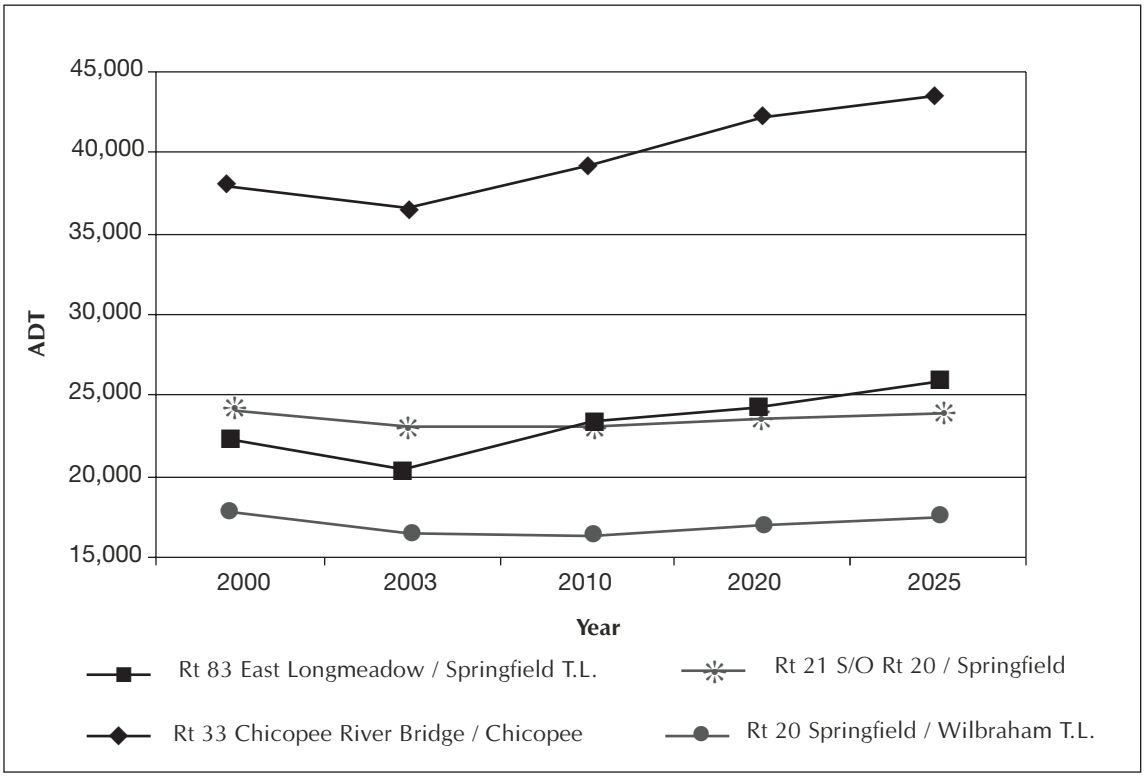
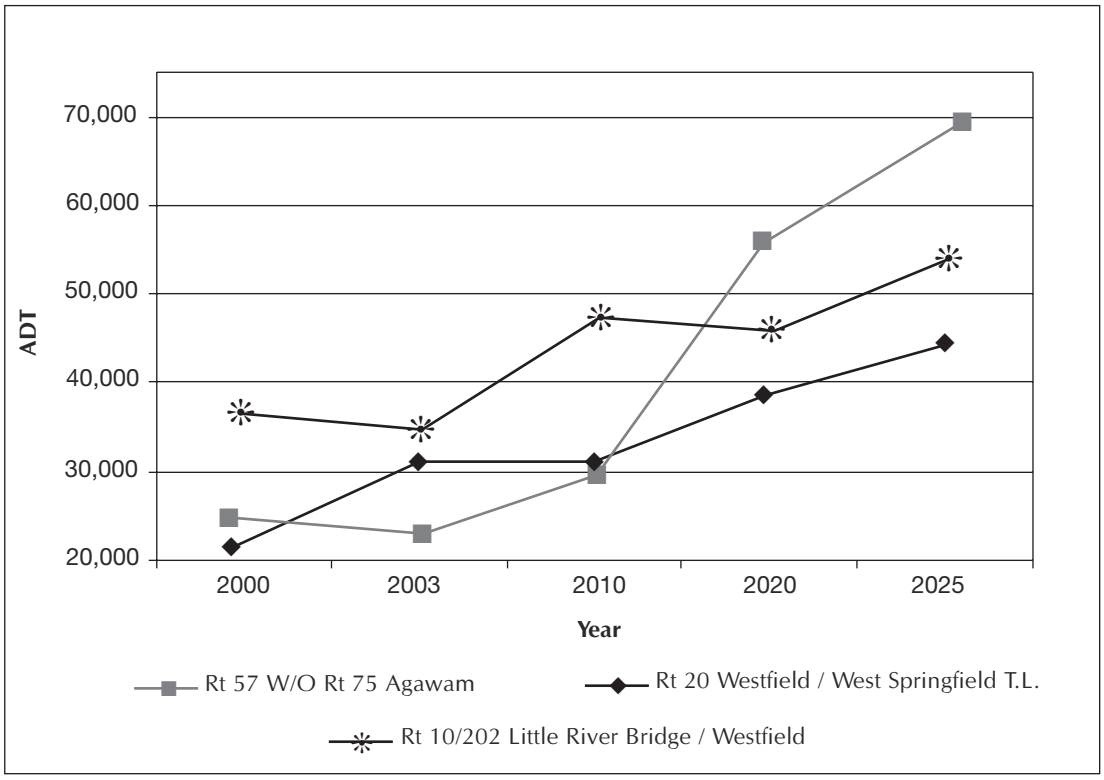


Figure 9-11 – Projected Average Daily Traffic on Arterial Roads in the Southwest



CHAPTER 10

Long Range Strategies and Projects

A. Highway System Improvement Strategies

The goal of the RTP focuses on the attainment of a safe and dependable transportation system. In a first step to achieve this goal, the system's present and future needs have been identified. The second step is to develop a plan of action to address these needs while adhering to the policies and objectives of the RTP. The third and final step towards the RTP goal is to implement program improvement activities that will enhance the transportation system. This process is continuous and as improvements alleviate problems in the regional transportation system the goal of the RTP is achieved.

Priorities are required to address transportation needs of the region. The priorities are based in part on the issues concerning our existing systems as well as its long range needs. The equally important priorities of improvement activity for the Pioneer Valley Region are presented below:

- Safety;
- Congestion Relief;
- Preservation;
- Enhanced Mobility; and
- Environmental Improvement.

Improvement proposals should focus on these items as a set of objectives to be achieved over the long range. In achieving these objectives, the first alternative for consideration should be directed toward the improvement of existing facilities rather than construction of new facilities. In either case, a complete analysis of alternatives is necessary prior to the recommendation of an improvement action. The resultant action will, therefore, be consistent with the cost effective, environmentally aware, efficient objectives identified in the RTP.

In the absence of analytical support, the proposed plan of action will present a general course in which the above mentioned priorities will be addressed. Communication with local officials will continue to define the alternatives to be analyzed. Regardless, the proposed plan of action will be financially constrained by the estimates of future apportionments in the Pioneer Valley Region through the year 2025, and the policies identified in the RTP.

1. Safety

The highest priority within the Pioneer Valley region related to safety is the rehabilitation of the bridge system. The continuous deterioration of bridge structures without restorative measures presents a serious problem in terms of safety as well as cost effectiveness. The plan of action for the Pioneer Valley Region is to perform regular, routine maintenance before conditions deteriorate to unsafe and/or irreparable conditions.

Safety also focuses on minimizing the number of high accident locations within the Pioneer Valley Region. Intersections listed on the states top 1,000 list of accident locations will be examined through analysis of the accidents, followed by proposed improvements to eliminate hazardous conditions. The crash history of the study area is also examined as part of all transportation studies conducted by the PVPC.

2. Congestion Relief

The TEA-21 legislation directly addresses congestion mitigation as a planning activity as well as a funding source. 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 system, 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.

3. Preservation

Pavement Management is a systematic process that collects and analyzes pavement information used as input in selecting cost-effective strategies for providing and maintaining pavement. The Pavement Management System (PMS) now provides a consistent set of recommended improvement actions based on a series of analysis including investment analyses. This feedback will be used as a prioritization measure in determining the appropriate selection of projects based on need and benefit/costs.

An active PMS will enable local highway officials to benefit from understanding the relationship between the roadway maintenance budget and future roadway conditions. Also, they will be able to provide objective information on road conditions and make cost-effective decisions on maintenance priorities and schedules. Historically, in the Pioneer valley region, the findings of the regional PMS have been directed and integrated into the regionwide transportation planning program. Results of project implementation can be used to establish, and in some cases, update highway historical records which have not been kept current.

Included in the financial element of this plan is a line item for the maintenance and preservation of the current transportation infrastructure. The funds included in this line item will be used for resurfacing and reconstruction of roadways and rehabilitation of bridges. Table 10-1 exhibits the financial need for these efforts which must be aggregated since most projects under this category are not regionally significant.

Table 10-1 - Maintenance of the System - Annual Allocation

Category	Unit Cost	Annual Units	Annual Cost	1998-2023	2000-2025
Pavement	$ 622,781/mile	8.5 miles/yr.	$ 5.3 M	$402.5 M	$132.5 M
Bridge	$ 2.5 M/bridge	4 bridges /yr.	$ 10.0 M	$517.5 M	$250.0 M
Other	$ 609 K	1.5 / yr.	$ 913.5 K	$1.016 B	$22.8M

Source: TIP from last five years, Regional Transportation Model

4. Enhanced Mobility

Enhancing mobility, like congestion relief, depends heavily on the reduction of vehicle miles traveled and improved highway operations. Intelligent transportation systems will play a vital role in enhancing the mobility of the residents of the Pioneer Valley. The Intelligent Transportation Systems Strategic Deployment Plan for the Springfield Metropolitan and Pioneer Valley Region was recently completed for the region. The study organizes and prioritizes ITS applications that are beneficial to the regional transportation network. ITS can improve the operational efficiency of all modes from centralized traffic signal control and automated vehicle locating systems to commercial vehicle applications and automated traveler information systems. They can increase tourism, encourage economic development and most importantly, mitigate areas of traffic congestion. The recommendations of the strategic deployment plan will be integrated into to future transportation planning studies and projects in the region in compliance with the National ITS Architecture. In addition, the recommendations will be enhanced and expanded when appropriate to promote information sharing and linkage of the Pioneer Valley ITS system to other neighboring projects.

B. Transit Service Improvement Strategies

1. Fleet Replacement

PVTA ordered 100 buses in 1995 to replace one of the oldest transit fleets in Massachusetts. Starting in 2007 these buses will be eligible for replacement. PVTA will use it's experience from the previous order to shape this large fleet replacement that will be the image of PVTA for many years to come.

2. ITS

Longer term ITS transit projects will continue the build out of ITS Implementation and Deployment Plan. Projects areas included in the later phases of the deployment plan are: Advanced Passenger Information Systems, Advanced Fare and Data Collection, Enhanced Transit Security, Advanced Paratransit Operations, Maintenance and Fleet Management, and include Regional ITS Integration.

3. PVTA Facility Improvements

PVTA's maintenance facility in Springfield is increasingly overextended by the needs 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 considering developing another location for the van maintenance. This other facility will hopefully address further long running difficulties with parking at the Springfield location.

4. Commuter Rail Service

Increasingly, commuter travel patterns have extended beyond the Pioneer Valley to adjacent regions and metropolitan areas. PVTA has worked with connecting transit systems in the past to improve connections between service areas. In the future direct partnerships will be required to provide the services needed by the regions commuters, businesses, and employers.

In 2001 Hartford's Capital Region Council of Governments finished a major investment study to develop a regional transit strategy. One component of the recommended alternative was the development of commuter rail service between New Haven, Hartford, and Springfield. Connecticut's Transportation Strategy Board, a body created by the state legislature and governor to address critical transportation issues, endorsed this commuter rail concept and provided Connecticut Department of Transportation with funds to create an implementation plan for the service. This planning effort began in 2002 and is expected to be completed by the end of this year. The Pioneer Valley Region expects to participate in a partnership with Connecticut Department of Transportation to develop commuter rail service to the Springfield Union Station.

PVTA with the support of its member municipalities has proposed to expand on the efforts of Connecticut by studying the restoration of passenger rail service along the "Connecticut River" line between Springfield, Holyoke, Northampton, Greenfield, and the Vermont border. This route historically had passenger service up until the late 1980s when the Montrealer was diverted to the New England Central route via Palmer and Amherst.

5. New Services

PVTA has proposed a number of new services and service models that were identified in the needs and issues section of this report that it expects to implement, as funding becomes available. These services are intended to improve both the level of service and kinds of service that PVTA can provide to the residents of the Pioneer Valley.

C. Movement of Goods System Improvement Strategies

1. Doublestack Clearance

Lack of adequate clearance along rail lines is a major obstacle to improving the economic efficiency of rail freight systems. Doublestacking rail cars can reduce the length of freight trains minimizing the delay and safety problems at railroad crossings while maintaining or even expanding its load. Many bridges are roadways passing over the tracks: when these bridges are to be reconstructed or repaired, the clearance over the tracks should be increased to accommodate doublestacked trains. Clearances in the Pioneer Valley have already been raised to accommodate rail cars with 17 feet of stacked containers (one 9Ωft and one 8Ωft.). In the future, 19 feet of clearance will be required to accommodate trains with two 9Ωft containers.

2. Improved Access to Intermodal Terminals

As mentioned in the Needs and Issues section, the Intermodal Management System (IMS) has been designed to include access roads to intermodal facilities on the National Highway System. Both rail/truck facilities in the Pioneer Valley currently experience some access problems. As the IMS is developed, strategies and projects to alleviate these regional access issues should be advanced.

3. Increased Public/Private Cooperation

Since the movement of freight is almost exclusively a privately operated industry, the opportunity exists to improve public/private cooperation. Private transportation providers are entitled to representation on the Joint Transportation Committee, but rarely exercise this option by attending the meetings. Future JTC initiatives should encourage more participation from private providers. Through greater cooperation, transportation improvements will have an increased benefit both in the operation of the transportation system and the economy as a whole.

4. ITS Commercial Vehicle Cooperation

ITS Commercial Vehicle Operation application may be an area for public investment to maximize the efficiency of the movement of goods throughout the region. As the Pioneer Valley Region makes investments in a highway ITS system on its major corridors the successful integration of the Commercial Vehicle Fleets allows the managed increase in use without the corresponding increase of congestion from goods movement.

D. Non-Motorized Transportation Strategies

Bicycling and walking in the Pioneer Valley can be enhanced through policy and program changes including engineering, education, enforcement, and encouragement efforts. The strategies and action items adopted by the Joint Transportation Committee's Bicycle and Pedestrian Subcommittee are designed to change either the physical or the policy environment for pedestrians and bicyclists in the Pioneer Valley or to directly affect the behavior of pedestrians, bicyclists, and motorists. In addition, it will also be important to coordinate bicycle and pedestrian projects with surrounding regions and the State of Connecticut.

In 2002 the Committee reviewed and prioritized the action items of the Pioneer Valley Regional Bicycle and Pedestrian Transportation Plan. Each action item was ranked as high, medium or low priority.

1. Engineering/Infrastructure

The physical environment directly affects the decision to walk or ride a bicycle. If people believe that there is a safe place for them to go, they will walk and ride their bikes. In the Pioneer Valley, there are many governmental and non-governmental entities that can contribute to making the environment more comfortable for bicyclists and pedestrians.

Action 1—(High Priority) The Pioneer Valley Planning Commission will systematically identify and assess roadway conditions throughout the region and create a database of road characteristics that affect bicyclists' comfort level. The database will include (but will not be limited to) width, shoulder width, average daily traffic (ADT), and speed, and be designed to identify and document the need for, and appropriate kind of, pedestrian and bicycle facility improvements for all roadways in the Pioneer Valley. (This effort may coincide with regional and local pavement management efforts, to maximize use of limited regional planning agency staff.) PVPC will update and expand the Pioneer Valley Regional Bikeway Map by classifying roadways based on the shoulder width specification defined in MassHighway Directive E-98-003 (5/5/98).

Action 2—(Medium Priority) PVPC will work with affected communities to secure financing from MassHighway and alternate funding sources, and to build new facilities, based on the list of projects and needs identified in the Appendix of this plan.

Action 3—(High Priority) PVPC will facilitate community efforts to provide opportunities for bicycle access to other modes of transportation, including

Action 4—(Medium Priority) At least one community in the valley will secure funding for and develop a local "spot safety improvement program" (Cambridge, Massachusetts has a program that could serve as a model) so that the public can identify situations of concern to bicyclists and pedestrians and report their presence to appropriate authorities, and so the local Department of Public Works can remedy these locations in a timely fashion.

Action 5—(Low Priority) At least one community will work with PVPC, the Joint Transportation Committee (JTC) and MassHighway to create and implement a model program for reconstruction and retrofitting of area bridges to assure provision of sidewalks and appropriate lane widths for bicycles.

Action 6—(Low Priority) At least two communities will work with PVPC and the JTC to improve pavement markings, lighting, and signs at pedestrian crosswalks and intersections.

2. Engineering/Policy

Action 7—(Low Priority) PVPC will recruit and add two new members with bicycling and pedestrian expertise to the Pioneer Valley's Joint Transportation Committee (JTC).

Action 8—(Low Priority) PVPC will re-activate the non-motorized transportation committee and charge them with oversight of implementation of this plan.

Action 9—(Low Priority) PVPC will work with the JTC to institutionalize a process to notify bicycling and pedestrian organizations in the respective MassHighway Districts of public hearings on transportation projects that could include bicyclist and pedestrian accommodations. This effort will include notification to elected officials of project advertisement and contract awards for transportation projects.

Action 10—(High Priority) At least one area community will adopt a level of service index for bicycling and walking (detail in Appendix). This index would serve the same function as that provided to motorized vehicles through the Highway Capacity Manual: it would systematically identify areas where pedestrian and bicyclists needs could be better met with met by existing transportation infrastructure.

Action 11—(Medium Priority) At least two area communities will incorporate traffic calming measures into neighborhood streets that reduce the risk of automobile injury to pedestrian and bicyclists. These measures may include the use of chokers, chicanes, traffic circles, speed humps, edgelines, and raised crosswalks.

Action 12—(High Priority) At least two area communities will adapt their application of the Transportation Management System (the mechanism by which communities plan and prioritize expenditures of federal and state highway funding) to include consideration of bicycling and walking.

Action 13—(High Priority) At least two area communities will include pedestrian and bicyclist needs in traffic studies. When a count reveals that pedestrians and bicyclists are not using a facility, an effort will be made to assess potential barriers and identify creative solutions. For example, if a community is conducting a traffic study for a proposed new shopping center, the study would look not only at automobile access to the proposed development, but also at pedestrian and bicyclist access. If there seemed to be a lack of pedestrian and bicyclist access, the community would consider requiring sidewalks, bikelanes, additional striping, bicycle parking, pedestrian and/or bicyclist specific signage, and other means to assure pedestrian and bicyclist access to the proposed development.

Action 14—(Medium Priority) PVPC will facilitate community efforts to work with the Rails-to-Trails Conservancy and other concerned groups to create a method of quick public response to purchase newly available corridors for future multi-use trails.

3. Land Use Planning—Zoning and Development

Action 15—(Low Priority) At least one interested community will create a pedestrian/bicyclist review committee to evaluate all proposed development projects with respect to bicycle and pedestrian access (information on model programs is available in the resources section).

Action 16—(Low Priority) PVPC and the JTC will work with at least two area communities to adopt sidewalk maintenance bylaws (model bylaws are available from PVPC, www.pvpc.org) and work to maintain existing roadways with the knowledge that the lack of maintenance is an obstacle for bicyclists and pedestrians.

Action 17—(Medium Priority) At least one municipality will adopt mandatory sidewalk bylaws for new residential and commercial developments.

Action 18—(High Priority) At least one municipality will adopt inclusion of bicycle parking as part of local parking ordinances.

Action 19—(Medium Priority) At least one community will encourage land use development patterns (as described in current land use section of this plan) that allow residents the opportunity to walk and bicycle as a means of travel and recreation.

4. Education

Action 20—(High Priority) At least two communities will host the "Pedestrian Road Show," the FHWA comprehensive community-based pedestrian accessibility program.

Action 21—(High Priority) At least 5 local planners (paid or volunteer) and public works officials will be trained in bicycle traffic safety through an educational program comparable to advanced driver's education for bicyclists.

Action 22—(Medium Priority) At least two workshops on transportation related issues, including the design of bicycle and pedestrian facilities, will be held in area communities (the federally funded Local Technical Assistance Program, Baystate Roads, is a resource).

Action 23—(High Priority) Interested citizens, the Northampton Safe Roads program, universities, and the Hampden County Traffic Safety program will launch a valley-wide public information and education effort designed to: 1) educate motorists about their responsibilities to share the road with bicyclists and their obligations to yield to pedestrians in crosswalks, and 2) educate bicyclists and pedestrians about their responsibilities interacting with motor vehicles.

Action 24—(Low Priority) Interested citizens, local bicycle clubs, and safety advocates will work with school boards, departments of education, universities, and parent-teacher associations to help municipalities incorporate pedestrian and bicycle safety as part of a comprehensive orientation during the beginning of every new school year. The Northampton Safe Roads program, the Hampden County Traffic Safety program, and the Massachusetts Bicycle Safety Alliance are existing resources for bicycle and pedestrian safety efforts.

Action 25—(Low Priority) Concerned citizens, local bicycle clubs, universities, and safety advocates will create a program to encourage bicycle retailers to include helmets as part of all bicycle purchases and to educate customers on the safe use of equipment and traffic rules.

Action 26—(Low Priority) Safety advocates will work with local hospitals and departments of public health to develop a region-wide injury database for bicyclists and pedestrians.

Action 27—(Medium Priority) PVPC will work with local communities, Governors Highway Safety, State and local Police, and safety advocates to incorporate improved crash reporting procedures for bicycle and pedestrian injuries as currently proposed by MassHighway.

Action 28—(Medium Priority) The Massachusetts Bicycle Safety Alliance, local bicycle clubs, the Western Massachusetts chapter of MassBike, the League of American Bicyclists, and other organizations will work to implement a driver's education for bicyclists. Training will be conducted in educational programs for both children and adults through safety clinics, and adult education outlets.

5. Enforcement

Action 29—(Low Priority) Interested communities will work with the Governor's Highway Safety Bureau to secure funding and other support necessary to implement law enforcement programs to support enforcement of existing traffic laws, especially pedestrian crosswalk laws, focusing on citing motorists and pedestrians or bicyclists whenever they violate traffic laws.

Action 30—(Low Priority) Interested community members will work with local legislators to change state legislation, specifically Massachusetts General Laws (Chapter 90) and the Uniform Vehicle Code (UVC) with respect to the protocol concerning drivers and their duty to stop for pedestrians. The UVC should indicate that the driver must stop or yield for a pedestrian in a crosswalk or who is standing adjacent to a crosswalk indicating a desire to cross by pointing to the other side of the roadway. While the existing code provides pedestrians standing at a crosswalk with the right of way, the pedestrian is forced to venture into the travel lane to exert this right.

6. Encouragement

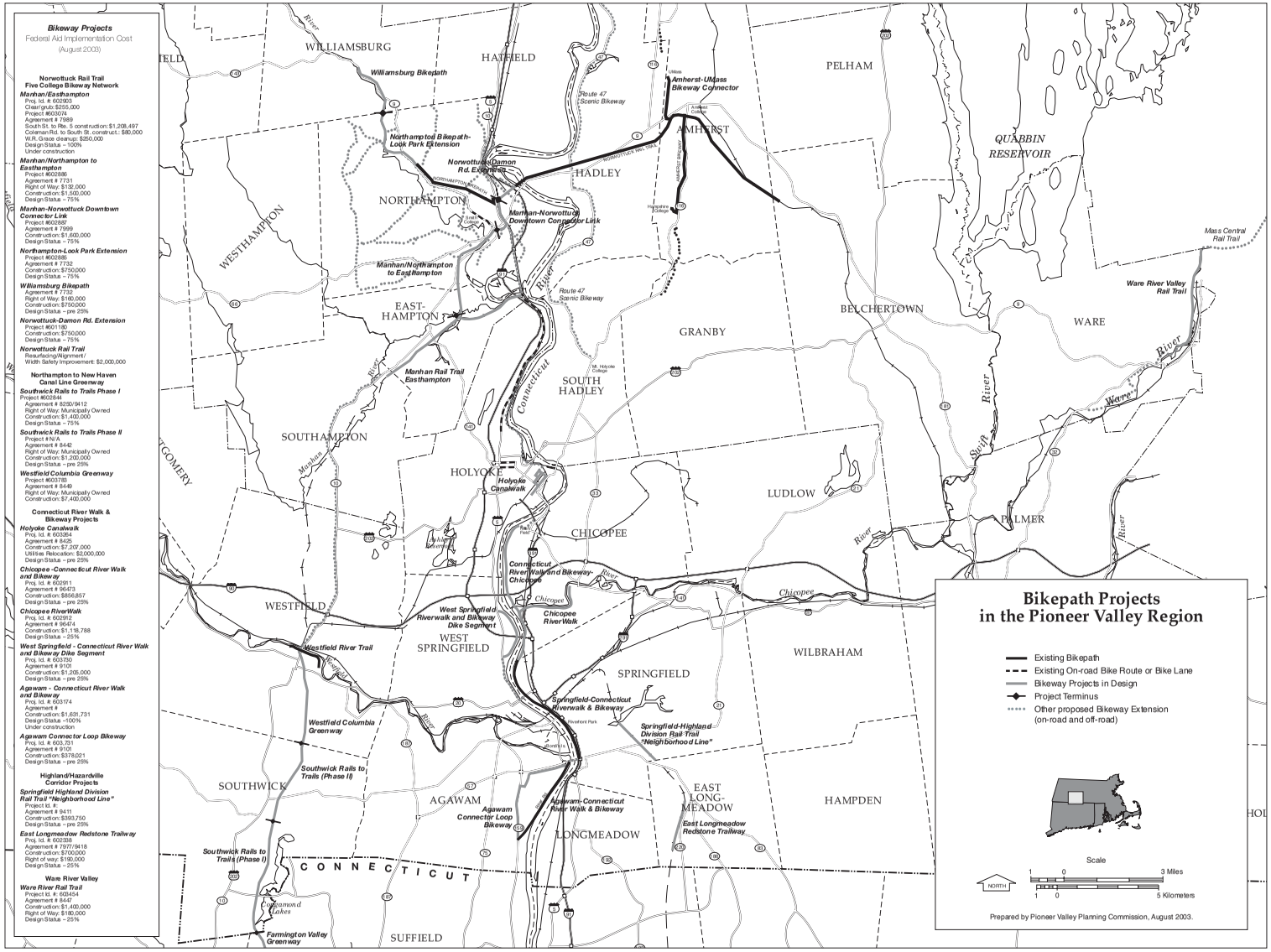
Though often overlooked, encouragement is at the heart of any community's successful efforts to make walking and bicycling viable means of transportation. PVPC, local governments, colleges and universities, businesses, and key community leaders must cooperate to make bicycling and walking viable transportation alternatives.

Action 31—(High Priority) PVPC will work with the non-motorized transportation committee and interested communities and employers and educational institutions to organize a regional "Bike, Bus, or Walk to School/Work Day" to coincide with "National Bike to Work Day" in 2000.

Action 32—(High Priority) PVPC will work with at least three area employers and educational institutions to create incentive programs to encourage employees and students to bike or walk to work or school in the year 2000. (this activity may include Bike to Work Week activities)

Action 33—(High Priority) PVPC will assure implementation of this Regional Bicycle and Pedestrian Transportation Plan via the work of the non-motorized sub-committee of the Joint Transportation Committee.

Figure 10-1 Bikepath Projects in the Pioneer Valley Region



Please Note: Bikepath projects can require the acquisition of right-of-way on privately owned property. Right-of-way acquisition is the responsibility of the local community.

E. Land Use and Development Iniatives

As explained in the Needs and Strategies section, if people do not need to travel great distances to meet their basic needs, i.e. work, shopping, school and recreation, then there will be less demand for expensive transportation facilities that do not make efficient use of land, i.e. roads. The following strategies are designed to facilitate compact growth and development that is pedestrian, bicycle and transit friendly. The following initiatives must be adopted and implemented by the 43 communities comprising the Pioneer Valley.

1. Encourage Traditional Neighborhood Developments (TNDs)

Create incentives in zoning and subdivision regulations to promote pedestrian-friendly TNDs. TNDs have grid-like street patterns with sidewalks and street trees, medium to high density housing, nearby public open space and are within walking distance to shops and services.

Adopt TND residential zoning regulations to permit lots of one-quarter to one-ninth acre with modest front yard set backs of 15 to 20 feet. Homes should be clustered around public commons, green belts, parks or playgrounds. Houses should be predominantly single-family homes, with some row houses; apartments and accessory apartments mixed in. Garages or parking should be placed to the rear oralong alleys. Houses often have picket fences or hedges to separate the front yard from the sidewalkand front porches. Convenient corner stores should be allowed in residential neighborhoods, allowingresidents to walk to the store. (Examples: Chapel Hill, NC; Jacksonville, FL; Kentlands in Gaithersburg, MD; York County, SC; Loudon County, VA; Beaufort County, SC)

Adopt TND subdivision regulations to encourage narrower streets with two ten-foot travel lanes for traffic calming, gridded streets for traffic flow improvements, sidewalks, shade trees planted at twenty-foot intervals between streets and sidewalks, and on-street visitor parking.

2. Promote Compact, Mixed-use Development Near Existing Town Centers and in Designated New Growth Centers

Provide incentives for urban infill, clustered residential and mixed-use villages within or immediately surrounding town centers or designated community growth centers in order to increase pedestrian/ bicycle access, jobs and affordable housing.

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. Building height should be 2-4 stories, with offices or apartments above first-floor shops. Storefronts should be brick, stone or clapboards, with awnings, and signs, which are subordinate to building architecture. Streets should have street lamps and shade trees.

•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 shopping or restaurants. (Examples: Boltwood Walk in Amherst, MA; South Hadley Commons, MA; Palo Alto, CA; Davis, CA).

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. These incentives can be created through amendments to the table of dimensional uses in the zoning bylaw.

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. These incentives can be created through amendments to the table of uses in the zoning bylaw, which allow these uses by right in designated community growth centers, and establish restrictions or Special Permit requirements in outlying areas.

Retrofit suburban shopping centers to become community centers, by adopting zoning which requires new buildings at the street line, with pedestrian connections across parking lots, street trees and streetscaping. (Example: Mashpee Commons, MA)

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.

3. Create Incentives for Downtown Revitalization

Streamline or update antiquated zoning regulations to promote mixed uses and infill development in downtown areas. Allow greater density downtown than in surrounding areas; for example permit 3-5 story mixed use buildings in central locations with proper design. Prescribe a balanced mix of commercial, residential, cultural and entertainment uses. Reduce parking requirements in higher density pedestrian oriented areas and promote shared or common parking lots. Revamp single-purpose districts to allow more flexibility of uses. Allow mixed uses in formerly single use buildings. (Examples: Bus Station Complex, Northampton, MA; downtown Amherst, MA)

Revise zoning to promote downtown residential uses and add people, vitality to downtown's. Permit residential use of upper floors above street-level commercial uses. Allow lofts and artists spaces in former warehouse or industrial buildings. Provide density bonuses for downtown residential uses, or set aside downtown land for residential use only. (Examples: Phoenix, AZ;Peekskill, NY; Providence, RI; Portland, OR)

Create public-private partnerships of civic leaders and property owners, such as Business Improvement Districts and downtown associations, to manage and market downtown's and to maintain or provide amenities, such as landscaping, street furniture, public art, pay phones, and rest rooms. Identify businesses and industries that would make a good fit with the community and actively market the downtown to these companies.

Work to restore downtown's 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. Take advantage of available financing programs, such as CDBG grants, federal loan guarantees, historic rehabilitation tax credits and industrial revenue bonds. (Examples: Portland, OR; Denver, CO; Times Square, NY; Northampton, MA).

Revise zoning to incorporate design, landscape, and streetscape standards to maintain community identity and historic character. Develop downtown zoning, including: standards to encourage pedestrian-scale development, architectural design standards, standards for signage on buildings. Building setbacks from public streets should be minimized to no more than 20 feet, and building facades should be varied and articulated. Revise parking bylaws to allow for an uninterrupted streetscape in the downtown, and allow flexibility in meeting parking requirements, such as shared parking lots. (Examples: Austin, TX; Stuart, FL; Amherst, MA)

Exploit opportunities for specialty retail and service businesses targeted toward underserved urbanmarkets, 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 walk ways, 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 downtown's, 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.

Make downtowns safe, comfortable and attractive. Make improvements to amenities, such as parks, streetscaping, and lighting. 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. 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. 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. Enact zoning to permit sidewalk cafes. Institute traffic calming measures. (Examples: San Diego, CA; Northampton, MA; Mountain View, CA).

Encourage government and private institutions, such as colleges, post offices, and museums, to retain or expand downtown offices and facilities, through zoning and other mechanisms..

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. (Examples: Hartford, CT; Minneapolis, MN; Chattanooga, TN).

4. Develop Incentives for Open Space Community or Cluster Development

Open space communities replicate the traditional New England village land use pattern by clustering single family homes on smaller lots surrounded by protected open space. Open space communities promote efficiency of land use, lower costs of development, roads and infrastructure, lower municipal maintenance costs, and preserve natural features such as waterways and farmland. Cluster development has been hampered in Massachusetts by antiquated state zoning enabling legislation, which requires a Special Permit for cluster projects.

Develop zoning regulations to promote cluster development, such as major residential development o rdinances or open space community development ordinances, as an alternative to standard large-lot subdivisions. (Example: Chesterfield, MA; Granby, MA; Amherst, MA; Southampton, MA)

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. Such legislation would eliminate the current requirement in M.G.L. Chapter 40a, section 9 for a Special Permit for any new 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 ANR lots, which do not require Special Permits.

5. Improve Housing Opportunities and Neighborhood Quality

Provide a wider variety of housing choices in existing residential neighborhoods, and create more livable, pedestrian-friendly neighborhood environment.

Permit development of accessory or "mother-in-law" apartments in single family neighborhoods. Accessory apartments improve rental housing opportunities while maintaining the residential character of neighborhoods, particularly if apartments are attached to owner-occupied homes. (Example: Easthampton, MA)

Adopt zoning to allow limited commercial service and convenience uses, such as corner stores, in r esidential neighborhoods to create opportunities to walk to needed services.

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. (Examples: Lexington, MA; Newton, MA; Amherst, MA)

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. (Example: Granby, MA)

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, playspaces, and commons, enhances the quality of life in neighborhoods, provides recreational opportunities, and improve community safety and desirability.

Enhance downtown neighborhoods through neighborhood public safety and public improvements programs. Create neighborhood policing and neighborhood watch programs. Improve street sweeping, trash collection, street lighting and streetscaping, and graffiti control. Promote housing improvements through tax rebates and loans for construction and rehabilitation of historic properties.

Install traffic calming measures in residential neighborhoods to reduce speeds and discourage through traffic.

6. Redevelop Brownfields

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. The region contains at least 450 known sites that are listed by the Massachusetts Department of Environmental Protection as being contaminated by pollutants other than petroleum. More than 75% of these sites are located in urban communities where a majority of the region's minority and low-income population lives. Side effects of neglecting Brownfields include increased industrial development pressure on greenfields sites (farmland and open space) in outlying comm unities, and the loss of industrial jobs in the urban core. Other under utilized urban lands, such as Northampton State Hospital, should be redeveloped for economically viable uses.

Identify and prioritize potentially developable abandoned, underutilized and/or contaminated sites within each community.

Obtain federal or state seed money for Brownfields environmental site assessments.

Market Brownfields sites and other underutilized urban lands suitable for redevelopment, by making an inventory of sites available to potential developers.

Create public-private partnerships of municipal and state agencies, lending institutions, insurance companies, and adjacent landowners to work cooperatively to redevelop sites. Develop effective agreements between these parties to work together.

Take advantage of existing state and federal programs which provide incentives for Brownfields redevelopment, such as the EOEA Clean Sites Initiative, which offers state tax benefits and priority status for state capital funding to sites within designated Economic Target Areas, and Community Development Block Grant funds targeted for Brownfields.

Support new state legislation or local actions to provide incentives to redevelopment through public-private partnerships, financial assistance for site assessment and clean up, liability relief and tax benefits.

7. Encourage Transit-Oriented Developments (TODs)

Along bus transit lines, re-zone areas to allow for TODs. A transit-oriented development is a mixed use community within a 2,000-foot walking distance of a transit stop and core commercial area. TODs are concentrations of moderate and high-density housing, civic facilities, and mixed-use business establishments in a pedestrian-friendly and transit-served area.

Create 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 c ommercial 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. (Example: San Diego, CA; Mountain View, CA)

Reduce parking requirements for developments in TOD zones, in anticipation of decreased automobile use.

Create a comfortable pedestrian environment, with tree-lined streets and sidewalks and well-defined transit stops to promote transit use.

Provide incentives to developers for installing transit amenities such as bus shelters or benches.

8. Establish Greenbelts and Blueways for Open Space Protection

Create programs to protect key open space features, including "Blueways" to protect river corridors a nd lakeshores, and "greenbelts" to protect prime farmlands, mountains and ridgelines. Programs should also target abandoned rail lines and other special scenic or natural features. A contiguous greenbelt around cities and towns should be designed to help contain urban growth. Greenbelts can provide recreational opportunities and wildlife migration corridors while protecting natural features. They balance urban development with the creation of parklands and open space.

Build regional greenbelts, which are implemented through municipal open space acquisition programs, in cooperation with land trusts, and nonprofit groups. Establish municipal open space acquisition funds with annual appropriations and seek state open space grants or loans. Target regionally significant "special places" and environmentally sensitive lands for greenbelts, and identify these lands for acquisition in municipal open space plans. Hire local or regional open space coordinators to oversee implementation of the plan. Establish open space zoning bylaws with strong development restrictions (e.g. mandatory cluster provisions) for greenbelt areas. (Example: Amherst, MA)

Adopt farmland preservation zoning to preserve prime agricultural lands. Several options are available to communities, including:

Farmland cluster zoning, which requires clustering of houses on the less agriculturally productive portion of a parcel, while preserving the most important farmland soils as open space. (Examples: Amherst, MA; Granby, MA; Southampton, MA).

Transfer of development rights ordinances, which the transfer of rights to develop property from parcels in a "sending zone", where open space and farmland is being preserved, to parcels in a "receiving zone", where more dense development is permitted. (Examples: Eden, NY; Buckingham, PA; Chesterfield, NJ; Sunderland, MA).

Preserve not only farmlands but also farm operations, by creating economic and tax incentives to keep farms in business. Options include: "right-to-farm" districts; zoning bylaws which encourage farmstands, farmer's markets and other farm-related businesses; promotion and education on the benefits of state programs such as the Agricultural Preservation Restriction Program and Chapter 61a property tax reductions; targeted marketing programs for locally-grown farm products; seeking new state legislation for reduction of farm taxes, such as excise taxes on farm machinery.

Require a dedication of protected open space, parks or recreational lands in close proximity to major residential developments, or a financial contribution to a municipal open space fund.

Create blueways along rivers, lakes and streams by adopting river protection overlay zones, to supplement provisions in the Massachusetts River Protection Act. Control waterfront uses to ensure they are compatible with waterways and maximize public visual and physical access to waterways. (Examples: Chester, Chesterfield, Middlefield, and Worthington, MA)

Preserve waterfront lands (or easements) for public access and open space to the maximum extent feasible; in order to provide waterfront trails, parks, boat and fishing access. Options include: zoning bylaws to encourage negotiated waterfront public access easements as part of waterfront developments; public acquisition of waterfront lands or easements through grant programs such as the Urban Self-help Program; land trusts dedicated to acquiring or accepting donations of waterfront lands.

Seek municipal approval of real estate transfer taxes to fund a local or regional Land Bank for open space acquisition, pending approval of general state enabling legislation or special regional legislation for such taxes. Funds are raised for a land bank through a small levy on real estate transactions (e.g. 1% or 2%). Some land banks exempt the first (e.g.$100,000). (Examples: Nantucket, Cape Cod and Martha's Vineyard, MA)

9. Protect Environmental Quality and Prevent Pollution

Establish zoning standards for improved environmental protection and pollution control.

Protect drinking water sources by adopting water supply protection zoning overlay districts for reservoir watersheds and aquifer recharge areas. Bylaws should prohibit hazardous land uses, establish

environmental performance standards, and require recharging of aquifers. Intergovernmental compacts should be developed to ensure complete protection of aquifers which cross municipal boundaries. (Examples: Barnes Aquifer Protection Advisory Committee and compact in Easthampton, Holyoke, Westfield and Southampton, MA)

Prevent pollution to rivers and lakes by requiring non-point source pollution best management practices, such as no-cut vegetated buffers along water bodies, erosion and sedimentation controls, and on-site stormwater recharge.

Prevent new construction in environmentally sensitive areas by adopting overlay zoning districts for floodplains, steep slopes and ridgelines in order to minimize flooding, control erosion and sedimentation, and prevent degradation of scenic areas. (Example: Monson, MA)

Create urban stormwater runoff bylaws, promoting measures to recreate natural filtration processes, such as constructed wetlands, drainage swales, and extended time detention basins. Require that impervious surfaces are minimized and on-site infiltration is maximized. (Example: Holyoke, MA)

Adopt municipal policies for correction of combined sewer overflows. Seek innovative CSO correction strategies and funding sources.

10. Control Commercial Strip Development

Change zoning along major highway corridors to prevent commercial strips from developing, and encourage clustering of new commercial development in nodes. Minimize automobile dependency by creating new commercial centers that are transit-friendly and accessible to pedestrians, bicyclists and transit.

Replace highway business zoning districts that extend along the entire length of highways and create multiple zoning districts for specific purposes. For example, districts can include a limited business district; historic village center business district, planned business village district, multi-family residential district, auto mall district and light industrial research park district. Most retail uses should be clustered in compact, pedestrian-friendly nodes or centers. Land along the highway between centers should be converted over time from auto-dependent; strip retail uses to apartments, condomini ums and office buildings - uses generating fewer auto trips than shopping.

Create a building streetline along arterials, by establishing zoning for maximum setbacks, parking in the rear of buildings, sidewalks and street trees in the front of buildings. A streetline creates a more aesthetically pleasing walking experience, and moving buildings up to the street improves pedestrian access.

Focus new, large-scale development along highways in planned business villages with on-site housing and pedestrian-friendly site plans.

Establish commercial development performance standards for all highway business uses, including “big box” retailers. Create standards for landscaping, screening, signage, curb cuts, parking, pedestrian and transit access, architectural design, lighting and environmental impacts. Discourage drive-in services.

Provide density bonuses for shared parking areas and common driveways. (Examples: Hadley, Granby and Northampton, MA; Fort Collins, CO)

Establish traffic management bylaws, including requirements for trip reduction plans and traffic impact statements for large-scale developments. (Example: Hadley, MA)

Adopt regulations to require businesses to include sidewalks, internal pedestrian circulation systems and stronger pedestrian connections to adjacent areas. Locate transit stops immediately adjacent to shopping and work entrances with covered waiting areas.

Establish limited access highways, where appropriate, through designation by Massachusetts Highway Department. Other deterrents for strip arterial shops could include a ban on curb cuts, the creation of medians, or zoning changes to encourage apartment and office developments over retail.

Create boulevards, with a planted median, by redesigning sections of arterial. Create a wide sidewalk shared by pedestrians and bicyclists, and angled on-street parking.

11. Improve Infrastructure in Urban Areas and Limit Infrastructure Expansions

In urban areas, target public funds for improvement and upgrading of infrastructure, such as sewer and water facilities, streets and roads, to promote private reinvestment. In rural areas, limit infrastructure expansions to prevent urban sprawl. The availability and adequate capacity of infrastructure is a key factor guiding the timing and location of new development.

Establish policies limiting extension of sewer and water lines beyond designated growth areas.

Seek targeted state and federal funding for improvement of urban infrastructure, such as correction of combined sewer overflows, water treatment facilities, road improvements, schools, police and fire protection, parks and recreation, burial of power lines and others.

F. Environmental Improvement Strategies

The Pioneer Valley Region must also address the need for environmental improvements associated with existing and proposed transportation systems. Actions targeted at preventing or mitigating potential negative environmental impacts should accompany the efforts toward improving the transportation system. The ISTEA legislation identifies this concern by providing funding sources such as the STP enhancement set-aside, the Scenic Byways Program and the National Recreational Trails Funding Program.

Examples of environmental improvement projects which may be eligible for federal funding include: mitigation of water pollution due to stormwater runoff; landscaping and aesthetic improvements; acquisition of scenic and historic sites along transportation corridors; scenic or historic highway programs; bicycle and pedestrian facilities; archaeological planning and research; preservation of abandoned rail corridors; control and removal of outdoor advertising; historic preservation and rehabilitation of historic transportation facilities. These activities may be eligible exclusively or in conjunction with highway projects.

Several proposed actions are outlined below which address the various areas on environmental concerns.

1. Water Quality Goals

The Pioneer Valley region should employ “Best Management Practices” (BMPs) to prevent and reduce urban runoff from highways and streets and mitigate its impacts to surface and groundwater drinking water supplies, rivers, lakes and streams. BMPs should be incorporated into the design and construction of all transportation projects, including redevelopment projects, to mitigate impacts to water resources. Project proponents should be strongly encouraged to capitalize on opportunities to retrofit existing BMPs to increase removal rates of pollutants such as total suspended solids (TSS), fertilizers,

and heavy metals, common contaminants found in highway run-off. Existing BMPs can be upgraded in several ways, including constructing artificial wetlands, and enhancing existing retention and detention areas with forebays to collect sediment for easy removal. A comprehensive inventory of needed urban runoff control projects should be undertaken in order to prioritize projects for future funding.

Combined sewer overflows adversely affect water quality in the Connecticut River and is a primary concern to the region. In older urban municipalities, such as Springfield, Chicopee, Holyoke, Agawam, West Springfield, Ludlow, South Hadley, and Palmer, combined sewer systems need to be replaced with separate sewer systems. Sewer separation is an expensive and time consumptive process, because it usually requires excavating and repaving streets. Road and street repair and reconstruction projects provide valuable opportunities to reduce the costs associated with sewer separation projects.

Reduced roadsalting programs have been successfully implemented on state highways in Goshen, Cummington, Granby, Belchertown, Easthampton, and Pelham to mitigate salt contamination of sensitive water supplies. Under reduced roadsalt programs, winter highway salt application rates are decreased by as much as two-thirds, and alternative maintenance practices, such as salt substitutes, pavement additives, increased sanding and plowing, and public education are employed. There are many other public and private water supply areas which are crossed by state highways or other major roads, and could benefit from reduced roadsalting policies. A comprehensive program should be undertaken to study the region's water resources (reservoirs, aquifer recharge areas and public and private wells), the watersheds, and transportation infrastructure (highways and roads). Sensitive areas should be identified, and reduced road sand and salt programs and additional mitigation measures should be initiated and implemented in these areas.

2. Air Quality Goals

The most successful strategies for reducing emissions are lowering the level of pollution emitted by individual vehicles through improved technology, reducing traffic congestion by improving intersection levels of service; and lowering overall vehicle use through a reduction in vehicle miles traveled (VMT) and the number of trips. Reducing engine emissions is highly dependent on research of reformulated gasoline, improved exhaust filters and scrubbers, increased vehicles inspection regulations and experiments with alternate fuels such as compressed natural gas and electric vehicles. Maximizing the efficiency of intersections is strictly a traffic engineering problem, and is accomplished through signal coordination and timing. The Clean Air Act and ISTEA, however, promote the use of both "supply-side" and "demand-side" strategies to achieve reductions in vehicle use. The RTP previously addressed supply-side strategies such as travel demand management, traffic control measures and alternate modes. The primary demand-side strategy for reduced emissions is through land use regulations.

Land use regulations and zoning bylaws that encourage mixed-use and high-density forms of development reduce low density sprawl and provide a balance of both jobs and housing in close proximity. Impact fee ordinances for new development can be employed by municipalities and can be used to provide transit, pedestrian and bicycle facilities for the community. Trip reduction zoning can be used to ensure that each new development project considers and includes alternatives to single occupan vehicle access.

G. Long Range Projects

1. 2010 Projects

a) Maple Street Bridge Improvements, Chester

The Maple Street Bridge is located in the western section of the Town of Chester and spans the western branch of the Westfield River. This bridge provides access from Route 20 to Main Street and was closed to vehicular traffic in 1981. As currently proposed, the bridge would be restored as a pedestrian/bicycle facility providing one lane of traffic in the northbound direction.

This project is expected to provide access from Route 20 to downtown Chester via Maple Street without increasing traffic flow along Main Street. The projected traffic volume along the Maple Street Bridge is approximately 200 vehicles per day.

b) Additional Ramp from 291 to West Columbus Ave, Springfield

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 proposed alternative is 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.

The new ramp is expected to reduce traffic flow along the existing I-291 ramp and the I-91 Exit 7 ramp as a result of vehicles choosing the shortest path to the Memorial Bridge. This direct path from I-291 to the Memorial Bridge should alleviate any safety hazards and congestion along I-91 due to weaving across the three lanes of traffic. In addition a decrease in traffic flow is expected along I-91 between the existing I-291 Ramp and Exit 7, which provides access to the Memorial Bridge. The I-91 Exit 7 ramp is further expected to decrease flow as vehicles will be utilizing the direct exit. The new ramp is projected to have an average traffic flow of approximately 10,882 vehicles. Traffic along the existing I-291 ramp and the I-91 segment between the existing ramp and Exit 7, is expected to decrease by 25%. In addition the I-91 Exit 7 ramp providing access to the Memorial Bridge from I-91 had a projected decrease in traffic flow by 53%.

c) Damon Road, Northampton Widening and Resurfacing

Damon Road in Northampton connects traffic from Route 9 to Kings Highway. The Kings Highway intersection with Damon Road serves as access to traffic from downtown Northampton to points north of the city, retail uses along Kings Highway 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 Kings Highway. The signal at this interchange would be re-timed to reduce congestion at this signal.

The model shows a projected traffic volume of 24,511 for the year 2010, along Damon Road reflecting a 27% increase. However, even with the additional traffic volumes, there is a reduction in travel time along the road by approximately 16% in the southbound direction. The decrease in travel time is influenced by the increase in travel speed by 15%. The northbound direction along this corridor experienced a decrease in congested travel time by 21% which resulted in travel speeds increasing by 19%. 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 Kings Highway interchange should also aid in reducing congestion at this interchange.2020 Projects

2. 2020 Projects

a) Relocation of Route 57 in Agawam and Southwick

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.

Projected traffic volumes along the Phase One portion of Route 57 increased over 51% as a result of the project. This may be due to additional changes in the 2020 network including the reconstruction of the South End Bridge in Springfield. The projected traffic flow improvements in this area confirm that Phase Two of the Route 57 project is an important improvement to the regional transportation system.

b) Reconstruction of South End Bridge, Springfield

The South End Bridge in Springfield 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. A Study for this area commissioned by MassHighway recommends construction of a new slip ramp off of the bridge to create direct access from the bridge to Route 57 westbound. Improvements are also needed to the I-91 corridor between Exits 1 and 3 to correct an existing lane reduction from three to two lanes and difficult weaving movements from the existing I-91 access ramps. Ideally, three travel lanes would be maintained on I-91 in each direction.

The projected traffic volume for the improved South End Bridge is approximately 70,559 vehicles. This represents a 19% increase relative to volumes on the existing South End Bridge.

Traffic volumes 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 the on and off ramp system located along this corridor increases travel speeds and decreases travel time.

3. 2025 Projects

a) Elmwood Bypass, Holyoke

Interstate 391 currently ends at High Street just north of the downtown Holyoke area. As a result, traffic congestion occurs through this neighborhood from northbound vehicles destined to Route 5 and the Holyoke Mall. A direct link between I-391 and Route 5 would alleviate traffic congestion throughout this area, while improving traffic conditions through these local residential neighborhoods.

The new roadway is proposed directly link Route 5 to I-391. The Elmwood Bypass would follow the right-of-way parallel to the west of the existing Pioneer Valley Railroad and connect to Route 5, (Northampton Street) just south of Whiting Farms Road.

The projected traffic volume along the Elmwood Bypass is 10,187 vehicles. Traffic volumes along South Street and Laurel Street both experienced significant decreases in traffic. The model shows this project should reduce congestion on local streets while providing vehicles a direct connection to points north of I-391.

b) Route 66 Connector, Northampton

The Route 66 project entails the construction of a new road connecting Old South Street and Route 66. It will allow traffic to access Route 66 while bypassing the intersection of Routes 9 and 10, which is the busiest intersection in Downtown Northampton.

c) Route 21 Bridge Reconstruction and Widening, Ludlow

This bridge is part of Route 21 spanning the Chicopee River between Springfield and Ludlow. Reconstruction and widening of the bridge would relieve traffic congestion along this heavily traveled corridor.

4. Non-motorized Transportation Projects

A number of off-road and on-road projects were identified and an implementation schedule has been developed within the Non-motorized Transportation Plan. The short range projects (between 2 to 12 years) that focus on off-road facility improvements include the: Norwottuck Easterly Extension, the Belchertown Rail Trail, the Norwottuck Westerly Extension, the Willamsburg extension of the Northampton Bikeway, Manhan Rail Trail Project in Easthampton, the Chicopee Riverwalk and Bikeway Project and the Southwick Rail Trail. The short range on-road projects include the: UMass to Norwottuck Connector via University Drive, the region-wide improvement of bicycle parking facilities, the State Street/Wilbraham Road bicycle lanes in Springfield, the Route 5 Northampton to Holyoke roadway improvement project, the Holyoke east-west signed bicycle route, and the Westfield Route 10/202 bikeway.

The off-road, long range priorities (to be implemented in the next 8 to 20 years) includes the Ludlow Bikeway project, the Connecticut Riverwalk and Bikeway project as it has been planned to eventually extend the entire length of the river from the Connecticut state line through to the Norwottuck Rail Trail in Hadley and Northampton, and the Hazardville Rail Trail. The long range on-road projects include the Route 116/141 Holyoke-Chicopee bridge improvement, the Route 5 Holyoke to Springfield road improvement, the Route 5/57 Agawam/Springfield bridge improvement and redesign, the Northwest Road in Westfield road improvement project, the Route 9 Belchertown road improvement project, the Route 32 Palmer/Ware roadway improvement project, and the East and Southeast Springfield roadway improvement project.

5. Transit Improvement Projects

a) Farebox Upgrade

An upgrade in farebox technology would have a significant effect on the PVTA. This is considered as a long range improvement because of the large investment needed to facilitate the upgrade. New Fareboxes will increase ridership by making buses more convenient. Correct change would no longer be necessary for potential riders since new fareboxes are capable of producing change.

As smart card technology continues to advance, the farebox system could automate transit data collection. The data collected, which was surveyed manually in the past, would be highly accurate. Furthermore, the smart card system could be utilized to obtain even more detailed ridership information just by encoding the cards with demographic and socioeconomic information. With the increase in information, better routing and operation will result.

b) Fleet Improvement Schedule

The average lifespan of a bus is 12-17 years; therefore, every vehicle in the fleet will need replacement at least once before the year 2025. The lifespan of a bus could easily shorten due to increasing regulations on emissions and accessibility, because it may not be feasible to retrofit a bus with satisfactory improvements.

CHAPTER 11

Financial Element

Title 23 CFR Section 450.322 and 310 CMR 60.03(9) require 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 in the reauthorization of TEA-21. Estimates of the projected revenue sources have been made by the PVPC based on past historical trends and information available from the estimated apportionment of the federal authorizations contained in the proposed Safe and Flexible Transportation Efficiency Act of 2003 (SAFTEA) bill. This section will be updated based on the latest information received from MassHighway as soon as it becomes available. Financial constraint will be maintained in the 2003 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 the proposed Safe and Flexible Transportation Efficiency Act of 2003 (SAFTEA) bill, 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 proposed as part of the FY2004 TIP.

Estimate of available transit revenue for this update which include farebox, local, state and federal sources were aggregated through the life of the RTP using the funding total from the most recent data and based on historical data from the PVTA. A summary of the projected transportation revenue from 2004 – 2028 is presented in Table 11-1.

Table 11-1 - Projected Revenue

Revenue Source	Projected Funding 2004 - 2028
Federal and State Highway Funding (includes state match)	$1,305,460,096.40
Federal Transit Funding Section 5307 formula	$178,290,661.75
Section 5309 Discretionary Funds	$102,200,000.00
Section 5310 (Elderly and Persons with Disabilities)	$3,175,000.00
Section 5311 (Non-urbanized Area Formula	$13,750,000.00
Discretionary State Capital Assistance	$44,572,665.44
Local assistance	$137,992,925.00
Fairbox Revenue	$185,344,450.00
Federal Grants	$12,500,000.00
State Contract Assistance (SCA)	$331, 159,400.00
Total	**$2,3142,445,198.59**

B. Expenditures

1. Operating and Maintenance

A review of the past Transportation Improvement Programs was conducted to estimate the annual programmed funds for system operating and maintenance activities for all transportation modes. Transit fleet and capital improvement estimates are based on average equipment lifespan and past spending history. The following assumptions should be noted:

- Annual estimates do not take into account inflation.
- Off-TIP project funding has been included in the financial element.
- Annual Highway and Bridge Maintenance is 75% of the total Highway and Bridge Funding.

A summary of the estimated operating and maintenance expenditures for the Pioneer Valley Region is presented in Table 11-2.

Table 11-2 - Operating and Maintenance Expenditures

System Expenditures	Annual Expenditure	Projected Funding
Annual Highway and Bridge Maintenance	$39,163,802.89	$979,095,072.30
Annual Transit Operations & Maintenance	$30,734,219.00	$768,355,475.00
Annual Commuter Rail Operating Expenses	$1,000,000.00	$25,000,000.00
Annual Transit Capital Investment	$8,000,000.00	$200,000,000.00
Sub-Total		**$1,972,450,547.30**

2. Future Projects

The RTP must identify the recommended transportation projects categorized by their air quality conformity status. Projects identified as non-exempt must be included in the air quality conformity analysis for the appropriate conformity year based on the expected completion date of the project. Projects that have not been defined to the extent to determine their exemption status have been asumed to be “non-exempt” for the purposes of this plan. All project costs must be estimated and summed over the twenty-five year life of the plan. The cost of the projects identified reflect generic project cost estimates provided by the Commonwealth and/or the most recent Transportation Improvement Program. Projects recommended for further study may not have any associated costs due to a lack of planning or design data. A summary of the estimated funding requirements for specific transportation projects in the Pioneer Valley Region is presented in Table 11-3.

Table 11-3 - Recommended Transportation Project Cost Estimates

Project Description	City/Town	Total Cost
Bikeway-Main Street to Robinson State Park	Agawam	$635,000
South End Bridge Improvements	Agawam	$80,000,000
Route 57 Phase II- Route 187 to Southwick Town Line	Agawam	$28,000,000
Route 5 Resurface from S. End Bridge to Elm Street	Agawam/W. Spfld	$2,000,000
Route 116 Relocation: 530 ft. north from South Hadley Line	Amherst	$1,100,000
UMass Multimodal Transfer Center	Amherst	$10,000,000
Downtown Intermodal Center	Belchertown	Further Study
Route 20 west 1.7 miles-Route 20 safety-sidewalk	Brimfield	$1,500,000
Maple Street Bridge Enhancement: Restoration	Chester	$614,288
Montgomery St. Bridge: Route 141 B#C-12-011 (Deady Mem.)	Chicopee	$4,7000,000
Grattan Street	Chicopee	$4,000,000
Chicopee Riverwalk	Chicopee	$1,115,781
Connecticut Riverwalk Plainfield Street to Nash Field	Chicopee	$1,289,000
Front Street reconstruction/replace signals	Chicopee	$4,000,000
Rte 116: Repair: BR# C-13-012,H-21-030	Chicopee/Holyoke	$18,750,000
Rotary Improvements	E. Longmeadow	$900,000
Construct Rail Trail- Est Longmeadow to Springfield Line	E. Longmeadow	$560,045
Manhan Rail Trail-Northampton to Easthampton	E'Hmptn/N'Hmptn	$1,500,00
Manhan/Norwottuck Rail Trail connections	E'Hmptn/N'Hmptn	$780,500
Route 9 widening-West Street to Coolodge Bridge	Hadley	$2,200,000
Norwottuck Rail Trail Parking Enhancements	Hadley	$100,000
Route 9 Connecticut River Crossing Study	Hadley/Northampton	Further Study
Commercial Street-Reconstuction:I-391 to Appleton Street	Holyoke	$2,000,000
Holyoke Canal Walk	Holyoke	$6,500,000
Elmwood Bypass	Holyoke	$24,000,000
Transfer Center	Holyoke	$1,750,000
Route 202/Westfield Intersection Improvements	Holyoke	$400,000
Route 5 Signal Coordination	Holyoke/W. Springfield	$1,000,000
Route 5 Traffic Signal Improvements	Longmeadow	Further Study
Rte 21: Reconstruction:BR# L-16-008 over Chicopee River	Ludlow/Spfld.	$15,000,000
Damon Road Reconstruction: Rte 9 to King St. (Rte. 5)	Northampton	$2,700,000
Improvement: Signalization North Maple/Bridge Road	Northampton	$175,000
Northampton Bikepath-Look Park Extension to Williamsburg Line	Northampton	$1,500,000
Manhan Rail Trail-Norwottuck Rail Trail Downtown Connector Link	Northampton	$1,600,000
Route 66 Connector	Northampton	$1,500,000
Norwottuck Rail Trail Damon Road Extension	Northampton	$729,750
Business Park link with Route 66 and Route 10	Northampton	$250,000
Earle Street State Hospital property access	Northampton	$600,000
Route 9 at Bridge Road improvements	Northampton	$300,000
Downtown Intermodal Center	Northampton	Further Study
Route 32 Reconstruction: Stimpson St. to Ware Line	Palmer	$4,000,000
Alternative energy source fueling stations	Regionwide	Further Study
Southern I-91 ITS study	Regionwide	Further Study
ADA Automotive Announcing System	Regionwide	$5,000,000
AVL transit system integrator	Regionwide	$1,875,000
Regional Park and Ride Lot Improvements	Regionwide	$1,000,000
Commuter Rail-Springfield to New Haven	Regionwide	$12,000,000
College Street, Woodbridge Street	South Hadley	$2,800,000
Route 10/202 Resurface: Westfield CL to CT	Southwick	$4,000,000
Southwick Rails to Trails Bikepath along Penn. Central Line	Southwick	$2,600,000
Main Street at Dover Street intersection improvements	Springfield	$225,000
Parker Street Improvements	Springfield	$9,000,000
Central Street at Hancock Street intersection improvements	Springfield	$200,000
Highland Division Rail Trail	Springfield	$300,000
Union Station Redevelopment	Springfield	$24,820,000
I-291 Slip Ramp	Springfield	$3,000,000
Intersection realignment-Rte 20 with Chestnut/Second Street	W. Springfield	$320,000
Install signals at Bernie Ave and Prospect Street	W. Springfield	$375,000
Route 20 reconstruction Second Street to Sibley Avenue	W. Springfield	$3,000,000
Route 5 to Brush Hill connector	W. Springfield	$925,000
Intersection improvements-Amostown Road at Dewey Street	W. Springfield	$320,000
Improvements to rail underpass	W. Springfield	$2,900,000
Ware River Valley Greenway Trail and Covered Bridge Preservation	Ware	$1,400,000
Great River Bridge: Construction: BR# W-25-010 over the Westfield River	Westfield	$20,000,000
Rte 187 traffic improvements-Highway and Bridge improvements	Westfield	$3,500,000
Columbia Greenway Rail Trail	Westfield	$8,000,000
Downtown Intermodal Center	Westfield	$5,000,000
	TOTAL	**$340,309,364**

C. Financial Constraint

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. A demonstration of Financial Constraint is presented in Table 11-4. As can be seen from the table, the Pioneer Valley Regional Transportation Plan is financially constrained over the life of the plan.

Table 11-4 - Financial Constraint

Projected Revenue	$ 2,314,445,198.59
Projected Operations and Maintenance	$ 1,972,450,547.30
Estimated Project Costs	$ 340,309,364.00
Total Revenue	$ 2,314,445,198.59
Total Expenditures	$ 2,312,759,911.30
Net	$ 1,685,297.29

CHAPTER 12

Conformity

A. Introduction

The 1990 Clean Air Act Amendments (CAAA) require Metropolitan Planning Organizations within nonattainment areas to perform air quality conformity determinations prior to the approval of Transportation Plans and Transportation Improvement Programs. 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 2003 Regional Transportation Plan of the Pioneer Valley MPO, as required by Federal Regulations 40 CFR Part 93, and the Massachusetts Conformity Regulations (310 CMR 60.03). This information and analyses include: regulatory framework, conformity requirements, planning assumptions, mobile source emissions budgets, and conformity consultation procedures.

1. Legislative Background

Western Massachusetts has been classified as "serious" ozone nonattainment area. This area includes all of Berkshire, Franklin, Hampden, and Hampshire counties. With this nonattainment classification, the CAAA require 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 by 1999 and beyond.

As of April 22, 2002, the City of Springfield was re-designated to be in 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 the City 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.

The CAAA and the Commonwealth acknowledge that mobile sources are among the major sources of emissions of VOCs, Nox, and CO. Prior to the 1990 amendments, the majority of pollution control measures focused on stationary industrial sources. The Massachusetts 1993 Emissions Inventory indicated that on-road mobile sources emit approximately 28% of the total VOCs, 43% of the total NOx and 56% of the total CO emissions (summer day) in the state. Mobile source CO emissions on a winter day are approximately 78% of the total statewide CO emissions.

The Commonwealth revised its State Implementation Plan (SIP) which was submitted to the United States Environmental Protection Agency (EPA) on November 15, 1993. This SIP revision is a strategy of programs to show Reasonable Further Progress of a 15% reduction of VOCs in 1996 toward attainment of the National Ambient Air Quality Standards (NAAQS) for ozone in 1999. A large number of the programs target mobile sources, including an enhanced inspection and maintenance program, reformulated gasoline, and California Low Emissions Vehicle Program. It also included a VOC mobile source emission budget for 1996.

A second major revision to the SIP was submitted to EPA in December 1994. This submission included programs to provide a further reduction of 9% in NOx emissions. NOx reduction credits will be taken from stationary sources through NOx Reasonably Available Control Technology (RACT), and from mobile sources through the Enhanced Inspection and Maintenance Program, the California Low Emission Vehicle Program, and the Tier I Federal Vehicle Standards. A NOx emission budget for 1999 and each year thereafter and a VOC emission budget for 1999 and each year thereafter were included in this submission. In addition, the 1996 VOC budget was revised.

In March of 1997, DEP submitted a 1996 Rate of Progress Report describing the progress to date on the SIP commitments that were submitted to EPA in 1993 and 1994. At that time they had the opportunity to make any revisions and corrections to programs that were submitted to ensure that the ozone air quality standards would be achieved by 1999. As part of the 1996 Progress Report, DEP revised the mobile source emission budget. Previously, the mobile source budget was developed using the Highway Performance Monitoring System which uses traffic count data from spot locations along different functional classes of roadway to determine vehicle miles of travel in the region. The new mobile source emission budget was calculated using transportation demand models maintained by the regional planning agencies. In addition, some inputs to the emissions model were changed.

On October 1, 1998, DEP submitted to EPA a technical correction to the Massachusetts SIP for Ozone, which included a 2003 mobile source emission budget. This budget was found adequate for conformity purposes by EPA on February 19, 1999, and was used in conformity determinations that were approved by FHWA on January 12, 2001, and again on September 25, 2002 (in August 2002, the Berkshire MPO had completed another RTP update).

2. Conformity Regulations

The CAAA revised the requirements for designated MPOs to perform conformity determinations by ozone non-attainment area for their Transportation Plans and Transportation Improvement Programs (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 2003 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; and
- will not delay the timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The EPA issued final conformity regulations in the November 24, 1993 Federal Register and Massachusetts DEP issued new conformity regulations effective December 30, 1994. They set forth requirements for determining conformity of Transportation Plans, Transportation Improvement Programs, and individual projects. The federal conformity regulations were amended on August 15, 1997. 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

(i) 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 below:

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 is 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.

The baseline vs. action test, and the "less than 1990" emission test were required under the November 1993 conformity regulations. The 1997 Conformity Amendments have eliminated the emission reduction test once a Control Strategy SIP's mobile source emission budget has been deemed adequate by EPA. Conformity of this amendment will be showing consistency with the mobile source emission budget in the Western Massachusetts Ozone Nonattainment Area.

B. Conformity Determination Criteria

This conformity determination has been prepared in accordance with 40 CFR Part 93 - Transportation Conformity Rule Amendments: Flexibility and Streamlining; Final Rule. It shows that 2003 Regional Transportation Plan for the Pioneer Valley MPO has been prepared following all the guidelines and requirements of the rule.

1. Horizon Year Requirements

Horizon years for regional model analysis have been established following 40 CFR 93.106(a) of the Federal Conformity Regulations. The years for which the model was run are shown below.

1990 - Milestone Year - This year was established as the original base year in the SIP for calculation of emission reductions of VOCs, NOx and CO (This year has become outdated and is no longer represented in the modeling).

1997 - Milestone Year – A former base year for the regional travel demand models.

2000 - Milestone Year – This year is currently being used by the statewide travel demand model as the new base year for calculation of emission reductions of VOCs and NOx.

2003 - Milestone Year – Attainment year

2007 - Analysis Year

2015 - Analysis Year

2025 - Horizon Year – last forecast year of transportation plan

2. Latest Planning Assumptions

a) Population, Households, Employment and Traffic 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 2003 Regional Transportation Plan for the Pioneer Valley MPO and other regional plans, the Massachusetts Highway Department (MassHighway) developed a series of forecasts – in cooperation with all the MPOs – that represent the most recent planning assumptions for most of Massachusetts (the Berkshire MPO retained certain planning assumptions that differed from the final MassHighway series, so the forecast results from that MPO are used in the conformity analysis).

Assumptions are based on U.S. Census data, data from the Massachusetts Department of Employment and Training (DET), the MassHighway forecasts, and other sources of information (used directly or indirectly), including from the Massachusetts Institute of Social and Economic Research (MISER), Woods & Poole Economics, and the U.S. Bureau of Labor Statistics (BLS). The following is a list of the major sources of data used for the 2003 Regional Transportation Plan for the Pioneer Valley MPO analysis (further explanation of forecast methods used can be found in Chapter 9 of the Plan):

- **Population:** Summary File 1 Data for Massachusetts from the 2000 U.S. Census of Population and Housing. Statewide and regional historical data for 1970, 1980, and 1990.

- **Population Forecasts:** MassHighway Statewide and Regional Population Forecasts 2007-2025, June 2003. Subsequent municipal forecasts developed (PVPC), June 2003.

- **Households:** Summary File 1 data for Massachusetts from the 2000 U.S. Census for Population and Housing. Statewide and regional historical data for 1970, 1980, and 1990.

- **Household Forecasts:** MassHighway Statewide and Regional Household Forecasts 2007-2025, June 2003. Subsequent municipal forecasts developed (PVPC), June 2003.

- **Household Sizes:** Calculated using Households and "Population in Households" data from Summary File 1 for Massachusetts and regions from the 2000 U.S. Census of Population and Housing. Similar calculations from historical data (1970, 1980, 1990).

- **Employment:** Town-level total employment from Massachusetts Department of Employment and Training (DET ES-202 data), historical data by town, 1980, 1990, and 2000, plus employment by industry sector for 2000 by town.

- **Employment Forecasts:** MassHighway Statewide and Regional Employment Forecasts 2007-2025, June 2003. Subsequent municipal forecasts developed by PVPC, June 2003.

- **Vehicle Ownership:** Summary File 3 data for Massachusetts from the 2000 U.S. Census of Population and Housing.
- **Traffic Volumes:** Massachusetts Highway Department, "2001 Traffic Volumes for the Commonwealth of Massachusetts" (contains data from 1992 – 2001), June, 2002.
- **Traffic Counts:** Additional traffic counts taken by MassHighway and PVPC.
- **Project-Level Data:** Obtained from the responsible implementing agency.

b) Transit Operating Policy Assumptions

The operating policies and assumed transit ridership have not changed since the conformity determination prepared for the 2000 Regional Transportation Plan**.**

c) Emission Inventory Assumptions

For this regional transportation plan, conformity is determined against the Massachusetts State Implementation Plan (SIP) mobile source emission budgets submitted in March of 1997 and October of 1998 for VOC and NOx. The VOC mobile source emission budget for 2003 for the Western Massachusetts Nonattainment Area has been set at 23.770 tons per summer day and the 2003 mobile source budget for NOx is 49.110 tons per summer day.

The Pioneer Valley MPO VOC and NOx emissions are included with the following MPOs to show conformity with the SIP in the Western Massachusetts Ozone Nonattainment Area:

- Berkshire Region MPO
- Franklin Regional Council of Governments*

* This region is considered to be an MPO for planning purposes.

MassHighway's Bureau of Transportation Planning and Development, on behalf of the Executive Office of Transportation and Construction (EOTC), estimated the results for all the MPOs in the Western Massachusetts Ozone Nonattainment Area using a statewide travel demand model (the Berkshire MPO model results were substituted as the latest planning assumptions for the conformity analysis). The air quality analysis has been finalized for all of the MPOs and the EOTC has made the final conformity determination for this ozone nonattainment area.

d) Latest Emission Model

Emission factors used for calculating emission changes were determined using MOBILE 6, the model used by DEP in determining the mobile source budget. Emission factors for motor vehicles are specific to each model year, pollutant type, temperature and travel speed. MOBILE 6 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. The inputs used for the 2000 base case existing network were the same as those used in determining the latest Emissions Inventory for the Commonwealth of Massachusetts. The inputs used for the years 2000 through 2025 were also received from DEP and include information on programs that were submitted to EPA in 1993, 1994, 1997, 1998 and 1999 as the control strategy for the Commonwealth to obtain ambient air quality standards for 1999 and beyond.

e) Timely Implementation of Transportation Control Measures

Transportation control measures (TCMs) have been required in the SIP in revisions submitted to EPA in 1979, 1982 and those submitted as mitigation for the construction of the Central Artery project. Those SIP TCMs included in the 1979 and 1982 submission for implementation in the Pioneer Valley Region have all been accomplished through construction or through implementation of ongoing programs. These projects have all been included past Pioneer Valley MPO Transportation Plans and TIPs.

DEP submitted to EPA their 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 and beyond. Within that strategy, there are no specific TCM projects. Traffic flow improvements to reduce congestion and, therefore, improve air quality are encouraged. 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

f) Consultation Procedures

The final conformity regulations require that the MPO must make a conformity determination according to consultation procedures set out in the federal and state regulations and it must also follow public involvement procedures established by the MPO under federal metropolitan transportation planning regulations.
The consultation requirements of both the state and federal regulations require that the Pioneer Valley MPO, EOTC/MassHighway, Mass. DEP, EPA - Region 1 and FHWA - Region 1 consult on the following issues:

- Selection of regional emissions analysis models including model development and assessing 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 of the agencies listed above.

g) Public Participation Procedures

Title 23 CFR Sections 450.324 and 40 CFR 90.105(e) require that the development of the Plan, TIP, and related certification documents provide an adequate opportunity for public review and comment.

Section 450.316(b) 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 March 3, 2003 and March 18, 2003, public notices were advertised in the Springfield Union News (now called the "Republican") and Daily Hampshire Gazette informing the public of its right to attend a series of public hearings to comment on the document. On May 12, 2003, public notices were advertised in the Springfield Republican and Daily Hampshire Gazette informing the public of its right to comment on the document. On August 13, 2003, the Pioneer Valley Joint Transportation Committee recommended that the MPO endorse the RTP and conformity determination as amended. Consequently, on September 10, 2003, the Pioneer Valley MPO voted to approve the 2003 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.

h) Financial Consistency

Title 23 CFR Section 450.324 and 40 CFR 93.108 require the 2003 Regional Transportation Plan for the Pioneer Valley MPO 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 2003 Regional Transportation Plan for the Pioneer Valley MPO and its latest conformity determination 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 federal authorizations contained in the proposed Safe and Flexible Transportation Efficiency Act of 2003 (SAFTEA) bill, as allocated to the region by the state or as allocated among the various MPOs according to federal formulas or MPO agreement. Projections of state resources are based upon the allocations contained in the current Transportation Bond Bill and historic trends. Therefore, the 2003 Regional Transportation Plan for the Pioneer Valley MPO substantially complies with federal requirements relating to financial planning.

C. Procedures For Determining Regional Transportation Emissions

The federal conformity regulations set forth specific requirements for determining transportation emissions. A summary of these requirements and the procedures used for this plan are summarized below:

1. Demographic, Employment and Transportation Demand

Specific sources of population, households, employment and traffic information used in the Transportation Plan have been listed above. Chapter 7 of the Plan presents conditions and characteristics of the existing regional transportation system.

Chapter 10 of the 2003 Transportation Plan discusses trends and changing demands that various components of the transportation system will serve in the future years. It discusses the future roles of the highways, transit, pedestrian and bicycle travel and water travel. It also describes the development and evaluation of alternative scenarios that were analyzed to help determine the final recommendations of the 2003 Transportation Plan.

Chapters 8 and 10 of the 2003 Transportation Plan outlines the specific project recommendations that are set forth in the Transportation Plan for the Pioneer Valley MPO Region through the year 2025. The recommended projects have been included in the regional transportation model networks for the analyses performed for the latest conformity determination of this transportation plan amendment.

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 projects have been exempt from regional modeling emissions analysis. The categories of 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, and
- 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 Baseline and Action Networks are composed of projects proposed in the approved Transportation

Improvement Programs, and the 2003 Transportation Plan. Projects in the Baseline networks consist of all in-place regionally significant and transportation demand management projects plus all projects where one of the following steps has occurred within the last three years:

- Comes from first year of the previously conforming TIP,
- Completed the NEPA process, or
- Currently under construction or are undergoing right-of-way acquisition.

A listing of the projects that meet these criteria and are included as part of the Baseline and Action networks is shown below. These projects include:

Palmer, intersection improvements at Route 20 and 181, Shearer's Corner
Chicopee, construction of a bridge over Chicopee River, connect with Route 41
Holyoke/South Hadley, construction of a bridge over Conn. River, Routes 116/141
Agawam, construction and relocation of Rte 57, East Phase
Springfield, construction of new bridge over Chicopee River
Holyoke, expansion of the Holyoke Mall and intersection improvements
West Springfield, widening and signalization of I-91 Exit 13 B
Springfield, State Street signal coordination
Springfield, Boston Road improvements and signal coordination

The 2007 Network includes all projects in the 2000 Baseline and all new TIP projects expected to be completed by the end of 2007. Those projects include the following:

Westfield, Route 20 traffic signal coordination
Chicopee, Route 33 traffic signal coordination
Amherst/Hadley, Route 9 traffic signal coordination
Holyoke/West Springfield, Rte 5 signal coordination
Hadley, widen Rte 9 to four lanes from West Street to Coolidge Bridge
Hadley/Northampton, rehabilitation of the Coolidge Bridge (lane addition)
Springfield, reverse the direction of four existing I-91 ramps
Springfield, improvements to Parker Street
Chicopee, Deady Memorial Bridge improvements
East Longmeadow rotary improvements

The 2015 and 2025 Action Networks include the following regionally significant projects:

Agawam, Rte 57 relocation from Rte 187 to Southwick town line
Holyoke, Commercial Street extension project
Holyoke, construct Elmwood Bypass, from Rte 391 to Lower Westfield Road
Westfield, Rte 10/202 bridge widening over Westfield River
Northampton, construct roadway from Old South Street to Route 66
Northampton, improvements to Damon Road
Ludlow/Springfield, Route 21 Bridge reconstruction
Springfield, construct a new off ramp from I-291 to East Columbus Avenue
Agawam/Springfield, I-91/South End bridge improvements, I-91 improvements
Chester, Maple Street bridge

In addition to emissions calculated from the network model, a separate analysis was performed off-model to determine emissions from the installation of Express Bus Service in Springfield and Intermodal Transportation Centers in the Pioneer Valley region (Springfield - Union Station , University of Massachusetts, Amherst, Westfield, Holyoke, and Belchertown).

2. Changes in Project Design Since the Last Conformity Determination Analysis

The Commonwealth requires that any changes in project design from the previous conformity determination for the region be identified. The last conformity determination was performed on the 2000 Transportation Plan. Changes which have occurred since this last conformity determination are as follows:

Conformity must be performed using new emission factors submitted by DEP, which reflect the latest assumptions (i.e., progress of the I/M program, etc.).

3. 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. The Pioneer Valley MPO has used the methods described in the conformity regulations in the analysis of this 2003 Regional Transportation Plan for the Pioneer Valley MPO.

4. Highway Performance Monitoring System Adjustments

As stated in guidance by EPA, all areas of serious ozone and carbon monoxide nonattainment must use the Federal Highway Administration's Highway Performance Monitoring System (HPMS) to track daily vehicle miles of travel (VMT) prior to attainment to ensure that the state is on line with commitments made in reaching attainment of the ambient air quality standards by the required attainment dates. MassHighway provides HPMS information to DEP. DEP used this information in setting mobile source budgets for VOCs, 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 is at present 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 has been developed which compares the 2000 HPMS VMT to the 2000 transportation model VMT. This adjustment factor is then applied to all modeled VOC and NOx emissions for years 2003 through 2025 to ensure consistency with EPA accepted procedures.

$$\frac{\text{2000 HPMS VMT}}{\text{2000 Modeled VMT}} = \text{Adjustment Factor for VOC and NOx}$$

HPMS adjustment factors are now calculated through the Statewide travel demand model on a regional basis. These factors are applied to model output of future scenarios, and occasionally change as base year models are updated or improved.

The latest factors for the Western Massachusetts Ozone Nonattainment Area are shown in Table 12-1.

Table 12-1 – Western Massachusetts NonAttainment Area Conversion Factors

County	2000 HPMS VMT (miles)	2000 Travel Demand Model VMT (miles)	HPMS/Model Conversion Factor
Berkshire	5,026,000	3,231,031	1.556
Franklin	3,500,000	2,396,793	1.460
Pioneer Valley	14,948,000	14,454,097	1.034
Western MA	**23,474,000**	**20,131,838**	**1.166**

5. The Conformity Test

a) Consistency with emission budgets set forth in SIP

The Pioneer Valley MPO has conducted an air quality analysis of the 2003 Regional Transportation Plan for the Pioneer Valley MPO. The purpose of the analysis is to evaluate the plan's air quality impacts on the State Implementation Plan (SIP). The analysis evaluates the change in ozone precursor (VOCs and NOx) emissions and carbon monoxide emissions due to implementation of the 2003 Regional Transportation Plan for the Pioneer Valley MPO. The modeling procedures and assumptions used in this air quality analysis follow the EPA's final conformity regulations issued on August 15, 1997. They are also consistent with procedures used by the Massachusetts Department of Environmental Protection to develop Massachusetts'1990 Base Year Emission Inventory, 1996 Reasonable Further Progress Plan, the,Post-1996 Reasonable Further Progress Plan, 1996 Rate of Progress Report, and the Ozone Attainment Demonstration for the SIP. All consultation procedures were followed to ensure that a complete analysis of the 2003 Regional Transportation Plan for the Pioneer Valley MPO was performed with consistency with the SIP.

The primary test to show conformity with the SIP is to show that the Air Quality Conformity of the 2003 Regional Transportation Plan for the Pioneer Valley MPO is consistent with the emission budgets set forth in the SIP. The Massachusetts Reasonable Further Progress Plan (RFP) was deemed complete by EPA on June 5, 1997. EPA determined that the 15% RFP SIP submittal contained an adequate mobile source emissions budget to conduct conformity determinations using the conformity criteria. In addition, the 2003 mobile source emission budget was found adequate for conformity purposes by EPA on February 19, 1999.

On behalf of the Executive Office of Transportation and Construction, the Bureau of Transportation Planning and Development estimated the emissions for VOC and NOx for all areas and all MPOs (emissions for the Berkshire Region were also estimated by MPO staff and were included in the final totals). The VOC mobile source emission budget for 2003 for the Western Massachusetts Nonattainment Area has been set at 23.770 tons per summer day and the 2003 mobile source budget for NOx is 49.110 tons per summer day. As shown in Tables 12-2 and 12-3, 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 12-2 - 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)
2000	n/a	31.845	23.770	n/a
2003	11.7201	19.540	23.770	-4.230
2007	8.7791	14.252	23.770	-9.518
2015	4.4025	7.255	23.770	-16.515
2025	3.3280	5.632	23.770	-18.138

TABLE 12-3 - 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)
2000	n/a	59.139	n/a	n/a
2003	28.0827	48.754	49.110	-0.356
2007	22.0636	36.405	49.110	-12.705
2015	8.0214	13.438	49.110	-35.672
2025	3.4632	5.950	49.110	-43.160

Note: The final emission estimates for the 2015 and 2025 analysis years are not yet available at the time of this printing. The final emission estimates will be available in subsequent versions of this draft RTP, and at the Pioneer Valley MPO meeting scheduled to endorse this document. Based on previous emission estimates, it is anticipated that the updated action emissions will fall within the emissions budget. The PVPC has developed an estimate of the change in the action emissions for the Pioneer Valley region using the regional transportation model. These estimates are shown in Table 12-4.

TABLE 12-4 - Estimated VOC and NOx Emissions for the Pioneer Valley Region

	VOC (in Tons/Summer Day)		NOx (in Tons/Summer Day)	
Year	2000 RTP	2003 RTP	2000 RTP	2003 RTP
2000	–	16.8667	–	42.4344
2003	14.0113	13.3298	29.6548	35.3801
2010	12.2527	7.6392	25.9482	18.3624
2020	13.6252	5.3973	28.9596	8.1325
2025	13.7745	6.2948	28.6691	5.384

D. Conclusion

The Clean Air Act Amendments of 1990 established new requirements for transportation plans, programs, and projects. EPA published a final rule in the November 24, 1993 Federal Register which was last amended on August 15, 1997 providing procedures to be followed by the United States Department of Transportation in determining conformity of transportation plans, programs, and projects with the SIP. Western Massachusetts has been designated as a Serious ozone nonattainment area. Federal conformity regulations require that transportation plans, programs, and projects evaluate their impact on nonattainment areas.

The Pioneer Valley MPO has conducted an air quality analysis of the 2003 Regional Transportation Plan for the Pioneer Valley MPO and its latest conformity determination. The purpose of the analysis is to evaluate the plan amendment's air quality impacts on the SIP. The analysis evaluates the change in ozone precursor emissions (VOCs, and NOx) due to the implementation of the 2003 Regional Transportation Plan for the Pioneer Valley MPO. The modeling procedures and assumptions used in this air quality analysis follow EPA's and the Commonwealth's guidance and are consistent with all present and past procedures used by the Massachusetts DEP to develop and amend the SIP.

The EOTC has found the emission levels from all areas and all MPOs in Western Massachusetts – including from the 2003 Regional Transportation Plan for the Pioneer Valley MPO— 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 2003 VOC mobile source emission budget for analysis years 2003 through 2025.
- The NOx emissions for the Action (build) scenario are less than the 2003 NOx mobile source emission budget for analysis years 2003 through 2025.

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 2003 Regional Transportation Plan for the Pioneer Valley MPO and its latest conformity determination conditionally conforms with 40 CFR Part 93, and 310 CMR 60.03, and is consistent with the air quality goals in the Massachusetts State Implementation Plan.

CHAPTER 13

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 an addressing as appropriate, disproportionately high an 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), MassHighway, 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 to 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 core 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.

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, 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 included in Tables 13-1 – 13-3.)

After reviewing three scenarios, the Environmental Justice target population for minorities was defining by using census block group data as: "any block group in which the percentage minority is greater than the percent minority of the region as a whole (21.9 percent). Other minority definition that were explored included: "Any census block group over 10% above the average percentage minority (any above 31.9%)" and "any census block group with over 50% minority."

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 percent above the regional average" minority definition was more inclusive but fell short of other goal of creating an analysis that would be clear to explain to the public at large as and clear to decision makers using the data for assessment. The "above the regional aver age" definition was unique in that outlying block groups were included without creating a large

Table 13-1 - 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:	**608479**	**100.00%**

Table 13-2 - Pioneer Valley Non-Hispanic or Latino Population Breakdown

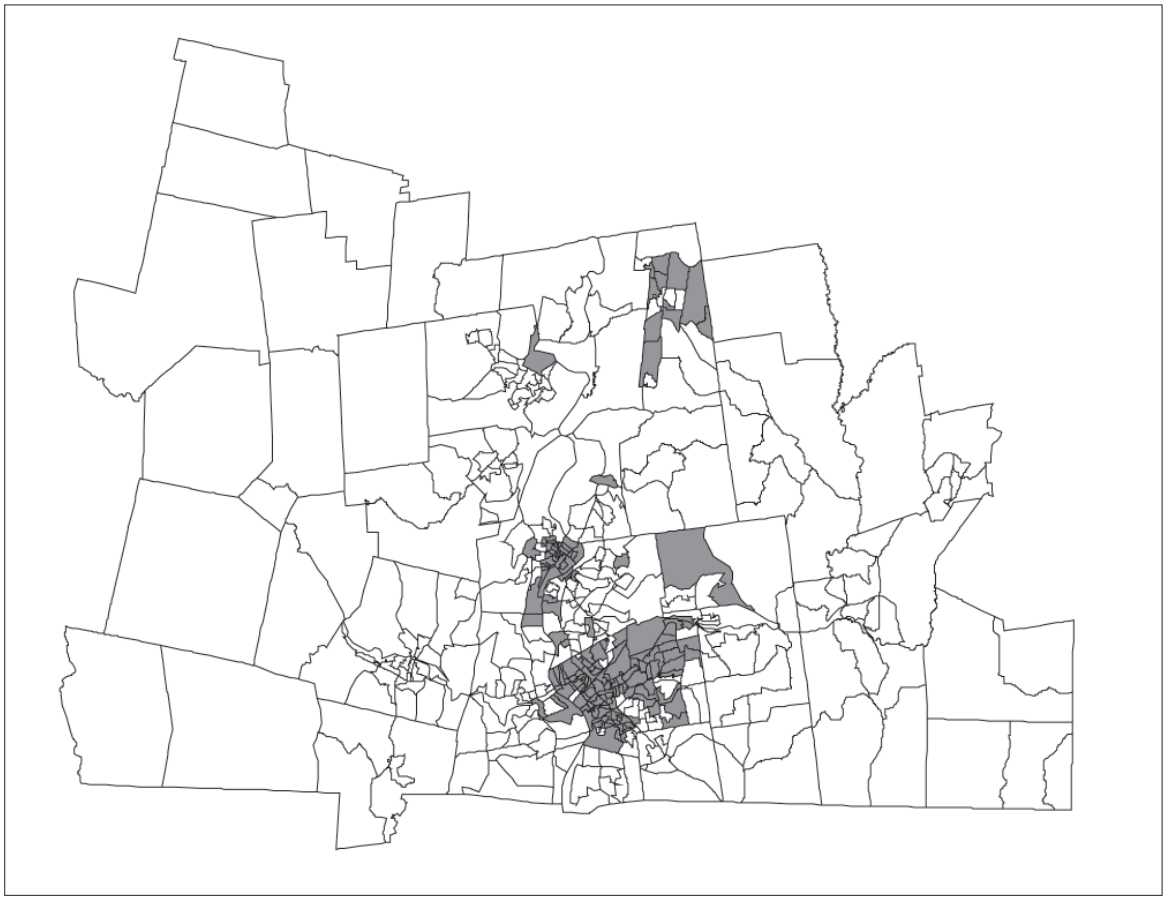
Race	Population	Percent
Not Hispanic or Latino:	534,070	87.77%
White alone	475,944	78.22%
Black or African American alone	36,774	6.04%
American Indian and Alaska Native alone	1009	0.17%
Asian alone	10,993	1.81%
Native Hawaiian and Other Pacific Islander alone	210	0.03%
Some other race alone	797	0.13%
Two or more races	8,343	1.37%

Table 13-3 - Pioneer Valley Hispanic or Latino Population Breakdown

Race	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%

geographic area that would rendered subsequent assessments inadequate. The Pioneer Valley Planning Commission's Joint Transportation Committee formally voted on and approved the "greater that average" definition in January of 2003.

Figure 13-1 - 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 in by similar MPOs. While the term "minority" is clearly defined under the US Census. The term "Low income" is not defined. The definition of "low income" for the purpose is referenced through official federal definitions as "poverty."

The six "low income" definitions include for evaluation included in 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:

Table 13-4 - 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

1. Any census block group where the poverty rate is 10% or more higher than that of the region (above 23.5%)

2. Any census block group where more than half the population lives below the poverty line.

3. 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%).

4. 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%).

5. Any census block group where more that half the population lives below 150% of the poverty line**.**

6. 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 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%).

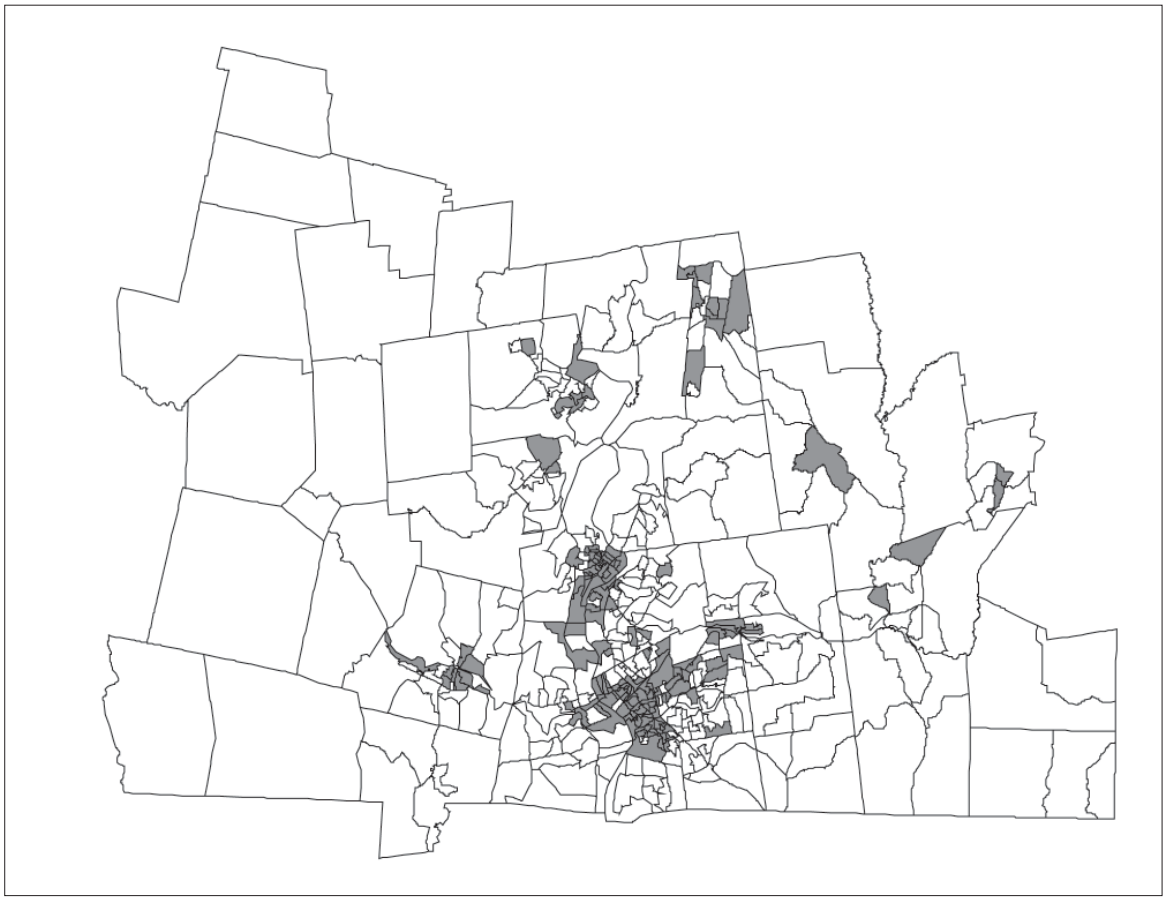
The definition is inclusive of 57,217 people living in 162 block groups and represents 73.7% of the low-income population. The 162 included block groups comprise 36% of the region's total (450). The geography of the low-income population includes the larger urban centers as well as smaller neighborhoods in Westfield and Ware.

D. 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 changes to the 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 developed a working relationship with the representatives of minority and low-income populations through the Plan for Progress, the Urban Investment Strategy Team, and the Welfare to Work Program and Regional Comprehensive Land Use Plan. These projects have created partnerships and working 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 in the development of the Transportation Improvement Plan and the Regional Transportation Plan. The goal was to examine all aspects of the transportation planning process and allow more opportunities for EJ target populations to become active and involved in the development of the planning tools that most affects their communities.

Figure 13-2 - 2000 Census Block Groups with a Poverty Rate Above that of the Region (13.5%)



1. Public Participation Action Items

The specific action items identified under this task include the following:

1. The PVPC will solicit input from the community regarding transportation planning efforts, including the Regional Transportation Plan and Transportation Improvement Plan.

2. Review existing public outreach and involvement plan. Early in the process PVPC will research similar Title VI public outreach efforts at other MPOs.

3. Make a presentation to the Plan for Progress Urban Investment Strategy Team regarding transportation planning in the region.

4. Expand public participation efforts related to the RTP and TIP to include local presentations at special group meetings, neighborhood council meetings and community activities.

5. Create a central file to document on-going public outreach efforts to minority and low-come populations. This effort will assist in documenting future activity.

6. Develop a protocol for responding to issues and concerns regarding Title VI.

7. PVPC staff will attend FHWA training workshops on Title VI.

8. Develop a special television broadcast related to Title VI and Environmental Justice for the PVPC "Region" cable access show.

9. Coordinate a presentation to JTC members regarding Title VI and Environmental Justice.

10. Survey surrounding regions for participation in Title VI and coordinate efforts between PVPC and CRCOG. Identify "best practice" examples from other regions.

11. Amend the PVPC Public Participation Plan to include bilingual outreach for all public participation efforts that impact target populations. This effort will include public notices for major planning documents (RTP, TIP, and UPWP) and transit surveys.

12. Expand public participation efforts related to the RTP and TIP to include local presentations at special group meetings, neighborhood council meetings and community activities.

In the summer of 2002 many of the EJ public participation tasks had begun. Staff attended two training workshops sponsors by FHWA and obtained copies of EJ plans from MPOs of similar size. FHWA's Environmental Justice staff was invited from Washington DC for a special presentation and overview of the EJ program to the Joint Transportation Committee. While visiting the region, FHWA representatives also videotaped a show for web broadcasting on "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, Urban Investment Strategy Team and followed up on inquiries from local communities on transportation issues and needs in their communities. In early 2002, 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. In addition, two public transit surveys were completed in bilingual format.

E. Equity Assessment Measures

Strategies: Four equity assessment strategies were developed under this task.

- *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.*

- *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.*

- *Identify and evaluate the availability of bus shelters for transit routes in minority and low-income neighborhoods and compare these to regional averages. including shelter availability)*

- *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.

1. 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 measures of effectiveness included the following:

1. **The 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 Figure 13-3 and 13-4.

2. **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 this service to regional averages. Specifically, each transit route was mapped through census block groups with the associated number of transit service hours provided to the 175 EJ census block groups. This LOS was compared to non-EJ census block groups. The measured average service hours demonstrated the balanced measure of service hours that PVPTA provides to EJ census block groups and formed a base for future decision making.See Figure 13-5.

3. **Transit amenities (including shelter availability).** Under this measure, staff did a field inventory of transit stops in PVPTA service area. Staff used GIS to identify the locations of bus shelters along PVTA routes and calculated a shelter/EJ population distribution for both EJ and non-EJ populations. The results of this analysis were not complete at the time of the RTP draft release. This information should be available for inclusion in the final RTP document. The shelter availability will be used to establish an accepted threshold and evaluate potential deficiencies.

4. **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. This proposed work will require the development of a transit layer to the regional transportation model.

2. Equity Assessment Action Items

The specific action items for equity assessment identified under this task include:

1. Incorporate the ability to model existing transit routes into PVPC's existing regional transportation model. At this time PVPC is examining options for incorporating a transit layer into the existing model. The task will be programmed into PVPC's FY2004 UPWP.

2. Annually update TIP expenditures by census block group and report findings to the Joint Transportation Committee.

3. Develop a process for evaluating transit service hour changes and impacts of future reductions in funding.

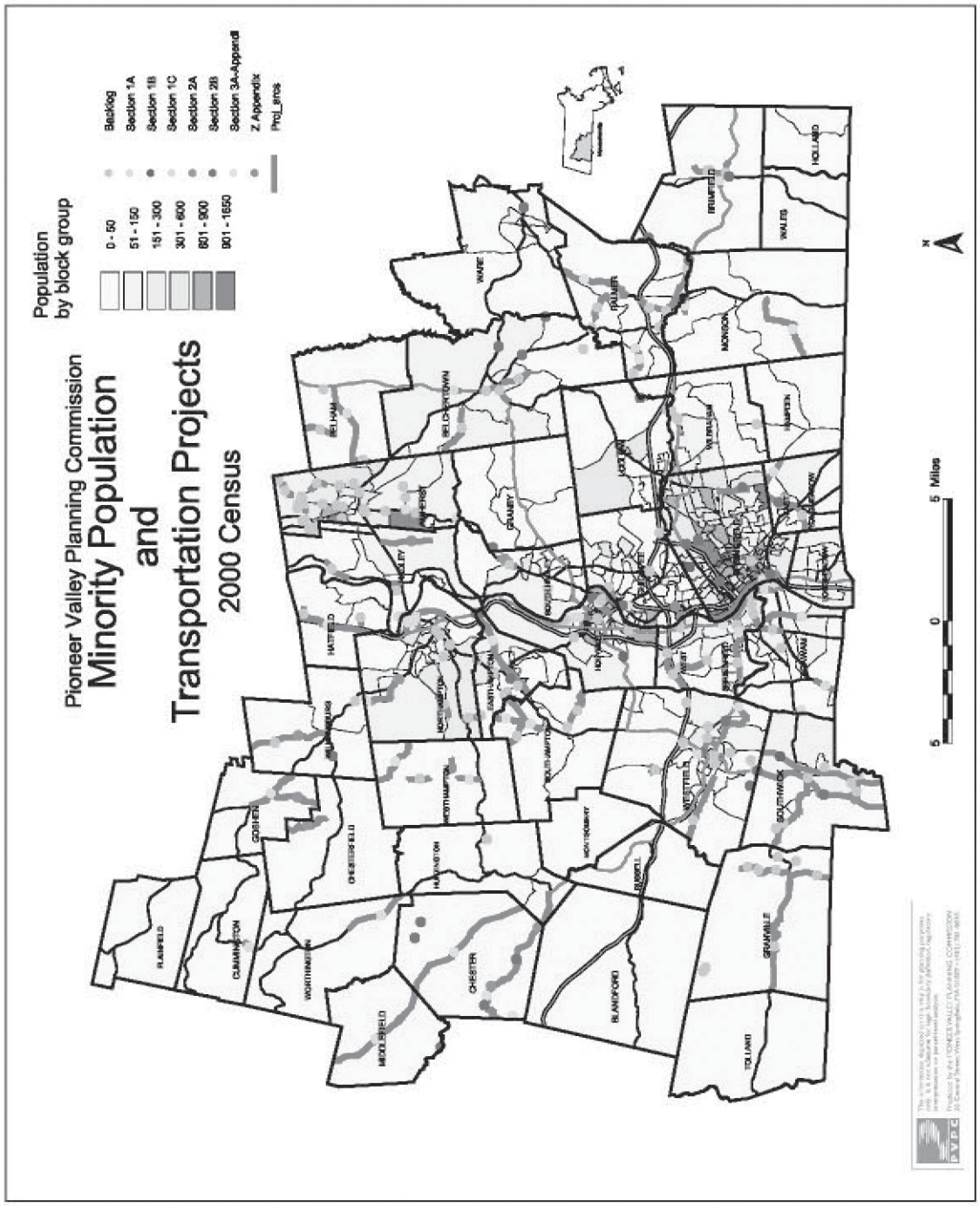


Figure 13-3- Minority Population and Transportation Projects

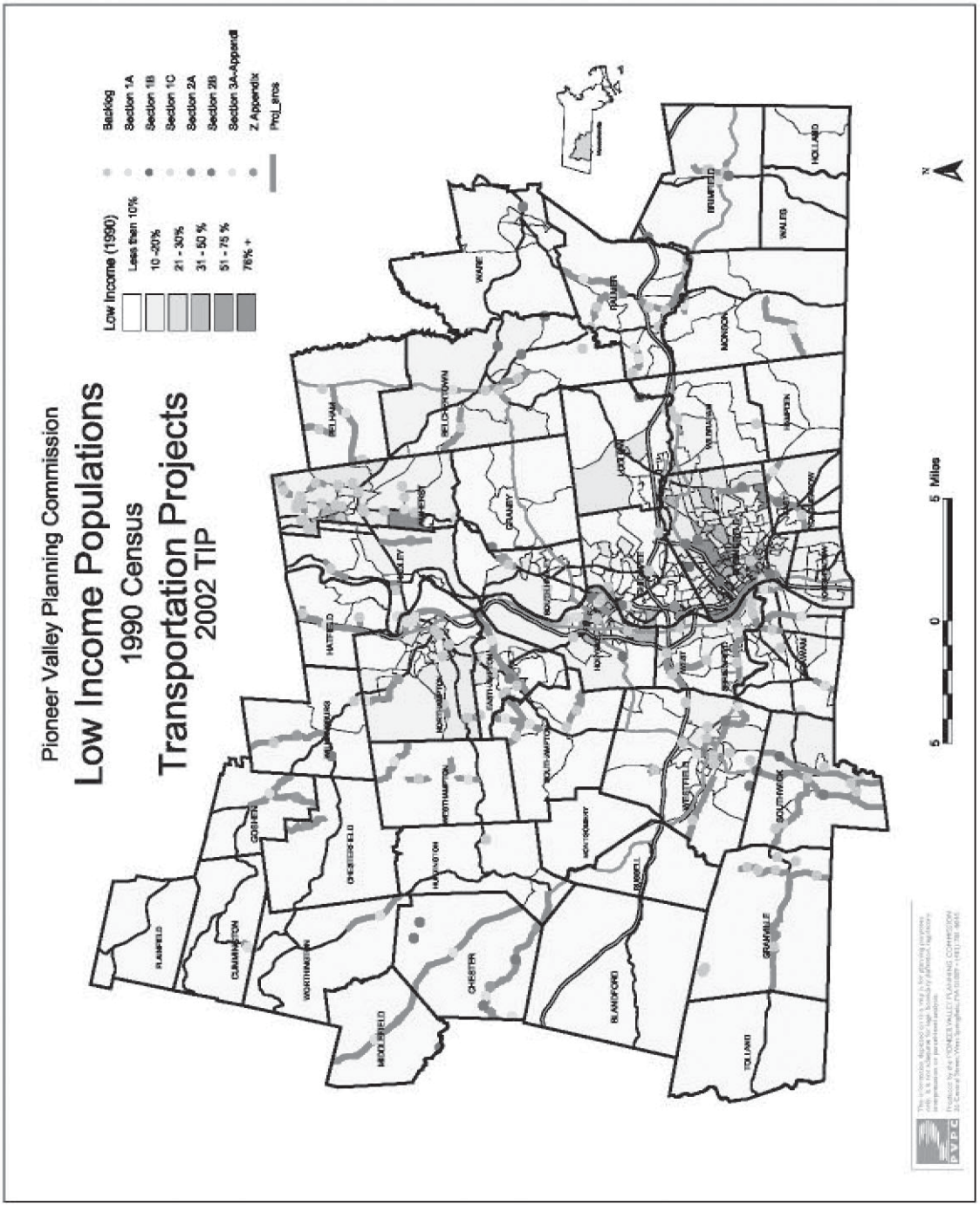


Figure 13-4- Low Income Population and Transportation Projects

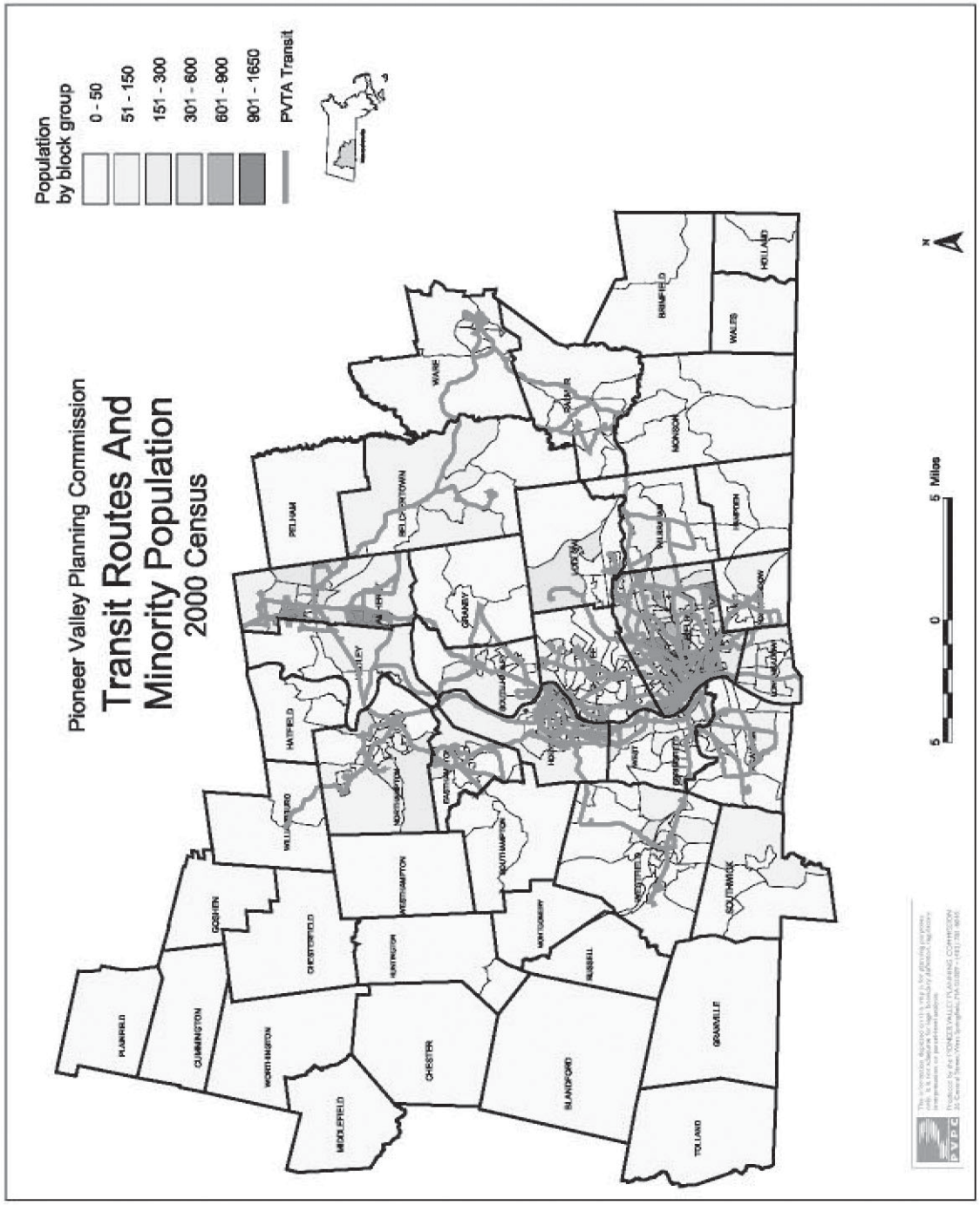


Figure 13-5- Transit Routes and Minority Population

4. Review and update the measures of effectiveness on 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.

5. 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.

6. 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 regular basis, incorporating new spending on projects listed in the TIP.

- 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 on-going review of the effectiveness of policies and practices related to EJ and Title VI.

1. 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?

2. Has the regional transportation model been upgraded to include existing transit operations?

3. 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?

4. Have Title VI reporting requirements been supplemented with a report to the JTC, identifying concerns, issues and actions?

5. Does the planning process use demographic information to examine the benefits and burdens of the transportation investments included in the plan and TIP?

6. 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?

7. 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?

8. What issues were raised, how are their concerns documented, and how do they reflect on the performance of the planning process?

9. 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?

10. 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 2003 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 and 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, 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, and requirements of Executive order 12898 (Environmental Justice) to give full and fair consideration to minority and low income resident in the region.

CHAPTER 14

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 2003 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, March 4, 2003 - Springfield City Hall, Room 220, 36 Court Street
- Wednesday, March 5, 2003 - Westfield City Hall, Room 201, 59 Court Street
- Thursday, March 6, 2003 - Amherst Town Hall, Town Room, 4 Boltwood Avenue
- Wednesday, March 12, 2003 - Northampton City Council Chambers, 210 Main Street
- Thursday, March 13, 2003 - Ware Town Hall, Selectman's Meeting Room, 126 Main Street
- Thursday, March 20, 2003 - Chesterfield Town Hall, 422 Main Road

The PVPC also maintained a public information booth at the Market Expo 2003 on Wednesday, April 23, 2003 at the Better Living Center on the Big E Grounds in West Springfield. Information was made available on the Draft RTP and PVPC staff was available to answer questions and receive public comment.

Two public meetings to solicit public comments on the Draft Regional Transportation Plan have been scheduled for 7:00 PM at the following locations:

- Tuesday, June 3, 2003 – Pioneer Valley Planning Commission, 26 Central Street, 3rd Floor, West Springfield
- Wednesday, June 4, 2003 - Northampton City Hall Public Hearing Room, 210 Main 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 Planning Department; the West Springfield office of PVPC; and, on-line from PVPC's web page at www.pvpc.org.

All public meetings were advertised in Legal Notices published in the Springfield Republican and Hampshire Daily Gazette. Information regarding the public participation process was also mailed to all City and Town Clerks, posted on the PVPC webpage, and sent via a press release to local media organizations. The thirty day public review process began on May 12, 2003 and ended on June 10, 2003.

Table 14-1 - Comments Received on the Draft RTP for the Pioneer Valley MPO

Comment	From	Affiliation	Date Recieved
Identify name of MPO on document cover	Kenneth Miller	MassHighway	7/31/2003
Identify MPO for policy and recommendation statements	Kenneth Miller	MassHighway	7/31/2003
Incorporate "Fix It First" and "Communities First" policies into the plan's goals.	Kenneth Miller	MassHighway	7/31/2003
EOTC/MassHighway disagrees with the statement regarding funding problems in Chapter 8, Section B(5).	Kenneth Miller	MassHighway	7/31/2003
Plan should consider roundabouts.	Bob White	NorthEast Area Roundabouts	7/10/2003
Status of proposed Route 66 connector in Northampton.	Daryl G. LaFleur	Northampton resident	6/6/2003
Better public transportation connections are necessary between Sprinfield and Northampton/Amherst.	Sue Bartone	Easthampton Resident	6/4/2003
There is no frequent, affordable public transportation to the metro-Boston area.	Sue Bartone	Easthampton Resident	6/4/2003
Better public transportation connections are required between Springfield and Worcester.	Sue Bartone	Easthampton Resident	6/4/2003
PVTA should consider "flex" transit service in more locations.	Sue Bartone	Easthampton Resident	6/4/2003
Plan should show the coordination between future housing development and transportation.	Sue Bartone	Easthampton Resident	6/4/2003
Bicycle should be allowed on all forms of public transportation all year round.	Sue Bartone	Easthampton Resident	6/4/2003
Plan should consider a new interchange for the Massachusetts Turnpike to link to Route 20 in Blandford or Chester.	Stephen Ricci, Susan Schneider via BRPC	Berkshire County Residents	4/9/2003
Access roads to Barnes Airport are in need of repair and require upgrades to support current traffic volumes.	Chris Willenborg	Barnes Airport	4/23/2003
Consider using one of the new travel lanes on Route 9 as an HOV lane during peak hours	Amherst Transportation Committee	Town of Amherst	4/8/2003
Consider light rail adjacent to the Norwottuck Rail Trail along the Route 9 corridor.	Amherst Transportation Committee	Town of Amherst	4/8/2003
Consider options to extend commuter rail service from Worcester to Springfield	Amherst Transportation Committee	Town of Amherst	4/8/2003
Supplement the cost of transportation improvements with a regional tax.	Amherst Transportation	Town of Amherst	4/8/2003
Include information on the cost to drive a car in the RTP as compared to other living expenses	Amherst Transportation Committee	Town of Amherst	4/8/2003
The I-91 exit 19 should be upgraded to a full interchange.	Amherst Transportation Committee	Town of Amherst	4/8/2003
Transit service to South Hadley and Holyoke needs to be improved.	Amherst Transportation Committee	Town of Amherst	4/8/2003
Explore the development of a new bikepath along the abandoned rail bed in East Amherst.	Amherst Transportation Committee	Town of Amherst	4/8/2003
Develop a "ride registry" for the region.	Amherst Transportation Committee	Town of Amherst	4/8/2003
Reference the "Zip Car" program in the RTP.	Amherst Transportation Committee	Town of Amherst	4/8/2003
Improved "on demand" lighting is required at bus stops.	Amherst Transportation Committee	Town of Amherst	4/8/2003
Parking programs should encourage and reward use of hybrid vehicles.	Amherst Transportation Committee	Town of Amherst	4/8/2003

Table 14-1 - Comments Received on the Draft RTP for the Pioneer Valley MPO (cont.)

Comment	From	Affiliation	Date Received
The RTP should recommend the use of bio-deisel fuel for all regional transit buses.	Amherst Transportation Committee	Town of Amherst	4/8/2003
Regional "Rack N' Roll" program should be expanded to PVTA's southern tier routes.	Amherst Transportation Committee	Town of Amherst	4/8/2003
Restore transportation bond appropriation to repair the Miler Street/Cottage Avenue bridge that connects Ludlow and Wilbraham	Betty Socha	Ludlow Board of Selectmen	3/21/2003
Proposed infrastructure improvements to Route 57 and the South End Bridge need to advance to construction.	Mark Vatousiou	Agawam resident	3/5/2003
RTP should reference the concept of "indeed traffic."	James Lowenthal	Northampton resident	6/12/2003
Consider using a different term other than "improvement" to describe proposed projects.	James Lowenthal	Northampton resident	6/12/2003
Include information on the benefits of roundabouts in the Plan.	James Lowenthal	Northampton resident	6/12/2003
Consider recommending HOV lanes for the newly widened portion of Route 9.	James Lowenthal	Northampton resident	6/12/2003
There is a need for increased public transit service to Bradley International Airport.	James Lowenthal	Northampton resident	6/12/2003
Increases in paratransit ridership fares will make the service expensive for the target users.	William Diamond	Northampton resident	6/7/2003
The RTP should stress the importance of express commuter bus routes.	William Diamond	Northampton resident	6/7/2003
The RTP should recommend that construction of the proposed Manhan Rail Trail be made a priority.	William Diamond	Northampton resident	6/7/2003
Preservation of existing rail service is important to the region and future.	Paul Hills	Town of Ware	3/13/2003
Ware could benefit from improved transit service to belchertown and the 5 College area.	Paul Hills	Town of Ware	3/13/2003
Updated the write-up on the MassCentral Railroad on page 75 to reflect that it is now operated by FingerLakes and that the Intermodal Center will soon close.	Michael Marciniec	Town of Palmer	8/28/2003
Updated the bicycle and pedestrian section to recommend that projects in the eastern part of the region be coordinated with proposed Worcester County projects when applicable.	Michael Marciniec	Town of Palmer	8/28/2003
Updated the Air Quality Conformity section to include information received from MassHighway.	Bob Frey	MassHighway	9/3/2003

CHAPTER 15

Pioneer Valley MPO Endorsement

PIONEER VALLEY MPO ENDORSEMENT SHEET

The signatures below signify that all members of the Pioneer Valley Region's Metropolitan Planning Organization, or their designees, have met on September 10, 2003 and discussed the following item for endorsement: The Pioneer Valley Region's Federal Fiscal Years 2004 Regional Transportation Plan.

Executive Office of Transportation and Construction (EOTC)
I, Secretary of the Executive Office of Transportation and Construction, hereby
☑ Endorse ☐ Do Not Endorse the above referenced item.

Daniel Grabauskas
Secretary - EOTC

9/10/03
Date

Massachusetts Highway Department (MHD)
I, Commissioner of the Massachusetts Highway Department, hereby
☑ Endorse ☐ Do Not Endorse the above referenced item.

John Cogliano
Commissioner - MHD

09-10-03
Date

Pioneer Valley Planning Commission (PVPC)
I, Chair of the Pioneer Valley Planning Commission, hereby
☑ Endorse ☐ Do Not Endorse the above referenced item.

Henry Barton
Chair - PVPC

Sept 10 2003
Date

Pioneer Valley Transit Authority (PVTA)
I, Vice-Chair of the Pioneer Valley Transit Authority, hereby
☑ Endorse ☐ Do Not Endorse the above referenced item.

Daniel Fitzpatrick — Date
Vice Chair - PVTA

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

Richard Kos — Date
Mayor-Chicopee

City of Westfield
I, Mayor of the City of Westfield, hereby
☑ Endorse ☐ Do Not Endorse the above referenced item.

Richard Sullivan — 9-10-03
Mayor-Westfield

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

Brian Ashe — Date
Selectman-Longmeadow

Town of Williamsburg
I, Board of Selectmen member of the Town of Williamsburg, hereby
☑ Endorse ☐ Do Not Endorse the above referenced item.

Chris Morris — 9/10/03
Selectman-Williamsburg