Chapter 1

Executive Summary

Linden Street Bridge in Allentown
Over the last 25 years, we have made tremendous progress in creating more transportation options for everyone who lives, works and plays in the Lehigh Valley. There is even more to come with significant capacity improvements planned for Route 22, a substantial restoration of the Route 33 corridor, emerging interest in alternative infrastructure improvements such as modern roundabouts, and innovative construction delivery techniques such as the rapid bridge replacement program.

Technology will lay the groundwork for future transportation innovations such as connected and autonomous vehicles and real time information services. Bridge and highway projects will move forward with greater speed and less disruption to the traveling public, and enhanced transit services will offer mobility options for younger populations, while allowing elderly population to age in place.

The Lehigh Valley Planning Commission (LVPC) and the Lehigh Valley Transportation Study (LVTS) will spend anticipated revenues upwards to $2.5 billion over the coming decades to operate and maintain our current and planned system, continue to deliver on commitments and identify new projects, programs, and initiatives.

The process of developing a long range transportation plan (LRTP), as well as the content to be included in the plan, is federally mandated. The purpose of the LRTP is to guide decisions made in the investment of federal and state transportation funds to highway, bridge, air, transit and transportation alternative projects most in need. The plan also serves as a conduit for projects to enter the Transportation Improvement Program (TIP). The various lists were reconciled and evaluated against project selection criteria addressed throughout the report.

To orient the reader, Lehigh Valley trends are shown in Chapter 3 and include data on population, households, employment, land use, income and other travel demand trends. Chapter 4 introduces the various travel modes found within the Valley and offers a brief description of each. Travel infrastructure within the Lehigh Valley includes highway, transit, rail freight, air, bicycling and pedestrian facilities. The highway network is by far the dominant system of travel infrastructure. It serves passenger vehicles, trucks and public bus transportation needs in the region.

In 2013, there were 13,693,885 daily vehicle miles of travel on the regional highway network. An average travel time of 24 minutes for Lehigh County and 27 minutes for Northampton County commuters, as derived from the 2009-2013 American Community Survey, makes the highway network attractive to personal vehicle use for economic and recreational purposes.

Chapter 4 also speaks to the importance of asset management, system maintenance, access management and public safety in the planning process. These themes are recurring throughout the plan. The LVTS continues to emphasize safety through policy that seeks to enhance existing infrastructure and reduce the number of crashes, fatalities and injuries on regional roadways. This approach is incorporated into every aspect of transportation planning and across all modes including highways, air, transit, pedestrian/bike and freight.
Chapter 1 - Executive Summary

There is reference to several reports on traffic safety, the most recent being the Traffic Safety Plan for the Lehigh Valley 2008-2012. This report includes a list of crash types, crash contributing factors and general recommendations to mitigate crashes. The LVTS also employs the 4 E’s of transportation safety: Education, Enforcement, Engineering, and Emergency response.

New to this plan is a section on mobility and the importance of a balanced transportation system that looks beyond level of service (LOS) as the sole indicator behind capacity enhancements. The plan recognizes that a functional and sustainable transportation system is one that considers existing and future land use, is contextually sensitive to its surroundings, and where success and efficiency are gained by introducing a brief explanation of the Linking Planning to NEPA process. Key elements of this relationship may include:

- Access management – The inclusion and adoption of comprehensive strategies that account for the entire network can serve to elevate project status.
- Municipal Considerations – A project rises in priority when it improves air quality funds must be modeled to assure reductions in Volatile Organic Compounds (VOCs) and Nitrous Oxides (NOx).

Environmental Justice – A project rises in priority when it has little to no adverse impact on disadvantaged communities.

Transportation Alternatives – Projects that do not meet the local need or federal transportation purpose and promote safety and mobility. The Rail Transportation Assistance Program (RTAP) is a capital budget grant program providing financial assistance for investment in rail freight

Air Quality – A project rises in priority when it improves air quality within the Valley, which is a designated non-attainment area.

Partnership – Priority to projects that include and/or recognize multiple transportation modes.

Projects are identified and programmed over time. A listing of those criteria include:

- Mobility – Priority to projects that include and/or recognize multiple transportation modes.
- Size – A project rises in priority when it is consistent with relevant policies and sensitive environmental features, such as wetlands, protected species habitat, parklands, etc.
- Consistency with Regional Comprehensive Plan – A project rises in priority when it is consistent with relevant policies and sensitive environmental features, such as wetlands, protected species habitat, parklands, etc.

Beyond the economy, the long range plan seeks to achieve the following: a balanced transportation system that looks beyond level of service (LOS) as the sole indicator behind capacity enhancements. The plan recognizes that a functional and sustainable transportation system is one that considers existing and future land use, is contextually sensitive to its surroundings, and where success and efficiency are gained by introducing a brief explanation of the Linking Planning to NEPA process. Key elements of this relationship may include:

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infrastructure. The intent of the program is to 1) preserve essential rail freight service where economically feasible, and 2) preserve or stimulate economic development through the generation of new or expanded rail freight service.

- Local Safe Roads Community Program (LSRCP)/Walkable Communities Program (WCP) are two programs focused on local road safety and offer a process of identification and recommendation for low cost remediation of high safety risk areas to municipal leaders at no cost for the service.
- The Automated Red Light Enforcement (ARLE) Grant Program provides PennDOT with quarterly deposits of revenue, generated by automated red light enforcement violations, into a restricted Motor License Fund account that is made eligible for grant funding.

Data Inputs – A project rises in priority when it meets certain warrants for Average Annual Daily Traffic (AADT) and peak hour trips, level of service, inclusion on the Federal Aid System, pavement condition, degree of congestion and accident history. Additional input for bridges may include sufficiency rating and posting/closure determinations. Data considerations include:

- Congestion Management
  - Priority goes to projects contained within the LVTS Congestion Management Program (CMP). CMP corridors are identified by traffic volumes, accident rates, corridor length and level of service.
  - Congestion outside of the urban development boundary will not be addressed through projects that add physical infrastructure capacity.

- Accessibility
  - Project locations that have utilized funding for capacity improvements within the past 20 years are not eligible for additional funding.
- Safety
  - Priority goes to projects in high crash corridors and intersections.
  - Projects are evaluated using PennDOT safety data, comparing local crash rates against statewide crash rates.
  - Projects must have a crash rate greater than the statewide average.
- Maintenance
  - Projects are generally proposed and prioritized by PennDOT through the 12-Year Program and Decade of Investment programs.

- Bridges
  - Bridge projects must have a sufficiency rating between 50 and 80 to be eligible for rehabilitation.
  - Bridge projects must have a sufficiency rating below 50 to be eligible for replacement.
  - Highest priority goes to closed, posted and structurally deficient bridges.
  - Bridges must be on the Billion Dollar Bridge Bill for state funding consideration.

The policies within this plan drive the investment of public money to qualifying projects. It is important to understand the impact of these decisions and to track and monitor progress over time. Accordingly, this plan includes a number of performance standards designed to determine the effectiveness of policy consideration.

FUNDING

The LRTP is required to be fiscally constrained, and federal planning regulations require that a transportation plan “include a financial plan that demonstrates the consistency of proposed transportation investments with already available and projected sources of revenue.” Cost and revenue projections reflect existing funding conditions and historic trends. The long range plan should be in accord with projections of future revenues.

The plan documents the assumptions and methods for projecting future revenues, calculating future costs and reconciling the plan with projections of future revenues. Costs reflect estimated future rates of inflation and revenues presume known funding sources will continue. With funding estimated at $2.5 billion over the life of the plan, it is clear that there are more projects and need than can be accommodated. Accordingly, it is the policy and evaluation criteria that will become more important to the planning process as projects mature and make themselves available for entry onto the Transportation Improvement Program.
Chapter 2

Introduction

View to Route 22 from the Karl Stirnur Arts Trail in Easton
The Lehigh Valley is comprised of two counties—Lehigh and Northampton counties, located in central eastern Pennsylvania. The region, comprising 726 square miles, is home to 647,232 persons as of the 2010 Census, for a population density of 892 persons per square mile. It is the third largest metropolitan area in the state behind only Philadelphia and Pittsburgh. The median household income is $54,923 as per the Census Bureau’s 2009-2013 American Community Survey. The region is bounded by the Blue Mountain to the north and the Delaware River to the east. The region is located within 300 miles of several major metropolitan areas in the northeastern United States.
WHO WAS INVOLVED IN DEVELOPING THIS PLAN

The plan was developed by the transportation planning staff of the Lehigh Valley Planning Commission, in concert with PennDOT Central Office (Harrisburg), PennDOT District 5 Office, the Lehigh-Northampton Airport Authority (LNAA) and the Lehigh and Northampton Transportation Authority (LANta). For a complete list of those solicited to provide input into the plan, see the report titled Public Involvement Documentation for the Long Range Transportation Plan.

ORGANIZATIONAL AFFILIATIONS

The Lehigh Valley Transportation Study (LVTS) is the Metropolitan Planning Organization (MPO) for Lehigh and Northampton counties. The body was formed in 1964 in response to the Federal Aid Highway Act of 1962, which stated that any urban area with a population exceeding 50,000 must maintain a transportation planning process in order to be eligible for federal transportation funds.

The LVTS is comprised of two committees—Technical Committee and Coordinating Committee. Both committees, their membership and voting structure are depicted in the flowchart. The Technical Committee is an advisory body to the Coordinating Committee, reviewing plans, programs and various other items brought before them for review and recommendation to the Coordinating Committee. The Coordinating Committee is the policy body which formally adopts items reviewed by the Technical Committee.
PURPOSE OF THE LONG RANGE PLAN

The purpose of the Long Range Transportation Plan (LRTP) is to guide decisions made in the investment of federal and state transportation funds to highway, bridge, air, transit and transportation alternative projects most in need. The plan also serves as a conduit for projects to enter the Transportation Improvement Program (TIP).

WHAT IS A LONG RANGE PLAN

The LRTP is a locally-developed plan that addresses transportation modes: highways, bridges, air, public transportation and bicycle and pedestrian. The plan identifies projects and line items for projects that are necessary for improving and enhancing the travel network. Projects within the plan are prioritized according to which element of the plan they appear within: short range (years 1-4), mid-range (years 5-12), or long range (years 13+). Long range plans are federally mandated to be intermodal in scope, cover at least a 20-year period and be financially constrained (the value of all projects in the plan may not exceed the amount of funds that can reasonably be expected to be available over the life of the plan). The plan places a strong emphasis on rebuilding and maintaining existing transportation infrastructure.

WHY ARE WE DEVELOPING THIS PLAN

This plan was developed to guide future investment in our transportation infrastructure. The development of this plan, in part, ensures that Lehigh and Northampton counties will remain eligible to receive federal transportation funds.

HOW WAS THE PLAN DEVELOPED

The plan was developed by identifying projects completed since the last update occurred in October 2010. A review of LVTS meeting minutes was conducted to obtain a list of potential projects that were presented by project sponsors. Two LVTS meetings were held, January 26 and February 2, 2015, for the purpose of soliciting projects for consideration into the plan. Eighty-seven project presentations were entertained. A current 12-Year Program project list and Decade of Investment project list were obtained. The various lists were reconciled and evaluated against project selection criteria addressed later in this report.
HISTORICAL MILESTONES

The long range plan was instrumental in forwarding the following projects from conception to completion:

**Highways & Bridges**

- LVPC/LVTS Created 1981
- Route 306 Opened 1967
- Route 22 Reopened 1991
- Route 314 Reopened 1963
- I-78 Opened 1989
- Route 72 Reopened 2007
- Route 19 Reopened 2018
- Scranton Bridge Reopened 1999
- Route 32 Extension Opened 2002
- Route 22 / I-140 Interchange Reconstructed 2014
- American Parkway Completed

**Public Transportation**

- Service Expanded to Individuals with Disabilities 1977
- Silverline Express Service Begins 2003
- Easton Intermodal Center Opens 2015
- Sunday Service Begins 2019
- Route 6 Service Ended 1999
- Kingdom Service Ended 1999
- LANS Created 1972
FEDERAL LONG RANGE TRANSPORTATION PLAN REQUIREMENTS

The process of developing a long range transportation plan, as well as the content to be included in the plan, is federally mandated. Long range transportation plans must meet the following criteria:

- Address a period of no less than 20 years.
- Shall include both long range and short range elements/strategies/actions that lead to the development of an integrated multimodal transportation system.
- Be updated at least every four years in air quality non-attainment and maintenance areas.

In addition, the plan shall, at a minimum, include:

- The projected travel demand of persons and goods in the region.
- Existing and proposed transportation facilities.
- Operational and management strategies to improve the performance of existing transportation facilities.
- Consideration of the results of the congestion management process.
- Assessment of capital investment and other strategies to preserve the existing and future transportation infrastructure and provide for multimodal capacity increases.
- Design concept and design scope descriptions of all existing and proposed transportation facilities.
- A discussion of types of proposed environmental mitigation activities.
- Pedestrian walkway and bicycle transportation facilities.
- A financial plan that demonstrates how the adopted plan can be implemented. The financial plan shall contain estimates of costs and revenue sources that are reasonably expected to be available.
Chapter 3

Trends

Bridge construction on Route 412 in Bethlehem
**POPULATION TRENDS**

**POPULATION GROWTH**

The Lehigh Valley has seen steady growth in population over the last half century as depicted below. The production of steel at Bethlehem Steel in the City of Bethlehem resulted in a large workforce (30,000 employees at its peak) and immigration that supplied labor for this industrial giant. While immigration today still accounts for a significant portion of population growth in the region, it currently results from the availability of affordable land and housing prices rather than one centralized mega-employer.

From 1980 to 2000, the decennial growth rate remained fairly steady, with a rate of 8.1% from 1980 to 1990 and 7.6% from 1990 to 2000. However, between 2000 and 2010, the Valley experienced a much higher growth rate (11.8% or approximately 68,000 residents). This growth rate exceeded both the state’s growth rate of 3.4% and the 5.7% rate for the nation between 2000 and 2010. Population projections prepared by the Lehigh Valley Planning Commission in 2012 indicate continued population increases through 2040. From the projections, the Valley is expected to add almost 230,000 residents over the 30-year period, bringing the total population to approximately 874,000.

**POPULATION DENSITY**

Population density is an important component of transport planning. According to the 2010 Census, there are 892 persons per square mile in the Lehigh Valley, and densities will continue to grow as areas are subdivided for residential and employment purposes. The center city sections of Allentown, Bethlehem and Easton contain the highest densities in the region, and most existing transit routes are concentrated in these areas. Townships located within the urbanized area contain low to moderate densities, while the rural township densities are very low.

**AGING POPULATIONS**

Longer life expectancy and rapid growth in the number of older Lehigh Valley residents are projected over the coming decades. This, coupled with the increasing ability to age in place, suggests that many residents will outlive their ability to drive. Accordingly, seniors will need a way to access the medical and social services that keep them active and healthy.

Accomplishing this is best served through expanded and enhanced public transportation services. The Valley’s current transportation system is primarily based on getting residents to and from work. It will be important that future transportation investment consider the aging population phenomenon and identify actions necessary to expand mobility options for older adults, quantify the demand for expanded and/or enhanced public transportation services, and estimate the funding necessary to provide the appropriate services. According to the 2000 Census, 91,464 persons in the Lehigh Valley were 65 and over. In 2010, that number rose to 98,210, representing a 7.4% increase.

**CRITERIA FOR VARIOUS TYPES OF TRANSIT**

<table>
<thead>
<tr>
<th>Suburbs (1 bus/hr.)</th>
<th>Residential Density</th>
<th>Dwellings per Resident/Acre</th>
<th>Population/Square Mile (inhabitant)</th>
<th>Employment Density (Jobs/Acre)</th>
<th>Corridor (mi)</th>
<th>Office Space (Mln. Sq. Feet)</th>
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<tr>
<td>Light Rail</td>
<td>9</td>
<td>16,000-18,000</td>
<td>50-60</td>
<td>25-100 sq. mi.</td>
<td>50-60</td>
<td>25-100 sq. mi.</td>
</tr>
</tbody>
</table>

Sources:
Disabled Populations

While transportation in the Lehigh Valley may present occasional challenges for many residents, the problems encountered by our most vulnerable populations often arise from different circumstances and require a different type of community response. Low income residents, older adults and disabled residents who are not able to drive themselves, or who are restricted in their driving, have limited options for transportation.

Equity in transportation is an important social issue, and it is critical to the independence of people with disabilities to have efficient and adequate access to public transportation. This access enhances the ability of the disabled community to contribute economically, socially and politically. While LANTA continues to enhance these services throughout the Valley, it is important to assure that all new vehicles used in public transit are accessible and that paratransit (on-demand, door-to-door) services are consistently reevaluated to assure optimal service for those who cannot use available mass transit.

Chapter 3 - Trends

New pedestrian and streetscape improvements in Easton

Percent of Persons with a Disability

- Less than 10%
- 10% - 15%
- Greater than 15%
**HOUSEHOLD TRENDS**

The Lehigh Valley has also seen steady growth in households over the last half century as depicted below. In the mid-1900s, most households were located in the urbanized cities of Allentown, Bethlehem and Easton. The increasing popularity of automobile ownership, coupled with the availability of large suburban tracts of undeveloped farmland, resulted in the suburban housing boom. The recession in the mid to late 2000s resulted in a paradigm shift in housing. The creation of new suburban housing developments slowed, and household densities began to increase within the urban core. Redevelopment efforts were being planned for urban areas within the three cities.

From 1970 through 2010, the rate of household growth was slowest during the 1990s at 9.6%, while it was highest in the 1970s at 19.6%. The average decade growth during this time was 13.1%.

**LAND USE TRENDS**

The residential, commercial and industrial land use sectors of both Lehigh and Northampton counties have seen steady growth over the last three decades. The commercial sector realized a nearly 22% average decade growth over the period, while the residential land use sector grew by over 14%. The agricultural and vacant land use sector declined in its percentage share of total land area as development activities consume this resource. The industrial land use sector grew by 19.7% in Lehigh County and 8.7% in Northampton County. Growth in both the commercial and industrial sectors was significant on a percentage basis since both of these sectors constitute a relatively small portion of total land use.
In 2012, 67.2% of the Lehigh Valley’s local GDP was produced in Lehigh County. Interestingly, 59.2% of the region’s daily vehicle miles traveled (DVMT) also occurred in Lehigh County.

EMPLOYMENT TRENDS

The Lehigh Valley has seen steady growth in employment over the last four decades as depicted below. The Lehigh Valley was prominent with large manufacturers and industries (Mack Truck, Bethlehem Steel) in the 1970s and 80s. As less costly steel was imported and truck manufacturing relocated to South Carolina, the composition of the local labor market began to change from a manufacturing-dominant industry to a service-dominant industry in the health care sector. Employment began to become decentralized, similar to population and housing growth, with employment centers occupying large suburban tracts of land.

From 1950 through 2010, the rate of employment growth was slowest during the 1980s at 5.2%, while it was highest in the 1990s at 20.8%. The average decade growth during this time was 10.4%.

GDP TRENDS

A strong, direct correlation exists between gross domestic product (GDP) and daily vehicle miles traveled (DVMT). Historical data has demonstrated that, as the total value of all goods and services produced increases, travel increases accordingly. Conversely, as GDP levels off or declines, DVMT mirrors that change. This correlation is greater than the correlation between either population growth, household growth or employment growth, and DVMT depicts this correlation from 2010 through 2012, which represents the most recent data available from a consistent source. Going forward, an alternate source of GDP data might be used for this purpose.

INCOME PROFILE

Income is another factor that affects travel demand. As income rises, auto ownership increases, with more and longer vehicle trips generated. Conversely, lower income groups have less access to private automobiles and rely heavily on public transit. For this reason, income information is used to predict future transit trips in the mode choice portion of the Lehigh Valley regional travel demand forecasting model.

The map shows per capita income estimates by municipality from the 2009-2013 American Community Survey. The wealthiest areas in Lehigh County are Upper Saucon, Weisenberg and Lower Macungie townships. In Northampton County, the wealthiest areas are Williams, Lower Saucon and Lower Nazareth townships. The low income areas in the Lehigh Valley are primarily concentrated in Allentown and Easton.
OTHER TRAVEL DEMAND TRENDS

Other trends were evaluated relevant to this plan update and include:

![National Vehicle Miles of Travel Chart]

<table>
<thead>
<tr>
<th>Year</th>
<th>Registered Cars</th>
<th>Registered Trucks</th>
<th>Licensed Drivers</th>
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<tbody>
<tr>
<td>1990</td>
<td>322,168</td>
<td>59,703</td>
<td>374,372</td>
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<tr>
<td>1995</td>
<td>333,448</td>
<td>65,786</td>
<td>396,194</td>
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<tr>
<td>2000</td>
<td>355,090</td>
<td>71,382</td>
<td>409,900</td>
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<tr>
<td>2005</td>
<td>409,408</td>
<td>448,588</td>
<td>440,588</td>
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<tr>
<td>2010</td>
<td>423,427</td>
<td>627,563</td>
<td>462,929</td>
</tr>
<tr>
<td>2013</td>
<td>427,482</td>
<td>813,665</td>
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</tbody>
</table>
Land Use Trips/Weekday/Independent Variable

Residential
- Single Family Detached: 9.52 Dwelling Units
- Multi Family: 6.65 Dwelling Units

Industrial
- General Light Industrial: 6.97 1000 Sq Ft.
- Industrial Park: 6.83 1000 Sq Ft.
- Manufacturing Facilities: 3.82 1000 Sq Ft.
- Warehousing: 3.56 1000 Sq Ft.

Institutional
- University/College: 1.71 student
- High School: 1.71 student

Medical
- Nursing Home: 3.26 employee
- Hospital: 4.50 employee

Office
- Government Office Building: 58.93 1000 Sq Ft.
- Medical-Dental Office Building: 38.15 1000 Sq Ft.
- General Office Building: 11.03 1000 Sq Ft.
- Corporate Headquarters Building: 7.98 1000 Sq Ft.

Retail
- Convenience Market with Gas Pumps: 845.60 1000 Sq Ft.
- Convenience Market: 737.89 1000 Sq Ft.
- Supermarket: 102.24 1000 Sq Ft.
- Free-Standing Discount Superstore: 60.76 1000 Sq Ft.
- Electronics Superstore: 45.04 1000 Sq Ft.
- Specialty Retail Center: 44.32 1000 Sq Ft.
- Home Improvement Superstore: 30.14 1000 Sq Ft.
- Pharmacy/Drugstore without Drive-Through Window: 9.06 1000 Sq Ft.
- Shopping Center: 42.70 1000 Sq Ft.
- Discount Club: 41.80 1000 Sq Ft.
- Furniture Store: 5.06 1000 Sq Ft.

Services
- Drive-In Bank: 148.15 1000 Sq Ft.
- Fast-Food Restaurant with Drive-Through Window: 496.12 1000 Sq Ft.
- High-Turnover Sit-Down Restaurant: 127.15 1000 Sq Ft.
- Quality Restaurant: 89.95 1000 Sq Ft.

*Certain retail establishments, particularly banks, service stations, and convenience markets, generate a significant amount of pass-by trips (trips are attracted from passing traffic on nearby streets)

Chapter 4
Planning Factors + Travel Modes

Oswald's Mill + Gun Club Road stone bridge in New Tripoli
A. TRAVEL INFRASTRUCTURE/MODES

Travel infrastructure within the Lehigh Valley includes highway, transit, rail freight, air, bicycling and pedestrian facilities. The highway network is by far the dominant system of travel infrastructure. It serves passenger vehicles, trucks and public bus transportation needs in the region.

In 2013, there were 13,693,885 daily vehicle miles of travel on the regional highway network. An average travel time of 24 minutes for Lehigh County and 27 minutes for Northampton County commuters, as derived from the 2009-2013 American Community Survey, makes the highway network attractive to personal vehicle use for economic and recreational purposes.

Highways are classified according to their function as depicted in the Functional Classification map. The classifications consist of freeways and expressways, arterials, collectors (urban, rural major and minor), and local streets. Each of these facility types serves a mobility function, land access function or some combination of both.

BRIDGES

There are more than 900 bridges in the Lehigh Valley. The average age of a bridge in the Lehigh Valley is approximately 50 years old, and maintenance is an ongoing priority at the local, state and national levels.

Repair Programs and Techniques

Accelerated Bridge Program – This state program utilizes stimulus funds for bridge infrastructure improvements. Sufficiency rating determinations are used to prioritize projects.

Billion Dollar Bridge Bill – This state program was developed in the early 1980s as a means to prioritize state funding for bridge rehabilitation. A bridge must be listed on the Billion Dollar Bridge Bill to be considered for funding, and additions to the Bill are made through the legislative process.

PennDOT Bridge Bundling Program – This program allows PennDOT to award a single contract for multiple bridges all at the same time. Similar criteria and economies of scale help to lower costs and ultimately allow the state to take on more projects.

Rapid Bridge Replacement – Rapid bridge replacement, or Accelerated Bridge Construction (ABC), is a technique that

Federal Highway Administration (FHWA) policy dictates that bridges with a sufficiency rating between 50 and 80 are eligible for rehabilitation. Bridges with a sufficiency rating below 50 are eligible for replacement. Any bridges on the National Highway System (NHS) that are in poor repair and in danger of being closed or posted will receive a high priority in the TIP.

Chapter 4 - Planning Factors + Travel Modes
allows bridges to be replaced with minimum traffic and environmental disruption. Unlike conventional techniques, the replacement bridge is pre-formed (constructed) in sections off-site and then transferred to the project site for assembly. Often the highway or railroad carried by the bridge is closed for a short period of time to accommodate the assembly.

PUBLIC TRANSPORTATION

The Lehigh and Northampton Transportation Authority (LANta), created in the midst of a transportation crisis in March of 1972 by Lehigh and Northampton counties, is charged with operating a "public transportation system for public use in the metropolitan area consisting of the Counties of Lehigh and Northampton." LANta, a bi-county municipal authority, supplements passenger fares and other revenues with county, state and federal funding to support operating and capital expenses.

Of its 12 member Board of Directors (ten voting, two ex-officio), six are appointed by the Lehigh County Executive and six are appointed by the Northampton County Executive. The Board meets monthly to review operations, finance matters and establish the policies and direction for the organization. The Board appoints an Executive Director to manage the transit system on a day-to-day basis. In Lehigh and Northampton counties, the Authority currently operates two different services including:

LANtaBus

LANta operates the LANtaBus system, a network of 30 fixed bus routes throughout the Lehigh Valley providing daily, later evening, Saturday and Sunday services. More than 485,000 people live within walking distance of a LANtaBus route.

There has been a 65% increase in ridership since 1997; currently more than 5.0 million rides are taken on the LANtaBus system annually. LANta’s 83 vehicle bus fleet has been continually modernized so that passengers may ride to work, school, shopping and medical services in safety and comfort. Transit fares have been maintained at reasonable levels, with discount tickets including a $4.00 day pass good for unlimited rides all day available to all riders.

The LANtaBus system is concentrated in the urbanized area of the Cities of Allentown, Bethlehem and Easton and surrounding boroughs and townships. Service spans from 5:30 AM – 12:30 AM Monday through Saturday, and 9:00 AM – 6:00 PM on Sunday. The LANtaBus service acts as an important element of the economic development and quality of life in the Lehigh Valley. Rider surveys show that:

• Over 50% of LANtaBus service riders use the service to travel back and forth to work. This represents approximately 10,000 work commutes daily. Another 10% to 15% use the service to travel back and forth to school.
• The remaining 35% to 40% use LANtaBus service for shopping, medical/dental appointments, personal business and other quality of life needs.

• On any given day, approximately 2,000 seniors will use LANtaBus service (which is free for those 65+ in Pennsylvania) allowing them to maintain independence and age in place. Allowing seniors to age in place helps to create more stability in the local housing market.

LANtaVan
LANta’s LANtaVan Division, a brokerage operation, arranges special door-to-door transportation services for people with disabilities and the elderly who cannot access the LANtaBus route network. The 108 accessible vans and mini-buses available to LANtaVan customers are dispatched daily. More than 420,000 trips were arranged by LANtaVan last year. LANtaVan is operated under contract with Easton Coach Company, Inc. of Forks Township.

System Development
LANta’s planning efforts for the continued development of the regional public transit network are guided by three documents that emerged from the Moving LANTA Forward planning effort. These include:

• Moving LANTA Forward Strategic Plan – This document lays out a vision for the enhancement of the LANta system to address projected population growth and development in the region. The plan calls for increased frequencies of service on high demand corridors in the urban core and the use of a mix of service delivery models to meet changes in demand in the more suburban areas. The plan also sets goals for the overall design of the system, the modernization and upkeep of transit facilities and equipment as well as improvements to marketing and public information. Lastly, the plan recognizes the need for Lehigh Valley communities to incorporate transit supportive practices into their development and land use decisions. The plan calls for an outreach and education program to be pursued by LANta with area municipalities. The Executive Summary can be seen at http://www.LANtabus.com/wp-content/uploads/2015/01/Moving-LANTA-Forward-Final-Report.pdf.

• Lehigh Valley Enhanced Bus/Bus Rapid Transit Plan – Building on the goal established in the Moving LANTA Forward Strategic Plan to increase the frequencies of service on high demand corridors in the urban core, this document establishes a multi-phased approach to introducing a Bus Rapid Transit type service to the Lehigh Valley. The Executive Summary can be seen at http://www.LANtabus.com/wp-content/uploads/2014/06/LANTA-Enhanced-Bus-BRT-Study-Exec-Summary.pdf.

• Transit Supportive Land Use for the Lehigh Valley – This document addresses the recommendation in the Moving LANTA Forward Strategic Plan for LANta to...
pursue greater communication and involvement in land use and development decisions made by area municipalities. This document identifies the conditions that need to exist in our communities to make transit a feasible modal choice. The report can be seen at http://www.LANtabus.com/wp-content/uploads/2014/01/LANTA-Transit-Supportive-Design-for-the-LV-FINAL-V3.pdf.

LANta’s capital planning is guided by its Capital Plan, which is updated with every TIP cycle. All of LANta’s capital planning efforts prioritize the replacement of transit buses and paratransit vans as they reach their economic useful life. Other key priorities include the continued modernization of transit facilities and the greater incorporation of technology into transit operations and public information.

Intra-regional and Inter-regional Travel

To expedite longer trip movements intra-regionally and inter-regionally, MOVELV includes the implementation of the Lehigh Valley Enhanced Bus/Bus Rapid Transit Plan to reduce transit travel time for trips within the region. For inter-regional trips, such as commuter services to New York, northern New Jersey or Philadelphia, the plan includes the pursuit of planning steps necessary to further the implementation of the most appropriate transit mode for each market, which may include private bus, subsidized bus, intercity rail or commuter rail options.

Freight Rail

The Lehigh Valley is served by two class one railroads. Six short line railroads operate within Lehigh and Northampton counties. The Active Railroads map shows the locations of seven railroads in the Lehigh Valley that either own track or operate in the area.

(NS) Norfolk Southern Corporation is the predominant class one carrier serving the Lehigh Valley. Norfolk Southern’s major lines linking the metropolitan New York City area and the Midwest pass through the Lehigh Valley. The Allentown Classification yard is one of the major yards in the Norfolk Southern System. The yard is at the juncture of the Lehigh Line and the Reading Line. Norfolk Southern also operates a series of Secondary Lines and Industrial Tracks that serve the area. A smaller yard, Chapman Yard, facilitates service to the fast growing industrial and distribution development in the area of Route 100 and Interstate 78 in western Lehigh County.

(CP) Canadian Pacific Rail is the second class one carrier serving the Lehigh Valley. CP Rail uses trackage rights along Norfolk Southern’s Lehigh Line to provide service. CP Rail provides service to the former Bethlehem Steel site in Bethlehem. The availability of two carriers serves as a competitive advantage for shippers at this site and assists in ongoing development. CP operates but does not own track in the Lehigh Valley.

Lehigh Valley Rail Management Railroad is the successor to the Bethlehem Steel’s Philadelphia, Bethlehem and New England Railroad. It provides rail service for the Lehigh Valley Industrial Park VII and a 450 acre site being developed by the Majestic Realty Company, both of which involve the redevelopment of the Bethlehem Steel site. The Lehigh Valley Rail Management Railroad also provides service to the Beth Intermodal Terminal.

Also operating in the Valley are the Belvidere & Delaware River Railroad, the Delaware & Lackawanna Railroad, the East Penn Railroad, the Northampton Development Corporation Railroad and the R.J. Corman Rail. Rail-highway crossings remain a priority focus area as it pertains to safety. Upgrades to active protection are needed for some of these crossings, particularly where circumstances
such as the average daily traffic on the road or the number of trains have increased significantly.

Rails-to-Trails – The conversion of an unused and/or abandoned railway into an alternative use trail, typically for walking and cycling. These types of conversions have taken place frequently in the Valley. Care has been taken to assure that abandoned rail is not feasible for future passenger service.

**Passenger Rail**

In 2014, the LVPC conducted a sample survey of Lehigh Valley residents to gauge public opinion on issues such as land use, growth and transportation. When asked to rank the most important transportation improvements in the Lehigh Valley, road improvements for the region were the number one priority, followed by rail service.

Despite the survey results, no passenger rail service currently exists in the Lehigh Valley, and little has been done to identify who would operate rail service or how operating costs would be subsidized. In addition, there is currently no commitment or agreement with Norfolk Southern for use of their facilities, and New Jersey has made no commitment to extend rail west of High Bridge, New Jersey.

Past studies have indicated that additional ridership densities and denser development surrounding station sites will be necessary to support future passenger rail efforts.

**Truck Freight**

The Lehigh Valley Transportation Study (LVTS), in cooperation with PennDOT, developed the first freight plan for the Lehigh Valley. The plan was developed in conjunction with work on Pennsylvania’s first-ever Comprehensive Freight Movement Plan (CFMP). The Lehigh Valley Regional Freight Plan includes a regional freight profile that was developed from the analysis of the transportation system, regional freight flows, stakeholder interviews and trends. It highlights the importance of close public and private coordination, and it is clear from the results that the region is geographically well-positioned and is rapidly growing in those economic industry sectors most conducive to freight growth.

All three modes—truck, rail and air—support the movement of goods in the region, yet trucking far surpasses the others in total volume and in the value of goods being moved. The Regional Freight Plan includes policy necessary to address these trends, to help identify the desired future performance of the multimodal regional freight network, and to put forth a strategic investment framework that will help the region to realize its regional freight goals while supporting statewide and national freight plan initiatives.
Lehigh and Northampton counties are well-served by air passenger carrier, air cargo and general aviation service. The Lehigh Valley Regional Airport (LVIA) provides a full range of passenger, general aviation and air cargo services. In addition, large international airports in Philadelphia and the New York City area are within a two-hour drive of the region. Queen City Airport in Allentown, Bradford Airport in Forks Township, the Stateline Airport and the Flying ‘M’ Aerodrome in Heidelberg Township also serve general aviation aircraft needs.

LVIA is operated by the Lehigh-Northampton Airport Authority (LNAA). It occupies 2,629 acres in both Lehigh and Northampton counties. The main runway is 7,597 feet long and 150 feet wide. The crosswind runway is 5,797 feet long and 150 feet wide. The airport’s tri-level passenger terminal building was opened in 1975 and was recently renovated in 2012. A new departure building, the Wiley M. Post Concourse, opened in 2015. Some of the major issues facing the airport over the past 25 years include planning for projected demand and evaluating opportunities to repurpose existing facilities, while also working with local, state and federal governments to achieve compatible off-airport land use in the communities surrounding the airport.

According to the Federal Aviation Administration’s (FAA) latest 2015 Terminal Area Forecasts, the LVIA is forecasted to operate as a general aviation airport over that five-year period. This trend is common across the country and has been affecting other non-hub airports similar to LVIA.

The LNAA receives Airport Improvement Grants from the FAA in aid to the planning and development of the airport. To ensure LVIA maintains operational efficiency, safety and meets projected demand, a new Master Plan update is programmed to start in early 2016. The previous master plan was completed in 2004, with new industry trends and challenges requiring a new evaluation of the planned maintenance and development of both the airside and landside facilities at LVIA. The new master plan will ensure the Airport can continue to be an asset to the region, while working with the LVPC and local communities.

LVIA continues to implement elements of the Noise Compatibility Study, which includes soundproofing structures, relocations if necessary, acquisition of avigation easements, zoning overlay districts, comprehensive plan revisions, real estate disposal, revision of building codes and environmental impact review procedures in the communities surrounding the airport.

Study is scheduled for completion in October of 2015. The updated study will provide new noise exposure maps and noise contours, which will allow LVIA to evaluate any mitigation measures required to reduce incompatible land use around the airport.

• Queen City Airport is owned and operated by LNAA. The airport is located on a 198 acre tract of land in south Bethlehem, adjacent to I-78 and Liberty Street. The airport’s primary east-northeast/west-southwest oriented runway is 3,489 feet long and 75 feet wide. The crosswind runway is 3,159 feet long and 75 feet wide. The airport serves as a general aviation airport for private aircraft.

• Bradford Airpark is owned and operated by LNAA. The airport is located on 7.13 acres in Forks Township just east of Tatamy, PA. The general aviation airport has a turf runway with a 50 foot wide paved center section. The runway numbers are 18/36 and 166 feet wide. The airport was acquired by LNAA from private ownership in 1999.

• Stateline Airport is a general aviation airport located on a 56.5 acre tract along the Lehighton River in Slatington, Lehigh County. The airport is in northwest Pennsylvania and is 2.5 miles south of the airport. The airport was acquired by LNAA from private ownership in 1999.

• The Flying ‘M’ Aerodrome is located at the base of Blue Mountain in northern Heidelberg Township. The privately-owned airport has a 2.375 foot long by 100 foot wide east-west grass oriented landing strip.

BICYCLE AND PEDESTRIAN

Based upon the 2009-2013 American Community Survey, bicycle and pedestrian travel in the region constitute 0.2% and 2.5%, respectively, of Lehigh Valley commuter trips. These trips are limited mostly to the cities of Allentown, Bethlehem and Easton and their immediate surrounding environs.

While commuter cycling in the Lehigh Valley is modest, biking for recreation and sport entertainment is growing in popularity. Accordingly, there is a growing list of publications intended to guide and inform recreational riding. In addition, numerous municipalities have developed bike trails, and the Lehigh Valley Velodrome is an internationally known site for bike racing.

The 2009-2013 American Community Survey estimated that 7,433 commuters walked to work, and about 60% of commuter walking is done in the cities of Allentown, Bethlehem and Easton. Pedestrian safety is an issue in the Lehigh Valley. From 2008 to 2012, 111 pedestrian-related deaths and major injuries occurred in the region resulting from pedestrian/motor-vehicle crashes. Pedestrian fatalities and major injuries account for 10% of the transportation-related fatal crashes and major injuries over that five-year period.

Many streets in the Valley are generally not safe for pedestrians or bicyclists because their design does not consider alternative transport modes and lacks sidewalks or bike lanes. Widened arterial streets are particularly dangerous and daunting for pedestrians to cross.

Pedestrian-related transport networks play an important role in facilitating travel. The Transportation Alternatives Program (TAP) is one of the ways to go beyond the normal or historic mode of transportation purposes. The objective of the Transportation Alternatives Program (TAP) is to fund activities that go beyond the normal or historic mode of transportation purposes. TAP is a federal program that provides funding for projects that improve transportation networks safer for pedestrians and bicyclists because their design does not consider alternative transport modes and lacks sidewalks or bike lanes. The 2014 Dangerous by Design report, prepared by Smart Growth America and the Complete Streets Coalition, recommends making transportation networks safer for pedestrians and bicyclists by incorporating key elements such as sidewalks or bike lanes, complete streets policies, safe routes to schools programs and walkable neighborhoods. It is important to encourage neighborhood and roadway designs that form an interconnected network, including automobile, bicycle and pedestrian routes that provide safe and convenient connections to local destinations.

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natural environment. Twelve categories of projects are eligible for transportation alternatives funding. These include:

1. Provision of facilities for pedestrians and bicyclists.
2. Provision of safety and educational activities for pedestrians and bicyclists.
3. Acquisition of scenic easements and scenic or historic sites.
4. Scenic or historic highway programs (including the provision of tourist and welcome centers).
5. Landscaping or other scenic beautification.
6. Historic preservation.
7. Rehabilitation and operation of historic transportation facilities and canals.
8. Preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails).
10. Archaeological planning and research.
12. Establishment of transportation museums.

The LVPC has published several reports on traffic safety, the most recent being the Traffic Safety Plan for the Lehigh Valley 2008-2012. This report includes an analysis of crash types, crash contributing factors and general recommendations to mitigate crashes. The LVPC also employs the 4 E's of transportation safety: Education, Enforcement, Engineering and Emergency response. This approach is embedded in all regional safety action plans.

There are many engineering improvements that are being installed on Lehigh Valley highways, such as centerline rumble strips, median barriers, pedestrian crosswalks, pedestrian push buttons, delineation of fixed objects, high friction surfaces and other systematic improvements, transit cameras, and pedestrian signal heads. Engineering improvements alone, however, are not enough. They need to be complemented with Engineering, Enforcement, and Emergency response to make up the 4 E's of safety.

In 2013, the National Highway Traffic Safety Administration (NHTSA) reported that seat belt usage in Pennsylvania was approximately 84% compared to the national average of 87%. Seat belt usage, distracted driving, alcohol-related incidents and fatigue are just some of the driver behaviors that require education and enforcement. Incident management is also vital in crash severity, and emergency response plays a key role.

The LVPC continues to work with PennDOT and other safety professionals to prioritize safety issues and to conduct Roadway Safety Audits and other safety studies for recommending safety improvements. Safety studies use an interactive approach in identifying and prioritizing safety needs in the region.

Moving Ahead for Progress in the 21st Century (MAP-21) continues the requirement of a Strategic Highway Safety Plan (SHSP). The SHSP requires that each state identify key safety problems and set goals and objectives. Accordingly, Pennsylvania has adopted the Highway Safety Improvement Program (HSIP), which adopts the national safety goal set by American Association of State Highway and Transportation Officials (AASHTO) to halve the five-year average of fatalities and major injuries over the next two decades.

HSIP projects are eligible for 100% federal funding and are targeted for highway safety improvement projects on any public road (state or non-state). In Pennsylvania, the SHSP includes the goal of reducing the five-year average of 1,413 fatalities in 2010 to 706 in 2030. In order to focus safety improvements, Pennsylvania’s SHSP identifies seven primary focus areas called the “vital seven”. These are:

1. Reducing Impaired Driving (DUI)
2. Increased Seat Belt Usage
3. Infrastructure Improvements
4. Reducing Speeding & Aggressive Driving
5. Reducing Distracted Driving
6. Mature Driver Safety
7. Motorcycle Safety

The continual improvement of the low cost safety improvements by PennDOT District 5 and safety projects on the TIP is making great strides in impacting the downward trends in these crash types. The highest fatalities and major injuries come from roadway departure crashes in the Lehigh Valley. The highest crash counts involve intersection-related crashes. Head-on and Opposite Direction Swipe (ODSS) and pedestrian-related crashes did not meet the goal for average fatalities and major injuries.

**Highway Safety**

**Crash Corridors and Intersections**

The Traffic Safety Plan for the Lehigh Valley 2008-2012 identifies high crash corridors and high crash intersections. This plan looks at clusters of crashes and identifies high crash corridors and high crash intersections. This plan identifies high crash corridors and high crash intersections.

PennDOT district 5 and safety projects on the TIP continue to work with PennDOT and other safety professionals to prioritize safety issues and to conduct Roadway Safety Audits and other safety studies for recommending safety improvements. Safety studies use an interactive approach in identifying and prioritizing safety needs in the region.
There are 33 at-grade rail crossings in the Lehigh Valley. When a train passes through an at-grade crossing, traffic on the road is forced to stop until the train has passed. Additionally, train speeds are reduced when traversing an at-grade crossing. At-grade rail crossings can pose a safety concern as collisions can occur between trains and other vehicles. Eliminating these at-grade crossings would improve the flow of both trucks and trains and remove a potential safety hazard.

Between 2008 and 2012, the Lehigh Valley met or exceeded fatality and major injury goals of the Strategic Highway Safety Plan (SHSP) of Pennsylvania for bicycle travel. The region did not meet those SHSP goals for pedestrian travel. From 2008 to 2012, bicycle-related crashes trended downward. Bicycle-related fatalities and major injuries remained fairly consistent as compared to 2008.

Two corridor safety reviews were produced as identified from the high crash corridor list in the Traffic Safety in the Lehigh Valley 2006-2010 report.
Chapter 4 - Planning Factors + Travel Modes

1. Schoennerville Rd: Weaverton to Hanover
2. Ri 248: W. Mountain View Dr. to Walnut Dr
3. Route 329: Mauch Chunk Rd to Behave Rd
4. Route 222: Dompey Park to RR Bridge before 100
5. Ri 29: Chestertown: Tunkahnil to Mill Rd
6. King’s Hwy: Zionsville Rd to Palm Rd
7. Tidman: Poplar to Airport Rd
8. Ri 22: MacArthur to Leigh River Bridge
9. William Penn Hwy: Stones Crossing to S Greenwood
10. Ri 22 & Schwarz Rd
11. Ri 145: Hovenden-N Best-Main St
12. Cedar Crest Blvd: Abridge to Tidman
13. 15th: Tidman to Hamilton
14. Lehigh St: Jefferson to Oxford
15. Central St: W Broad to Church
16. East Susquehanna St: Seiverson Rd to Frezer Ave
17. Warleys Corner Rd (Ri 4016) @ Country Spring Rd
18. Ri 100 @ Bittner’s Corner Rd
19. Golden Key Rd (Ri 863) @ Kilmer Ct
20. Ri 378 & Ri 22: William Penn Hwy (Bram D Rd)
21. Tidman Street (SR 1002) @ Blue Barn Rd (SR 4001)
22. Brookside Rd (SR 2017) @ Lehigh St (SR 2018)
23. Ri 309 @ Golden Dr/Cortland Dr
24. Willow St (SR 4002) @ Between Shelby Dr & Bridge St
25. Lehigh St (SR 1014) @ Between S 2nd St & S 3rd St
26. Mountain Rd (SR 2018) @ Reservoir Hill Rd
27. Ri 309 @ Park Rd (SR 2028)
28. Easton Ave (SR 2020) @ Between Lexington Ave & West Blvd/Fleming St
29. Freemansburg Ave (SR 2019) @ Washington St
The first of these reviews was conducted along the Route 222 corridor area, which is bounded by State Route 222 (Hamilton Boulevard), Schantz Road (SR 3012), Independent Road (SR 0863) and Farmington Road (SR 3011) in Upper Macungie Township, Lehigh County. The second review was conducted along the Route 248 corridor, which is bounded by Walnut Drive (SR 4003) to the east and Mountain View Drive (SR 0946) to the west in Lehigh Township, Northampton County.

The safety reviews were conducted by a safety team from PennDOT, the LVPC, and the Federal Highway Administration (FHWA). Both reports contain an inventory of existing road conditions, safety review site observations, short term implementation recommendations and long term implementation recommendations.

Next Steps
The LVPC plans to continue performing safety reviews and reviewing crash data. Countermeasures will be recommended after considering various crash types, driver behavior factors and vehicle type crashes. A systematic approach will also be explored to deploy low cost countermeasures to different areas of the Lehigh Valley. The Citizen Traffic Advisory Committee (CTAC) for the City of Allentown and City of Bethlehem are proactive at staying up-to-date on pedestrian/bike safety initiatives in the two cities. Traffic safety plans measuring the status of the current targets and identifying high crash corridors and intersections will be published biennially to keep performance measures in check.

C. MAINTENANCE AND PRESERVATION

Maintenance of the existing highway and bridge network is a top priority item. Federal and state funds are used for maintenance. State funds are allocated at the county level for maintenance based on a statewide formula determined by the Pennsylvania legislature. Only very large maintenance projects come before the Lehigh Valley Transportation Study Technical and Coordinating Committees for programming. Smaller projects, such as surface overlays, pothole patches, etc., are typically planned and programmed by PennDOT outside of the Transportation Improvement Program and Long Range Transportation Plan. PennDOT has developed an asset management program that is incorporated into long range plans.

PennDOT develops its program of priority projects for highway maintenance by using the International Roughness Index (IRI), Overall Pavement Index (OPI), life expectancy of maintenance improvements and other inspection techniques. IRI is used to identify the condition of a roadway by quantifying general roughness. Lower IRI values translate to better roads. The higher the value, the greater the need for improvement.

OPI – PennDOT also employs a more comprehensive metric to assess overall pavement conditions, specific to Pennsylvania. The Overall Pavement Index, or OPI, combines IRI data with additional measures that assess pavement distress in addition to the general roughness measurement. The higher the OPI value, the better the condition of the road. The lower the value, the greater the need for improvement.
BRIDGES

Bridges may be classified as:

• Functionally Obsolete – A bridge that does not meet current design standards and becomes an impediment to the system network.
• Structurally Deficient – A bridge that typically requires significant maintenance and repair to remain in service and eventual rehabilitation or replacement to address deficiencies.

Posting and Closures

As an interim measure to prolong the life of the structure and provide safe passage, structurally deficient bridges are often posted with weight limits to restrict the gross weight of vehicles using the bridges to less than the maximum allowable weight. Maintaining the bridge network is important because posted and closed bridges create travel diversions. Not only is the movement of goods and people diverted and delayed, but emergency vehicle response time can increase greatly due to bridge restrictions.
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<th>Deck Area (sq.ft.)</th>
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<th>ADTT (2)</th>
<th>NHS (3)</th>
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Notes:
1 – ADT = Average Daily Traffic
2 – ADTT = Average Daily Truck Traffic
3 – National Highway System (NHS) - a nationwide system of primary highways important to the nation's economy, defense, and mobility which the Moving Ahead for Progress in the 21st Century Act (MAP-21) expanded to incorporate additional principal arterials.
4 – Risk-based weight limits: the first or only value represents the typical weight limit; a second value indicates an exception for combination loads (tandem and trailer trucks).
Bike and pedestrian bridges and underpasses.

Crossing improvements that shorten crossing distance, provide access and/or primarily improve bicycle and pedestrian safety.

Traffic realignments, road diets or intersection changes that improve bicycle and pedestrian access or safety.

The TAP program is an extremely popular and competitive program within the region and has provided much needed funding for alternative modes of transportation and recreation.

D. MOBILITY AND ACCESSIBILITY

Measuring a Balanced Transportation System

A functional and successful transportation network will be one that considers existing and future land use and that is contextually sensitive to its surroundings. Many past capacity improvements were developed based on level of service (LOS) measures alone. While important, this measure should be just one factor when considering improvements and priorities. Success and efficiency are better gained by policy that also promotes quality of life, economic development, social justice and ecological sustainability measures.

Level of Service has been the typical measuring tool but it has shortcomings:

- Only considers vehicles and not other modes of transportation such as pedestrians and bikes
- Does not consider corridor travel time
- Undercounts the value of transit

Maintenance of existing bicycle and pedestrian amenities provides a safer, more user-friendly network. The Transportation Alternatives Program (TAP) is a vehicle commonly used to fund the maintenance and preservation of the existing network. Such eligible activities include:

- New or reconstructed sidewalks or walkways.
- Pedestrian and bicycle signs or signals.
- Lighting, when there is a clearly demonstrated safety need.
- Transportation projects that achieve ADA compliance, such as curb ramps.
- New or reconstructed off-road trails that serve a transportation need, such as trails that provide connections to schools, parks or other public places.
- Crosswalk, bicycle lane or sharrow painting.
- Wide paved shoulders.
- Bike parking facilities or bus bike racks.
- Bike share programs (including the purchase of bikes).
- Shared use paths, side paths, trails that serve a transportation purpose.

The TAP program is an extremely popular and competitive program within the region and has provided much needed funding for alternative modes of transportation and recreation.
Traffic Calming and Street Design

Traffic calming includes a variety of engineering techniques used to physically alter road design for the purpose of slowing traffic and improving safety for bicyclists and pedestrians. Beyond simply installing sidewalks, these improvements enhance safety through a focus on intersections with features such as pedestrian refuge medians, bulb outs, improved road geometry and signals that offer pedestrians a “head start” when crossing roads. These techniques have proven to reduce speed and collisions.

Modern Roundabouts

Modern roundabouts are another calming method that offers improved safety over other forms of at-grade intersections. When properly designed, this type of improvement can significantly reduce crashes and fatalities, while also reducing idle times and improving intersection efficiency. The inclusion of this alternative into transportation considerations is supported and funded by the federal government in the form of both policy and funding. In addition, PennDOT has developed and released a number of informational pamphlets on roundabouts and has committed to a detailed study and pilot project(s) in PennDOT District 5.

Mobility and Accessibility Defined

- Mobility - means traveling easily where you want to go; reducing roadway congestion; increasing transit frequency, reliability and speed; and creating bicycle accommodations and complete sidewalks.
- Accessibility - means getting the goods and services you need; bringing people, goods and services closer together; mixing land uses and using technology to deliver transportation services.

Many factors affect mobility and accessibility, including the quality and affordability of transportation options, transportation system connectivity and land use patterns. Conventional planning techniques may often overlook and undervalue some of these factors and perspectives. Some techniques that can be investigated to offer a more holistic approach include:

- Social justice - Do benefits accrue equivalently?
- Economic Development - Net benefits equitably?
- Quality of Life - Environmentally sustainable?
- Access to jobs - Impact on CO2, NOx, CO, etc?
- Access to shopping - Land use/transportation connection
- Resilient property value impact - Residential property value

Complete Streets

Complete Streets design strategies ensure that future road projects consistently take into account the needs of all users, of all ages and abilities, particularly pedestrians and bicyclists. Complete Streets designs vary from place to place, but they might feature sidewalks, bicycle accommodations, comfortable bus stops, median islands, frequent crosswalks and pedestrian signals. Both the American Academy of Pediatrics and the Centers for Disease Control and Prevention recently endorsed the adoption of local and statewide Complete Streets policies as a strategy for improving safety and increasing physical activity among children and adults.

Road Diets

Road diets typically involve converting a lane or multiple lanes of travel into an alternative use, such as a dedicated bicycle lane, sidewalks and/or on-street parking. In other words, existing space is reallocated, while the overall area remains the same.

A study by the Federal Highway Administration and Insurance Institute for Highway Safety found that roundabouts reduce fatality collisions by 90% at intersections where stop signs or signals were previously used for traffic control. See also: http://www.fhwa.dot.gov/research/deployment/roundabouts.cfm
http://safety.fhwa.dot.gov/intersection/roundabouts/
Road diets can offer potential benefits to both vehicles and pedestrians. Road diets reduce vehicle speeds and vehicle interactions during lane changes, while pedestrians have fewer lanes of traffic to cross. The Federal Highway Administration (FHWA) report, **Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations**, found that pedestrian crash risk was reduced when pedestrians crossed two and three lane roads versus roads with four or more lanes.

### Safe Routes to School

**Safe Routes to School** (SRTS) programs take a comprehensive approach to improving safety around schools for children walking and bicycling. Common approaches are engineering upgrades, such as sidewalks and crosswalks, improved traffic enforcement and bicycle and pedestrian safety education. The intent is to address parental concerns about traffic dangers and get more children walking and bicycling to school, which improve their physical fitness and health.

### Walkable Neighborhoods

Walkable communities are safe and inviting for walking and bicycling, while also featuring compact development and a variety of destinations, such as parks, public spaces, schools, workplaces and other amenities like restaurants and retail facilities. The tools to increase community livability by improving walkability go beyond investing in pedestrian infrastructure—residents and visitors should have convenient destinations they can walk to comfortably.

### Transportation Demand Management (TDM) Programs

**Transportation Demand Management (TDM) Programs** consists of a series of strategies and policies aimed to reduce travel demand by single-occupancy vehicles. Such strategies include parking cash out programs, employment-based transit pass programs, bicycle and pedestrian support programs, traffic calming, ride-sharing and other activities that reduce or redistribute transportation demand in space and time.

**Transport Oriented Design (TOD AND TRD)**

An LVPC report entitled **Community Planning and Transit: A Case for Transit Supportive Design** points out that, in many parts of the Lehigh Valley, development density is too low to allow transit to operate efficiently. The report advocates increased densities in transit-served areas, greater use of mixed land uses and numerous other techniques for improving the potential for transit.

Mixed land uses, occurring primarily in the urban areas of the Lehigh Valley, can reduce the number of trips and increase the feasibility of transit use. Mixed land uses can occur within the same building or, for larger scale developments, the uses are mixed within the context of the entire development. A single trip to a mixed use location can serve multiple purposes.

**Parking Cash Out Program** - a program in which an employer offers employees the option to take cash instead of a free or subsidized parking space of work. This encourages employees to carpool, walk, bike or take transit to work, a goal of all TDM applications.

**Transit Oriented Development** promotes denser development around transit stations and offers a range of destinations within walking distance, usually including multifamily homes, shops and workplaces.

**Transit Ready Development** (TROD) promotes suitable higher density mixed use development in anticipation of future transit service.

Together these development choices serve to:
- Improve air quality.
- Reduce gasoline consumption.
- Increase modal choice for residents.
- Decrease congestion and length of commute.
- Improve health and public safety (pollution and traffic accidents).
- Improve economic health (income and employment).
- Stimulate population redistributed into transit corridors, thus reducing sprawl and related infrastructure costs.

### Connected and Automated Transportation

Connected and Automated Transportation systems are rapidly developing, and several options include alternative mobility and modal options. These systems generally consist of an integrated logistic management system founded in advanced technology and resulting in efficient highway, rail and air movements.

These systems are developing over a number of areas including freight and trucks, transit, active traffic management solutions, long range planning, advanced deployment opportunities, traffic control devices and personal vehicle automation. Driverless vehicles can operate on a network of guideways and are expected to match the capacity of light rail and bus rapid transit systems in certain situations with shorter life cycle costs, wait times and travel times.

**For existing “conventional” communities with strip commercial areas and no actual town centers or downtowns, one way to create walkable downtowns may be to reduce traffic lanes with “road diets”. Road diets can tame higher speed multilane roadways by reducing the number of lanes in a roadway system. An example of a road diet would be a four-lane road reduced to two road lanes, with the other two lanes converted into additional parking, bike lanes, or sidewalk. A reduction in vehicle lanes will also reduce the speed of cars traveling on the roadway, which is a positive application for pedestrians and drivers alike.**

**Road diets can have fewer lanes of traffic to cross.**

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Studies and corridor planning are instrumental in identifying mobility issues and directing funding to the most appropriate locations. Studies should focus on the most logical and appropriate transportation and freight corridors. Studies would ideally include a detailed analysis of existing conditions and projections of future demands worthy of future investment.

Existing and future land use, employment concentrations, underperforming properties and transit hotspots are just a few indicators that might be used to study mobility options. Scenario modeling, the use of fast available data and sound planning techniques will result in identifying mobility solutions deserving of priority investment and the solutions mentioned previously, such as TOD, Bike/Ped connections, SRTS initiatives, Complete Streets, etc.

**Vehicle Miles Traveled (VMT)**

The average daily Vehicle Miles Traveled (VMT) in 2013 for the Lehigh Valley was 13,693,885. This represented a 0.6 percent decrease from 2010. The region should continue to look for opportunities to reduce and/or minimize additional levies. This can be accomplished in many ways including:

- Build upon existing networks and develop interconnected street networks for traffic distribution.
- Mix residential/office/commercial land uses along transit-served corridors in urban centers.
- Build compact, walkable neighborhoods.
- Develop additional transit options throughout the region.

One could conclude that suburban growth, coupled with auto-dependency, contributes to obesity because we drive everywhere, and walking is discouraged by design. Additionally, doctors are finding that other health-related issues, such as chronic heart disease, are more prevalent in suburban settings.

The analysis of congestion in the Lehigh Valley is done by the LVPC, as part of the regional Congestion Management Process (CMP). Thirteen corridors have been identified as eligible for inclusion in the CMP. Each corridor was required to be at least a mile long and have an average LOS of “D” or worse, have a functional classification of at least a minor arterial, be located within the area recommended for urban development in the LVPC’s Regional Comprehensive Plan, and not have had publicly-funded capacity improvements over the last 20 years.

Most past TDM projects in the Lehigh Valley have been unsuccessful. Reasons for this vary, but a few circumstances in the Lehigh Valley almost certainly address the reasons for these failures. PACE, according to the 2000-2015 American Community Survey, the average commute time in Lehigh County was 24 minutes, while Northampton County was 27 minutes. People don’t park and ride for short commutes. The region must continue to prioritize opportunities that provide a well-designed and compact urban form, which will incentivize pedestrian movements, reduce greenhouse gas emissions, reduce obesity and improve health.

**Traffic Congestion**

In February 2010, the LVPC conducted a sample survey of registered voters to gauge public opinion on issues such as land use, growth and transportation. When asked what the most significant consequences of growth have been since the year 2000, nearly 79% of respondents stated increased traffic congestion.

Congestion and bottlenecks are a detriment to an efficient transportation system. The causes vary and include contributing factors such as population growth, economic forces, poor land use decisions, etc. Although congestion in the Lehigh Valley is generally becoming more widespread, it is generally sporadic and short in duration. It occurs primarily during the morning and evening peaks.

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Second, development patterns in the Lehigh Valley are not dense enough to support many of these strategies. Third, due to the Lehigh Valley air quality non-attainment status, many strategies that are mandatory in areas with worse air quality are voluntary in the Lehigh Valley.

**E. OPERATIONS AND MANAGEMENT**

**Transportation and Health**

Emerging research suggests that auto-centric development contributes to obesity because we drive everywhere, and walking is discouraged by design. Additionally, doctors are finding that other health-related issues, such as chronic heart disease, are more prevalent in suburban settings.

Two types of air pollution are regulated by the U.S. EPA: ozone and particulate matter (PM). Ozone forms in the presence of sunlight, vehicle exhaust emissions, and VOC emissions from a variety of sources including the production of biomass. Particulate matter smaller than 2.5 microns in diameter (PM2.5) and 10 microns in diameter (PM10) are harmful to human health.

A growing body of research indicates that auto-centric development contributes to obesity because we drive everywhere, and walk is discouraged by design. Additionally, doctors are finding that other health-related issues, such as chronic heart disease, are more prevalent in suburban settings.

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Efficiency improvement strategies include:

**Intelligent Transportation Systems (ITS)** are a technology-based approach to increase efficiency on existing networks.

Much of the basis for this approach focuses on real-time information provided to the motorist. ITS strategies include variable message signs, traffic camera detection, ramp metering, highway advisory radio, etc.

**Freeway Service Patrol** is a program that assists stranded motorists and mitigates congestion.

PennDOT District 5 Traffic Control Center (TCC) is responsible for implementing real-time congestion management and incident management strategies essential to maximizing the operation and safety of the highway system. Presently, the TCC implements programs, operates fixed and variable message signs (VMS), and dispatches freeway service patrols within the Lehigh Valley on Route 22, Route 309, Route 33 and I-78. By collecting, coordinating and disseminating traffic information to both incident management responders (directly) and to the traveling public (through VMS and traffic information providers), incidents are cleared more efficiently, and travelers are provided near real-time information to base their travel decisions.

**511 Traveler Information System** provides motorists with real-time traffic information to improve the mobility and safety of our existing highway systems. Disseminating reports that help drivers make informed decisions before leaving to their destination is a critical component in operations and management.
Chapter 4 - Planning Factors + Travel Modes
The 511 Traveler Information System is a free system that provides real-time traffic reports 24 hours per day, 7 days per week. 511 offers users up-to-the-minute reports on traffic conditions, travel times, construction events, links to other agencies and more. The system covers major highways and freeways in the region and offers route-specific information. Commuters can access 511 by dialing 5-1-1, logging onto www.511pa.com or downloading the mobile application.

PennDOT Local Technical Assistance Program (LTAP) is one of 56 LTAP centers across the nation (in one state. Puerto Rico and six regional centers serving American Indian tribal governments). LTAP's mission is to extend transportation technology through training, technical assistance and other customer services to municipal officials and their staff. LTAP has provided technology transfer services to Pennsylvania's 2,600 municipal governments since 1983.

The LTAP program is designed to help Pennsylvania's municipalities, which maintain over 68,000 miles of roadways, make the best use of their roadway maintenance dollars. PennDOT LTAP provides technical information and proven technologies dealing with roadway maintenance and safety methods to meet the growing demands on municipal governments.

The LVPC became involved in the program to present transportation-related training opportunities to municipalities in the two-county area and to maintain more awareness of the value of LTAP services.

F. INTEGRATION AND CONNECTIVITY

ACCESS MANAGEMENT

Decisions involving access to the highway network play a major role in the performance of the highway network. Problems occur when numerous driveways are allowed on roads that are designed for higher speed and through movement.

Conflict points usually result in an unsafe road that performs far below standards. Examples of poor access management practices can be found on nearly every arterial with a lot of curb cuts for commercial development. Higher functional class roads, particularly arterials, must be preserved for their traffic carrying capabilities. Conversely, lower order roads primarily serve to provide access to land parcels.

Preserving traffic carrying capacity is only one reason for developing an access management program. Research done by the FHWA, the National Highway and Traffic Safety Administration and other state Departments of Transportation indicates that access management programs can enhance safety, improve roadway efficiencies and protect both private and public investments.

Highway Occupancy Permit (HOP)

PennDOT requires that an access permit be acquired by anyone who wishes to access a state road. Their authority includes ensuring that capacity and safety are sufficient in newly created intersections, safety issues as they relate to the adjacent stretches of highway, and drainage issues. However, PennDOT does not have the authority to deny access because a roadway has insufficient capacity (unless it is directly tied to the site of the development).

Municipal Authority

Most PennDOT actions deal with access improvements in relationship to the comprehensive plan, increases in traffic, drainage and design issues. Additional municipal authority is offered through local subdivision and zoning regulations. Many municipalities have relied on PennDOT actions through their Highway Occupancy Permit but are rapidly realizing the importance of access management at the local level, particularly as it relates to the design characteristics of local roads, and impacts on the overall municipal circulation pattern.

Training and Tools

PennDOT has developed a statewide study of access management and a model municipal ordinance. They have also conducted a statewide road walk to present it to municipalities. In April 2005, the LVPC conducted a workshop on the subject for Lehigh Valley officials. The LVPC has worked directly with Bethlehem, Steel and Pocono townships to develop local access management regulations using the PennDOT model and/or other similar models.

Street layouts in residential subdivisions are often deliberately designed to discourage traffic circulation. To create the impression of quiet residential streets, subdivision designs have sought to make through travel within subdivisions difficult, if not impossible. This is apparent in subdivisions utilizing an abundance of cul-de-sacs, where few connections between interior streets are possible. These practices do not serve the traffic needs of a community.

In 1996, the LVPC completed a report entitled Creating Better Traffic Circulation. Some of the policy considerations of the report are:

- Encourage municipalities to develop and implement a local comprehensive plan that is part of their comprehensive plan.
- Encourage the local transportation plan to contain pertinent data on existing and future traffic conditions and identify deficient intersections and road segments to improvements.
- Propose improved improvements to be included in a local capital improvement program.
- Encourage the local geographic area to develop Land Development Ordinances (SALDOs) to improve local traffic circulation.
- Encourage municipalities to coordinate their circulation plans with those of adjacent municipalities to improve the efficiency of the network.
- Encourage the use of transportation impact fees to augment funding for traffic improvements.
- Support design that promotes an interconnected street network.

MUNICIPAL LAND USE PLANNING

The Lehigh Valley consists of 62 cities, boroughs and townships, each having land use decision-making authority. Accordingly, land use and transportation coordination is difficult to manage, and development is currently outpacing the capacity to deliver transportation infrastructure. If transportation improvements do not keep up with new development, congestion will continue to grow.

It is important that strategies focus on increasing density and transit opportunities in urban cores and suburban corridors and preserving open space in rural areas. The General Land Use Plan shows the general land use plan for the Lehigh Valley.
The LVPC intends to steer highway capacity projects to areas designated for urban growth.

Smart Transportation planning recommends a new approach to roadway planning and design, where transportation investments are tailored to the unique, specific needs of each project. The different contexts of each project, such as financial, community, land use, transportation and environmental resources, determine the design solution. Context sensitive design, network connectivity, access management and corridor management are all considered workable elements of Smart Transportation.

For the ten-year period ending in 2012, the region’s highway network expanded by 215 linear miles; however, 213 miles of this includes locally-owned or municipally-owned roadways. Volume growth over this same decade was 12%. This demonstrates that most local municipal plans fail to link land use decisions with the transportation network. In fact, many local plans do not contain a transportation element.

Very few municipalities have taken advantage of the transportation impact fee process, and fewer undertake sound access management strategies or plan for new or expanded road infrastructure in capital improvement programs. The Pennsylvania Municipalities Planning Code conveys this authority, and it is important that all Lehigh Valley municipalities take advantage of this opportunity.

Case Study: the case for one-way street conversions

In 2011, Louisville converted two one-way streets near downtown, each a little more than a mile long, back to two-way traffic. In data that they gathered over the following three years, Gilderbloom and William Riggs found that traffic collisions dropped steeply—by 36 percent on one street and 60 percent on the other—after the conversion, even as the number of cars traveling these roads increased. Crime dropped too, by about a quarter, as crime in the rest of the city was rising. Property values rose, as did business revenue and pedestrian traffic, relative to before the change and to a pair of nearby comparison streets. The city, as a result, now stands to collect higher property tax revenues along these streets, and to spend less sending first-responders to accidents there. The basic pattern holds city-wide: They found that the risk of a crash is twice as high for people riding through neighborhoods with these one-way streets. The property values in census tracts there were also about half the value of homes in the rest of the city.

**Analytical Tools/Technology**

Aspects of highway planning, such as major investment studies, congested corridor analyses and evaluation of projects for inclusion into the long range plan, are dependent upon analytical tools.

**Regional Travel Model**

The most important tool for highway planning is the Lehigh Valley regional travel model. It is a computer model of the Lehigh Valley road network that simulates trips based upon socio-economic data inputs. The true value of the model lies in the ability to develop scenarios for evaluation, to prioritize congested corridors and to aid in the prioritization of transportation projects affecting air quality.

**Transportation Geographic Information System (GIS-T)**

Another tool available for use is the Transportation Geographic Information System (GIS-T). It is a tool used to assist in performing various transportation
analyses and consists of multiple layers of PennDOT databases. Some examples of data available are traffic volumes, bridge load limits, bridge ownership, bridge sufficiency ratings, functional classifications of roads, level of service, pavement type, road ownership, road roughness index and speed limit.

Highway Performance Monitoring System (HPMS) – Another data resource available is the Highway Performance Monitoring System (HPMS) program. The program consists of two elements: traffic counting and the roadway segment inventory. Annually, about 100 traffic counts are conducted under a contract with PennDOT. The data gathered is used in monitoring traffic flows, determining traffic background growth rates, projecting future traffic volumes, determining road design, determining federal funding allocations, conducting air quality conformity determinations, congestion management systems, determining funding priorities for transportation improvement projects, and validating the regional travel demand forecasting model.

Commodity Information Management System (CIMS) – The CIMS tool uses existing and future projected freight data and programs it into a statewide GIS platform for ease of accessibility and analysis. The tool provides tonnage and value quantities for truck, rail, air, and water modes against 700 commodity types for 2011 (base year) and future forecasts through 2040. The freight data provided in CIMS will assist and inform freight planning and infrastructure decisions.

Highways and Economic Development

Major transportation projects are almost always linked with economic development. For the past 50 years, many jobs have located in industrial parks and on business sites in the Route 22 corridor. The Route 100/I-78 corridor in western Lehigh County has been a strong development center, and the Route 33 link between Route 22 and I-78 in Northampton County is rapidly becoming another center for employment, retailing and services.

Economic development is one of a number of justifications for transportation improvement projects. Accident reduction, congestion relief, maintenance improvements and traffic management are other factors important in the transportation planning process. In some instances, transportation improvements may be undesirable because of their impacts. Emphasis on improvements in urban places rather than rural locations may help to expedite the redevelopment process in urban areas and slow the pace of growth in suburban or rural areas. Transportation improvements can and should relate to the overall development goals of the region as expressed in the regional comprehensive plan.

The LVTS, in collaboration with PennDOT, developed the first-ever Lehigh Valley Regional Freight Plan. This regional effort compliments the state Comprehensive Freight Movement Plan (CFMP) and was developed under the direction of a regional Freight Advisory Committee. The Regional Freight Plan includes:

- An employment analysis of the most freight-dependent industries.
- An analysis of roadway and bridge assets, including pavement conditions, parking facilities, bridge condition, at-grade rail crossings, congestion and bottlenecks.
- An analysis of travel demand and growth on the local system.
- A review of existing modal facilities and a detailed overview of truck, rail and air movements.

G. ECONOMIC VITALITY/PRODUCTIVITY/ GLOBAL COMPETITIVENESS

The regional freight profile supports the importance of efficient freight movement to the regional economy, and all modes of travel were considered during the development of this profile. Considerations to be found in more detail within the plan include:

- A summary of current freight flows, including inbound/outbound movements and movements within the Valley.
- An in-depth look at commodity type and year 2040 forecasts for tonnage and value.
### Chapter 4 - Planning Factors + Travel Modes

#### % Value by Direction

<table>
<thead>
<tr>
<th>Year</th>
<th>Inbound Freight</th>
<th>Internal Freight</th>
<th>Outbound Freight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>55%</td>
<td>2%</td>
<td>38%</td>
</tr>
<tr>
<td>2040</td>
<td>47%</td>
<td>3%</td>
<td>46%</td>
</tr>
</tbody>
</table>

### 2040 Probable Growth

- **Total Value Lehigh Valley Freight Economy:** $130M
- **61%**
- **90% all freight**

### % Tonnage by Direction

<table>
<thead>
<tr>
<th>Year</th>
<th>Inbound Freight</th>
<th>Internal Freight</th>
<th>Outbound Freight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>59%</td>
<td>2%</td>
<td>38%</td>
</tr>
<tr>
<td>2040</td>
<td>51%</td>
<td>2%</td>
<td>46%</td>
</tr>
</tbody>
</table>

#### 2040 Top Commodities by Tonnage

1. Rail Intermodal Drayage from Ramp
2. Rail Intermodal Drayage to Ramp
3. Petroleum Refining Products
4. Broken or Stone/Riprap
5. Warehouse / Distribution Center
6. Soft Drinks or Mineral Water

#### 2011 Top Commodities by Tonnage

1. Rail Intermodal Drayage from Ramp
2. Rail Intermodal Drayage to Ramp
3. Petroleum Refining Products
4. Broken or Stone/Riprap
5. Warehouse / Distribution Center
6. Portland Cement
The National Environmental Protection Act (NEPA) requires, to the fullest extent possible, that the policies, regulations and laws of the federal government be interpreted and administered in accordance with its environmental protection goals. Accordingly, the LVTS is committed to the examination and avoidance of potential impacts to the social and natural environment when considering approval of proposed transportation projects.

All capacity improvement projects take into account the transportation needs of the public in reaching a decision that is in the best overall public interest. The LVTS uses the NEPA process to identify both impediments and appropriate mitigation strategies early in the process.

An Agency Coordination Meeting (ACM) meeting was also held with various state and federal environmental agencies, including PennDOT, Pennsylvania Department of Conservation and Natural Resources (DCNR), U.S. Fish and Wildlife Service and U.S. Environmental Protection Agency, among others, to assure that appropriate policy and mitigation strategies were identified as part of the long range planning process.

Stormwater

There are two types of surface water pollution: nonpoint source, which is a result of rainwater runoff, and point source, which is the discharge from industries into a waterbody through a pipe or outflow source. Nonpoint pollution sources are often difficult to determine and regulate because the sources are not always readily obvious. For example, sediment loads can come from a variety of sources, such as construction sites, roadways and driveways that may generate toxic materials during a rain event.

As the population in the Lehigh Valley increases and development and infrastructure expand, so do surface and groundwater contamination and the cost of stormwater management. Historically, the main goal of stormwater management was flood control and directing stormwater to a nearby channel, ditch, river or lake. We now know that the long term effect of this practice has resulted in adverse impacts to water quality.
Today, stormwater management practices have evolved and holistically look at surface drainage, flood control, erosion and sediment control, water quality treatment and habitat protection.

Low Impact Development (LID)

Low Impact Development (LID) is generally described as a stormwater management approach that strives to produce pre-development hydrologic systems in land development. LID techniques typically include bio-retention, green roofs, permeable pavers, rain barrels and cisterns, soil amendments and tree box filters. In an effort to mimic natural processes, LID uses uniformly distributed and decentralized micro-scale controls to infiltrate, evaporate, transpire, filter, store and detain stormwater runoff close to its source. Avoiding centralized retention, the process of controlled runoff generation keeps pollutants out of natural waterways and helps to prevent flooding.

Green Infrastructure

Green infrastructure is a development technique that mimics nature through the systematic use of vegetation, soils and natural processes. Unlike a centralized system, these systems absorb and store water naturally. Several green infrastructure techniques can be related to road and bridge infrastructure, including “Green Streets and Alleys”, which integrate green infrastructure elements into the street. Techniques such as permeable pavement, bioswales, planter boxes and trees are among the features that could be utilized.

Bioswales are vegetated stormwater swales that slow, absorb and filter stormwater flows. As linear features, vegetated swales are particularly suitable along streets and parking lots. Permeable pavements are paved surfaces that are constructed from pervious materials. These pavements are particularly cost-effective where land values are high and where flooding or icing is a problem.

According to the U.S. Environmental Protection Agency, many of the green infrastructure elements described above can be readily integrated into parking lot designs. Permeable pavements can be installed in sections of a lot, and rain gardens and bioswales can be included in medians and along a parking lot perimeter. Benefits include urban heat island mitigation and a more walkable built environment.

Wetlands

Wetlands include swamps, marshes and bogs and are an environmental feature that affects the transportation network in the Lehigh Valley. These systems are vital to the health of waterways as they serve to feed downstream waters, trap floodwaters, recharge groundwater supplies, remove pollution and provide fish and wildlife habitat. Wetlands are also economic drivers because of their key role in fishing, hunting, agriculture and recreation.

Threatened/Endangered Species

Also important to transportation planning and capacity improvement is the effect on the plant and animal kingdom. Threatened and endangered species include any species (including animals, plants, fungi, etc.) that are vulnerable to endangerment in the near future. Species that are threatened may be characterized by a declining population due to an increase in the human population growth rate and/or a loss of habitat. The Lehigh Valley has particular interest in the Bog Turtle.

According to the U.S. Fish and Wildlife Service, “This is the smallest hard shell (emydid) turtle, and one of the smallest turtles in the world. The dark brown or black dorsal part of the shell structure (carapace) may be marked with radiating light lines or a light blotch on the shell covering (scutes).”
A. GOALS AND POLICIES

Projects originating at the Metropolitan Planning Organization (MPO) level must pass through a screening process to determine how the project addresses transportation problems. The screening process seeks to determine if a proposed project is in accord with both federal and LVTS goals and policies. It is this screening process that differentiates a plan from a wish list. The major policies involved in the placement of projects in the long range plan are outlined in one or more of the policy statements listed under goals and policies.
General Goals and Policies

1. Goal – To develop a plan that provides systematic procedures for selecting projects based on a consistent planning process and specific criteria for determining needs.

   Policies
   - In general, the entry point for a project shall be a study of need developed by any of the following parties: PennDOT, the MPO, LVPC, LANTA, LANA, local municipalities in the Lehigh Valley, a credible private organization. U.S. Department of Transportation and/or Pennsylvania Department of Transportation initiatives, such as Linking Planning and NEPA screening forms, shall be completed for all new projects under consideration to allow for consistent processing and decision-making.
   - The MPO may periodically consider and act upon placement of projects on the long range element, mid-range element or short range element. Such placement may be based on immediacy of need, status of studies and financial constraints of the Transportation Improvement Program (TIP) and Long Range Transportation Plan.
   - Projects must be consistent and comply with the transportation goals and policies of the LVTS and Comprehensive Plan 2030 (or its successor).
   - Projects must be on the Federal Aid System, or they must be a state road to be eligible for federal or state funds unless federal safety funds are used, in which case all public roads are eligible. Projects other than those funded under the Transportation Alternatives Program (TAP) should have a construction cost greater than $200,000. The cost of procuring federal funds for projects less than $200,000 is prohibitive.
   - To enhance transportation funding in the Lehigh Valley, all potential funding sources should be investigated during the programming of a project. In addition to traditional Transportation Improvement Program funding, other sources of private, public/private, local, state and federal funding should be investigated. Projects with a greater than 20% local share will be enhanced in priority.
   - Replace transportation projects that significantly fall behind performance milestones set at the time a project is funded.
   - Highest priority shall be assigned to those projects that are essential for safety, maintenance of the transportation system and/or relief of congestion through operational improvements.
   - Preferential consideration shall be given to those projects that include mobility elements and alternative mode choices.
HIGHWAY, BRIDGE AND ROAD GOALS AND POLICIES

2. Goal – To provide a safe, well-maintained road network that facilitates the movement of traffic.

Policies
• Give high priority to projects that upgrade unsafe roads and intersections, rehabilitate or replace deficient bridges and upgrade existing highways that are deficient.
• Conduct planning studies on high priority congestion and safety corridors and program appropriate improvements.
• Safety projects shall be identified based on the high priority safety corridors or from other credible, documented safety analyses. Projects programmed must contribute to attaining the performance standards identified in this plan.
• Maintenance priorities will be determined by the systematic application of asset management criteria. Projects programmed must contribute to attaining the performance standards identified in this plan.
• Priority will only be given to bridges deemed structurally deficient. Bridges with a sufficiency rating of 0 to 50 are eligible for replacement. Bridges with a sufficiency rating of 50 to 80 are eligible for rehabilitation. All other bridges are eligible for preventive maintenance improvements only. Projects programmed must contribute to attaining the performance standards identified in this plan.
• Support construction techniques that expedite infrastructure delivery, minimize adverse impacts on the built and natural environment, and maximize cost delivery efficiencies.
• Access management practices should be initiated in accord with recommendations of the Lehigh Valley Planning Commission’s report entitled Access Management on Arterial Roads and PennDOT’s Access Management Handbook.
• Support municipal projects that demonstrate a funding commitment in the form of capital programming, engineering and/or transportation impact fees.
• Support municipal projects that have included or can demonstrate strategic access management principles.
• Support projects that involve public/private partnerships.
HIGHWAY, BRIDGE AND ROAD GOALS AND POLICIES

3. Goal – To improve mobility and to provide access to major traffic generators.

Policies

- Support highway capacity improvements only in areas designated for urban development in the Comprehensive Plan The Lehigh Valley...2030 (or its successor).
- Support highway capacity improvements only in locations that are dedicated for urban development and that have not received public funding within the past 20 years unless an identified safety issue can only be adequately addressed through capacity additions.
- Projects with a mobility justification must have documented evidence of existing or forecasts of future congestion. Projects must be identified in the LVTS Congestion Management Process.
- New and/or expanded facilities must be justified primarily on the basis of current or future congestion or safety problems. Secondary factors, such as access improvement and economic development, may be given consideration to the degree that they support the goals and policies of the Comprehensive Plan The Lehigh Valley...2030 (or its successor) and that the financial resources are available.
- Congestion relief and access improvement projects shall address intermodal connections where such connections are appropriate.
- Encourage an interconnected street network for all future local roads where feasible.
- Encourage alternatives to automobile use, both motorized and non-motorized.
4. Goal – To promote economy and efficiency in highway, road and right-of-way planning, design and function.

Policies

- Preserve arterial roads for their through traffic carrying function through access management techniques.
- Highway, road and right-of-way improvements should be scaled to needs that result from reliable and documented travel forecast procedures.
- Improvements to existing highways, roadways and rights-of-way at current locations are generally preferred over relocations and bypasses.
- Improvement of existing grade-separated interchanges to resolve major safety and capacity problems will be supported only if there is a compelling and well-documented need that cannot be met by upgrading an existing interchange and sufficient funds are available. Interchanges at new locations are not otherwise recommended.
- This plan supports transportation system management, operations strategies, intelligent transportation systems, access management practices, context sensitive design and other innovative transportation practices in appropriate situations.
- Travel demand on existing facilities should be met to the greatest degree possible by programming low cost safety and mobility improvements.
- Support development of park and ride lots where there is documented demand for such facilities.
- Improve sidewalk, trail and local street connectivity to offer multimodal options to reduce the number of vehicle trips taken on the major highway network; encourage growth and revitalization of the region’s urbanized areas; and support social, cultural and economic equality.
- When feasible, transit should be used to mitigate short term, high volume traffic congestion, such as those related to special events, rather than building permanent highway capacity improvements.
- Support efficiencies achieved through contract management, such as bundling of like projects and design/build, as appropriate.
- Transportation control measures, such as carpooling and encouraging increased transit usage, should be implemented, where feasible, to reduce vehicle miles traveled, emissions and multimodal options supportive of the region’s urban development areas and environmental justice goals.
HIGHWAY, BRIDGE AND ROAD GOALS AND POLICIES

5. Goal – To construct transportation improvements that are compatible with the built and natural environments.

Policies

• Major highway and bridge projects should be studied, designed and constructed in accordance with the most recent environmental regulations.
• Through traffic should be diverted away from existing residential areas.
• Reduce Lehigh Valley greenhouse gas emissions. Air quality conformity determinations of the Transportation Improvement Program and Long Range Transportation Plan shall document that hydrocarbon, nitrogen oxide and small particulate matter emissions from vehicles do not exceed the emissions budgets established by the U.S. Environmental Protection Agency.
• Protect, conserve and enhance natural ecosystems to provide long term resilience to climate change.
• Considerations for the existing built and natural environments should be applied during transportation improvement design.
• Major highway and interchange projects that increase access should not be located in areas designated for natural features or agricultural preservation in the Comprehensive Plan - The Lehigh Valley - 2030 (or its successor).
• Support economic development strategies to target industry sectors that match the unique competitive advantages of the region.
• Integrate stormwater management practices in the form of blue-green infrastructure into the design of new or improved rights-of-way.
Chapter 5 - Goals + Policies

Transit Goals and Policies

6. Goal – To support the enhancement of the transit system to provide adequate mobility to area residents and promote transit use as an alternative to driving.

Policies

- Pursue the implementation of the Moving LANta Forward Strategic Plan to provide convenient and reliable fixed route service between major travel origins and destinations.
- Maintain and update transit facilities and rolling stock to keep up with new technologies.
- Provide coordinated, specialized public transportation for people who cannot use conventional bus services.
- Shopping, workplace, government and housing facilities that are destinations of transit riders should be sited at locations where transit service exists.
- Transit destinations should accommodate transit access through design features, such as bus lay-bys and front door access.
- LANta should continue to offer and improve a wide range of service options to meet a variety of mobility needs in the Lehigh Valley.
- Higher density housing and employment facilities should be developed along transit service routes. In the LANta market area, a minimum density of five dwelling units per acre should be developed.
- Support passenger rail transit only if studies show such a system to be viable and cost-efficient with respect to capital and long term operating costs.
- Support connected and automated transit systems that improve commuter choice and efficiency.
Transit Goals and Policies

7. Goal – To promote economy and efficiency in public transit planning, design and function.

Policies
- LANta should plan and implement its services in adherence with its adopted service and performance guidelines to ensure that fixed route transit service should be provided only in those areas where there is a market for such service and it is financially feasible through operating revenues and projected available subsidies.
- Replace buses and paratransit vehicles on a regular basis based upon life-cycle costs and LANta’s financial capacity.
Transit Goals and Policies

8. Goal – To have a sufficient supply of convenient intercity public ground transportation available to popular destinations such as New York City and Philadelphia.

Policies
- This service should be met through unsubsidized, privately-owned transportation providers, to the degree possible.
- New publicly subsidized service should not be considered unless established, unsubsidized transportation providers are unwilling or unable to supply a sufficient, convenient service.
- Adequate and convenient terminals should be available for intercity transportation.
- Service opportunities to important destinations outside of the Lehigh Valley should be reviewed on a regular basis or as significant changes dictate.
- Rail rights-of-way should be preserved for future rail reuse if analysis shows that the re-establishment of service is warranted and financially feasible.
- Pursue planning steps necessary to continue the process to extend commuter/intercity rail services into the Lehigh Valley.

Chapter 5 - Goals + Policies

Mixed use development with Transit Center in Easton scheduled for 2015 completion.
AIR GOALS AND POLICIES

9. Goal – To be a model aviation system, providing the highest levels of service to diverse customers while serving as a gateway to the community, region and world.

Policies

- Promote the LVIA as the region’s air passenger carrier, corporate aviation and air cargo airport. All other airports should serve general aviation and specific corporate aviation needs.
- Support LVIA programs that enhance existing and forecasted demand for scheduled and non-scheduled air carrier services, corporate aviation and air cargo in an adequate, safe and efficient manner.
- The LVPC prefers that all future runway extensions at LVIA be limited to the main airport property bounded by Airport Road on the east, Race Street on the north, and LVIP #3 on the south unless it is demonstrated that expansion beyond these limits is necessary due to safety and/or site limitations of the main airport property described above and the expansion is in accord with the FAA-approved Airport Layout Plan.
- Local highway access to the LVIA should be improved as necessary on the basis of periodic evaluation of access needs in connection with LVIA.
Chapter 5 - Goals + Policies

AIR GOALS AND POLICIES

10. Goal – To maximize the compatibility of LVIA operations and nearby land uses.

Policies

• Support future development in the vicinity of LVIA that is compatible with existing and projected air traffic operations.
• Remedial and preventive measures, such as land acquisition, relocation, zoning overlay districts, environmental review, soundproofing, revised building codes, real estate disclosure and easement acquisition, should be used as needed to promote compatibility with existing and future LVIA operations.
• Encroachment of airport operations on existing residential areas should be minimized, and new residential development should not encroach on LVIA or its approach paths.
• Airport operations should seek to minimize the noise impacts on existing developed areas as much as possible without compromising safety.
**AIR GOALS AND POLICIES**

11. **Goal** – To optimize the operational efficiency, effectiveness and safety of the facility.

**Policies**
- The Lehigh-Northampton Airport Authority should continue to conduct and revise, as necessary, the LVIA Master Plan, FAR 150 Airport Noise Compatibility Study, Regional Aviation System Plan, and any other pertinent studies to ensure efficiency, effectiveness and safety.
Freight Goals and Policies

12. Goal – To provide transportation choices, improve system connectivity and improve safety for all passenger and freight modes.

Policies

• Identify projects that reduce rates of crashes, fatalities and injuries on the regional freight transportation system.
• Improve the overall ratings of pavement and bridges on the regional freight transportation system.
• Improve freight corridor mobility and first/last mile connectivity between freight modes and major generators and gateways.
• Identify the most cost-effective methods to improve freight system capacity (including technology and operations).
• Lead efforts to foster greater coordination among the agencies responsible for freight system investment.
• Support the planning and development of both short and long term truck parking facilities.
BICYCLE/PEDESTRIAN GOALS AND POLICIES

13. Goal – To meet recreation, transportation and utility needs by acquiring or retaining abandoned rail rights-of-way.

Policies

- Rail rights-of-way proposed for abandonment should be acquired if analysis shows that they are desirable for recreation, transportation right-of-way, utility right-of-way or other uses.
14. Goal – To support bicycle and pedestrian activity and to provide safe access to the transportation system for cyclists and pedestrians in the Lehigh Valley.

Policies

- Promote transportation infrastructure improvements, such as road diets, shoulder improvements, sidewalks and crosswalks, to resolve bicycle and pedestrian safety issues. The appropriateness of bicycle and pedestrian facilities should be considered as part of all road projects.
- Encourage specialized bicycle and pedestrian design techniques to facilitate convenient access to transit in areas recommended for urban development.
- Support municipal regulations that mandate construction of sidewalks and pathways to serve pedestrian and other non-motorized traffic.
- Support the construction of rails-to-trails projects for use in both recreation and transportation.
- Promote the construction of missing links in the bicycle and pedestrian networks.
- Support future development patterns conducive to non-motorized travel.
- Promote bicycle sharing where appropriate and provide safe, convenient bicycle parking and storage facilities in key areas.
- PennDOT should adopt bicycle and pedestrian design and performance standards. Consideration of pedestrians and bicyclists should be given when designing and locating traffic control devices, signs and crosswalks.
- Support the creation and maintenance of citizen traffic advisory committees to monitor and advocate for multimodalism.
- Support Safe Routes to Schools (SRTS) projects.
B. PERFORMANCE STANDARDS

The policies articulated above drive the investment of public money to qualifying projects. It is important to understand the impact of these decisions and to track and monitor progress over time. Accordingly, the LVTS has developed the following performance standards:

**TRANSPORTATION PERFORMANCE STANDARDS**

<table>
<thead>
<tr>
<th>Highway</th>
<th>Percent reduction of segment miles with poor RII and OPI</th>
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<tbody>
<tr>
<td></td>
<td>Baseline: 2013 percent segment miles</td>
</tr>
<tr>
<td></td>
<td>• Poor RII: Interstate (6.6%), Non-Interstate (14.5%), Non-NHS, &gt;2000 ADT (20.6%), Non-NHS, &lt;2000 ADT (40.6%)</td>
</tr>
<tr>
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<td>• Poor OPI: Interstate (0.8%), Non-Interstate (7.8%), Non-NHS, &gt;2000 ADT (6.5%), Non-NHS, &lt;2000 ADT (9.5%)</td>
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<tr>
<td>Source:</td>
<td>PennDOT Annual Pavement Performance Measures Report</td>
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<tr>
<th>Bridges</th>
<th>Reduction in number of structurally deficient bridges</th>
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<tr>
<td></td>
<td>Baseline: 169 of 912 bridges are structurally deficient (2014)</td>
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<tr>
<td></td>
<td>• State-Owned (Lehigh and Northampton): 96</td>
</tr>
<tr>
<td></td>
<td>• Locally-Owned (Lehigh and Northampton): 73</td>
</tr>
<tr>
<td>Source:</td>
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<tr>
<th>Bridges</th>
<th>Reduction in number of posted bridges (weight restricted)</th>
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<tr>
<td></td>
<td>Baseline: 98 of 912 bridges are posted (2014)</td>
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<tr>
<td></td>
<td>• State-Owned (Lehigh and Northampton): 26</td>
</tr>
<tr>
<td></td>
<td>• Locally-Owned (Lehigh and Northampton): 72</td>
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<th>Transit</th>
<th>Increase transit ridership by service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline: 5,823,430 riders in 2014</td>
</tr>
<tr>
<td></td>
<td>• Fixed Route Service: 5,407,854</td>
</tr>
<tr>
<td>Source:</td>
<td>LANTA (Paratransit Service: 415,576)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Baseline: 13 identified sites (2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• US 22 (I-78 to Route 33)</td>
</tr>
<tr>
<td>• Cedar Crest Blvd. (US 22 to Chestnut St.)</td>
</tr>
<tr>
<td>• I-78 (US 22 to PA 100)</td>
</tr>
<tr>
<td>• I-78 (SR 33 to SR 33)</td>
</tr>
<tr>
<td>• Route 369 (Shankweiler Rd. to Walbert Ave.)</td>
</tr>
<tr>
<td>• Lehigh St./Ellis Harrison St. (31st St. to 5th St.)</td>
</tr>
<tr>
<td>• 25th St. (Neshaminy Rd. to Freeman Ave.)</td>
</tr>
<tr>
<td>• SR 191 (US 22 to Newburg Rd.)</td>
</tr>
<tr>
<td>• SR 378 (Bedminster Rd. to Center Valley Parkway)</td>
</tr>
<tr>
<td>• SR 100 (Lotz/Lion Township line to Schantz Rd.)</td>
</tr>
<tr>
<td>• American Parkway/S. 4th St./Bartram St. (Gordon St. to I-78)</td>
</tr>
<tr>
<td>• Broadview/E. 4th St. (Susquehanna St. to Fillmore St.)</td>
</tr>
<tr>
<td>• Morgan Hill Rd./Phila Rd./Sunnt St./Shantz Rd./SR 111 (I-78 to vicinity of Paxinose Ave.)</td>
</tr>
<tr>
<td>Source:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Freight</th>
<th>Reduce number and rate of at-grade railroad crossing fatalities and injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline: Number of existing at-grade crossing crashes + fatalities + injury rates (2008-2012)</td>
</tr>
<tr>
<td></td>
<td>• Source: PennDOT CDART Crash Data Analysis Retrieval Tool</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Freight</th>
<th>Reduce number of congested corridors and freight bottlenecks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline: 13 identified sites (2014)</td>
</tr>
<tr>
<td></td>
<td>• US 22 (I-78 to Route 33)</td>
</tr>
<tr>
<td></td>
<td>• Cedar Crest Blvd. (US 22 to Chestnut St.)</td>
</tr>
<tr>
<td></td>
<td>• I-78 (US 22 to PA 100)</td>
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<td>• I-78 (SR 33 to SR 33)</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>• Broadview/E. 4th St. (Susquehanna St. to Fillmore St.)</td>
</tr>
<tr>
<td></td>
<td>• Morgan Hill Rd./Phila Rd./Sunnt St./Shantz Rd./SR 111 (I-78 to vicinity of Paxinose Ave.)</td>
</tr>
<tr>
<td>Source:</td>
<td>LVPC CMP (Freight Plan)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Freight</th>
<th>Reduce number and rate of at-grade railroad crossing fatalities and injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Source: PennDOT CDART Crash Data Analysis Retrieval Tool</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bike/Pedestrian</th>
<th>Reduce number of bicycle and pedestrian crashes, fatalities and major injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline: Bike/ped number of crashes, fatalities and injuries (2008-2012)</td>
</tr>
<tr>
<td></td>
<td>• Source: PennDOT CDART Crash Data Analysis Retrieval Tool</td>
</tr>
</tbody>
</table>
C. EVALUATION AND PROJECT PRIORITY

In addition to the policy considerations, projects are evaluated and prioritized against a series of planning documents and data analyses. These criteria are applicable to a variety of project types, including road capacity, corridor, safety, and rehabilitation improvements. A listing of those criteria include:

- **Mobility** – A project rises in priority if it is inclusive of multiple transportation modes.
- **Partnerships** – A project rises in priority if it includes a public and private arrangement for funding and/or maintenance.

PennDOT Public: Private Partnerships Office

What is a P3 Project?

A P3 project is a contractual agreement between a public entity and private entity that:

- Transfers the responsibility of a facility’s engineering, construction, operation and/or maintenance to the private sector for a defined period of time.
- Allows the private sector to perform a service previously provided by the public sector.
- Ensures the private firm receives payments either from existing revenue sources or through the sale of new debt.
- The two basic P3 project types are:
  - New Build Facilities – Adding capacity to the system by building something.
  - Transfer of Responsibility – A P3 project may involve a range of different “permissions” (use of public right-of-way).

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Municipal Considerations – A project rises in priority if a municipality has a strategic plan for transportation improvements, which may include:

- Access management – The inclusion and adoption of comprehensive strategies that account for the entire network can serve to elevate project status.
- Municipal capital improvement program – Projects are identified and programmed over time.

Transportation Alternatives – Projects that do not meet federal and local requirements for funding may be eligible for alternative programs such as:

- **Transportation impact fees** – Assessed against the land development community to assure appropriate improvements are made commensurate with the development proposed. Municipalities should assure that surrounding road networks are upgraded concurrently with new development and, to the extent practical, at the expense of the developer.
- **Design contributions** – Engineering design consistent with PennDOT standards and performed at the expense of the municipality or the developer so that a transport project may promote safety and mobility.
- **The Pennsylvania Infrastructure Bank (PIB)** is a PennDOT-operated program or the private sector that serves as an economic incentive to the developer to serve as a transportation project.
- **Transportation impact fees** – Assessed against the land development community to assure appropriate improvements are made commensurate with the development proposed. Municipalities should assure that surrounding road networks are upgraded concurrently with new development and, to the extent practical, at the expense of the developer.
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Consistency with Regional Comprehensive Plan – A project rises in priority if it is consistent with relevant policy. This includes the location of projects within urban boundaries and the proximity to historic structures and sensitive environmental features, such as wetlands, protected species habitat, parklands, etc.

Air Quality – A project rises in priority when it improves air quality within the Valley, which is a designated non-attainment area.

- Proposed projects that use congestion mitigation/air quality funds must be modeled to assure reductions in Volatile Organic Compounds (VOCs) and Nitrous Oxides (NOx).

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Environmental Justice – A project rises in priority if it has little to no adverse impact on disadvantaged communities.

PennDOT Public Private Partnerships Office

Environmental Justice – A project rises in priority if it has little to no adverse impact on disadvantaged communities.

- Transportation Alternatives – Projects that do not meet federal and local requirements for funding may be eligible for alternative programs such as:
  - The Green Light-Go Program provides state funds for the operation and maintenance of traffic signals and improves safety and efficiency at intersections.
  - The Transportation Alternatives Program provides for transportation projects that improve pedestrian and bicycle facilities, create trails that serve a transportation purpose and promote safety and mobility.
  - The Multimodal Program provides for transportation alternative projects that enhance pedestrian and bicycle facilities, improve access to public transportation, create safe routes to school, preserve historic transportation structures, provide environmental management improvements that serve a transportation purpose, and assist in the use of interest loans to help fund transportation projects. The goal of the PIB is to leverage state and federal funds, accelerate priority transportation projects, spur economic development and assist local governments with their transportation needs.
  - The Rail Transportation Assistance Program (RTAP) is a capital budget grant program providing financial assistance for investment in rail freight infrastructure. The intent of the program is to:
    - Preservice and reentry rail freight service where economic feasibility, and 2) preserve or stimulate economic development through the generation of new or expanded rail freight service.
    - Local Safe Roads Community Program (LSRCP)/Walkable Communities Program (WCP) are two projects that focus on local road safety and offer a process of identification and recommendation for low cost remediation of high safety risk areas to municipal leaders at no cost for the service.
    - The Automated Red Light Enforcement (ARLE) Grant Program provides PennDOT with quarterly deposits of revenue, generated by automated red light enforcement violations, into a restricted Motor License Fund Account that is made eligible for grant funding.

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Data Inputs – A project rises in priority when it meets certain warrants for Average Annual Daily Traffic (AADT) and peak hour trips, level of service provided on state corridors on state highways.

PennDOT Public Private Partnerships Office

- The Multimodal Program provides for transportation alternative projects that enhance pedestrian and bicycle facilities, improve access to public transportation, create safe routes to school, preserve historic transportation structures, provide environmental management improvements that serve a transportation purpose, and assist in the use of interest loans to help fund transportation projects. The goal of the PIB is to leverage state and federal funds, accelerate priority transportation projects, spur economic development and assist local governments with their transportation needs.

PennDOT Public Private Partnerships Office

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PennDOT Public Private Partnerships Office

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PennDOT Public Private Partnerships Office

Data Inputs – A project rises in priority when it meets certain warrants for Average Annual Daily Traffic (AADT) and peak hour trips, level of service provided on state corridors on state highways.

PennDOT Public Private Partnerships Office
### TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Municipality</th>
<th>Phase(s)</th>
<th>Cost ($000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamilton Street - 4th to 6th streets</td>
<td>Allentown</td>
<td>P/C</td>
<td>237</td>
</tr>
<tr>
<td>Chew Street - Ott to 31st streets</td>
<td>Allentown</td>
<td>P/U/C</td>
<td>873</td>
</tr>
<tr>
<td>Mack Blvd. - Emaus to S. 8th streets</td>
<td>Allentown</td>
<td>P/C</td>
<td>847</td>
</tr>
<tr>
<td>Rt. 22 Section 400 - P (Lehigh River Bridge)</td>
<td>Whitehall/Tilden</td>
<td>P/U/R</td>
<td>56,648</td>
</tr>
<tr>
<td>Lehigh Street Bridge</td>
<td>Whitehall</td>
<td>P/U/R</td>
<td>12,184</td>
</tr>
<tr>
<td>Rt. 125 Bridge</td>
<td>Whitehall</td>
<td>P/C</td>
<td>7,862</td>
</tr>
<tr>
<td>Rt. 1235/Old Classical St. Intersection</td>
<td>Whitehall</td>
<td>C</td>
<td>1,365</td>
</tr>
<tr>
<td>Rt. 12 Street Electrical Conduit</td>
<td>Allentown</td>
<td>C</td>
<td>412</td>
</tr>
<tr>
<td>Hamilton St. between 10th and 15th streets</td>
<td>Allentown</td>
<td>P/C</td>
<td>472</td>
</tr>
<tr>
<td>Rt. 222 Median Barrier</td>
<td>U./L. Macungie</td>
<td>P</td>
<td>563</td>
</tr>
<tr>
<td>Rt. 222/ Schantz Rd./Rt. 863</td>
<td>U. Macungie</td>
<td>P/F/U/R/C</td>
<td>7,546</td>
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<tr>
<td>Rt. 309/Center Valley Parkway Interchange</td>
<td>U. Saucon</td>
<td>P</td>
<td>3,000</td>
</tr>
<tr>
<td>PA 309 Betterment</td>
<td>N./S. Whitehall</td>
<td>P/F/U/R/C</td>
<td>13,833</td>
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<tr>
<td>PA 309/Tilghman Street Reconstruction</td>
<td>S. Whitehall</td>
<td>P/F/U/R</td>
<td>10,738</td>
</tr>
<tr>
<td>Tilghman St. Resurfacing</td>
<td>Allentown</td>
<td>C</td>
<td>1,545</td>
</tr>
<tr>
<td>2nd Street Extension</td>
<td>Catasauqua</td>
<td>F/U/R/C</td>
<td>5,995</td>
</tr>
<tr>
<td>Schoenersville Rd. Corridor</td>
<td>Bethlehem City</td>
<td>P/F/U/R/C</td>
<td>1,586</td>
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<tr>
<td>15th St. Corridor</td>
<td>Allentown</td>
<td>P/F/U/R/C</td>
<td>2,832</td>
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<tr>
<td>Lehigh Street Corridor</td>
<td>Allentown</td>
<td>C</td>
<td>35</td>
</tr>
<tr>
<td>Hamilton Blvd. Resurfacing</td>
<td>U./L. Macungie</td>
<td>C</td>
<td>2,334</td>
</tr>
<tr>
<td>New England Avenue</td>
<td>Allentown</td>
<td>C</td>
<td>984</td>
</tr>
<tr>
<td>Easton Ring Road Conversion to 2-way</td>
<td>Easton P/F/U/R/C</td>
<td>2,468</td>
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<tr>
<td>SR 412 Connector Rd</td>
<td>Bethlehem City</td>
<td>C</td>
<td>412</td>
</tr>
<tr>
<td>SR 248/946 Intersection Safety Improvements</td>
<td>Lehigh F/U/R/C</td>
<td>1,255</td>
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</tr>
<tr>
<td>SR 248/Walnut Drive Intersection</td>
<td>Lehigh</td>
<td>C</td>
<td>456</td>
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<tr>
<td>Northampton Street Corridor</td>
<td>Easton</td>
<td>C</td>
<td>35</td>
</tr>
<tr>
<td>Rt. 248 Realignment</td>
<td>Bath</td>
<td>C</td>
<td>570</td>
</tr>
<tr>
<td>SR 412 Improvements</td>
<td>Bethlehem City</td>
<td>C</td>
<td>5,000</td>
</tr>
<tr>
<td>SR 512 Resurfacing</td>
<td>Various</td>
<td>C</td>
<td>5,150</td>
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<tr>
<td>Uhler Road (SR 1002) Resurfacing</td>
<td>Forks</td>
<td>C</td>
<td>500</td>
</tr>
<tr>
<td>Rt. 33/Freemansburg Ave. Interchange</td>
<td>Bethlehem Twp.</td>
<td>C</td>
<td>5,758</td>
</tr>
<tr>
<td>Easton Ave. Corridor Improvements</td>
<td>Bethlehem City/Twp. P/F/U/R/C</td>
<td>2,131</td>
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<tr>
<td>Center Street Resurfacing</td>
<td>Bethlehem City</td>
<td>F/U/R/C</td>
<td>2,774</td>
</tr>
<tr>
<td>SR 946 Resurface</td>
<td>Various</td>
<td>C</td>
<td>900</td>
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<tr>
<td>Guide Sign Replacement</td>
<td>N/A</td>
<td>C</td>
<td>1,744</td>
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<tr>
<td>Freeway Service Patrol</td>
<td>N/A</td>
<td>C</td>
<td>3,531</td>
</tr>
<tr>
<td>LVTS Roundabout Study</td>
<td>N/A</td>
<td>C</td>
<td>2,382</td>
</tr>
<tr>
<td>Urban Line Item</td>
<td>N/A</td>
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<td>330</td>
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<tr>
<td>Low Cost Safety Improvements</td>
<td>N/A</td>
<td>C</td>
<td>1,000</td>
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<tr>
<td>Highway Line Item</td>
<td>N/A</td>
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<td>741</td>
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<tr>
<td>Consultant Assistance</td>
<td>N/A</td>
<td>P/C</td>
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<tr>
<td><strong>Subtotal - Highway Element</strong></td>
<td></td>
<td></td>
<td><strong>185,518</strong></td>
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### LEHIGH VALLEY TRANSPORTATION IMPROVEMENT PROGRAM: 2015 - 2018

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Municipality</th>
<th>Phase(s)</th>
<th>Cost ($000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA 29/100 over Indian Cr.</td>
<td>U. Milford</td>
<td>F/U/R/C</td>
<td>3,198</td>
</tr>
<tr>
<td>PA 29/Reading RR Br.</td>
<td>U. Milford</td>
<td>F/U/R/C</td>
<td>4,794</td>
</tr>
<tr>
<td>Wire Mill Bridge</td>
<td>Allentown</td>
<td>P/F/U/R/C</td>
<td>6,277</td>
</tr>
<tr>
<td>Cementon Bridge</td>
<td>Whitehall/Northampton</td>
<td>F/U/R/C</td>
<td>6,136</td>
</tr>
<tr>
<td>Tilghman St. over Lehigh River and RR</td>
<td>Allentown</td>
<td>C</td>
<td>22,145</td>
</tr>
<tr>
<td>Lehigh Street Tri-Bridges</td>
<td>Whitehall</td>
<td>C</td>
<td>125</td>
</tr>
<tr>
<td>Cedar Crest Blvd. over Little Cedar Creek</td>
<td>S. Whitehall</td>
<td>F/U/R/C</td>
<td>5,377</td>
</tr>
<tr>
<td>Cold Springs Bridge</td>
<td>Whitehall</td>
<td>C</td>
<td>50</td>
</tr>
<tr>
<td>E. Station Ave (SR 2026) over trib. To Saucon Cr.</td>
<td>Coopersburg</td>
<td>F/U/R/C</td>
<td>1,699</td>
</tr>
<tr>
<td>Limeport Pike (SR 2029) over trib. To Saucon Cr.</td>
<td>L. Milford</td>
<td>F/U/R/C</td>
<td>1,079</td>
</tr>
<tr>
<td>Eighth Street Bridge</td>
<td>Allentown</td>
<td>C</td>
<td>6,000</td>
</tr>
<tr>
<td>Trout Creek Bridges on Main St., Emerald</td>
<td>Washington (LC)</td>
<td>F/U/R/C</td>
<td>2,803</td>
</tr>
<tr>
<td>Gordon Street Bridge</td>
<td>Allentown</td>
<td>P/C</td>
<td>3,827</td>
</tr>
<tr>
<td>Coplay/Northampton Bridge</td>
<td>Coplay/Northampton</td>
<td>C</td>
<td>16,616</td>
</tr>
<tr>
<td>Walnut St. Bridge</td>
<td>Slatington</td>
<td>P/F/U/R/C</td>
<td>1,784</td>
</tr>
<tr>
<td>SR 248 over Hokendauqua Cr.</td>
<td>Moore</td>
<td>P/F/U/R/C</td>
<td>1,553</td>
</tr>
<tr>
<td>Rt. 611 over Bushkill Creek</td>
<td>Easton</td>
<td>C</td>
<td>35</td>
</tr>
<tr>
<td>Messinger St. Bridge</td>
<td>over Jacoby Cr./S. Race</td>
<td>Bethlehem</td>
<td>C</td>
</tr>
<tr>
<td>High Street Bridge</td>
<td>Bethlehem City</td>
<td>C</td>
<td>1,000</td>
</tr>
<tr>
<td>State St. (SR 1032) over Jacoby Cr./Mill Race</td>
<td>U. Mt. Bethel</td>
<td>F/U/R/C</td>
<td>1,399</td>
</tr>
<tr>
<td>Kromer Road Bridge</td>
<td>Plainfield</td>
<td>C</td>
<td>3,616</td>
</tr>
<tr>
<td>Third St. (SR 2023) over Bushkill Cr.</td>
<td>Easton</td>
<td>F/U/R/C</td>
<td>1,658</td>
</tr>
<tr>
<td>Water St. (SR 3003) over Susquehanna Cr.</td>
<td>Hazleton</td>
<td>C</td>
<td>1,200</td>
</tr>
<tr>
<td>Fahy Bridge Rehabilitation</td>
<td>Easton</td>
<td>C</td>
<td>207</td>
</tr>
<tr>
<td>Bushkill Creek Bridge</td>
<td>Lehigh</td>
<td>C</td>
<td>1,820</td>
</tr>
<tr>
<td>Northampton County Bridge #102</td>
<td>L. Nazareth</td>
<td>C</td>
<td>2,677</td>
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<tr>
<td>High Street Bridge</td>
<td>Bethlehem City</td>
<td>C</td>
<td>1,000</td>
</tr>
<tr>
<td>Lebanon Street Bridge</td>
<td>Bethlehem City</td>
<td>C</td>
<td>1,000</td>
</tr>
<tr>
<td>Ittner Street Bridge</td>
<td>Bethlehem City</td>
<td>C</td>
<td>1,000</td>
</tr>
<tr>
<td>SR 248 over trib. to Irondequoit Br.</td>
<td>Moore</td>
<td>C</td>
<td>1,349</td>
</tr>
<tr>
<td>Lehigh Valley Bridge Management</td>
<td>NA</td>
<td>C</td>
<td>3,720</td>
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<tr>
<td>Bridge Rehabilitation</td>
<td>NA</td>
<td>C</td>
<td>1,000</td>
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<tr>
<td>Bridge Preservation and Repair</td>
<td>NA</td>
<td>C</td>
<td>1,000</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>145,121</strong></td>
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</table>

### LEHIGH VALLEY TRANSPORTATION IMPROVEMENT PROGRAM: 2015 - 2018

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Municipality</th>
<th>Phase(s)</th>
<th>Cost ($000)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subtotal - Bridge Element</strong></td>
<td></td>
<td></td>
<td><strong>140,721</strong></td>
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### TRANSIT ELEMENT

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Cost ($000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Bus Fleet Purchase (24)</td>
<td>15,061</td>
</tr>
<tr>
<td>ADA Paratransit Van Purchase (68)</td>
<td>9,425</td>
</tr>
<tr>
<td>Service Vehicle Replacements (6)</td>
<td>206</td>
</tr>
<tr>
<td>Capital Asset Maintenance</td>
<td>26,195</td>
</tr>
<tr>
<td>Passenger Facilities and Amenities</td>
<td>1,268</td>
</tr>
<tr>
<td>Technology</td>
<td>2,010</td>
</tr>
<tr>
<td>Planning/Program Development</td>
<td>1,900</td>
</tr>
<tr>
<td><strong>Subtotal - Transit Element</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Phase Abbreviations:**
- **S** - Study; **P** - Preliminary Engineering; **F** - Final Design; **U** - Utility; **R** - Right-of-Way; **C** - Construction


### PROJECT LIST

#### Heading 1 - New/Expanded Facilities

- **Line Item 1**: Project 1 - US 22 Widening (Airport Road to 15th Street) $199,455,750.00
- **Line Item 2**: Project 2 - US 22 Widening (15th Street to 309) $500,000,000.00
- **Line Item 3**: Project 3 - 309 Center Valley Interchange $35,170,000.00

#### Heading 2 - Safety Projects

- **Line Item 1**: Project 1 - 222 & Shantz & 863 Improvement $517,150.00
- **Line Item 2**: Project 2 - 309 & Tilghman Interchange Reconstruct $48,922,388.00
- **Line Item 3**: Project 3 - Route 29/100 Corridor Safety Improvements $15,000,000.00
- **Line Item 4**: Low Cost Safety Improvements LVTH High Friction Surface $1,000,000.00
- **Line Item 5**: Project 4 - Corridor/Intersection Projects $64,262,680.00
- **Line Item 6**: Project 5 - Safety Improvement within Lehigh and Northampton County $2,400,000.00
- **Line Item 7**: Project 6 - District Wide Safety Improvement within Lehigh and Northampton County $2,875,000.00

#### Heading 3 - Maintenance Projects

- **Line Item 1**: Project 1 - Resurface US 33 - 101-300 $74,220,560.00
- **Line Item 2**: Project 2 - PA 22 - US 22 $7,617,000.00
- **Line Item 3**: Project 3 - PA 22 - 20 to Monroe $49,158,083.00
- **Line Item 4**: Project 4 - US 22 Resurfacing $4,152,000.00
- **Line Item 5**: Project 5 - Rehabilitation/Restoration $121,984,405.00
- **Line Item 6**: Project 6 - Urban $58,532,000.00
- **Line Item 7**: Project 7 - Repair and Maintenance Wetlands $190,000.00

#### Heading 4 - Bridge Projects

- **Line Item 1**: Replacement Investment within Lehigh and Northampton County $153,951,405.00
- **Line Item 2**: Rapid Replacement Initiative Investment within Lehigh and Northampton County $7,490,000.00
- **Line Item 3**: Rehabilitation Investment within Lehigh and Northampton County $155,162,414.00
- **Line Item 4**: New Bridge Investment within Lehigh and Northampton County $8,780,912.00
- **Line Item 5**: Highway and Bridge Preservation Investment within Lehigh and Northampton County $40,678,792.00
- **Line Item 6**: Construction Assistance Investment within Lehigh and Northampton County $7,750,600.00

#### Heading 5 - Transportation Alternatives/Multimodal

- **Line Item 1**: Transportation Alternatives Investment within Lehigh and Northampton County $3,180,000.00
- **Line Item 2**: Safe Routes To School Program Investment within Lehigh and Northampton County $23,197,000.00
- **Line Item 3**: Transportation Studies Corridor and Access Management Studies $10,000,000.00
- **Line Item 4**: Delivery Consultant Assistance and Transportation Enhancement Investment within Lehigh and Northampton County $20,493,590.00

#### Heading 6 - Mobility Projects/ITS/Congested Corridors

- **Line Item 1**: Traffic System Management Freeway Service Patrol $8,382,492.00
- **Line Item 2**: Intelligent Transportation Systems Deploy ITS Strategies $26,490,000.00
- **Line Item 3**: Signal Improvement Corridor $24,682,750.00

#### Grand Total

$2,500,514,500
<table>
<thead>
<tr>
<th>ID</th>
<th>Project Description</th>
<th>Municipal Location</th>
<th>Project Improvement Description</th>
<th>Mid-Range Element 2019 - 2024</th>
<th>Long Range Element 2027 - 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>US 22 Widening (Airport Road to 15th St)</td>
<td>Hanover Twp./Whitehall Twp./South Whitehall Twp.</td>
<td>Widen Route 22 with one additional lane westbound and one additional lane eastbound from Airport Rd. to 15th Street</td>
<td>X - 2023</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>US 22 Widening (15th St to 309)</td>
<td>South Whitehall Twp.</td>
<td>Widen Route 22 with one additional lane westbound and one additional lane eastbound from 15th Street to Route 309</td>
<td>X - 2033</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>336 Center Valley IC</td>
<td>Upper Saucon Twp.</td>
<td></td>
<td>X - 2023</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>122 &amp; Shantz &amp; 800 Improv</td>
<td>Upper Macungie Twp.</td>
<td></td>
<td>X - 2017</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>209 &amp; Tiffinman IC Recon</td>
<td>South Whitehall Twp.</td>
<td></td>
<td>X - 2018</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Route 22/100 Corridor Safety Improvements</td>
<td>Upper Milford Twp.</td>
<td>Add left turn lanes at the Route 100/Route 22 Intersection. Upgrade signalization at Route 100/Route 22, St. Peters/Shimmers Rd., Route 22/Buckeye Rd., and Route 22/Collbrook Ave/Ramer Rd.</td>
<td>X - 2035</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Resurface US 22, 191-259</td>
<td>Bethlehem Twp./Palmer Twp.</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>PA 53, 178 to US 22</td>
<td>Bethlehem Twp./Lower Saucon Twp.</td>
<td></td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>PA 53, 22 to Monroe</td>
<td>Bethlehem Twp./Rockampton Borough/Frankford Twp./Reynolds Twp./Weston Twp./Wind Gap Borough</td>
<td></td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>13th Street Corridor</td>
<td>City of Easton</td>
<td></td>
<td>X - 2027</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hybrid Propulsion System for LANta Fleet Expansion</td>
<td>Bethlehem Twp./Palmer Twp.</td>
<td>Expand near urban feeder routes with electric hybrid buses</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Chapter 5 - Goals + Policies

1. Hamilton Street - 4th to 6th
2. Chew Street - Ott to 31st
3. Mack Boulevard Resurface
4. US 22 Sec. 400-Ph 2 (LRB)
5. US 22 Widening
6. PA 100 Reconstruction
7. SR 100 Resurface Kernsville Rd-309
8. PA 145-329 Chestnut Intr.
9. 7th St. Multimodal Corridor
10. Hamilton Street - 100 to 15th
11. Route 222 Median Barrier
12. Route 222 & Shantz & Rt 863 Improvement
13. Route 309 Center Valley Interchange
14. Route 309 Settlemier
15. Route 309/Tighe & Martin St Reconstruction
16. Route 309 Resurfacing
17. Tighe & Martin Street Resurface
18. Second Street Extension
19. Schoenersville Road Corridor
20. 15th Street Corridor
21. Lehigh Street Corridor
22. Hamilton Blvd. Resurface
23. New England Avenue
24. Easton Ring Road Conversion to 2-way
25. SR 248/946 Intersection Improvement
26. SR 412 Connector Road
27. SR 249 and Walnut Drive
28. Northampton St. Corridor
29. Route 248 Realignment
30. SR 412 Improvements
31. SR 512-Wind Gap to Blumberg
32. Utter Road (SR 1002) Resurfacing
33. Rt. 33/Freemansburg Ave. Interchange
34. Easton Avenue Corridor Improvements
35. Center Street Resurfacing
36. SR 946 Resurfacing
37. PA 29/100 over Indian Creek
38. PA 29/Reading RR Bridge
39. Wire Mill Bridge
40. Cameron Bridge
41. Teghin St. over Lehigh & RR
42. Lehigh Street Tri-Bridges
43. Cedar Crest Blvd. over Little Cedar Creek
44. Cold Springs Bridge
45. Station Ave (SR 2029) over Trib to Saucon Creek
46. Limeport Pk. (SR 2029) over Trib to Saucon Creek
47. 6th Street Bridge
48. Trout Creek Bridges
49. Gordon Street Bridge
50. Coplay-Northampton Bridge
51. Walnut Street Bridge
52. SR 248 over Hokensauqua Creek
53. PA 611 Bushkill Creek Bridge
54. Messinger Street Bridge
55. State St (SR 1032) over Jacoby Creek/Rill Race
56. Kromer Road Bridge over Rt. 33
57. Third St (SR 2023) over Bushkill Creek
58. Water St (SR 304) over Saucon Creek
59. Fath Bridge Rehabilitation
60. Maple Drive (SR 4029) over Berksch Creek
61. Northampton County Bridge #112
62. High Street Bridge over Conrad - Bethlehem
63. Lynne Avenue Bridge
64. PA 248 over E. Branch Monocacy Creek
65. PA 248 over Hokensauqua Creek
In Pennsylvania, the Pennsylvania Department of Transportation (PennDOT) is responsible for the development of the Interstate Management Program statewide. Projects are selected by PennDOT and provided to the regions for informational purposes.

The draft Interstate Management Transportation Improvement Program (TIP) includes a project in Lehigh County. The project is titled "I-78 PM 2 – Lehigh." This project is a resurfacing and slab stabilization project on I-78 from the Adams Road overpass in Upper Macungie Township to the Lehigh Street Interchange in Allentown. Preliminary design is anticipated to start in 2015, final design in 2016 and construction in 2017. Total project cost for all three phases of work mentioned is $7,901,000.

### FFY 2015 Interstate TIP Highway & Bridge

**Original US DOT Approval Date:** 2014-09-30

**Current Date:** 5/29/15

<table>
<thead>
<tr>
<th>Lehigh</th>
<th>FFY 2015 Interstate TIP</th>
<th>Highway &amp; Bridge</th>
<th>Original US DOT Approval Date: 2014-09-30</th>
<th>Current Date: 5/29/15</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>16M</td>
<td>87646</td>
<td>I-78 PM 2 - Lehigh</td>
<td>P</td>
</tr>
<tr>
<td>78</td>
<td>16M</td>
<td>87646</td>
<td>I-78 PM 2 - Lehigh</td>
<td>F</td>
</tr>
<tr>
<td>78</td>
<td>16M</td>
<td>87646</td>
<td>I-78 PM 2 - Lehigh</td>
<td>C</td>
</tr>
<tr>
<td>78</td>
<td>17M</td>
<td>104147</td>
<td>I-78 Auxiliary Lane-Lehgh</td>
<td>P</td>
</tr>
<tr>
<td>78</td>
<td>17M</td>
<td>104147</td>
<td>I-78 Auxiliary Lane-Lehgh</td>
<td>F</td>
</tr>
<tr>
<td>78</td>
<td>SLB</td>
<td>95667</td>
<td>I-78 Slab Stabilization</td>
<td>C</td>
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</table>

**MPMS #:** 87646

**Municipality:** Upper Macungie (Twp)

**Title:** I-78 PM 2 - Lehigh

**Route:** 78

**Section:** 16M

**A/Q Status:** Exempt

**Improvement Type:** Resurface

**Exempt Code:** Pavement resurfacing and/or rehabilitation

**Est. Let Date:** 10/19/2017

**Actual Let Date:**

**Geographic Limits:** I-78, from SR 3015 (Adams Road) overpass to Exit 57 (Lehigh Street) in Salisbury Township, South Whitehall Township, Lower Macungie Township, Upper Macungie Township and the City of Allentown, Lehigh County

**Narrative:** Highway Resurface and slab stabilization of I-78 from State Route 3015 (Adams Road) overpass to Exit 57 (Lehigh Street) in Salisbury Township, South Whitehall Township, Lower Macungie Township, Upper Macungie Township and the City of Allentown in Lehigh County

**TIP Program Years ($000)**

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>PE</td>
<td>S81</td>
<td>$ 258</td>
<td>$ 0</td>
<td>$ 0</td>
<td>$ 0</td>
<td>$ 0</td>
<td>$ 0</td>
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<tr>
<td>FD</td>
<td>S81</td>
<td>$ 0</td>
<td>$ 265</td>
<td>$ 0</td>
<td>$ 0</td>
<td>$ 0</td>
<td>$ 0</td>
</tr>
<tr>
<td>CON</td>
<td>S81</td>
<td>$ 0</td>
<td>$ 0</td>
<td>$ 3,689</td>
<td>$ 3,689</td>
<td>$ 0</td>
<td>$ 0</td>
</tr>
<tr>
<td>CON</td>
<td>S81</td>
<td>$258</td>
<td>$265</td>
<td>$3,689</td>
<td>$3,689</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>

**Total FY 2015-2018 Cost:** $7,901,000
F. FINANCIAL ANALYSIS

Federal planning regulations require that a transportation plan “include a financial plan that demonstrates the consistency of proposed transportation investments with already available and projected sources of revenue.” Cost and revenue projections reflect existing funding conditions and historic trends. The long range plan should be in accord with projections of future revenues.

The following sections document LVTS metrics for projecting future revenues, calculating future costs and reconciling the plan with projections of future revenues. Before proceeding, a few comments on the uncertainties in this process are in order. The process involves the calculation of costs and revenues over a 25 year period. On the cost side, the estimates are made without the kind of engineering detail that is required for precise cost data. Secondly, costs reflect future rates of inflation that can only be estimated. On the revenue side, estimates are based on projections of future revenues for the motor license fees, registrations, etc. These rates depend on money raised by the state from gas taxes, approximately 80% of such revenues. Likewise, future revenues depend on the kinds of engineering detail that is required for precise cost data. Secondly, costs reflect future rates of inflation that can only be estimated. On the revenue side, estimates are based on projections of future revenues for the motor license fees, registrations, etc. These rates depend on money raised by the state from gas taxes, approximately 80% of such revenues. Likewise, future revenues depend on the kinds of engineering detail that is required for precise cost data. Secondly, costs reflect future rates of inflation that can only be estimated. On the revenue side, estimates are based on projections of future revenues for the

The following table shows projections of future revenues by time period and category. The following table shows projections of future revenues by time period and category.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway</td>
<td>$145,512,000</td>
<td>24%</td>
<td>$151,392,000</td>
<td>25%</td>
<td>$161,512,000</td>
<td>26%</td>
<td>$169,512,000</td>
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<tr>
<td>Bridge</td>
<td>$18,912,000</td>
<td>3%</td>
<td>$20,912,000</td>
<td>3%</td>
<td>$21,912,000</td>
<td>3%</td>
<td>$22,912,000</td>
</tr>
<tr>
<td>Transit</td>
<td>$80,000,000</td>
<td>15%</td>
<td>$85,000,000</td>
<td>15%</td>
<td>$90,000,000</td>
<td>15%</td>
<td>$95,000,000</td>
</tr>
</tbody>
</table>

The distribution of highway and bridge funding is as follows:

Transportation Infrastructure Investment

$25 million annually is reserved for Transportation Infrastructure Investment (formerly economic development) opportunities statewide. Funds are for transportation improvements associated with economic development opportunities. These dollars are allotted at the discretion of the Pennsylvania Secretary of Transportation.

Statewide Transit Flex

An additional $25 million annually is reserved to flex to transit agencies in accordance with agreements reached with the enactment of Pennsylvania Act 3 of 1997.

Statewide Line Items

An average of $40 million per year in federal and state highway and bridge funds is reserved for state and local bridge inspections, environmental resources, DCNR bridges, and other related statewide line items.

Discretionary Funding (Spike)

Twenty percent of the balance of Surface Transportation Program funding is reserved for distribution by the Pennsylvania Secretary of Transportation, in consultation with the State Transportation Commission, to offset the impact of high cost projects or programs that are beyond a region’s allocation. These funds are referred to as “spike funds.”

National Highway Performance Program (NHPP)

Twenty percent of the balance of NHPP funds will be held in a statewide reserve to advance projects on the enhanced NHPP. Funds remaining after the Interstate Management Program drawdown will be distributed to urban and rural areas based upon the region’s share of highway and bridge needs on non-interstate federal aid routes on the enhanced National Highway System (NHS).

Surface Transportation Program Formulas (STP, STN, STF)

Eighty percent of the funds will be distributed among the urban and rural areas based upon those regions’ share of highway and bridge needs on federal aid routes not on the enhanced NHS. The initial 20% is a discretionary funding set-aside.

Bridge Funding Formula (State)

Bridge funding will be allocated to planning regions based on square feet of deck area of structurally deficient bridges and square feet of deck area for all bridges. Federal funding for bridges was not continued in MAP-21, with the exception of dedicated funding for off-system bridges. Federally funded bridge projects now utilize NHPP and STP funds, which is reflective in the advance of bridge factors to the distribution formulas for those categories. A PennDOT priority remains the rehabilitation, replacement and preservation of bridges.

 earmarks

Additional highway funds are available through several “earmarking” processes. If a project receives special allocations (that are part of federal transportation legislation (i.e. “demonstration projects”), those dollars are earmarked to that project until the money is spent or the project is abandoned. Similarly, if money from the Pennsylvania Secretary of Transportation’s discretionary dollars is allocated to a project, the money is considered earmarked to that project until spent or the project is abandoned. Earmarked funds are funds that are over and
above an area’s formula allocation. Only earmarked funds that have already been procured are included in this plan. There are no earmarked dollars assumed in the mid- and long range elements of the plan.

Highway (Capital) Funding (State)

Act 89 mandated 15% of available funds for both highway and bridge programs be held in reserve for highway capital proj- ects. Remaining highway funds will be distributed based upon each region’s share of highway need according to the follow- ing formula: 33% vehicle-miles traveled, 33% lane-miles, 33% poor international roughness index (RI).

Off-System Bridges (SOB)

Funding will be allocated to planning partner regions based on total PennDOT and FHWA-approved Safety Program.

Transit Funding Programs:

1. Operating Program (Section 1513)

The local match requirement is 15% of state funding or 5% growth, whichever is less.

2. New Initiatives Program

The local match is established at 3.33% of state funding.

3. Congestion Mitigation and Air Quality (CMAQ)

The local match is calculated at 5% of state funding or 5% growth, whichever is less.

4. Alternative Energy Capital Investment Program

The local match is calculated at 8% of state funding or 5% growth, whichever is less.

5. Capital Improvement Program

The local match is calculated at 5% of state funding or 5% growth, whichever is less.

6. Asset Improvement Program

The local match is calculated at 5% of state funding or 5% growth, whichever is less.

7. Revenue vehicle hours

8. Revenue vehicle miles

9. Senior passengers

10. Total passengers

11. Revenue vehicle hours

12. Revenue vehicle miles

13. Asset Improvement Program

The distribution of transit funding is as follows:

Transit funding includes federal, state and local dollars. Fed- eral funding assumptions are based upon year 2013 via MAP- 21 and its anticipated successor. Federal revenue assumes no growth. As part of Act 3, a total of $25 million per year in federal highway funding is flexed to transit agencies for their projects. This funding is reserved in the highway financial guidance previously addressed. Federal funding is based on guaranteed authorizations only and includes a mix of urban formula, fixed guideway, new starts and bus project funding.

State funding for transit programs is provided for in Act 44, which established the Public Transportation Trust Fund (PTTF) to fund public transportation programs and projects. Federal transportation funds from the Turnpike, Sales and Use Tax, Public Transportation Assistance Fund (PTAF), Capital Bond Funds, Lottery, transfers from the Motor License Fund that are not restricted to highway purposes, and various fines are included as a capital program in the public transporta- tion legislation, no new funding has been deposited in this program after December 31, 2013.

Alternative Energy Capital Investment Program – This establishes a competitive grant program to imple- ment capital improvements conversion to an alternative energy source.

Programs of Statewide Significance – Programs such as Persons with Disabilities, Welfare to Work, energy source.

Public Transportation Assistance Fund (PTAF), Capital Bond Funds, Lottery, transfers from the Motor License Fund that are not restricted to highway purposes, and various fines are included as a capital program in the public transporta- tion legislation, no new funding has been deposited in this program after December 31, 2013.

Alternative Energy Capital Investment Program – This establishes a competitive grant program to imple- ment capital improvements conversion to an alternative energy source.

Programs of Statewide Significance – Programs such as Persons with Disabilities, Welfare to Work, intercity bus and rail service, as well as technical assis- tance and demonstration projects, are funded using a dedicated portion of PTTF. The State Lottery Law includes as a capital program in the public transporta- tion legislation, no new funding has been deposited in this program after December 31, 2013.

Alternative Energy Capital Investment Program – This establishes a competitive grant program to imple- ment capital improvements conversion to an alternative energy source.

Programs of Statewide Significance – Programs such as Persons with Disabilities, Welfare to Work, intercity bus and rail service, as well as technical assis- tance and demonstration projects, are funded using a dedicated portion of PTTF. The State Lottery Law authorizes the Reduced Fare Shared-Ride Program for Senior Citizens – Shared-Ride Program is a program where the state funds are used to replace 85% of the fare for senior citizens 65 and older on shared-ride, advanced reservation, curb to curb transportation services.

Chapter 5 - Goals + Policies
Revenues for the mid-range and long range years are projected to be $770,258,000 and $1,347,951,500, respectively. These figures are substantially larger than the TIP because they cover 8 years and 14 years, respectively, rather than four years covered by the TIP. Following are the methods used for computing future revenues for the mid- and long range portion of this plan.

Funding assumptions at the federal and state level were supplied by PennDOT. Federal highway and bridge funds are anticipated to remain flat over the life of the plan. While state funding levels reflect expected revenue increases resulting from the passage of Act 89 in November 2013, the full funding potential of Act 89 is accounted for in year 2018, the last year of the short term element. In addition, greater contributions to the State Police each year will not allow for the additional revenues to be available for highways and bridges. Subsequently, post-2018 Act 89 funding was held constant during both the mid- and long range elements of this plan. In addition, State Appropriations 582 and 409 funding is used for highway maintenance activities and is allocated to individual PennDOT County Maintenance Offices under a formula established by the State General Assembly. These funds may serve as matching funds for highway restoration and preservation projects. 582 funds have previously been used in the Lehigh Valley. The percentage of those funds previously utilized to the region’s 582 budget were assumed to remain constant throughout the life of this plan. No 409 funds were used in the region. Funding for highways, bridges and transit for the 2015 program was considered to remain constant throughout the life of this plan and results in $2.5 billion in anticipated revenues through 2040. This was corroborated by a trend line analysis on long range plans dating back to 1994, where the projected trend line also equates to $2.5 billion in anticipated revenues. On the project side, a 3% annual inflation factor was applied to each project cost estimate to reflect “year of expenditure” requirements. In instances where the actual year of construction is unknown, project costs were escalated to the mid-year of the element in which construction falls.
Federal formula transit funds are based on year 2013 via MAP-21 and its anticipated successor, which assumes no federal revenue growth. The contribution assistance from the state general fund was anticipated to grow at the historical rate of inflation. Dedicated funding for planned projects under Act 89 is distributed by formula and is expected to grow at a rate of 4%-6% per year. State capital funding to LANta under Act 89 is discretionary and based on identified needs and is expected to grow at a rate of 4%-6% per year.

**FUTURE COSTS**

Since the update of this plan corresponds with a TIP update, all costs used in the TIP are based on updated current cost estimates for projects listed in the TIP. All costs in the mid- and long range parts of the plan are calculated at a rate of 3% per year compounded. This inflation rate was used to be consistent with year of expenditure rates utilized by PennDOT in the development of their 12-Year Program.

Since it is impossible to predict the year within the mid-range or long range plan elements in which a project will be completed, inflation rates are extended up to the mid-year within the time frame. This calculated to an inflation factor for the mid-range projects of 1.2484 (3% inflation compounded and averaged over 8 year mid-range element), and for long range projects, the inflation factor was 1.7024 (3% inflation compounded and averaged over 14 years long range element). These inflation rates were applied up to the mid-year within the time frame. This calculated to an inflation factor for the mid-range elements of a TIP. The intent is to creatively integrate transportation facilities into their surrounding community and natural environment. Twelve categories of projects are eligible for transportation alternatives funding. These include:

1. Providing for pedestrian and bicycle facilities.
2. Providing for safety and educational activities for pedestrians and bicyclists.
3. Acquisition of scenic easements and scenic or historic sites.
4. Scenic or historic highway programs (including the provision of tourist and welcome centers).
5. Landscaping or other scenic beautification.
6. Historic preservation.
7. Rehabilitation and operation of historic transportation buildings, structures or facilities (including historic railroad facilities and canals).
8. Preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails).
10. Archaeological planning and research.
11. Environmental mitigation of runoff pollution and provision of wildlife.
12. Establishment of transportation museums.

Several transportation programs exist to aid sponsors with improving safety and funding project costs. Some of these programs provide funding external to the Transportation Improvement Program and Long Range Transportation Plan, while others provide assistance in identifying project needs and improvements. Project sponsors are encouraged to utilize these programs to address their safety and financial project needs.

**TRANSPORTATION ALTERNATIVES PROGRAM (TAP)**

The objective of the Transportation Alternatives Program is to fund activities that go beyond the normal or historic elements of a TIP. The intent is to creatively integrate transportation facilities into their surrounding community and natural environment. Twelve categories of projects are eligible for transportation alternatives funding. These include:

1. Providing for pedestrian and bicycle facilities.
2. Providing for safety and educational activities for pedestrians and bicyclists.
3. Acquisition of scenic easements and scenic or historic sites.
4. Scenic or historic highway programs (including the provision of tourist and welcome centers).
5. Landscaping or other scenic beautification.
6. Historic preservation.
7. Rehabilitation and operation of historic transportation buildings, structures or facilities (including historic railroad facilities and canals).
8. Preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails).
10. Archaeological planning and research.
11. Environmental mitigation of runoff pollution and provision of wildlife.
12. Establishment of transportation museums.

**AUTOMATED RED LIGHT ENFORCEMENT (ARLE)**

When motorists ignore a red light indication, either intentionally or unintentionally, the potential for a serious incident occurs to protect pedestrians. These incidents, which are usually right-angle crashes (1-bone crashes), often lead to serious injuries and, in some cases, even fatalities. While it is difficult to have police officers monitor all these locations, it is possible to police these intersections using technology that has been tested and successfully deployed in other states. This technology, which PennDOT refers to as Automated Red Light Enforcement (ARLE), utilizes multiple cameras to capture the license plate number of a vehicle that fails to obey a traffic signal indication. These photographs are then reviewed to validate that the vehicle indeed ran the red light indication, and upon validation, a ticket is mailed to the registered owner of the vehicle. In Pennsylvania, the typical ticket fine is $100, unless a lesser amount is set by a local ordinance. Revenues generated are utilized to fund the following types of improvements:

1. Upgrading, modernization or improvements to traffic control signals already equipped with automated red light enforcement systems or proposed to be equipped with automated red light enforcement systems.
2. Removal of unwarranted traffic control signals.
3. Retiming of existing traffic control signals.
4. Upgrading, modernization or improvements to traffic control signals.
5. The interconnection and coordination of traffic control signals to improve mobility.
6. The installation of a traffic control signal system or the expansion of an existing system to improve mobility.
7. Revisions to traffic control signal operational modes to improve safety or mobility. Examples include conversion to actuated, traffic responsive or traffic adaptive modes of operation.
8. Improvements to traffic control signals or other official traffic control devices to reduce energy consumption. Examples include the conversion of traffic-control signal infrastructure to solar powered.
9. The installation of new or improved detection systems for traffic control signals.
10. Upgrading, modernization or safety improvements to traffic control signals having railroad preemption.
11. Roadway capacity upgrades such as auxiliary turning lanes.
12. Roadway intersection and signing pavement restriping projects that will either increase capacity or improve driver safety.
13. Local Technical Assistance Program (LTAP) Local Safe Roads Communities Program and implementation of recommendations.
14. LTAP Walkable Communities Program and implementation of recommendations.
15. School zone designations through striping, signing or signal improvements.
16. Pedestrian and bicycle safety improvements at signalized intersections, such as countdown timers, easily accessible and smooth responder installations.
17. Pedestrian mobility improvements, particularly projects with a combination of eligible features.
18. Centerline rumble strips.
19. New guiderail or replacement of damaged/substandard guiderail.
20. Transition guiderail for exposed bridge parapet ends.
21. Removal of roadside fixed objects and/or clearing of vegetation for sight distance improvements.
22. Improvements to correct drop-off issues along local roadways.
23. Minor drainage improvements to improve safety.
For more information, visit the PA Vehicle Code at http://www.dot.state.pa.us/Parcels/20Information/Traffic%20Signals%20Portal/FUND.html.

Green Light-Go

Green Light-Go is Pennsylvania’s Municipal Signal Partner Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems. The program was created as a result of Act 84 of the 2011-2012 Legislative Session, as the Green Light—Go Program, and it provides state funds for the operation and maintenance of signal systems.
Chapter 6

Appendix

Traffic drums in the service yard of Traffic Services in Allentown
PUBLIC INVOLVEMENT

Public involvement is a vital component of the transportation planning process. Providing full disclosure of plans and programs, not only during the development phase, but also after the adoption of these plans and programs, allows the general public the opportunity to be involved, comment on and influence the development process. Every person, regardless of race, religion, ethnicity, gender, disability, or socio-economic status should have the opportunity to take part in and influence the transportation planning process. Public participation in the transportation field is emphasized and mandated by Federal Transportation Legislation, the Civil Rights Act, the Americans with Disabilities Act and Environmental Justice considerations. Transportation Legislation, the Civil Rights Act, the Americans with Disabilities Act and Environmental Justice considerations.

Chapter 6 - Appendix

- LVPAC and LANta staff participated in an outreach effort with the following tribes:
  - Onondaga Indian Nation
  - Eastern Shawnee Tribe of Oklahoma
  - Absentee-Shawnee Tribe of Oklahoma
  - Delaware Nation Oklahoma
  - Stockbridge-Muskegon Band of the Mohican Nation
  - Shawnee Tribe
  - Present sent out brief 20 to 30 second public service announcements to the following local radio stations: WABE AM 790, WCBO Cat Country 96.1, WDGY 88.1, WEXA AM 1230, WGPA Sunny 1100, WKAP, WLEV 100.7.
ENVIRONMENTAL JUSTICE (EJ) ANALYSIS

Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, states “Each Federal agency shall make 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 and low-income popu-
lations.”

Environmental justice (EJ) builds on the foundation of Title VI of the Civil Rights Act of 1964, which prohibits discrimi-
nation on the basis of race, color or national origin. In 1997, the Department of Transportation (DOT) issued its Order to Address Environmental Justice in Minority Populations and Low-Income Populations to summarize and expand upon the requirements of Executive Order 12898 on EJ.

EJ contains three main objectives:

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

EJ improves the transportation decision-making process. Its principles, when properly implemented, improve all levels of transportation decision making by:

- Making better transportation decisions that meet the needs of the people;
- Designing transportation facilities that fit more harmoni-
  ously into communities;
- Enhancing the public involvement process, strength-
  ening community-based partnerships, and providing minority and low-income populations with opportunities to learn about and improve the quality and usefulness of transportation in their lives;
- Improving data collection, monitoring and analysis tools that assess the needs of, and analyze the potential impacts on, minority and low-income populations; and
- Partnering with other public and private programs to leverage transportation agency resources to achieve a common vision for communities;
- Avoiding disproportionately high and adverse impacts on minority and low-income populations; and
- Minimizing and/or mitigating unavoidable adverse impacts by identifying concerns early in the planning phase and providing offsetting initiatives and enhancement mea-
  sures to benefit affected communities and neighbor-
hoods.

The analysis described in this chapter relates to the first of the three EJ objectives listed above. Specifically, it looks at whether the projects in LySE’s LRTP have a disproportionate adverse effect on minority and low-income populations.

The accessibility tool for the LySCE regional travel demand model was used for this analysis. For each of the last three LRTP plan years (2020, 2035, and 2040), two accessibility measures were developed at the Traffic Analysis Zone (TAZ) level for both a Base (Existing plus Committed) Scenario and the LRTP (including LRTP projects to be open by the respec-
tive analysis year) Scenario. The two measures are:

- Project of Easton
- Third Street Alliance
- Treatment Trends Inc.
- Turning Point of the Lehigh Valley
- Sent public meeting notices on the draft MoveLV plan to the following organizations to assure good coverage of a cross section of the public:
  - TransBridge Lines, Inc.
  - Ways to Work
  - United Way of the Greater Lehigh Valley
  - Easton Coach Co.
  - Visual Impairment and Blindness Services
  - Lehigh Valley Traffic Club c/o Westgate Global Logistics
  - Lehigh Valley Rail Management
  - South Bethlehem Neighborhood Center
  - Community Action Development Corporation of Allentown/NACPC Allentown Chapter
  - Lehigh County Aging and Adult Services
  - Northampton County Area Agency on Aging
  - EMS Environmental, Inc.
  - Good Shepherd Rehabilitation Services
  - Lehigh Valley Center for Independent Living
  - ShareCare
  - ARC of Lehigh and Northampton Counties, Inc.
  - VIA of the Lehigh Valley, Inc.
  - Accessible Transportation for the Disabled, Inc.
  - American Red Cross of the Greater Lehigh Valley
  - NAACP Easton Chapter
  - NAACP Bethlehem Chapter
  - Northampton County Executive
  - Lehigh County Executive
  - Logistics Transportation
  - Lehigh Valley Black News Network
  - South Whitehall Patch
  - Nazareth Patch
  - Northampton Patch
  - North Whitehall Patch
  - Palmer-Forks Patch
  - Salisbury Patch
  - South Whitehall Patch
  - Upper Macungie Patch
  - Upper Saucon Patch
  - SENT public meeting notices to the various Patch.

Patch.com is an online newspaper that publishes 13 com websites for posting on their respective websites.

- Sent public meeting notices to the various Patch.

- Ensures to benefit affected communities and neighbor-

- The accessibility tool for the LySCE regional travel demand model was used for this analysis. For each of the last three LRTP plan years (2020, 2035, and 2040), two accessibility measures were developed at the Traffic Analysis Zone (TAZ) level for both a Base (Existing plus Committed) Scenario and the LRTP (including LRTP projects to be open by the respec-
tive analysis year) Scenario. The two measures are:
1. Highway Accessibility – the number of jobs within the LVPC region that can be reached from a TAZ by car within 20 minutes of peak period driving time; and
2. Transit Accessibility – the number of jobs within the LVPC region that can be reached from a TAZ by peak period transit service within 40 minutes.

The 473 TAZs in the LVPC region were classified into three groups, based on the number of “degrees of disadvantage” that apply, as follows:

- Zero degree of disadvantage – 296 TAZs fall into this category (see map below).
- One degree of disadvantage – Either the percentage of the TAZ population that are members of disadvantaged minority groups is greater than the regional average percentage OR the percentage of TAZ households that are below the poverty line is greater than the regional average. 107 TAZs fall into this category (see map below).
- Two degrees of disadvantage – The percentage of the TAZ population that are members of disadvantaged minority groups is greater than the regional average percentage AND the percentage of TAZ households that are below the poverty line is greater than the regional average. 70 TAZs fall into this category (see map below).

For each group of TAZs, average values of the accessibility measures (weight-averaged based on TAZ population in households) were computed for each of the last three LRTP plan years for each scenario (Base and LRTP). Region-wide averages were also computed.

Highway accessibility is different, however, between the Base and LRTP scenarios because the LRTP contains a number of regionally significant projects.

The tables below show the highway accessibilities for each analysis year and related statistics. The columns in the tables are as follows:

- DD_EJ: If a number, Number of Degrees of Disadvantage. “ALL” refers to all 473 TAZs in the LVPC region.
- ZONES: Number of zones with the corresponding number of Degrees of Disadvantage.
- NB_HWYACC: The weighted-average number of jobs within the LVPC region that can be reached by car within 20 minutes of peak period driving time in the Base Scenario from the TAZs with a particular number of Degrees of Disadvantage.
- PL_HWYACC: The weighted-average number of jobs within the LVPC region that can be reached by car within 20 minutes of peak period driving time in the LRTP Scenario from the TAZs with a particular number of Degrees of Disadvantage.
- PCT_CHNG_HWY: The percentage change in the averaged highway accessibility measure between the Base and LRTP scenarios.
- STD_ERR_HWY: The standard error of the percent changes in the averaged highway accessibility measure for the TAZs with a particular number of Degrees of Disadvantage.

For the year 2025, the changes in the averaged accessibility measures are slightly negative for TAZs with zero, one and two Degrees of Disadvantage. There is no significant correlation, however, between the amounts of the average changes and the number of Degrees of Disadvantage. For the years 2035 and 2040, all TAZ groups benefit from an increase in average accessibility.

Therefore, based upon these measures, there is no disproportional adverse effect of the LRTP on minority or low-income populations.
## HIGHWAY ACCESSIBILITIES AND RELATED STATISTICS FOR EACH ANALYSIS YEAR

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<th>DD_EJ</th>
<th>ZONES NB_HWYACC</th>
<th>PL_HWYACC</th>
<th>PCT_CHNG_HWY</th>
<th>STD_ERR_HWY</th>
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