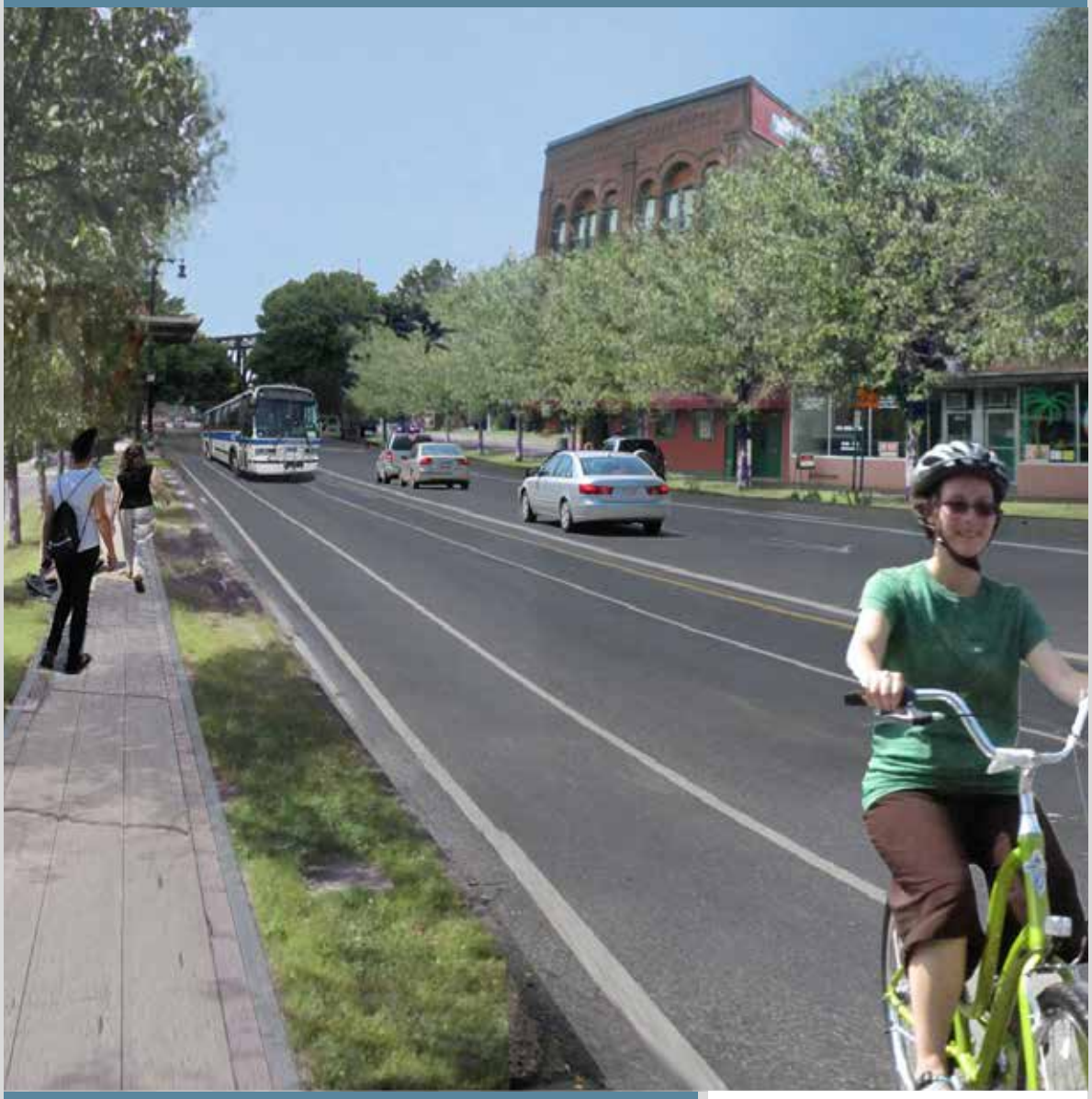
Pioneer Valley Planning Commission

Sustainable Transportation Element Plan

Improving Mobility.
Promoting alternative modes of transportation.



Produced by the Pioneer Valley Planning Commission with the support of the U.S. Department of Housing and Urban Development Sustainable Communities Initiative Regional Planning Grant Program.

February / 2014

Catalyst for Regional Progress
PVPC

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ACKNOWLEDGEMENTS

This project was funded through a Sustainable Communities Initiative grant from the U.S. Department of Housing and Urban Development (HUD), received by PVPC in partnership with the Capitol Region Council of Governments (CRCOG). PVPC would like to thank HUD and CRCOG for an outstanding partnership, and in particular acknowledge the efforts of the following staff:

Dwayne Marsh, U.S. Department of Housing and Urban Development (HUD)
Kate Dykgraaf, HUD
Lyle Wray, Capitol Region Council of Governments (CRCOG)
Mary Ellen Kowalewski, CRCOG

The work that provided the basis for this publication was supported by funding under an award with the U.S. Department of Housing and Urban Development. The substance and findings of the work are dedicated to the public. The author and publisher are solely responsible for the accuracy of the statements and interpretations contained in this publication. Such interpretations do not necessarily reflect the views of the Government.

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INTRODUCTION

ELEMENT PLAN PURPOSE

Sustainable transportation consists of the efficient use of existing resources to increase mobility while positively impacting economic development, quality of life, and the preservation of the natural environment. This document identifies the existing sustainable transportation initiatives in the region and develops strategies to improve the sustainability of the regional transportation system in the Pioneer Valley. The purpose of the plan is to identify how sustainability can be incorporated into the transportation planning process in order to meet existing needs without compromising the assets of future generations.

Much of the Sustainable Transportation Element Plan was developed from the current Regional Transportation Plan (RTP) for the Pioneer Valley. Last updated in 2012, the RTP embraces and integrates principles of sustainability and community livability. The present update further integrates sustainability principles activities, particularly those related to climate change, green house gas emissions and energy efficiency.

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 2035. It provides the basis for all state and federally funded transportation improvement projects and planning studies. This document is an update to the current RTP (last published in 2007) and is endorsed by the Pioneer Valley Metropolitan Planning Organization (MPO).

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

Although the RTP focuses on transportation, it is a comprehensive planning document. The Pioneer Valley has taken great strides in coordinating the RTP development process with other non-transportation planning efforts in the region. The plan 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.

A complete version of the RTP can be accessed at: http://www.pvpc.org/resources/transport/2011-rtp/2012%20Final%20RTP_9_21_11_web.pdf

VISION

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

GOALS

Thirteen transportation goals were developed to support the realization of the Vision of the plan for the Pioneer Valley MPO. Through cooperative planning efforts the region can maintain a dependable transportation system and develop strategies to maximize the efficiency of transportation funding for the region.

Safety	To provide and maintain a transportation system that is safe for all users and their property.
Operations and Maintenance	To provide a transportation system that is dependable and adequately serves users of all modes. To give priority to the repair of existing streets, roads and bridges.
Environmental	To minimize the transportation related adverse impacts to air, land, and water quality and strive to improve environmental conditions at every opportunity.
Coordination	To collaborate the efforts of the general public with local, state and federal planning activities.
Energy Efficient	To promote the reduction of energy consumption through demand management techniques and increase the use of energy efficient travel modes.
Cost Effective	To provide a transportation system that is cost effective to maintain, improve and operate.
Intermodal	To provide access between travel modes for people and goods while maintaining quality and affordability of service.
Multimodal	To provide a complete choice of adequate travel options that are accessible to all residents, visitors and businesses.
Economically Productive	To maintain a transportation system that promotes and supports economic stability and expansion.
Quality of Life	To provide and maintain a transportation system that enhances quality of life and improves the social and economic climate of the region.
Environmental Justice	To provide an equitable transportation system that considers the needs of and impacts on low-income, minority, elderly and disabled persons.
Land Use	To incorporate the concepts of Sustainable Development in the regional transportation planning process and integrate the recommendations of the current Regional Land Use Plan into transportation improvements.
Climate Change	To promote and advance transportation projects that reduce the production of greenhouse gasses, such as CO_2, and advance new energy technologies consistent with the Pioneer Valley Clean Energy Plan.

MOVING AHEAD FOR PROGRESS IN THE 21ST CENTURY ACT

On July 6, 2012, President Obama signed into law P.L. 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21). This new law funds surface transportation programs at over $105 billion for fiscal years (FY) 2013 and 2014. MAP-21 is the first long-term highway authorization enacted since 2005. MAP-21 creates a streamlined, performance-based, and multimodal program to address the challenges of maintaining and improving the U.S. transportation system. It builds on and refines many of the programs and policies established in 1991 to ensure that local communities are able to build multimodal, sustainable projects. Some of the provisions of MAP-21 include:

- Strengthens America's highways
- Establishes a performance-based program
- Creates jobs and supports economic growth
- Supports the Department of Transportation's (DOT) aggressive safety agenda
- Streamlines Federal highway transportation programs
- Accelerates project delivery and promotes innovation
- Protects the environment

TRANSPORTATION PLANNING

As part of MAP-21, the metropolitan and statewide transportation planning processes are enhanced to incorporate performance goals, measures, and targets into the project selection process. In addition, long-range plans must describe the performance measures, the targets used to assess system performance, and progress made to reach each target. Transportation Improvement Programs (TIP) are also required to demonstrate progress toward established performance targets. Criteria to establish the evaluation of performance measures in planning is forth coming.

MAP-21 establishes national performance goals for the following Federal Highway programs:

- **Safety**—To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- **Infrastructure condition**—To maintain the highway infrastructure asset system in a state of good repair.
- **Congestion reduction**—To achieve a significant reduction in congestion on the NHS.
- **System reliability**—To improve the efficiency of the surface transportation system.
- **Freight movement and economic vitality**—To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- **Environmental sustainability**—To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- **Reduced project delivery delays**—To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

Source: FHWA

PASSENGER TRANSPORTATION

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

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

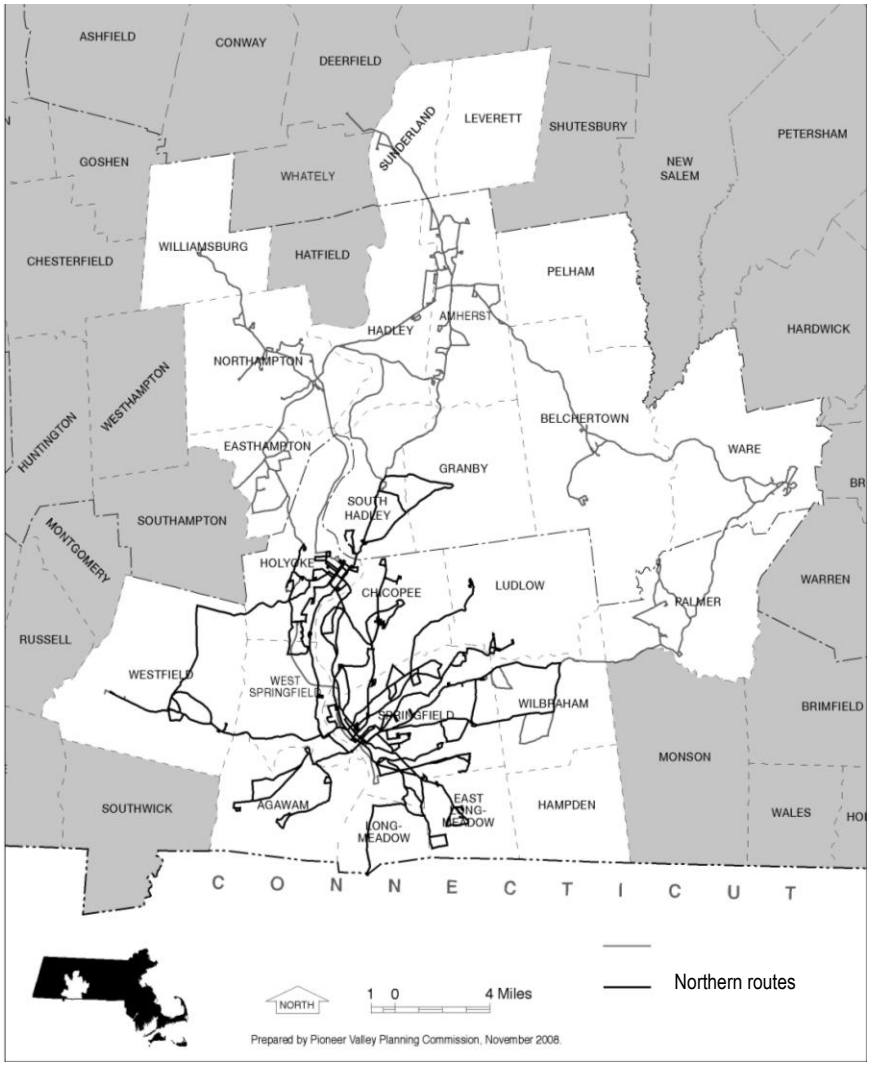
PIONEER VALLEY TRANSIT AUTHORITY (PVTA) BUS AND PARATRANSIT SERVICE

PVTA is the regional transit authority for the Pioneer Valley. It was created in 1974 to consolidate public transportation in the region. Today, PVTA provides service on 44 scheduled bus routes and on-demand paratransit van service in 24 communities with a total population of 575,616 (2011 U.S. Census estimate).

PVTA's funding comes from federal, state and local governments; passenger fares; and advertising. The authority's operating budget in FY13 is $38.9 million. The 24 member cities and towns of PVTA contribute an annual assessment based on the level of service received. Passenger fares cover about 18% of the total cost of the service. Funds for capital improvements are received through various state and federal grant programs and are not subject to forward funding.

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

Figure 1 - PVTA Service Communities and Scheduled Bus Routes

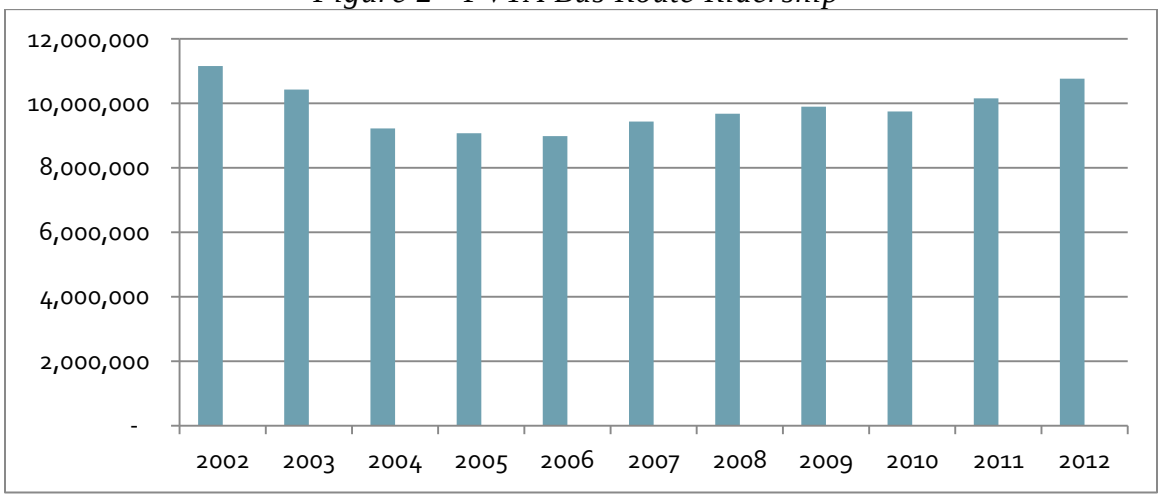


Agawam	Granby	Ludlow	Sunderland
Amherst	Hadley	Northampton	Ware
Belchertown	Hampden	Palmer	West Springfield
Chicopee	Holyoke	Pelham	Westfield
Easthampton	Leverett	South Hadley	Wilbraham
E. Longmeadow	Longmeadow	Springfield	Williamsburg

PVTA RIDERSHIP

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

Figure 2 - PVTA Bus Route Ridership



Fiscal years July 1 through June 30

Capital and service improvements implemented by PVTA during the 1970s-1990s resulted a ridership peak of nearly 13 million in 1985. However, state-imposed budget reductions in 2002 necessitated deep service cuts, eliminating nearly one-fifth of bus service, including many Sunday trips. Ridership fell during the following two years to about 9 million rides. From 2007 to 2010, ridership recovered to approximately 10 million rides per year, even though funding has not been restored to pre-2002 levels (when annualized for inflation). 2011 and 2012 saw ridership increases of 4% and almost 6% respectively with 2012 coming in at almost 11 million rides.

PVTA SCHEDULED BUS SERVICE

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

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

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

PVTA BUS RIDERS

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

Table 1 - PVTA Bus Route Ridership

Fiscal Year	Passenger Trips	% Change
2001	11,705,973	1.13%
2002	11,154,252	-4.71%
2003	10,427,793	-6.51%
2004	9,221,309	-11.57%
2005	9,071,913	-1.62%
2006	9,108,550	0.40%
2007	9,435,885	3.47%
2008	9,722,016	2.94%
2009	9,896,940	1.77%
2010	9,745,869	-1.55%
2011	10,152,538	4.01%
2012	10,872,898	5.70%

Fiscal years July 1 through June 30 Source: PVTA

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

PVTA BUS FLEET

PVTA's bus fleet consists of 162 vehicles from three manufacturers: 110 Gillig low-floor clean diesel vehicles manufactured after 2006, and 12 General Motors Rapid Transit Series (RTS) diesel vehicles manufactured in the mid to late 1990s. The most recent addition to PVTA's bus fleet is 40 GM Flyer buses that were purchased in 2011 and 2012. PVTA's plan is to replace all of their fleet with the GM Flyer buses. The RTS vehicles are the oldest in the fleet and will soon be retired. There are only 12 remaining. All buses provide comparable passenger amenities: all are air conditioned and equipped with wheelchair lifts or ramps. PVTA's buses are based at three garages, as shown below.

Table 2 - PVTA Bus Fleet

Bus Model	Springfield Garage (Southern Area)	Northampton Garage (Northern Area)	UMass Garage (Northern Area)	**Totals**
Gillig	*81	11	18	**110**
RTS	4	0	8	**12**
GM Flyer	**23	7	**10	**40**
Totals	**108**	**18**	**36**	**162**

**includes 1 diesel-electric hybrid*
*** includes 5 diesel-electric hybrids*

PVTA received funding to purchase 4 articulated buses from New Flyer Industries and delivery is anticipated in June of 2013. These articulated buses are 60 feet in length with a flexible midsection that reduces the vehicles turning radius. Some bus routes currently experience overcrowding and require more frequent service to meet demand. Sixty-foot articulated buses have the capacity to carry a total of 80-90 passengers when including standing room which allows a reduction in the number of buses used, saving operating costs while meeting demand. UMASS Transit and the Valley Area Transit Company will each receive two of these buses.

PVTA PARATRANSIT

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

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

Table 3 - PVTA Annual Paratransit Ridership

Fiscal Year	Annual Rides	% Change
2001	462,683	11.20%
2002	527,698	14.05%
2003	548,363	3.92%
2004	407,430	-25.70%
2005	373,622	-9.05%
2006	373,448	-0.05%
2007	299,529	-24.68%
2008	308,787	3.00%
2009	308,323	-0.15%
2010	317,733	2.96%
2011	318,869	0.36%
2012	316,208	-14.44%

Fiscal years July 1 through June 30 *Source: PVTA*

AMERICANS WITH DISABILITIES ACT (ADA) SERVICE

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

SENIOR DIAL-A-RIDE SERVICE

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

FRANKLIN REGIONAL TRANSIT AUTHORITY (FRTA) PARATRANSIT SERVICE

There are 14 additional towns in the PVPC region that are not members of PVTA and instead contract with the Franklin Region Transit Authority (FRTA), based in Greenfield, for paratransit service. These

towns are: Blandford, Chester, Chesterfield, Cummington, Goshen, Huntington, Middlefield, Montgomery, Plainfield, Russell, Southampton, Southwick, Westhampton, and Worthington.

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

COMMERCIAL SCHEDULED BUS SERVICE

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

BUS TERMINALS AND SERVICE LOCATIONS

SPRINGFIELD BUS TERMINAL

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

NORTHAMPTON BUS TERMINAL

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

HOLYOKE INTERMODAL CENTER

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

OTHER COMMERCIAL BUS SERVICE LOCATIONS

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

COMMERCIAL CARRIERS

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

PETER PAN BUS LINES

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

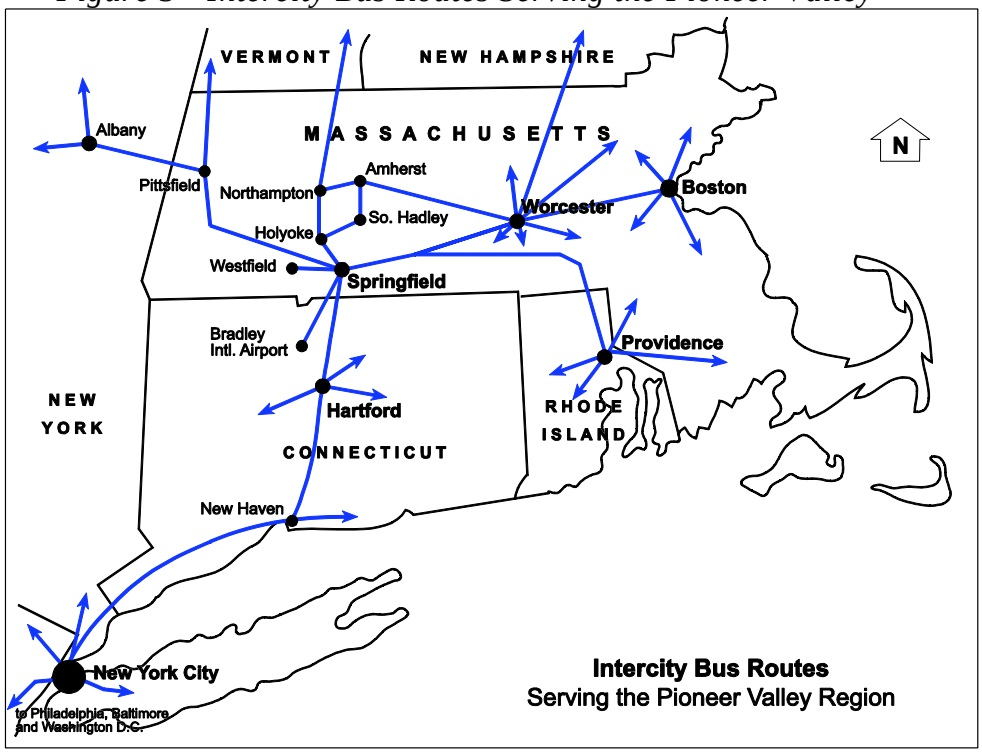
GREYHOUND LINES, INC.

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

MEGABUS

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

Figure 3 - Intercity Bus Routes Serving the Pioneer Valley



SHUTTLES, CHARTERS AND TAXIS

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

SHUTTLES

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

CHARTERS AND TOURS

Charter and tour bus services in the region provide special trips for tourism and other purposes within and outside the region. Commercial companies offer package trips and private party excursions to many attractions throughout the Pioneer Valley, including Yankee Candle Company in South Deerfield, Basketball Hall of Fame in Springfield, gambling casinos in Connecticut, Six Flags Amusement Park in

Agawam, senior tours to Atlantic City, and other recreational trips. Major charter and tour providers in the region include Peter Pan Bus Lines, King Ward Coach Lines and Laidlaw, Inc.

TAXIS

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

RIDESHARING

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

Ride sharing
Park and ride lots

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

MASSRIDES

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

NURIDES

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

UMASS RIDESHARE

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

ROUTE 9 CORRIDOR TRANSPORTATION MANAGEMENT ASSOCIATION

The Route 9 Corridor Transportation Management Association (TMA) is an organization composed of the University of Massachusetts, Cooley-Dickenson Hospital, the City of Northampton and private businesses in the area that offers transportation and carpooling incentives to member employees. Based on comments from the City of Northampton, this TMA is currently inactive. There are no immediate plans to reactivate the TMA.

CARPOOLING MATCHING SERVICES

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

COMMERCIAL CAR SHARING

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

PARK AND RIDE

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

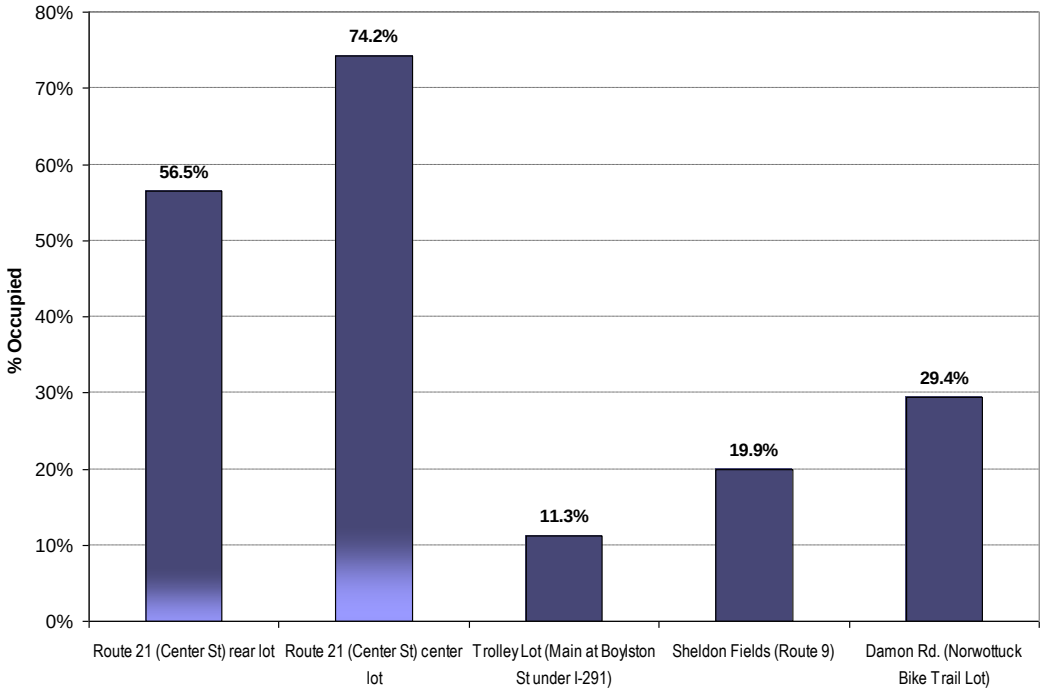
Ludlow MassPike Exit 7—Center Street (Route 21) at Cherry Street near MassPike (I-90) Exit 7. Two lots near the rear and center areas of the McDonalds parking lot. Used principally for carpooling and those parking to ride Peter Pan buses to Boston. Rear lot is formally designated; center lot is informal.

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

Northampton Norwottuck Rail Trail Lot—Damon Road near Bridge Street (Route 9). Mainly used for carpooling; no convenient PVTA stop. *Informal*.
Springfield Five Town Plaza Lot—Cooley and Allen Streets. Connection with PVTA G1 and Sumner Express. *Informal*.
Springfield Trolley Park Lot—Main Street at Boylston Street. Connection with PVTA G1, G2, B4, G19, P20, P21). This lot is also near the intersection of I-91 and I-291, making it attractive for regional commuters who may not wish to drive in downtown Springfield. Designated by City of Springfield.

MassDOT is currently finalizing plans to construct a 75 space park and ride lot at the Veterans Administration campus on Route 9 in the Leeds section of Northampton. Another park and ride lot was recently completed near the intersection of Routes 5, 10, and 116 in Whately. There are also numerous "informal" park and ride lots, often at shopping malls and commercial businesses near major highway access points. A summary of average weekday park and ride usage at known lots is presented below.

Figure 4 - Park and Ride Lot Average Daily Occupancy 2007-2009



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.

NORTH - SOUTH SERVICES

Most trains in Springfield are part of Amtrak's Northeast Corridor Business unit and have recently been branded as Acela Regional Service. This service includes six daily departures between 5:30 AM and 3:00 PM, and six arrivals between 10:00 AM and 10:30 PM. Amtrak provides frequent daily service between Springfield and Washington D.C., with major stops at Hartford, New York City and Philadelphia. None of the trains are convenient for commuters to jobs outside the region and are basically limited to long distance travelers. As traffic congestion on I-90 to Boston and I-91 to Hartford increases, it will become necessary to explore the use of commuter rail as an alternative mode. PVPC has been working with officials from the Connecticut Department of Transportation (ConnDOT) on expanded passenger rail service between New Haven Hartford and Springfield. ConnDOT submitted an application for federal rail stimulus funding to fund this additional service.

VERMONTER

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

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

EAST - WEST SERVICE

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

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

East-West line may be limited. A feasibility study on increased passenger rail service between Springfield and Boston is currently being pursued by MassDOT.

NON-MOTORIZED TRANSPORTATION

BICYCLE AND PEDESTRIAN FACILITIES

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

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

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

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

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

Valley Planning Commission's (PVPC) Joint Transportation Committee as the bicycle and pedestrian component to the Regional Transportation Plan.

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

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

BICYCLE COMPATIBILITY INDEX ANALYSIS FOR ROADWAYS

PVPC frequently uses the FHWA Bicycle Compatibility Index (BCI) to evaluate road conditions for bicyclists. The BCI uses data collected on the roadway including travel lane width, shoulder width, vehicle speed, traffic volume and parking along each roadway segment. The FHWA analysis tool assigns an alphanumeric score to each roadway segment ("A" through "F"). "A" roads represent "perfect" roads for bicycling and "F" is the least favorable. In the Pioneer Valley Region data has been collected for all the federal aid roadways. The BCI data is a useful tool for bicycle coordinators, transportation planners, traffic engineers, and others to evaluate existing facilities in order to determine what improvements may be required as well as determine the geometric and operational requirements for new facilities to achieve the desired level of bicycle service.

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

OPERATIONAL EVALUATION

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

DESIGN

Designers have used BCI data to assess new roadways or roadways which are being re-designed to ascertain if they are bicycle compatible. Planned geometric parameters and predicted or known operational parameters can be used as inputs to the model to produce the BCI value and determine the

bicycle LOS that can be expected on the roadway. If the roadway does not meet the desired LOS, the model can be used to evaluate changes in the design necessary to improve the bicycle LOS.

PLANNING

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

ON-ROAD INFRASTRUCTURE

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

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

BICYCLE PARKING IMPROVEMENTS

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

BICYCLE ACCOMMODATIONS ON TRANSIT

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

OFF ROAD INFRASTRUCTURE (BIKEPATHS AND MULTI-USE TRAILS)

Off-road facilities include multi-use trails and traditional bikepaths or rail trails. The Norwottuck Rail Trail, the region's largest bikeway project, opened in 1993. The Norwottuck is 10 miles long connecting the communities of Northampton, Hadley, Amherst, and Belchertown. The route facilitates travel between the communities, educational facilities, downtown commercial areas, and major employment

centers. Weekend counts on the bikepath range from 600 to 1200 users per day during the peak season. A summary of on and off road bicycle facilities is provided below.

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

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

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.

Table 4 - Existing On and Off-Road Bikepaths in the PVPC Region

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

Table 5 - Proposed Bikepaths for the PVPC Region

Pioneer Valley Bicycle Facility	Communities	on/off road
Agawam Connector Loop Bikeway	Agawam	on/off
North Campus Bikeway Extension	Amherst	on/off
Amherst Bike Route	Amherst	on
Five College Bikeway (including Notch)	Amherst, Granby, South Hadley	on/off
Brimfield Trail Expansion	Brimfield	on/off
CT. River Riverwalk and Bikeway	Chicopee	off
Chicopee Center Canal Walk	Chicopee	off
Redstone Rail Trail Extension	East Longmeadow	off
Route 47 Scenic Farm Bikeway	Hadley, South Hadley	on
CT River Greenway (River Run to Elm Court)	Hatfield/Northampton	off
Appleton Street Bikeway Improvements	Holyoke	on
Holyoke Canalwalk (segments 2 and 3)	Holyoke	off
Holyoke Canalwalk Route 5 extension	Holyoke/Northampton	on/off
Ludlow Mills Riverwalk	Ludlow	off
Elm Street Bikeway Extension	Northampton	on/off
Manhan Route 10 Spur to Burts Pit Rd	Northampton	off
Village Hill to Northampton High School	Northampton	off
Damon Road bicycle lanes and sidewalks	Northampton	on
Tunnel Norwottuck Manhan Rail Trail	Northampton	off
Southampton Greenway	Southampton	off
McKnight Neighborhood Trail	Springfield	off
Ware River Valley Rail Trail	Ware	on/off
CT. River Riverwalk and Bikeway	West Springfield	off
Columbia Greenway (segment 2, 3 and 4)	Westfield	off
Western Avenue Bikeway	Westfield	on/off

SAFE ROUTES TO SCHOOL PROGRAM

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

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

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

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

PIONEER VALLEY COMMUTER BIKE MAP

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

TOURISM AND COMMERCE

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

MASSACHUSETTS BICYCLE PLAN

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

AIR QUALITY

The Commonwealth of Massachusetts is classified as serious nonattainment for ozone, and is divided into two nonattainment areas. The Eastern Massachusetts ozone nonattainment area includes Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Suffolk, and Worcester counties. Berkshire, Franklin, Hampden, and Hampshire counties comprise the Western Massachusetts ozone nonattainment area. With these classifications, the 1990 Clean Air Act Amendments (CAAA) required the Commonwealth to reduce its emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx), the two major precursors to ozone formation to achieve attainment of the ozone standard.

In April 2002, the City of Springfield was re-designated attainment for carbon monoxide (CO) with an EPA-approved limited maintenance plan. In areas with approved limited maintenance plans, federal actions requiring conformity determinations under the transportation conformity rule are considered to satisfy the "budget test" (as budgets are treated as not constraining in these areas for the length of the initial maintenance period). Any future required "project level" conformity determinations for projects located within this community will continue to use a "hot-spot" analysis to assure that any new transportation projects in this CO attainment area do not cause or contribute to carbon monoxide nonattainment.

Using the latest planning assumptions, the Massachusetts Department of Transportation, Office of Transportation Planning, estimated the emissions for VOC and NOx for all areas and all MPOs through a combination of the statewide and selected regional travel demand models (and with assistance from MPO staff). The VOC mobile source emission budget for 2009 for the Western Massachusetts Nonattainment Area has been set at 10.73 tons per summer day and the 2009 mobile source budget for NOx is 27.73 tons per summer day. The results of the air quality analysis are included in the 2012 Update to the Regional Transportation plan for the Pioneer Valley. The RTP demonstrates 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.

TITLE VI/ENVIRONMENTAL JUSTICE

BACKGROUND

The Pioneer Valley Planning Commission (MPO) is required to certify to the Federal Highway Administration and the Federal Transit Administration that their planning process addresses the major transportation issues facing region. This certification assures that planning is conducted in accordance with Title VI of the Civil Rights Act of 1964, and requirements of Executive Order 12898 (Environmental Justice). Under the provisions of Title VI and Environmental Justice PVPC works to assess and address the following:

Civil Rights Act of 1964, Title VI " No person in the United States shall, on the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

Executive Order 12898, Environmental Justice "Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing as appropriate disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

The U.S. Department of Transportation (USDOT) issued a DOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations in 1997. It identifies environmental justice as an "undeniable mission of the agency" along with safety and mobility. USDOT stresses three principles of environmental justice:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of reduction in or significant delay in the receipt of benefits by minority and low-income populations.

GOALS OF THE PIONEER VALLEY ENVIRONMENTAL JUSTICE PLAN

The Pioneer Valley Planning Commission has been working together with Pioneer Valley Transit Authority (PVTA), MassDOT, Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) on addressing the principles of Title VI and Environmental Justice in the transportation planning process for the Region. The primary goals of the plan include:

Goals related to identifying the Region's Minority and Low-Income Populations:

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

Goals related to public involvement:

- Create a public involvement process that identifies a strategy for engaging minority and low-income populations in transportation decision making, and routinely evaluate this strategy for its effectiveness at reducing barriers for these populations.

Goals related to service equity:

- Institutionalize a planning process for assessing the regional benefits and burdens of transportation system investments for different socio-economic groups. Develop an on-going data collection process to support the effort and identify specific actions to correct imbalances in the RTP, TIP and Transit funding.

IDENTIFICATION OF MINORITY AND LOW INCOME POPULATIONS AND TARGET POPULATIONS

The 43 communities of the Pioneer Valley Region are diverse in incomes and ethnicity. The region's urban cores of 14 communities comprise the majority of the population and nearly 90 percent of the jobs. To establish the most effective measure of equity, PVPC staff reviewed EJ plans from similar Metropolitan Planning Organizations in other parts of the country. The definition used to define "target populations" in each of these plans was scrutinized and evaluated based on its applicability to our region. From these plans, 8 different population definitions for low income and minority populations were singled out for review in Pioneer Valley.

MINORITY POPULATION

The PVMPO's Environmental Justice population for minorities is defined by using census block group data "in which the percentage of minorities is greater than the percentage of minorities in the entire region," as agreed upon by the PVMPO's Joint Transportation Committee in January of 2003.

Pioneer Valley Population by Race

Race	Population	Percent
White alone	494,830	79.61%
Black or African American alone	45,569	7.33%
American Indian and Alaska Native alone	2,199	0.35%
Asian alone	16,303	2.62%
Native Hawaiian and Other Pacific Islander alone	286	0.05%
Some other race alone	45,201	7.27%
Two or more races	17,182	2.76%
Total	621,570	100.00%

Pioneer Valley Non-Hispanic or Latino Population Breakdown

Race	Population	Percent
Not Hispanic or Latino:	517,339	100.00%
White alone	450,095	87.00%
Black or African American alone	39,239	7.58%
American Indian and Alaska Native alone	959	0.19%
Asian alone	16,060	3.10%
Native Hawaiian and Other Pacific Islander alone	155	0.03%
Some other race alone	931	0.18%
Two or more races	9,900	1.91%

Pioneer Valley Hispanic or Latino Population Breakdown

Race	Population	Percent
Hispanic or Latino:	104,231	100.00%
White alone	44,735	42.92%
Black or African American alone	6,330	6.07%
American Indian and Alaska Native alone	1240	1.19%
Asian alone	243	0.23%
Native Hawaiian and Other Pacific Islander alone	131	0.13%
Some other race alone	44,270	42.47%
Two or more races	7,282	6.99%

Source: U.S. Census Bureau, Decennial Census 2010 (not ACS 2006-10)

LOW INCOME POPULATION

PVMPO relies on a definition of "low income" based on the federal definitions of "poverty." Annual household income levels associated with this federal definition are shown below.

Low-income Definitions

Household Size	Federal Poverty Level
1 person	$8,500
2 persons	$10,800
3 persons	$13,290
4 persons	$17,000
5 persons	$20,000

The PVMPO method defines a "low income" area as one with a proportion of people living at or below this federally defined poverty level that exceeds the proportion of people in poverty in the region as a whole, which is 15.4%.

THE NEEDS OF LOW-INCOME AND MINORITY POPULATIONS

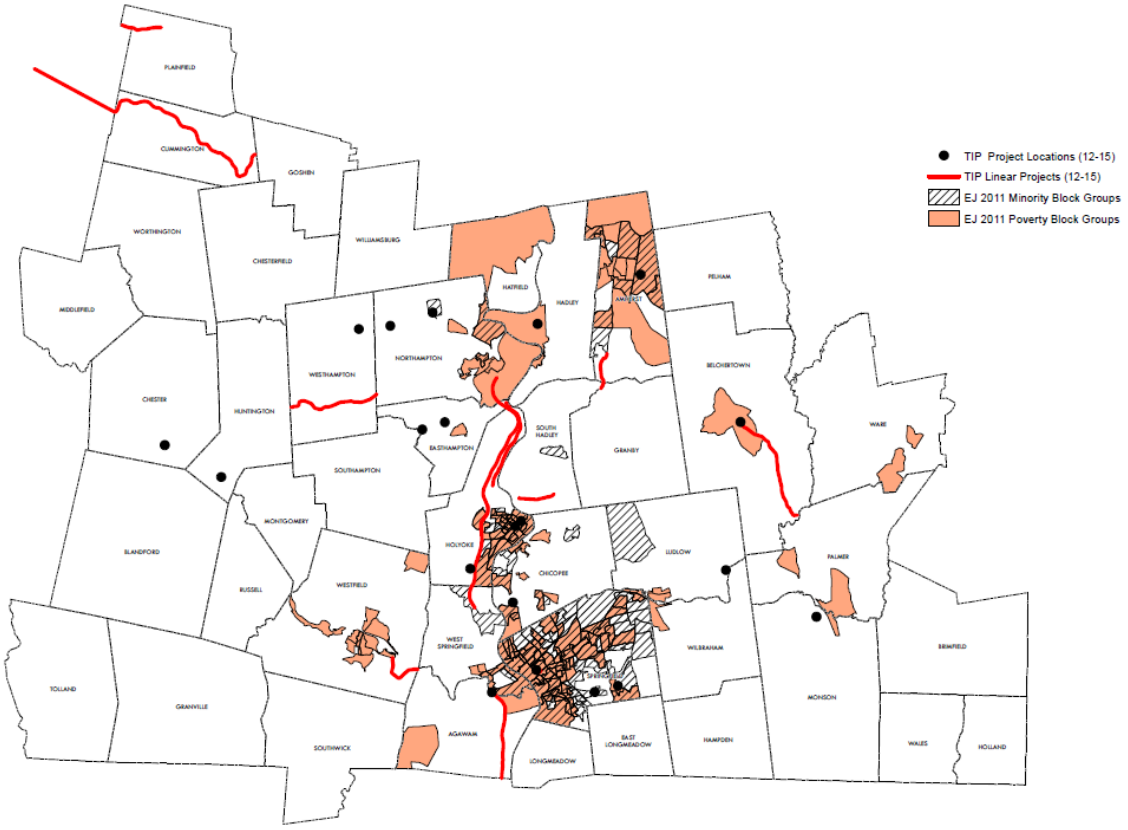
The PVMPO Public Participation Plan includes strategies and techniques geared to help identify the mobility and transportation investment needs of low-income and minority populations. The PVMPO actively solicits the needs of low income residents of the region through an ongoing and expanding consultation with community partners.

BENEFITS AND BURDENS OF TRANSPORTATION SYSTEM INVESTMENTS

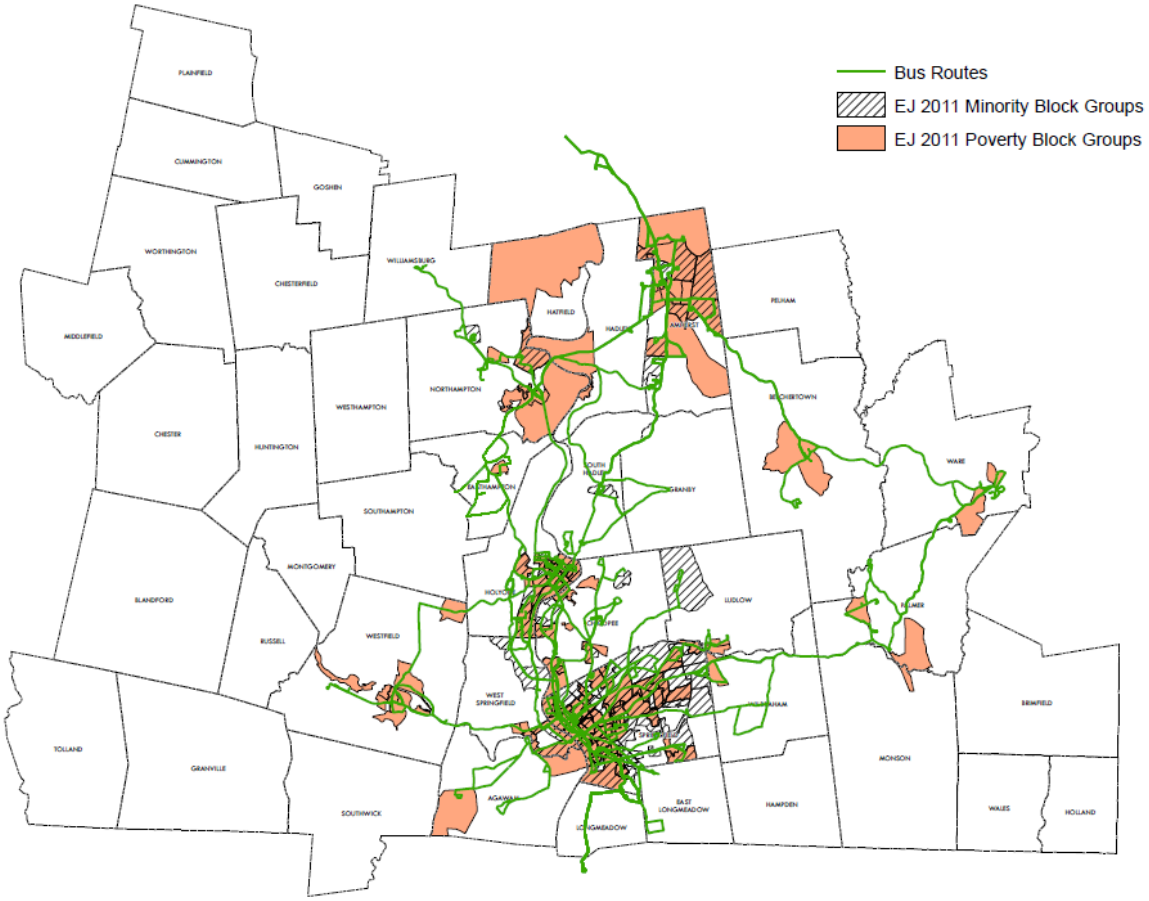
The PVMPO relies on a three-step process to assess the benefits and burdens of transportation system investments for low-income populations and minority populations. These steps are:

1. Identification of transportation investments programmed through the Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP).
2. Scoring and prioritization of programmed TIP projects.
3. Analysis of programmed TIP project locations in relation to census block groups (defined as by the percentage of low-income and/or minority residents that exceed the regional average) to determine the relative distributional equity of programmed transportation investments.

Distribution of TIP Project by Minority and Low Income Block Groups



Distribution of Transit Route by Minority and Low Income Block Groups



Total PVTA route miles (2012)	640 mi	100%
Route miles in minority and/or low-income census blocks	335 mi	52.3%
Census blocks in the region (2012)	442	100%
Census blocks with greater than average minority and/or low-income populations	209	47%

LIMITED ENGLISH PROFICIENCY

The PVMPO makes a special effort to seek out and consider the needs of individuals or neighborhoods with Limited English Proficiency. The PVMPO engages persons with LEP with regard to region wide planning activities such as the adoption of the Regional Transportation Plan, Unified Planning Work Program, transit studies, or an updated TIP. The PVMPO outreach to Spanish speaking residents is a routine undertaking. Meeting notices are available upon request in Spanish, with an opportunity to request translator services highlighted in the notice. Important reports are summarized and translated into Spanish upon request. With regard to special activities focused on a specific neighborhood or corridor, maps depicting the distribution of non-English speaking persons will be consulted at the beginning of any such project to determine what, if any, special outreach in any language other than English should be undertaken. If it is determined that a special outreach is warranted, PVMPO consults

with neighborhood groups such as ethnic and religious associations to determine the best method for reaching and involving those non-English speaking residents.

Title VI and its implementing regulations require that recipients of FTA funds take steps to ensure meaningful access to the benefits, services, information, and other important portions of their programs and activities for people who are Limited English Proficient (LEP). PVTA understands the importance of serving its LEP customers and the role that public outreach plays in achieving equality of access to public transit.

PVTA 2012 TITLE VI PROGRAM UPDATE

This 2012 Title VI Program Update of the Pioneer Valley Transit Authority (PVTA) is offered to verify compliance with Civil Rights Act of 1964 and its amendments (42 U.S.C. §2000d), collectively known as Title VI, which prohibit discrimination on the basis of race, color, or national origin in programs and activities that receive federal funds.

PVTA is the largest regional transit authority in Massachusetts. PVTA's geographic service area covers approximately 570 square miles, encompassing 24 communities that contain urban centers, suburbs and rural areas. PVTA oversees the operation of 165 buses on a system that includes 40 fixed bus routes and four community shuttles. PVTA customers made more than 10.2 million bus trips on PVTA in FY2011. PVTA also oversees an extensive paratransit van service system that provided 361,865 trips for people with disabilities and senior citizens in FY2011.

PVTA's annual cost of fixed route operations was $26.5 million in 2010 and $25.8 million in 2011. Fixed Route hourly operating expenses were $80.37 per vehicle revenue hour. The PVTA system delivered 30.70 passenger trips per vehicle operating hour.

The mobility that PVTA provides through its fixed route and paratransit services is critical for the many people in the region who do not, or cannot, drive. PVTA's most recent bus rider survey (n=3,520 riders) found that 4 of every 5 customers have no other way, other than PVTA, to make their trips. For these residents, PVTA brings essential daily access to places of work, education and shopping. For the region's businesses and institutions, PVTA provides essential links to economic, academic and cultural activity centers.

This 2012 Title VI Program Update has been prepared to verify that:

1. PVTA benefits and services supported by FTA funds are available to, and fairly distributed among, transit customers without regard to race, color or national origin;
2. The opportunity and ability of persons to participate in transit planning, programming and implementation is not limited on the basis of race, color or national origin; and
3. Any necessary corrective, remedial and affirmative actions have been taken to eliminate and prevent discriminatory treatment of people on the basis of race, color or national origin.

ADDITIONAL INFORMATION

PVPC Title VI Plan:
file://dc1/transportation/TRANSIT/EJ-TitleVI/PVPC/2012%20PVPC%20Title%20VI%20submission%20to%20FTA/PVPC%20Title%20VI%20Program%20Update%2009-4-12_ALL_SMALL.pdf

PVPC Title VI Submission to MassDOT (1/9/2013)

http://www.pvpc.org/resources/transport/pvmpo/pvmpo-titleV-update-jan-9-2013.pdf

PVTA Title VI Plan:
http://www.pvpc.org/resources/transport/mpo/PVTA%20Fare%20Equity%20Analysis%20FINAL%2004-18-12%20v2.pdf

http://www.pvpc.org/resources/transport/2012/pvta2012-titleVI-cert-assur-submittal.pdf

CLIMATE CHANGE

REGIONAL WEATHER TRENDS AND ANTICIPATED CHANGES

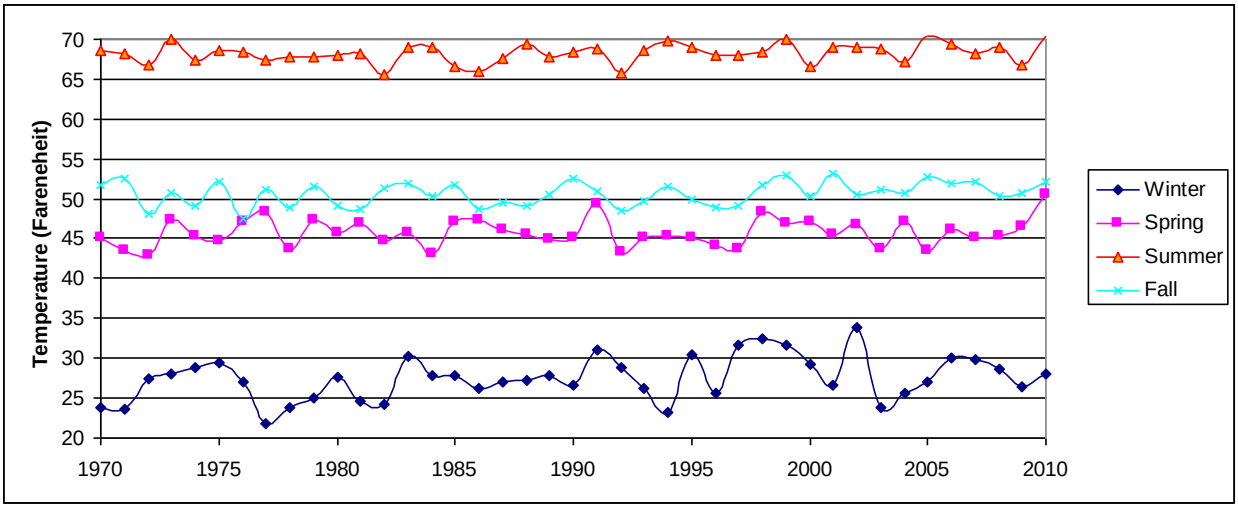
The transportation sector is a significant source of greenhouse gases, accounting for 1/3 of the Pioneer Valleys emissions. While it is widely recognized that emissions from transportation have a major impact on climate, climate change will have a major impact on the transportation system.

TEMPERATURE

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

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

Figure 5 - Regional Temperature Trends by Season (1970-2010)



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

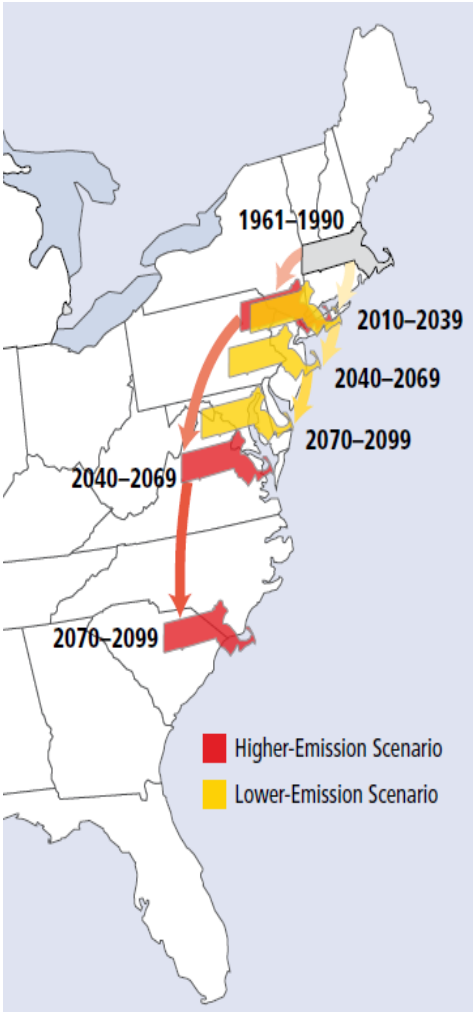
future mode share changes and transportation enhancements for emissions. Using these two scenarios a range of anticipated "likely" and "very likely" weather conditions can be created over the next 19 years.

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

Table 6 - Northeast Anticipated Temperature Changes by Season

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

Figure 6 - Potential Future Summer Heat Index for Massachusetts



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

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

standards for ground-level ozone, putting additional stress on people with respiratory diseases.

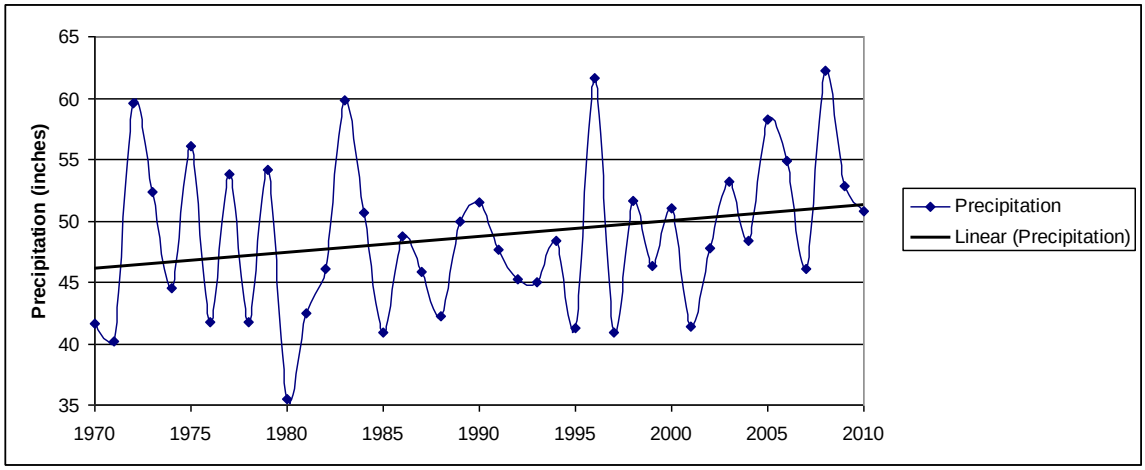
Longer periods of extreme heat in summer can damage roads in several ways, including softening of asphalt that leads to rutting from heavy traffic.
Extreme heat can cause deformities in rail tracks, at minimum resulting in speed restrictions and at worst causing derailments.
Increases in very hot days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

PRECIPITATION

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

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

Figure 7 - Regional Precipitation Trends by Season (1970-2010)



The 2009 USGCRP report anticipates a continued precipitation increase annually from 2010 to 2040. The Northeast region is projected to see an increase in winter precipitation on the order of 20 to 30 percent. The ranges reflect the uncertainty of future weather events, as shown in the "very likely" range precipitation has a small potential to decrease over this 30 year period. The Northeast Climate Impacts Assessment (NEICA) reports that the number of days with rain greater than 2 inches to increase 1 day (low scenario) to 1.25 day (high scenario). The increase in heavy precipitation could potentially result in

weather-related crashes, delays, and road closures in a network already challenged by increasing congestion. Other effects that climate change will have on the transportation system include:

Increased flooding of roadways, rail lines, and underground tunnels
Drainage systems will be overloaded more frequently and severely, causing backups and street flooding. Areas where flooding is already common will face more frequent and severe problems.
Limitation on visibility because of precipitation and windshield obstruction
Decreased skid resistance affecting vehicles performance, including traction and maneuverability, resulting in loss of control and skidding
Lower travel speeds and greater speed variability resulting from differing driving habits and abilities

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

Table 7 - Northeast Anticipated Precipitation Annual Percentage Change

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

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

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

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

Figure 8 - 100 and 500 Year Flood Areas

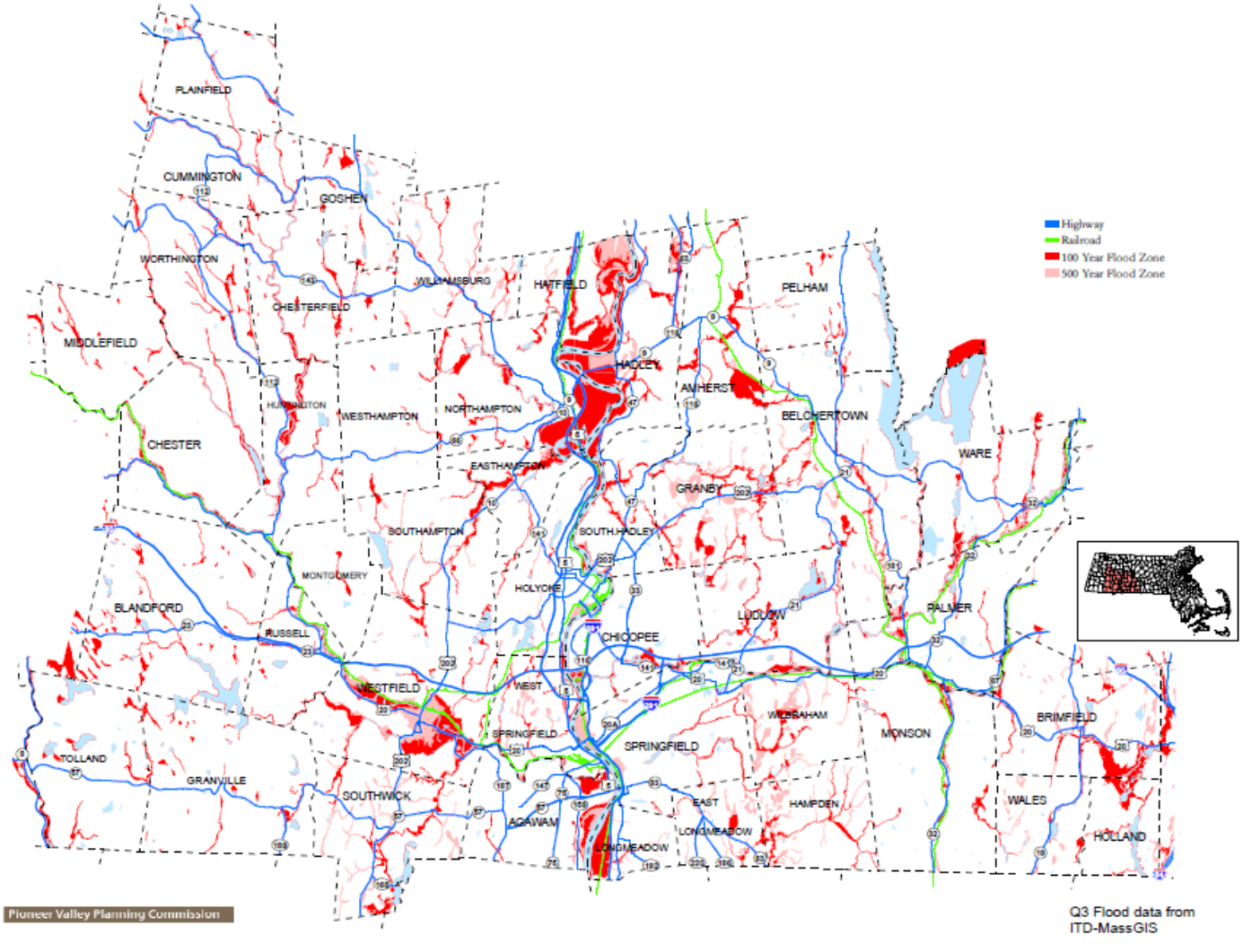
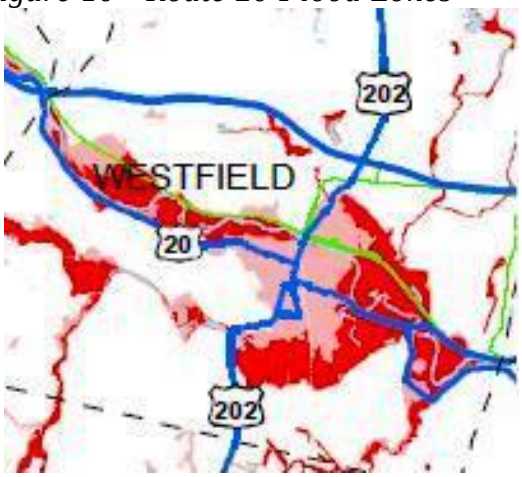


Figure 9 - Route 9 Flood Zones

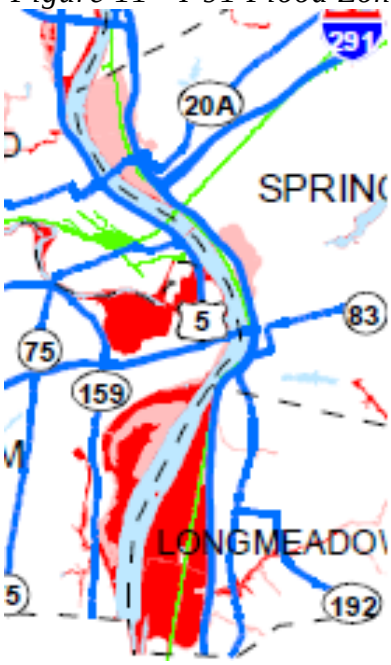
Hadley/Northampton-The western border of Hadley and the eastern border of Northampton possess a 100 year flood zone. During flood events road closures could potentially occur on Routes 5, 9, and 47. The Connecticut River would be the source of the flooding event.

Figure 10 - Route 20 Flood Zones



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

Figure 11 - I-91 Flood Zones



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

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

EXISTING POLICIES

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

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

EXPANDED POLICY

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

NEW POLICIES

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

In December, 2010 the Commonwealth of Massachusetts released their Clean Energy and Climate Plan for 2020 that sets out an ambitious state-wide GHG emissions reduction target and lays out a framework for how the state will achieve that target. In January, 2008 the PVPC released our Clean Energy (and Climate Action) Plan (CEP) which set out our regions' emissions reduction targets and laid out a framework for how we would achieve those targets. The Commonwealth's Plan was released in compliance with the state's Global Warming Solutions Act of 2008 (GWSA), a legislative initiative adopted in June of 2008, six months after the release of our regional CEP. The GWSA mandates an 80

percent reduction in state-wide GHG emissions from 1990 levels by 2050. This goal is consistent with the Pioneer Valley Clean Energy Plan. In addition to a goal for 2050, GWSA required the Secretary of Energy and Environmental Affairs to establish an interim GHG emissions reduction target of between 10 and 25 percent below 1990 levels for 2020, and to issue a plan for achieving those reductions.

Both the Pioneer Valley Clean Energy Plan and the Massachusetts Clean Energy and Climate Plan include a mix of existing, expanded and recommended new policies to address climate change, including energy efficiency requirements, advanced building codes, a renewable portfolio standard (RPS), fuel efficiency standards, incentives for purchasing more efficient vehicles and reducing vehicle miles traveled (VMT), and smart growth policies. The Commonwealth's Plan portfolio of policies is broken down into five categories: buildings; electricity supply; transportation; non-energy related sources of emissions; and cross-cutting policies.

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

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

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

CLIMATE ADAPTATION ACTIONS

The Pioneer Valley Climate Action and Energy Plan presents a series of Transportation Adaptation Actions to maintain transportation facilities in safe and usable operating conditions. The actions were developed to minimize damage to the regional transportation infrastructure and are summarized below.

> **Transportation Assets Vulnerability Assessment** - Perform an inventory that includes vulnerability assessments of critical transportation infrastructure to provide a baseline for future damage assessments and improvement recommendations. The Pioneer Valley Metropolitan Planning Organization (MPO) may wish to consider

incorporating additional climate change vulnerability assessments in the regional transportation planning process and in the project ranking criteria for federally funded transportation projects on the region's Transportation Improvement Program (TIP).

Storm-proof Roads and Other Transportation Infrastructure - Because roads are typically the used by travelers of any mode (auto, public transit, bus and pedestrian), it is essential that these facilities receive priority in efforts to increase resilience to severe storm events and flooding. The vast majority of roads and sidewalks in the region are owned and maintained by municipalities. Therefore, assistance to these communities in storm-proofing to withstand severe weather and flooding is critical to the overall resilience of the region's transportation system. The MPO's Regional Transportation Plan provides general assessments and appropriate strategies for this action.

Inventory and Prioritize Culvert and Bridge Stream Crossings For Upgrades and Replacement - Continue to identify and prioritize culverts and bridges for replacement and design upgrades through the Stream Continuity Program.

Utilize Appropriate and Adequate Culvert and Bridge Design Standards – As detailed in Appendix X: Best Management Practices for Stream Crossing Replacement of the Climate Action and Energy Plan.

Employ Appropriate Stream Reconstruction and Repair Designs and Methods - As detailed in Appendix X: Best Management Practices for Stream Crossing Replacement of the Climate Action and Energy Plan.

Enact Climate Bond Bill - Seek community support for a state climate action bond bill, similar to the Transportation Bond bill, to help communities pay for infrastructure improvements that address climate and weather vulnerabilities and protection needs.

SUSTAINABILITY

MASSDOT/GREENDOT

This element plan defines an overarching vision of the future of the region, establish principles and policies that will lead to the achievement of that vision, and allocate projected revenue to transportation programs and projects that reflect those principles and policies. MassDOT has articulated the following 10 themes to guide transportation work in the Commonwealth.

Improve transportation system reliability
Focus more attention on maintaining our transportation system
Design transportation systems better
Encourage shared use of infrastructure
Increase capacity by expanding existing facilities and services
Create a more user-friendly transportation system
Broaden the transportation system to serve more people
Provide adequate transportation funding and collect revenue equitably
Minimize environmental impacts
Improve access to our transportation system

In addition, MassDOT has elaborated a Green DOT Vision:

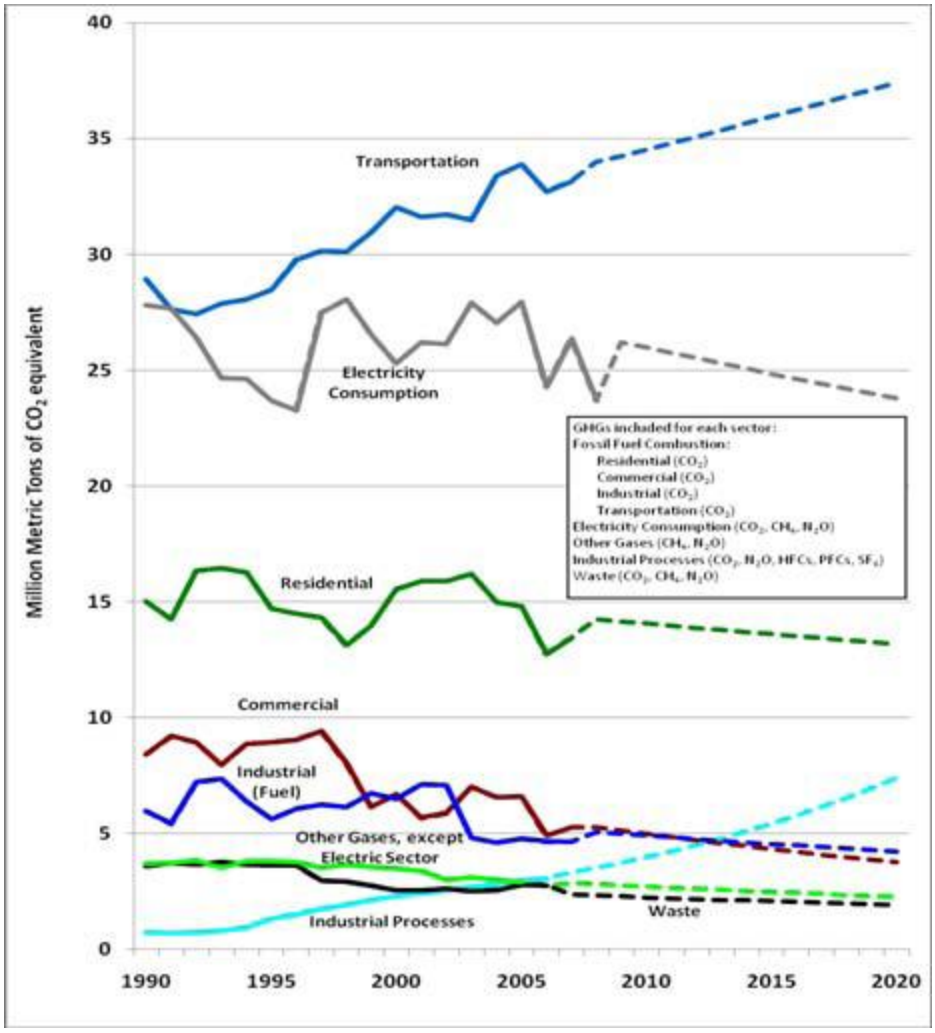
> *"The Massachusetts Department of Transportation will be a national leader in promoting sustainability in the transportation sector. Through the full range of our activities, from strategic planning to construction and system operations, MassDOT will promote sustainable economic development, protect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

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

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

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

Figure 12 - Projected Greenhouse Gas Emissions



EXISTING CONDITIONS

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

In the Pioneer Valley we have 80 miles of bicycle paths as well as 44 fixed transit routes with an estimated 15,000 to 20,000 regular riders. In 2009, the regional VMT was 15,232,000 miles. Many of our communities are not well served by transit, nor are they bicycle or pedestrian friendly. Only now,

after many years of advocacy from public and private coalitions, is the region looking forward to the arrival of improved commuter rail service.

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

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

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

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

Air quality
Water quality
Green House Gas Emissions (GHG)
Health status
Voter registration
Recycling rate
Housing affordability
Graduation rate
Local food production
Vehicle Miles Traveled

Arguably every one of these indicators is affected by transportation. Motorized vehicles consume fossil fuels to operate and necessarily produce exhaust and other GHG emissions from burning these dirty fuels. Transportation affects air quality. Roads are impervious surfaces across which water has to run before being absorbed into surface water bodies or the ground. Motorized vehicles require impervious surfaces, which pollute ground water, as well as surface water sources. As noted above, the transportation sector is Massachusetts largest GHG emitter, producing 31% of 1990 emissions and projected to produce 38% of 2020 emissions. Polluted air and water and global warming caused by dramatic increases in GHG emissions in the last 10 years negatively affects humans. Transportation affects voter turnout by making it more or less easy to get to polls. Lack of transit services can hamper lower income people's ability to get to polls to participate in the democratic process. A balanced transportation system is more sustainable, as it meets more people's needs while using resources efficiently to make it more likely that future transportation systems will meet future generations'

needs. Transportation doesn't have a very direct affect on recycling rate, but it certainly can affect housing affordability. Sprawl is the dominant form of housing development, and as a result homes are less affordable than in a region characterized by mixed use development. Local food production is not directly affected by transportation, although having the opportunity to produce local food can minimize transportation of food from outside the region to feed residents. The last sustainability indicator, VMT, is the cornerstone measurement of a sustainable transportation system.

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

Figure 13 - Annual Vehicle Miles

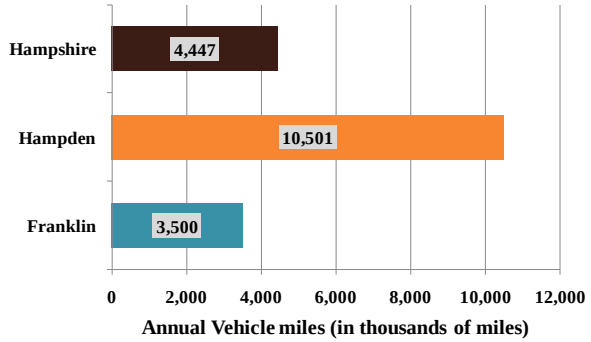
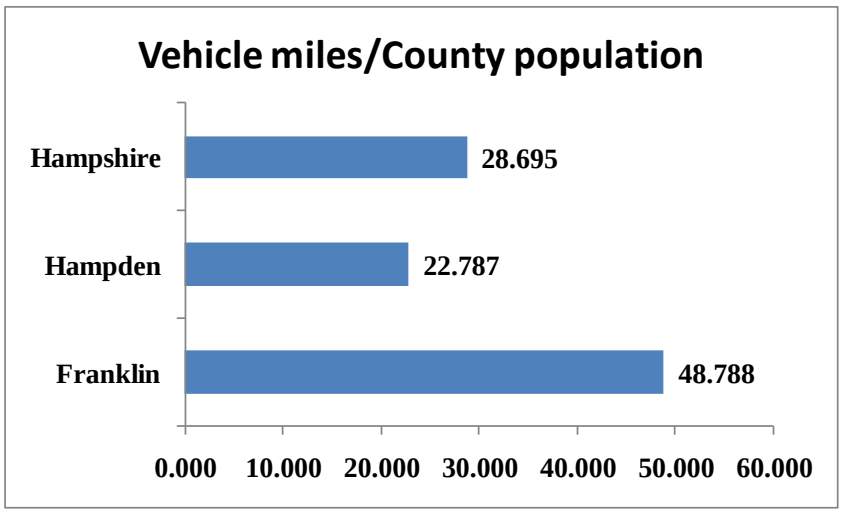


Figure 14 - Vehicle Miles/Population



In addition to the Pioneer Valley Sustainability Network's indicators of sustainability, the Pioneer Valley Planning Commission has identified a number of indicators to assess the overall state of the region. One of the measures tracked is the number and total cost of transportation improvement projects that

rely on federal and/or state financial resources that have yet to be programmed in the TIP. This backlog of projects provides an indication of the needs of the regional highway and transit systems.

Table 8 - TIP Project Value

HIGHWAY PROJECTS

Year	Number of Projects	Estimated Total Cost
2002	128	$ 139,830,212
2003	176	$ 219,031,869
2004	158	$ 260,151,977
2005	152	$ 355,115,493
2006	129	$ 298,501,051
2007	132	$ 363,981,681
2008	120	$ 453,753,771
2009	131	$ 498,603,095
2010	141	$ 607,087,064
2011	151	$ 1,186,546,795
2012	139	$ 1,026,121,880

TRANSIT PROJECTS

Year	Number of Projects	Estimated Total Cost
2006	12	$ 86,300,000
2007	12	$ 104,900,000
2009	15	$ 232,900,000
2010	16	$ 250,129,000
2011	14	$ 278,844,850
2012	11	$ 160,424,915

Data Source: Pioneer Valley Planning Commission

On the highway side, the project backlog has steadily increased over time due to rising material prices and construction costs. The large increase seen from 2010 to 2011 is a result of the estimated $385,000,000 needed to reconstruct the Interstate 91 viaduct in Springfield. The estimated total cost of regional transit costs decreased from 2011 to 2012 as a result of the start of construction on the Knowledge Corridor track improvement project.

ENHANCING SUSTAINABILITY

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

STABLE FUNDING

A goal of PVPC's sustainable transportation system is to have a stable source of funding for transportation projects that is removed from political squabbles and that reflects the true cost of

different transportation options. The region would like more government and private financial support for a wide range of measures that will achieve greater sustainability. These include reduction of impervious surfaces, and improved accessibility provided by transit.

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

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

PROMOTING SMART GROWTH AND CLIMATE ACTION

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

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

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

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

Improve System and Operational Efficiencies
Reduce Growth of Vehicle Miles Traveled (VMT)
Transition to Lower GHG Fuels
Improve Vehicle Technologies

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

effective, the region must pursue all four strategies together. Potential opportunities to integrate GHG reduction strategies into regional transportation planning activities include:

- Incorporate an environmental assessment into Unified Planning Work Program (UPWP) tasks as appropriate.
- Identify methods to maintain sidewalks, bicycle trails, and bus stops in the winter.
- In cooperation with the Pioneer Valley MPO, include sustainability and smart growth in decision-making process for future transportation investments.
- Incorporate regional performance measures consistent with MAP-21 into the transportation planning process. Performance measures will assist in tracking the progress made towards attaining regional goals as a result of investments in the transportation system. Potential performance measures include: transit ridership, roadway congestion, vehicle emissions, and fuel and energy consumption.

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

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

ENSURING HEALTH AND SAFETY

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

AVOIDED TRIPS

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

TECHNOLOGY-ENHANCE CAPACITY OF EXISTING INFRASTRUCTURE

Intelligent transportation system (ITS) technologies need to be implemented to help existing transportation systems work more efficiently, rather than be expanded. This includes traffic congestion monitoring and transit schedule information as well as ride and car sharing programs linked to smart

phones. Transportation planning needs to address and include electric charging infrastructure for electric-only vehicles. This first free electric car chagrining station opened at Springfield Technical Community College in May of 2011. The use of highway medians and other transportation property for solar energy production should be studied. The use of recycled roadway materials should be encouraged on roadway projects carried out by MassDOT and municipal DPWs.

COMPLETE STREETS

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

LAND USE POLICY

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

INVEST IN ALTERNATIVE MODES

Funding should be increased for greater PVTA bus operating frequencies and hours (especially Sunday service). Promote and encourage transportation centers, such as the Holyoke Transportation Center and proposed Springfield Union Station, because they expand transit accessibility and connect the region to destinations outside the region.

INSTITUTIONALIZE SUSTAINABILITY AND SMART GROWTH INTO DECISION-MAKING PROCESS

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

The region will continue to monitor the progress of FHWA's Infrastructure Voluntary Evaluation Sustainability Tool (INVEST). The tool identifies characteristics of sustainable highways and provides best management practices to integrate sustainable techniques into roadway projects and planning products.

INVEST consists of three modules that address different areas of a project lifecycle. Specifically, the tool can be used to review System Planning, Project Development, or Operations and Maintenance. Each module uses separate criteria to evaluate a project or program at the discretion of the user. For more information on INVEST, please visit http://www.sustainablehighways.org.

PVPC participated in the FHWA Pilot Program to evaluate INVEST. Six staff members from the transportation and land use and environmental sections participated in an evaluation of the 2012 RTP Update using the System Planning module of INVEST. The RTP received a "Silver" rating at that time, but more importantly, staff identified a number of areas in which improvements could be made to further incorporate sustainability into the regional transportation planning process. PVPC is looking for opportunities to use INVEST in other planning projects.

EDUCATION/TRAINING

The PVPC has developed a short video on the transportation project development process. PVPC also routinely meets with incoming elected municipal officials to discuss the regional transportation planning process and the development and evaluation of individual transportation projects.

REGIONAL SUSTAINABILITY PLANNING

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

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

BUS SYSTEM

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

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

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

Table 9 - Transportation Sustainability Indicators

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

CAPITAL IMPROVEMENTS

INTERMODAL CENTERS AND TRANSPORTATION CENTERS

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

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

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

Northampton Bus Terminal - This three-story building at One Roundhouse Plaza behind City Hall accommodates two intercity buses and includes an enclosed waiting area (PVTA service is available one block west at the Academy of Music). Approximately 12-15 trips per day depart this terminal. The building also contains commercial offices and a restaurant.

Springfield Bus Terminal - Located at 1776 Liberty Street in downtown Springfield, this terminal is the regional hub for commercial bus service. The terminal is owned and operated by Peter Pan Bus Lines. It has 16 boarding gates, eight of which are leased to PVTA, and a limited number to other commercial carriers. There are waiting areas, a ticket counter and concessions vendors for passengers.

The following provides additional information on some of the proposed transportation centers for the Pioneer Valley.

Springfield Union Station - The Springfield Union Station project will revitalize the long-vacant Springfield landmark into a comprehensive multimodal facility with business, entertainment, cultural and retail operations. The Union Station Project will consolidate the different transportation terminals of Springfield into one location. The Multimodal center will include the Springfield Hub for PVTA routes, Intercity Buses, and Amtrak. The downtown Springfield location has convenient access to the Interstate Highway System, ample parking at local garages, as well as convenient pedestrian access. Phase I of the project will include:

- Restoration of the Terminal Building and its central concourse.
- Removal of the Baggage Building and construction of a 24-bay bus terminal and a 146-space parking garage, with 4 additional bus bays on adjacent site.
- Reopening and restoring of the passenger tunnel linking the terminal building to rail boarding platforms and pedestrian access to the downtown.

- New stair and elevator access from the re-opened passenger tunnel leading to passenger rail boarding platforms.

Phase II of the project will include:

- Transit-related administrative functions.
- Additional parking spaces.
- Development of transit-related commercial space.

Westfield Intermodal Transportation Center - PVTA and the City of Westfield are collaborating on the development of an intermodal transportation center to be located on Elm Street between Church and Arnold Streets in downtown Westfield. The facility will include bus berths for local and intercity buses, bicycle facilities and a connection to the Columbia Bikeway, as well as space for shops and transit-related uses inside. The project, currently in the preliminary design stage, will support additional transit ridership that is expected to accompany the growth of Westfield State University's downtown campus and student housing. It will also help anchor new urban and commercial redevelopment in the vicinity.

VEHICLE IMPROVEMENTS

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

PVTA AMENITIES

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

OPERATIONAL IMPROVEMENTS

SURVEYS

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

INTELLIGENT TRANSPORTATION SYSTEMS

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

BICYCLE PLANNING

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

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

OTHER BICYCLE PLANNING EFFORTS

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

PASSENGER AND FREIGHT RAIL

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

Springfield Rail Terminal – Located on Lymon Street in the City of 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 terminal will be greatly enhanced upon completion of the Union Station Intermodal Center, completion of the Connecticut River Line Improvements, and Hartford/New Haven/Springfield Rail Project.

Holyoke Rail Station - Holyoke was awarded a $2 million grant through the MassWorks program to build a rail platform. A train stop will be built at the bottom of Dwight street, near the intersection with Main street in Holyoke, on the west side of the track. This site is located approximately one-tenth of a mile to the south of the former Station location, three-tenths of a mile from City Hall and just north of the Holyoke's first freight rail station site. Amtrak service is anticipated to begin in early 2014. The Holyoke Rail Station is currently in design and the train will serve the Holyoke Station once construction is complete.

Northampton Rail Station - In 2009, MassDOT applied for high speed intercity rail stimulus funds to return the Vermonter to the Connecticut River line, and in January of 2010 the project was funded. Passenger rail service was discontinued on the Connecticut River line in 1989 and relocated through Amherst and Palmer due to poor track conditions. Moving the train back to the Connecticut River line will reduce the existing travel time between Springfield and St. Albans, VT by approximately 40 minutes. This will improve service for the region's urbanized area with stops in Greenfield, Northampton and Holyoke, replacing the single stop in Amherst. The funding includes track improvements in Northampton and includes refurbishing the rail platform at Union Station with a covered self service ticket kiosk. Construction is currently underway and service on the new line is anticipated to begin in early 2014. As a long term downtown improvement, the City of Northampton will be undertaking an analysis to evaluate locations for a multi-modal facility near the railroad tracks which would include an indoor train station, bus connections, and commuter parking.

LAND USE

The coordination of Land Use and Transportation Planning is an essential step in attaining sustainability opportunities for the region. Coordination provides opportunities for implemented sustainability practices from land use and transportation to support each other. Some of the most effective coordination efforts come from city and town master planning, transit oriented development districts, and the creation of bike parking standards.

MASTER PLANNING

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

TRANSIT ORIENTED DEVELOPMENT

Transit Oriented Development (TOD) promotes a balance of jobs and housing, and encourages the use of bus and other transit opportunities, while reducing single occupant vehicle trips and discouraging

suburban sprawl. TOD is a land development strategy that seeks to concentrate more homes, jobs and shopping within 5-10 minute walking distance (usually ¼ to ½ mile) of a well-used transit station or bus stop. TOD attempts to limit sprawl, improve air quality, and provide access to goods, services and jobs in close proximity to residential areas. TOD application is expected to increase as the use of rail becomes a more viable option for the region's population. The Knowledge Corridor rail line will have increased frequency of passenger cars and will enhance connections to cities outside of the region.

TOD districts can vary, depending on local needs and real estate market. TODs generally include a variety of housing, commercial, professional, and retail uses, civic and public spaces, and pedestrian friendly amenities. Here are a few examples of TOD districts in the Northeast:

Holyoke Transportation Center

Newton Center Green Line Station

Andover Mill Redevelopment at MBTA

Brockton, MA

GRAVEL ROADS

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

TOD PLANNING ANALYSIS

INTRODUCTION

The 2012 Update to the Regional Transportation Plan for the Pioneer valley Metropolitan Planning Organization identifies the promotion of transit oriented and pedestrian friendly development as an "immediate" need. A number of strategies are included in the RTP that can assist in the advancement of this need, however, one of the most critical will be to develop transportation facilities to support and promote smart growth in and around existing city and town centers. Transit Oriented Development (TOD) promotes a balance of jobs, housing, and retail development; encourages the use of bus and other transit opportunities; and reduces single occupant vehicle trips. TOD helps to limit sprawl, improve air quality, and provide access to goods, services and jobs in close proximity to residential areas.

A critical component of the Sustainable Knowledge Corridor project was develop a methodology to analyze the level and type of development transit can support and identify key areas to begin Transit Oriented Development (TOD) demonstration projects. This analysis was design to be conducted in two distinct phases. Phase One identified areas in the Pioneer Valley that had the potential to support TOD. A matrix analysis was conducted for each of the selected TOD sites to identify the transportation merits of each location. A quantitative methodology was then developed to rank each of the sites and prioritize the location best suited for further analysis as part of Phase Two.

Phase Two will result in a more in depth analysis of the preferred location identified in Phase One. Transit service will be evaluated, pedestrian amenities inventoried, and a build out will be developed to identify the potential impact of TOD on trip generation. This analysis could be used to assist in the identification of a series of short and long range transportation improvement projects that could assist in the implementation of the preferred TOD build out.

To date, Phase One is complete and summarized in this chapter. Work on Phase Two is ongoing and will be completed in late 2013.

WORKING GROUP

A Transportation Working Group was organized to assist staff in the selection of potential TOD sites and the development of the evaluation methodology. The group is comprised of members of both the Pioneer Valley Joint Transportation Committee and the Valley Development Council. This working group will be expanded as part of Phase Two planning efforts to include more diverse representative from the study area.

Member	Community	Representing
Jessica Allen	City of Easthampton	Valley Development Council
Stuart Beckley	Town of Ware	Valley Development Council, JTC
Raymond Berry	United Way of Pioneer Valley	Consortium Member
James Czach	City of West Springfield	JTC
Nicole Rohan	Pioneer Valley Transit Authority	JTC, Pioneer Valley MPO
Matthew Sokop	City of Holyoke	JTC
Jonathan Tucker	Town of Amherst	Valley Development Council

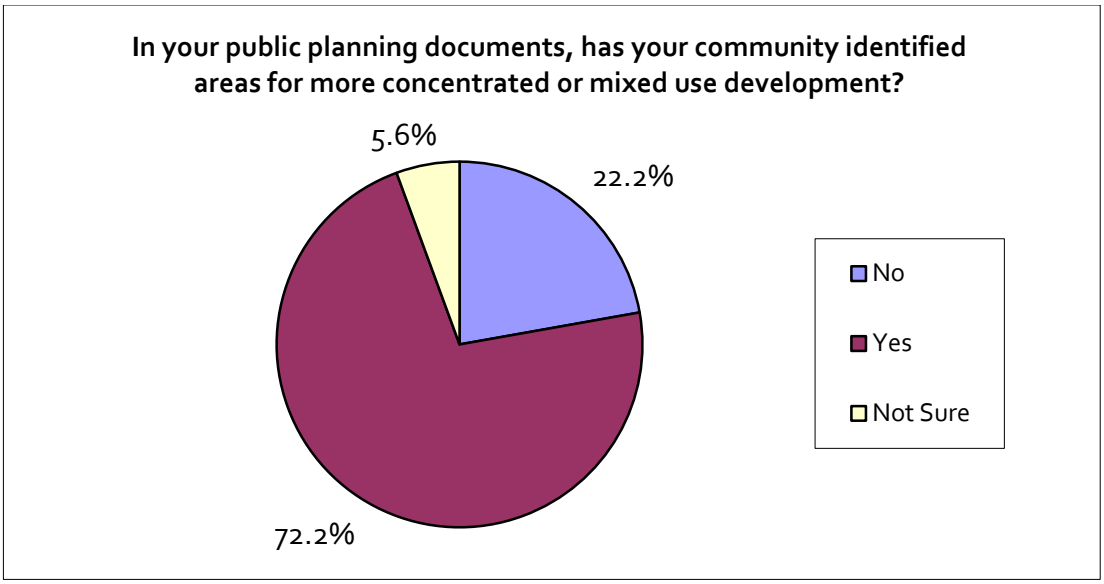
SURVEY

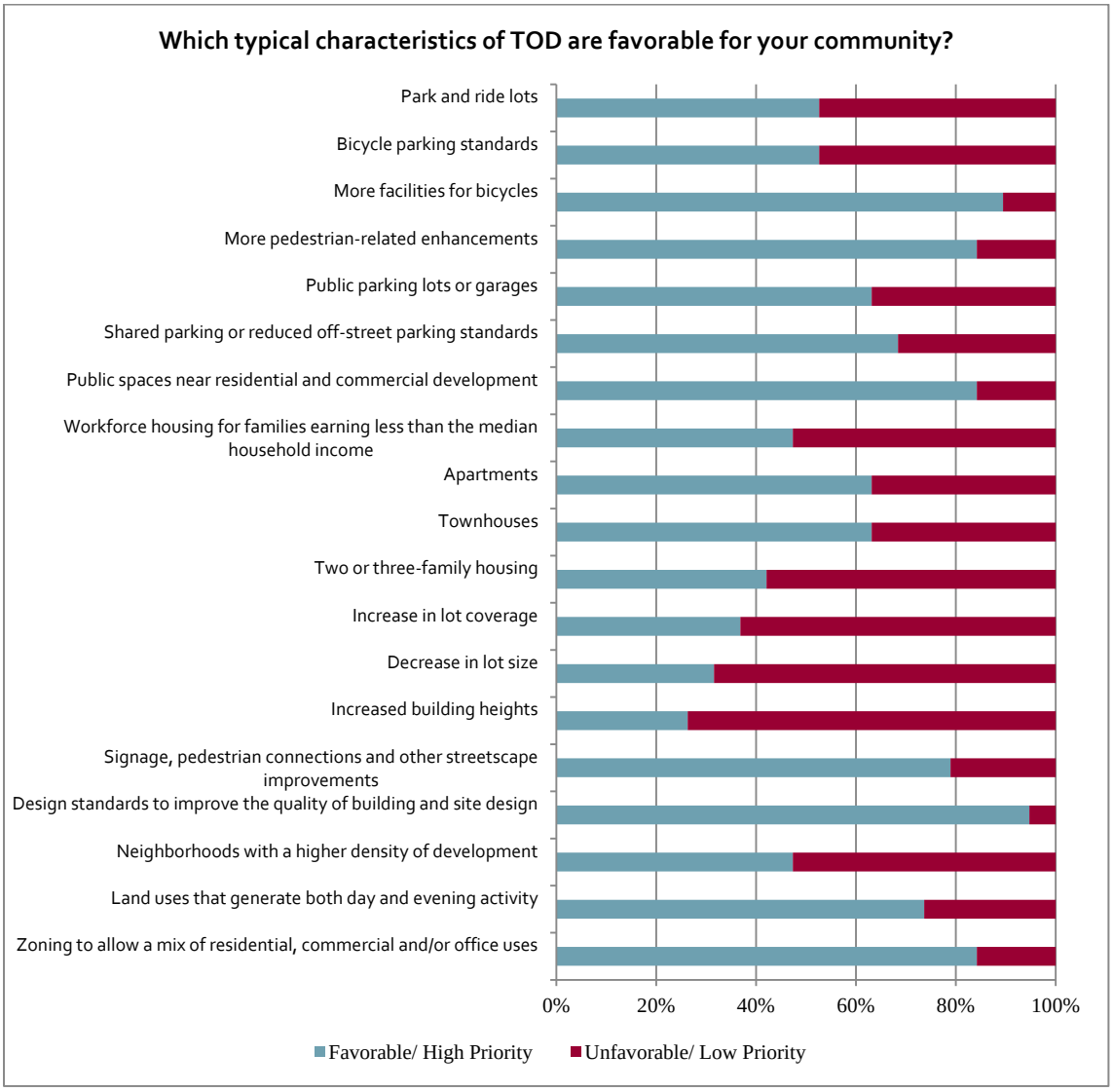
One of the initial recommendations of the Working Group was to develop a survey to assist in the selection of areas that might be suitable for TOD. PVPC developed an online survey and sent notices to the representatives from the Pioneer Valley Joint Transportation Committee (JTC), planners, planning board members, selectmen, and mayors in the PVPC region to request their participation in the survey. Responses were received from 14 unique communities in the Pioneer Valley region.

TOD Community Survey Questions

1. What municipality do you represent?
2. Which municipal office or department are you affiliated with?
3. How familiar are you with the concept of Transit Oriented Development?
4. In your public planning documents (such as a Master Plan or Community Development Plan) has your community identified areas or districts for TOD? If so, where are these areas or districts?
5. In your public planning documents, has your community identified areas for more concentrated or mixed use development? If so, where are these areas or districts?
6. Which community plan identifies TOD as a strategy?
7. Please identify which typical characteristics of TOD you believe your community would find favorable and which ones would likely be considered unfavorable:
8. Do your local parking requirements allow flexibility in the number of required off street spaces for mixed use developments and/or shared parking?
9. What neighborhoods within your community do you believe would be appropriate for TOD development?
10. What local roads or streets within your community are highly traveled and very important to local mobility, access to shopping, schools, etc. – but are not considered major arterials or regional routes?
11. Please list any major intersections or roads where you are aware of ongoing traffic/ pedestrian/ bike safety problems.
12. Is your community expecting new development (of any type) in a downtown or village area the next 6-12 months?

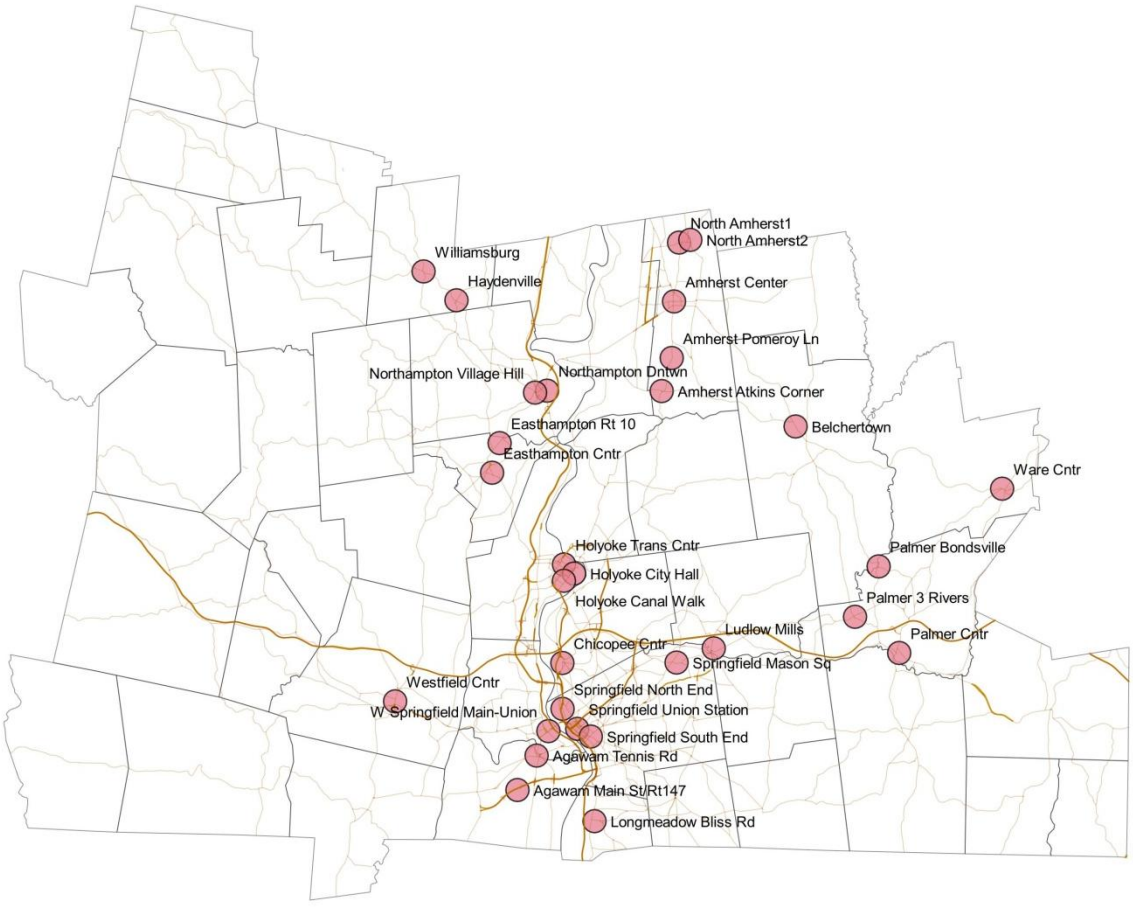
Most of the survey respondents indicated they had some form of a planning background. All respondents also had at least a basic understand of the concept of TOD. Nearly 75% of all responses indicated that at least one public planning document for the community has identified potential areas for TOD. Survey responses were very wide spread on the TOD characteristics that would be favorable in the responder's community. While 13 of the 19 identified characteristics were ranked as favorable by the majority of respondents, no characteristic was unanimously viewed as being favorable to every community. The most favorable TOD characteristics were "Design standards to improve the quality of building and site design" and "More facilities for bikes, including bike lanes and locking racks." The least favorable TOD characteristics were "Increased building heights" and "Decrease in lot size."


In your public planning documents, has your community identified areas for more concentrated or mixed use development?
5.6%
22.2%
72.2%
No
Yes
Not Sure


Which typical characteristics of TOD are favorable for your community?
Park and ride lots
Bicycle parking standards
More facilities for bicycles
More pedestrian-related enhancements
Public parking lots or garages
Shared parking or reduced off-street parking standards
Public spaces near residential and commercial development
Workforce housing for families earning less than the median household income
Apartments
Townhouses
Two or three-family housing
Increase in lot coverage
Decrease in lot size
Increased building heights
Signage, pedestrian connections and other streetscape improvements
Design standards to improve the quality of building and site design
Neighborhoods with a higher density of development
Land uses that generate both day and evening activity
Zoning to allow a mix of residential, commercial and/or office uses
0%
20%
40%
60%
80%
100%
Favorable/ High Priority
Unfavorable/ Low Priority

Based on the results of the survey and consultation with the Transportation Working Group, a total of 30 sites were selected for the Phase One analysis. Each if the locations are shown below.

Community	Description	Community	Description
Agawam	Main Street/Route 147	Palmer	Palmer Center
Agawam	Tennis Road	Palmer	Three Rivers
Amherst	Amherst Center	Palmer	Bondsville
Amherst	North Amherst	Springfield	North End
Amherst	West Street/Pomeroy Lane	Springfield	Downtown - Main Street
Amherst	Atkins Corner	Springfield	South End
Chicopee	Chicopee Center	Springfield	State Street/Mason Square
Easthampton	Easthampton Center	Springfield	Medical District
Easthampton	Route 10 Corridor	Springfield	Boston Road
Holyoke	Transportation Center area	Ware	Ware Center
Holyoke	Holyoke City Hall area	West Springfield	Park/Main/Union Streets
Holyoke	Canal Walk area	Westfield	Westfield Center
Longmeadow	Bliss Road	Williamsburg	Williamsburg Center
Ludlow	Ludlow Mills	Williamsburg	Haydenville
Northampton	Village Hill	Palmer	Palmer Center



CRITERIA

PVPC performed research using a variety of existing data sources to identify criteria to analyze the potential of each of the 30 identified locations to support TOD. Staff reviewed demographic data such as the percentage of population that lives within ¼ mile of the proposed site, vehicle ownership, and journey to work data. Existing transit service data such as route alignment, headways, ridership and on-time performance data was reviewed for all bus routes within walking distance of the 30 sites. Information was also summarized on existing pedestrian and bicycle amenities, known transportation needs, and proposed transportation improvements that could occur within the next several years.

All total, 18 different criteria were used to review the potential for each of the Phase One identified areas in the Pioneer Valley to support TOD. A matrix analysis was conducted for each of the selected TOD sites to identify the transportation merits of each location. The criteria used in the analysis are defined below.

Category	**Description**
Priority Development Area	Development priority recommendation (TOD Development, Community Priority Area, Area Suitable for Smart Growth) as defined by the 2011 Valley Vision Update Map
Number of Transit Routes	The number of transit routes that serve at least a portion of the priority area.
Transit Level of Service (LOS)	The total number of bus trips that occur in the priority area over an average weekday.
Annual Ridership	The most recent route ridership figures for the routes serving the priority area. Reflects total route ridership, not ridership from the priority area.
Park and Ride Lot Proximity	A Park and Ride Lot exists or the area has (in PVPC's opinion) the potential to support park and ride.
2010 Population	The estimated 2010 population within the priority area.
Median Annual Income	The Median Annual Household Income for the Census tract based on the 2006-2010 ACS data.
% No Vehicle Households	The % of all households in the area that do not own at least 1 vehicle.
% Gen X	The % of the population that falls in the 19-34 age group (group that may be more likely to use transit and desire to live in a TOD).
% Age 60+	The % of the population that is 60 years or older.
Planned Improvements	Recently completed transportation improvements or proposed transportation improvements that could be completed within 5 years.
Known Needs	Transportation needs for the area as identified by PVPC.
Community Support	The estimated level of support (high, medium, or low) for TOD in this area.
Major Employers	The major employers in the vicinity of the area based on PVPC's 2008 report.
Workforce Characteristics	The predominate type of employment currently in the study area as defined by PVPC.
Existing Housing Density	The average number of dwelling units/acre and the existing level of housing density (high, medium, or low).
Anticipated Housing Density	The expected level of housing density if TOD were to be implemented (high, medium, or low).
Ease of Implementation	The anticipated likelihood of TOD to be implemented and development to occur.

PROCESS

Three scoring methods were developed in consultation with the Transportation Working group to assist in the analysis of the 18 scoring criteria. Each of the scoring options is summarized by category below.

Category	Option 1	Option 2	Option 3
Priority Development Area	1 - 3	1 - 3	1 - 3
Number of Transit Routes	Inverse Rank	Inverse Rank / 10	Inverse Rank * 20%
Transit Level of Service	Inverse Rank	Inverse Rank / 10	Inverse Rank * 50%
Annual Ridership	Inverse Rank	Inverse Rank / 10	Inverse Rank * 30%
Park and Ride Lot Proximity	Yes = 3, No = 0	Yes = 3, No = 0	Yes = 3, No = 0
2010 Population	Inverse Rank	Inverse Rank / 10	Inverse Rank * 10%
Median Annual Income	Rank Low to High	Rank Low to High / 10	Rank Low to High * 20%
% No Vehicle Households	Inverse Rank	Inverse Rank / 10	Inverse Rank * 30%
% Gen X	Inverse Rank	Inverse Rank / 10	Inverse Rank * 30%
% Age 60+	Inverse Rank	Inverse Rank / 10	Inverse Rank * 10%
Planned Improvements	Variable Scoring 0 – 3	Variable Scoring 0 – 3	Variable Scoring 0 – 3
Known Needs	Variable Scoring 0 – 3	Variable Scoring 0 – 3	Variable Scoring 0 – 3
Community Support	High, Medium, Low	High, Medium, Low	High, Medium, Low
Major Employers	Variable Scoring 0 – 3	Variable Scoring 0 – 3	Variable Scoring 0 – 3
Workforce Characteristics	Variable Scoring 0 – 3	Variable Scoring 0 – 3	Variable Scoring 0 – 3
Existing Housing Density	High, Medium, Low	High, Medium, Low	High, Medium, Low
Anticipated Housing Density	High, Medium, Low	High, Medium, Low	High, Medium, Low
Ease of Implementation	Variable Scoring 0 – 3	Variable Scoring 0 – 3	Variable Scoring 0 – 3

- Priority Development Area was scored by the actual designation on the Valley Vision II Update Map. Areas designated as TOD Development were awarded 3 points, Community Priority Areas were awarded 2 points, and Areas Suitable for Smart Growth were awarded 1 point.
- The Inverse Rank was awarded the actual point total based on the rank from High to Low. The area with the highest total was awarded 30 points, the second highest 29 points, etc.
- Rank Low to High awarded 30 points to the area with the lowest score, 29 points to the area with the second lowest score, etc.
- Areas with an existing Park and Ride Lot or potential for Park and Ride were awarded 3 points. All other areas were awarded 0 points.
- For categories scored as "High, Medium, or Low," areas that received a "High" rank were awarded 3 points, areas that received a "Medium" rank were awarded 2 points, and areas that received a "Low" rank were awarded 1 point.
- Variable Scoring categories awarded 0 – 3 points based on the weight the scorer chose to assign to the value of that category for each area.

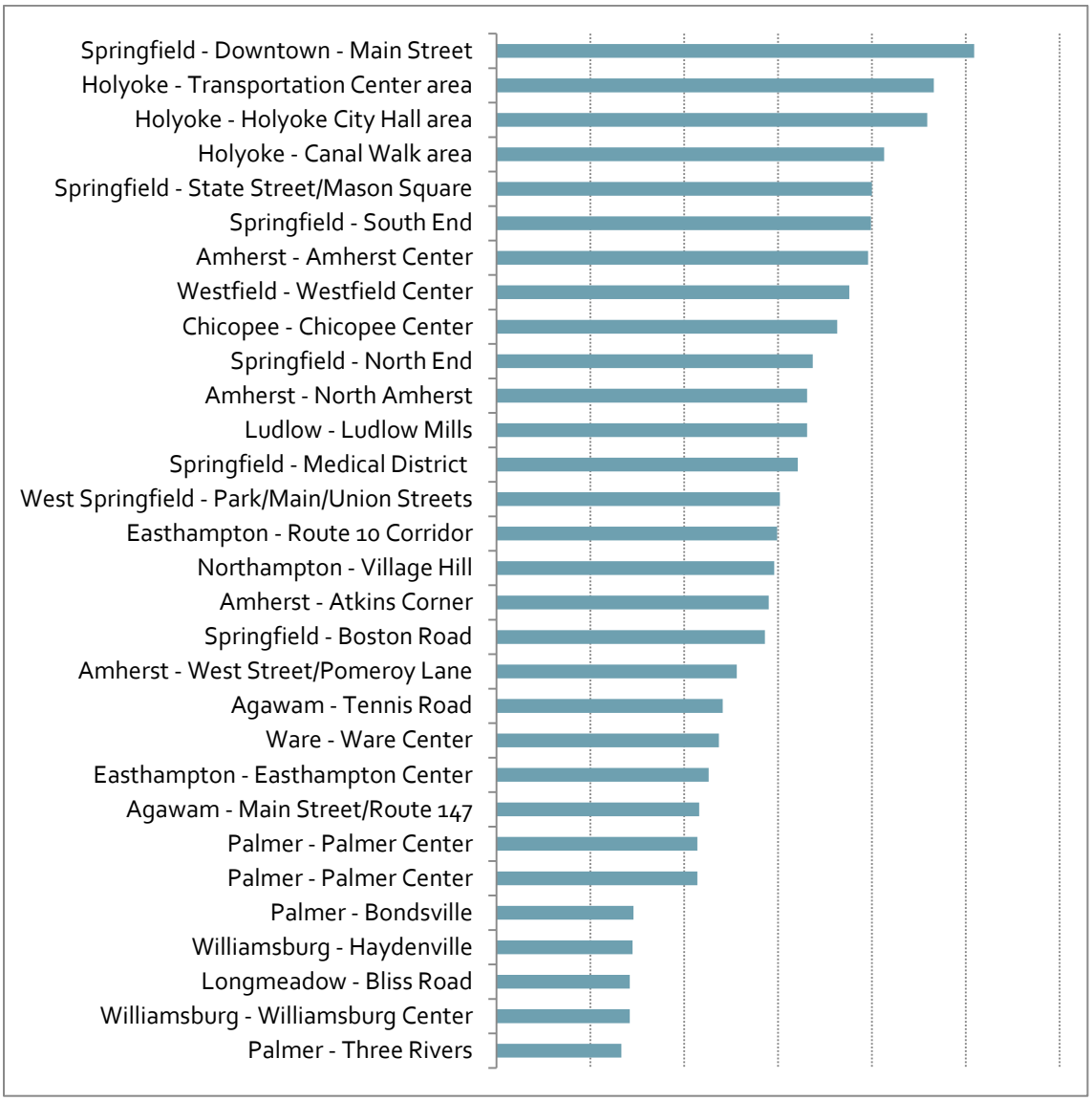
Scoring Option I resulted in the highest scores and the highest range of scores as it reflected the actual values of the eight categories scored as a result of their rank. Scoring Option 2 attempted to equalize the value of the eight ranked categories to the 10 categories that had a maximum value of 3 by dividing the actual ranked value by "10." Scoring option 3 attempted to apply weight to the eight ranked transit

and demographic categories based on the importance as defined by the Transportation Working Group.

After significant debate, Option 2 was chosen by the Transportation Working Group. Option 2 was chosen as the working group it resulted in the most equal scoring method for each category as no area could receive a score greater than 3 in any one category.

RANKING

Each of the 30 areas identified as having the potential to support TOD was analyzed using the scoring methodology defined under Option 2. The results are presented below in descending order.

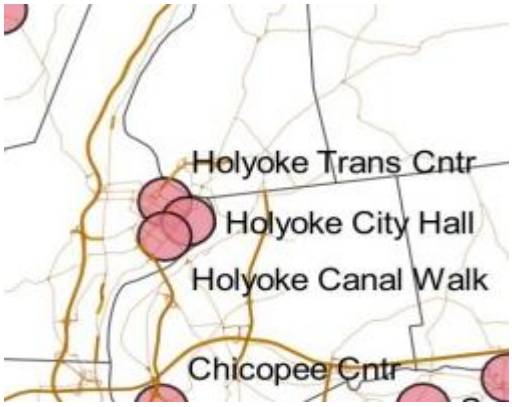


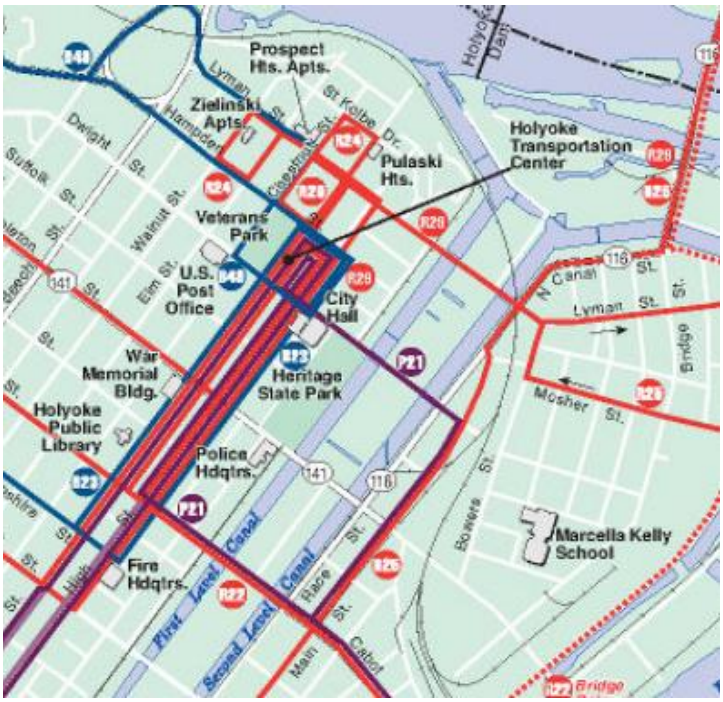
The first ten areas were defined as having a "High" potential to support TOD. The next ten areas were defined as having a "Medium" potential to support TOD. The final ten areas were defined as having a "Low" potential to support TOD. The High, Medium, and Low designations were chosen to remain

consistent with how projects were ranked in the current Regional Transportation Plan. A "Low" designation is not necessarily an indication that an area is a poor fit for TOD, rather that it does not currently have as many beneficial characteristics to support TOD as the higher ranked areas.

SELECTION

Upon review of the 10 areas that were defined as having a "High" potential to support TOD it was determined that all had a valid argument to be advanced to the Phase Two stage to conduct a more in depth analysis. Four of the "High" potential areas are located in the City of Springfield while three are located in the City of Holyoke. The three Holyoke locations were selected by the Transportation Working Group as these three areas all overlap and share many of the same characteristics. It was agreed that a study should be developed that addresses all three areas to the extent possible. The information gathered as a result of this analysis could then be used to advance future studies, potentially as part of the Unified Planning Work Program (UPWP) in the other "High" potential TOD areas.





NEXT STEPS

Based on the results of the "Alternatives Analysis" it is anticipated that Phase Two work could begin in the Spring of 2013. The following activities will be advanced to develop recommendations that will both advance and support TOD implementation.

- Expand the Transportation Working Group to include a broad representation of municipal government, the business community, and local residents.
- Ridership surveys will be developed for all PVTA routes serving the area. The surveys will be conducted over a sample selection of times and days of the week to identify how proposed transit route modifications could enhance existing ridership. Recommendations will be developed on how to best alter the existing transit routes and schedules to accommodate both their existing and anticipated new riders.
- Assess the pedestrian infrastructure to evaluate the overall condition of the pedestrian system and identify key maintenance projects to maintain a safe walking environment for all users.
- Develop a series of short and long term recommendations that would improve transportation conditions and assist in fostering development in the proposed area. Work with local communities and Consortium partners to develop projects that address congestion and pedestrian needs in the vicinity of key transit and rail stations.
- Estimate trip generation characteristics, potential parking requirements, increase in transit ridership, and decrease in single occupant vehicle travel that could be expected as a result of TOD.

RECOMMENDED STRATEGIES

ELEMENT PLAN STRATEGIES

The strategies included in this element plan are based on those recommended in the 2012 Pioneer Valley Regional Transportation Plan (RTP). The RTP focuses on the attainment of a safe and dependable transportation system. A total of five emphasis areas were identified to assist in the development of the regional transportation strategies required to assist in the achievement of the RTP vision and goals. These emphasis areas are not intended to be a replacement for the regional transportation goals. Instead they were established with the recognition that many of the transportation improvement strategies included as part of the RTP Update can meet multiple regional transportation goals. The five emphasis areas are:

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

CROSS CUTTING STRATEGIES

Cross Cutting Strategies are defined as over-arching strategies that advance multiple element plans. For example the "Promote transit oriented development" strategy also assists in the advancement of the economic development, climate change, and land use element plans. A summary of each of the cross cutting icons is shown below.

 Green Infrastructure

 Housing

 Land Use

 Transportation

 Brownfields

 Climate

 Economic Development

 Environment

 Food Security

SAFETY AND SECURITY

Highway Safety focuses on the reduction of crashes and resulting deaths, injuries and property damage occurring on public roads. Passenger vehicle movements, truck conflicts, pedestrian and bicycle travel, and bridge conditions are all included as part of Highway Safety.

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

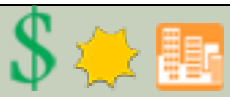
STRATEGY	DESCRIPTION	LEAD ROLE	CROSS CUTTING STRATEGIES
Provide accommodations for pedestrians, transit users, and bicyclists in roadway and bridge design and the maintenance of existing facilities.	Identify and prioritize transportation improvement projects that promote the safety of bicyclists, pedestrians, and transit riders to assist in developing a balanced transportation system	MassDOT, Municipalities	
Implement communications and ITS technologies to improve public transit safety, and security.	Utilize the existing ITS equipment on PVTA busses to improve operational efficiency, give passengers real time information, provide critical information to first responders, and interface with the other ITS infrastructure.	MassDOT, PVTA	
Work with appropriate agencies to improve the transmittal of bike and pedestrian crashes to local police departments.	Increase documentation of bicycle and pedestrian crashes.	MassDOT	
Promote the Safe Routes to School program.	Promote the Safe Routes to Schools Program and assist in identifying potential candidate locations for inclusion in the program.	MassDOT, PVPC	
Develop appropriate educational resources to promote safety for drivers, bicyclists, transit users, and pedestrians.	Promote safety for all transportation users.	MassDOT, PVTA, PVPC	

THE MOVEMENT OF PEOPLE

Efficient movement of people remains a top priority of the regional transportation system. Congestion typically occurs when the demands on a system surpass the actual handling capacity. These types of conditions are prevalent in areas where a number of roadways converge onto a single segment, like major bridge crossings. Feasible alternatives to congestion relief through increases in roadway

capacity without actual lane expansion are strongly encouraged. This approach requires that vehicle users, commuters, and travelers change their travel patterns and opt for more congestion friendly alternatives such as public transportation, ridesharing, bicycling, and walking.

It is important to develop balance in the regional transportation system. Improvements in the regional transit system and provisions for pedestrians and bicyclists in transportation design can help achieve balance and reduce our reliance on the automobile. Similarly, the development of transportation improvements that do not increase capacity will not induce more vehicle trips that can quickly develop into new areas of congestion.

STRATEGY	DESCRIPTION	LEAD ROLE	CROSS CUTTING STRATEGIES
Seek innovative methods to increase transit ridership, including express routes and flex vans.	Identify areas that could benefit from additional or improved transit service and develop recommendations to increase transit ridership.	PVTA	
Monitor congested areas using the regional Congestion Management Process (CMP).	Utilize the regional congestion management process to monitor areas of congestion with travel conditions that are no longer acceptable to the public. Identify strategies to assist in reducing congestion. Develop regional performance measures to prioritize congestion severity. Utilize performance measures to track congestion and develop mitigation actions.	PVPC	
Promote the implementation of bicycle lanes where practical.	Identify areas where bicycle lanes could be included as part of ongoing transportation improvement projects.	MassDOT, Municipalities	
Promote transit oriented development.	Include TOD strategies and recommendations in future transportation planning studies as appropriate.	Planning Boards	
Seek to develop a TOD Investment Fund	Participate in the development of a framework for a TOD Investment Fund to provide for infrastructure and catalytic funding of TOD projects, and identify potential funding sources to capitalize the fund	PVPC	
Fund Bikeway/Walkway projects	Support CMAQ and other funding as appropriate for bikeway/walkway	PVPC, MassDOT	

	projects to help build out the region's linked network of bikeways and walkways, including bi-state linkages		
Develop a comprehensive Commuter Rail network.	Work with officials from the Commonwealth of Massachusetts, the State of Connecticut, local communities, and other interested parties to advance the development of a viable Commuter Rail network.	MassDOT	
Identify locations for park and ride lots and supporting express transit service.	Monitor usage at existing park and ride lots in the region. Develop feasibility studies for potential new park and ride lot locations through consultation with MassDOT, PVTA and local officials.	PVPC, PVTA	
Encourage private connections to the regional bikeway network.	Work with local communities and interested private developers to develop incentives to enhance connections to the regional bikeway network.	DCR, Planning Boards	
Maintain equity in providing transportation services and access throughout the region.	Incorporate an assessment of transportation equity as part of transportation planning studies as appropriate. Work with local communities to identify neighborhood groups and local organizations to include in ongoing public participation activities.	PVPC, PVTA, MassDOT, FHWA, FTA, local communities	

THE MOVEMENT OF GOODS

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

A large portion of the freight transportation system is privately owned and operated. As a result, it is critical to develop partnerships between state, regional and local agencies with the private sector to coordinate and maintain efficient freight planning and implementation.

STRATEGY	DESCRIPTION	LEAD ROLE	CROSS CUTTING STRATEGIES
Develop incentives to encourage businesses to utilize a mix of freight transportation alternatives.	The movement of goods in the Pioneer Valley is dominated by trucking, which has 98 percent of the market. Identify measures to encourage a wider mix of freight transportation uses.	Local Government	
Identify and mitigate vertical clearance issues at underpasses.	Low clearance underpasses restrict the efficient movement of freight in the Pioneer Valley region. Identify locations with vertical clearance issues and advance transportation improvements that enhance freight movement.	MassDOT	

THE MOVEMENT OF INFORMATION

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

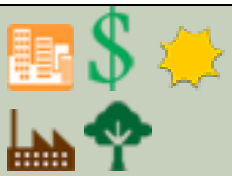
STRATEGY	DESCRIPTION	LEAD ROLE	CROSS CUTTING STRATEGIES
Include ITS equipment as part of transit and roadway improvement projects.	Work with MassDOT and local communities to identify opportunities to include ITS equipment as part of future roadway and bridge improvement projects.	MassDOT, PVTA,	
Support ITS projects to foster deployment of ITS technology.	Encourage the development of pilot projects to identify new and innovative uses of ITS equipment. Use ITS technology to enhance data collection and develop new methods to analyze and improve existing transportation problems.	MassDOT, PVTA, PVPC	
Continue to refine and improve the regional project prioritization system as necessary.	Work with MassDOT and the Pioneer Valley MPO to identify enhancements to the regional project prioritization system. Specifically, develop a separate	MassDOT, PVPC	

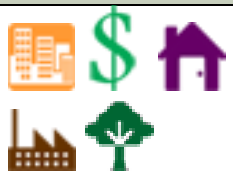
	prioritization system for transit and freight improvement projects.		
Encourage and promote telecommuting and video conferencing.	Develop initiatives to encourage major employers to offer options for tele-commuting. Promote video conferencing to reduce the rise in vehicle miles traveled in the region.	Major Employers	
Implement real-time passenger and travel information systems.	Develop a reliable process to share relevant data with appropriate agencies. Assist in the coordination to collect and distribute real-time travel information in the PVPC region.	MassDOT, PVTA	

SUSTAINABILITY

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

A balanced transportation system is more sustainable as it meets more people's needs while using resources efficiently to make it more likely that future transportation systems will meet future generation's needs. The goal of PVPC's sustainable transportation system is to consistently reduce the VMT per population. Efficient transportation options, especially public transportation, can maximize social equity, increase social connectivity, maximize safety, and maximize resource efficiency. Public transit and ridesharing reduce the number of vehicles on the road. Transportation efficiency benefits society and reduces its impacts on the environment.

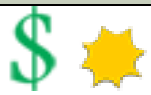
STRATEGY	DESCRIPTION	LEAD ROLE	CROSS CUTTING STRATEGIES
Properly mitigate the adverse impact of sprawl by promoting development through the use of permitting and zoning measures.	Control sprawl outside existing town centers and growth centers by creating disincentives for development. Establish lower land use zoning intensities and restrict uses which are not appropriate for rural areas. Encourage mixed-use projects to provide opportunities for people to live in close proximity to work, or to walk from the office to shops or restaurants. Facilitate the redevelopment of Brownfields sites, and other underutilized urban lands.	Planning Boards	

	Market Brownfields sites and other underutilized urban lands suitable for redevelopment. Consider reduced parking requirements to encourage business to locate in downtown areas.		
Create incentives for downtown revitalization.	Streamline or update antiquated zoning regulations to promote mixed uses and infill development in downtown areas. Create public-private partnerships of civic leaders and property owners, such as Business Improvement Districts and downtown associations, to manage and market downtowns. Invest in upgrading physical infrastructure 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. Implement a signage program to direct visitors to key downtown destinations.	Planning Boards	
Divert highway runoff to stormwater Best Management Practices, such as rain gardens and dry swales.	Rain gardens and dry swales help filter pollutants before water reaches underground aquifer. A multi-level filtration system can be applied with use of pebbles, aggregate, soil, and vegetation. Planters with dense, grassy vegetation that help absorb water can be placed near water collection areas to buffer crosswalks and areas that flood.	MassDOT, DPW	
Restore or maintain connected habitats that allow for movement of fish, water, and wildlife.	Utilize data developed by the University of Massachusetts, The Nature Conservancy, and others to determine where transportation projects can have the biggest positive or negative impact on the movement of wildlife and	DCR	

	connectivity of habitat. The interconnectedness of different parts of a stream or watershed is essential to animals. The combined effects of dams and poorly designed bridges and culvers impact wildlife by limiting access to coldwater habitat, access to feeding areas, access to breeding and spawning areas, and natural dispersal.		
Expand use of permeable pavements on sidewalks, paths, car-parks, and minor roads.	Surface material that allows precipitation to infiltrate storm water into the soil below is an important link in the life cycle of local clean water supplies. Permeable pavements help reduce water volume carried through the sewage system and decrease incidents of flooding and overflow. On sidewalks, they reduce the occurrence of tree root damage.	MassDOT, DPW	
Encourage use of materials such as pervious concrete, porous asphalt, paving stone, brick, tile, and gravel where appropriate.	Using a variety of materials is useful to both users and the environment as it provides visual interest, creates a distinguished character, and reduces the heat island effect generated by large asphalt surfaces. PVPC will explore including the use of porous pavement as a recommended improvement strategy in the regional pavement management system.	MassDOT, DPWs, PVPC	
Utilize narrower road widths for local roads where appropriate.	A road diet can have a calming effect that encourages reduced vehicular speeds. This in turn can also reduce noise and air pollution while improving safety and livability.	MassDOT, DPW	
Develop transportation facilities to support and promote smart growth in and around existing city and town centers.	Transportation hubs and multimodal centers that provide services such as showers, lockers, bike shelters, and information centers attract residents and customers. They can also assist in increasing the viability of high density development initiatives for	PVTA, Municipalities	

	town centers.		
Designate wild and scenic corridors along highways that abut rivers and streams of historic and natural significance.	Designation serves to protect significant corridors from development and signage encroachment and preserve their natural beauty and historic character. As a regional resource, it attracts visitors and supports the local economy through tourism. It also protects wildlife by maintaining habitat connectivity.	DCR	
Implement the Regional Clean Energy Plan.	The goals of the Pioneer Valley Clean Energy Plan are to reduce 2000 levels of energy use by 15% by 2020, replace fossil fuels with clean energy, reduce green house gas emissions 80% below 2000 levels by 2050, and create local jobs in the clean energy sector. The plan identifies 30% of the reductions to come from the transportation sector.	PVPC	
Encourage local fleets to use clean fuel alternatives.	Fleets of local government, schools, businesses, transit, and the service industry would benefit from converting fleets to use clean energy and become less dependent on petro chemicals.	DEP	
Promote energy efficient travel modes.	Work with MassRides and major employers to promote energy efficient travel modes such as the use of alternative fuel vehicles, carpooling, and car sharing to reduce fuel consumption in the region. Offer incentives such as preferred parking spaces for employees that carpool or drive an alternative fuel vehicle.	MassRides, Major Employers	
Implement the Regional Hazard Mitigation Plan.	The Pioneer Valley Regional Natural Hazard Mitigation Plan assesses risk and vulnerability and creates an action plan for adoption, implementation, and monitoring. The main goal of the plan is to reduce the loss of or damage to life,	MEMA	

	property, infrastructure, and natural, cultural, and economic resources from natural disasters.		
Invest in the repair and maintenance of existing transportation infrastructure.	Utilize pavement management to identify roads in need of repair before they reach critical conditions. Maintaining a state of good repair results in more cost effective projects that enhance the safety and efficiency of all modes.	MassDOT, DPW	
Advance and promote the use of alternatively fueled vehicles.	Advance measures to promote alternatively fueled vehicles when appropriate. Provide assistance in the conversion of vehicle fleets to alternative fuel sources. Promote alternatively fueled vehicles by identifying charging locations and free parking at major activity centers.	MassDOT, Municipalities	
Work with major employers to develop incentives to decrease single occupant vehicle use.	Continue to work with MassRides to reduce the percentage of single occupant vehicles that commute to work. Incorporate strategies as appropriate into ongoing transportation planning studies.	MassRides	
Mitigate the impacts of roadway salt and chemical usage during snow season.	Identify areas as part of ongoing transportation studies to may benefit from reduced road salt. Road salt contaminates drinking water supplies as a result of poor storage, highway runoff, and snow removal. High levels of salt also impacts food production in the region and the availability of local produce that may not tolerate high levels of salt in the soil.	MassDOT, DPW	
Refer new projects to Valley Vision Toolbox resources.	Work with local communities to advance the strategies and model bylaws of the most current version of the regional land use plan. Transportation planning studies should include recommendations consistent with the Valley Vision Toolbox as appropriate.	PVPC	

Support urban forestry initiatives.	Promote a larger, healthier urban forest as part of the urban ecosystem through community planting, maintenance, and education. An urban forestry initiative would help protect existing trees and open space. It can also work to reclaim abandoned space for use as community gardens and recreational space.	DCR	
Utilize energy efficient lighting and solar panels in new facilities.	Energy efficient lighting can be installed both in indoor and outdoor facilities along roadways and in parking lots using solar panels for electricity. Motion activated lights are useful along sidewalks in urban residential neighborhoods.	Planning Boards	
Enforce idling reduction programs in major activity centers.	Enforce idling reduction programs at transportation hubs, bus terminals and facilities that operate a fleet of vehicles. Develop an educational campaign about the adverse effects of idling on air quality.	Police	
Identify hazardous locations due to drought under major roadways.	Perform an inventory of soil conditions and the water table under major highways to identify prone to sink holes and surface cracking due to drought.	MassDOT, DPW	
Identify potential flooding locations along major highways and rerouting alternatives.	The 100 and 500 year flood zone maps help identify locations of potential impact to major highways during a flood incident. Local flood evacuation studies can be conducted to identify potential hazard sites, vulnerable receptors, impacted roads, and traffic flow patterns when certain roads become impassable.	MassDOT, DPW	
Develop ordinances and bylaws that encourage mixed use and high density forms of development where appropriate.	Develop zoning regulations to promote cluster development, such as major residential development ordinances or open space community development ordinances, as an alternative to	Planning Boards	

	standard large-lot subdivisions. 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. Adopt zoning for elderly and handicapped congregate housing. Improve the quality of compact neighborhoods with the strategic placement of public amenities. Provide accessible open space close to homes in compact neighborhoods. Create Transit Oriented Development (TOD) zones within walking distance, about 2,000 feet, of major bus transit lines in urbanized areas, which allow for higher density and mixed use.		
Construct roads without curbing where practical to enable sheet flow.	On low-traffic speed streets without curbs pedestrians are given equal importance to drivers, providing for a pedestrian friendly environment by forcing drivers to become more conscious of other users of the roadway facility. This design is also inviting to cyclists as it reduces the potential of losing balance from a tire accidently striking the curb and reduces the accumulation of debris that often pose a safety hazard to cyclists driving on the right side of the road. It aids roadway drainage and eliminates puddles at curb's edge by allowing sheet flow of rain water onto a green buffer or permeable sidewalk.	MassDOT, DPW	
Screen lighting on highways.	Screening of highway lighting helps protect all species living within its proximity. Screening can be accomplished using indirect lighting fixtures or standard barriers such as fencing or dense foliage from trees.	MassDOT, Utility Companies	
Prohibit billboards along	Identify billboards to be eliminated	Local Communities,	

highways.	as part of ongoing transportation planning studies. Assist communities in identifying funding to facilitate billboard removal. Eliminating billboards where appropriate on highways would reduce driving distraction as well as light pollution and visual clutter. It preserves community character and protects the natural scenery of our region.	MassDOT	
Green Streets policies.	Work with DPWs and MDOT to adopt Green Streets policies to promote on-site stormwater runoff and installation of tree box filters, rain gardens, sheet flow runoff and permeable pavements in road construction or re-construction projects.	PVPC, DPWs, MassDOT	
Replacement of under-sized culverts and stream crossings	Promote replacement of under-sized culverts and stream crossings to accommodate increased storm flows and wildlife passage, through changes in MassDOT and FEMA policies.	PVPC, MassDOT, FEMA	
Reduce combined sewer overflow (CSO) impacts	Work with MassDOT to reduce combined sewer overflow (CSO) impacts from highway runoff, including I-91, through MassDOT's GreenDOT initiative	PVPC, MassDOT	

TOP 5 STRATEGIES

Each of the Sustainable Transportation Plan Strategies were submitted to the Pioneer Valley Joint Transportation Committee (JTC) for their input. In addition, the JTC was asked to rank the top 5 strategies they believe were most important to advance sustainable transportation in the Pioneer Valley. The results of this survey are shown below.

1. Invest in the repair and maintenance of existing transportation infrastructure.
2. Provide accommodations for pedestrians, transit users, and bicyclists in roadway and bridge design and the maintenance of existing facilities.
3. Develop a comprehensive Commuter Rail network.
4. Promote the Safe Routes to School program.
5. Promote the implementation of bicycle lanes where practical.

IMPLEMENTATION PROJECTS

Implementation projects are transportation plans and projects that are expected to be completed over the next few years that will assist in the advancement of the Sustainable Transportation Plan. These projects are summarized below.

PROJECT NAME	RESPONSIBLE PARTY
TOD Market Analysis	CRCOG/PVPC
TOD Transit Planning Study	PVPC
Regional Greenhouse Gas Monitoring	PVPC
Sustainable Transportation Project Review Criteria	MassDOT, Pioneer Valley MPO
East/West Passenger Rail Study	MassDOT
TOD Investment Fund	PVPC
Green Street Policies	PVPC, DPWs, MassDOT
Replacement of Under-sized Culverts and Stream Crossings	PVPC, MassDOT, FEMA
Reduce CSO Impacts	PVPC, MassDOT
Funding for Bikeway/Walkway Projects	PVPC, MassDOT

TOD MARKET ANALYSIS

The Pioneer Valley Sustainable Knowledge Corridor Transportation and TOD element plan is a parallel effort alongside a broader real estate market analysis for the 10 Knowledge Corridor passenger rail stations in Massachusetts and Connecticut with new or increased Amtrak and commuter rail service and the 11 CTfastraks bus rapid transit stations between New Britain and downtown Hartford. The TOD market analysis is an implementation-oriented effort that is identifying the types of TOD investments that are likely to attract and retain homeowners, renters and commercial property owners within walking distance of these stations. For each station type, the analysis proposes strategies that can be initiated at the state, regional and local levels to support desired development. Key emerging strategies include the active engagement of major educational and medical anchor institutions in TOD planning, the creation of TOD zoning districts, streetscape inventories and bike/pedestrian enhancements, and land banking, to name a few.

TOD TRANSIT PLANNING STUDY

An ongoing component of the Sustainable Transportation Element Plan is an analysis of the level and type of development transit can support in the Pioneer Valley region. The PVPC has developed a

process to build upon existing regional plans such as Valley Vision 2 and the Plan for Progress to identify a series of potential sites for Transit Oriented Development (TOD) demonstration projects. An alternatives analysis of select regional sites that have the potential to support TOD sites will be performed to identify the transportation merits of each location. This alternatives analysis will be matrix driven and include information on the demographics, existing transit service, known transportation needs, and potential to support TOD.

Upon completion of the alternatives analysis, one site will be chosen for a more detailed analysis geared towards the implementation of TOD in the future. Specifically, ridership surveys will be conducted along PVTA routes that are anticipated to be impacted by the proposed site to identify how proposed transit route modifications might impact existing ridership. In addition, an assessment of the location and condition of existing sidewalks in the vicinity of the proposed site will be conducted to identify key maintenance projects to maintain a safe walking environment. A series of short and long term recommendations would be developed based on the results of the analysis to assist in fostering economic development, advance projects that address congestion and pedestrian needs, and identify performance measures that can assist in monitoring effectiveness.

The goal of this study will be to develop substantive next action steps in cooperation with an expanded project advisory committee to instruct how to achieve measurable results. Potential placed-based actions include: TOD overlay zoning, TOD amenities to encourage use of alternative modes of transportation improvements, promotion of a TOD investment fund, and enhanced coordination of transit services for residents with income and language barriers.

REGIONAL GREENHOUSE GAS MONITORING

The Pioneer Valley Planning Commission recently procured a greenhouse gas monitor for the University of Massachusetts Transit Services (UMass Transit) as part of a FTA grant to fund their new bus garage. The Picarro Cavity Ring Down Spectroscopy (CRDS) Analyzer measures three primary greenhouse gases, CO_2, CH_4 and H_2O, down to parts-per-billion (ppb) sensitivity. The analyzer incorporates temperature and pressure control and uses time-based measurement system via a laser to quantify the greenhouse gases. The analyzer can be used as a stationary device or as a mobile device.

PVPC is working in cooperation with the University of Massachusetts to identify uses for the monitor. Current efforts are focused on integrating mobile measurements taken by the analyzer into the regional Congestion Management Process (CMP). It is necessary to quantify greenhouse gas levels along CMP corridors in order to develop new performance measures to assist in identifying and prioritizing congestion in the region. The device will also be used at congested intersections to demonstrate the impact peak hour traffic flows have on green house gas production.

SUSTAINABLE TRANSPORTATION PROJECT REVIEW CRITERIA

Projects considered for funding as part of the Transportation Improvement Program for the Pioneer Valley (TIP) are reviewed using project review criteria endorsed by the Pioneer Valley Metropolitan Planning Organization (MPO). This criteria has not undergone a significant update for quite some time. The PVPC will work with MassDOT and the Pioneer Valley MPO to review the current criteria to incorporate the requirements of the new federal MAP-21 legislation as well as the GreenDOT policy to promote smart growth and green infrastructure, and reduce greenhouse gas emissions as appropriate.

EAST/WEST PASSENGER RAIL STUDY

In the 2005 transportation appropriation Congress designated the Boston – Springfield to New Haven as well as the Springfield to Albany corridors as part of the Northern New England High Speed Rail Corridor. With partial funding from the Federal Railroad Administration (FRA), MassDOT is advancing a study of the corridor. MassDOT has recently hired HDR Consultants to conduct the study of this route between Boston and New Haven as well as the route between Boston and Montreal via Springfield. This planning effort provides an opportunity to develop a long term master plan for Passenger Rail in Southern New England. It is the intention that this plan will explore opportunities for passenger rail service and provide a scalable, incremental plan for implementation of new or expanded services. Particular emphasis will be placed on developing an innovative funding strategy as well as looking at the economic impacts that rail service would have on affected communities. MassDOT has included passenger rail service connecting Boston and Springfield as part of its 21st-Century Transportation Plan.

PLACE BASED PROJECTS

Place based projects are transportation projects located in the Pioneer Valley are advancing or are expected to advance towards construction in the short term. Each of the place based projects will contribute to the advancement of the strategies included in the Sustainable Transportation Plan. Additional information on each of the projects is provided below.

PROJECT NAME	RESPONSIBLE PARTY
New Haven – Hartford – Springfield Rail Project	MassDOT / ConnDOT
Union Station Regional Intermodal Transportation Center	Springfield Redevelopment Authority
Holyoke Rail Station	City of Holyoke
Northampton Rail Station	MassDOT
Westfield Intermodal Transportation Center	City of Westfield, PVTA
PVTA Bus Maintenance Facility	PVTA
Northampton Park and Ride Lot	MassDOT
Transit Pulse Point	PVTA/City of Northampton

NEW HAVEN – HARTFORD – SPRINGFIELD RAIL PROJECT

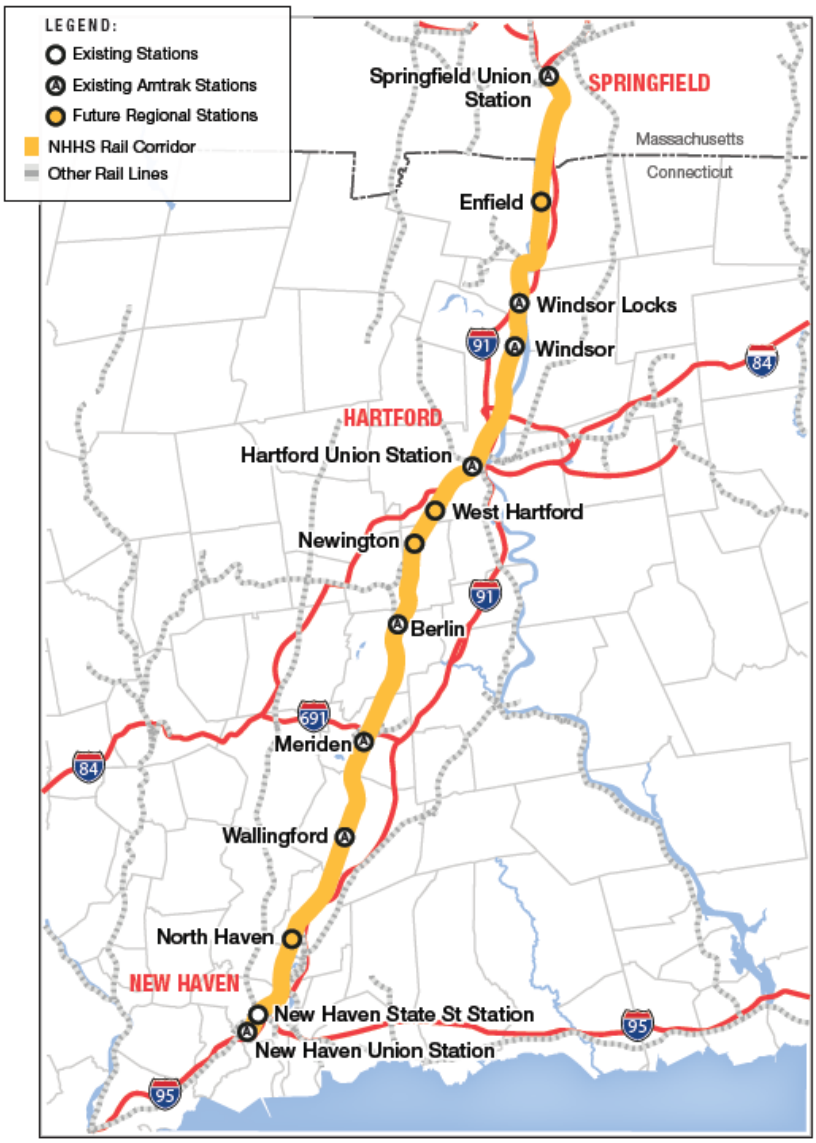
The New Haven-Hartford-Springfield Rail project represents a broad partnership between the State of Connecticut, Amtrak and the Federal Railroad Administration, as well as the states of Massachusetts and Vermont. The goal is ambitious – to provide those living, working or traveling between New Haven, Hartford and Springfield with high speed rail service equal to the nation's best rail passenger service. Since 1999, the Pioneer Valley Region and Connecticut have been working toward the implementation of passenger rail service between Springfield, Hartford, and New Haven. In 2009 and 2010, ConnDOT applied for and received federal funds to complete the necessary track and station improvements between New Haven and Hartford. In 2011, ConnDOT applied for $227 million in federal funds and authorized an additional $97.3 million in state bonds to complete the line from Hartford to Springfield. In May, 2011 the FRA awarded the project $30 million, leaving a funding gap of $196.7 million.

The service would operate on the existing 62 mile Amtrak owned Springfield Line connecting the three cities. The rail corridor crosses the MA/CT border in Longmeadow and continues to Union Station in Springfield. Union Station would be the primary station located in Massachusetts with the possibility of another station located in Downtown Springfield

Intercity Rail service is expected to have a significant impact on the 13 railroad station areas serving the 17 communities along the rail corridor. The service will connect the third, fourth and fifth largest metropolitan areas in New England and provide a connection to both Amtrak and Metro North Service into the New York Region. When the project is complete, service will expand from the existing six trips daily between New Haven and Springfield, to 25 trips per day.

In Springfield, the project should have a direct and significant impact on the Union Station Redevelopment and the surrounding downtown area. The rail service will bring a large number of

commuters through the station and increase housing and business opportunities for people looking to live or work in any of the three cities or outlying communities.



Source: www.nhhsrail.com

UNION STATION REGIONAL INTERMODAL TRANSPORTATION CENTER

Source: Springfield Redevelopment Authority

The redevelopment of Union Station on Frank B. Murray Street in downtown Springfield has long been an important regional project to enhance the mobility of residents throughout the Pioneer Valley region. The goal of the station redevelopment is to consolidate regional and local transit services, passenger rail, parking and approved transit-related uses. The project is being managed by the Springfield Redevelopment Authority, which owns the property. Proposed tenants include PVTA, Peter Pan Bus Lines, and Amtrak. The Union Station project is a two-phase, $78 million rehabilitation of the property. Phase one will restore the terminal building, add a 24-bay bus terminal, a 146-space parking garage, and an additional 4 bus bays adjacent to this garage. The total cost of phase one is $48.6 million. A pedestrian tunnel linking the station with train boarding platforms will be restored allowing pedestrian access to Union Station from Lyman Street. The second phase of the project will include developing more retail and office space at Union Station, including the upper floors.

Improvements to Union Station could also result in expanded passenger rail service on the Vermonter Line to Springfield. Massachusetts would be responsible for funding additional trips along this route. The Massachusetts State Rail Plan identifies expanded passenger rail service along the Connecticut River line as a cost-effective improvement with an additional six round trips between Greenfield, MA and Springfield, MA recommended each day.

HOLYOKE RAIL STATION

The restoration of passenger rail service in Holyoke is possible due to the realignment of the Knowledge Corridor Rail Line, which will shorten the distance and improve speeds along Amtrak's Vermonter service line. A train stop will be built at the bottom of Dwight street, near the intersection with Main street in Center City Holyoke, on the west side of the track. This site is located approximately one-tenth of a mile to the south of the former Station location, three-tenths of a mile from City Hall and just north of the Holyoke's first freight rail station site.

Significant local and regional economic and mobility benefits will be achieved from this project, connecting Holyoke to nearby Cities of Greenfield, Northampton, Springfield, Hartford, and beyond. Amtrak's Passenger service is scheduled to begin serving this corridor during the spring of 2014.

Source: http://www.holyokeredevelopment.com/

NORTHAMPTON RAIL STATION

Passenger Rail service will return to the City of Northampton in 2014 as a result of infrastructure improvements along the Connecticut River line. In the short term, a refurbished rail platform at Union Station with a covered shelter will allow passengers to board the train in Northampton. As a long term downtown improvement, the City of Northampton will be undertaking an analysis to evaluate locations for a multi-modal facility near the railroad tracks which could include an indoor train station, bus connections, and commuter parking. This analysis will encompass a wide range of options for all modes of transportation. The City of Northampton has formed a new Passenger Rail Advisory Committee to assist in this endeavor.

WESTFIELD INTERMODAL TRANSPORTATION CENTER

PVTA and the City of Westfield are collaborating on the development of an intermodal transportation center to be located on Elm Street between Church and Arnold Streets in downtown Westfield. The facility will include bus berths for local and intercity buses, bicycle facilities and a connection to the Columbia Bikeway, as well as space for shops and transit-related uses inside. The project will support additional transit ridership that is expected to accompany the growth of Westfield State University's downtown campus and student housing. It will also help anchor new urban and commercial redevelopment in the vicinity.

PVTA BUS MAINTENANCE FACILITY

The Pioneer Valley Transit Authority's (PVTA) existing bus maintenance garage in Springfield (2840 Main Street) does not adequately support the existing transit operational needs. PVTA is challenged in the existing facility by a lack of space. PVTA also stores its paratransit vans in a secure outdoor lot in Chicopee; ideally these vans would have indoor parking. PVTA's proposed maintenance facility near Cottage Street and Berkshire Avenue in Springfield would allow PVTA to meet current operational needs while allowing for future growth. The new maintenance facility would allow both fixed route buses and paratransit vans to have secure indoor parking. The new facility will also allow PVTA to maintain and store articulated buses to provide additional capacity on overcrowded routes. The new facility will be built to meet LEED certification to continue PVTA's commitment to sustainability and energy efficiency. Furthermore, the facility will be built with the ability to adapt to other green technologies such as solar and clean natural gas in the future.

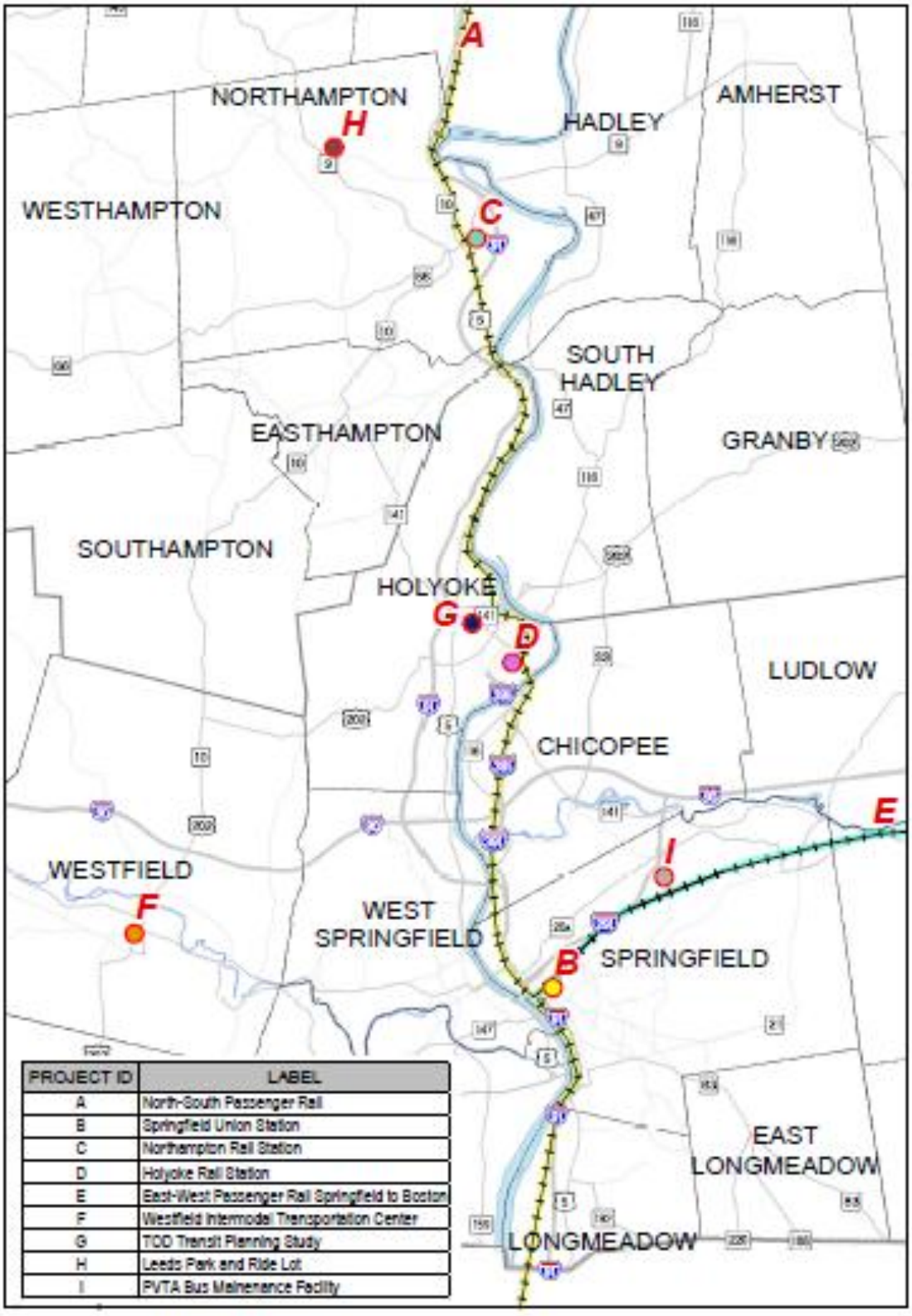
NORTHAMPTON PARK AND RIDE LOT

A new 75 space park and ride lot will be constructed at the Veterans Affairs Medical Center in Northampton. This lot will be served by PVTA buses and provide additional opportunities for ride-sharing and encourage the use of alternative forms of transportation to the single occupant automobile. The project was advertised for construction on January 26, 2013 and a Notice to Proceed was given on May 20, 2013. Construction is anticipated to be complete by Spring 2014.

TRANSIT PULSE POINT

The City of Northampton has discussed the need to move its existing transit pulse point at the Academy of Music further east along Main Street. The relocation of this pulse point or the creation of a secondary pulse point closer to the heart of the city could assist in enhancing transit ridership and future connections to passenger rail service at Union Station. Additional analysis is necessary prior to the implementation of changes to existing transit service in downtown Northampton.

Sustainable Transportation Work Map



PROJECT ID	LABEL
A	North-South Passenger Rail
B	Springfield Union Station
C	Northampton Rail Station
D	Holyoke Rail Station
E	East-West Passenger Rail Springfield to Boston
F	Westfield Intermodal Transportation Center
G	TOD Transit Planning Study
H	Leeds Park and Ride Lot
I	PVTA Bus Maintenance Facility

COMMENTS

DRAFT SUSTAINABLE TRANSPORTATION ELEMENT PLAN

Comments by	Date Rec.	Comment #	Comment	PVPC Response
Wayne Feiden, Director of Planning and Sustainability, City of Northampton	3/29/2013	1-1	Route 9 Corridor Transportation Management Association. This is basically dead. I think you should either drop it or at least mention that it is currently inactive with no immediate plans to bring it back.	Change made as requested.
Wayne Feiden, Director of Planning and Sustainability, City of Northampton	3/29/2013	1-2	Northampton Park and Ride Lot at the VA Medical Center in Leeds. This project is currently out to bid and should be mentioned.	Change made as requested.
Wayne Feiden, Director of Planning and Sustainability, City of Northampton	3/29/2013	1-3	We have discussed the need to move Northampton's main pulse point or create a secondary pulse point further east on Main Street closer to the heart of the city and to the Union Station Amtrak stop. I think it should be mentioned here.	Change made as requested.
Wayne Feiden, Director of Planning and Sustainability, City of Northampton	3/29/2013	1-4	You discuss analysis of a multimodal facility at the train station. Because the options are broader (maybe all modes at train station except PVTA/FRTA and that a block away etc), your discussion (p.54) should encompass those options.	Additional language added to clarify.
Tim Doherty, MassDOT		2-1	(Phone comment) The plan should highlight the investments made to enhance passenger rail service and the potential opportunities to increase passenger rail service in the Pioneer Valley	Additional language was added to the document to attempt to reinforce the investments that have been made and the opportunities for future expansion.

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