

Connections 2040

2016 Update



THE TRANSPORTATION ELEMENT



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Acknowledgements

RESOLUTION NO. 74 OF 2016

On the motion of Commissioner Lehman, seconded by Commissioner Parsons;

WHEREAS, The Board of County Commissioners charged the Lancaster County Planning Commission with developing and implementing the Comprehensive Plan for the County; and

WHEREAS, The Lancaster County Comprehensive Plan currently consists of six functional elements and the Policy Element (*Revisions*) and the Growth Management Element; and

WHEREAS, Lancaster County's Transportation Element is designed to help achieve the goals and strategies in *Balance* and to provide an interconnected, multimodal transportation network that strengthens linkages between transportation planning and land use planning; and

WHEREAS, The Lancaster County Planning Commission staff, guided by the Transportation Technical Advisory Committee, which acted as the Long Range Transportation Plan Update Task Force and with substantial public involvement throughout the process, have prepared the 2016-2040 Long-Range Transportation Plan element (LRTP), entitled *Connections 2040:2016 Update*, of the Lancaster County Comprehensive Plan, as required by both Federal and State legislation; and

WHEREAS, *Connections 2040:2016 Update* identifies significant transportation needs throughout the County and opportunities and improvements to enhance the County's transportation system; and

WHEREAS, *Connections 2040:2016 Update* is consistent with and supports the other elements of the Lancaster County Comprehensive Plan; and

WHEREAS, The Lancaster County Planning Commission made *Connections 2040:2016 Update* available to all segments of the community, sought public comment on the Long Range Transportation Plan from May 1, 2016-May 31, 2016 and, consistent with Federal and State planning requirements and the PA Municipalities Planning Code, held a public meeting on May 19, 2016 and has considered, responded to and incorporated all comments received as appropriate into *Connections 2040: 2016 Update*; and

WHEREAS, The Lancaster County Transportation Coordinating Committee (the county's federally required Metropolitan Planning Organization) adopted *Connections 2040:2016 Update* as the Metropolitan Planning Organization's Long Range Transportation Plan on June 27, 2016; and

WHEREAS, The Lancaster County Planning Commission, at its regular meeting of September 26, 2016, held a public meeting to receive comments on the plan and took formal action to recommend that the Board of County Commissioners adopt *Connections 2040:2016 Update* as an official functional element of the Lancaster County Comprehensive Plan; and

WHEREAS, The Board of County Commissioners in compliance with the PA Municipalities Planning Code held a 45-day public review and comment period on *Connections 2040: 2016 Update* from August 12, 2016-September 25, 2016 to receive comments from Lancaster County and from Planning Commissions, municipalities, and school districts in contiguous counties; and

"continued"



WHEREAS, Lancaster County Planning Commission responded in writing to all comments received during the comment period and provided these comments to the Board of County Commissioners for their review, and held a public hearing today, October 5, 2016, to receive any additional comments on the Long Range Transportation Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF LANCASTER COUNTY, PENNSYLVANIA that the Board hereby adopts *Connections 2040:2016 Update* as a functional element of the Lancaster County Comprehensive Plan.

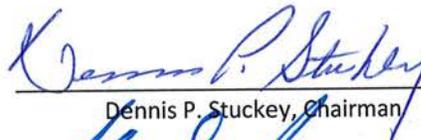
Motion passed unanimously.

ADOPTED this 5th day of October 2016 by the Board of County Commissioners of the County of Lancaster, Pennsylvania in lawful session duly assembled.

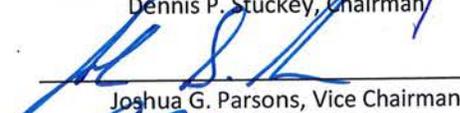
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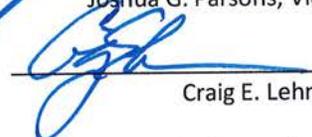
Robert T. Still, Chief Clerk
County of Lancaster, PA
Date: October 5, 2016



Dennis P. Stuckey, Chairman



Joshua G. Parsons, Vice Chairman



Craig E. Lehman

**Board of Commissioners of
Lancaster County, Pennsylvania**

10/05/16

Prepared by

Lancaster County Transportation Coordinating Committee
Transportation Technical Advisory Committee

Lancaster County Board of Commissioners

Dennis P. Stuckey, *Chairman*
Joshua G. Parsons, *Vice-Chairman*
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Lancaster County Transportation Coordinating Committee

Commissioner Dennis P. Stuckey, <i>Chairperson</i> ¹	James Ritzman
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¹ Commissioner Scott F. Martin chaired the LCTCC for many years until completing his term on the Board of Commissioners at the end of 2015. Thanks are extended to him for his leadership of the LCTCC.

Transportation Technical Advisory Committee (TTAC)

Leo Lutz, <i>Chairman, Lancaster County Planning Commission</i>	Ralph Hutchison, <i>Vice Chairman, LIMC</i>
Alice Yoder, <i>Lancaster County Planning Commission</i>	Cindy McCormick, <i>Engineer, City of Lancaster</i>
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	Maureen Westcott, <i>Disabled persons representative</i>
	Representative P. Michael Sturla, <i>Pennsylvania House of Representatives</i>
	Justin Evans, <i>Outer Municipalities</i>

Lancaster County Planning Commission

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² David Royer served as Transportation Director until his retirement in January 2016 and provided guidance to the LRTP Update process.

FUNDING

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Lancaster County Board of Commissioners
and the United States Department of Transportation**

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Chapter 1

Executive Summary

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Long-Range Transportation Plan Background

Why is Lancaster County developing this plan?

The Lancaster County Transportation Coordinating Committee (LCTCC) recognizes the important role it plays in efficiently planning for and meeting the transportation needs of Lancaster County. Decisions must be based on an analysis of trends impacting the county and policies and investment strategies must be designed to help the county achieve its vision and goals. The Long-Range Transportation Plan (LRTP) is a framework for transportation decision-making through the year 2040.

Transportation investments have long-lasting and significant impacts on the development patterns of Lancaster County's communities and the way people choose to travel. Lancaster County seeks to offer its residents and visitors reliable and convenient mobility choices so that walking, biking, riding transit or sharing a ride become logical choices for many trips. Better coordination of transportation and land use planning, can reduce the total number of miles people have to travel. This will have positive impacts on the quality of the air, energy use and preservation of the county's farmlands and natural areas and it will support improved health by encouraging people to use "active transportation" modes. In addition, it will enhance Lancaster County's ability to retain existing and attract new businesses and workers. This LRTP focuses on the transportation system's connection to all of these aspects of life and builds upon the foundation set in the last LRTP, which is why the plan is called

Connections 2040: 2016 Update.

Lancaster County has embraced the concept of "smart transportation" which the county defines as projects that support economic development in Designated Growth Areas and enhance livability by building the infrastructure to enable more trips to be made by alternatives to driving. Smart transportation projects are designed to be context-sensitive and to help the county



leverage private dollars to increase the total amount of funding available for transportation projects. In addition, by measuring projects against sound evaluation criteria, the county can be sure that its funds are advancing transportation projects that provide the greatest benefit to the community.

This smart transportation approach is important because the Lancaster County MPO operates in an environment where funds are limited. Despite the enactment of new transportation legislation at the state and federal levels with added funding for transportation, infrastructure needs continue to exceed the funding available to pay for needed projects. Lancaster County's transportation network includes 1,131 bridges and 3,901 linear miles of roadway – the second largest roadway network in the state. Lancaster County receives approximately \$70 million annually to develop, maintain, and operate its transportation system but some capacity-adding and other desired projects must be deferred to the future or listed as "unfunded" because expected resources are not adequate to construct them. Red Rose Transit Authority (RRTA) is Lancaster County's primary provider of public transportation services. It receives approximately \$12 million annually to provide fixed route service, as well as countywide specialized transportation for human services and medical assistance agencies and for senior citizens. Other modes, including Amtrak passenger rail, rail freight, aviation, and a network of bicycle and pedestrian routes are playing an



increasingly important role in the movement of people and goods in Lancaster County.

In order to address the complex and changing transportation needs of Lancaster County's residents, businesses and visitors and make the best possible use of limited funding, detailed analysis and planning over a long-term horizon is required.

How was the LRTP developed?

The LRTP was developed to be consistent with federal, state, and county laws, policies and priorities:

- The LRTP has been developed in accordance with the Moving Ahead for Progress (MAP-21) and the Fixing America's Surface Transportation (FAST Act) legislation, signed into law in 2012 and 2015, respectively.
- The LRTP is consistent with the federal regulations for metropolitan planning. The LRTP's goals are based in part on the eight federal planning factors. The plan also meets the conformity requirements of the Clean Air Act Amendments (CAAA) of 1990.
- The LRTP is consistent with the 2015 Pennsylvania Long-Range Transportation Plan and the Comprehensive Freight Movement Plan which define a statewide transportation direction and establish transportation priorities for movement of people and goods.

- The LRTP has been developed to be part of the Lancaster County Comprehensive Plan. The Comprehensive Plan is comprised of a Policy Element, a Growth Management Element, and Functional Elements. The LRTP is one of the six functional elements. The LRTP has also been developed to help implement **Balance**, the Growth Management Element.

Who was involved?

Transportation decisions in Lancaster County are guided by a 19-member Transportation Technical Advisory Committee (TTAC). The recommendations made by this committee are then forwarded to the policy-making arm of the Metropolitan Planning Organization (MPO), the Lancaster County Transportation Coordinating Committee (LCTCC). The public and key transportation stakeholders such as the business community are engaged throughout the LRTP development process through a variety of means such as surveys, meetings and a 30-day public review and comment period. After all public comments received within the public comment period have been included and responded to, the MPO votes at its June meeting on approval of the LRTP. The Lancaster County Board of Supervisors is the final body to act on the LRTP by approving it as an element of the Lancaster County Comprehensive Plan.

Trends and Issues

The LRTP presents population demographics, travel data and information about the condition of highways, bridges and other transportation infrastructure in the county. Understanding the trends, current conditions, and future forecasts is essential in planning a balanced and effective transportation system over the next 25 years. The following table highlights the planning implications of various trends.



Table 1: Trends and Issues

<i>Trends and Issues</i>	<i>Implication</i>
<p>Lancaster County continues to be one of the fastest-growing counties in the state</p>	<p>Lancaster County grew by 2.7% between 2010 and 2014 to 533,320. This is a 13.3% increase over the population in 2000. The county is the sixth-most populous county in Pennsylvania. The county is projected to grow to over 600,000 people by 2040. This growth will increase demands for all forms of transportation.</p>
<p>The county's senior population is its fastest-growing age group</p>	<p>Lancaster County's share of seniors increased more than any other age group from 2010–2014 and grew by 2.5 percent to become 20 percent of the total population. The 35–59 age group decreased slightly by about 2 percent. The growing number of seniors has implications for the transportation system in terms of safety and services that may need to be provided.</p>
<p>At 3,901 linear miles, Lancaster County has Pennsylvania's second-largest roadway network</p>	<p>Among Pennsylvania counties, only Allegheny County has more miles of road. Lancaster's total of 3,901 miles is boosted by its large number of local roads, which in 2014 totaled 2,822 linear miles. Farm to market mobility and access is important as Lancaster is one of the nation's leading agricultural counties, with approximately 5,462 farms.</p>
<p>Major indicators from the U.S. Census and PennDOT point to growing demands on the county's roadway network</p>	<p>The rate of workers commuting by single occupant vehicles (SOV) rose by .7 percent from 2010–2014 to 79 percent.</p> <p>93 percent of the county's households own or have access to an automobile.</p> <p>The number of Daily Vehicle Miles of Travel (DVMT) totaled 11.8 million miles in 2014, a 13 percent increase from 2001, with minimal increases in corresponding roadway capacity.</p>
<p>Conditions are best on roads that carry the most traffic</p>	<p>PennDOT data indicate that 83 percent of Lancaster County's roads on the National Highway System (NHS) are in either excellent or good condition, with only 5 percent rated as "poor." While the NHS includes only about 6 percent of county roads, it carries 43 percent of all travel. On lower volume, non-NHS networks, however, 17 percent of the pavement is rated as poor. With Lancaster County's strong agri-business economy, these lower volume roads must be effectively maintained and improved over time.</p>



Table 1: Trends and Issues (cont'd)

<i>Trends and Issues</i>	<i>Implication</i>
<p>Safety data reveals a downward trend in crashes for Lancaster County</p>	<p>Vehicle crashes reached a high of 5,875 in 2007 and have been on a downward trend since then, with a total of 5,339 crashes in 2014, down 9 percent from 2007. This downward trend occurred even though DVMT increased. Crashes as a share of DVMT have decreased from 5.09 for every 100,000 miles of travel in 2007 to 4.53 in 2014.</p>
<p>A greater share of the county’s workers commute outside the county for employment</p>	<p>While approximately 83 percent of the county’s resident workers are employed within their county of residence, an estimated 36,511 now commute outside the county with the largest number commuting to Dauphin County followed by Chester County, York County and Berks County. Median travel time to work has increased modestly, up 6 percent from 2000, to 23 minutes in 2013. Longer commute times translate to more fuel usage, congestion, environmental and air quality issues, as well as lost productivity. To help reduce the cost of travel, some commuters with long commutes have joined carpools and vanpools and employers in Lancaster County are providing various forms of commuter benefits to them.</p>
<p>Bridge needs continue to figure prominently in the county’s project improvement needs</p>	<p>There are 720 state-owned bridges in Lancaster County that are more than 8 feet long. A total of 146 or 20 percent are structurally deficient. Of the 266 locally-owned bridges in the county that are over 20 feet in length, 78 or 29 percent are structurally deficient, a higher percentage than the state-owned bridges. Bridge funding needs will continue to figure prominently as bridges age and replacement needs grow. Lancaster County’s 29 covered bridges, which are important from a tourism and cultural heritage perspective, also require restoration.</p>
<p>Amtrak ridership has increased significantly</p>	<p>Ridership at the three Amtrak stations in Lancaster County—Lancaster Station, Mount Joy Station and Elizabethtown Station—increased by 65 percent from 2005–2014. Ridership totaled 684,522 in 2014 compared to 412,754 in 2005. Improvements to the Keystone Corridor passenger rail service between Philadelphia and Harrisburg and improvements to the train stations in Lancaster County, combined with growing congestion on the roads in the region, explain much of this surge in rail ridership.</p>

Table 1: Trends and Issues (cont'd)

<i>Trends and Issues</i>	<i>Implication</i>
<p>Transit ridership is rising after several years of decline</p>	<p>Red Rose Transit provided 2.2 million passenger trips in FY 2014, an increase from FY 2010 but down from a high of 2.3 million in FY 2005. In 2015, Red Rose Transit Authority joined with Berks County Regional Transit Authority (BARTA) as a new administrative authority which is expected to achieve cost-savings for both transit authorities and may provide the basis in the future for new intercounty bus services.</p>
<p>New opportunities for bicycling and walking are being created</p>	<p>Lancaster residents have expressed in online surveys, through the Bicycle and Pedestrian Advisory Committee and other means, a desire for more bicycle and pedestrian facilities to enable them to walk and bike safely for more trips. Lancaster County and its municipalities have funded new bicycle and sidewalk projects as well as shoulder widenings on certain corridors. The county has also engaged a consultant to update its Bicycle and Pedestrian Plan with a new Active Transportation Plan.</p>
<p>Growth in freight traffic continues to be an issue in the county and the region</p>	<p>Freight movement is not confined to the borders of a single MPO but is a regional issue. In 2013–2014, Lancaster County provided input into development of the Pennsylvania Comprehensive Freight Movement Plan, an element of the 2015 Pennsylvania Long-Range Transportation Plan.</p>

Plan Direction

The Long-Range Transportation Plan sets broad system goals and strategies for Lancaster County, recognizing that the benefits and the costs of today’s transportation investments extend over many years. Long-range problem solving and direction setting must then connect with present decision-making and actions. The following Vision statement was established for **Connections 2040: 2016 Update**.

TRANSPORTATION VISION STATEMENT

“Lancaster County will have a transportation system that meets the needs of the 21st Century. A truly multimodal system will operate to move people and goods safely and efficiently throughout Lancaster County and promote health and wellbeing. The system will support the communities’ goals to balance the needs of a growing community and economy with the goal to protect and preserve the rural and agricultural resource areas. The physical and economic environments of Lancaster County will be supported by a framework of transportation alternatives. Mobility and access will be maximized by a balanced system of roadway networks, transit, rail freight, pedestrian, and bicycle modes.”

The LRTP is guided by five themes, or goals. Each goal, in turn, is supported by a number of strategies. The five goals are:

1. Target transportation investments to support Smart Growth.
2. Maintain and improve the county's multimodal infrastructure.
3. Improve safety and security.
4. Manage and operate the transportation system to reduce congestion.
5. Protect the county's natural and historic assets.

Federal transportation law requires that Performance Measures be an integral part of the transportation planning process. The Pennsylvania Department of Transportation (PennDOT) has developed a number of performance measures that are used by this MPO and others throughout the state to measure progress, or lack of progress, toward reaching goals for safety and the quality of the transportation infrastructure in the county. These performance measures provide critical feedback to policymakers and help guide decisions about future investments.

Selecting Priority LRTP Projects

The “investment strategies” of **Connections 2040: 2016 Update** are exhibited as a list of projects included in the FY 2017–2020 Transportation Improvement Program (TIP). There are 110 highway and bridge projects and “reserve line items” (for programming additional projects in the future) in the four-year TIP. The total value of these projects is \$224,858,425. Total funding for highway and bridge projects over the entire 24-year period of the LRTP (through the year 2040) totals \$1,182,231,000. The FY 2017–2020 transit TIP totals \$50.9 million, an investment of some \$12.5 million annually. Transit investments over the entire life of the LRTP total on the order of \$331 million. The LRTP projects address a number of issues including economic development, safety, mobility, intermodalism, connectivity, congestion mitigation, and quality of life. The entire LRTP project listing is included in **Appendix A**.

How the Plan will be implemented

A plan needs to be implemented in order to produce tangible results. Implementation is the critical stage for turning ideas, goals and direction into action. Implementation represents the culmination of the planning process. The final chapter of **Connections 2040: 2016 Update**, the Implementation Plan, discusses how the various phases of the transportation planning process fit together in an action plan to achieve the Vision and Goals. It presents the trends taking place in the county in recent years and the current condition of the infrastructure. The Implementation Plan discusses the way in which public involvement has been solicited throughout development of the LRTP. Lancaster County residents, businesses and other stakeholders were given an opportunity to provide their opinions through surveys (one written in Spanish to gain input from the Hispanic community), information placed on the LCPC website, special presentations by LCPC staff and a 30-day public comment period on the draft plan and Transportation Improvement Plan (TIP).

Based on the trends and conditions, citizen input and other factors, the TIP was developed, presenting the list of priority projects that will be funded over the first four-years of the LRTP, the next eight years and the remaining outyears. This list of projects must be based on a realistic assessment of funding that will be available.

A number of Performance Measures have been developed by PennDOT and were incorporated into the planning process. These enable Lancaster County planners to determine how well the investments we've made are working and where future investments are needed.

The LRTP represents the long-range vision for an efficient and multimodal transportation system for all of the people and businesses in Lancaster County. This Executive Summary highlights the detailed information contained in the plan to provide the public with an easy to understand summary and to keep all interested parties informed and involved as we plan for Lancaster County's long-term viability.

Chapter 2

Introduction

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Lancaster County is located in southeastern Pennsylvania about 70 miles west of Philadelphia and in close proximity to other major metropolitan areas in the Northeast. The county is approximately 984 square miles in size with a population of 533,320, according to 2014 Census data. The county has 60 municipalities. The City of Lancaster, in the central part of the county, has the largest population. The county has been and remains one of the fastest growing counties in the state. Its population is also diversifying with a growing number of people of Hispanic, Asian and other backgrounds who have moved to Lancaster for work opportunities. Agriculture remains the predominant land use, comprising approximately 70 percent of the county's land area and defines much of the county's identity, heritage and economy. However, manufacturing, health care, education and tourism play a strong role in the county's prosperity, as they have for over 100 years. The Lancaster County Long-Range Transportation Plan (LRTP), **Connections 2040: 2016 Update**, addresses the needs and requirements of the county's transportation system from 2016 through 2040. It includes transportation improvements that support the goals and strategies established in the county comprehensive plan. The LRTP includes near-term projects and mid- to long-range strategies to advance steady progress toward long-range goals for the region's transportation system.

The Long-Range Transportation Plan was developed within the following context:

- Consistency with federal transportation planning and air quality requirements.
- Consistency with "**Pennsylvania On Track**," the State Long-Range Transportation Plan.
- Consistency with the state's Highway Safety Plan.
- Consistency with the Lancaster County Comprehensive Plan and supportive of its Growth Management Element.
- Incorporation of new state and federal requirements for coordinating transportation planning and the National Environmental Policy Act (NEPA).
- Inclusion of new Transportation Performance Measures required by the federal MAP-21 and FAST Act legislation to create an outcome-based transportation plan.
- Consideration of a Congestion Management Process (CMP).
- Attention to input from transportation stakeholders and the public throughout the plan development.
- MPO policies.

Federal Policy Context

This Long-Range Transportation Plan has been developed in accordance with the Moving Ahead for Progress in the 21st Century (MAP-21) and the Fixing America's Surface Transportation Act (FAST Act) legislation and with the Statewide and Metropolitan Transportation Planning Regulations issued by the United States Department of Transportation (USDOT) to implement the legislation. The LRTP is required to be updated every four years in air quality non-attainment areas like Lancaster County

The Lancaster County Transportation Coordinating Committee (LCTCC) is Lancaster County's Metropolitan Planning Organization (MPO) and was designated by the Governor of Pennsylvania to be the county's MPO. It is comprised of elected and appointed officials from the region who represent the varied interests of county residents and businesses. The Lancaster County Planning Commission (LCPC) serves as staff to the MPO. As required by federal law, the MPO undertakes a "continuing, cooperative and comprehensive" transportation planning process that spans a period of at least 20 years. The MPO is responsible for approving the allocation of available funds to projects in a Transportation Improvement Program (TIP), which covers the first four-year period of the LRTP. The MPO is also responsible for approving and maintaining the LRTP. The LRTP must be financially constrained which means that the projects listed on the TIP must be based on a reasonable expectation of transportation revenues that will be available to the county. A full description of financial assumptions,

methodology, and estimates is contained in the Financial Plan section. The LRTP was developed with consideration of the following eight federal planning factors required by law:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety of the transportation system for motorized and non-motorized users.
- Increase the security of the transportation system for motorized and non-motorized users.
- Increase accessibility and mobility of people and freight.
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and consistency between transportation improvements and state and local planned growth and economic development patterns.
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
- Promote efficient system management and operation.
- Emphasize preservation of the existing transportation system.

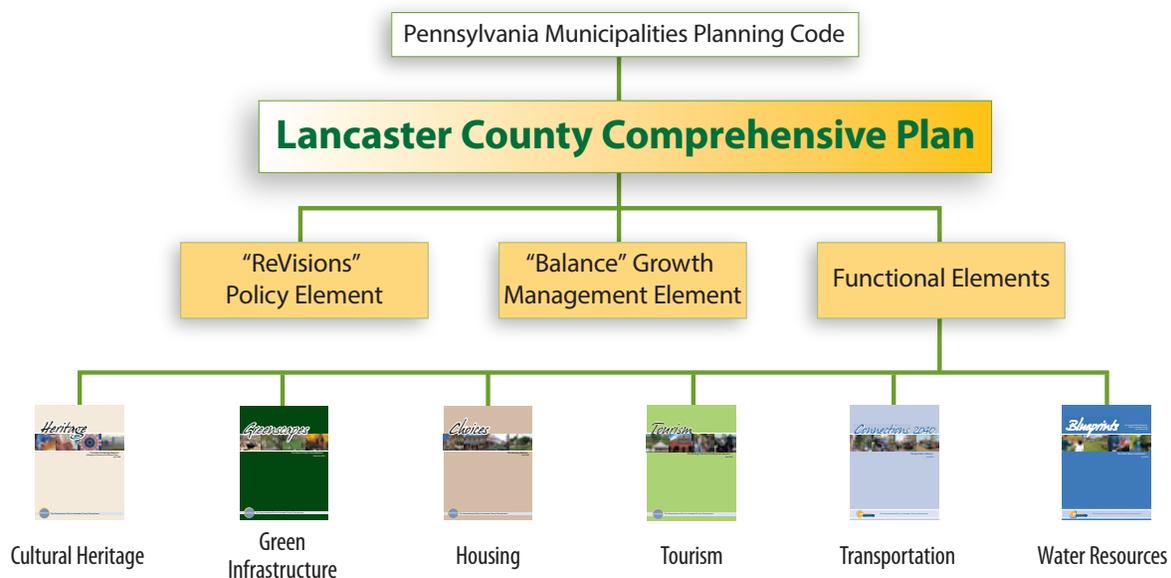
Federal transportation planning regulations also require that the LRTP conform to the requirements of the Clean Air Act Amendments (CAAA) of 1990. The LRTP must not contribute to a decline in the quality of the air in the MPO region.

While not a LRTP requirement by the federal government, MPOs also are strongly encouraged to include livability and smart growth concepts in their LRTP goals, policies and investments. As an indicator of the federal interest in livability and smart growth, in 2010, three federal agencies—Department of Transportation (DOT), Department of Housing and Urban Affairs (HUD) and Environmental Protection Agency (EPA)—established a joint “Sustainable Communities Planning Grant Program” to coordinate investments in housing, transportation and environmental protection to foster greater livability in communities.

State Context

The Pennsylvania Department of Transportation (PennDOT) has developed a statewide Long-Range Transportation Plan, “**PA On Track**” and the **Comprehensive Freight Movement Plan** that define the state’s transportation direction for passenger

Figure 1: Organization Chart for the Lancaster County Comprehensive Plan



and freight mobility and the state's transportation priorities through the year 2040. The state plan has four goal areas:

- Preserve transportation assets through sound asset management practices.
- Improve safety for all modes and all users.
- Increase efficiency through modernization of assets and streamlining of processes.
- Expand and improve system mobility and incorporate modal connections.

As an integral element of the state's transportation system, Lancaster County's LRTP needs to be consistent with these four goals and their supporting objectives and strategies.

County Context

The LRTP must also be consistent with the Lancaster County Comprehensive Plan. The LRTP is one of six functional elements of the county comprehensive plan (**Figure 1**). Other functional elements address housing, water resources, natural areas, and cultural heritage and tourism.

The Lancaster County Comprehensive Plan contains a Vision and Goals that guide the Plan and policies and actions that need to be implemented to achieve the Vision. The Growth Management Plan, called **Balance**, is the leading element of the Comprehensive Plan that guides future land use and development in the county. The functional elements, such as the LRTP, are designed to help accomplish the growth management plan. The plan identifies an Urban Growth Strategy—areas appropriate for urban growth and reinvestment; a Rural Strategy—areas that should be maintained in agriculture, natural resources, and similar uses; and an implementation strategy—tools to shape growth to achieve desired land use patterns.

The third component, the Functional Plans, provide specialized planning documents designed to specifically address issues of concern. These address

topical issues such as open space, housing, cultural resources, or transportation.

This LRTP was specifically targeted to address the transportation needs in relation to the Comprehensive Plan and to support the Growth Management Element.

The LRTP must also be consistent with the policies adopted by the MPO. Policies adopted as of November 2015 include:

- 2006: Policy regarding the procedure for adding an item to the TTAC meeting agenda.
- 2006: Policy related to programming and project delivery of Transportation Enhancements, Home Town Streets and Safe Routes to School Program projects.
- 2008: Policy related to projects where Accessible Pedestrian Signals (APS) should be considered.
- 2013: Complete Streets Policy Statement.

Smart Growth Transportation

Lancaster County established a Smart Growth Transportation (SGT) Program in 2011 to serve as a logical supporting strategy for smart growth development. Smart growth transportation seeks to achieve a balance of mobility, safety, economic, social and environmental elements by providing a mix of uses and facilities for walking, bicycling and transit to create more livable communities. Greater use of these active modes can help improve people's health. The investments promote more efficient use of existing infrastructure and reduce the need to expand roadway infrastructure. Project designs are arrived at in collaboration with the community and designed to be "context-sensitive" to reflect the environmental, cultural and other contexts of the surrounding environment.

Smart growth transportation projects facilitate development within the county's Designated Growth Areas and support smart land use and economic development. They are public projects with the potential to leverage private dollars to create new public-private partnerships that expand the total

pool of investment dollars. They include traffic calming and projects to make walking and bicycling more attractive transportation options.

All transportation projects that seek federal funds and listing on Lancaster County's Transportation Improvement Program (TIP) are evaluated by a set of criteria. Projects that seek funding through the Smart Growth Transportation Program must meet an additional set of criteria. They must meet a set of "core criteria" and then projects that meet these core criteria are advanced to be evaluated against several "weighted" criteria. Another program, the Transportation Alternatives (TA) Program, created under the MAP-21 legislation, and continued under the FAST Act, supports similar types of projects but has different core criteria and evaluation criteria against which projects are rated. The county provided the first round of SGT funding in FY 2013–2014 by allocating \$2 million of federal funding over the two-year period on the TIP for the program. In FY 2017–2018, funding was increased to \$1.5 million per year or \$3 million over the two-year period. The TA program was funded at \$808,000 in FY 2015–2016 with a similar amount expected in FY 2017–2018.

Plan Development

The long-range transportation planning process is all about making the best possible choices. The LRTP is intended to introduce the options before us as a region, and to facilitate a dialogue regarding those choices. This document:

- Presents an overview of the most significant trends and issues affecting transportation in Lancaster County;
- Presents the county's collective transportation vision, goals, and strategies;
- Underscores the need for our transportation decisions to support the county's Growth Management Strategy;

- Presents a financially-constrained plan, consistent with federal transportation regulations;
- Provides a list of projects from the FY 2017–2020 TIP, as well as longer-range projects in later years; and
- Sets the stage for action through an implementation plan.

The LRTP recognizes that there are more candidate projects than resources available to improve and maintain the county's multimodal transportation system. The need for realistic transportation planning becomes even more important in this era of financial constraint.

The LRTP was developed with guidance from the Transportation Technical Advisory Committee. The MPO Policy Committee was provided with reports on the status of the update throughout the process. Broader public participation was obtained through an online survey, participation of Lancaster County residents in a transportation priorities survey conducted by the State Transportation Commission, questions included in the METROQUEST public engagement method used by the county to update the county Comprehensive Plan and through review of the draft plan.

The LRTP is organized into several sections, as follows:

- A profile of the most significant transportation-related trends and issues facing Lancaster County;
- A description of the public participation process;
- Plan directions including the Vision, Goals and Strategies; and
- The Financial Plan and Implementation Plan.

Chapter 3

Transportation Conditions, Trends and Issues

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Overview

Lancaster County continues to be one of the fastest-growing counties in the state. Lancaster County grew by 2.7 percent between 2010 and 2014, from 519,445 in 2010 to 533,320 in 2014. This is the equivalent of .7 percent per year. From 2000 to 2010 the county grew by 10.4 percent or 1 percent per year, a slightly faster rate. The county is the sixth most populous county in Pennsylvania. Lancaster was among the fastest growing counties in the state between 2010 and 2014 ranking fourth in its growth rate among Pennsylvania counties. The county is projected to grow to over 600,000 persons by 2040. This growth will increase demands for all forms of transportation and add to road congestion.

At 3,901 linear miles, Lancaster County has Pennsylvania's second largest roadway network. Among Pennsylvania counties, only Allegheny County has more roadways. Lancaster's total is boosted by its large number of local roads, which in 2014 totaled 2,845 linear miles. The large number of local roads is significant in that the county is one of the nation's leading agricultural counties, with approximately 5,462 farms.

Demands on the county's roadway network are increasing.

- The rate of workers commuting by single occupant vehicles (SOV) rose .7 percent from 2000–2013 to 79.3 percent.
- About 6.5 percent of the county's households (15,658) do not own an automobile and are dependent on public transportation, walking or other means for mobility.
- The number of Daily Vehicle Miles of Travel (DVMT) totaled 11.8 million miles in 2014, up from 10.4 million miles in 2001, a 13 percent increase with minimal increases in new road construction. The vast majority of this mileage is traveled on the state-owned roadway network (9.3 million miles) with local roads carrying 2.5 million miles of travel. If current trends in travel growth continue, DVMT will reach 15.3 million miles in 2040.



Conditions are best on roadways that carry the most traffic. PennDOT asset management data indicate that 83 percent of Lancaster County's National Highway System (NHS) roads are in either "excellent" or "good" condition, with only 5 percent rated as "poor." While the NHS represents only about 6 percent of county roads, it carries 42.8 percent of all travel. On lower volume, non-NHS networks (less than 2,000 ADT) however, 17 percent of the roadways are rated as "poor." With Lancaster County's strong agricultural economy, these lower volume roads are important.

Safety data reveals a downward trend in crashes for Lancaster County. Vehicle crashes reached a high of 5,875 in 2007 and have been on a downward trend since then, with a total of 5,339 crashes in 2014, a 9 percent decrease from 2007. This downward trend occurred even though DVMT increased. Crashes as a percent of DVMT have decreased from 5.09 in 2007 to 4.53 in 2014.

A greater share of the county's workers commute beyond the county for employment than in the past. While approximately 83 percent of the county's resident workers are employed within their county of residence, an estimated 36,511 now commute outside



Lancaster County, with the largest number commuting to Dauphin County. The next highest number commute to Chester County, followed by Berks County. Median travel time to work has increased modestly, up 6 percent since 2000, to 23 minutes in 2013. Increasing commuter times translate to more fuel usage, congestion, environmental and air quality issues, as well as lost productivity. The home-work axis is an important definer of travel.

Bridges continue to be prominent in the county’s project improvement needs. There are 720 state-owned bridges in Lancaster County over 8 feet long. A total of 146 or 20 percent are structurally deficient and will require improvement. Of the 266 locally-owned bridges in the county that are over 20 feet in length, 78 or 29 percent are structurally deficient, 9 percent higher

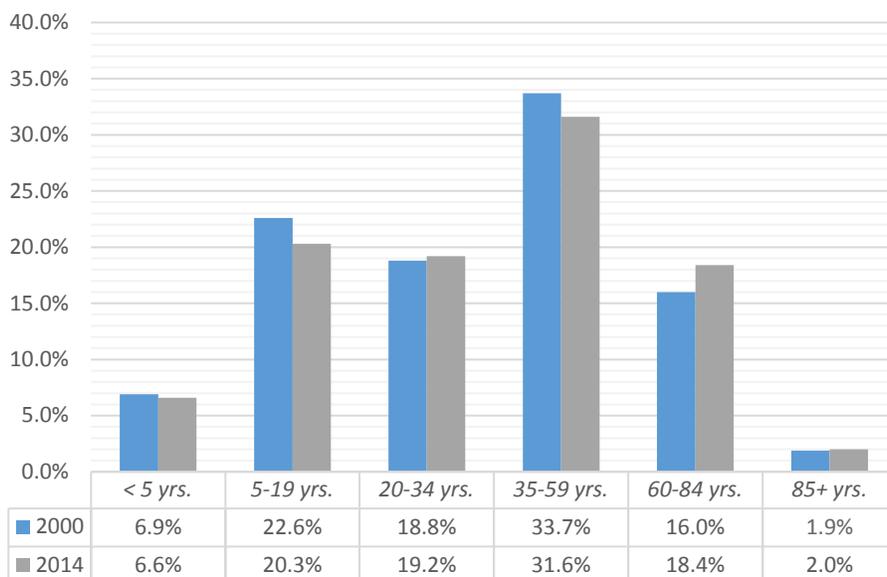
than the state-owned bridges. Bridge funding requirements will continue to increase in the future. Lancaster County’s 29 covered bridges also have improvement requirements.

Passenger rail ridership continues to increase. Ridership at the Lancaster Station, Mount Joy Station and Elizabethtown Station increased by 65 percent between 2005 and 2014. Ridership in the county totaled 684,522 in 2014 compared to 412,724 in 2005. Improvements to the Keystone Corridor passenger rail service between Philadelphia and Harrisburg and to the county’s stations, combined with growing congestion on highways in the region explain much of this surge in rail ridership.

Public transportation ridership is rising after a decline. Red Rose Transit provided 2.2 million passenger trips in FY 2014, a modest increase from FY 2010 but down from a high of 2.3 million in FY 2005.

Investments in bicycle and walking infrastructure are creating more opportunities for citizens to engage in these healthy transportation modes. Lancaster residents have expressed a desire for more bicycle and pedestrian facilities to enable them to walk and bike safely for more of their trips. Lancaster County has responded with implementation

**Figure 2:
Age Group as a Percent
of the Lancaster County
Population,
2000 and 2014**



Source: U.S. Census

Table 2: Change in Population, 2000–2014

	Lancaster County and Pennsylvania			
	2000	2010	2014	% Change
Lancaster County	470,658	519,445	533,320	13.3%
Pennsylvania	12,281,054	12,702,379	12,787,209	4.1%

Source: 2010 U.S. Census

of a Smart Growth Transportation Program, through the Transportation Alternatives Program and by funding multi-use trail, shoulder-widening and streetscape projects on the TIP. The county has embarked on an update of its Bicycle and Pedestrian Plan to plan for improvements on a countywide level of facilities to encourage these modes.

Growth in Freight Traffic continues to be an issue in the county and the region. In 2013–2014, Lancaster County provided input into development of the Pennsylvania Comprehensive Freight Movement Plan, an element of the update of the statewide 2015 Long-Range Transportation Plan.

Lancaster County's Population and Its Implications for Transportation Infrastructure and Services

Lancaster County's population is growing. The county ranks among the fastest-growing counties in Pennsylvania. The population is becoming more diverse, with people of various ethnic and economic backgrounds moving to Lancaster to live and work. Like much of the rest of the country, Lancaster County's population is also aging which requires attention to alternatives to driving such as improved transit services, pedestrian facilities and shared ride services. Freight traffic is also growing and carrying heavier loads which places additional demands on roads and bridges.

All of these factors directly impact the need for new or improved transportation services and facilities to ensure mobility for all population groups and road users. Finally, there are environmental and social considerations such as meeting federal air quality mandates and the desire

for more livable communities that impact the types of transportation projects that the county funds.

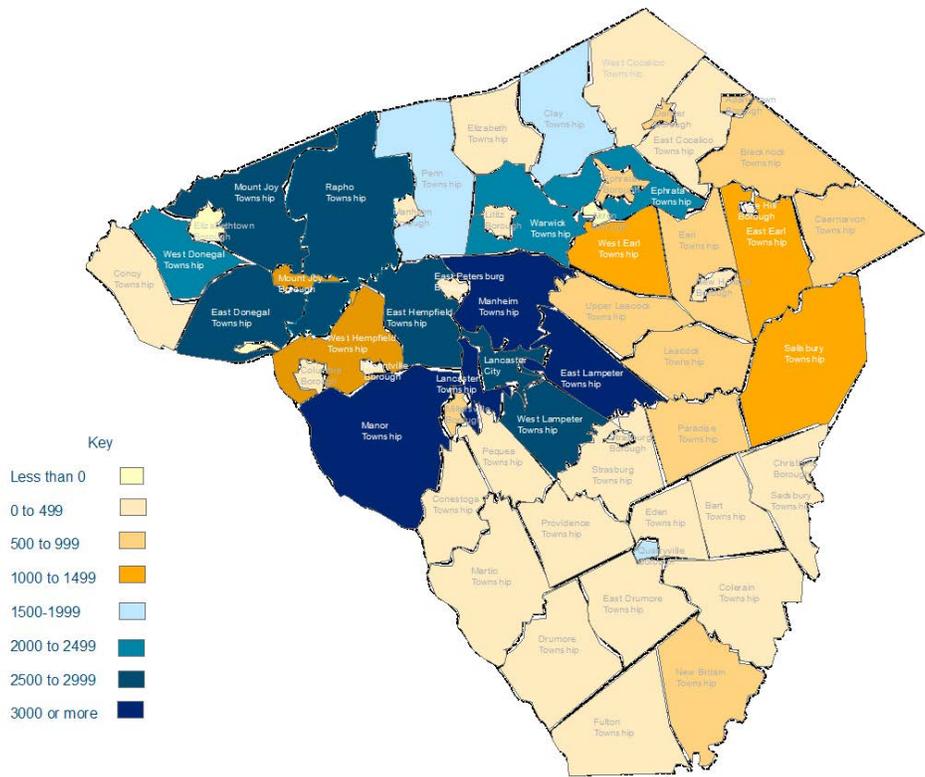
Population Change

Lancaster County's population reached 533,320 in 2014, a 13.3 percent increase from its level in 2000, according to U.S. Census data. Lancaster County maintained its position as Pennsylvania's sixth most populous county and continued to be one of the fastest growing counties (4th out of 67 counties) in the state between 2010 and 2014. Municipalities located in the northern and northwestern parts of the county experienced the highest rates (percentages) of population increase while municipalities in the south central and eastern parts of the county tended to experience lower rates of increase. Increases in some of the municipalities that experienced large percentage gains may be due to the fact that they had smaller numbers of people in the year 2000 and, therefore, smaller numeric gains translate into larger percentage increases than in municipalities that had larger populations in 2000.

Figure 2 provides more data on the county's population growth trends between 2000 and 2014. **Table 2** shows population gains from 2000–2014.

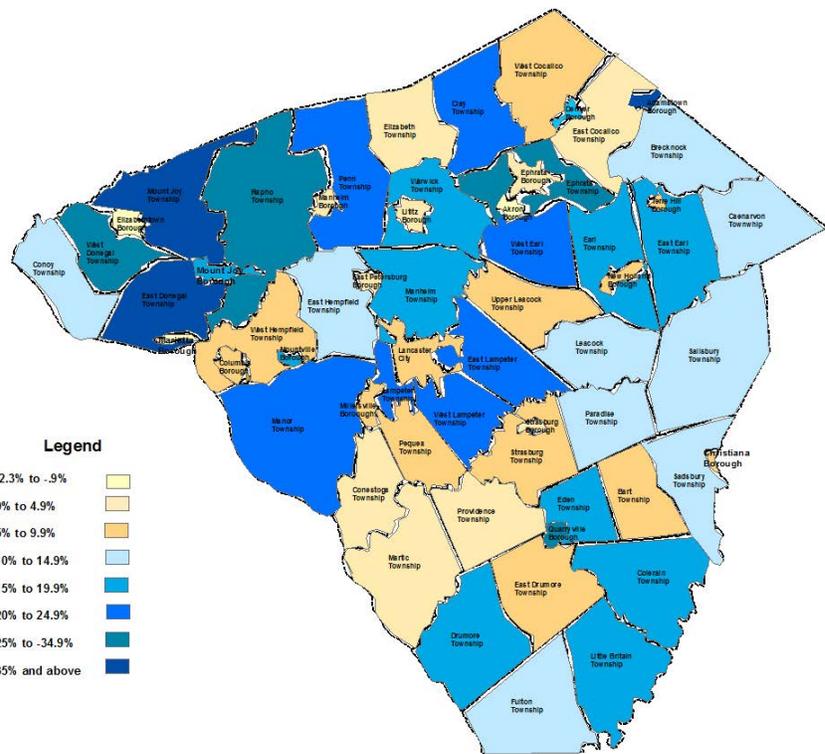
Figure 3 shows the increase in the number of people from 2000 to 2014 by municipality. The largest gains in actual numbers of people were in the central and northwestern municipalities including the City of Lancaster, East Lampeter Township, Manheim Township, Rapho Township, Mount Joy Township, East Donegal Township and Martic Township. **Figure 4** shows the percentage increase in population by municipality. While the central and northwestern municipalities also gained the largest percentage increases, some rural municipalities in the southern and eastern parts of the county experienced strong percentage gains due

Figure 3:
Lancaster County
Population Change
(Number of People),
2000 to 2014



Source: U.S. Census

Figure 4:
Lancaster County
Population Change,
2000 to 2014



Source: U.S. Census

Table 3: Population Composition by Age (in percent), 2014
Lancaster County and Pennsylvania

	<5 Yrs.	5-19 Yrs.	20-34 Yrs.	35-59 Yrs.	60-84 Yrs.	85+ Yrs.
Lancaster County	6.6%	20.3%	19.2%	31.6%	18.4%	2.0%
Pennsylvania	5.6%	18.3%	19.6%	33.4%	20.5%	2.6%

Source: 2010 U.S. Census

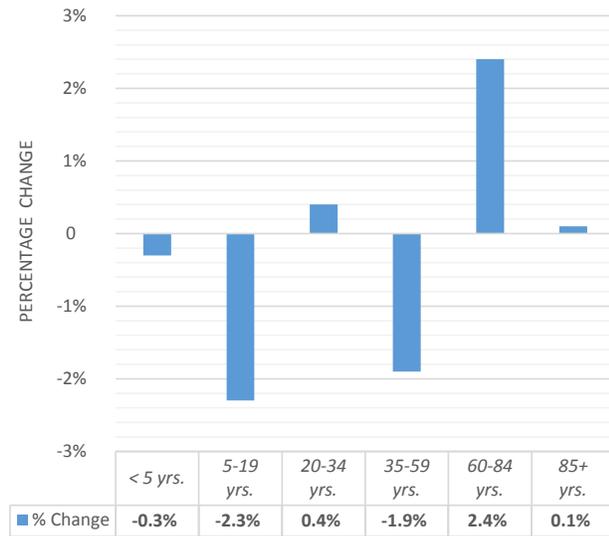
to their small base population in 2000, such as Earl Township, East Earl Township, Eden Township, Little Britain Township, Colerain Township and Quarryville Borough.

Age of the Population

The composition of Lancaster County's population closely approximates that of Pennsylvania. The county added 13,875 people between 2010 and 2013 and 62,662 since 2000. The composition of the population shows an aging trend with a modest decline in the

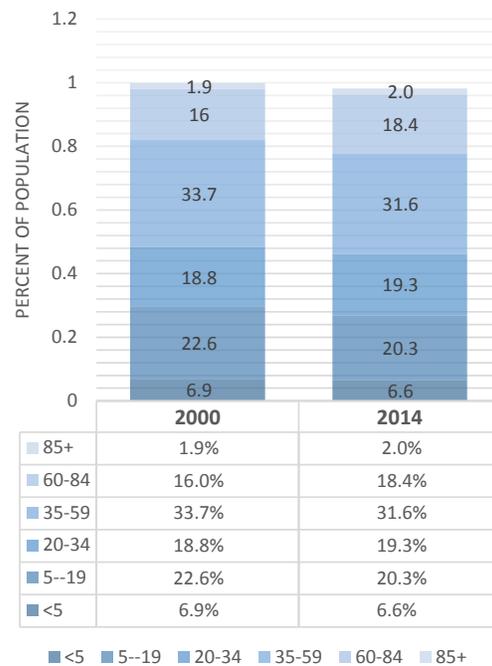


**Figure 5:
Change in Percent of
Population by Age Group,
2000 to 2014**



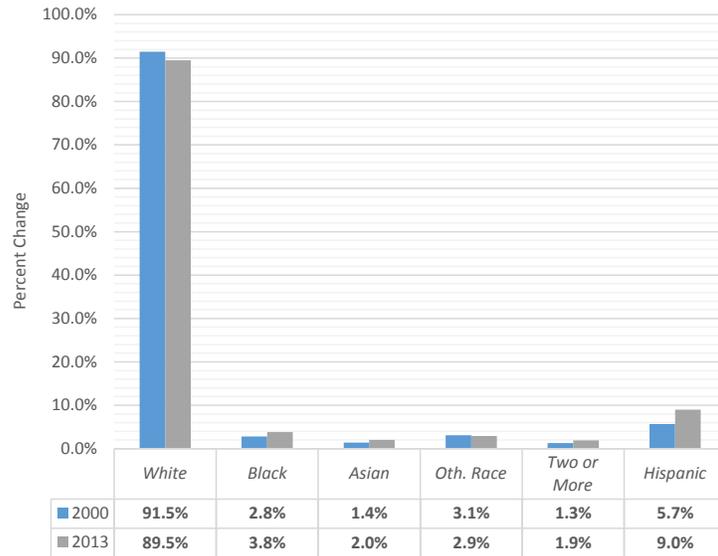
Source: U.S. Census

**Figure 6:
Age Groups as a Percent
of the Lancaster County
Population,
2000 and 2014**



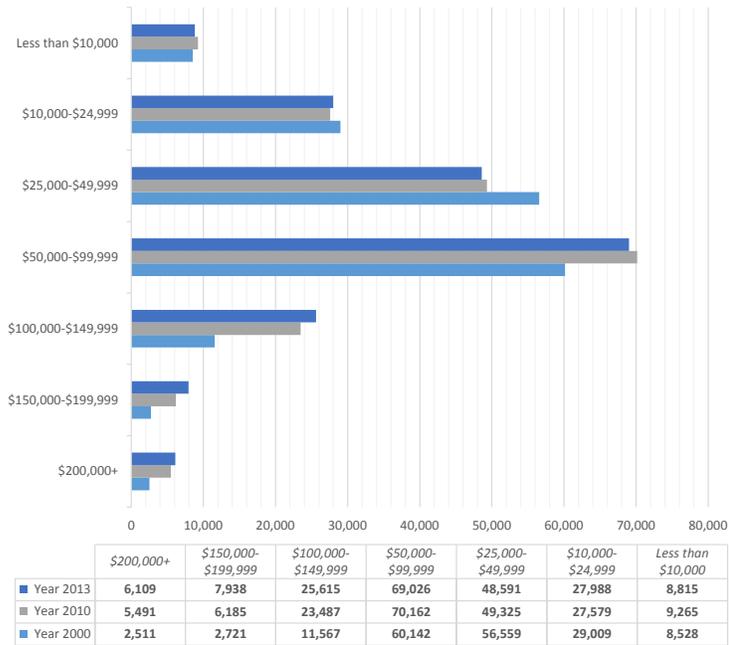
Source: 2010 U.S. Census

**Figure 7:
Change in Ethnic
Composition of Lancaster
County, 2000 to 2013**



Source: U.S. Census

**Figure 8:
Lancaster County
Household Income,
2000, 2010 and 2013**



Source: U.S. Census

Table 4: Population Composition by Race and Ethnicity in Lancaster County (in percent), 2013

	White Alone	Black Alone	Asian Alone	Some Other Race Alone	Two or More Races	Hispanic or Latino Ethnicity
Lancaster County	89.5 %	3.8%	2.0%	2.9%	1.9%	9.0%
Pennsylvania	82.2 %	10.9%	2.9%	2.4%	1.9%	5.9%

Source: U.S. Census

Table 5: Change in Lancaster County Median Household Incomes, 2013

	<i>Household</i>	<i>Percent Change 2000–2013</i>	<i>Family</i>	<i>Percent Change 2000–2013</i>	<i>Non-Family</i>	<i>Percent Change 2000–2013</i>
Lancaster County	\$56,483	24.1%	\$67,646	28.8%	\$31,147	19.0%
Pennsylvania	\$52,548	31.0%	\$66,646	35.5%	NA	NA

Source: U.S. Census, 2010–2014 American Community Survey

percent of working age people aged 35–59 but a slight increase in persons’ ages 20–34 years. The percent of the population represented by senior citizens increased. Lancaster’s share of young people (below age 20) in 2014 was 26.9 percent which is higher than the state share of 23.9 percent. The county’s share of senior population (age 60 and above) in 2014 was 20.4 percent, below the state’s 23.1 percent.

The median age of Lancaster’s population in 2014 was 38.2 years old compared to the statewide median age of 40.3 and up from 36.1 in 2000 in Lancaster County. As Lancaster County develops plans for the next 30 years, it will need to consider the growing demands placed on the transportation system by an increasing population and the fact that the population is aging.

Table 3, Figure 5 and **Figure 6** provide more detail on these important transportation planning indicators.

Ethnic Composition of the Population

The county’s ethnic composition remained relatively unchanged between 2010 and 2013 but has shown some increases in the ethnic population since 2000, with the Hispanic population having increased at the fastest rate. Lancaster County’s population was 89.5 percent White in 2013 compared to 91.5 percent in 2000. The Black population totaled just under 4 percent and the Asian population was 2 percent. The Hispanic population was 9 percent of the total county population, an increase from 5.7 percent in 2000. Estimates of the Amish population in Lancaster County area about 30,000, up from 25,000 in the year 2000. Since the Amish are a religious group, they are not counted in the U.S. Census and estimates are arrived at by other means.

Economic Levels of the Population

In 2013, the median household income in Lancaster County was \$56,483, up from \$54,765 in 2010 and \$45,507 in 2000. The number of middle income households (incomes \$50,000–\$99,999) has remained relatively stable over the past 13 years: in 2013, 35.6 percent of households were in this income level compared to 34.4 percent in 2000. The number of households with higher income levels has been growing. In 2013, there were 25,615 households or 13.2 percent of the households with incomes of \$100,000–\$149,000, up from 11,567 or 6.7 percent in 2000. The number and percent of households with incomes over \$150,000 also increased. These trends are shown in **Figure 8**. On the other end of the economic spectrum, 7.3 percent of families in Lancaster County were living below the poverty level in 2013, down from 7.8 percent in 2000. **Figure 8** shows the change in percentage of Lancaster County households by income level from 2000 to 2013. The change in median incomes of county families and non-family groups compared with Pennsylvania is shown in **Table 5**.

FHWA policy requires that specific transportation projects be assessed as to their benefits and burdens on all population groups including environmental justice populations such as minority or low income groups. A project programmed for construction (or advanced environmental study) must consider all populations affected by each discrete project, regardless of municipal averages.

Special Needs Groups

The percent of older adults in the county (those 60 years or older) made up 21 percent of the population

Table 6: Lancaster Resident Workers by Place of Work

<i>Work Location</i>	<i>Number of Workers</i>
Work in State of Residence	240,794
Work in Lancaster County	204,463
Work outside Lancaster County	36,511
Work in a state other than Pennsylvania	4,166
TOTAL	245,040

Source: U.S. Census

in 2013. This has been the fastest growing population group, as shown in **Figure 2** and this trend is expected to continue. Senior citizens may have special transportation needs due to physical limitations and hearing and sight disabilities associated with aging which can be addressed through dial-a-ride bus service, longer pedestrian crossing signal times at intersections with heavy pedestrian traffic and other measures. There are 55,687 persons with some type of disability in Lancaster County, according to the 2010 U.S. Census or 10.5 percent of the county population. In the 18–64 age group, 8 percent of the age group has a disability with the most common being a cognitive disability followed by an ambulatory disability. In the population 65 and over, just under one-third have some type of disability.

Commute to Work

Travel Time to Work

As more people have moved to Lancaster County, the average commute time for county workers has increased but remains below the state average. In 2013, the average commute time was 23 minutes, up from 22.2 in 2010 and 21.7 in 2000, a 6 percent increase since 2000. However, about half of all workers continue to enjoy a commute of less than 20 minutes. About 5.5 percent of the county’s workers require an hour or more to get to work, nearly 3 percent less than the state rate. These individuals with long commutes remain a small percent of the Lancaster County workforce.

Table 7 and **Figure 9** provide more detail on these commute trends.

Where People Work

Lancaster County has one of Pennsylvania’s highest rates of workers employed within their county of residence: 83 percent. Of those who work outside Lancaster County, 15 percent work in another Pennsylvania county and just under 2 percent work outside the state. In 2013, 40,677 Lancaster residents worked outside the county. Of these, 36,511 worked in another county and 4,166 worked outside the state. **Table 6** shows the number of Lancaster County workers by their place of employment. **Figures 10, 11** and **12** show commuter work flows to some of the major employment centers in the county and work flows to Harrisburg and Philadelphia, two major employment centers outside the county.

How People Commute

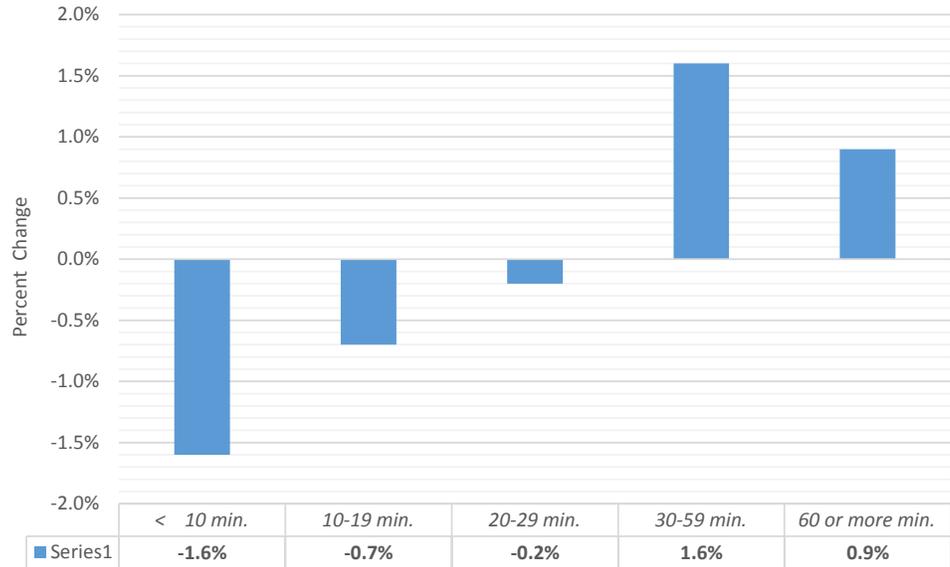
A majority (88.3 percent) of Lancaster County workers rely on the private automobile to commute to work. The vast majority, 79.3 percent, are people driving alone. This percent has not moderated and, in fact, has increased slightly since 2000. The other 9 percent of auto commuters travel by carpool or vanpool. This percent has declined slightly since 2000 when 10.2 percent shared a ride. A total of 3.7 percent of workers walk to work, a decline from 4.4 percent in 2000. Taken together, however, these alternative modes account for 20.5 percent of all commuters. Not surprisingly, the City of Lancaster with its density of residences and businesses and interconnected network of sidewalks has the highest percentage of persons who walk to work.

**Table 7: Percent of Commuters by Travel Time to Work (in minutes), 2013
Lancaster County**

	Total Commuters	<10	10-19	20-29	30-59	60+
Lancaster County	245,040	16.2	34.3	22.5	21.5	5.5
Pennsylvania	5,794,492	14.0	29.2	20.7	27.6	8.4

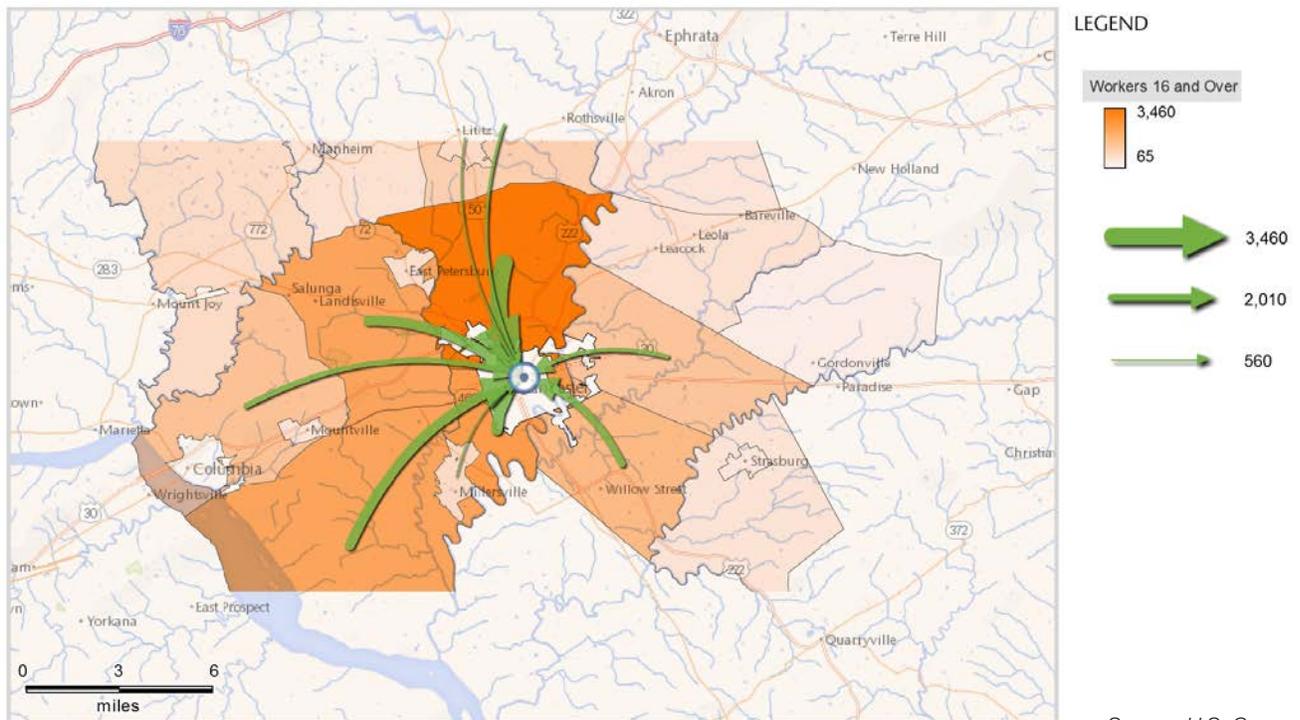
Source: U.S. Census

**Figure 9:
Change in Travel Time
to Work, Lancaster
County
2000-2013**



Source: U.S. Census

Figure 10: Population Living in Non-Rural Municipalities and Working in the City of Lancaster



Source: U.S. Census

Figure 11: Population Living in Lancaster and Working in Philadelphia

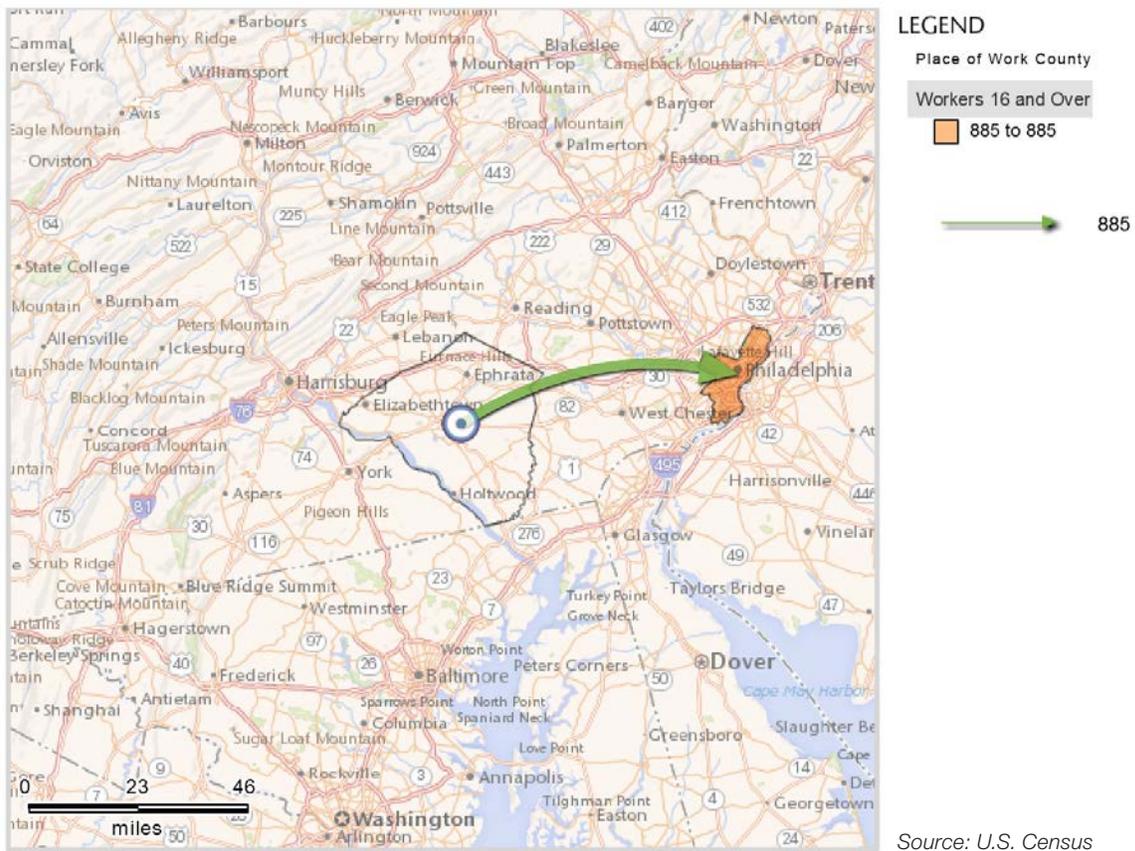
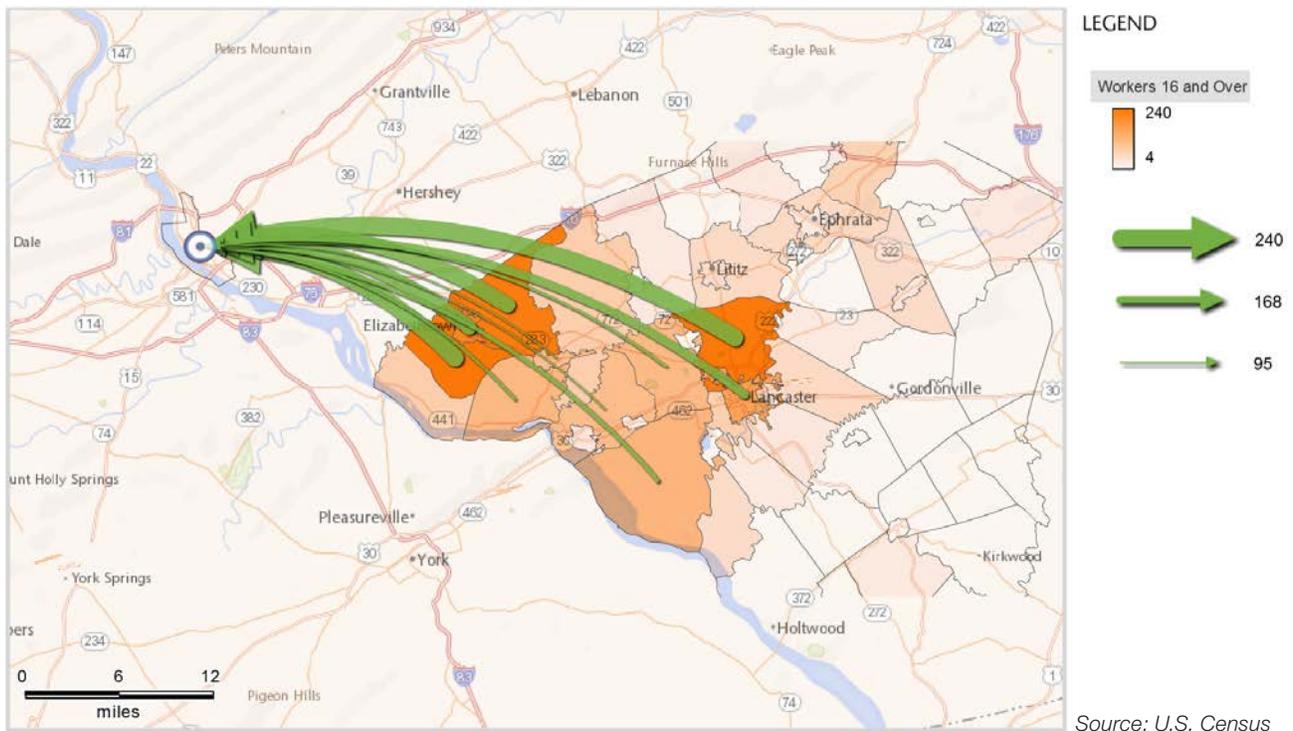


Figure 12: Population Living in Lancaster County and Working in Harrisburg

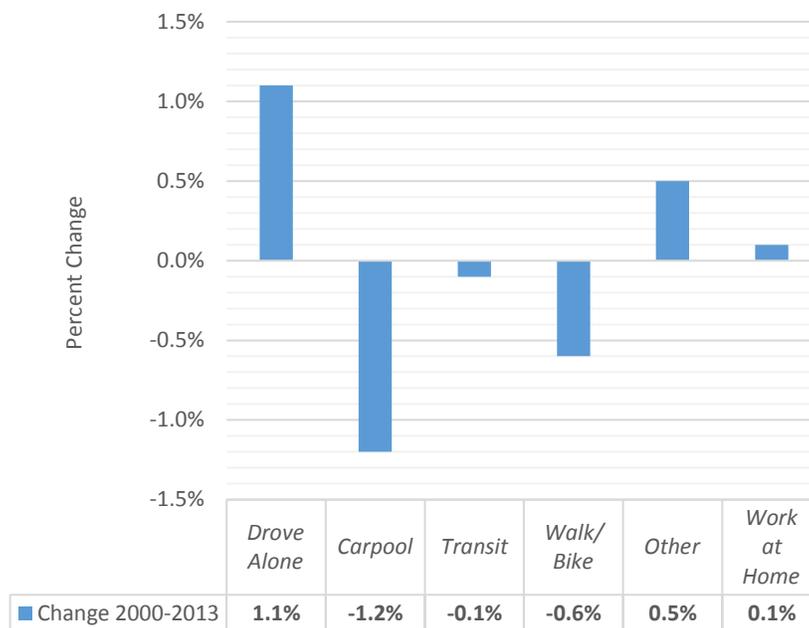


**Table 8: Mode to Work Split (in percent), 2013
Lancaster County**

	<i>Number of Workers</i>	<i>SOV</i>	<i>Carpool</i>	<i>Public Trans.</i>	<i>Walk</i>	<i>Other</i>	<i>Work at Home</i>
Lancaster County	247,777	79.3%	9.0%	1.1%	3.7%	1.9%	4.8%
Pennsylvania	5,794,492	76.7%	8.1%	5.4%	3.9%	1.9%	3.8%

Source: U.S. Census

**Figure 13:
Change in Commute
Mode, Lancaster
County
2000–2013**



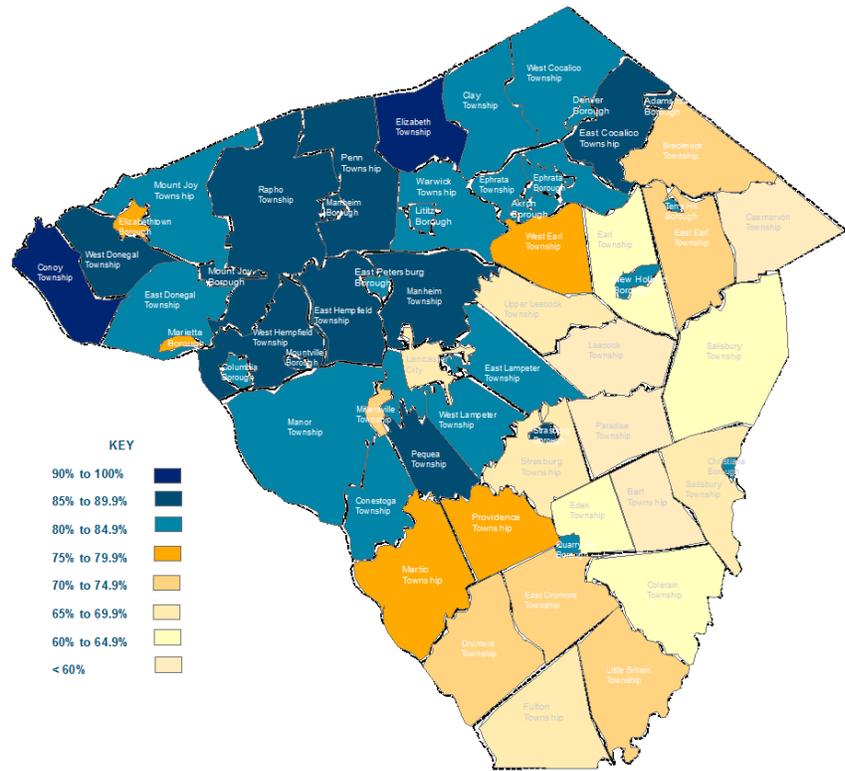
Source: U.S. Census

The share of workers using public transportation was 1.1 percent, a decline from 1.4 percent in 2000 and significantly below the state average of 5.4 percent. The availability of transit and other alternatives to driving is important because 15,683 individuals or 6.4 percent of Lancaster County workers do not own a car and another 16 percent or 39,206 live in households with only one car. Since, in many households, both adults work and one or more children may need a car to get to school or work, public transportation, carpools and good sidewalks are critical for economic independence as well as mobility.

Table 8 shows how Lancaster County commuter choices compare to the state. **Figure 13** shows how

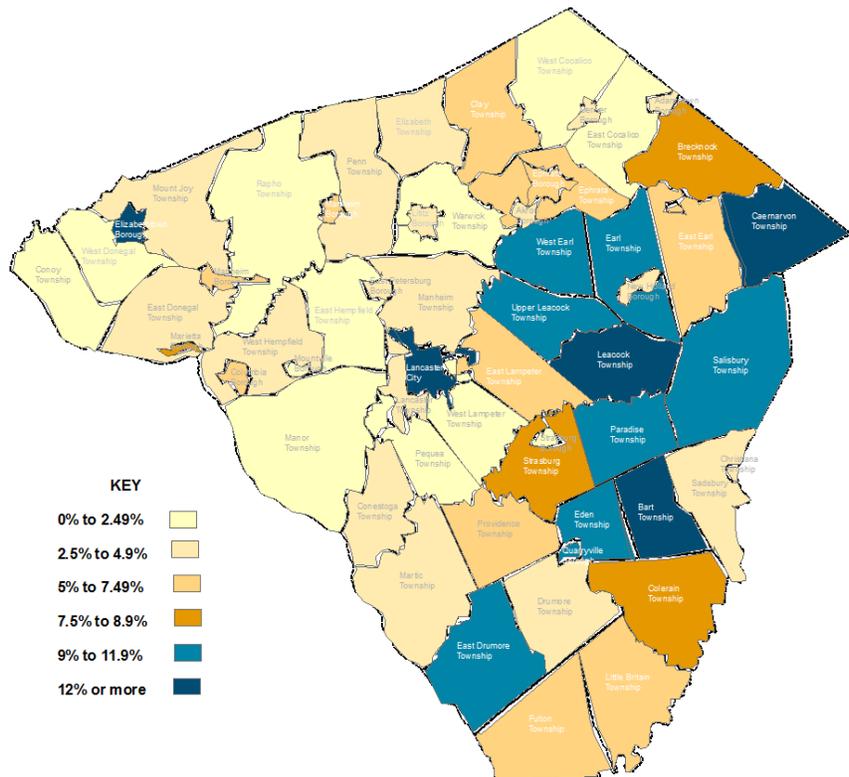
commute modes changed between 2000 and 2013. **Figure 14** shows the percentage of single occupant auto commuters by municipality. Municipalities in the north, northwestern and west central parts of the county have the highest number of single occupant auto commuters (shown in shades of blue, with darkest blue the highest percent) while the rural municipalities in the eastern and southern parts of the county have lower percentages of single occupant auto commuters. The large number of farmers, many of whom are Amish or Mennonite, help explain these lower percentages. **Figure 15** shows the percent of commuters who walk, bicycle or use a motorcycle to get to work. The eastern and east central municipalities and the City of Lancaster and Elizabethtown Borough have the

Figure 14:
Means of Commute to Work
by Municipality, Lancaster
County:
% Single Occupant Auto



Source: U.S. Census

Figure 15:
Means of Commute to Work
by Municipality, Lancaster
County, 2013:
Percent Who Bike, Walk, or
Motorcycle



Source: U.S. Census



highest percentages of people who use these alternative modes to commute (shown in shades of blue on the map). Municipalities in the northern, northwest and west central parts of the county have lower, and in many cases, significantly lower, rates of people using these alternate modes (shown in yellow and tan).

Lancaster County’s efforts to encourage workers to use alternatives to solo driving are assisted by the county’s participation in Commuter Services of Pennsylvania. This organization works with local businesses to help them establish carpool and vanpool programs, subsidized transit passes and other employee commute programs. Over 40 employers in Lancaster County participate in the program.

Roadway Network

Lancaster County has one of the largest roadway networks in Pennsylvania. It ranks second—behind

only Allegheny County—in total linear miles of road, with 3,901 miles. Its local roadway network also ranks second in the state, with 2,822 linear miles. Of all the county’s roads, 687 miles are on the federal aid system. This includes 114 miles of locally-owned roads. In addition to state and local roads, the county also includes nearly 31 miles of the Pennsylvania Turnpike. **Appendix B Map 2** shows the roadway functional classification for Lancaster County.

Table 9 shows the county’s linear roadway mileage by jurisdiction.

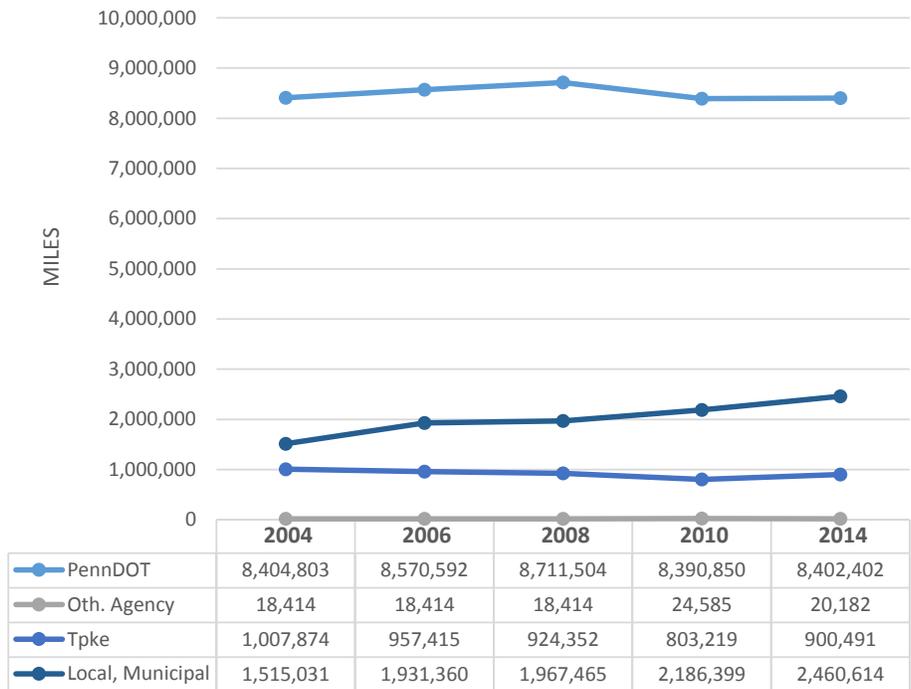
Table 10 shows historical vehicle miles of travel on Lancaster County roads between 2004 and 2014. State-owned roads, including the Pennsylvania Turnpike, carry 79 percent of all travel. DVMT on PennDOT-owned roads declined .3 percent and turnpike travel dropped by 11.0 percent. DVMT on

**Table 9: Roadway Mileage by Jurisdiction, 2014
Lancaster County**

	<i>PennDOT Linear Miles</i>	<i>Other Agencies’ Linear Miles</i>	<i>Turnpike Linear Miles</i>	<i>Local Municipal Linear Miles</i>	<i>Total Linear Miles</i>
Lancaster County	1,040.0	7.9	30.6	2,822.3	3,900.9
Pennsylvania	39,770.2	1,579.2	554.4	78,119.8	120,038.6

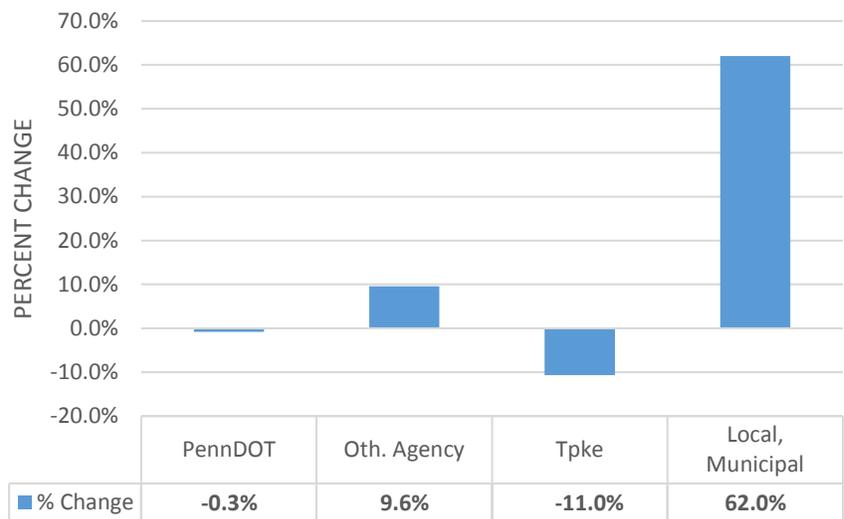
Source: PennDOT Bureau of Planning and Research

Figure 16:
Growth in DVMT by
Jurisdiction, Lancaster County
2004–2014



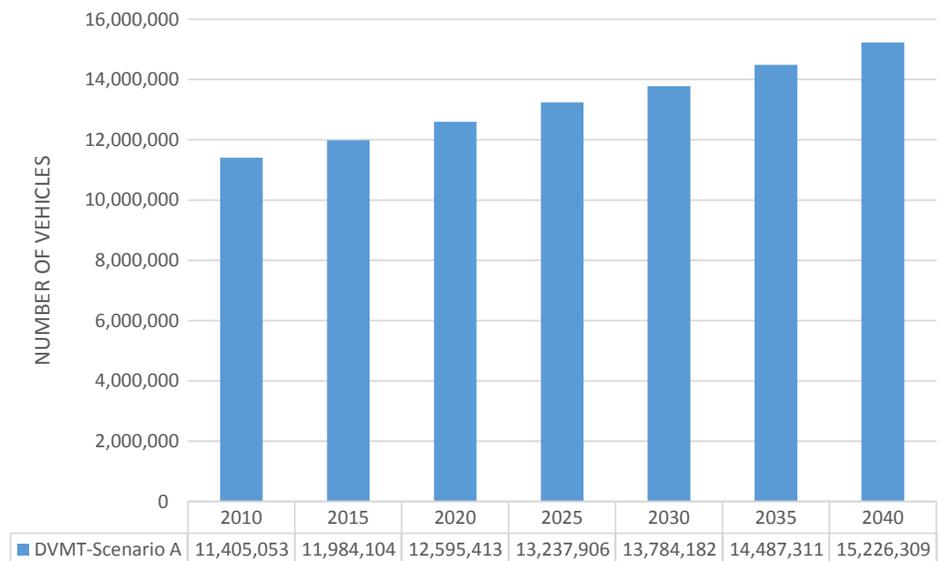
Source: PennDOT

Figure 17:
Change in Percent of DVMT by
Jurisdiction, Lancaster County,
2004-2014



Source: PennDOT

Figure 18:
Projected Growth in DVMT,
No Major Policy Change



Source: LCPC

**Table 10: Daily Vehicle Miles of Travel (DVMT) by Roadway Owner, 2004–2014
Lancaster County**

Roadway Owner	2004	2006	2008	2010	2014
PennDOT	8,404,803	8,750,592	8,711,504	8,390,350	8,402,402
Other Agencies	18,414	18,414	18,414	24,585	20,182
Turnpike	1,007,874	957,415	924,352	803,219	900,491
Local Municipal	1,515,031	1,931,360	1,967,465	2,189,399	2,460,614
Total	10,946,122	11,657,781	11,621,735	11,407,553	11,783,689

Source: PennDOT, Bureau of Planning and Research

local roads, however, increased by 62 percent which has contributed to the congestion Lancaster County residents experience on these roads. Some are carrying traffic volumes beyond those for which they were designed. **Figures 16** and **17** present these trends. The fact that the overall size of the county’s roadway network increased minimally between 2004 and 2014 has contributed to the congestion problems.

If daily vehicle miles of travel (DVMT) continues to grow at the rate it has since 2004 (approximately 1.1 percent per year), it will reach 15,226,309 by 2040, a 34 percent increase from 2010, as shown in **Figure 18**. This growth rate is consistent with the Federal Highway Administration’s estimates for growth nationwide. At a national level, DVMT is projected to average 1 percent annually over the next 20 years and drop to .75 percent over the next 30 years. Truck travel is projected to grow at 1.6 percent annually over the 20-year and 30-year forecast periods.

A mix of strategies such as establishing higher density, mixed-use land use patterns in the county’s urbanized areas and investing in infrastructure to support alternatives to driving will be required to make a significant change Lancaster County’s DVMT growth trend.

The Congestion Management Process

The Lancaster County MPO has been monitoring congestion through its Congestion Management System (CMS) and now through its Congestion Management

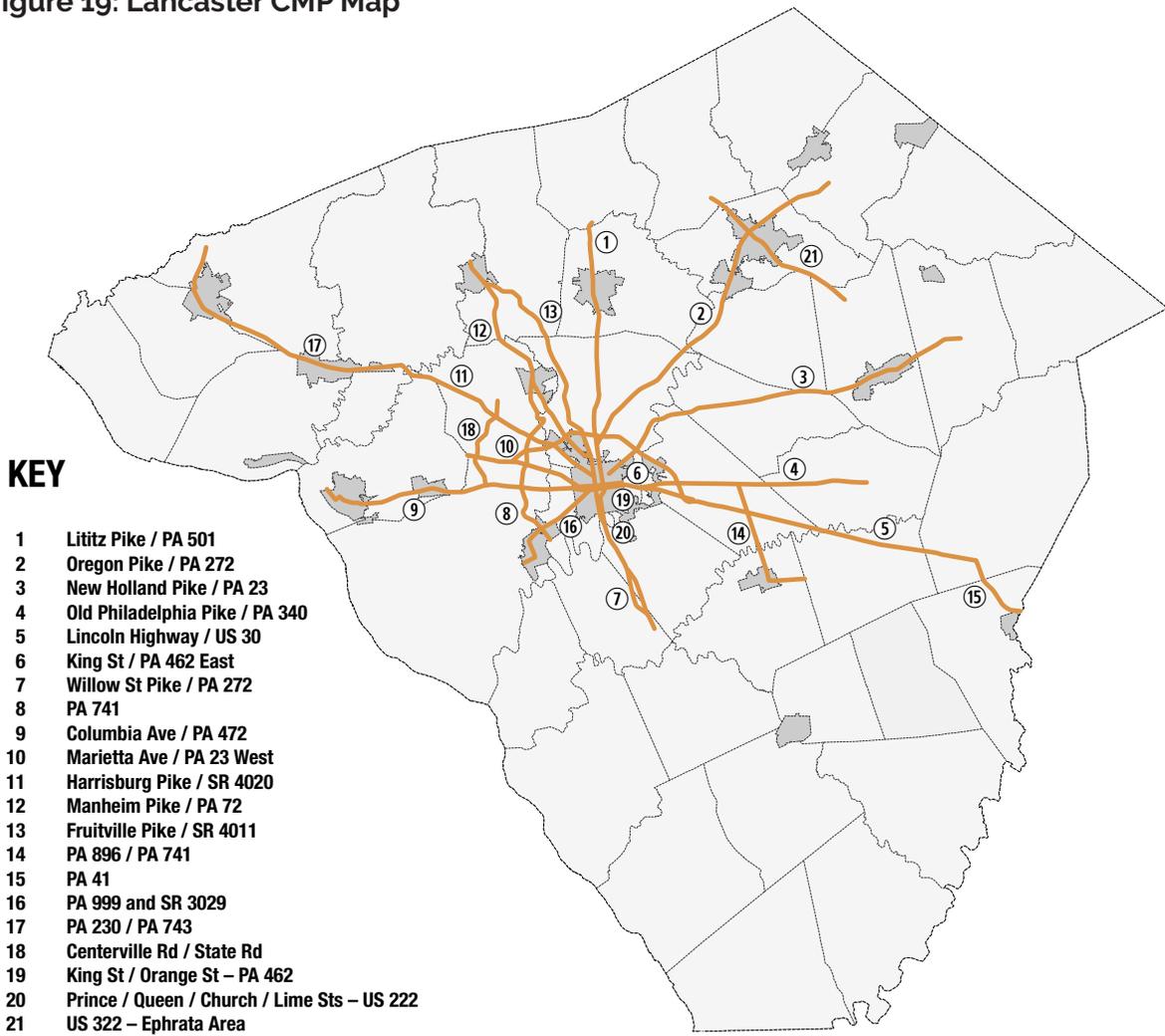
Process (CMP) for over 20 years. The CMP was developed in 2008–2010 with the assistance of a consultant. It replaced the prior CMS and was adopted by the MPO in September 2010. In February 2014, an updated CMP report was approved. The purpose of the CMP is to collect and analyze various data and trends related to roadway congestion throughout Lancaster County. The findings from the CMP are considered in the updates of the Long-Range Transportation Plan (LRTP) and in development of the Transportation Improvement Program (TIP).

The federal Moving Ahead for Progress in the 21st Century (MAP-21) and the Fixing America’s Surface Transportation Act (FAST Act of 2015) require the MPO to expand upon its CMP and develop specific quantifiable performance measures that will be used to track improvements to the transportation network over time.

Presently, there are 21 corridors in the CMP. The total network comprises 165.1 miles. Future analyses will examine congested interchanges on limited access highways. **Figure 19** shows the county’s congested corridors relative to its growth management framework (Urban and Village Growth Areas). **Figure 20** shows the national causes of traffic congestion by the percent each contributes to congestion.

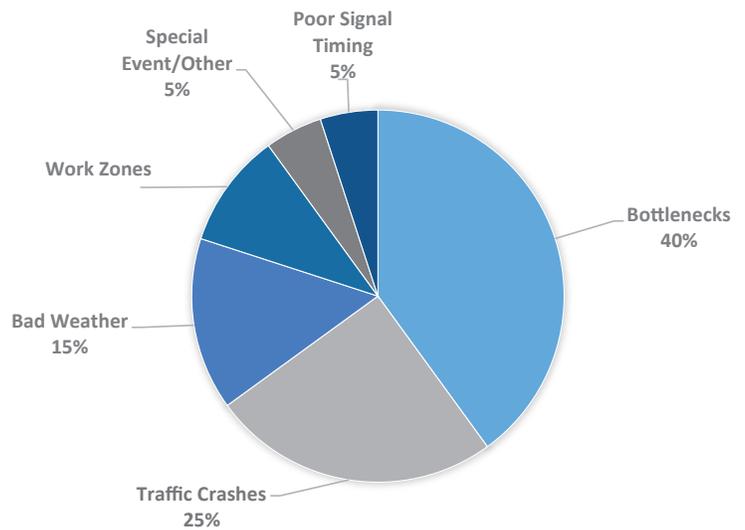
Maximizing the efficiency of the road system has become a major focus of transportation planning and investment in recent years. Funding for major road expansions is limited and concerns about quality of

Figure 19: Lancaster CMP Map



Source: LCPC, 2012–2014 CMP Report

Figure 20: National Causes of Traffic Congestion



Source: LCPC, 2012–2014 CMP Report

life and preservation of the environment and historic/cultural heritage have prompted states and counties to seek alternate ways to create new capacity for travel.

The CMP embraces a multi-faceted approach to congestion management. Strategic capacity enhancements such as turning lane additions at key intersections can help manage capacity and demand. Additional measures such as traffic signal synchronization and Intelligent Transportation Systems (improved incident management and traveler information) are important actions that can improve capacity. Demand management initiatives can also be implemented to modify driver behavior by encouraging people to travel in off-peak hours when possible or take other forms of transportation, such as transit, bicycling or walking. Finally, land use policies that focus development in designated growth areas can support greater use of alternative modes and shorten the length of vehicle trips.

What is Congestion?

Congestion results when traffic demand approaches or exceeds the available capacity of the system. There are two basic types of congestion: recurring and non-recurring. Recurring congestion takes place

virtually every day when and where traffic demand exceeds the existing roadway capacity. This is sometimes called peak period congestion and it makes up about 45 percent of congestion. Better signal timing and improvements at constricted points along the road can do much to relieve recurring congestion. Non-recurring congestion, which is about 55 percent of congestion, is caused by irregular events such as crashes, roadway hazards, highway construction, adverse weather, and special events. Both need to be addressed in different ways to effectively deal with the full spectrum of congestion.

To address congestion and other road management issues, a South Central Pennsylvania Regional Operations Plan (ROP) was developed in 2007. The ROP is intended to address various facets of operations. Highlights of the ROP for Lancaster County are as follows:

- Deployment of Intelligent Transportation System (ITS) equipment on key corridors in the county. This includes closed-circuit TV, dynamic message signing, and Highway Advisory Radio, primarily on the US 30, US 222, and PA 283 corridors, with

Table 11: Traffic Signal Synchronization Projects, Lancaster County

Columbia Borough (PA 462 & 441)
Fruitville Pike (SR 4011) – Buck to Keller Ave
Harrisburg Pike (SR 4020) - Mulberry St. to LG Health Campus
Lincoln Hwy. (US 30) – Greenfield Rd. to PA 896 - Adaptive Signal System
Manheim Borough (PA 72 & 772)
Millersville Borough (PA 999 & SR 3029)
Mount Joy Borough (PA 230) – Angle St. to Mt. Joy Shopping Center
New Holland Avenue (SR 1063) – Plum Street to US 30
Oregon Pike (PA 272) – Lititz Pike to Landis Valley Rd.
Rohrerstown Road (PA 741) – Harrisburg Pk. to Embassy Dr. –complete
Centerville Road - PA 462 to PA 23 – complete
Columbia Avenue PA 462 - Industry Dr. to President Ave.-complete
Lititz Pike (PA 501) - Keller Ave. to Owl Hill Road - complete
Market St. & Hershey Rd.- Cloverleaf Rd to PA 283(PA 230 & PA 283)-complete

Source: LCPC, 2012–2014 CMP Report

**Table 12: Mileage by Highway Functional Classification, 2014
Lancaster County**

Area	Federal Aid Linear Miles					Non-Federal Aid Linear Miles		Total Linear Miles
	Interstate	Other Freeway	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	
Lancaster County	31	50	103	290	357	225	2,845	3,902
Pennsylvania	1,867	862	4,399	8,497	12,596	7,252	84,565	120,039

Source: PennDOT Bureau of Planning and Research

communications tied to the PennDOT District 8-0 Traffic Management Center. This would allow for incident management and traveler information on these corridors.

- Improvements to the 485 signalized intersections in the county. These include the upgrades to traffic signal equipment and synchronization of traffic signals along key arterial routes.

Lancaster County is in the process of implementing a traffic signal coordination program under which traffic signals will be coordinated along priority corridors. Some corridors will have state-of-the-art Adaptive Signal Control technology. This has been installed on Lititz Pike (PA 501) and is scheduled for installation on Harrisburg Pike. A similar Responsive Traffic Control

system will be installed on US 30 between Greenfield Road and PA 896. **Table 11** shows the status of traffic coordination projects, indicating the corridors that have been completed and those planned for 2015–2018.

Functional Classification

PennDOT has been classifying its network of roadways according to their function since the mid-1960s. The classifications group highways into a hierarchy based on the type of highway service they provide. The classification system is based on the concept that individual roads and streets do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads. Streets and highways generally perform two types of service. They either provide traffic mobility or land access and can be grouped (or “ranked”) in terms of the proportion of service they perform.

This Road Functional Classification System is shown in **Table 12**. Interstate 76, the Pennsylvania Turnpike, is the county’s highest functionally classified road, with nearly 31 miles in Lancaster County. “Other Freeway” includes roads similar to interstates such as PA 283 and US 30.

Asset Management

PennDOT utilizes a pavement and bridge Asset Management Plan to determine when a road or bridge project on the state-owned road network requires



improvement or resurfacing and to ensure that the appropriate treatment is performed at the proper time.

Asset management is conducted by field observation, inspections and measurements of the transportation facility and consideration of other aspects of a bridge, road or other facility's condition. Asset Management is a major component of the Linking Planning and NEPA process and ensures that transportation assets continue to be maintained in good condition for their expected lifetimes.

PennDOT developed performance measures and goals for roads and bridges to provide MPOs with information to guide investment decisions that will enable the goals of the statewide Asset Management System to be achieved and maintained. Performance measures were developed for roads and bridges under four roadway network types:

- Interstate
- National Highway System (NHS), non-Interstate
- Non-NHS > 2000 ADT
- Non-NHS < 2000 ADT.

New Performance Measure requirements were required by the MAP-21 and the FAST Act legislation. This LRTP includes Performance Measures developed and implemented by PennDOT. These are described in **Chapter 6: Vision, Goals, Strategies and Performance Measures.**

Terms used in Asset Management include:

International Roughness Index (IRI). IRI is a worldwide standard for measuring pavement smoothness. A low IRI indicates good ride quality.

Overall Pavement Index (OPI). OPI is a more comprehensive assessment of pavement condition that is specific to Pennsylvania. The OPI is determined by combining the IRI with factors such as cracks, ruts and other measures of pavement surface condition. A low OPI indicates poor roadway performance. The lower the IRI, the smoother the road. Using IRI ranges, all roads are rated as excellent, good, fair, or poor.

Asset Management data provides valuable information to PennDOT and the Lancaster County MPO in prioritizing roadway improvement projects and bridge replacement and rehabilitation needs.

Roadway Conditions

Table 13 shows IRI ratings for all tested state highways in Lancaster County for 2014.

Mileage includes breakouts for divided highways, so mileage does not match linear mileage for the county.

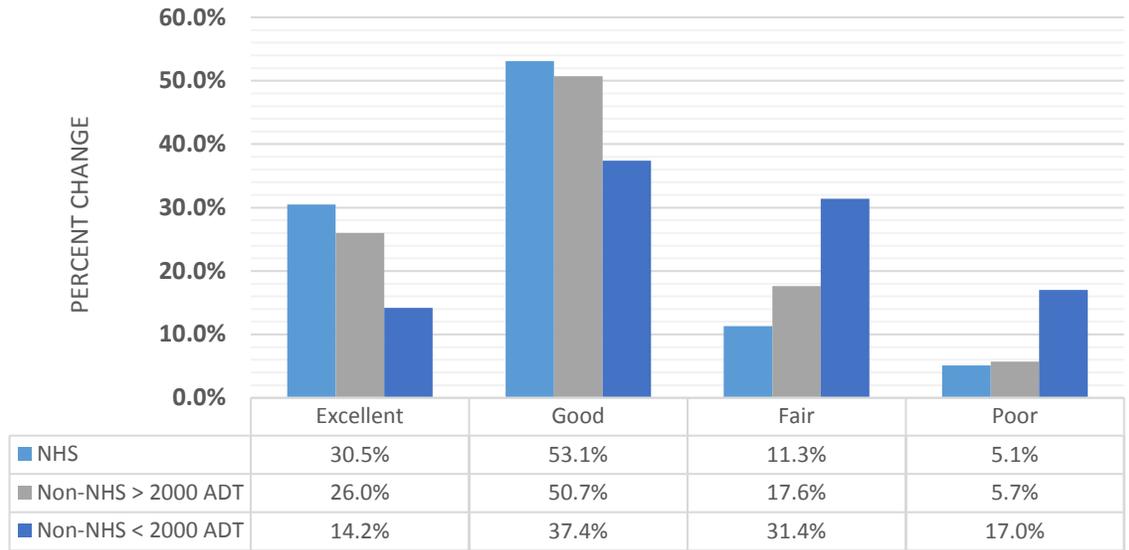
PennDOT's goals are to improve the overall condition of the road network by keeping as many miles

Table 13: International Roughness Index (IRI), 2014 Lancaster County

IRI rating	NHS		Non-NHS with ADT > 2000		Non-NHS with ADT < 2000		Total	
	Miles	%	Miles	%	Miles	%	Miles	%
Excellent	65	30.5%	141	26.0%	50	14.2%	256	23.1%
Good	113	53.1%	275	50.7%	132	37.4%	520	46.9%
Fair	24	11.3%	95	17.6%	111	31.4%	230	20.8%
Poor	11	5.1%	31	5.7%	60	17.0%	102	9.2%
TOTAL TESTED	213	100%	542	100%	353	100%	1,108	100%

Source: PennDOT, 2014 Performance Measures Annual Report

**Figure 21:
Pavement Condition
by Road Type, 2014**



Source: PennDOT, 2014 Performance Measures Annual Report

**Figure 22:
Change in Pavement Quality,
2006–2013**



Source: PennDOT, 2014 Performance Measures Annual Report

**Table 14: Highway Bridge Inventory
Lancaster County**

	Count	% of Tot. Count	Tot. Deck Area (Msf)	% of Tot. Deck Area
State > 8' NHS	133	11.8%	1.5068	37.1%
State, Non-NHS >2000 ADT	328	29.0%	1.4658	36.1%
State > 8', Non-NHS < 2000 ADT	259	22.9%	.5546	13.7%
Local > 20'	266	23.5%	.4576	11.3%
Local < 20'	145	12.8%	0.0723	1.8%
TOTAL	1,131	100.0%	4.0571	100.0%

Source: PennDOT, 2014 Performance Measures Annual Report



in good or excellent condition as possible and reducing the miles in poor condition. The state is particularly focused on the high volume state-owned roads which carry the majority of traffic. Lancaster County's IRI ratings show that for the major roads (NHS and Non-NHS >2000 ADT), 84 percent and 77 percent, respectively, are in excellent or good condition. Only 5 percent and 6 percent, respectively, are rated as poor. The lower volume local and municipal roads present a different situation. Only 51 percent are in excellent or good condition. Seventeen percent of the pavement miles are rated as poor and another 31 percent as fair. This is significant in light of Lancaster County's strong agri-business economy and the reliance of agriculture on lower volume secondary roads.

Significant resources are required to reduce the poor IRI roads on all highway networks in the county. The pavement condition of Lancaster County roads in 2014 is shown in **Figure 21**. **Figure 22** shows the percentage change in pavement quality from 2006 to 2014. Pavement in excellent and good condition has improved overall while pavement in fair or poor condition has remained stable or declined, except on the lower volume non-NHS roads where pavement in fair condition increased by 12%.

Bridges

A structurally sound network of bridges is essential for providing access to activities, goods and services. Preservation, improvement and expansion of bridges are critical to the county's economic health, as well as personal and commercial mobility. PennDOT maintains a Bridge Management System which includes extensive information on close to 32,000 bridges: 25,325 bridges greater than 8 feet in length and 6,318 bridges 20 feet or greater in length which are owned by municipalities and other agencies throughout the state. The Bridge Management System includes condition information based on detailed inspections of state and local bridges. Each bridge is inspected at least once every two years. Some bridges, such as those with weight restrictions, are inspected annually.

Information from the PennDOT Bridge Management System for Lancaster County bridges is shown in **Table 14**. In 2014, Lancaster County had a total of 1,131 bridges of which 720 or 64 percent are state-owned bridges longer than 8 feet in length and 266 are locally-owned bridges greater than 20 feet in length. Another 145 local bridges are less than 20 feet in length. The extent of the bridges can also be measured by the square foot of deck area (SFDA).

Substandard Bridges

Bridge conditions can be measured in a number of ways. The designation of a sub-standard bridge can be expressed as "structurally deficient" or "functionally obsolete." These terms are defined as follows:

Structurally Deficient. Structurally Deficient (SD) means that the bridge has deterioration to one or more of its major components. Although deterioration is present, a structurally deficient bridge is safe.

Functionally Obsolete. Functionally Obsolete (FO) means that a bridge has older features (for example, road widths or weight limits) compared to more recently built bridges. FO bridges are structurally adequate but have not been built to current standards.

**Table 15: Structurally Deficient Bridges on the State System, 2014
Lancaster County**

	Lancaster County Bridges			Statewide Bridge Percentages		
	# of County	% of County	% Deck Area (msf)	# of Bridges in PA	% of All Bridges in PA	% of Deck Area
SD Bridges	146	20.3%	7.5%	4,016	15.8%	10.2%

Source: PennDOT, 2014 Performance Measures Annual Report

**Table 16: Structurally Deficient Bridges on the Local System, 2014
Lancaster County**

	Lancaster County Bridges			Statewide Percentages		
	#	% of County	% Deck Area	# of Bridges in PA	% of All Bridges in PA	% of Deck Area
SD Bridges	78	29.3%	25.6%	2,218	34.5%	29.4%

Source: PennDOT, 2014 Performance Measures Annual Report

As shown in **Table 15**, Lancaster County has 146 state-owned bridges (20.3 percent) that are classified as structurally deficient. In comparison to statewide percentages, the number of bridges is several percent higher but the SD deck area is less than statewide (7.5 percent versus 10.2 percent.).

Table 16 shows the same information for local bridges, and compares Lancaster to statewide percentages for local bridges. The percent of Structurally Deficient bridges in the county is less than the statewide percentage (25.6 percent vs. 34.5 percent) as is the percent of SD deck area.

New Lititz Pike Bridge Opens in 2013



PennDOT

The \$18.2 million Lititz Pike (US 222) bridge opened in July 2013 although removal of the old bridge and other work on the project were not completed until 2015. The bridge replaced a deteriorated bridge on US 222 and was constructed next to the old bridge which remained open during construction. Located just east of the Amtrak train station and spanning the tracks, the new bridge alignment connects directly to Duke Street and eliminates the previous turn onto McGovern Street that was required before. The bridge project has been combined with improvements to adjacent roads and intersections, such as the intersection with Keller Avenue and Marshall Street on the north end and improvements to McGovern Street, which is directly in front of the Amtrak Station, on the south end. The bridge creates an attractive new gateway into the City of Lancaster. Citizen input during design of the bridge led to the inclusion of attractive lighting, a sidewalk on one side of the bridge and a design consistent with the historic character of the area. The City of Lancaster funded an art project that was installed on the south end.

Table 17: Posted and Closed Bridges 2014, Lancaster County

	Lancaster County			Pennsylvania Statewide		
	Total Bridges	Closed	Posted	Total Bridges	Closed	Posted
State Road System	720	8	36	25,390	37	844
Local Road System	266	9	62	6,437	217	1,709

Source: 2014 PennDOT Bridge Management System

Table 18: County-Owned Bridges Lancaster County

	# Bridges	SD	F0	Closed	Posted
County-Owned	60	20	14	0	14

Source: PennDOT Bridge Management System

Load Restricted Bridges

To maintain safety, bridges are weight-restricted when their structure can accommodate only vehicles that weigh less than or up to the posted weight limit. A bridge is closed when advanced deterioration results in a load rating capacity of less than 3 tons (6,000 pounds). Although weight-restricted bridges can safely carry traffic based on adherence to the posted limits, they have impacts on commerce by requiring heavier trucks to find alternative routes. This can increase the cost of business, especially in rural areas with few alternative routes. Lancaster County’s agribusiness industry depends on transport over rural roads where 71 of the total 115 or 62 percent of all closed or posted bridges in Lancaster County are located. Twenty-seven percent of the bridges on the local road system in the county are either closed or posted compared to only 6 percent on the state road system in the county. **Table 17** provides additional detail.

County-Owned Bridges

Of the 266 local bridges in the Lancaster County that are over 20 ft. in length, 60 are county-owned. Twenty-nine of these are historic covered bridges. **Table 18** shows the overall condition of these bridges. Conditions are significantly worse for county-owned bridges than local bridges in general, with 57 percent of these bridges being either structurally deficient or

functionally obsolete. Also, 14 of the 60 bridges are posted for weight. One of the reasons for these conditions is the fact that the county-owned bridges are old. In fact, 61 percent of these bridges are more than 50 years old.

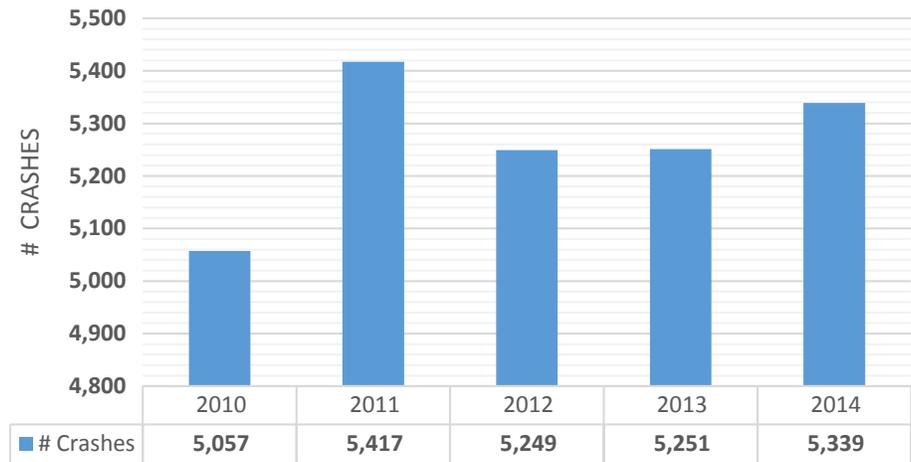
Roadway Safety

Transportation safety is a top priority of Lancaster County and a major factor in the transportation investments that are made by the county. Statewide, the cost of traffic crashes in 2014 was \$13.8 billion. This is an economic cost of nearly \$1,100 for every person in the state and suggests the priority that should be given to improving the safety of the transportation system.

As seen in **Figure 23**, there were 5,339 vehicle crashes in Lancaster County in 2014. This was the second highest level over the five-year period 2010–2014, with the lowest level in 2010; however, it is a decrease from 5,939 crashes in 2007. This contrasts with the statewide trend where the number of crashes were essentially the same in 2014 as in 2010.

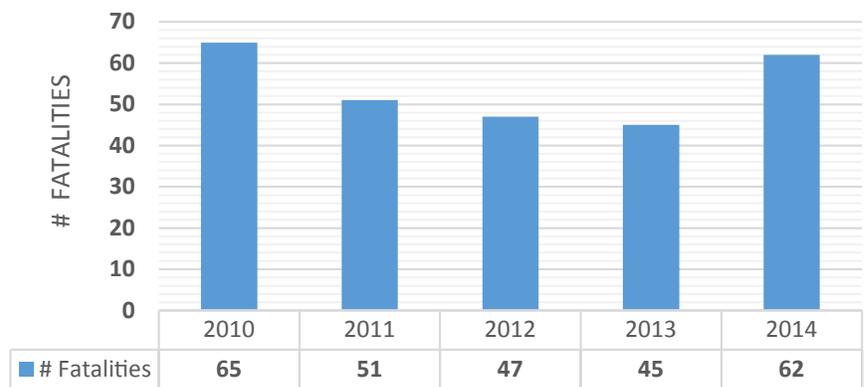
Urban counties, with their higher populations, number of vehicles, and vehicle miles of travel, experience a higher number of crashes. Fifty-three

Figure 23:
Five-Year Crash Trend
in Lancaster County,
2010–2014



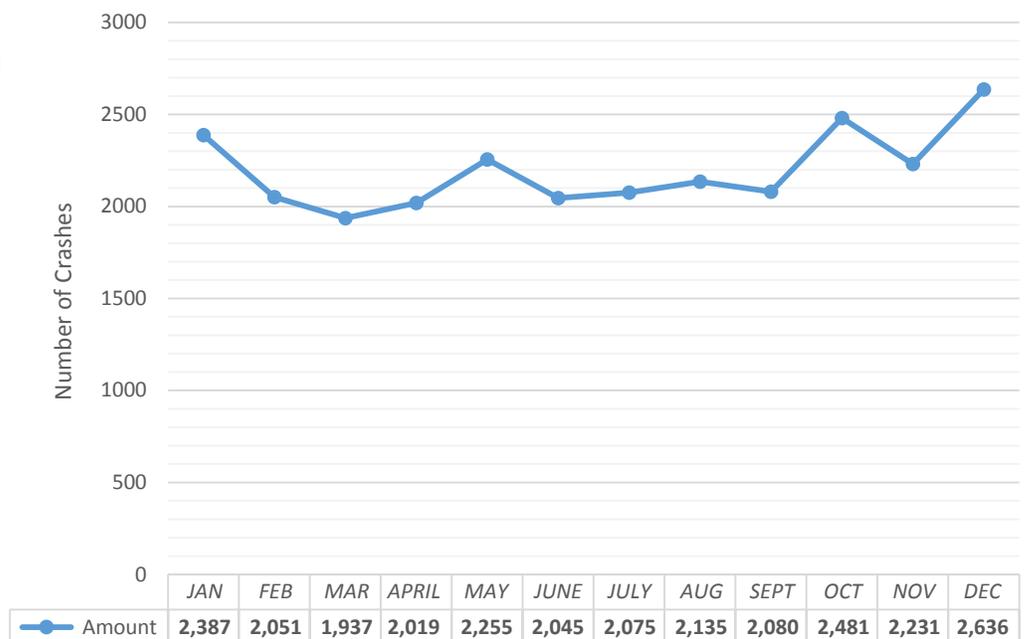
Source: PennDOT

Figure 24:
Five-Year Trend in Traffic
Deaths in Lancaster County,
2010–2014



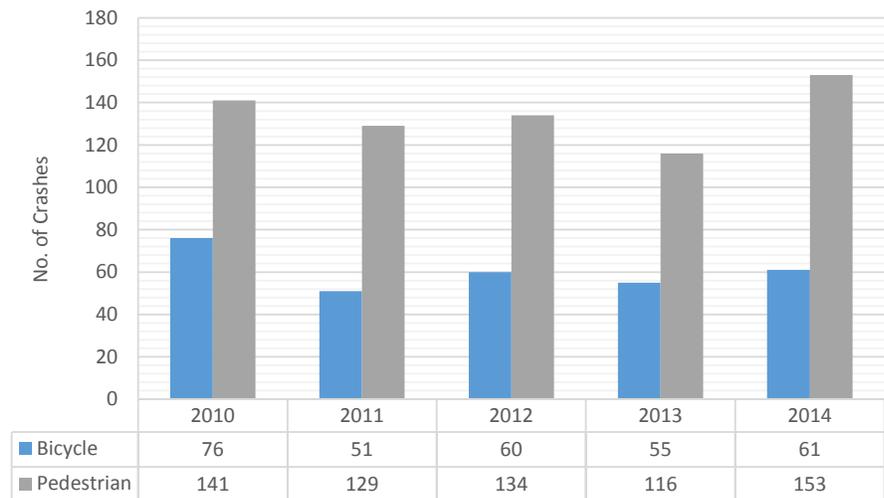
Source: PennDOT

Figure 25:
Total Crashes by Month in
Lancaster County,
2010–2014



Source: PennDOT

**Figure 26:
Bicycle and Pedestrian
Crashes in Lancaster County,
2010–2014**



Source: PennDOT, 2014 Crash Facts and Statistics

percent of the total traffic crashes in 2014 occurred in only 10 of Pennsylvania’s 67 counties, with Lancaster County among these. Lancaster County, on the other hand, is among the counties with the highest level of seat belt usage—86 percent—which can play a vital role in reducing the severity of injuries and result in injuries rather than death for some individuals involved in accidents. There were 62 deaths in Lancaster County in 2014, the second highest level over the five-year period 2010–2014 and up 30 percent over just two years earlier in 2012 as shown in **Figure 24**. This contrasts with the statewide trend where traffic deaths in 2014 (1,195) were the lowest over the five-year period, a decline of 9 percent from 2012.

Crash data from PennDOT indicates that crash activity averaged 445 per month in 2014, an increase from an average of 422 per month in 2010. **Figure 25** shows that for the five-year period from 2010–2014, crash activity was generally highest during the winter months of December and January when road conditions can be more hazardous due to snow and ice.

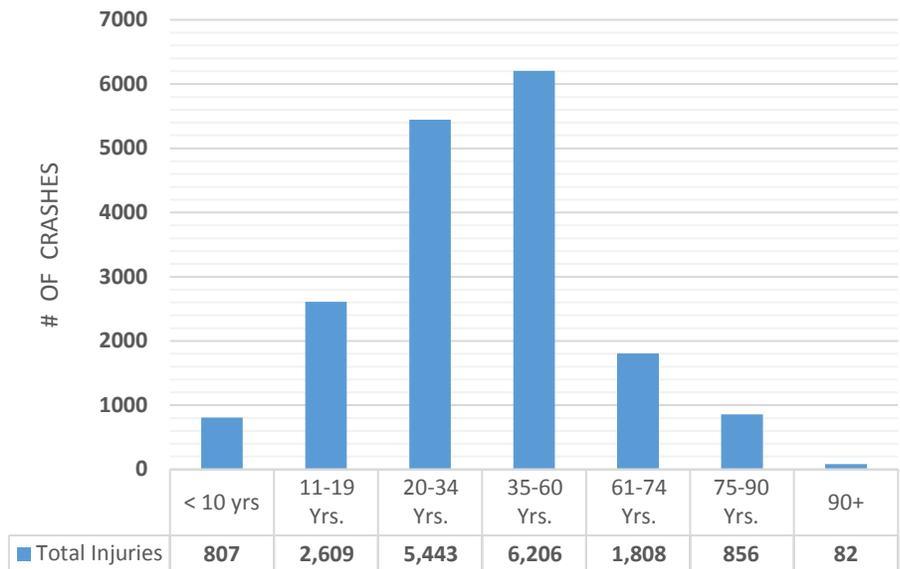
Over the five-year period 2010–2014, there were a total of 303 bicycle crashes, with the highest number (76) in 2010 and a lower number (61) in 2014. Annual pedestrian crashes, however, increased between 2010 and 2014, with 141 in 2010 and 153 in 2014. **Figure 26**

shows bicycle and pedestrian crashes in Lancaster County.

A large percentage of the state’s crashes involving horse and buggies occur in Lancaster County which is not surprising given the large number of Amish and Mennonites who live in Lancaster County. For the period 2010–2014, there were 125 crashes involving horse and buggies. Looking at the age group of people injured in traffic accidents, the greatest number of injuries are between the ages of 11 and 60. This is not surprising since this is the age group that spends the most time driving and travels the most miles. Injuries



Figure 27:
Total Vehicle Injuries by Age
Group in Lancaster County,
2010–2014



Source: PennDOT

for children and the elderly were significantly lower, as shown in **Figure 27**.

Public Transportation

Red Rose Transit Authority (RRTA) is Lancaster County’s primary provider of public transportation services. RRTA was formed in 1973 as an administrative agency and became an operating agency on April 1, 1976 when it acquired the fixed route assets of two private carriers. In 2015, RRTA went through another administrative transition when it joined with Berks Area Regional Transportation Authority (BARTA) to form a new regional transit authority known as the South Central Transit Authority (SCTA). Under the agreement, each transit agency continues to operate under its prior name and displays that name on equipment and publications but management of the two transit authorities has been combined. State and federal funding is received and administered by the new authority.

Ridership and Route Structure

RRTA operates scheduled fixed route bus service within the City of Lancaster and on county bus routes that connect the city to outlying communities. RRTA also operates an on-demand transit service, known as Red Rose Access, which is operated by private vendors under contract to RRTA. The service operates

throughout Lancaster County. As part of the fixed route service, RRTA operates an historic trolley in the City of Lancaster and a Shuttle/Circulator service for Millersville University.



Table 19: RRTA Ridership FY 2012 – FY 2014

<i>Fiscal Year</i>	<i>Fixed Route</i>	<i>Red Rose Access</i>	<i>Total Ridership</i>
2012	1,924,770	335,732	2,260,502
2013	1,886,115	311,467	2,197,582
2014	1,887,846	300,833	2,188,679

Source: RRTA

Table 20: RRTA Operating Characteristics

<i>Passengers</i>	<i>Hours</i>	<i>Trip Length</i>	<i>Passenger/Hr.</i>	<i>Revenue/Expense</i>	<i>Subsidy/Mile</i>	<i>Subsidy/Passenger</i>
1,886,115	108,774	4.3 miles	17.3	34.50%	\$3.15	\$0.73

Source: RRTA

In FY 2014, RRTA provided 2.2 million trips. Of the total trips, 1.89 million trips were taken on the fixed route system and 300,833 on Red Rose Access. This represented a decrease from 2.3 million trips in FY 2005. See **Table 19**.

RRTA is an essential means of mobility for most of the people who use the transit system. Nearly 60 percent of the riders indicated in a survey that they use the system five days per week, suggesting that for many riders RRTA is their means of getting to work. Another 13 percent use the system four days per week. Just under 90 percent stated that they have no vehicle at home. Most transit system users walk to the bus stop (92 percent) and to their destination at the end of the trip, underscoring the need for sidewalks to provide safe conditions for people to get to and from the service.

Facilities

RRTA’s major transfer center is Queen Street Station, which is located in the City of Lancaster within easy walking distance of many downtown businesses, shops and homes. Opened in 2005, Queen Street Station includes 11 areas for buses to pick up and discharge customers, a 3,000 square foot sales and information center and 14,000 square feet of leasable office space. In 2012, RRTA opened Queen Street Station 2, a \$19.6 million addition to the existing Queen Street Station transfer facility. Queen Street Station 2,

located at the corner of Chestnut and Queen Street, includes more space for RRTA buses, commercial and retail space and a 395 car public parking garage whose revenues help offset the transit authority’s operating expenses.

Operating Characteristics and Trends

RRTA operates a network of 19 fixed routes with its own employees and vehicles. Routes operate from 5:00 a.m. to 11:00 p.m. on weekdays and provide limited weekend service. RRTA has a total of 49 vehicles: 42 revenue buses for the fixed route service, 4 private passenger vehicles, and 3 non-revenue vehicles. The



buses range in size, model, and year. The majority of fixed route buses accommodate 27–34 passengers.

Red Rose Access, the on-demand transit service, provides a free service for individuals with disabilities that operates within three quarters of a mile of the fixed route corridors and core area and has been extended to the rural areas of Lancaster County. This service also provides 24-hour, shared ride service for clients of social service agencies, senior citizens, and medical assistance patients. Passenger fares and a variety of federal, state, and local programs fund these services.

RRTA provided 11,920,770 passenger miles of service in 2013. Of its operating revenues, \$2.4 million came from fares paid by riders with the remainder supplied by state and federal funds. The system had a fare box recovery of 28 percent.

Public Transportation Funding

Act 89, approved in 2013 by the Pennsylvania legislature, provides additional funding for transit systems throughout the state. By FY 2017–2018, these added revenues will total just under \$500 million. The federal FAST Act will also provide added revenues for transit systems in the state.

Long-Range Transit Plan

In 2008, RRTA completed a Long-Range Transit Plan, 2008–2035 that included an evaluation of its existing routes and services and a plan for service improvements over a 25-year period. The purpose of the Transit Plan was to coordinate RRTA's services and long-term goals with Lancaster County's Comprehensive Plan and Long-Range Transportation Plan.

In February 2014 and May 2014, RRTA published two Transit Development Updates that serve to update the Long-Range Transit Plan with more current financial, ridership and other information and recommend service improvements.

Like the original Long-Range Transit Plan, the updates propose a series of possible service improvements.

The focus of these are:

- Implement more frequent service;
- Enhance and develop key corridors;
- Focus on circulation and connectivity to the urban area;
- Improve service to key employment nodes;
- Increase transit vehicle speeds; and
- Improve the customer experience.

The improvements will be implemented in three phases: short-term (1–5 years); long-term (6–10 years) and longer-term (more than 10 years).

Short-term proposals can be accomplished without any major capital investment and include actions such as increasing hours of service of certain routes, eliminating or modifying less productive routes.

Medium-term proposals require a major capital investment and include strategies such as increasing the frequency of service on some routes, reinstating an improved downtown trolley service, initiating Lancaster to Harrisburg regional service, implementing regional bus service to Denver Borough and other improvements. Long-term service proposals are developed in anticipation of continuing growth in certain areas and require a major operating and/or capital investment. These include implementation of Bus Rapid Transit on key corridors.

Intercity Bus

Bieber Transportation Group provides intercity bus service and stops at the Lancaster Amtrak Station. The county is served by four bus trips daily (two arrivals and two departures) on weekdays and two bus trips on weekends. The service operates between New York City and York, with stops along the route, including the City of Lancaster. Intercity bus ridership has dropped substantially from 32,576 in 2005 to 10,787 in 2014. Enhanced passenger rail service along the Keystone Corridor may help to



explain some of this ridership drop as rail ridership in Lancaster County has surged over the same period.

Passenger Rail

Amtrak provides Lancaster County with passenger rail service through its Keystone Corridor, one of the nation's federally-designated high-speed rail corridors, which connects Lancaster County to Harrisburg and Pittsburgh to the west, and Philadelphia and the Northeast Corridor to the east. Amtrak and Pennsylvania made significant investments in the rail corridor in recent years to improve the quality and speed of the service between Philadelphia and Harrisburg. Amtrak owns this section of the rail line. The improvements included electrification of the rail line in 2006 which enables trains to travel at speeds up to 110 miles per hour, making it one of the fastest rail corridors in the nation. The closure of the last three highway-rail grade crossings between Philadelphia and Harrisburg, all of which were located in Lancaster County, has prepared the rail corridor to safely accommodate train speeds up to 125 miles per hour in the future. The track west of

Harrisburg is owned by Norfolk Southern Railroad (NS). A study to examine possible improvements that would allow faster passenger rail service on this section of the line has been completed with several scenarios at different costs included as part of the study. Although Amtrak owns the segment east of Harrisburg, NS has trackage rights along the entire Keystone Corridor.

Lancaster County understands the value that the rail corridor provides in terms of mobility and economic development and has been engaged in recent years in rehabilitating all three Amtrak stations located in the county: Lancaster Station, Elizabethtown Station and Mount Joy Station.

Lancaster Station. The Lancaster Station is the second busiest Amtrak station in Pennsylvania and is owned by Amtrak. It was built in 1929 and is on the National Register of Historic Places. A \$14 million restoration of the station was completed in 2012. The restoration included rehabilitation of the interior and exterior of the building, increased parking for Amtrak and Bieber bus passengers, a new heating and ventilation system, a canopied area for the intercity buses, retail shops, meeting rooms and a future restaurant and outdoor landscaping.

Elizabethtown Station. This station went through a \$9 million restoration, funded with federal American Recovery and Restoration Act (ARRA) funds. Investments included improvements to the platforms and construction of new canopies over



PennDOT

Rendering of new Mount Joy Station.

**Table 21: Amtrak Ridership, 2005–2014
Lancaster County**

Station Name	2005 Ridership	2007 Ridership	2008 Ridership	2010 Ridership	2012 Ridership	2014 Ridership	10 Yr. Gain 2005–2014
Lancaster City	333,812	420,524	484,102	514,971	559,364	529,409	59%
Elizabethtown	51,481	74,091	90,644	95,096	112,128	108,722	111%
Mount Joy	27,461	46,109	53,828	59,650	69,025	46,391	83%
TOTAL RIDERSHIP	412,754	540,724	628,574	669,537	740,517	684,522	65%

Source: Amtrak

the platforms, installation of an elevator for compliance with the Americans with Disabilities Act (ADA), improvements to the parking area and restoration of the stone station building. Re-dedication of the restored station took place on May 4, 2011.

Mount Joy Station. Improvements to the Mount Joy Station are estimated to total \$27.5 million and include extension of the platforms, a new covered passenger waiting area, installation of elevators, parking improvements and construction of a covered walkway to connect the station to Mount Joy Borough’s Main Street. Preliminary engineering was completed in December 2010 and parking and street improvements were completed at the end of 2011. Final design on the station and new platforms was completed in 2014 and construction is expected to be done in 2017.

Ridership at the three Amtrak stations in Lancaster County has experienced dramatic growth in recent

years. Ridership at all three stations totaled 684,522 in 2014, up from 412,754 in 2005, a 65 percent gain in ridership over nine years, as shown in **Table 21**.

In addition to Amtrak service, the Strasburg Rail Road is a private railroad that operates steam locomotive train trips throughout the year. Located in Strasburg Township in the eastern part of Lancaster County, the Strasburg Rail Road is a major tourist destination that provides rail excursions to approximately 350,000 annually. As a tourist train, this line does not affect mobility within the county. The railroad has proposed to privately fund a new platform at Paradise that would enable people to transfer from Amtrak trains to the tourist railroad’s trains. The proposal is under review by the Federal Railroad Administration.

The Strasburg Rail Road also operates a freight rail service that provides transportation of farm produce, lumber and other products for businesses in the eastern part of the county.

Table 22: Tonnage and Value of Freight in South Central Pennsylvania, 2011–2040

	Inbound Tons, Value (millions)		Internal Tons, Value (millions)		Outbound Tons, Value (millions)		Total Tons	Value (millions)
2011	50,490,632	\$70,380	19,374,422	\$22,846	61,496,362	\$64,379	131,361,416	\$157,606
2040	84,403,583	\$158,055	40,515,303	\$38,526	104,976,169	\$112,840	229,895,055	\$309,421
Chg. 2011–2040	33,912,951	\$87,675	21,140,881	15,680	43,479,807	\$48,461	98,533,639	\$151,815
% Change	67%	125%	109%	69%	71%	75%	75%	96%

Source: Pennsylvania Comprehensive Freight Movement Plan, 2015

Finally, Lancaster County has participated in a multi-county planning effort to establish a new commuter rail service between Lancaster and Harrisburg called the Capital Red Rose Corridor. The Capital Red Rose Corridor would serve as the first corridor in a regional rail system planned for South-Central Pennsylvania (PA), operating along the Keystone Corridor and using existing track and rail stations. Constraints on transportation funding for new initiatives such as this have put the planned service on hold at the present time.



Freight

Freight movement is not confined to the borders of a single MPO but is a regional issue. The 2015 Pennsylvania Long-Range Transportation Plan included a Pennsylvania Comprehensive Freight Movement Plan. The plan found that in 2011 the state's freight network carried \$1.6 trillion worth (1.1 billion tons) of goods into, within and out of the state. This is expected to increase to more than \$3.7 trillion (\$1.9 billion tons) by 2040. Approximately, 25 percent of Pennsylvania's export companies are located in rural counties. The total freight tonnage carried in the South Central Pennsylvania region (inbound, internal and outbound) in which Lancaster County is located, is expected to increase 75 percent between 2011 and 2040, from 131.4 million tons in 2011 to 229.9 million tons in 2040.

The value of the freight is projected to increase by nearly 100 percent from \$157 billion in 2011 to \$309 trillion in 2040. **Table 22** presents the tonnage and value of freight in the South Central Pennsylvania region for years 2011 and 2040.

The vast majority of freight is carried over the highways by trucks: in 2011, 76 percent of the freight tonnage in the state was moved by truck, 18 percent by rail and the remainder by air and water. In 2040, it is projected that the share of freight tonnage moved by truck will increase to 80 percent while that moved by rail will decrease to 16 percent. This increase in freight shipments by truck will add to congestion on the state's highway network and on the roads in South Central Pennsylvania. Since funding for road improvements

Table 23: Lancaster County Freight Efficiency Projects

MPMS #	Project Name	Project Type	Length	Notes
83168	Gap Bottleneck Improvements	Corridor Safety Improvement	1.4 mi.	A
89207	PA 23 TSM Improvements	Intersection Improvement	11.9 mi.	B
94910	Columbia Ave and Rohrerstown Rd.	Intersection Improvement	.4 mi.	A
94912	PA 23/PA 741 Intersection Improvement	Intersection Improvement	.5 mi.	K
80930	US 30/Harrisburg Pike Interchange	Reconstruction	1.2 mi.	B
89198	PA 501/Oregon Pike Intersection	Intersection Improvement	2.3 mi.	E
89654	Harrisburg Pike/Dillerville Rd.	Intersection Improvement	3.7 mi.	A

Source: LCPC

A. Construction, reconstruction, rehabilitation and operational improvements directly related to improving freight movement

B. Intelligent transportation systems and other technology to improve the flow of freight

E. Geometric improvements to interstates, interchanges and ramps

K. Improvements to truck bottlenecks

is unlikely to be sufficient to meet the demand, the increased traffic could also adversely impact air quality and efforts to improve energy-efficiency since rail is a more energy-efficient mode of transport than truck. **Table 23** presents the major projects in Lancaster County that will contribute to improving freight movement in and through the county.

Freight in South Central Pennsylvania

In the South Central Pennsylvania region, rail freight shipment depends primarily on use of the Keystone Corridor, which accommodates passenger trains during the day and freight rail at night. This rail line is vital to the future growth of passenger and freight rail in Lancaster County.

While there are four Class I railroads in the region including Norfolk Southern (NS), CSX Transportation, Canadian National and Canadian Pacific, NS is by far the largest freight rail service in the county providing service to over 100 customers daily. NS participated in the Keystone Corridor improvement program which



upgraded the line for the accommodation of 286K rail cars, the rail freight industry standard and for passenger rail service

The Dillerville Rail Yard is the largest facility NS operates in Lancaster County. In 2013, NS completed a relocation of the rail yard to a location further west in the City of Lancaster. The \$40 million relocation and expansion enabled the railroad to increase its capacity to handle rail traffic and improve the efficiency of its operations. NS estimates that the improvements will remove approximately 55,000 trucks from the regional road system annually. Improvements are also

F&M and LGH Partner on a New Mixed-Use Development



As part of the relocation of the Dillerville Rail Yard, Norfolk Southern Railroad (NS) entered into an agreement with Franklin & Marshall College (F&M) and Lancaster General Hospital (LGH) to transfer 30 acres of the vacated rail site to them. Combined with 47 adjacent acres once used by Armstrong Industries, the 77-acre site is being transformed into a new “eds and meds” corridor. The \$70+ million project is being funded with private dollars from both institutions along with federal, state and local dollars. F&M will build new athletic fields and a new sports stadium and LGH plans to locate its nursing school and other facilities here. The site will include housing and retail shops. New road connections (Liberty Street to College Avenue) are part of the plan.

being completed on local lines that serve customers in Lancaster County. In an agreement with Franklin and Marshall College and Lancaster General Hospital, the vacated portion of the yard was turned over to them for development into a mixed-use development. Relocation of the rail yard provides the opportunity to link two parts of Lancaster City that have been separated for nearly 100 years by the rail. The callout box on page 3-34 provide more details about this innovative project.

The primary commodity hauled by trucks nationwide and in the South Central PA region is nonmetallic metals (construction rocks, phosphates and other non-metallic minerals with the exception of coal). The South Central PA region, however, has a higher percentage of “secondary traffic” than the national percentage. Secondary traffic is the movement of goods from a warehouse or distribution center to a retail store, customer location or another warehouse. This higher percentage in the region is due to the large number of warehouse facilities located here. In terms of freight hauled by rail, coal is the dominant commodity, nationwide and in the region.

Warehouses and Distribution Centers

Because of its proximity to many major metropolitan areas, the South Central PA region has experienced significant growth in freight warehouses and distribution centers. These facilities require easy access to major highways, particularly the Interstate System. Warehouses are also located where goods shift modes, for example, from rail to truck. With several major rail yards, the South Central PA region is well-located for these facilities. Approximately 20 percent of the total 186 million square feet of warehouse and distribution center space in the region is located in Lancaster County (39.3 million square feet). In 2015, Urban Outfitters completed construction of a 1 million square foot distribution center in Gap in the eastern part of Lancaster County that will employ from 300–500 workers and bring economic benefits to the area. In the northwest area of the county, in Elizabethtown Borough, Nordstrom’s department store opened



a 672,000 square foot distribution center in the fall of 2015. The facility will employ approximately 370 full-time employees with increased hiring expected in future years.

Aviation

Lancaster County is home to one public airport and three small private airports. The Lancaster Airport, the largest of the four, is located in Manheim Township about six miles north of the City of Lancaster. The private airports are: Smoketown Airport in East Lampeter Township, Donegal Springs Airpark in East Donegal Township and McGuinness Field in Columbia Borough. The airports are shown on **Map 1** in **Appendix B**.

Lancaster Airport

Lancaster Airport is the largest and only public airport in the county. It is owned and operated by the Lancaster Airport Authority, a joint authority of the City and County of Lancaster. The airport has two runways. The longer of the two is 6,934 feet in length. The other runway is 4,102 feet long. Sun Air Express, with headquarters in Pittsburgh, provides a limited number of regularly scheduled daily flights to and from the airport. Scheduled flights connect to Dulles International Airport in Virginia and Pittsburgh Airport. Charter flights can also be arranged for businesses or individuals from the airport. In addition, the airport services privately owned small aircraft. Total take offs and landings have been about 100,000 or an average of 270 per day in recent years. Over twenty businesses are located at the airport which are used by both the aviation community and the general public. Products and services range from aircraft inspection, repair, sales, charters and rentals to flight instruction,



Table 24: Passengers Enplaning and Deplaning Annually at Lancaster Airport

Year	Passengers Enplaning/Deplaning
2000	29,802
2007	11,458
2011	7,000

Source: Lancaster Airport Authority

dining at the airport restaurant, car rentals and a retail aviation and hobby shop. Airports in Harrisburg, Philadelphia, and Baltimore are all within under a two-hour driving distance from Lancaster County and provide additional flight choices for Lancaster residents. **Table 24** shows passenger volumes over the past 15 years. Data for the year 2007 reflects the fact that scheduled service was available for only part of the year.

Donegal Springs Airpark

Donegal Springs Airpark has an asphalt runway 3,250 feet in length. It supported an average of 99 aircraft operations a day for the 12-month period ending January 15, 2008. Those operations were 66 percent local general aviation and 34 percent transient general aviation. The airport is accessed primarily via PA 743. Several small businesses that service aircraft are located at the airport. In addition, a Lancaster skydiving club uses the airport, especially on weekends.

Smoketown Airport

Smoketown Airport is smaller in size than Donegal Springs. It has a 2,400 foot long asphalt runway, and supported an average of 74 aircraft operations per day for the 12-month period ending July 11, 2007. Most aircraft operations are local general aviation. The airport is located directly off PA 340.

McGuinness Field

McGuinness Field has a turf runway surface and is 1,800 feet in length. Columbia Borough is looking at

opportunities to redevelop this acreage into another use, which has not been determined at this time.

Bicycle and Pedestrian Modes

Transportation planning in recent years has given a higher priority than in the past to construction of facilities for bicycling and walking. This has occurred because transportation and land use planners see these modes as a way to help reduce the growth in vehicle miles of travel, especially for trips under five miles, and because these modes support more livable communities where people can walk and bike safely instead of drive for some of their trips. The interest in bicycling, walking and transit is also driven by the interest of many citizens in protecting the environment.

Bicycling and walking already play an important role in transportation in Lancaster County. People in the county walk and bicycle every day for transportation and recreation. Pedestrians use existing sidewalks in downtown Lancaster and in many of the county's boroughs and new developments to do errands and for recreation. The quiet neighborhood streets and rural roads in the county are also used by bicyclists and pedestrians. Multi-use trails like the Lititz-Warwick Trail and the Lancaster County Northwest River Trail are primarily used for recreation but since they link boroughs and townships to one another are also used for commuting and other trips.

According to the U.S. Census, about 3.7 percent of Lancaster County employees over the age of 15 walk



to work and another .7 percent bicycle to work. A large number of people bicycle and walk in the Amish and Mennonite communities and contribute to these percentages.

RRTA has installed bike racks on the front of most of its buses which enable transit riders to ride the bus for the long part of their trip and then use their bicycle to arrive at their office, home or other destination. In addition, RRTA has installed six secure bike lockers at Queen Street Station 2.

A survey by Lancaster County Planning Commission staff in 2012 found that an interconnected network of sidewalks exists in the areas around nearly all borough municipal buildings and public libraries, enabling people to walk safely to and from them. Township municipal buildings, which are generally located in more rural areas and oftentimes along busy streets, do not have good sidewalk access. Less than ten have sidewalks leading to them. Far less attention has been paid to the provision of bicycle facilities at public buildings in both boroughs and townships. Only three borough municipal offices had bicycle racks and, among the townships, only the Warwick Township Municipal Building, has a bicycle rack. Public libraries, on the other hand, generally have bicycle racks.

Led by the LCTCC Bicycle and Pedestrian Advisory Committee, the county is working with its municipalities to improve pedestrian and bicycle facilities. The county is in the process of updating the Lancaster County Bicycle and Pedestrian Transportation Plan with an “Active Transportation Plan” that should be completed in

Elizabethtown Bicycle and Pedestrian Pathway



Construction of the Elizabethtown Bicycle and Pedestrian Pathway Project (Phase 3) was funded under the FY 2013–2014 funding cycle of the County’s Smart Growth Transportation. A total of \$329,743 was provided by the MPO for construction of the project. The pathway extends from the Amtrak station in the western part of Elizabethtown Borough through the downtown to the school district in the eastern part of the Borough. It provides a safe route for people to walk and bicycle. The long-term goal of the Borough’s trail plan is to connect this trail to the Conewago Trail in Mount Joy Township that extends across the northern tier of the county.

Table 25: SGT Projects Funded in Lancaster County

<i>Project Name</i>	<i>Municipality</i>	<i>LCTCC Funds</i>	<i>Total Project Costs (with LCTCC \$ incl.)</i>
1. FY 2013–2014 Projects			
Pedestrian & Bicycle Pathway Extension	Elizabethtown	\$329,743	\$960,615
Mulberry Street Conversion to two-way traffic	City of Lancaster	\$675,000	\$750,000
Northwest Lancaster County River Trail Signage Project	East Donegal Township	\$59,000	\$65,000
2. FY 2015–2016 Projects			
Comprehensive Bicycle Plan	City of Lancaster	\$48,000	\$60,000
LIMC Non-Motorized Transportation Plan	LIMC	\$48,000	\$60,000
PA 741 Multimodal Safety Improvements	Strasburg Township	\$397,200	\$500,000
Bridgeport Area Transportation Study	East Lampeter Township	\$187,200	\$237,500
Doe Run Pedestrian Enhancements	Penn Township	\$858,758	\$1,192,678
North and South Duke St. Realignment	Millersville Borough	\$497,200	\$2,608,856
3. FY 2017–2018 Projects			
Willow Street Traditional Village Project	West Lampeter Township	\$1,214,652	\$1,574,652
Charlotte Street Conversion to Two-Way	City of Lancaster	\$977,500	\$1,500,000
Mount Joy Borough Pedestrian Safety	Mount Joy Borough	\$1,337,200	\$1,558,200
Manheim Borough Downtown Connections Study	Manheim Borough	\$100,000	\$125,000
TOTAL		\$6,729,453	\$11,592,501

Source: LCPC

2016–2017. A consultant was hired in December 2015 to work with the county on this plan.

County’s residents and enable them to lead more active lifestyles by increasing opportunities for people to make non-driving trips.

Transportation and Health

Greater reliance on walking and bicycling also holds the potential to improve people’s health, through its contribution to cleaner air and by getting people to engage in “active transportation” which helps to reduce the risk of obesity and its related diseases of hypertension, respiratory and heart problems. In Lancaster County, 64 percent of adults, 40 percent of teenagers and 36 percent of elementary school children (through 6th grade) are either obese or overweight. About 7.2 percent of adults in the county have diabetes (U.S. median is 8.1%), the cancer rate is 457 per 100,000 (equal to the U.S. median) and 12 percent of adults over age 35 have experienced a heart attack or other heart-related incident. Nationwide, the cost of health care for obesity-related diseases is estimated at between \$147-210 billion per year. Well-designed transportation systems can improve the health and well-being of Lancaster

The following strategies are recommended by the Centers for Disease Control (CDC) for supporting active transportation through transportation policies and practices:

- Promote safe and convenient opportunities for physical activity by improving infrastructure such as well-lit sidewalks, safe roadway crossings and bicycle infrastructure (lanes on the street, separate pathways, bicycle racks and lockers).
- Provide economic incentives for municipalities that reduce VMT per capita and increase the use of walking, bicycling and transit.
- Provide local officials with tools to implement Complete Streets.
- Bring health and community planners together to develop pedestrian and bicycle master plans and provide funding to implement the plans.

- Work with state and local officials to incorporate bicycle and pedestrian design guidelines into their zoning codes and Subdivision and Land Use Ordinances (SALDOs).
- Explore opportunities for increasing availability of funds for establishing active transportation initiatives.
- Develop and implement policies that encourage transit-oriented and mixed-use developments.

As described earlier in this chapter, motor vehicle crashes are a leading cause of serious and fatal injuries for many age groups.

Smart Growth Transportation Program (SGT). In 2011, the Lancaster County MPO approved a new Smart Growth Transportation (SGT) Program that had been developed by a task force appointed by the MPO in 2009. The SGT Program awards funding to transportation projects located in the county's Designated Growth Areas that enhance economic development and livability. SGT Task force members consist of county and municipal planners, a local developer, non-profit organizations and PennDOT officials who are appointed by the MPO. The program accepts applications every two years from municipalities and transportation service providers in the county. Since the intent of the program is to construct new infrastructure, only a maximum of 20 percent of program funding can be awarded to studies and these must demonstrate a realistic implementation strategy. A total of \$1.5 million per year is set aside by the MPO for the program, providing \$3 million for each two-year funding cycle. Applicants must meet four basic criteria to be considered for funding. These are:

- Project is consistent with and implements goals and policies of the county comprehensive plan and Long-Range Transportation Plan and regional plans;
- Project is located within a designated growth area;
- Demonstration of applicant's ability to pay pre-construction costs for construction projects and 20% match for studies; and

- The project has a viable implementation strategy.

Projects that meet the core criteria are then evaluated by task force members against five weighted criteria. Projects with the highest scores are recommended to the MPO for funding.

Complete Streets Initiative. In 2014, the Lancaster County MPO approved a program to undertake a series of actions to implement a Complete Streets Program to make the streets of Lancaster County safe for all modes of transportation and people of all ages and abilities. Lancaster County staff has worked with community partners such as Lancaster General Hospital, the Coalition for Smart Growth and the county's municipalities to implement the program. Technical assistance has been provided by the National Complete Streets Coalition. Activities to implement the program to date have included:

- Adoption of Complete Streets Policy Statements by the LCTCC and the LCPC;
- Assistance to municipalities on adoption of municipal complete streets resolutions and policies. Three municipalities adopted resolutions and several others are working on them;
- Convened a series of workshops for municipalities and the public on the concept of complete streets and how to implement a policy;
- Development of a PowerPoint to be used in presentations to municipal officials and organizations in the community;
- Development of a Complete Streets Design Guidebook that provides guidance on recommended standards for complete streets measures such as sidewalk width, buffer width, number of lanes for various types of roads and more; and
- Inclusion of complete streets concepts into the update of the Lancaster County Comprehensive Plan and this LRTP.

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Chapter 4

Environmental and Historic Resources Overview

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Background

Environmental and historic resources in Lancaster County support a diversity of uses, including highly-productive farmland, natural habitat areas, water resources, and woodlands. In addition, Lancaster County has an abundance of historic and cultural resources that are an integral part of the county's character and connection to its past. Lancaster County's LRTP is designed to protect and, to the extent possible, to enhance environmental, historic and cultural resources. **Maps 5, 6, 7 and 9 in Appendix B** illustrate the distribution and location of environmental, historic and cultural features in Lancaster County.

In adopting a Growth Management Plan in 2006, Lancaster County established a framework that would enable the county to manage growth while protecting these resources.

Agricultural Land and Soils

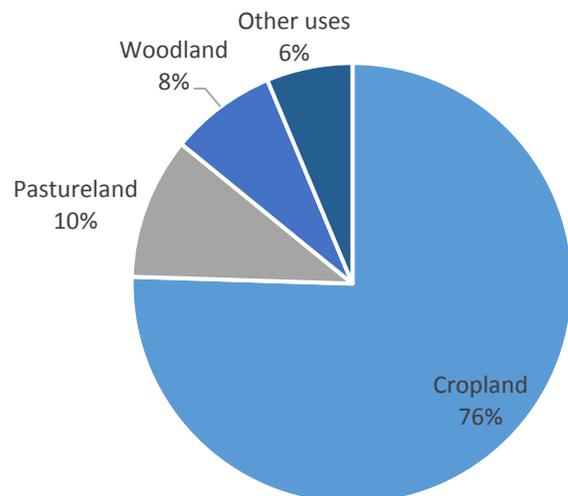
Agricultural Lands

Agriculture is the predominant land use in Lancaster County. In 2012, there were 5,657 farms in the county, comprising approximately 439,481 acres or 72 percent of the county's land area, according to the US Agricultural Census 2012. As such, it defines much of

Lancaster County's identity, heritage, and economy. The total market value of farm products from Lancaster County in 2012 was \$1.5 billion, a 38 percent increase over 2007. **Figure 28** shows the county's farmland by the type of crops or agricultural use it produces. The region is well known for its high-quality agricultural soils, which support some of the best non-irrigated farmland in the world.

Agricultural land uses are found throughout the county with large expanses in the eastern and southern areas. Growth in Lancaster County's population, which increased 26 percent from 422,822 in 1990 to 533,320 in 2014, has brought people and businesses into suburban townships and scattered residential developments which encroach upon the county's farmlands. Between 2002 and 2015, 24,185 housing units were constructed in Lancaster County of which 78 percent were within the Urban Growth Areas (UGAs). When housing units in Village Growth Areas (VGAs) are added, the total rises to 82 percent constructed within Urban and Village Growth Areas or Designated Growth Areas (DGAs) as shown in **Table 26**. The amount of acreage consumed by residential and commercial development outside the DGAs, however, continues to be a concern because a large percent the land converted to residential and retail/commercial use occurred outside the DGAs.

Figure 28:
Land in Farmland,
Lancaster County
2012



Source: LCPC

Table 26: Housing Units Built in Lancaster County, 2002–2015

<i>Location of Housing</i>	<i># Units</i>	<i>Percent</i>
Designated Growth Areas	19,795	82%
Urban Growth Areas	18,743	78%
Village Growth Areas	1,052	4%
Outside Designated Growth Areas	4,390	18%
Total Housing Units Built	24,185	100%

Source: LCPC

Soils

The quality of the county’s agricultural soils is a major environmental resource for Lancaster County. More than 50 percent of the soils are classified as prime farmland by the U.S. Natural Resources Conservation Service and 75 percent are classified as either prime farmland or soils of statewide importance (**Map 5**).

Lancaster County ranks first in the state in terms of the market value of agricultural products sold and first in terms of total market value of livestock and poultry sold¹. Farmland preservation is consistently ranked by Lancastrians as a priority for the county’s future. The productive agricultural soils found in the county provide the basis for the farmland economy and way of life. These soils are also highly suitable for development, posing a challenge to balancing future growth with a viable agricultural economy.

Steep Slopes

Topography in Lancaster County is extremely varied. The central part of the county is dominated by rolling hills with slopes that typically do not exceed 15 percent, which is ideal for farming. Steeper slopes are concentrated in the northern part of the county along the Lebanon and Berks County boundaries. Most of these slopes range between 15 to 35 percent in the northern portion of the county and exceed 35 percent in the northernmost corner of the county. Steeper slopes are also found in the southern portion of Lancaster County along the Susquehanna River and its stream valleys,

where slopes of 15 and 25 percent are common (**Map 6**). Given the challenges to agriculture and urban development presented by steep slopes, these areas support much of Lancaster County’s remaining forestlands.

Steep slopes and soils are sensitive environmental areas. Construction in these areas disturbs fragile land and can exacerbate soil erosion on hillsides and increase soil sediment deposited in streams and waterways. Aquatic species that depend on high quality water conditions are particularly sensitive to sedimentation. Protecting steep slopes and highly erodible soils prevents flooding and other problems due to slope instability. Slopes above 15 percent are generally considered steep and require precautionary measures when natural cover is removed for construction or other land uses. Slopes above 25 percent are considered severe and unsuitable for both agriculture and land development.

Natural Habitat Areas

Agriculture and urban development have replaced most of the county’s native forest cover. Yet, significant areas of woodlands remain, largely because they are unsuitable for agriculture or other land uses. Large contiguous areas or “blocks” of forests have a higher conservation value. The largest of these are found in Furnace Hills, along the county’s northern border, in the northeast and on Welsh Mountain in the eastern part of the county. Interior forests which are an important habitat for some plant and animal species have

1 2002 U.S. Census of Agriculture

Table 27 : Summary of Environmental Resources, Lancaster County

	<i>Land In Acres</i>	<i>% of Total Acreage</i>
Environmental Resources		
a. Prime Farmland Soils	337,973	58%
b. Farmland of Statewide Importance	125,166	22%
c. Steep Slopes	4,548	1%
d. Wetlands	26,600	5%
e. Floodplains	55,044	9%
Total Environmental Resources	549,331	94%
Total Land Area (Lancaster County)	582,036	100%
State-Owned Lands		
a. Gamelands	9,257	2%
b. Forests	11	0%
c. Parks	219	.04%

Source: LCPC

been greatly reduced in Lancaster County. They are concentrated in many of the same areas as the larger forest blocks. Some of the forested areas have been preserved in state parks, gamelands, and forests—including the Susquehannock State Park in southern Lancaster County and the gamelands along the northern boundary—and in county regional parks such as Chickies Rock, Speedwell Forge, and Money Rocks. The Lancaster County Conservancy has identified priority areas for preservation based on the presence of environmental features. These preservation areas are referred to as “Natural Gems” (Map 6). Table 27 shows the acreage of the environmentally sensitive and agricultural lands in Lancaster County.

In 2008, the Pennsylvania Natural Heritage Program completed an update to the Natural Heritage Inventory of Lancaster County. This update identified natural areas of the county that support plant and animal species of special concern, exemplary natural communities, and intact natural ecosystems that represent important components of Pennsylvania’s native species diversity. The Natural Heritage Inventory was a vital

activity to underpin and support development of the **Greenscapes** Plan.

Greenscapes Plan for Preservation of Natural Areas, Farmlands and Water Resources

In February 2009, Lancaster County adopted the **Greenscapes** element to its Comprehensive Plan. This element replaced and updated the Lancaster County Regional Open Space Plan that was adopted in 1992. In contrast to “gray infrastructure” which is the man-made infrastructure (roads, sewer and water systems, power transmission lines), “green infrastructure” encompasses a range of landscapes including natural areas, public and private conservation lands and private lands of conservation value. Both gray and green infrastructures play important roles in the physical and economic health of communities.

Farmland is an important green infrastructure resource that adds value to ecosystem functions such as a groundwater recharge and habitat for wildlife. Because

long-standing protections exist for farmlands in the county through agricultural zoning, the Purchase of Development Rights program and other means, the **Greenscapes** plan focuses primarily on preservation of natural lands and water resources. The plan defines a system of green infrastructure lands within the county and identifies strategies that can be used to preserve and enhance the system.

Water Resources

Water resources in Lancaster County include surface water, wetlands, 100-year floodplain areas, and hydric soils (**Map 7**). These resources provide numerous benefits such as groundwater recharge, public water supply, habitat for plants and animals, wildlife migratory corridors and opportunities for recreation.

Lancaster County is divided into 20 watersheds which drain into separate rivers or streams in the county. Ultimately, nearly all of the county's surface waters drain into the Susquehanna River, the major tributary to the Chesapeake Bay, providing over half of the fresh water in the bay. Thus, preservation of riparian buffers and measures to prevent soil erosion and other runoff from farms and urban development is of critical importance not only because of the impact on the water quality of the streams in Lancaster County, but because of its impact on the Chesapeake Bay, which is the largest estuary in the United States. While some of the waterways in Lancaster County have excellent water quality, many rivers and streams have been adversely impacted by agriculture and urban development. Approximately 689 miles of the county's waterways are on the list of impaired waters developed by the Pennsylvania Department of Environmental Protection, as required by the Clean Water Act.

As part of the 2008 update to the National Heritage Inventory of Lancaster County, the quality of the county's waterways was analyzed and classified. Waterways with the best potential water quality are generally located in southern, northern and northeastern parts of the county, where natural features such as Furnace

Hills, Welsh Mountain and the Susquehanna River Gorge are located. Waterways with the worst potential water quality are concentrated in central Lancaster County, associated with agricultural and urban uses.

In 2012, Lancaster County adopted the **Blueprints** element to its Comprehensive Plan. This element of the plan describes the county's water resources in detail and presents goals and actions for their protection.

Historic and Cultural Resources

Background

Lancaster County is known for its scenic agricultural landscapes, small towns and villages, historic urban neighborhoods, and diverse cultures that include large Amish and Mennonite communities. American Indians lived in this area for thousands of years, and the legacy of that settlement is evident in the county's archaeological heritage.

European settlers began arriving in the early 18th century. The first extensive European settlement was established here in 1710 when German-speaking Mennonites settled in the area between today's Willow Street and Strasburg. The county's oldest surviving building, the Hans Herr House, was built within that settlement. Soon after, English and Scots-Irish established their own communities. The area that became Lancaster County was part of William Penn's 1681 Charter. It was part of Chester County until May 10, 1729 when it became the fourth county in Pennsylvania.

The county is known for several transportation inventions including the Conestoga wagon and the steamboat invented by Lancaster County resident Robert Fulton. The nation's first turnpike, the Philadelphia and Lancaster Turnpike, passed through Lancaster County. It was later incorporated into U.S. 30 which extended from New York to San Francisco. Railroads came to Lancaster County in the 1830s. Today, Amtrak's Keystone Corridor passes through

Lancaster County. Lancaster County's historic resources and cultural traditions are among its greatest assets and an essential part of its identity. They form a link to the county's past, and are a vital ingredient in defining its future. Without careful efforts to protect these assets, however, historic and cultural resources can be irreparably damaged or destroyed by new commercial, retail and residential developments and transportation and other infrastructure projects. The historic character of a community can be permanently degraded if new construction is not designed and built to be context-sensitive.

The Lancaster County Comprehensive Plan and its six functional elements, including the Long Range Transportation Plan (LRTP) seek to protect and preserve this unique heritage and raise public awareness of its importance. As part of the development of **Connections 2040** in 2012 the Lancaster County Planning Commission entered into a partnership with the Pennsylvania Historical and Museum Commission (PHMC). The purpose of this partnership was to develop an improved process for identifying early in the transportation planning and project development process, important heritage conservation and tourism destination areas and other types of resources (e.g., covered bridges, mills and forges) highlighted in the Lancaster County Comprehensive Plan. A Historic and Cultural Resources Task Force consisting of LCPC and PHMC staff worked together to develop strategies and actions to protect these "treasured places." A map of these heritage resource areas is included in this LRTP Update. This **Connections 2040: 2016 Update** incorporates the resource maps and strategies that were developed through this cooperative effort. Moreover, the new statewide Transportation and Planning NEPA Forms serve to identify early in the project planning process, valued resources that may be impacted by a transportation project and seek ways to prevent or minimize adverse impacts to them.

Some of the strategies and actions under Goal E (Ensure Protection of the county's Agricultural, Natural, Historic and Cultural Resources and Environmental

Quality) are directed at protection of these heritage resources.

Types of Historic and Cultural Resources

Lancaster County's most significant historic and cultural resources can be categorized into several areas:

1. **Agricultural Landscapes.** Agricultural landscapes are an indelible part of the county's identity. They are also a major attraction for tourists, who support lodging and dining establishments and other aspects of the county's economy.
2. **Historic Villages.** Preserving the built environment in historic villages is a critical part of Lancaster County's heritage. The county comprehensive plan, municipal comprehensive plans and zoning regulations help to protect these resources.
3. **Urban Neighborhoods.** Protecting the character and structures in urban neighborhoods is equally important. Adaptive reuse of historic structures, such as tobacco warehouses in the City of Lancaster, helps to maintain the integrity of these neighborhoods and their continued role in the life of the community.
4. **Historic Bridges, including Covered Bridges.** Lancaster County has many historic bridges, including 29 covered bridges, more than any other county in Pennsylvania. The bridges are a major tourist attraction and also continue to serve a vital transportation function for farmers, rural residents and businesses. Lancaster County's Covered Bridge Protection Program uses federal Transportation Enhancements and/or other funds to identify appropriate materials and techniques for maintaining and rehabilitating these bridges. In addition LCPC staff developed interpretive signs highlighting the significance of these structures.
5. **Heritage Byways.** Throughout Lancaster County, residents have identified roadways that

are important to local quality of life—roads they would like to conserve and enhance. Lancaster County is one of only a handful of counties that has developed its own byway program. In 2013, two corridors in Lancaster County received special recognition for their historic and scenic significance: portions of PA 741 and PA 23 were designated as Lancaster County Heritage Byways by the Lancaster County Planning Commission and a portion of PA 23 was also designated as a state Scenic Byway. The designations followed several years of work and cooperation by communities along the route with professional assistance provided by LCPC staff.

6. **Tourism Destination Areas.** Heritage tourism is the practice of traveling to experience historic and cultural attractions to learn more about a community's heritage. It is an aspect of tourism that has the potential to generate revenues in a manner that is sustainable and preserves the distinctive character of local communities. The Lancaster County Tourism Plan identifies Tourism Development Areas (TDAs) in the county, but they are more appropriately called Tourism Destination Areas, since the concept is more about investing in and enhancing the assets these communities already have.
7. **High Priority Resource Types that Exist Countywide.** Some of the county's most significant historic and cultural resources are scattered throughout the county, rather than being concentrated in just a few specific communities, corridors and landscapes. These include, but are not limited to: National Register Historic Districts and sites, locally regulated historic districts, historic mills, historic cemeteries and archaeological sites.

Historic Resources Inventory

The Lancaster County Planning Commission has for many years played a role in collecting and sharing information about the county's historic buildings. In 1972, LCPC compiled **Lancaster's Heritage**, the first attempt to list the county's most significant

buildings and sites. This effort was continued by the Historic Preservation Trust of Lancaster County, which surveyed additional resources and published the results in **Our Present Past** (1985). In the early 1990s, the Trust comprehensively surveyed historic resources in several regions within the county. These survey records have been digitized and made part of the county's Geographic Information System (GIS).

LCPC has completed a comprehensive historic resources inventory, funded by a Preserve America grant, focused on fourteen Lancaster County boroughs. Data for this inventory is accessible to the public through a web application.

Historic/Cultural Resources Review as part of the NEPA Process

The MAP-21 and FAST Act legislation establish formal consultation requirements for MPOs and state DOTs to work with environmental, regulatory, and resource agencies in the development of long-range transportation plans (discussed in more detail at the end of this Chapter). Successful use of the NEPA process depends on early and continuous involvement of environmental, regulatory, and resource agencies. Early participation provides an important opportunity for environmental, regulatory, and resource agency concerns to be identified and addressed early in the process, such as those related to permit applications.

Energy Use, Air Quality/GHG Emissions and Transportation Planning

Lancaster County's efforts to create better connections between transportation and land use planning and invest in smart growth transportation projects, hold great potential to improve energy-efficiency, air and water quality and reduce global greenhouse gas (GHG) emissions in the county.

Energy Consumption

Nationwide, transportation accounted for over 67 percent of the petroleum consumed in the United

States in 2012. Within transportation, the overwhelming majority of petroleum, 85 percent, is consumed by highway vehicles. In Lancaster County, 88 percent of workers use private automobiles to commute to and from work and 90 percent of freight moves by truck on highways. Vehicle registrations in the county increased at about the same rate as the population (about 1 percent per year) as illustrated in **Figure 29**. Travel, measured in Daily Vehicle Miles of Travel (DVMT) has also increased at about 1.1 percent annually or 10.7 percent from 2002 to 2012. If this rate of growth continues, DVMT will reach 15,226,309 in the year 2040, a 34 percent increase over 2010 levels. This will strain the capacity of the county’s roads and lead to increased levels of congestion, especially on major travel corridors

Since there is inadequate funding available to construct new roads or undertake major expansions of existing roads, Lancaster County is responding by applying “smart transportation” principles and investing in transportation projects and strategies that seek to maximize the efficiency of the existing infrastructure and provide alternatives to travel by single-occupant

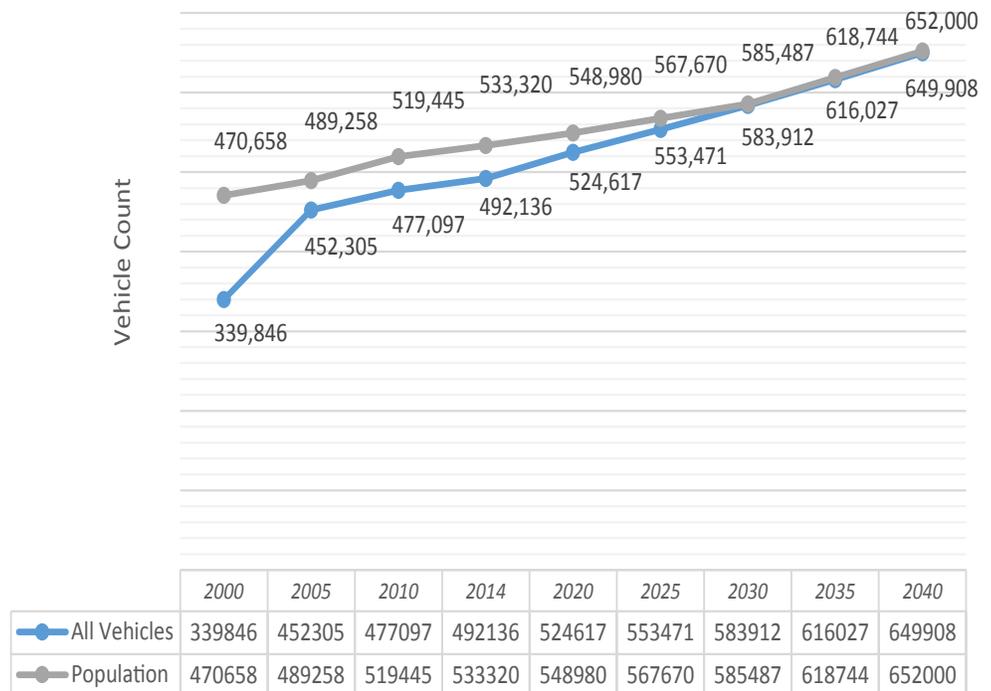
automobiles. This focus on transportation systems management is integral to Lancaster County’s success in reducing energy consumption in transportation while maintaining high levels of mobility.

Travel by transit, intercity passenger rail, carpool and vanpool, walking and bicycling, is more energy-efficient than travel by single-occupant auto. Shipment of freight by rail or intermodal shipments that use rail and truck in combination offer significant energy-efficiencies over shipment by truck alone. Transportation planning and investments in Lancaster County that improve the infrastructure for these modes and for smart growth transportation projects will provide energy, environmental and quality of life benefits.

Air Quality Conformity and Greenhouse Gas Emissions

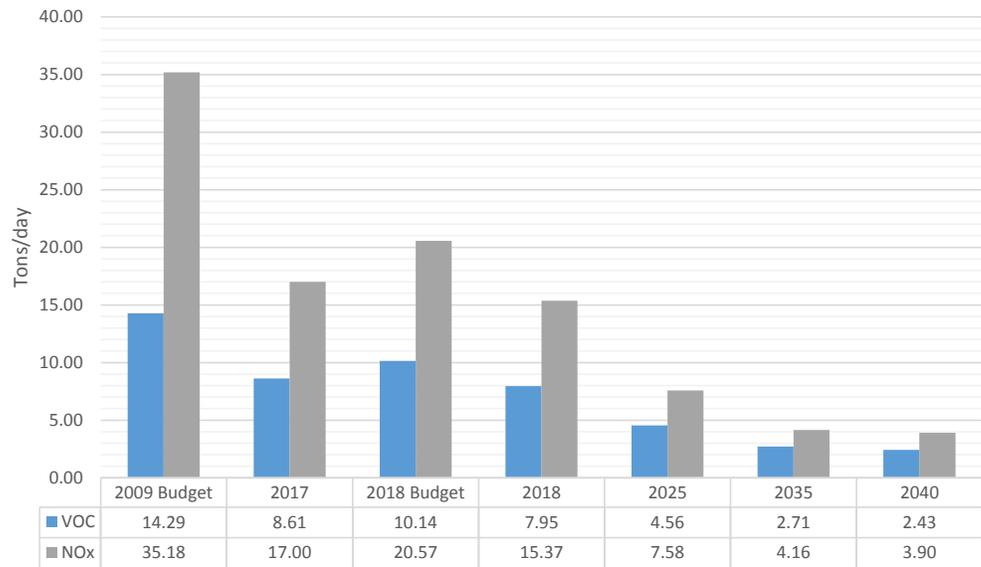
Energy use in transportation directly impacts emissions of air pollutants and global greenhouse gases. Transportation is responsible for over half (56 percent) of the carbon monoxide (CO) and oxides of nitrogen (NOx) emissions, the major components of ozone “smog” pollution. Transportation also accounts

Figure 29:
Projected Growth in Vehicle Registrations and Population Compared, Lancaster County



Source: LCPC

**Figure 30:
Ozone Emissions
Analysis and
Conformity, Test for
2017 LRTP and TIP
(summer weekday)**



Source: Air Quality Analysis for 2017-2020 TIP

for one-third of all carbon dioxide (CO₂) emissions, the predominant global greenhouse gas, in the United States. Three major transportation strategies are recognized by which transportation-related air pollutants and greenhouse gas emissions can be reduced:

1. Improve the fuel economy of vehicles manufactured in the U.S.;
2. Reduce the carbon content of the fuel; and
3. Establish better linkages between land use and transportation to create more walkable, bikeable, transit-friendly communities.

Action on the first two strategies occurs at the federal and state levels of government. Regional and local transportation plans can have the most significant impact on the third strategy—linking transportation and land use planning. This strategy is crucial because research indicates that growth in vehicle miles of travel is projected to offset the gains made through technological improvements to vehicles and fuels. In other words, unless we change the way our communities are designed to make them more supportive of walking, bicycling and transit, energy consumption and greenhouse gas emissions will continue to rise.

Lancaster County is a non-attainment area for the federal 2008, 8-hour ozone standard as are many other southeastern Pennsylvania counties. Lancaster County is a maintenance area for federal standards for particulates (the 1997 annual and the 2006 24-hour PM 2.5 standards). On December 18, 2014, the Environmental Protection Agency (EPA) issued final designations for the 2012 annual PM 2.5 standard and Lancaster County is in attainment of this standard. The Clean Air Act Amendments of 1990 (CAAA) required transportation improvement programs (TIPs) and Long-Range Transportation Plans (LRTPs) to undergo an air quality conformity determination. Pollutants that must be addressed include volatile organic compounds (VOCs) and nitrogen oxides (NO_x) for ozone and direct PM 2.5 and NO_x for fine particulates. Lancaster County must demonstrate through modeling that its program of transportation investments will not result in a deterioration of air quality in the county.

The ozone conformity test must demonstrate that future year emissions are not greater than the Motor Vehicle Emissions Budgets (MVEBs) established in the state maintenance plan (SIP). Lancaster County has an approved MVEB for ozone pollutants under the 1997 8-hour Ozone air quality standard, using

the MOVES model. PM 2.5 particulates can be the result of either direct or indirect emissions. The EPA requires that for direct emissions, vehicle exhaust and brake/tire wear emissions be included in the analysis. For indirect emissions, only NOx must be examined at this time.

Under the modeling conducted, the ozone emissions (VOCs and NOx) for 2017 were found to be lower than the 2009 emissions budget of 14.29 tons/day. Ozone emissions projected for 2018, 2025, 2035 and 2040 were also found to be lower than the 2018 emissions budget, as shown in **Figure 30**. Thus, Lancaster County's TIP and LRTP "passed" the ozone air quality test for all the years modeled. The particulate emissions for 2017, 2025, 2035 and 2040 conform with the applicable MVEBs for PM 2.5 and for NOx. Emissions of ozone and particulates are expected to decline significantly by 2040 over 2017 levels.

Smart growth transportation investments, linked to land use planning, will need to play a larger role in transportation planning and funding if Lancaster County is to grow and remain within its mandated air emissions budgets. Well-planned mixed-use developments in designated growth areas, supported by infrastructure and facilities to encourage greater use of bicycling, walking and transit, can play an important role in reducing the number and length of auto trips that are made in the county in future years.

Nationwide research on land use and driving show that compact development has the potential to reduce the need to drive by 20–40 percent, compared with dispersed development where homes are distant from workplaces, schools and other destinations. The benefits of compact development and smart growth transportation extend beyond energy savings. Other benefits include improved health from increased physical activity through bicycling and walking, preservation of farmland and natural areas and protection of water quality. There are also social justice benefits for lower income individuals and families who own fewer cars and are more dependent on alternative modes of travel.

Land Use Management

Existing development patterns are the result of zoning and land use decisions made by local governments. Lancaster County's growth management program is intended to provide guidance for local land use decisions and the LCPC continues to work cooperatively with municipalities to update and improve municipal ordinances. As an example, many of the municipalities have Designated Growth Areas (DGAs) coupled with effective agricultural zoning. Some municipalities have adopted innovative overlay zones such as Lititz Borough's Traditional Neighborhood Development (TND) overlay district and Downtown Overlay District and West Lampeter's Neighborhood Option, which provide flexibility and promote design that encourages walking and use of transit. In some cases, however, municipal land use ordinances are not fully consistent with the county's growth management program. For example, large lot residential development is allowed in some rural parts of the county. This type of scattered rural development does not support the public's strongly stated desire to preserve agriculture and other rural resources.

Balance – The Growth Management Element of the Comprehensive Plan

To manage the impacts of rapid growth and suburbanization in the county, the LCPC initiated a growth management program in 1993 and updated it in 1997 and 2006. The most recent update is referred to as **Balance** and is a key element of the Lancaster County Comprehensive Plan. The growth management program seeks to direct most growth to DGAs where roads, utilities, and services already exist, while maintaining the traditional agricultural uses and natural resources outside of DGAs that define Lancaster County's rural character. Lancaster County's growth management strategy has evolved into a tailored approach to land development and preservation in designated Urban and Rural Resource Areas. **Map 8** shows the adopted Growth Management Framework. The three major components of **Balance** are an Urban Growth Area Strategy, a Rural Strategy, and an Implementation Plan.

Urban Growth Area Strategy

Lancaster County's strategy for Urban Growth Areas (UGAs) is to focus growth in areas with existing roads and services or in areas where services are anticipated. The strategy includes increasing the proportion of residential development in UGAs to 85 percent of the total number of new units constructed in the county, increasing the density of new development in UGAs to an average of 7.5 dwelling units/net acre, and improving the character and form of new development in UGAs.

Rural Strategy

The Rural Strategy designates Agricultural Areas, Agricultural with Natural Areas, Natural Areas, and Rural Centers within which rural resources, character, and way-of-life are sustained. Rather than allowing development to occur in a scattered pattern throughout rural Lancaster County, **Balance** calls for development outside of UGAs to be directed to Rural Centers, including Village Growth Areas (VGAs) and Crossroads Communities. VGAs are presently designated through municipal and multi-municipal planning processes while Crossroads Communities are a new type of Rural Center called for by **Balance**. Another objective of the Rural Strategy is to maintain the viability of the rural economy, which includes activities such as agriculture and forestry that are dependent on rural resources or land use.

Implementation Plan

The Implementation Plan contained in **Balance** includes a County Action Program, Smart Growth Funding Program, Smart Growth Toolbox, and Monitoring Program. The Smart Growth Toolbox describes the most innovative and effective policy, regulatory and capital investment tools available to municipalities and Lancaster County to implement the Growth Management Element. It includes transportation-related tools such as transit-oriented development, strategic infrastructure investments (e.g., road and bridge improvements), coordinated land use and transportation corridor planning, and context-sensitive design standards.

MAP-21 and FAST Act Requirements for Environmental Review

The Moving Ahead for Progress in the 21st Century (MAP-21) legislation and the newer Fixing America's Surface Transportation Act (FAST Act) establish formal consultation requirements for MPOs and state DOTs to employ with environmental, regulatory and resource agencies in the development of Long-Range Transportation Plans. Transportation plans must include "discussion of types of potential environmental mitigation activities and potential areas to carry out these activities" and the discussion must be developed in consultation with Federal, State, and Tribal land management, wildlife, and regulatory agencies. In addition, MPOs are to consult, as appropriate, with State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of a long-range transportation plan. This consultation will involve, as appropriate, comparison of transportation plans with State conservation plans or maps, if available, or comparison of transportation plans to inventories of natural or historic resources, if available. MAP-21 revised aspects of the environmental review process for highway and transit projects that must undergo an Environmental Impact Statement (EIS) with amendments to 23 USC Section 139 (the Federal-Aid Highway law) and Section 1319 of MAP-21. The new guidance expands the definition of "lead agency" or "lead agencies" to refer to a "collaboration among all joint lead agencies (not only FHWA or FTA) when making decisions or performing tasks..." The Guidance also provides further definition of the terms "cooperating agency" and "participating agency."

Appendix A to Part 450 of the Highway Code of Federal Regulations (23 CFR) provides additional information to explain the relationship between transportation planning and the project development/NEPA process. This information is non-binding on the MPO and the

state but is intended to provide guidance on ways to enhance the transportation planning process relative to public involvement and consideration of environmental, natural resource and other factors. Appendix A notes that environmental analyses to meet the NEPA requirements have often been disconnected from analyses used to develop Long-Range Transportation Plans and TIPs. This can result in development of information in the NEPA process that would have been better developed earlier in the planning process and prevented duplication of work and potential delays in a project.

PennDOT responded to this federal guidance by developing a Linking Transportation and NEPA process, that includes forms to be used in the identification and planning of new transportation projects. MPOs have been working with this process and the forms for several years now and LCTCC has found them helpful in identifying, early in the planning process, environmental, historic and/or cultural resources that may be adversely impacted by a proposed project. This early identification leads to discussion and resolution of these issues so that a project is not held up in later planning or implementation phases. For this plan update, LCTCC made the LPN Form 1 available to municipalities and other interested parties for identification of transportation problems. These were reviewed and considered in the development of the update and the TIP.

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Chapter 5

Public Participation

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Public Participation Summary

The projects and policies of the LRTP are developed with participation of the public through a process defined by the federal policies in the MAP-21 and FAST Act legislation and the Statewide Transportation Planning and Metropolitan Transportation Planning Regulations. More specifically, the Lancaster County MPO has a Public Participation Plan, adopted in April 2012 with technical corrections made in September 2014 and 2016, which guides the involvement of the public in the development of the MPO's transportation planning products and processes.

The plan is based on several major principles:

- Early and continuous involvement;
- Reasonable public availability of technical data and other information;
- Collaborative input on alternatives, evaluation criteria, and mitigation needs;
- Open public meetings where matters related to transportation policies, programs, and projects are being considered; and
- Open access to the decision-making process prior to closure.

The Lancaster County LRTP update should be viewed as an ongoing process as well as a formal planning document. For this update, the process was guided by the Transportation Technical Advisory Committee (TTAC) whose members represent a wide range of interests in Lancaster County. Public input was also obtained through public surveys, meetings with certain stakeholder groups such as the Amish community and a 30-day public review and comment period and a public forum on the draft plan. The 2016 LRTP Update is a "strategic update" of the 2012 LRTP. The vision, goals and strategies the 2012 LRTP were reexamined and reconfirmed and updates were made to charts, tables and text using data from the U.S. Census, 2010–2014 American Community Survey and PennDOT 2014 Asset Management and highway data. The public involvement approaches that were involved in **Connections 2040: 2016 Update** are highlighted below.

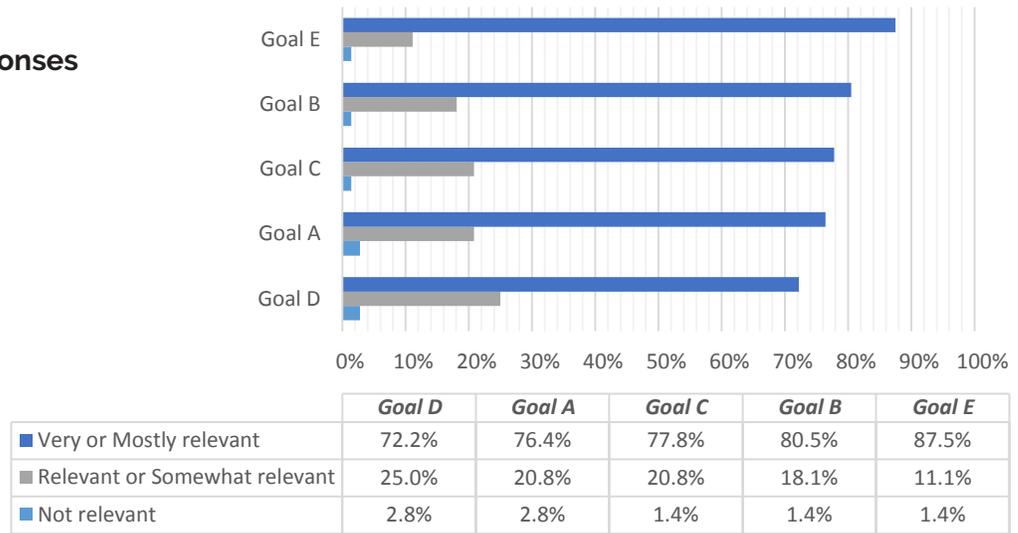
Transportation Technical Advisory Committee (TTAC)

The TTAC is a 19-member advisory body responsible for providing technical guidance to the Lancaster County MPO. Beginning in 2016, the TTAC began meeting monthly (rather than every two months) to consider and make recommendations to the MPO policy committee on matters related to transportation policy and the programming of projects that involve state and federal funds. The TTAC is composed of members from the Lancaster County Planning Commission, modal operators such as RRTA, the business and finance community, other local stakeholder groups representing environmental issues and persons with disabilities. State partners, such as the PennDOT Central Office and District 8-0 are also TTAC members. One of the TTAC's primary responsibilities involves maintaining and updating the county's Long-Range Transportation Plan and for this LRTP Update the committee served as the LRTP Update Task Force. Members of the LCPC Transportation Planning Division provided updates to the TTAC at major milestones during the plan update process.

Public Surveys

A transportation survey developed by the State Transportation Commission asked people throughout the state to rank their priorities for investment of state transportation dollars. Over 300 Lancaster County residents took the state survey. In addition, an online survey was developed by LCPC to obtain public opinion on the relevance of the five goals in the 2012 LRTP and the performance of transportation facilities in the county. The survey was posted on the LCPC website, from October–December 2015. A Spanish language version of the survey was distributed to organizations that work with the county's Hispanic population for completion from December 2015–February 2016. Municipal officials, stakeholder groups and citizens were contacted by email to make them aware of the survey and encourage them to complete it. A total of 72 Lancaster citizens took the survey (online and Spanish language). As part of the Lancaster

**Figure 31:
Transportation Survey Responses
(N=72)**



Source: LCPC

County Comprehensive Plan update, an online survey asked citizens to identify measures they would use to improve the appearance and efficiency of major travel corridors in the county.

State Transportation Commission Survey

The results for Lancaster County residents on the State Transportation Commission survey show that respondent’s highest priorities for investment of state transportation dollars are: road pavement improvements (21%), bridge repair and replacement (15%) and public transit (15%). Other priorities were: safety (12%), mobility (12%) and pedestrian and bicycle facilities (12%). The lowest priorities were freight (6%) and aviation (3%).

Lancaster County MPO Transportation Priorities Survey

A total of 59 people took the LCPC online survey on the relevance of the goals in the 2012 LRTP and rating of the county’s transportation facilities. The results reaffirmed the relevance of the goals: Goals A, B, C and E were each rated as either very relevant or mostly relevant by over 80 percent of the respondents and 74 percent rated Goal D as either very relevant or mostly relevant. The other respondents rated the goals as either relevant or somewhat relevant. The survey offered respondents an opportunity to write comments and nine people submitted comments. The most frequently mentioned topics that citizens raised were the need to improve pedestrian and bicycle facilities

and to manage growth at levels that can be sustained by the transportation system. A Spanish language version of the survey was distributed to churches and organizations that work directly with the county’s Hispanic community. Thirteen surveys were completed and also showed strong support of the plan’s goals.

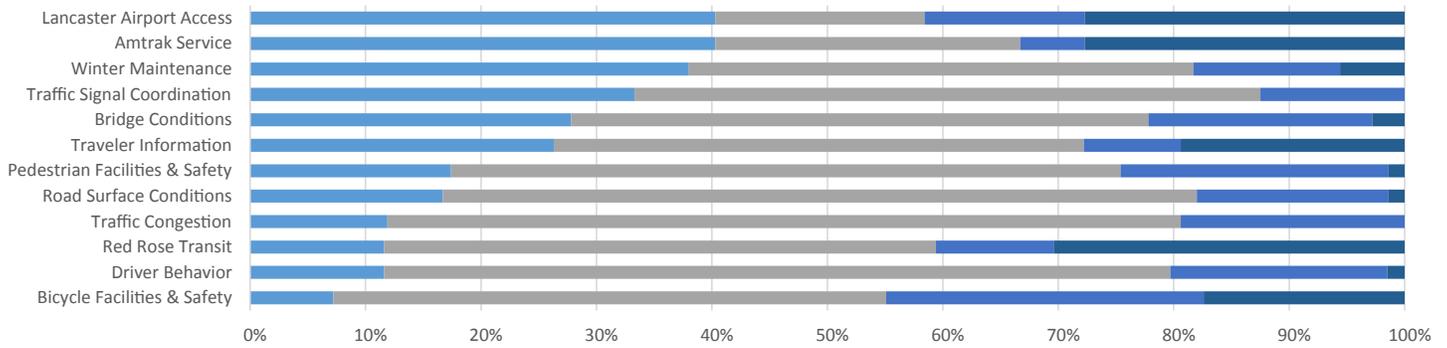
Figure 31 shows the combined results of the online and Spanish surveys.

County Transportation System “Report Card”

The survey also asked the public to rate the performance of various parts of the transportation system, giving each one a letter grade, as in a report card: A=Excellent; B=Good; C=Acceptable; D=Fair; E=Poor and F=Don’t Know.

The highest ratings of Excellent or Good on the online survey were given to Amtrak service, access to the Lancaster Airport and winter road maintenance. Traffic signal coordination, traveler information and bridge conditions also received strong ratings. Aspects of the transportation system that were rated lowest in performance (highest “poor” ratings) were bicycle facilities/safety, pedestrian facilities/safety, traffic congestion and driver behavior. On the Spanish survey, the highest ratings were given to traffic signal coordination, bridge condition and pedestrian facilities and safety. The ratings, combined with other input the MPO has received, suggest that Lancaster citizens would like to

Figure 32:
Quality of Transportation Facilities in Lancaster County (N=72)



	Bicycle Facilities & Safety	Driver Behavior	Red Rose Transit	Traffic Congestion	Road Surface Conditions	Pedestrian Facilities & Safety	Traveler Information	Bridge Conditions	Traffic Signal Coordination	Winter Maintenance	Amtrak Service	Lancaster Airport Access
■ Excellent-Good	7.2%	11.6%	11.6%	11.9%	16.7%	17.4%	26.3%	27.8%	33.3%	38.0%	40.3%	40.3%
■ Acceptable-Fair	47.9%	68.1%	47.8%	68.7%	65.3%	58.0%	45.9%	50.0%	54.2%	43.7%	26.4%	18.1%
■ Fair	27.5%	18.8%	10.2%	19.4%	16.6%	23.2%	8.4%	19.4%	12.5%	12.7%	5.6%	13.9%
■ Don't Know	17.4%	1.5%	30.4%	0.0%	1.4%	1.4%	19.4%	2.8%	0.0%	5.6%	27.7%	27.7%

Source: LCPC

see greater investment in non-motorized travel which would help alleviate traffic congestion and contribute to improved air quality and health. **Figure 32** shows the results of the report card. More details on the results of both surveys are found in **Appendix C** of the plan.

Corridors Survey

In another online survey, citizens were asked to identify measures they would use to improve major corridors in the county. A total of 132 citizens responded. **Appendix C** of the plan provides more details on this survey.

Special Groups

In addition to outreach to the general public, the planning process included outreach to various user groups including the Amish, the business community, and the Hispanic community. The results of these outreach efforts are summarized in the following subsections.

Amish Community

LCPC planning staff met with members of the Amish Safety Committee to obtain their perspective on transportation issues and concern to the Amish community. Lancaster County’s Amish population, estimated at about 31,000, is a distinct user group of the county’s

transportation system and presents unique considerations in system design and operation. For example, traffic signal sensors at intersections do not detect the presence of horse and buggies. Video detection systems have been installed at some intersections that experience significant Amish buggy traffic that can signal the presence of these non-motorized vehicles. Lancaster County is the location of nearly half of all crashes that involve horse and buggies in Pennsylvania.

The Amish Safety Committee was provided with information about TIP projects that would benefit buggy travel on PA 23, PA 896 and some other routes. The following projects have been mentioned of particular concern to them:

- Width of shoulders: Buggy lanes/shoulders on a busy highway should be 8 feet wide (a buggy is 6 feet wide). PennDOT recommended shoulder widths are 6 feet wide.
- Improved shoulders are needed on PA 772 (north of U.S. 30), PA 896, south of Strasburg to U.S. 10 and PA 372 between Quarryville and PA 272 to accommodate buggy traffic.
- Crossings at Intersections: Video detection at signalized intersections represents a good

solution since buggies are generally not heavy enough to be detected by normal traffic detection loops. The committee supports installation of video detection at most signalized intersections in the eastern part of the county on PA 23, PA 340, US 30, and PA 741.

More education is needed among the Amish community as to the extent and availability of both fixed route and shared-ride public transportation services.

Business Community

A safe, multimodal transportation system is vital to the economic health of the county and its ability to retain existing businesses and attract new ones. Because of the importance of transportation infrastructure, the Lancaster County Chamber of Commerce and Industry established a Transportation Task Force that developed a 25-year Vision for the county's transportation system and a strategy to build consensus around priority projects that have the greatest positive long-term impacts. The Chamber's mission is to "build Lancaster County into a model of prosperity for 21st Century America." The 25-year transportation vision is: "Moving and connecting people and goods efficiently and responsibly within the county, across the state and throughout the world." The vision centers on five core strategies: 1) innovation through new technologies and new modes of transportation; 2) integration of a multi-modal network; 3) interconnection of modes 4) improvement of the existing network with attention to capacity-adding projects and 5) investment to maintain the existing system and add capacity where needed. The Vision has policy recommendations and specific capital project recommendations. Short-term recommendations include: Route 30 East (896 to 41), Harrisburg Pike (from Lancaster City to East Hempfield Township), North/South Routes (Lititz, Oregon, Manheim and Fruitville Pikes) and Centerville Road. Long-term recommendations include: continued system preservation and signal improvements, Route 23 improvements (and possibly a bypass) and Regional and High Speed Rail. The Chamber's transportation vision statement is included in **Appendix C**.

Hispanic Community

One of the planning principles of the federal MAP-21 and FAST Act laws involves the incorporation of Environmental Justice (EJ) issues as part of the public participation process in order to assure "full and fair participation by all potentially affected communities in the transportation decision-making process."

As part of this plan update process and consistent with recommendations from the MPO's most recent federal certification review, the MPO made an effort to reach out to the Hispanic community as a specific transportation user group in providing input on the plan direction. With a 2014 population of 48,984, the Hispanic community constitutes Lancaster County's largest and fastest growing minority group, making up 9 percent of the county's population and outnumbering Blacks by more than two to one. Many Hispanics have come to the United States in search of a better life and transportation is an important factor in being able to access jobs. Many lack cars and depend on public transportation systems. Here, in Lancaster County, they use RRTA's bus services and participate in employer-sponsored ride-sharing programs.

Public Comment Period

The public comment period ran from May 1, 2016–May 31, 2016. A public meeting was held on May 19, 2016 from 4:00–7:00 p.m. at the Lancaster County Office Building, 150 N. Queen Street, Lancaster, PA. Fourteen people attended the meeting including representatives of the Lancaster County Board of Supervisors and the state legislature, environmental and health organizations and other interested citizens. LCPC staff used map displays and other materials to respond to questions about the LRTP and projects on the FY 2017–2020 TIP. LCPC staff also responded to questions and comments that were filled out on forms at the meeting or that were received by e-mail during the month of May. **Appendix D** presents the public comments received on the draft **Connections 2040: 2016 Update** and the FY 2017–2020 TIP.

Chapter 6

Vision, Goals, Strategies and Performance Measures

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TRANSPORTATION VISION STATEMENT

“Lancaster County will have a transportation system that meets the needs of the 21st Century. A truly multimodal system will operate to move people and goods safely and efficiently throughout Lancaster County and promote health and wellbeing. The system will support the communities’ goals to balance the needs of a growing community and economy with the goal to protect and preserve the rural and agricultural resource areas. The physical and economic environments of Lancaster County will be supported by a framework of transportation alternatives. Mobility and access will be maximized by a balanced system of roadway networks, transit, rail freight, pedestrian, and bicycle modes.”

Goals/Strategies

Connections 2040: 2016 Update is directed by a Vision Statement that outlines a preferred future for Lancaster County’s transportation system. The Vision Statement is supported by a series of goals, which are supported by strategies. This section presents each of the LRTP’s five goals and the strategies to achieve the goals.

Goal A: Target transportation investments to support the Lancaster County Comprehensive Plan Vision and Goals, and the county’s Growth Management Plan.

The Lancaster County Comprehensive Plan is designed to promote managed growth that sustains the local economy, improves environmental quality, and enhances quality of life. As defined in **Balance**, the Growth Management Element of the Lancaster County Comprehensive Plan, the intent is to revitalize Lancaster City and the boroughs by directing growth to Urban Growth Areas while maintaining the viability of the agricultural economy and natural resources in Rural Areas.

Transportation investments play an important role in implementing the Growth Management element by influencing patterns of growth, development, and land preservation consistent with smart growth principles. Participants in the LRTP process have consistently

emphasized the need to coordinate land use and transportation.

The Strategies to achieve Goal A are:

- **Strategy A-1:** Refine a transportation investment prioritization process to support land use goals.
- **Strategy A-2:** Target transportation investments to support appropriate growth and development of Urban Growth Areas (UGAs).
- **Strategy A-3:** Ensure that transportation projects and programs in Designated Rural Areas support rural land uses, safety and mobility.
- **Strategy A-4:** Encourage transit-oriented development.
- **Strategy A-5:** Continue to implement a Lancaster County Smart Growth Transportation Program.

Goal B: Maintain and improve the county’s multimodal infrastructure and services to provide an acceptable level of service.

The Lancaster County MPO, like PennDOT and other MPOs and RPOs in Pennsylvania, has for many years made preservation of the existing system rather than new construction its highest priority. The 2016 LRTP continues this priority. To achieve this, the county has embraced an approach to mobility that calls for

investments to make the transportation system operate more efficiently, including investments in pedestrian and bicycle infrastructure and transit. Lancaster County's Smart Growth Transportation Program makes investments in projects located in Designated Growth Areas that will promote quality of life and alternatives to solo driving.

Red Rose Transit Authority (RRTA) is Lancaster County's primary provider of public transportation service. RRTA completed an update to its Strategic Long Term Transit Plan that included recommendations for short-term, mid-term and long-term policies and actions to increase efficiency and improve service delivery through changes to its routes and operations.

Improvements to Amtrak's Keystone rail corridor resulted in higher train speeds and more comfortable service. In addition, all three rail stations in Lancaster County have undergone major improvements to make them more attractive to rail users. As a result, rail ridership in the county rose 65 percent between 2005 and 2014. Lancaster County also participates in a multi-county program, Commuter Services of Pennsylvania, to promote ridesharing for commuters. Over 40 Lancaster County employers actively participate in the program. The county participated in the development of a multi-county study, the Regional Transit Coordination Study, completed in September 2011, which examined major commute corridors between the South Central Pennsylvania counties and opportunities to create better connections between the transit services provided by the various county transit agencies.

Many of the municipalities in the county have made and continue to make investments in bicycle and pedestrian infrastructure to increase the use of these energy-efficient modes. New multi-use trails such as the Northwest River Trail along the Susquehanna River, the Ephrata to Lititz Trail, the Enola Low Grade Trail and others have been constructed. An Active Transportation Plan that will serve as the update to the county's Bicycle and Pedestrian Plan is in progress.

Opportunities to promote intermodalism in freight operations to reduce the number of heavy trucks travelling on highways in the county are also supported by the public and part of Goal B.

Five strategies have been developed to support achievement of this goal:

- **Strategy B-1:** Maintain and improve highways and bridges on a regular maintenance cycle.
- **Strategy B-2:** Plan for strategic capacity improvements that support economic development and system connectivity.
- **Strategy B-3:** Improve transit services and programs through support of RRTA's long-range plan.
- **Strategy B-4:** Improve intermodal connections between highway, transit, air, rail and non-motorized modes.
- **Strategy B-5:** Support improvements to the county's passenger and freight rail and airport infrastructure.

Goal C: Improve safety and security for all users of the transportation system.

The U.S. Department of Transportation recognizes safety as its top priority and safety is a leading factor in all aspects of transportation planning and implementation in Lancaster County. The passage of MAP-21 included dedicated funding for safety-related projects through the Highway Safety Improvement Program. The FAST Act continues this program.

Transportation safety and security entails more than just highways and includes transit, rail, freight and bicycle and pedestrian planning and project implementation. Yet, it is the county's highway network that is responsible for the majority of the county's mobility and where much of the safety funding has been directed.

A total of 5,339 crashes occurred on the county's road network in 2014. While this was a decline from 5,875 in 2007, it was the second highest level in the 2010–2014 period. Bicycle and pedestrian crashes have increased

slightly, which may be a result of the greater number of people using these modes. These statistics suggest that continued efforts to improve safety for all users must remain a high priority in transportation planning and investment.

The LRTP includes five strategies to achieve this goal:

- **Strategy C-1:** Reduce the number of crashes and fatalities.
- **Strategy C-2:** Improve and maintain shoulders on the county's road network to accommodate all users.
- **Strategy C-3:** Support safety education programs for all transportation modes.
- **Strategy C-4:** Work with PennDOT and emergency responders to make the transportation system safer and improve response time.
- **Strategy C-5:** Develop safe and convenient bicycle and pedestrian facilities and infrastructure.

Goal D: Manage and operate the transportation system to reduce congestion.

Pennsylvania's Act 89, enacted in 2013 and the federal FAST Act, enacted in 2015, provided new revenues for state, county and local highway, bridge and other surface transportation projects. For Lancaster County, the Act 89 legislation provided an additional \$65 million over four years in formula funding. Even with Act 89 and funding that will be provided by the FAST Act, the county's transportation infrastructure needs exceed available funding and Lancaster County will continue to rely on a range of congestion mitigation measures to maintain acceptable levels of transportation service. Goal D of the LRTP addresses the operational aspects of the system and ways that the system's performance can be enhanced through management and operational improvements. Three strategies are included in the LRTP to achieve this goal:

- **Strategy D-1:** Implement the Regional Operations Plan and implement Intelligent Transportation Systems (ITS) technologies.

- **Strategy D-2:** Improve the operation of highway intersections through the addition of turning lanes, geometric and traffic signalization improvements.
- **Strategy D-3:** Plan for, implement and promote alternatives to single-occupant vehicle use.

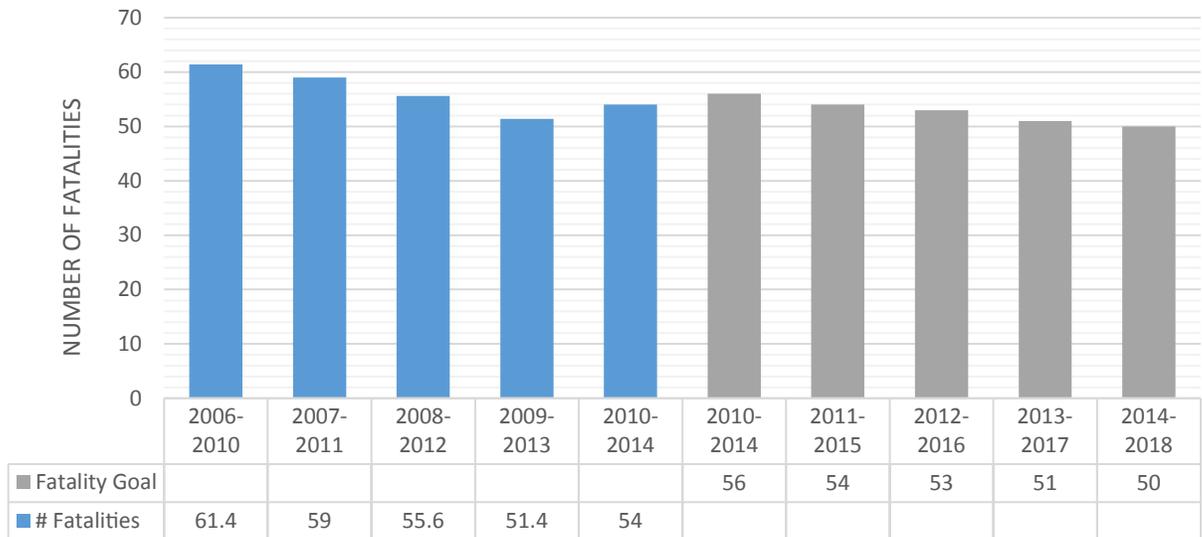
Goal E: Ensure that transportation investments address protection of the county's agricultural, natural, historic, and cultural resources and environmental quality.

Lancaster County is rich in natural, cultural, and historic resources that contribute to the county's quality of life, character, and sense of place. Lancaster County's productive agricultural soils support some of the world's best non-irrigated farmland. Other important natural resources include woodlands, habitat for plant and animal species, steep slopes and environmentally sensitive lands, and river and stream corridors. Water quality is an especially important issue because the county lies within the Chesapeake Bay watershed. The **Greenscapes** element of the county comprehensive plan defines a vision, strategies, and tools to preserve and enhance natural resources in the county.

Lancaster County also has a rich legacy of heritage resources that include historic buildings, historic sites, districts and landscapes and archaeological sites. The Cultural Heritage element of the Lancaster County Comprehensive Plan establishes a plan for action at all levels of government and across all sectors of the community to identify and preserve, the county's historic and cultural resources. In addition, the Strategic Tourism Development element emphasizes the importance of maintaining a healthy and sustainable tourism industry. Changes that were made to the 2012 LRTP to strengthen protection of heritage resources in the county and to make the terminology in the LRTP consistent with that used in other elements of the Lancaster County Comprehensive Plan are continued in this 2016 LRTP update.

Transportation investments can significantly impact critical resources, both as a direct result of construction

Figure 33:
Five Year Averages of
Fatalities, Lancaster County



Source: PennDOT Safety Report

and through the indirect effects of growth induced by mobility improvements. These impacts can be experienced in rural areas with agricultural and natural resources as well as in established communities with their historic architecture and traditional development patterns.

The county’s partnership with the Pennsylvania Historical and Museum Commission during the 2012 LRTP Update and the use of PennDOT’s Linking Planning and NEPA forms have helped to establish a process for early identification of critical historic, cultural and natural resources that may be adversely impacted by proposed new transportation projects. Lancaster County’s transportation network also impacts other aspects of the environment such as air and water quality, energy use and emissions of global greenhouse gases.

Four Strategies are included in the LRTP to implement this goal

- **Strategy E-1:** Apply transportation design standards that incorporate context-sensitive solutions into projects.

- **Strategy E-2:** Meet federal air quality conformity standards with updated LRTPs and TIPs.
- **Strategy E-3:** Further incorporate the NEPA process into project planning and design for early awareness of potential impacts and understanding of issues.
- **Strategy E-4:** Coordinate transportation planning and investment with preservation and conservation of heritage resources in the county comprehensive plan.

Performance Measures

The MAP-21 legislation and the FAST Act require states and MPOs to incorporate performance measures into their long-range transportation plans to measure how well state and MPO goals and strategies are being achieved. PennDOT developed a number of safety, infrastructure, congestion and transit performance measures that have been part of the state’s transportation planning process and its work with MPOs and RPOs for many years. Other measures are being developed in response to federal legislation. When they are finalized, the Lancaster County MPO will work with PennDOT to include them in its planning work. PennDOT’s existing performance measures have been

incorporated by the Lancaster County MPO into its long-range transportation planning process and the goals and strategies in **Connections 2040: 2016 Update** are designed to achieve the performance measures and specific performance targets that PennDOT has set for Lancaster County.

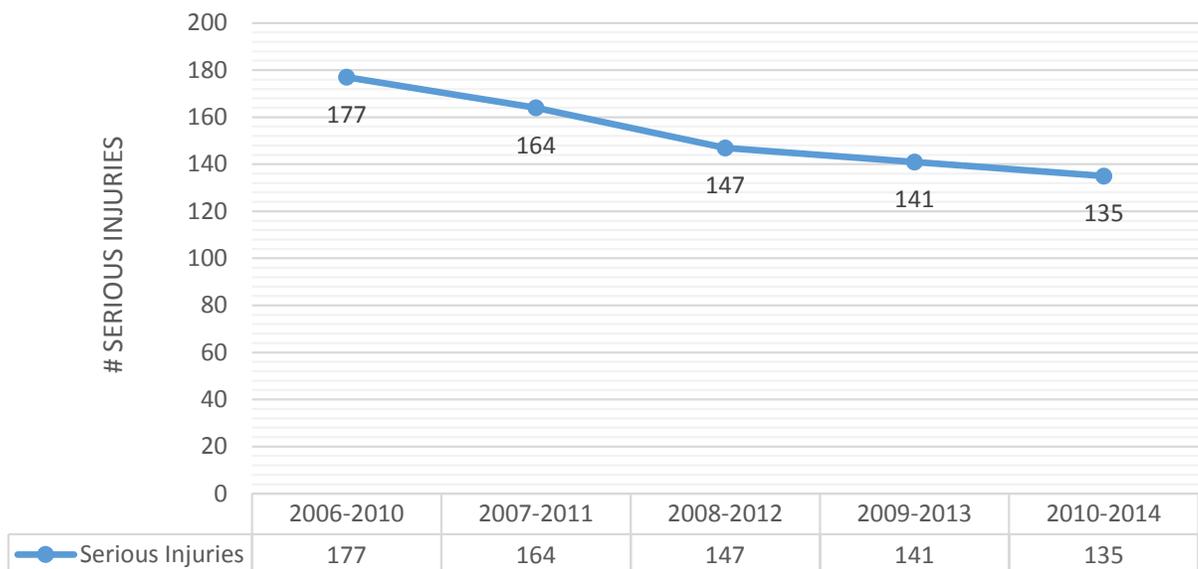
Safety Measures

The statewide safety goal is to “reduce average fatalities and serious injuries by 50 percent over the next two decades.” The goals and strategies in **Connections 2040: 2016 Update**, particularly Goal C, “improve safety and security for all users of the transportation system,” are designed to support PennDOT’s safety performance measures. One of the safety measures is the Five-Year Average of Fatalities. Specific targets for reduction in fatalities have been established for Lancaster County. Lancaster County’s five year average of fatalities dropped from 61.4 fatalities in the 2006–2010 period to 54 fatalities in 2010–2014, a 12 percent decrease, and a level that is below the target set by PennDOT for 2010–2014, as shown in **Figure 33**.

Another PennDOT safety performance measure is the Five Year Average of Serious Injuries. In Lancaster County, the number of serious injuries dropped from 176.6 in the 2006–2010 period to 135.2 serious injuries in the 2010–2014 period, a 31 percent decline and a level below the goal of 159 set for the county for the 2010–2014 period, as shown in **Figure 34**.

Lancaster County’s investments in alternatives to driving alone such as transit and infrastructure for bicycling and walking and the county’s Smart Growth Transportation Program and Transportation Alternatives Program contribute to achieving the safety performance measures by reducing the number of vehicles on the roads and the likelihood of vehicle crashes. Criteria that have been developed for the Smart Growth Transportation Program, such as “increases mobility options” and “project is located in a designated growth area” are used to rank projects that apply for funding under the SGT program and support the goal of improved safety. Goal B, “Maintain and Improve the county’s multi-modal infrastructure...,” and Goal D, “Manage

Figure 34: Five Year Average of Serious Injuries, Lancaster County



Source: PennDOT Safety Report

Table 28: 2014 Bridge Performance Report, Lancaster County

	Long-term goal # of SD Bridges	2014 Target # of SD Bridges	Actual # SD Bridges	Long-term Goal % SD Deck Area	2014 Target % SD Deck Area	Actual % SD Deck Area
State >8', NHS	3	8	8	1.1%	2.9%	2.2%
State >8', Non- NHS >2000 ADT	35	63	59	7.9%	14.5%	10.0%
State >8', Non-NHS, <2000 ADT	43	78	79	10.4%	18.9%	14.9%
Total State Bridges >8'	80	149	146	5.3%	10.1%	7.5%
Local Bridges	39	71	78	12.8%	23.0%	25.5%

■ Indicates SD# is above the Target

source: PennDOT, 2014 Bridge Performance Report

and operate the transportation system to reduce congestion,” also contribute to achievement of the safety performance measures and targets set for the county.

Bridge and Highway Infrastructure Measures

PennDOT developed several performance measures to assess the condition of highways and bridges throughout the state and has been using these for many years as part of the state’s Asset Management system. Each year, PennDOT provides the Lancaster County MPO with a Performance Measures Annual Report for Bridges and a Performance Measures Annual Report for Pavements. The bridge report shows the number of Structurally Deficient (SD) bridges and percent of SD deck area for each road type as well

as the short-term target and long-term goal for the number of SD bridges and SD deck area in Lancaster County. The county’s investments on its Transportation Improvements Program (TIP) help it to achieve these. The bridge report includes targets and long-term goals for reducing the rate of deteriorated bridges as well.

Table 28 presents some of this data.

The pavement performance report includes data on the Overall Pavement Index (OPI) and the International Roughness Index (ORI) for segments of road in Lancaster County by road type. It presents long-term goals and 2015 targets for reducing poor IRI pavement, for maintaining good and excellent IRI and for other pavement quality measures for the National Highway System (NHS) roads and for the non-NHS roads.

Table 29 presents some of these goals and targets.

Table 29: 2014 Pavement Goals and Targets, Lancaster County

Goals	NHS Roads					
	Long-term % IRI		2015 Target % IRI		Actual % IRI	
Reduce % Poor IRI	5.0%		5.0%		5.4%	
Maintain % Good, Excell. OPI	89.8%		89.9%		91.6%	
Reduce % Out of Cycle OPI	6.6%		6.6%		3.9%	
	Non-NHS Roads					
Maintain % Poor IRI	>2000ADT	5.4%	>2000ADT	5.4%	>2000ADT	5.7%
	<2000ADT	24.7%	<2000ADT	24.7%	<2000ADT	17.1%
Maintain % Good, Excell. OPI	>2000ADT	91.0%	>2000ADT	91.0%	>2000ADT	81.1%
	<2000ADT	82.3%	<2000ADT	82.3%	<2000ADT	93.7%
Maintain % Out of Cycle OPI	>2000ADT	0.7%	>2000ADT	0.7%	>2000ADT	0.8%
	<2000ADT	1.1%	<2000ADT	1.1%	<2000ADT	0.0%

Source: PennDOT, 2014 Pavement Performance Report

**Table 30: June 2013–2015 Most Congested Corridors in Lancaster County
(seconds of delay per mile)**

<i>CMP Corr. #</i>	<i>PA Rte.</i>	<i>Corridor Name</i>	<i>Segmt. Length</i>	<i>AM delay/mi. (seconds)</i>	<i>PM delay/mi. (seconds)</i>	<i>Av. Delay/mi. (seconds)</i>
22	US 222	Lime/Prince (PA324-Golden Triangle)	2.9 mi.	70	279	96
19	PA 462	E. Orange/King St.(Broad-W. End Av)	1.9 mi.	40	138	73
1	PA 501	Lititz Pike (Oregon Rd-Newport Rd)	8.1 mi.	193	536	67
18		Centerville Rd (PA 462-PA 283)	3.7 mi.	78	226	61
8	PA 741	Rohrerstown Rd (Wabank-PA 722)	7.5 mi.	167	443	59
7	US 222	Willow St. Pke (PA 324-Boehms Rd)	4.8 mi.	62	68	14

Source: LCPC, CMP Report , 2012–2014

Congestion Management Performance Measures

The Lancaster County Congestion Management Process (CMP) is used to measure the performance of the most congested corridors in the county and to determine the most effective measures to reduce congestion along specific road segments and at congested intersections. A total of 21 corridors making up 165.1 miles, constitute the Lancaster County CMP network. The CMP uses a number of performance measures to assess performance and changes in congestion over time. These include: Traffic Volume to Capacity Ratio and Travel Time Delay (the time it takes to traverse a corridor segment). The delay per mile, measured in seconds of delay, determines the most congested roadway segments. In the June 2013–June 2015 period, the most congested corridor segments had delays of more than 50 seconds per

mile compared to the corridor with the least congestion which had 14 seconds of delay per mile, as shown in

Table 30.

Transit Performance Measures

The Red Rose Transit Authority (RRTA) uses a number of safety and operational performance measures, consistent with the requirements of federal law for transit authorities, to assess its performance and to enable the transit system to become more efficient in its delivery of services to the public. These include measures such as: ridership per route; revenue to expense ratio; subsidy/passenger mile; subsidy/passenger; passengers/hour; on-time performance by route and other measures. Details on RRTA's routes and performance can be found in the RRTA Transit Development Plan Update, Executive Summary and Final Report, October 2014.

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Chapter 7

Financial Plan

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By federal law, the Long-Range Transportation Plan must be “financially constrained” and contain a section outlining the amount of revenue expected over the life of the LRTP. For the LRTP to be fiscally constrained means that the LRTP and the Transportation Improvement Plan, or TIP include sufficient financial information for demonstrating that proposed projects can be implemented using committed, available, or reasonably available revenue sources. A second purpose is to provide assurance that the federally supported transportation system is being adequately operated and maintained. This requirement applies to each program year for the TIP. For the LRTP, this applies to a planning horizon of at least 20 years.

The first part of this chapter outlines how future funding projections were estimated for this update of the Lancaster County LRTP. The second part presents a discussion on the continuing challenge to find sufficient funding to address future transportation infrastructure needs.

Revenue and Cost Estimation Methodology

The LRTP’s time horizon spans 24 years to the year 2040. The plan estimates the level of funding that can reasonably be expected over that period, and it shows how the transportation projects in the LRTP and TIP can be accommodated within the financial constraint. The sources of revenue and the process used to calculate the projected transportation revenue and project costs are discussed.

Year of Expenditure

Act 89, enacted by the Pennsylvania legislature in 2013 and enactment of the federal law, Fixing America’s Surface Transportation Act (FAST Act) in 2015, are providing more stable and predictable funding for Pennsylvania’s transportation infrastructure and that of the Metropolitan Planning Organizations (MPOs) and Regional Planning Organizations (RPOs) in the state. PennDOT and its MPO and RPO planning partners, working with the US Department of Transportation (U.S.

DOT) have convened a financial working group prior to each TIP update to discuss and develop formulas for the fair distribution of formula funds to MPOs/RPOs and non-distributed (discretionary and competitive grant) funds. Estimates of costs for the 2017–2020 TIP, for the 12 Year Program and the outyears of the LRTP are based on a “year of expenditure” cost estimating process. A 3 percent annual inflation rate was agreed to by the financial working group and used in this plan.

Highway Revenue

The highway capital revenue baseline was developed using Pennsylvania’s 2017 Transportation Financial Guidance (issued on 12/18/15) as a base for the years FY 2017–2020. Funding for the development of the FY 2017 Program includes all Federal and State capital funding that is anticipated over the next four years. This includes State 581 funding for highway capital projects, State 183 and 185 funding for bridge capital projects and all federal highway and bridge funding apportioned or allocated to Pennsylvania as well as estimates of federal and state transit funding. Revenues were projected to 2040. Some of the guidance that underlies the FY 2017 program revenue estimates is outlined below:

- Program implementation is dependent upon actual federal obligation levels that are appropriated each year and state funds included in the 2015/2016 state budget.
- The program is fiscally constrained by year for each MPO and RPO. PennDOT will work with each planning partner to assign projects and their funding to appropriate years based on a combination of project readiness and estimated funding availability.
- The program has been developed using the “year of expenditure” approach. A 3 percent inflation factor is applied in cost calculations for each project each year.
- Needs-based formulas that were developed for the 2015 Program to reflect provisions in the MAP-21 legislation that have been updated for the 2017 Program to reflect the new FAST Act legislation.

Table 31: Highway and Bridge Distributed Funding (\$000), 2017–2040, Lancaster County

Years	Federal	State	Spike	Total	Time Period
2017–2020	\$133,540	\$91,318		\$224,858	4 Year TIP
2021–2028	\$276,052	\$127,581	\$20,000	\$423,634	8 Years (2nd/3rd 4 yr. periods of 12 Year Program
2029–2040	\$362,450	\$191,379		\$553,829	12 Years-LRTP Outyears
Total	\$772,042	\$410,278		\$1,202,321	

Source: PennDOT

Table 32: Transit Distributed Funding (\$000), 2017–2040, Lancaster County

Years	Federal	State	Local	Total	Time Period
2017-2020	\$21,390	\$29,285	\$287	\$50,962	4 Year Tip
2021-2028	\$46,676	\$60,061	\$3,219	\$109,956	8 Years-2nd/3rd Four-Year Pd. of 12 Year Program
2029-2040	\$71,264	\$90,394	\$8,207	\$169,865	12 years-LRTP Outyears
Total	\$139,330	\$179,740	\$11,713	\$330,783	

Source: PennDOT, 2017 Financial Guidance

- State transit funding is based on estimated revenues to the Public Transportation Trust Fund.

Table 31 shows the distributed highway and bridge distributed funding for the Lancaster County MPO through the year 2040.

Transit Revenue

Funding for transit improvements in Pennsylvania consists of federal, state and local funding sources. Federal funding assumptions are based on year 2015 according to the MAP-21 legislation and its successor, the FAST Act of 2015. Federal revenue assumes modest growth. As part of an agreement reached in 1997 between Pennsylvania and the transit authorities in the state during enactment of Act 3, \$25 million per year in federal highway funding is flexed to transit agencies for transit projects.

State funding for transit programs is provided through Act 44 passed in 2007, as amended by Act 89 passed in 2013. Act 44 established a Public Transportation Trust Fund into which revenues are placed to fund public transportation programs and projects. Transit funding comes from a variety of

sources: Turnpike revenues, Sales and Use Tax, Public Transportation Assistance Fund, Capital Bond funds, Lottery revenues, transfers from the Motor License Fund that are not restricted for highway purposes and various fees. Some of the transit funding programs include:

- Transit Operating Program (Sec. 1513).** Operating funds are allocated among public transportation providers based on:
 - Operating assistance received in the prior fiscal year plus funding growth, and
 - Funding growth over the prior year which is based on four operating statistics: total passengers, senior passengers, revenue vehicle miles and revenue vehicle hours.
- Asset Improvement Program for Capital Projects (Sec. 1514).** This program funds the public transportation capital improvements with funding from Turnpike revenues, other fees and Capital Bond funds.
- Alternative Energy Capital Investment Program (Sec. 1517).** This is a competitive grant program to implement capital improvements that incorporate an alternative energy source.

- **New Initiatives Program (Sec. 1515).** This program provides the framework to advance a new or expand an existing fixed guideway system.

Table 32 shows the distributed transit funding for Lancaster County from 2017–2040.

Highway and Bridge Funding Programs

The following summarizes the major federal and state formula highway and bridge funding programs and how each program can be used.

FEDERAL FUNDING PROGRAMS

National Highway Performance Program (NHPP)

- Eligible Uses: 80 percent of the funding is for a range of projects on the NHS.
- Distribution formula: 65 percent bridge: 20 percent sq. foot deck area of all bridges > 20' and 80 percent sq. foot deck area of structurally deficient bridges > 20'; and 35 percent highway: 16.7 percent VMT; 33.3 percent lane miles; 33.3 Poor IRI; 16.7 percent truck VMT.

Surface Transportation Block Grant Program (STBGP)

- Eligible Uses: The FAST Act expanded the STP funding that may be used by States and localities for projects on any Federal-aid highway, including the NHS, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities.
- Distribution Formula: 65 percent bridge; 20 percent sq. footage deck area of all bridges >20' and 80 percent square foot deck area of structurally deficient bridges > 20'; and 35 percent Highway: 16.7 percent VMT; 33.3 percent Lane miles; 33.3 percent Poor IRI; 16.7 percent Truck VMT.

Surface Transportation Program Urban (STP-Urban) Set Aside

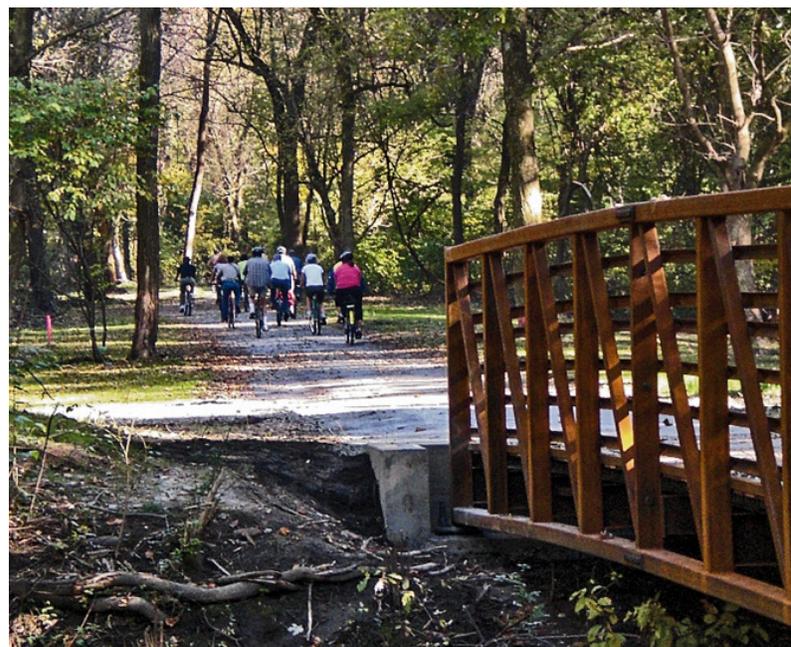
- Eligible Uses: Funds from the STBGP are set-aside for urbanized areas over 200,000 population for a range of on-system and off-system federal aid transportation system improvements.
- Distribution Formula: Funding is allocation to each regional with a population over 200,000 based on the current federal urbanized area population formula.

Transportation Alternatives Program (TAP)

- Eligible Uses: \$835–\$850 million is also set-aside each year for a range of pedestrian, bicycle, scenic viewing, historic preservation and environmental projects. In Pennsylvania, project sponsors often pay all pre-construction costs and federal funds pay 100 percent of construction costs.
- Distribution Formula: funds are allocated to each region with a population over 200,000 based on the current federal formula.

Congestion Mitigation and Air Quality Program (CMAQ)

- Eligible Uses: Generally 80 percent flexible funding for state and local governments for





a range of projects that result in congestion reduction and air quality improvement. Eligible projects include establishment or operation of a traffic monitoring, management, and control facility; projects that improve traffic flow through improved signalization, construction of HOV lanes, improved intersections, added turning lanes, improved TSM projects that mitigate congestion and improve air quality, ITS and other CMAQ-eligible projects.

- Distribution Formula: Funding is distributed to MPOs based on federal factors which consider each region's air quality classification.

Highway Safety Improvement Program (HSIP)

- Eligible Uses: Generally 90–100 percent funding for a range of on-system and off-federal aid system safety improvements. Eligible projects include any strategy, activity or project on a public road that is consistent with the data-driven State Strategic Highway Safety Plan (SHSP) and corrects or improves a hazardous road location or feature or addresses a highway safety problem.
- Distribution Formula: Based 50 percent on fatalities and major injuries and 50 percent on reportable crashes.

Off-System Bridges (BOF)

- Eligible Uses: Funding set-aside each year for the improvement of bridges located off the federal-aid system.
- Distribution Formula: Based 20 percent on square foot deck area of state and locally-owned bridges <20' and 80 percent on square foot deck area of state-owned structurally deficient bridges >8' and locally-owned structurally deficient bridges > 20'.

STATE FUNDING PROGRAMS

Bridge Program

- Eligible Uses: Program funds repair, restoration and replacement of state-owned bridges > 8' and locally-owned bridges > 20'.
- Distribution Formula: Based 20 percent on square foot deck area of state-owned bridges > 8' and locally owned bridges > 20' and 80 percent on square foot deck area of state-owned structurally deficient bridges > 8' and locally-owned structurally deficient bridges > 20'.

Highway Capital Funding

- Eligible Uses: Funds a range of highway capital improvements.



- Distribution Formula: Based 33 percent on VMT, 33 percent on Lane Miles and 33 percent on Poor IRI.

Bridge Rapid Replacement Program (P3)

- Eligible Uses: This new public-private partnership program for bridge replacements will replace 31 state bridges in Lancaster County in 2017. Funding will be placed on the Lancaster County TIP starting in 2020 for 25 years to repay the investment in these bridges which will be maintained by the private sector for this period of time and then turned over to PennDOT.

Non-Distributed/other Federal and State Funding Programs

- Eligible Uses: A variety of other state funding programs and sources are available to match distributed funding projects or to fully-fund projects. These include the following programs:
 - » PennDOT County Maintenance Funding: for surface treatments by PennDOT forces and snowplowing;
 - » RRX (federal)/Green Light Go (state);
 - » State Spike Funds: discretionary funds distributed by the PennDOT Secretary that

can be added to project funding or pay for an entire project;

- » Act 13, Marcellus Shale Funding: distributed to counties for bridge projects;
- » DCNR Trail funding: supports construction of bicycle and multi-use trails;
- » Local Funds: supports local bridges, Smart Growth Transportation and Transportation Alternatives Projects; and
- » Liquid Fuels Tax: funding for municipalities and the county for variety of projects.

The amount and percentage of total 2017 TIP funding for each program is shown in **Table 33**.

The LRTP Short- and Long-Range Programs

The LRTP's Financial Plan establishes the basis for the list of specific projects that can be funded over the plan's life. This process starts with the development of the TIP, or the first four years of the LRTP. The outyears' portion of the project list was developed based on completing projects on the TIP, keeping the program aligned with investment priorities of the plan, and maintaining financial constraint.

Table 33: FY 2017–2020 Distributed Funding by Highway and Bridge Program

<i>Program Type</i>	<i>Funding</i>	<i>% of Funding</i>
Federal Programs		
National Highway Performance Program (NHPP)	\$40,109,000	17.8%
Surface Transportation Program(STP)	\$23,271,000	10.3%
Surface Transportation Program-Urban (STP-U)	\$22,259,570	10.3%
Transportation Alternatives Program (TAP), SGT	\$11,216,430	4.4%
Congestion Mitigation and Air Quality (CMAQ)	\$16,137,000	7.3%
Highway Safety Improvement Program (HSIP)	\$10,495,000	4.7%
Off-System Bridges (BOF)	\$10,052,000	4.5%
State Programs		
Bridge Funding	\$43,318,049	19.3%
Highway Capital Funding	\$48,000,376	21.4%
Total	\$224,858,425	100.0%

Source: PennDOT



Appendix A contains the Highway and Transit project lists for the first 4 years of the 12-year TIP and funding and major projects in the outyears. It represents the projects for which there is currently funding available. The LRTP and TIP includes \$1.2 billion for highways and \$331 million for transit over the 24 years of the LRTP. There are a number of line items which identify particular funding that is available for the addition of specific projects at a later time. These line items generally cover specific programs such as safety, air quality improvement, smart growth transportation (SGT) and transportation alternatives projects (TAP) or they address specific needs such as bridge and highway preservation.

Appendix A also contains a list of Unfunded Projects which are discussed at the end of this Financial chapter.

The LRTP funding priority is to address System Preservation projects, while major new capacity projects have been deferred. Various line item amounts are typically larger in the outyears of the plan. Several major highway preservation and construction projects are funded on the FY 2017-2020 TIP. These include: final design for the US 222 Reconstruction project (construction will be funded on future TIPs); Centerville Road Widening; US 30 and Centerville Road interchange improvements, and PA 283 and State Road Interchange project.

The Transportation Funding Outlook

Even with the additional funds provided by enactment of Act 89 and the FAST Act, funding challenges remain at the federal, state, and local levels since investment needs continue to outpace available resources. Some of the funding challenges that exist today are described in the following sections followed by a discussion of strategies that could close the funding gap in the future.

Aging Infrastructure and Increased Travel Demand

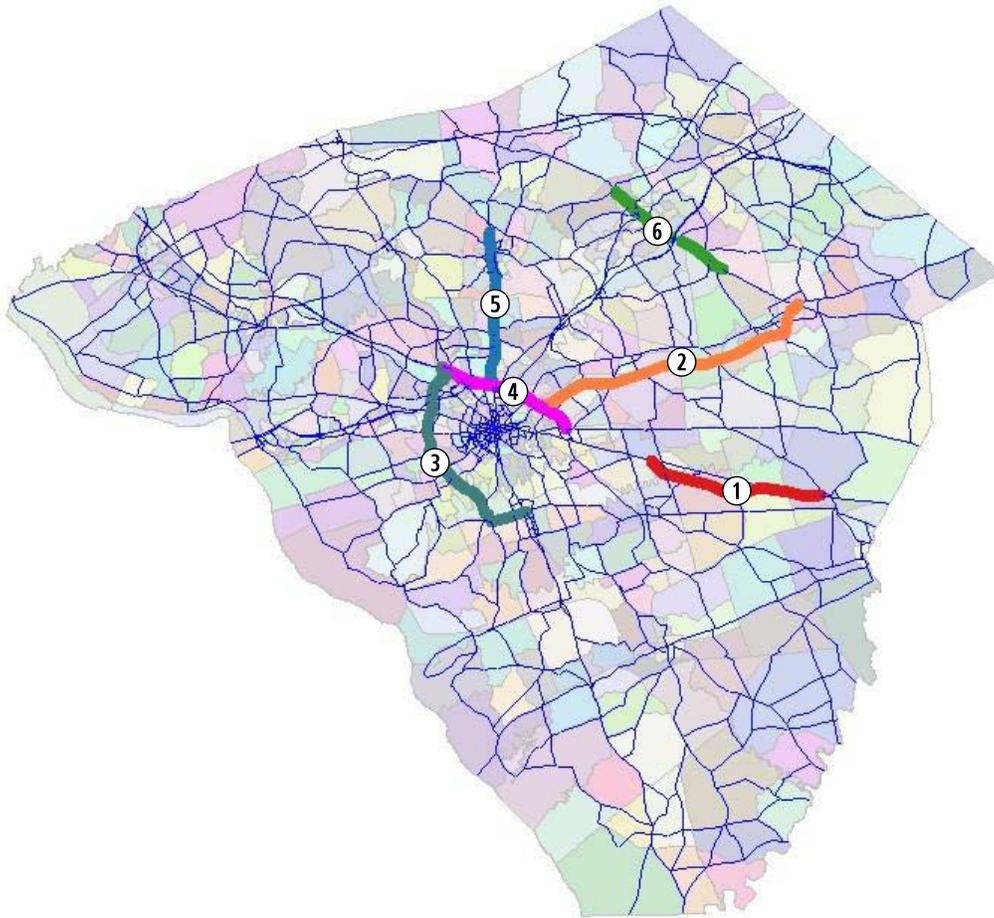
Highway and bridge funding has not kept pace with investment needs due to the age of much of the infrastructure and the growth in vehicle miles of travel which places new demands on the transportation network's ability to sustain high levels of service. Lancaster County has a higher percentage (20.3 percent) of structurally deficient (SD) bridges than the state percentage on the state-owned road network: 20.3 percent of the County's bridges are SD compared to 15.8 percent state average. On the local road system, nearly 30 percent of the bridges are SD. While this is lower than the state percentage of 34.5 percent, it represents nearly one-third of the local road bridges.

The focus of preservation has concentrated on the major roadway network. As a result, only 5 percent of the pavement on the National Highway System (NHS) is rated as poor. On the non-National Highway System roads with more than 2,000 ADT, 5.7 percent of the pavement is rated as poor but on roads with less than 2000 ADT, 17 percent of the pavement is rated as poor. These facts underscore the financial challenges that Lancaster County faces in maintaining and improving its highway and bridge infrastructure.

Federal Funding Has Improved

The outlook for federal transportation funding improved with enactment of the FAST Act in December 2015, a five-year surface transportation authorization bill that increases highway funding nationwide by 3 percent annually and transit funding by 3.4 percent annually. Federal highway, bridge and transit programs are

Figure 35: Unfunded Projects Location Map



Source: LCTCC Consultant Study

Table 34: Unfunded Major Capital Capacity Adding Highway Projects in Lancaster County Congestion Benefits and Costs–2015 Analysis

Map Ref. #	Project	Limits	Cost (\$000)*	Corr. Delay Reduc.	Reg. Delay Reduc.
1	New US 30 Southern Expressway (relocation)	PA 896 to PA 772	\$477	-89.0%	-1.2%
2	New PA 23 Two Lane Arterial (relocation)	US 30 to New Holland	\$194	-61.0%	-10.0%
3	PA 741 Widening (2 additional travel lanes)	PA 283 to US 222	\$82	-71.0%	-2.7%
4	US 30 and PA 283 Widening (2 additional travel lanes)	PA 741 to PA 340	\$49	-86.0%	-7.8%
5	PA 501 Widening (two additional travel lanes)	US 30 to Newport Rd.	\$36	-78.0%	-6.6%
6	US 322 Widening (two additional travel lanes)	PA 340 to Hinkletown Rd	\$28	-95.0%	-2.0%
Total Cost			\$866		

* costs escalated 3%/yr to 2030 costs

Source: LCPC

funded through revenues in the Highway Trust Fund (HTF), which is primarily supported by the 18.4 cent federal gas tax. For many years, balances in the HTF have been decreasing as revenues into the HTF have been negatively impacted by improved vehicle fuel efficiency and by the national trend in recent years toward fewer annual vehicle miles of travel. The FAST Act provided a one-time infusion of new funding but it did not address the long-term issue of a new ongoing source of funding for highways and bridges. The Act allows the addition of new revenues into a HTF if Congress takes action on revenues between 2016 and 2020. Without such action, funding for the nation's transportation infrastructure will fall short again in the future.

State Funding Has Also Improved

Enactment of Act 89 by the Pennsylvania legislature provided increased state revenues for highway, bridge and transit programs. The vast majority of this funding will be directed toward preservation of the existing infrastructure with limited funding available for major new capacity increases.

Local Funding Is Limited

Municipalities generally finance their share of transportation improvements through liquid fuels payments and General Funds. A portion of the state liquid fuels tax is distributed to municipalities based on road miles and population but it is limited to the more heavily travelled local road network in the County. Liquid fuel distributions have increased modestly in recent years (from \$.31 per gallon in 2010 to \$.51 per gallon in 2015). Municipalities' General Fund revenues are largely derived from

property taxes, with many local services competing with transportation for funding from this source.

Unfunded Identified Problems and Major Projects

A total of 39 transportation problems and projects were identified during the LRTP development process through input from municipalities and other stakeholders using the Linking Planning and NEPA Form 1. Most of these projects are not included in the FY 2017–2020 TIP but can be considered for future TIP updates. The 39 problems identified by municipalities and others can be categorized as the following types of issues: road and bridge maintenance, congestion, safety, land use/economic development impacts, transit, bike and pedestrian issues, and freight. They are presented in **Appendix A**.

In addition to these problem identifications, in 2015, the travel demand consultant for the Lancaster County MPO evaluated the benefits and costs to construct five major capacity-adding projects that were either programmed on a prior regional TIP, part of a prior LRTP or that consistently have been identified as significant problem areas. A list of these projects and a summary of the costs and benefits of each is presented in **Table 34**. A more detailed analysis of the report and its findings is found in **Appendix A**.

Chapter 8

Implementation Plan

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The first seven chapters of **Connections 2040: 2016 Update** presented the vision, goals and strategies of the plan, conditions and trends that are taking place in Lancaster County, how the public has been involved in the plan's development and funding available for investment in transportation projects. **Chapter 8** presents the Implementation Plan that shows how all of these aspects of the LRTP fit together in a cohesive manner that takes Lancaster County's Vision and Goals for the future of the county and makes them achievable through a realistic and financially-sound plan of action.

Setting a Strategic Direction

The Vision and Goals of **Connections 2040: 2016 Update** set the direction that Lancaster County citizens, businesses and other stakeholders see for the future of transportation in the county. The transportation vision is established within the broader context of the quality of life and balanced growth goals of the Lancaster County Comprehensive Plan. The LRTP Vision Statement envisions Lancaster County in 2040 with a "multimodal system that operates to move people and goods safely and efficiently throughout Lancaster County" and supports the economy of our communities while protecting and preserving the county's agricultural, natural and environmental resources.

The plan's five goals are designed to achieve the Vision. The goals are:

1. Target transportation investments to support Lancaster County's "balanced growth" approach to development;
2. Maintain and improve the multi-modal transportation network
3. Improve safety and security for all users of the transportation system
4. Reduce congestion and improve system efficiency; and
5. Ensure that transportation investments support and preserve agricultural, historic, cultural and natural resources.

Taken together, the Vision and Goals answer "Where does Lancaster County want to be by the year 2040?"

Assessing Current Conditions and Developing Strategies

In order to determine how the Vision and Goals of the plan will be achieved, an assessment of trends that are taking place in the county and the current condition of the transportation infrastructure is undertaken. Demographic trends such as the change in the age, income levels and ethnicity of the population are important factors that are considered. Senior citizens may have special transportation needs and low-income individuals and families that lack a car will probably have a greater need for good transit and ridesharing services than the overall population. The condition of the pavement and bridges on the various road networks in the county, the quality of public transportation and the condition of sidewalks and bicycle infrastructure (or the lack of such facilities) are examined in order to prioritize the infrastructure in greatest need of repair or replacement and determine where essential gaps exist in the transportation network. Finally, the rate at which travel is increasing on urban and rural road networks is also looked at to determine which roads and intersections have the greatest investment needs.

Once this assessment of current trends and conditions has been completed, strategies are developed to address the needs that have been revealed. The strategies present more specific steps that Lancaster County transportation planning staff, working with advice from its policy and technical committees and the community, have determined need to be taken in achieve the Vision and Goals. The strategies represent the "How are we going to get there?" part of the equation.

For example, to achieve Goal A, strategies in **Connections 2040: 2016 Update** include:

- Target transportation investments to support appropriate growth and development of Urban Growth Areas (UGAs);
- Ensure that transportation projects and programs in Designated Rural Areas support rural land uses, safety and mobility;
- Encourage transit-oriented development; and
- Continue to implement a Lancaster County Smart Growth Transportation Program.

Strategies to achieve Goal B include:

- Maintain and improve highways and bridges on a regular maintenance cycle;
- Plan for strategic capacity improvements that support economic development and system connectivity;
- Improve transit services and programs through support of RRTA's long-range plan; and
- Improve intermodal connections between highway, transit, air, rail and non-motorized modes.

Chapter 6 details the strategies to achieve each of the goals.

Measuring Performance

Performance measures form an integral part of the transportation planning process. The measures provide reliable information about the extent to which strategies that have been developed as part of the LRTP are being achieved. They are used to benchmark progress, or the lack of it, in reducing fatalities, crashes, improving the quality of bridges and pavement and other issues. Performance Measures address the question: "How are we doing and what do we need to do better in the future?"

Trends revealed by the performance measures are used as input to the process of prioritizing investments on the regional Transportation Improvement Plan (TIP). They are the ongoing evaluation and monitoring element of the Plan. **Chapter 6** on Visions, Goals, Strategies and Performance Measures presented some

of the performance measures that have been developed and used by PennDOT to prioritize transportation investment needs for each MPO and RPO in the state. The federal MAP-21 legislation and its successor, the FAST Act of 2015, require states and MPOs to incorporate performance measures in their planning processes. LCTCC will consider incorporating in the future any additional performance measures that are developed by PennDOT in response to the FAST Act.

Figure 36 shows how Performance Measures fit into the overall transportation planning process.

Listening to the Public

Connections 2040: 2016 Update is a long-range transportation plan that reflects the vision of the citizens of Lancaster County. It is their plan for a future that will support a higher quality of life and achieve the smart growth goals of the Lancaster County Comprehensive Plan. Public involvement on the LRTP was obtained throughout the planning process through a variety of methods including:

- Data reviews by the MPO Technical Advisory Committee;
- Online surveys;
- Spanish language survey;
- Meetings with stakeholder groups such as the business community and Amish Safety Committee;
- Transportation Problem Identification and Projects (LPN Form 1);
- Information posted on the LCPC website;
- 30-day public review period at which the draft plan and TIP were widely available throughout the county for public review and comment; and
- Public meeting at which the Plan, TIP and maps were displayed and staff were present to answer questions.

As part of the on-line survey and the Spanish language survey, citizens provided their opinions on whether the goals from the 2012 LRTP are still relevant and the quality of various aspects of the county's transportation

Figure 36:
Performance Measures in the Transportation Planning Process



Source: U.S. DOT *Performance-Based Planning and Programming Guidebook*

infrastructure (bridges, airports, RRTA, bicycle and pedestrian facilities and other aspects of the network). The public expressed strong support for the goals which have been retained for this plan update. Over 300 Lancaster citizens also participated in a State Transportation Commission Transportation Priorities Survey and their input was considered in development of the plan.

Making Investments Through the TIP

The Transportation Improvement Program (TIP) is the list of projects that have been determined through the various steps discussed in this Implementation chapter to be the priority projects needed to preserve the condition of the county’s transportation infrastructure

and to meet growth in travel. As stated in **Chapter 7**, the Financial Plan, the LRTP and the TIP must be “financially constrained” which means that only projects for which funding is available can be listed. PennDOT worked with the MPO, with the benefit of input received from the public, to determine the projects that were selected for the FY 2017–2020 TIP and the years in which they were programmed, based on project readiness and funding availability. For the Lancaster County FY 2017–2020 Highway TIP, a total of \$224,858,425 is available for transportation projects. For the FY 2017–2020 Transit TIP, a total of \$50,964,859 is available to invest in transit capital projects and operations. **Table 35** shows how the 4-year TIP funding will be spent among the various highway and bridge programs. The largest percent (40 percent) of funding is for bridge preservation and rehabilitation projects,

Table 35: FFY 2017–2020 Lancaster County TIP (\$'000)

	FFY 2017	FFY 2018	FFY 2019	FFY 2020	FFY 2017–2020	% of Funds
Harrisburg Pike Reserve	\$2,000	\$2,000	\$0	\$0	\$4,000	1.8%
Highway Reserve	\$929	\$676	\$7,121	\$4,109	\$12,835	5.7%
Bridge Reserve + Box culverts	\$0	\$415	\$295	\$1,332	\$2,042	0.7%
CMAQ Reserve	\$2,193	\$48	\$138	\$3,841	\$6,220	2.8%
Transportation Alternatives (TA) Reserve	\$0	\$0	\$0	\$56	\$56	0.4%
Safety Line Item (HSIP) and RSA Reserve	\$200	\$1,510	\$530	\$2,741	\$4,981	2.2%
Consultant/Product Delivery Reserve	\$1,200	\$1,200	\$1,200	\$1,200	\$4,800	2.1%
Surface Transportation Urban (STU) Reserve	\$0	\$39	\$4,054	\$557	\$4,650	2.1%
Highway Construction (Centerville widen, 222 recon)	\$2,500	\$1,750	\$1,750	\$0	\$6,000	2.7%
Bridge Restoration/Replacement	\$27,744	\$24,953	\$17,113	\$18,201	\$88,011	39.1%
Highway Interchange (Centerville Rd, State Rd)	\$2,431	\$4,913	\$11,183	\$8,181	\$26,708	11.9%
Highway Resurfacing	\$14,730	\$9,030	\$0	\$5,550	\$29,310	13.0%
Intersection Improvmt/Rideshare (SAMI), Signal Coord.	\$6,348	\$8,826	\$6,068	\$2,787	\$24,029	10.7%
Smart Growth Transportation (SGT) and TA	\$3,708	\$3,669	\$1,920	\$1,920	\$11,217	4.9%
Total	\$63,983	\$59,029	\$51,372	\$50,475	\$224,859	100%

Source: LCPC and PennDOT

followed by highway preservation and resurfacing projects (13 percent). Funding for projects that will improve the efficiency of the transportation system through transportation systems management projects (improvements to intersections with the addition of left and right turning lanes, signal coordination and other methods) totals about 10 percent of the funding. The “reserve” line items in the table represent funding by project category that is not yet programmed for specific projects and can be programmed as other priority projects finish final design and are ready for construction.

both important tools to evaluate how well the implementation plan is working to reach the vision and goals of the plan. Monitoring and evaluation should take place on an ongoing basis to provide feedback into the process. Data for the CMP is collected annually and the report is updated every two-three years. Asset Management data on bridge and pavement performance is provided to the MPO from PennDOT each year, showing the change in the quality of the county’s highway and bridge infrastructure.

Monitoring and Evaluation

The final phase of the Implementation Plan involves monitoring and evaluation. The performance measures and the Congestion Management Process (CMP) are

Appendix A
Projects

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Table 36: DRAFT 2017–2020 Highway & Bridge User Friendly Transportation Improvement Program (TIP) - Lancaster County

DRAFT 2017–2020 HIGHWAY & BRIDGE USER FRIENDLY TRANSPORTATION IMPROVEMENT PROGRAM (TIP) - Lancaster County

SORTED BY MUNICIPALITY

bold = new project

4/20/16

MPMS	SR	PROJECT NAME	DESCRIPTION	MUNICIPALITY	PHASE	COST *
101037	1088	Bowmansville Rd bridge preservation	Bridge preservation on Bowmansville Road over US 222	Brecknock Township	P	\$1,400,000
78906	1044	Little Muddy Creek Bridge	Bridge Replacement on Red Run Road over Little Muddy Creek	Brecknock Township	PFUR	\$325,000
93088	222	City Resurface	Resurfacing on Prince Street from King Street to W. Andrew Street, Duke Street from South Queen Street to Lime Street, and Duke Street from McGovern Avenue to Orange Street	City of Lancaster	C	\$2,890,000
106630	0	Charlotte St. Two-way	Conversion of Charlotte Street from one-way to two-way traffic from James St. to King Street	City of Lancaster	C	\$977,000
84016	3028	Pitney Road Bridge over Amtrak	Bridge Rehabilitation on Pitney Road over Amtrak Bridge	City of Lancaster and East Lampeter Township	C	\$2,700,000
80932	4020	Harrisburg Pike Reserve	Widening, signalization, and non-motorized improvements on Harrisburg Pike from US 30 to Lancaster County Solid Waste Management Authority	City of Lancaster, Mannheim Township	C	\$4,000,000
91267	1035	Kleinfeltersville Rd Bridge	Bridge Replacement on Kleinfeltersville Road over a tributary to Middle Creek	Clay Township	PC	\$350,000
78893	1024	Lincoln Rd bridge improvements	Bridge Improvements on Lincoln Road over Hammer Creek east of Clay Road	Clay Township	PFRC	\$1,776,000
98280	441	Columbia Borough Signal Coordination	Traffic signal coordination on PA441 from US30 to Locust Street, PA462 from Locust Street to Washington Street, and Locust Street from PA441 to PA462	Columbia Borough	PFC	\$400,000
78965	2009	Noble Rd bridge improvements	Bridge Improvements on Noble Road over West Branch of Octoraro Creek north of Wesley Road	Colerain Township	PFRC	\$1,425,000
105376	896	Georgetown Rd Resurface	Resurface Georgetown Road/PA896 from the Sproul Rd/Creek Rd/Chester County line to Valley Road/PA372	Colerain and Bart Townships	C	\$1,200,000
101074	3017	Safe Harbor Rd Bridge	Bridge preservation on Safe Harbor Road over Conestoga River	Conestoga Township	P	\$1,300,000
91261	441	River Road Bridge #2	Bridge Replacement on River Road/PA441 over a tributary to the Susquehanna River , approximately 900 feet north of Bainbridge Rd/PA241	Conoy Township	PC	\$375,000
100537	441	River Rd bridge over Conoy Creek	Bridge preservation on River Road/PA441 over Conoy Creek south of Locust Lane	Conoy Township	PC	\$825,000
90342	441	River Rd bridge	Bridge Replacement on River Road/PA441 over Tributary to Susquehanna River, just north of Spruce Street	Conoy Township	PC	\$650,000
101015	1032	North Third Street Bridge	Bridge replacement on North Third Street over the Little Conestoga Creek	Denver Borough	FURC	\$825,000
87504	1045	South 4th Street Bridge	Bridge replacement on South 4th Street over Cocalico Creek	Denver Borough	URC	\$1,780,000
87497	3004	Fishing Creek Road Bridge	Bridge Replacement on Fishing Creek Road over Fishing Creek	Drumore Township	URC	\$1,789,904
101036	1901	Gristmill Rd Bridge	Bridge replacement on Grist Mill Road over Conestoga River, just north of Mill Road	Earl Township	PFC	\$2,576,000
101323	1082	Kramer Mill Road Bridge Preservation	Bridge preservation on Kramer Mill Road and Mohler Church Road over US 222	East Cocalico and Ephrata Townships	C	\$1,456,000
87703	772	Anderson Ferry Road bridge replacement	Bridge replacement on Anderson Ferry Road/PA772 over Donegal Creek	East Donegal Township	PFURC	\$1,975,000

96210	743	Maytown Road Resurface	Road resurfacing on Maytown Road/PA743 from River Road/PA441 to S. Market Street/PA230	East and West Donegal Townships and Elizabethtown Borough	C	\$3,584,000
101124	625	Reading Rd bridge over Conestoga	Bridge preservation on Reading Road/PA625 over the Conestoga River	East Earl Township	PFC	\$405,000
64767	4057	Centerville Road Interchange Improvements	Interchange reconstruction on Centerville Road (T-408) over US 30	East Hempfield Township	FURC	\$9,231,250
101505	0	Centerville Road Widening	Widen Centerville Road to 5 lanes from Marietta Avenue/PA23 to Columbia Avenue/PA462	East Hempfield Township	PF	\$2,500,000
94910	462	Columbia Ave & Rohrerstown Rd Intersection Improvements	Add lanes and improve signalization at and between the intersections of PA 462 with PA 741 and Good Drive	East Hempfield Township	FURC	\$4,000,000
20053	7214	Holland St. bridge removal	Removal of Holland Street bridge over Amtrak in Salunga	East Hempfield Township	PFURC	\$500,000
94912	23	Marietta Avenue Intersection Improvements	Intersection Improvements on Marietta Avenue/PA23 from Good Drive to Rohrerstown Road/PA741	East Hempfield Township	FURC	\$3,750,000
64829	722	State Road Interchange	Upgrade interchange, replace bridge over PA-283 and bridge over Amtrak on PA-722 (State Road)	East Hempfield Township	PC	\$16,095,000
99179	300	Lanc Grp H Preservations	Bridge preservations at these locations along PA283: NS rail line just west of PA741, Schwanger Rd, Cloverleaf Rd, Hershey Rd/PA743, Beverly Rd, and Conewago Rail Trail	East Hempfield and Mount Joy Townships	C	\$3,880,000
106587	30	ITS Phase 4	Installation of Highway Advisory Radio (HAR) or equivalent technology at these highway interchange locations: 222/322, 283/MT. JOY, 283/722, 30/STONY BATTERY, 30/340 & 30/222	East Hempfield, East Lampeter, Ephrata, Manheim, West Earl, and West Hempfield Townships	C	\$2,500,000
83617	30	ITS Phase 1	Installation of Closed Circuit Television cameras (CCTV) at these highway interchange locations: 30/PROSPECT, 30/STONY BATTERY, 30/72, 30/GREENFIELD & 283/722 and installation of permanent Dynamic Message Signs (DMS) at these locations: 283/RHEEMS, 30E/741, 30W/340 & 30E/HBG PIKE	East Hempfield, Manheim, Mount Joy, and West Hempfield Townships and City of Lancaster	C	\$3,250,000
105372	30	Lincoln Hwy Resurface	Mill, overlay, ADA, drainage and guiderail updates on US-30 from PA-462 to PA-896	East Lampeter Township	C	\$2,542,400
101159	1092	Hartman Station Rd Bridge	Bridge preservation on Hartman Station Road over the Goat Path	East Lampeter Township	PC	\$1,900,000
87535	30	US30 Bridge	Bridge Replacement on US 30 (Lincoln Highway) over tributary to Pequea Creek	East Lampeter Township	PFURC	\$850,000
88944	1005	Mt. Sidney Road Bridge	Bridge Preservation on Mount Sidney Road over Amtrak	East Lampeter Township	C	\$644,000
105377	2043	Oakview Rd Resurface	Mill, overlay, ADA, drainage and guiderail updates on Oakview Road from US-30 to PA-340	East Lampeter Township	C	\$819,950
94753	7215	S Ronks Rd Bridge over Pequea Creek	Bridge Restoration/Replacement on South Ronks Road over Pequea Creek - (County owned bridge)	East Lampeter Township	FURC	\$3,820,000
101158	1090	Willow Road Bridge	Bridge preservation on Willow Road over proposed PA23 relocation right of way	East Lampeter Township	PC	\$1,400,000
94923	23	East Walnut St. Bridge	Bridge preservation on East Walnut Street/PA23 over Conestoga River	East Lampeter Township and City of Lancaster	PC	\$4,641,670
91195	72	Lebanon Road Resurface 1	Road resurfacing on Manheim Pike/PA72 from Edgemont Drive to Chiques Creek	East Petersburg Borough, East Hempfield and Penn Townships	C	\$2,688,000

90221	300	ITS Phase 2	Installation of Closed Circuit Television cameras (CCTV) at these highway interchange locations: 30/340, 30/462, 283/743, 283/CLOVERLEAF & 283/ESBENSHADE and installation of permanent Dynamic Message Signs (DMS) at these locations: 283W/722, 283E/72, 30W/23, & 30E/441	East Lampeter, Manheim, Mount Joy, and Rapho Townships and Columbia Borough	C	\$3,500,000
74962	230	North Market Street Bridge	Bridge Replacement on PA 230 (North Market Street) over Conoy Creek	Elizabethtown Borough	FURC	\$801,322
87564	1026	Hopeland Rd Bridge	Bridge Replacement on Hopeland Road Bridge over Furnace Run	Elizabeth Township	P	\$50,000
96320	501	Furnace Hill Pike Resurfacing	Resurface Furnace Hills Pike/PA501 from Litzitz Borough line to Brubaker Valley Road	Elizabeth and Warwick Townships and Litzitz Borough	C	\$2,576,000
106588	472	Deep Excavations	Slip lining or replacement of 9 cross pipe locations under deep fills in various municipalities in Lancaster County.	Ephrata and Litzitz Boroughs, Ephrata, Rapho, and Warwick Townships	PC	\$1,140,000
90491	322	US322/US222 Intersection Improvements	Intersection improvements at the interchange of US322 and US222	Ephrata Township	SPFC	\$1,381,364
100593	222	South Bridge over Glenwood Rd.	Bridge preservation on US222 South bridge over Glenwood Road	Ephrata Township	P	\$881,372
100588	222	North Bridge over Glenwood Rd.	Bridge preservation on US222 North bridge over Glenwood Road	Ephrata Township	P	\$1,070,593
94754	7219	Peters Creek Road Bridge over Peters Creek	Bridge Restoration/Replacement on Peters Creek Road over Peters Creek	Fulton Township	FURC	\$487,500
100543	741	Millersville Road Bridge	Bridge Improvements on PA 741 (Millersville Road) over Conestoga River	Lancaster Township	PFURC	\$1,825,000
99194	462	Columbia Ave. and Race Ave. Intersection Improvements	Intersection improvements at Columbia Avenue and Race Avenue	Lancaster Township and City of Lancaster	PC	\$414,000
74957	2033	Leacock Road Bridge	Bridge replacement on Leacock Road over Pequea Creek	Leacock and Paradise Townships	C	\$4,032,000
92395	7226	Pequea Lane Bridge	Bridge Replacement on Pequea Lane over Pequea Creek - (County owned bridge)	Leacock and Paradise Townships	FURC	\$1,765,000
94747	7409	Cedar St Bridge over Litzitz Run	Bridge Restoration/Replacement on Cedar Street over Litzitz Run - (Municipal owned bridge)	Litzitz Borough	FURC	\$1,460,000
105373	272	Nottingham Rd Resurface	Resurface PA-272 from the Chester County line to Little Britain Rd	Little Britain Township	C	\$1,000,000
106633	0	Manheim Borough Downtown Connection Study	Study will examine possible alternate routes for trucks to make the downtown area safer for residents, with attention to pedestrians and bicyclists.	Manheim Borough	S	\$100,000
19862	772	Rife Run Rd bridge	Bridge Rehabilitation on W. High Street/PA772 over Rife Run	Manheim Borough	FURC	\$1,939,900
102174	72	Lebanon Road Resurface 2	Road resurfacing on Manheim Pike/Lebanon Road/PA72 from Chiques Creek to county line	Manheim Borough and Rapho Township	C	\$3,282,000
89288	7101	Rohrerstown Rd Bridge	Bridge Replacement on Rohrerstown Road over Little Conestoga Creek - (Municipal owned bridge)	Manheim and East Hempfield Townships	C	\$1,500,000
94924	30	US 30 bridge over Fruitville Pike	Bridge preservation on US30 over Fruitville Pike	Manheim Township	FUC	\$3,025,000

101004	1029	Butter Rd bridge	Bridge preservation on Butter Road over Kurtz Run	Manheim Township	PC	\$300,000
97013	222	US 222 Reconstruction	Roadway reconstruction and bridge rehabilitation on US222 from US30 to north of Newport Road/772 interchange	Manheim, Warwick, and West Earl Townships	F	\$3,500,000
96324	272	Oregon Pike Resurfacing	Resurface PA 272 (Oregon Pike) from US 30 (Lincoln Highway) to Zooks Mill Road	Manheim and Warwick Townships	C	\$2,660,000
106626	0	Safe Harbor Trestle Bridge	Rehabilitation of the Safe Harbor Trestle Bridge on the Enola Low Grade Trail	Manor Township	C	\$808,000
87375	3027	Walnut Hill Road Bridge	Bridge replacement on Walnut Hill Road bridge over Indian Run	Manor Township	C	\$872,405
90852	441	Water Street Bridge	Bridge Replacement on PA 441/Water Street over Schumans Run	Manor Township	PC	\$225,000
19931	3023	Frogtown Road Bridge Rehab	Rehabilitation of Frogtown Road bridge over Pequea Creek	Martic Township	FURC	\$1,200,000
91336	3018	Martic Heights Drive Bridge	Bridge Replacement on Martic Heights Drive over a tributary of Tucquan Creek	Martic Township	P	\$75,000
102513	3029	North and South Duke St Realignment	Realignment of North Duke Street to the east to make a four-way intersection at South Duke Street and West Frederick Street	Millersville Borough	C	\$497,200
95715	772	Mount Joy Ped Safety	Construct curb and sidewalks and associated roadway improvements along Marietta Avenue/PA772 from School Lane to New Haven Street	Mount Joy Borough	C	\$1,337,200
19828	0	S. Jacob St. Bridge	Removal of South Jacob Street Bridge over Amtrak	Mount Joy Borough	FC	\$875,000
90855	230	Harrisburg Pike Bridge	Replacement of Harrisburg Pike/West Main Street bridge over tributary to Donegal Creek	Mount Joy Township	PFURC	\$2,475,000
97555	0	Diller Avenue RR Crossing	Install Rail Road Warning Devices at the Diller Avenue Crossing	New Holland Borough	C	\$196,200
94751	7226	Pequea Valley Road Bridge over Pequea Creek	Bridge Replacement on Pequea Valley Road over Pequea Creek - (County owned bridge)	Paradise Township	FURC	\$1,212,000
74961	741	Strasburg Road Bridge	Bridge replacement on Strasburg Road/PA741 over a tributary to Londondale Run	Paradise Township	PFUR	\$385,000
87553	741	Strasburg Road Bridge	Bridge Replacement on Strasburg Road/PA741 over Eshleman's Run, just east of Keneagy Hill Rd	Paradise Township	PC	\$500,000
97250	30	US 30 Improvements	Intersection and safety improvements on Lincoln Highway/US30 from Hartman Bridge Road/PA896 to Newport Road/PA772	Paradise, East Lampeter, Leacock, and Salisbury Townships	F	\$1,250,000
102510	4040	Doe Run Road Pedestrian Improvements	Installation of sidewalk along Doe Run Road from Manheim Borough limits to West End Drive	Penn Township	C	\$858,378
78847	72	Lebanon Rd bridge over Chickies	Bridge rehabilitation on Lebanon Road/PA72 over Chickies Creek	Penn Township	FURC	\$1,260,000
87712	4030	Newport Rd bridge preservation	Bridge Replacement on Newport Road over Boyers Run, east of Sanctuary Road	Penn Township	PC	\$600,000
102532	0	Low Grade Trail Improvements	Construction of a pedestrian bridge over US222 to replace the stone arch bridge that was removed and surface and drainage improvements from Quarryville east to the county line	Providence Township	C	\$1,908,000
90490	272	PA 272 Intersection Improvement	Intersection improvements at Penny Road and at Byerland Church Road	Providence Township	C	\$3,472,000
101070	3009	Rawlinsville Rd Bridge	Bridge Preservation on Rawlinsville Road over Pequea Creek, just south of Creek Road	Providence Township	PC	\$800,000
19952	472	S Lime Street Bridge Replacement	Bridge replacement on S. Lime Street over a tributary to the south fork of Beaver Creek	Quarryville Borough	PFURC	\$1,485,000
87500	30	Lincoln Hwy Bridge #3	Bridge Improvements on US 30/Lincoln Highway over Houston Run, west of Brackbill Road	Salisbury Township	PFURC	\$1,200,000

102512	PA741 Multimodal Safety 741 Improvements	Installation of sidewalk, a pedestrian crossing, shoulder widening along Gap Rd/PA741 from Bishop Rd. east to the RR Museum	Strasburg Township	C	\$460,000
100570	Newport Rd bridge 772 preservation	Bridge preservation on Newport Road/PA772 over proposed PA23 relocation right of way	Upper Leacock Township	PC	\$2,100,000
104473	PA23 TSM Improvements 2 23	Install Center turn lane, install curb and sidewalks and signal replacement on PA 23 (Main Street) from Hellers Church Road to Granger Road	Upper Leacock Township	FURC	\$4,928,000
79023	1031 Creek Road Bridge	Bridge replacement on Creek Road over tributary to Litz Creek	Warwick Township	PC	\$525,000
87379	Cocalico Road Bridge 1047 replacement	Bridge replacement on Cocalico Road bridge over Cocalico Creek, north of Furnace Hills Road	West Cocalico Township	URC	\$865,000
63227	Greenville Road Bridge 1053 Replacement	Replacement of Greenville Road/S. Peartown Road bridge over Cocalico Creek, south of Blue Lake Road	West Cocalico Township	PFUR	\$435,000
19503	Farmersville Rd Bridge 1010	Bridge Replacement on West Farmersville Road over the Conestoga River in the Village of Brownstown	West Earl Township	C	\$3,380,000
100582	Miley Road over US 222 1074	Bridge preservation on Miley Road over US222	West Earl Township	C	\$1,680,000
100539	Pool Road over US 222 1072	Bridge preservation on Pool Road over US222	West Earl Township	C	\$966,000
94918	US222 Bridge over Pleasant Valley Rd 222	Bridge Preservation/Restoration on US 222 over Pleasant Valley Road	West Earl Township	C	\$1,240,120
78995	4003 Kinderhook Rd over Chickies Creek	Bridge Improvements on Kinderhook Road over Chickies Creek	West Hempfield Township	P	\$150,000
101144	Spooky Nook Rd over Amtrak 4001	Bridge preservation on Spooky Nook Road over Amtrak railroad	West Hempfield Township	PC	\$1,300,000
79020	Veteran's Memorial Bridge 462 Rehab	Bridge rehabilitation on the Veteran's Memorial Bridge/PA462 over the Susquehanna River	West Hempfield Township and Columbia Borough	F	\$3,500,000
106629	272 Willow St. Village	Improvements to calm traffic, enhance safety and support the revitalization of the Village of Willow Street on Willow Street Pike/PA272	West Lampeter Township	C	\$1,214,652
106257	0 DF Box Culverts	Box culvert repair/replacements by PennDOT District Forces at various locations TBD	Countywide	C	\$450,000
94572	0 Rideshare Program	Ridesharing, Vanpooling Programs, and Transit Coordination - Commuter Services of PA	Countywide	P	\$1,353,143
106534	0 RSA Line Item	Road Safety Audit - location to be determined by PennDOT and LCPC Staff	Countywide	C	\$60,000
87826	0 Bridge Reserve	Bridge Reserve	Reserve	C	\$1,591,612
87832	0 CMAQ Line Item	Congestion, Mitigation, Air Quality Reserve	Reserve	C	\$6,219,857
87848	0 Delivery/ Consult Assist	Delivery/Consultant Reserve	Reserve	PC	\$4,800,000
87827	0 Highway Reserve	Highway Reserve	Reserve	C	\$12,835,058
87825	0 HSIP Line Item	Highway Safety Improvement Program Reserve	Reserve	C	\$4,920,363
93151	0 Smart Growth Program	Smart Growth Transportation (SGT) Program Reserve	Reserve	C	\$3,000,000
87823	0 TAP Reserve	Transportation Alternatives Program (TAP) Reserve	Reserve	C	\$56,000
88067	0 STU Reserve	Surface Transportation Urban Reserve	Reserve	C	\$4,650,012

Phases: P=Preliminary Engineering, F=Final Design, U=Utilities, R=Right-of-Way, C=Construction, S=Study

* Costs subject to change

TOTAL \$224,858,425

Table 37: Outyear Funding

	Phase	2021–2024 Costs (\$000's)	2025-2028 Costs (\$000)	2029–2040 Costs (\$000's)	Total
Major Projects					
64767: US 30/Centerville Road Interchange	C	\$12,029			\$12,029
97013: US 222 Reconstruction (pavement, bridges, PA 222/US 30 interchange)	C	\$51,650	\$34,350		\$86,000
Highway Reserve		\$35,953	\$112,038		
Bridge Reserve		\$10,506	\$27,789		
Outyear Bridge Projects Total		\$50,117	\$56,407		
Outyear Highway Resurfacing Projects Total		\$14,360	\$16,162		
Significant Outyear Bridge Projects (funding is included in the Outyear Bridge Projects Total)					
94924: Fruitville Pike (PA 4011) Bridge on US 30, Bridge Preservation, Manheim Twp.	C	\$2,700			\$2,700
74961: Strasburg Rd. (PA 741) Bridge over Londonland Run, Bridge Replacement, Paradise Twp.	C	\$1,300			\$1,300
63227: Greenville Rd. Bridge over Cocalico Creek, Bridge replacement, West Cocalico Twp.	C	\$1,800			\$1,800
101132: Mount Joy Rd over PA 283, Bridge preservation, Rapho Twp.	C	\$1,118			\$1,118
78906: Little Muddy Creek (SR 1044) over Little Muddy Creek, Bridge Replacement, Brecknock Twp.	C	\$1,000			\$1,000
63227: Greenville Rd. Bridge (SR 1053) over Cocalico Creek, Bridge Replacement, West Cocalico Twp.	C	\$1,800			\$1,800
87545 Leacock Rd. Bridge (PA 2033) over Pequea Creek, Bridge rehabilitation, Leacock and Paradise Twps.	P,F,U,R,C	\$3,625			\$3,625
78995: Kinderhook Bridge (PA 4003) over Chiques Creek, Bridge Replacement, West Hempfield Twp.	C	\$3,925			\$3,925
101120: East State Street (PA 372) Bridge over abandoned railroad line, Bridge preservation, Quarryville Boro.	C	\$1,328			\$1,328
87508: West Harrisburg Avenue (PA 4018) Bridge over Donegal Creek, Bridge replacement, West Donegal Twp.	C	\$1,916			\$1,916
Highway Safety Improvement Program Reserve (HSIP)		\$10,964	\$10,966	\$131,592	\$153,524
Congestion Management Air Quality Reserve (CMAQ)		\$16,735	\$16,735	\$200,820	\$234,290
Surface Transportation Program-Urban Reserve (STU) (includes \$1.5 m/yr. for Smart Growth Transportation)		\$18,215	\$32,658	\$269,453	\$269,453
Transportation Alternatives Program Reserve (TA)		\$1,680	\$1,680	\$20,160	\$23,520
Total Highway and Bridge		\$211,817	\$211,817	\$553,829	\$977,463
Transit Reserve Line Item		\$55	\$55	\$170	\$280

Table 38: FY 2017-2020 Transit TIP

DRAFT 2017-2020 LANCASTER PUBLIC TRANSIT TIP			4-Apr-16
MPMS	Project Title	Project Description	Cost
102410	Operating Assistance	Funds provided by PennDOT in FY 2017, 2018, 2019 and 2020 and used by SCTA to fund the operation of the public transportation service in Lancaster County	\$23,508,339
102414	Queen St Station I Upgrade	Queen Street Station (QSS) opened for service in August 2005. This project will provide for the targeted investment in the rehabilitation and renovation of the Station facilities that are impacted by regular and heavy use by buses and customers. The improvements will include but are not limited to the rehabilitation of the concrete bus drive area, sidewalks and internal pedestrian crossings; safety and security features; signage; and passenger amenities.	\$1,422,408
102416	Preventative Maintenance	As provided for under federal guidelines, this project funds eligible maintenance costs SCTA incurs in maintaining the buses and the Erick Road and Queen Street Station facilities for its Lancaster operation. The costs incurred in FY 2017, 2018, 2019 and 2020 are funded at an 80% Federal and 20% Non-federal level.	\$7,673,108
102417	ADA Services	As provided for under federal guidelines, this project funds the cost of providing ADA paratransit service complementary to existing fixed route service up to ten percent (10%) of SCTA's annual allocation of federal transit 5307 funds to the Lancaster urbanized area. The costs incurred in FY 2017, 2018, 2019 and 2020 are funded at an 80% Federal and 20% Non-federal level.	\$2,410,748
102419	Purchase Four (4) Buses	SCTA has in place a program providing for the planned replacement of buses that have exceeded their useful life. These 5307 funds will be used to purchase four (4) electric hybrid buses for SCTA's Lancaster fixed route bus operation. The hybrid buses are expected to have a positive impact on SCTA's operating costs. These buses will replace 2005 vehicles that have reached the end of their 12 year useful life.	\$2,275,880
102420	Purchase 9 Paratransit Vans	SCTA has in place a program providing for the annual replacement of vehicles in the shared ride fleet that reached the end of their useful life. These 5307 funds will be used to purchase nine (9) paratransit vehicles for SCTA's Lancaster Shared Ride Service. Vehicles purchased in 2009 and 2010 will be replaced.	\$612,000
102422	Capital Leases	These funds will be used to lease 50 parking spaces from the Lancaster Barnstormers in downtown Lancaster for a park-and-ride facility for our customers in FY 2017.	\$12,000
102425	Computer/Security Upgrade	Project provides for the planned upgrades and expansion of the SCTA computer software/hardware and security systems to support SCTA operations and changing technologies. Computer hardware/software and security equipment that has reached the end of its useful life will also be replaced.	\$125,000
102426	Purchase Maint. Equipmt.	SCTA has in place a program providing for the annual purchase of equipment to replace equipment that has reached the end of its useful life. Additional maintenance equipment will also be purchased to support the maintenance of SCTA's buses and facilities.	\$40,000
102427	Purchase Office Furniture/ Equipment.	SCTA has in place a program providing for the annual purchase of replacement or additional office equipment or furniture needed to support the operation of an efficient office.	\$10,000
102429	Purchase One (1) Bus	SCTA has in place a program providing for the planned replacement of buses that have exceeded their useful life. These 5307 funds will be used to purchase one (1) electric hybrid bus for SCTA's Lancaster fixed route bus operation. The hybrid bus is expected to have a positive impact on SCTA's operating costs. This bus will replace a 2006 vehicle that has reached the end of its 12 year useful life.	\$724,867
102430	Purchase 2 Paratransit Vans	SCTA has in place a program providing for the annual replacement of vehicles in the shared ride fleet that reached the end of their useful life. These 5307 funds will be used to purchase two (2) paratransit vehicles for SCTA's Lancaster Shared Ride Service. Vehicles purchased in 2012 will be replaced.	\$115,516
102431	Purchase 3 Trolleybuses	These 5307 funds will be used to purchase vehicles to replace two (2) 2003 trolleybuses and one (1) 2005 trolleybus that have reached the end of their 12 year useful life.	\$2,025,000
102433	Capital Leases	These funds will be used to lease 50 parking spaces from the Lancaster Barnstormers in downtown Lancaster for a park-and-ride facility for our customers in FY 2018, 2019 and 2020.	\$36,000
102435	Replace Service Vehicles	Service and supervisory vehicles are used to support maintenance, operations, service monitoring and administrative activities. This project will provide funding to replace one (1) 2002 pickup truck and one (1) 2008 supervisory vehicle.	\$60,000
106683	Purchase One (1) Bus	SCTA has in place a program providing for the planned replacement of buses that have exceeded their useful life. These 5339 funds will be used to purchase one (1) electric hybrid bus for SCTA's Lancaster fixed route bus operation. The hybrid bus is expected to have a positive impact on SCTA's operating costs. This bus will replace a 2005 vehicle that has reached the end of its 12 year useful life.	\$632,500

106684	Supervisory Vehicle	Service and supervisory vehicles are used to support maintenance, operations, service monitoring and administrative activities. This project will provide funding to replace one (1) 2007 supervisory vehicle.	\$30,000
106686	OSS Parking Garage Equip	The OSS Parking Garage was opened in 2012. This project will provide for upgrading the equipment used by the customers and to support the operation to ensure reliability and to reflect changes in technology.	\$3,568,234
106686	Purchase Six (6) Buses	SCTA has in place a program providing for the planned replacement of buses that have exceeded their useful life . These 5307 funds will be used to purchase six (6) electric hybrid buses for SCTA's Lancaster fixed route bus operation. The hybrid buses are expected to have a positive impact on SCTA's operating costs. These buses will replace 2007 vehicles that have reached the end of their 12 year useful life.	\$3,507,345
106687	Purchase One (1) Bus	SCTA has in place a program providing for the planned replacement of buses that have exceeded their useful life . These 5339 funds will be used to purchase one (1) electric hybrid bus for SCTA's Lancaster fixed route bus operation. The hybrid bus is expected to have a positive impact on SCTA's operating costs. This bus will replace a 2007 vehicle that has reached the end of its 12 year useful life.	\$666,250
106689	Paratransit Vans (2)	SCTA has in place a program providing for the annual replacement of vehicles in the shared ride fleet that reached the end of their useful life. These 5307 funds will be used to purchase two (2) paratransit vehicles for SCTA's Lancaster Shared Ride Service. Vehicles purchased in 2013 will be replaced.	\$138,900
106690	Replace Telephone System	The telephone/communication will be upgraded and replaced to ensure reliability and improved customer service.	\$75,000
106691	Purchase Two (2) Buses	SCTA has in place a program providing for the planned replacement of buses that have exceeded their useful life . These 5307 funds will be used to purchase two (2) electric hybrid buses for SCTA's Lancaster fixed route bus operation. The hybrid buses are expected to have a positive impact on SCTA's operating costs. These buses will replace 2009 vehicles that have reached the end of their 12 year useful life.	\$1,527,733
106692	Thirteen Paratransit Vans	SCTA has in place a program providing for the annual replacement of vehicles in the shared ride fleet that reached the end of their useful life. These 5307 funds will be used to purchase thirteen (13) paratransit vehicles for SCTA's Lancaster Shared Ride Service. Vehicles purchased in 2014 will be replaced.	\$911,950
106693	Operations Center Upgrade	The rehabilitation of the Erick Road Operations Center was completed in 2010. This project will upgrade infrastructure and operating systems to ensure the facility will achieve its useful life and is operating efficiently.	\$641,416
106695	Purchase One (1) Bus	SCTA has in place a program providing for the planned replacement of buses that have exceeded their useful life . These 5339 funds will be used to purchase one (1) electric hybrid bus for SCTA's Lancaster fixed route bus operation. The hybrid bus is expected to have a positive impact on SCTA's operating costs. This bus will replace a 2009 vehicle that has reached the end of its 12 year useful life.	\$683,750
106696	Replace Service Vehicle	Service and supervisory vehicles are used to support maintenance, operations, service monitoring and administrative activities. This project will provide funding to replace one (1) 2010 supervisory vehicle.	\$30,000
106697	Replace 2 Paratransit Vans	SCTA has in place a program providing for the annual replacement of vehicles in the shared ride fleet that reached the end of their useful life. These 5307 funds will be used to purchase two (2) paratransit vehicles for SCTA's Lancaster Shared Ride Service. Vehicles purchased in 2012 will be replaced.	\$159,500
106700	Purchase One (1) Bus	SCTA has in place a program providing for the planned replacement of buses that have exceeded their useful life . These 5339 funds will be used to purchase one (1) electric hybrid bus for SCTA's Lancaster fixed route bus operation. The hybrid bus is expected to have a positive impact on SCTA's operating costs. This bus will replace a 2006 vehicle that has reached the end of its 12 year useful life.	\$648,750
		TOTAL	\$54,272,194

Table 39: Lancaster County Problem Identification for 2017 TIP/LRTP

Lancaster County Problem Identification for 2017 TIP/LRTP (1/12/16)

Num	Municipality	Location	Category	Problems					Possible Solution	MPO Involvement	Bridge Info
				Road Maint.	Bridge Maint.	Congestion	Safety	Land Use/Econ. Dev.			
1	Caernarvon	Hammertown Rd. Bridge over L. Conestoga	Bridge - Loc							Bridge Replacement/Rehab.	SD;SR24;36720308234001
2	Christiana	PA 41 to PA 372	Signage							Signs for Truck traffic	
3	Christiana	Community Wide	Transit							Transit Service	
4	Denver	Weaver Rd. Bridge over Cocalico Creek	Bridge - Loc							Replace/Relocate Bridge & Approaches	SR51;36740530004001
5	E. & W. Lampeter	Strasburg Pk. at Rockvale Rd.	Intersection							Intersection Improvements	
6	E. Cocalico	US222 at Colonel Howard Blvd.	Intersection							Signage/Signal Improvements	
7	E. Hempfield	Landville Rd. Bridge over Amtrak	Bridge - Loc							Bridge Rehabilitation	SR87;36721407115053
8	E. Hempfield	PA 462 at Donerville Rd.	Intersection							Intersection Widening	
9	E. Lampeter	Greenfield Rd. Underpass of Amtrak	Bridge							Widen Underpass	
10	E. Lampeter	PA 462 over Conestoga	Bridge - State							Replace Bridge with Wider One	CMP; SGT Study
11	E. Lampeter	Strasburg Pk. (PA 462 - Millport)	Corridor							Add 2nd SB Lane, Ped. & Trail Improvements	
12	E. Lampeter	US 30 (Strasburg Pk. - PA 896)	Corridor							Restripe (narrow lanes) & crosswalks	CMP
13	E. Lampeter	US 30/PA 462 (Strasburg Pk. - Oakview Rd.)	Inters/Interchg							Intersection/Interchange & Ped. Improvements	CMP
14	E. Lampeter	Strasburg Pk. @ Millport Rd.	Intersection							Add Northbound Left Turn Lane	
15	E. Petersburg	PA 72 at PA 722	Intersection							Upgrade Signalization	CMP
16	Earl	Gristmill Rd. (SR 1901) over Conestoga	Bridge - State							Replace Bridge	SD;SR24;36190100100000
17	Elizabethtown	NE Corner Etown & Mt. Joy Twp.	Bike/Ped.							Shared Pathway Connecting with Conewago Trail	
18	Elizabethtown	PA 230 at PA 743	Intersection							Intersection Improvements	CMP
19	Ephrata	US 322 (Parkway Street to US 222)	Corridor							Corridor Improvements	CMP
20	Lancaster City/LIMC	Engliside	Intersection							Intersection Improvements/Roundabout	CMP
21	LIMC	Centerville Rd. (PA 462 to PA 283)	Corridor							Widen/New Road	CMP
22	LIMC	PA 741 Corridor (PA 283 to Wabank Rd.)	Corridor							Widen/New Road	CMP
23	Manor	PA 741 at Charlestown Rd.	Intersection							Northbound Left Turn Lane needed	CMP
24	Manor	PA 462 at Centerville Rd.	Intersection							Intersection Improvements	CMP
25	Mt. Joy Boro.	Jacob Street over Amtrak	Bridge - Loc							Bridge Removal	PUC order
26	Mt. Joy Twp.	PA 283 at Cloverleaf Rd.	Interchange							Interchange Improvements	CMP
27	New Holland	PA 23 Corridor	Corridor							Relocation/New Roadway	Prior EIS; TSM Imprsr. on TIP
28	Penn	Fruitville Pk. at Sunhill Road	Intersection							Intersection Improvements	CMP
29	Penn	Fruitville Pk. at Litz Road	Intersection							Signalize or Roundabout	CMP
30	Penn	Fruitville Pk. at Oak Street	Intersection							Signalize or Roundabout	CMP
31	Rapho	PA 283 at PA 772	Interchange							Signalization/Interchange Improvements	CMP
32	Rapho	PA 72 at Elizabethtown Rd.	Intersection							Study, Intersection Improvements	CMP
33	Upper Leacock	Gibbons Rd. over Mill Creek	Bridge - Loc							Bridge Rehab. or Replacement	SD;SR60;36723406834004
34	Upper Leacock	Stumptown Rd. over Mill Creek Trib.	Bridge - Loc							Replace Bridge	SD;SR51;36723405454001
35	Upper Leacock	Beechdale Rd. over Mill Creek	Bridge - Loc							Bridge Rehab. or Replacement	SD;SR49;36723406554003
36	Upper Leacock	PA 23 at PA 772	Intersection							Add Turning Lanes	CMP
37	Warwick	PA 501 at Santo Domingo Creek	Culvert							Extend/Widen Box Culvert for Bikes/Peds.	
38	Warwick	Newport Rd. at Brunnerville Rd.	Intersection							Widen Intersection for LT Lanes and Alt. Modes	
39	Warwick	PA 772 Rothsville Rd. at Clay Rd.	Intersection							Construct Roundabout	

NOTES: Bridge Info.: SD means the bridge is SD; SR is the sufficiency rating - must be 50 or lower for fed. funding for replacement; the long number is the BMS number

21 Municipalities

39 Problems: (1 Transit; 1 Signage; 1 Bike/Ped.; 3 Interchanges; 6 Corridors; 11 Bridges; 16 Intersections)

MEMORANDUM: Analysis of Major Capacity Increasing Projects



MEMORANDUM

To: Dave Royer, LCPC

From: Dan Szekeres, Michael Baker Intl.
Avinash Sinha, Michael Baker Intl.

Date: January 3, 2016

Subject: Analysis of Major Capacity Increasing Projects

As part of the development of the Long Range Transportation Plan (LRTP), the regional travel model has been used to analyze and estimate performance measures related to several large scale capacity increasing highway projects within Lancaster County. These analyses have been developed as an illustrative case study to identify the potential benefits and costs associated with the projects. Some of these projects have been defined and included in past planning efforts, while others have been defined for this analysis at a simplified conceptual level. **Table 1** lists the projects analyzed within the travel model. **Figure 1** provides a map of the project location and extents.

Table 1: Projects Analyzed

MAP ID	Project Description	Project Limits
1	US 30 Southern Relocation Alternative (4 Lane Expressway)	PA 772 to PA 896
2	PA 23 Two-Lane Southern Alternative	US 30 to US 322
3	PA 741 Widening	PA 283 to US 222
4	US 30 and PA 283 Widening	PA 741 to PA 340
5	PA 501 (Lititz Pike) Widening	US 30 to Newport Road
6	US 322 Widening	Lincoln to Hinkleton near Ephrata

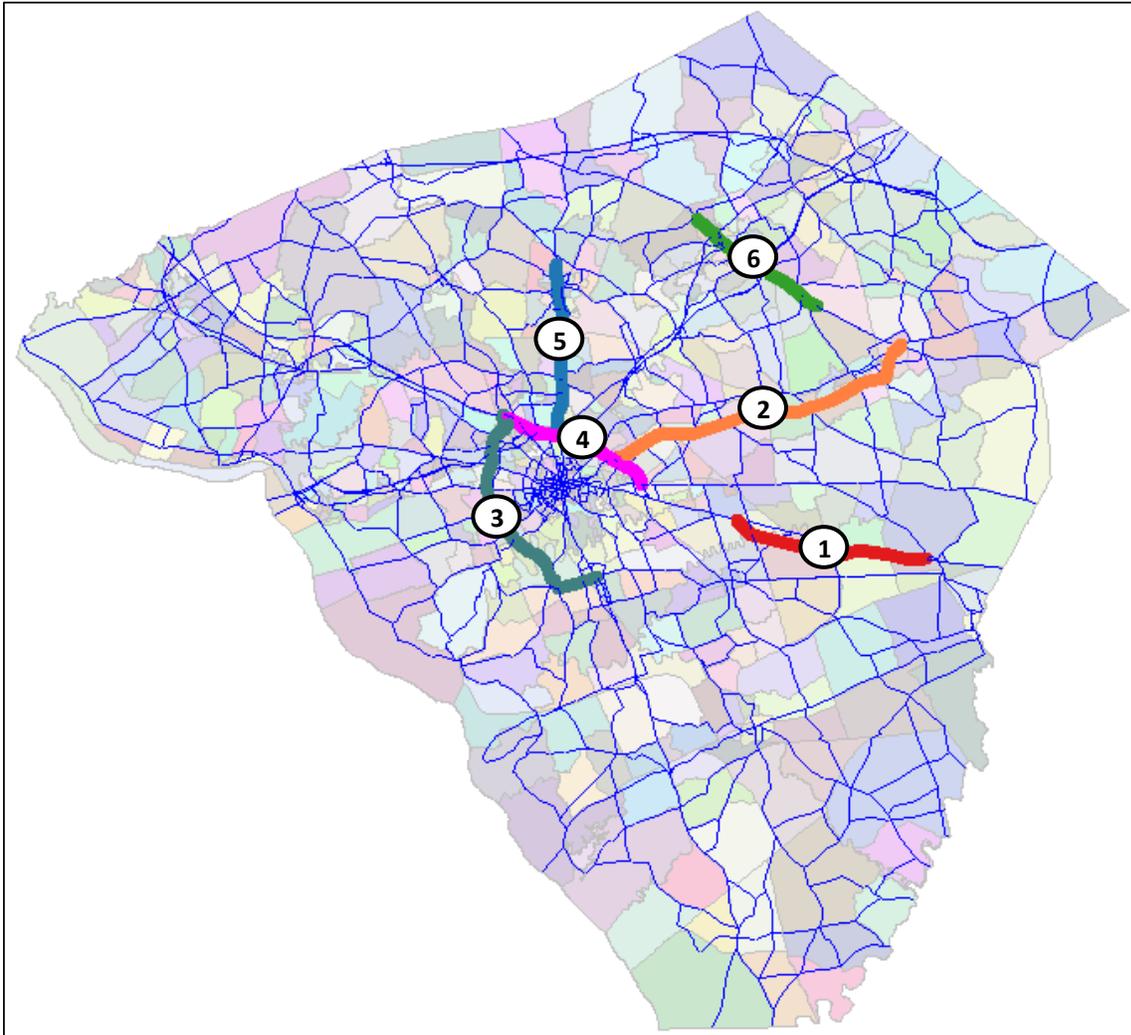
Overview of Projects:

The US 30 and PA 23 projects are defined alternatives from previous planning efforts. The alternatives and alignments are documented in the county’s 2008 LRTP and associated environmental impact statements.

The PA 741 project represents a combination of roadway widening and possible new construction from PA 283 to US 222 south of city of Lancaster. The project would aim to provide a minimum of 4 travel lanes for the entire section length. In some cases, available right-of-way may limit the feasibility of this conceptual project and/or increase project costs.

The PA 283 / US 30 mainline freeway section between PA 741 and US 340 (east of Lancaster City) currently includes between 4-6 travel lanes. Long-term traffic forecasts indicate potential traffic congestion along this section. This conceptual project evaluates the impact of adding a mainline travel lane in each direction. This can be accomplished by extending existing merge lanes and the construction of new lanes in available right-of-way. For costing purposes, the project is assumed to not require major reconstruction of bridge structures.

Figure 1: Project Location Map



PA 501 north of US 30 is a key congested corridor in the region. A conceptual project has been identified to widen portions of PA 501 from US 30 to Newport Road north of Lititz (an approximately 6.5 mile section). There are currently 3 travel lanes on PA 501 from US 30 to just south of Neffsville. Much of the remaining portion has 2 travel lanes with intersection turn lanes. This conceptual project assumes the widening of the corridor to 4 travel lanes for about 4 of the 6.5 mile corridor. Limited right-of-way in the towns of Neffsville and Lititz would most likely prevent major roadway expansion in those areas. In these cases, intersection improvements are assumed part of the project.

The County's available GPS data indicates current traffic congestion along US 322 between the towns of Lincoln and Hinkleton, which includes the US 322 stretch through Ephrata. To address these locations of congestion, a conceptual project has been included to add an additional lane in each direction in the areas outside of Ephrata. With limited available right-of-way in the city, other capacity alternatives will need to be considered including intersection turn lanes, signal coordination efforts, and/or additional parallel routes.

Project Costs:

For the US 30 and PA 23 projects, costs were estimated from those presented in the county’s 2008 LRTP. Within the LRTP, the costs were extrapolated to the forecast construction years based on a 3% escalation factor.

Other project costs were estimated based on typical rates by project type and length. The sources of costing information include other state department of transportation costing sheets developed for planning purposes. The costs were extrapolated to a 2030 construction year (using a 3% escalation rate) to remain consistent with the approaches used for the US 30 and PA 23 projects. **Table 2** provides the estimated costs for each project. These costs represent simplified estimates for use in this assessment study. Actual costs can vary greatly and may be dependent on specific design and right-of-way issues.

Table 2: Estimated Project Costs (2030 dollars)

Project Description	Project Cost (millions of dollars)
US 30 Southern Relocation Alternative	\$477 million *
PA 23 Two-Lane Southern Alternative	\$194 million *
PA 741 Widening	\$82 million
US 30 and PA 283 Widening	\$49 million
PA 501 (Lititz Pike) Widening	\$36 million
US 322 Widening	\$28 million

** Based on the Lancaster 2008 LRTP planning costs*

Project Analysis:

Each project was coded into the regional travel model network. The model was executed using 2040 demographic data for both the “No-Build (without the project) and “Build” (with the project) conditions. Performance measures were evaluated for each model run and the delta impact calculated as shown in **Table 3**.

The reported performance measures include vehicle miles of travel (VMT), vehicle hours of travel (VHT), and delay (in vehicle hours). Percentage reductions for each of the performance measures were estimated for the specific roadway corridor and for the regional (e.g. county) totals. For the US 30 and PA 23 projects, the roadway performance measure impacts are based on the existing roadway section and the new bypass road together. Within the model, changes to individual roadways can have impacts across the region, as the model re-estimates potential trip origins and destination pairs based on the zonal socioeconomic data.

Table 3 also includes a calculation of the regional cost vs. delay benefit rank. This ranking was calculated based on the absolute regional delay benefit divided by the total cost.

Analysis Interpretation Notes

The analyses conducted using the regional travel model represent typical weekday conditions. In addition, the model congestion forecasts on some of the road segments may not represent actual conditions due to the limitations of regional modeling in representing intersection and signal operations.

As a result, special considerations should be made in interpreting the results for the US 30 relocation project, as the peak levels of traffic are often experienced during weekends.

Table 3 Summary of Project Performance Measures

Project	Measure Type	Impact on Roadway Improvement Section			Impact on Regional Performance			Regional Cost vs. Delay Benefit Rank
		VMT	VHT	Delay	VMT	VHT	Delay	
US 30 Southern Relocation Alternative	Absolute	+ 62,724	+ 424	- 249	+ 28,872	- 2,596	- 2,468	6
	%	+ 46%	+ 11%	- 89%	+ 0.2%	- 0.4%	- 1.2%	
PA 23 Two-Lane Southern Alternative	Absolute	+ 110,869	+ 1,071	- 792	+ 46,967	- 19,516	- 19,851	4
	%	+ 35%	+ 11%	- 61%	+ 0.3%	- 3.4%	- 10%	
PA 741 Widening	Absolute	+ 33,584	- 3,977	- 4,942	+ 21,998	- 4,874	- 5,356	5
	%	+ 14%	- 29%	- 71%	+ 0.1%	- 0.8%	- 2.7%	
US 30 and PA 283 Widening	Absolute	+ 60,833	- 8,525	- 9,717	+ 77,350	- 14,234	- 15,473	2
	%	+ 13%	- 42%	- 86%	+ 0.5%	- 2.5%	- 7.8%	
PA 501 (Lititz Pike) Widening	Absolute	+ 37,169	- 5,545	- 6,594	+ 10,939	- 12,875	- 13,211	1
	%	+ 19%	- 40%	- 78%	+ 0.1%	- 2.2%	- 6.6%	
US 322 Widening	Absolute	+ 7,534	- 2,679	- 2,907	+ 2,300	- 3,969	- 4,041	3
	%	+ 5%	- 38%	- 95%	+ 0.0%	- 0.7%	- 2.0%	

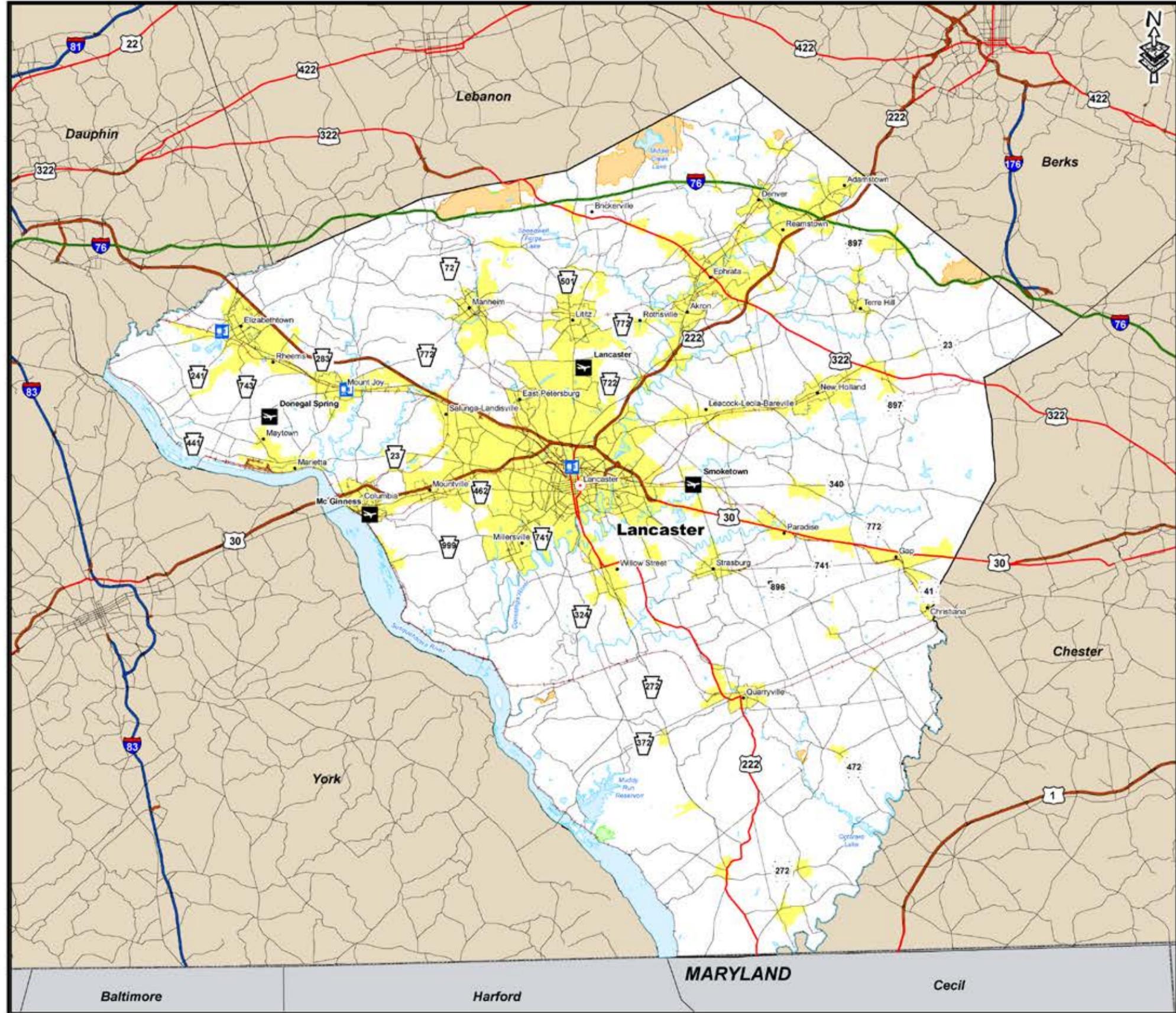
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Appendix B
Maps

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LANCASTER COUNTY

Map 1



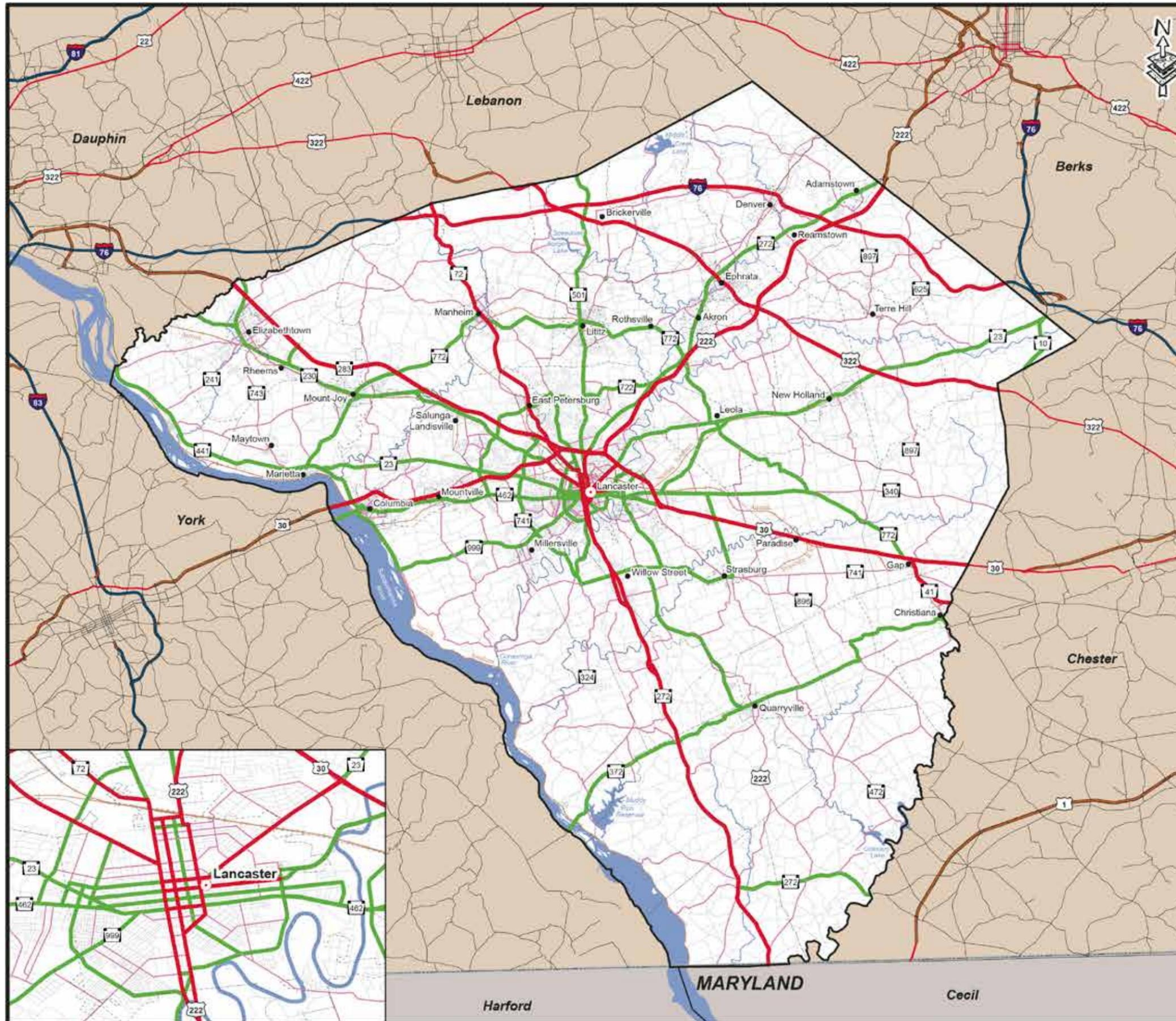
Legend

- Airport
- Amtrak Station
- Railroad
- Fully Controlled Access (Toll)
- Fully Controlled Access (Interstate)
- Fully Controlled Access (Other)
- Major Through Traffic Routes
- Secondary Traffic Routes
- Stream / River
- Lake / Pond
- Designated Growth Area
- Municipal Boundary



Miles

JANUARY 2016



Lancaster County Planning Commission

LONG RANGE TRANSPORTATION PLAN

ROADWAY FUNCTIONAL CLASSIFICATION Map 2

Legend

- Principal Arterials
- Minor Arterials
- Collectors
- Local Roads
- Railroads
- Municipal Boundary
- Rivers
- Lakes



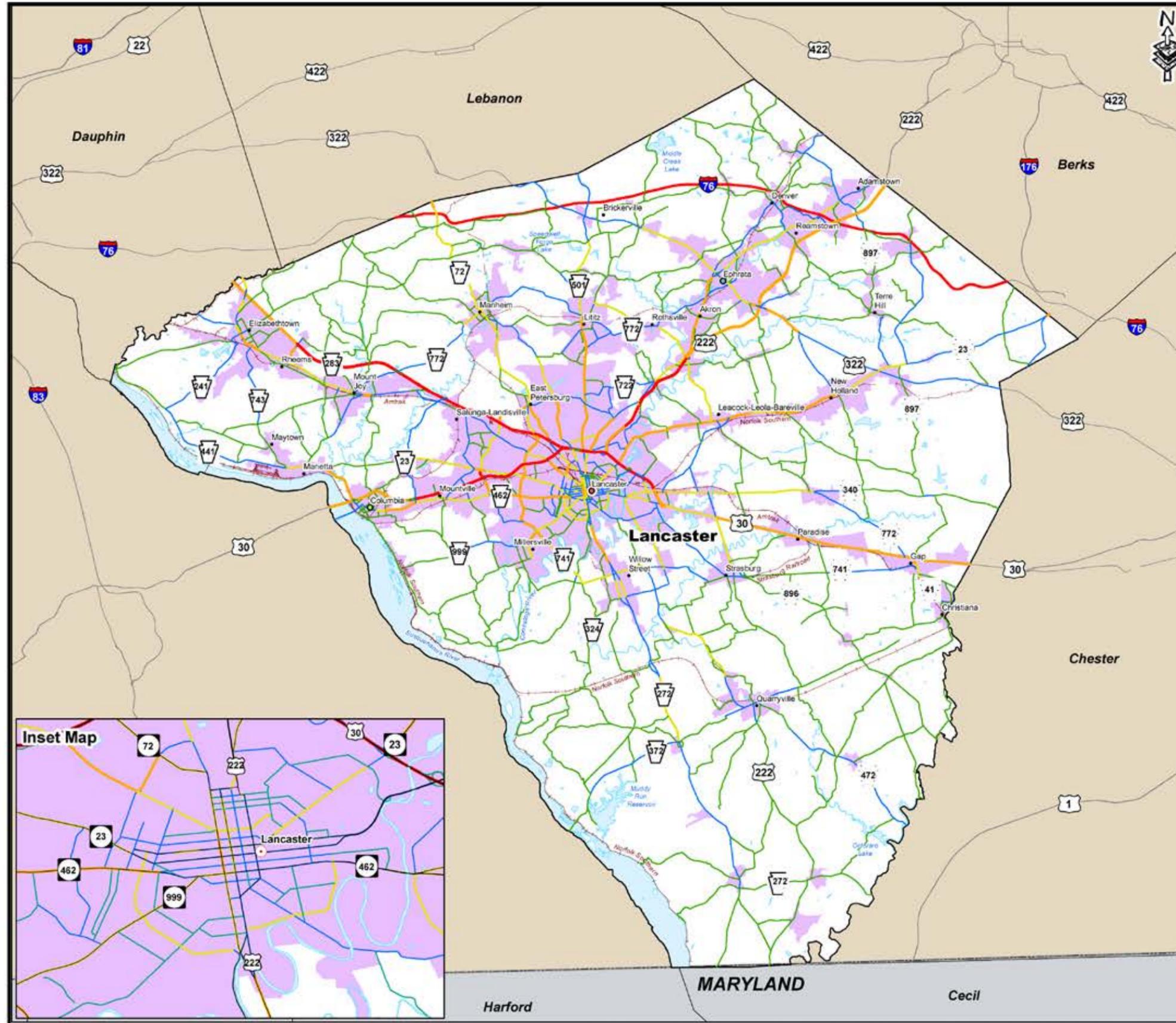
MARCH 2012

Lancaster County Planning Commission

LONG RANGE TRANSPORTATION PLAN

ANNUAL AVERAGE DAILY TRAFFIC VOLUME

Map 3



Legend

- 0 - 5,000
- 5,001 - 10,000
- 10,001 - 15,000
- 15,001 - 25,000
- 25,001 - 100,000
- Stream / River
- Lake / Pond
- Designated Growth Area



JANUARY 2016

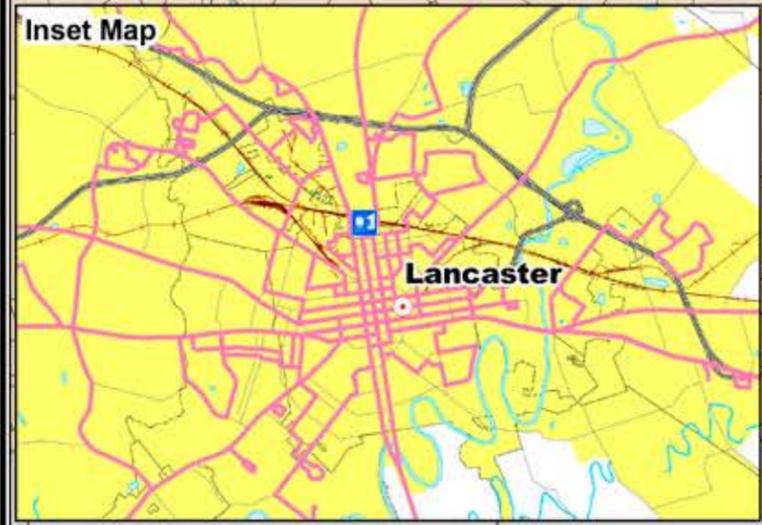
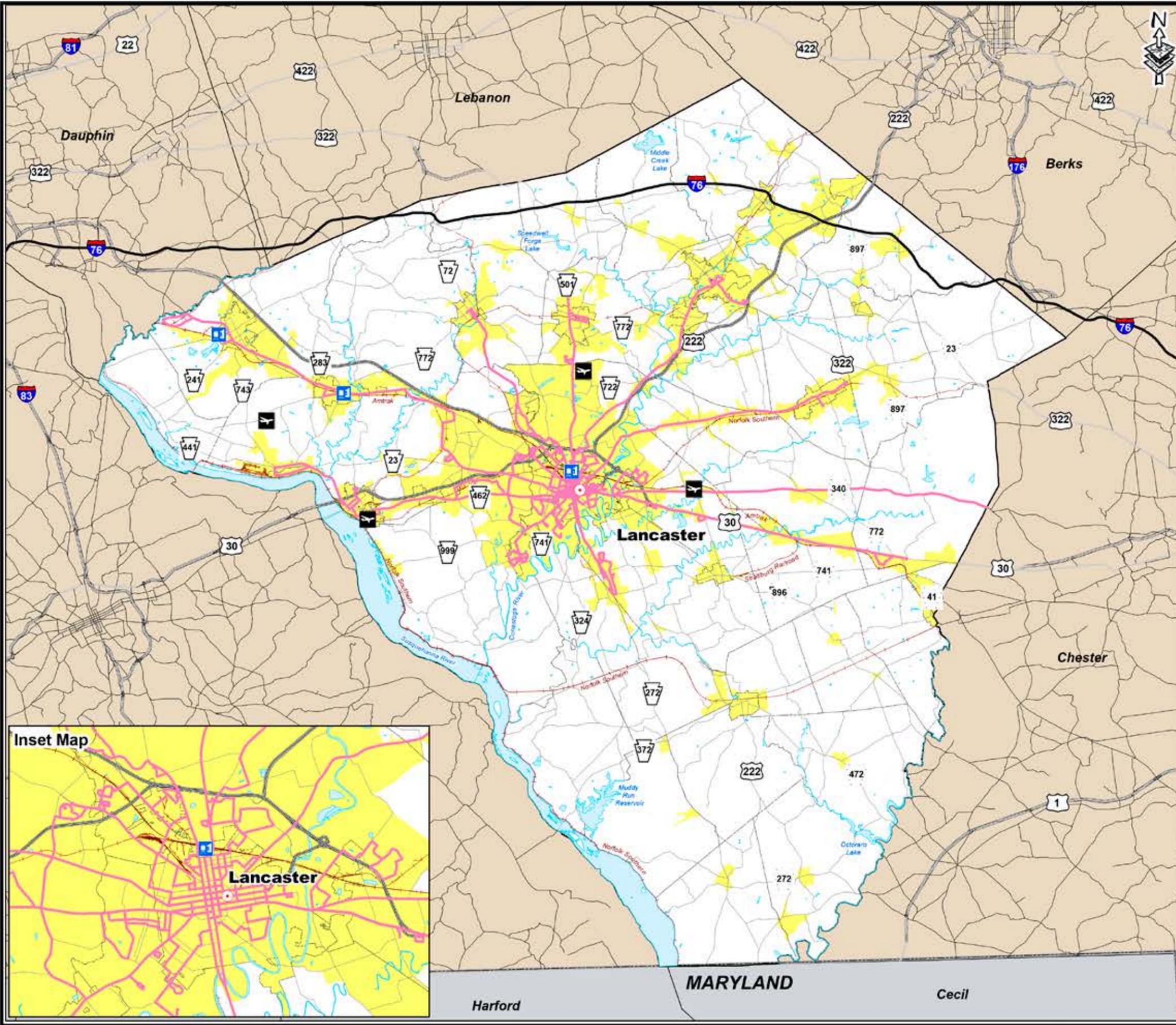
RED ROSE TRANSIT BUS ROUTES Map 4

Legend

-  Airport
-  Amtrak Station
-  Railroad
-  RRTA Bus Routes
-  Fully Controlled Access (Toll)
-  Fully Controlled Access (Other)
-  Major Through Traffic Routes
-  Secondary Traffic Routes
-  Stream / River
-  Lake / Pond
-  Designated Growth Area
-  Municipal Boundary



March 2016



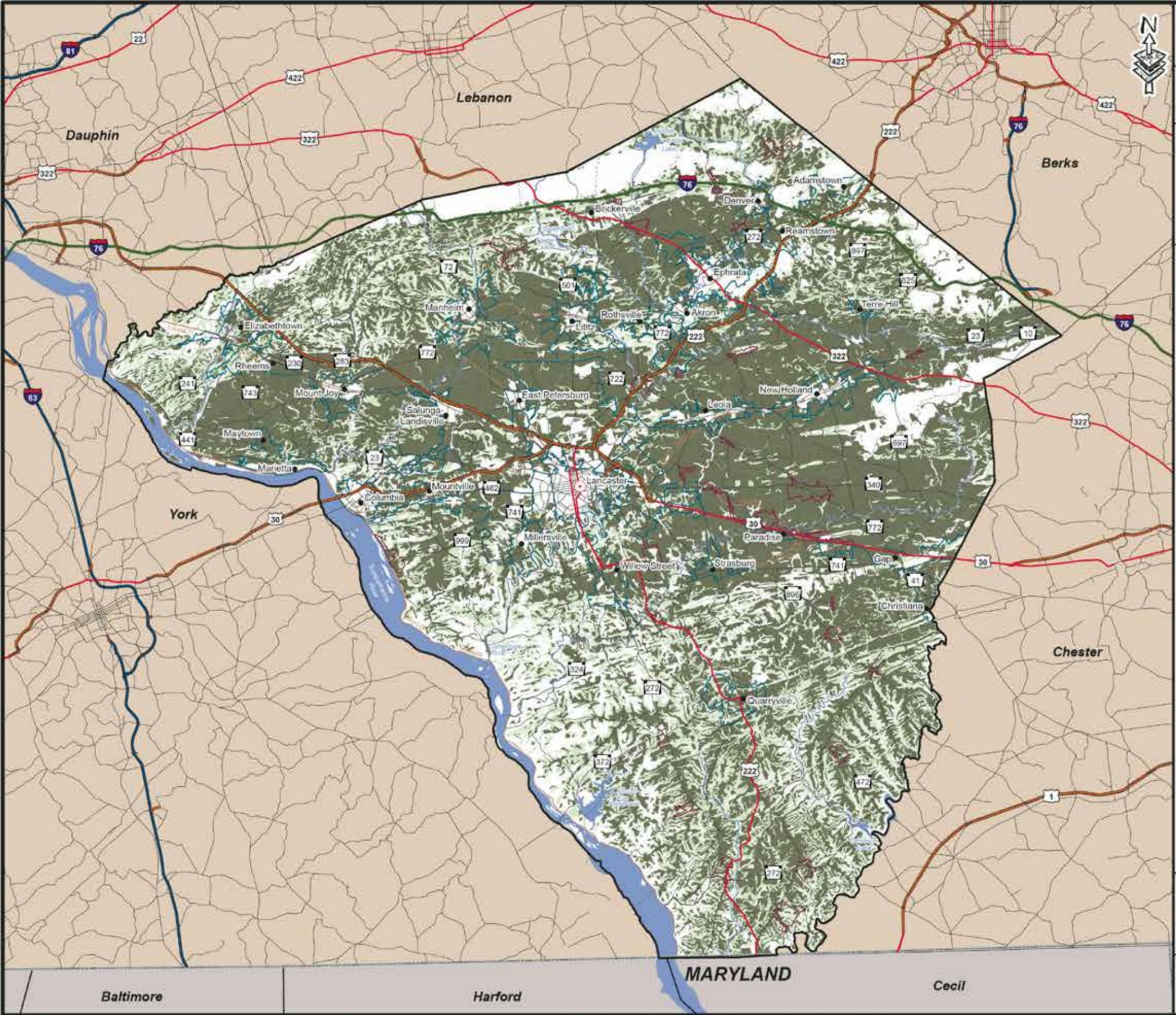
AGRICULTURAL RESOURCES Map 5

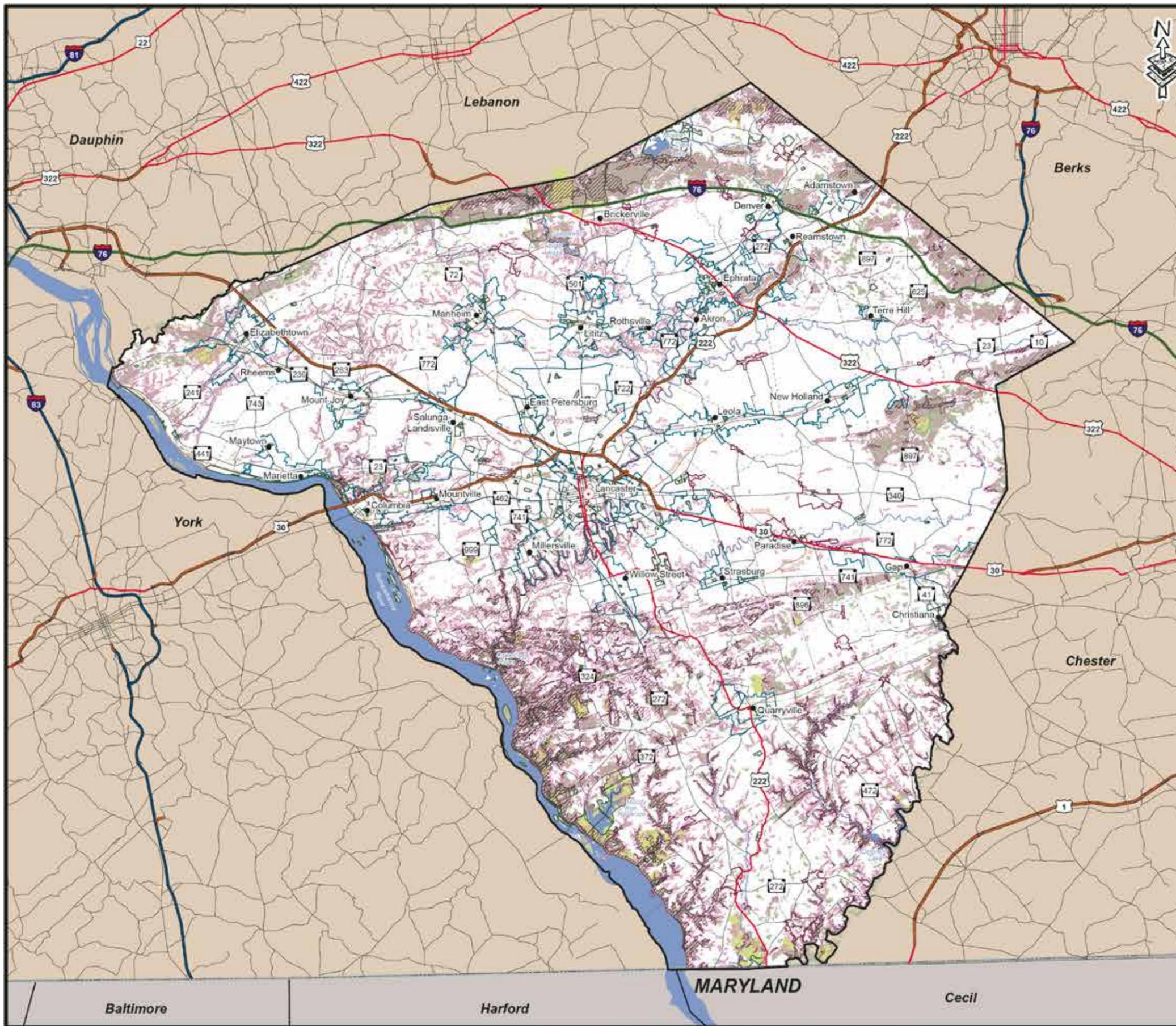
Legend

-  Fully Controlled Access (Toll)
-  Fully Controlled Access (Interstate)
-  Fully Controlled Access (Other)
-  Major Through Routes
-  Secondary Traffic Routes
-  Railroads
-  Prime Agricultural Soil
-  Soils of Statewide Importance
-  Urban Growth Area
-  Village Growth Area
-  Municipal Boundary
-  Rivers
-  Lakes



MARCH 2012



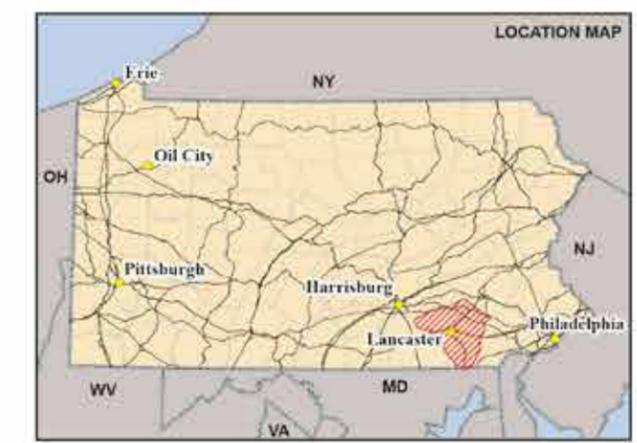


STEEP SLOPES & NATURAL AREAS

Map 6

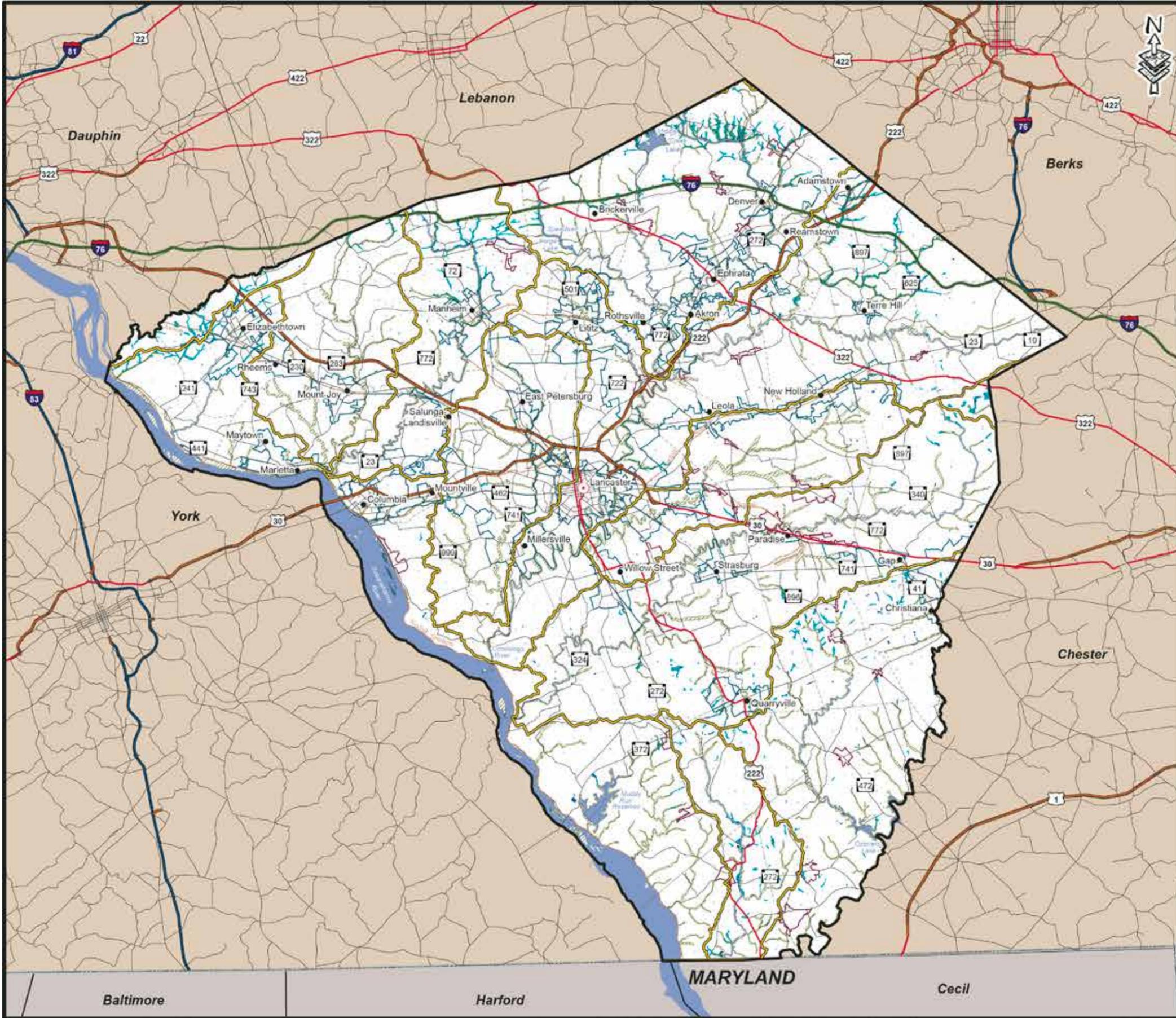
Legend

- Fully Controlled Access (Toll)
- Fully Controlled Access (Interstate)
- Fully Controlled Access (Other)
- Major Through Routes
- Secondary Traffic Routes
- Railroads
- Urban Growth Area
- Village Growth Area
- Municipal Boundary
- Slopes 25% and Over
- Slopes 15-25%
- Woodlands
- Natural Gems
- ~ Rivers
- ~ Lakes



MARCH 2012

HYDROLOGIC RESOURCES Map 7



Legend

- Fully Controlled Access (Toll)
- Fully Controlled Access (Interstate)
- Fully Controlled Access (Other)
- Major Through Routes
- Secondary Traffic Routes
- Railroads
- Major Watersheds
- 100 Year Floodplain
- Wetlands
- Hydric Soils
- Urban Growth Area
- Village Growth Area
- Municipal Boundary
- ~ Rivers
- Lakes



MARCH 2012

GROWTH MANAGEMENT FRAMEWORK

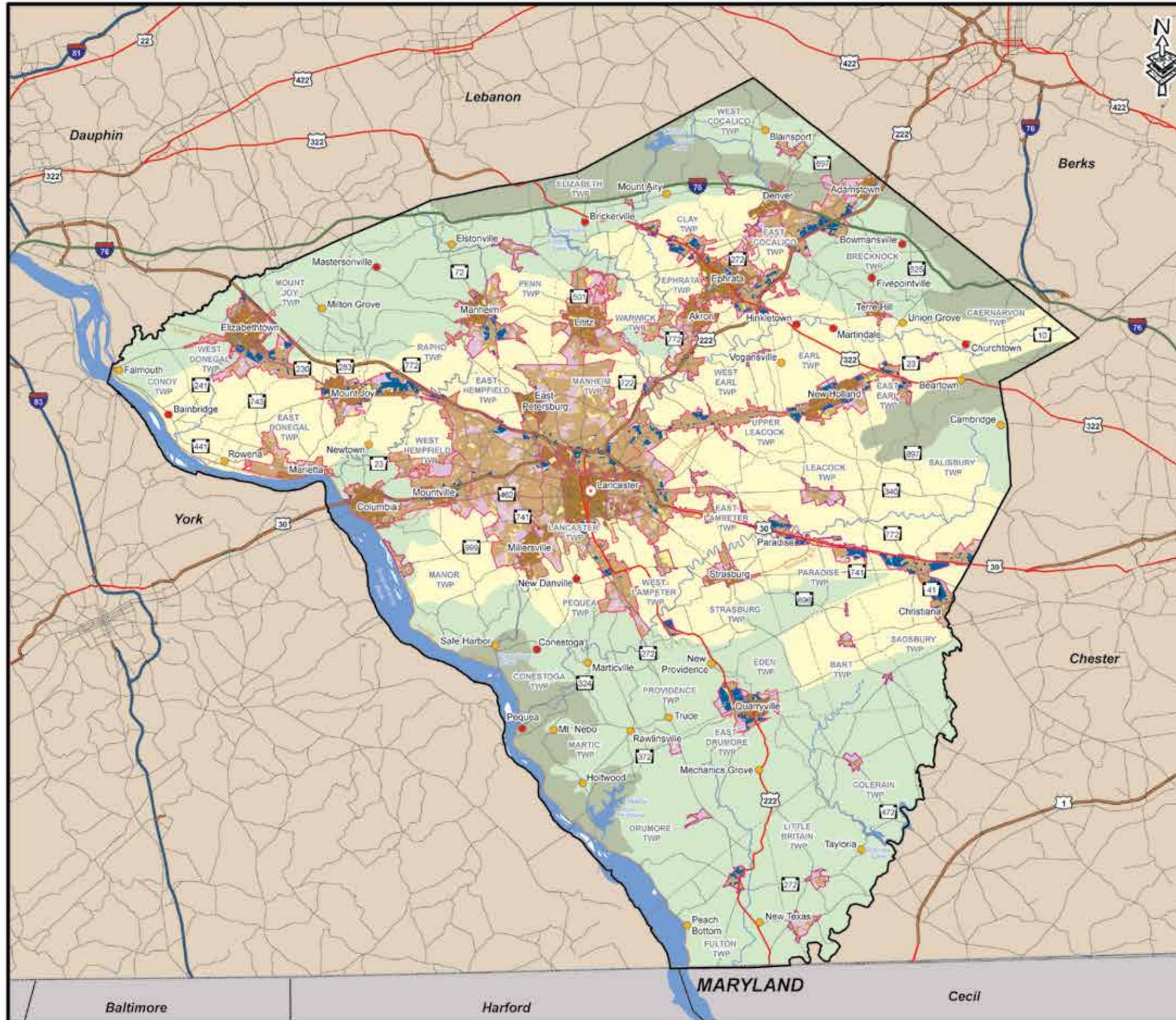
Map 8

Legend

- Recommended Villages
 - Recommended Crossroads Communities
 - Fully Controlled Access (Toll)
 - Fully Controlled Access (Interstate)
 - Fully Controlled Access (Other)
 - Major Through Routes
 - Secondary Traffic Routes
 - Railroads
 - Municipal Boundary
 - Rivers
 - Lakes
- Urban Growth Area Strategy**
- Core Reinvestment Areas
 - General Reinvestment Areas
 - Concentrated Building Areas
 - General Building Areas
- Rural Strategy**
- Designated Agricultural Areas
 - Designated Natural Areas
 - Designated Agricultural with Natural Areas



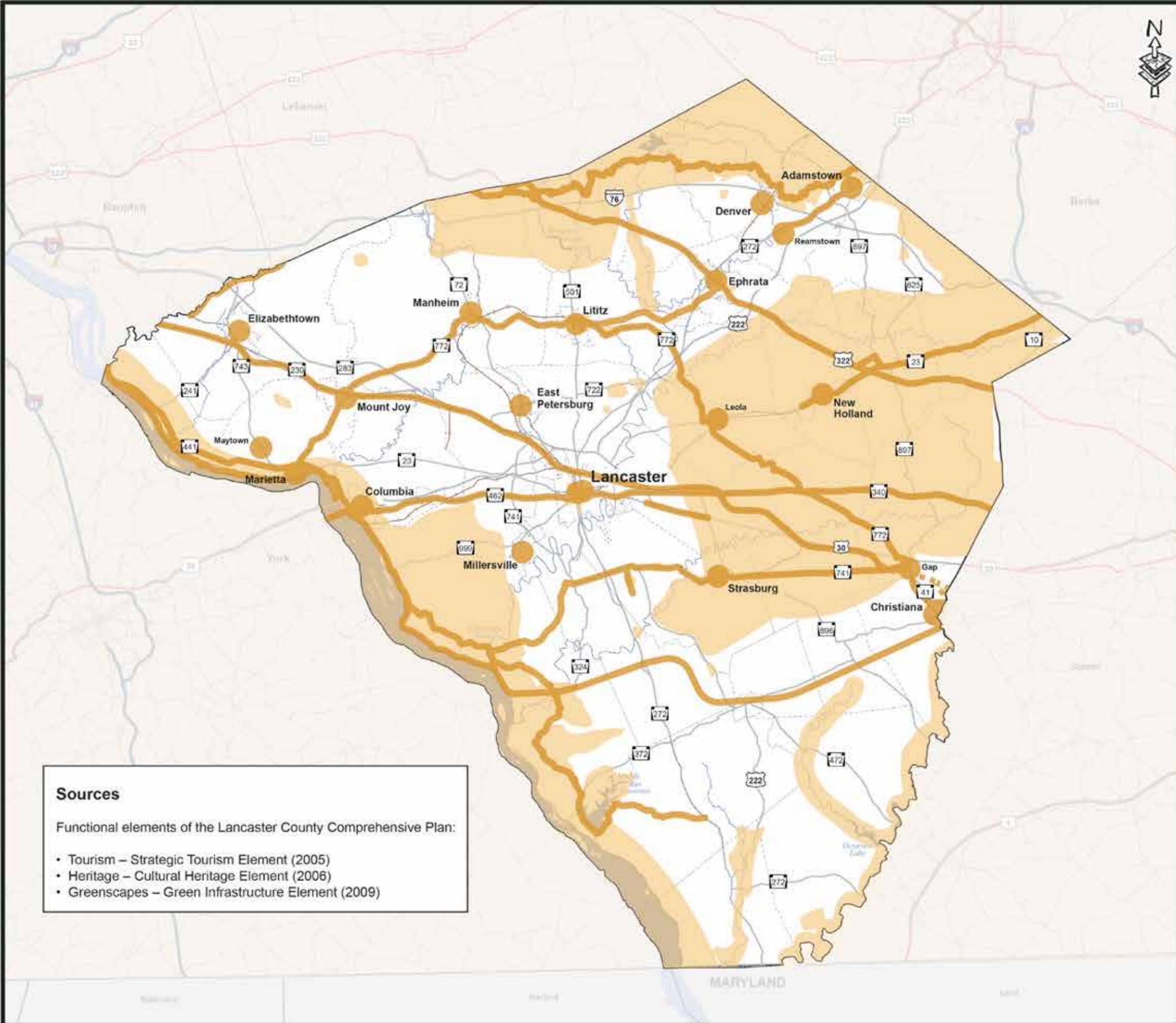
MARCH 2012



TREASURED PLACES

(Heritage Conservation and Tourism Destination Areas)

Map 9



Legend

- Communities
- Corridors
- Landscapes
- Major Roads
- Railroads
- Municipal Boundary
- Rivers
- Lakes



Sources

- Functional elements of the Lancaster County Comprehensive Plan:
- Tourism – Strategic Tourism Element (2005)
 - Heritage – Cultural Heritage Element (2006)
 - Greenscapes – Green Infrastructure Element (2009)



Miles

JANUARY 2016

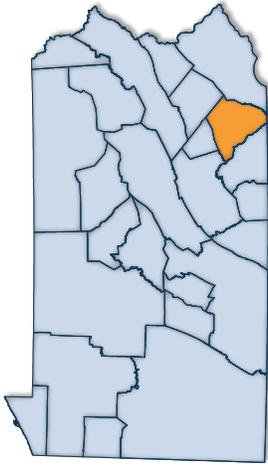
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Appendix C

Public Participation Data

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A Closer Look at Your Region



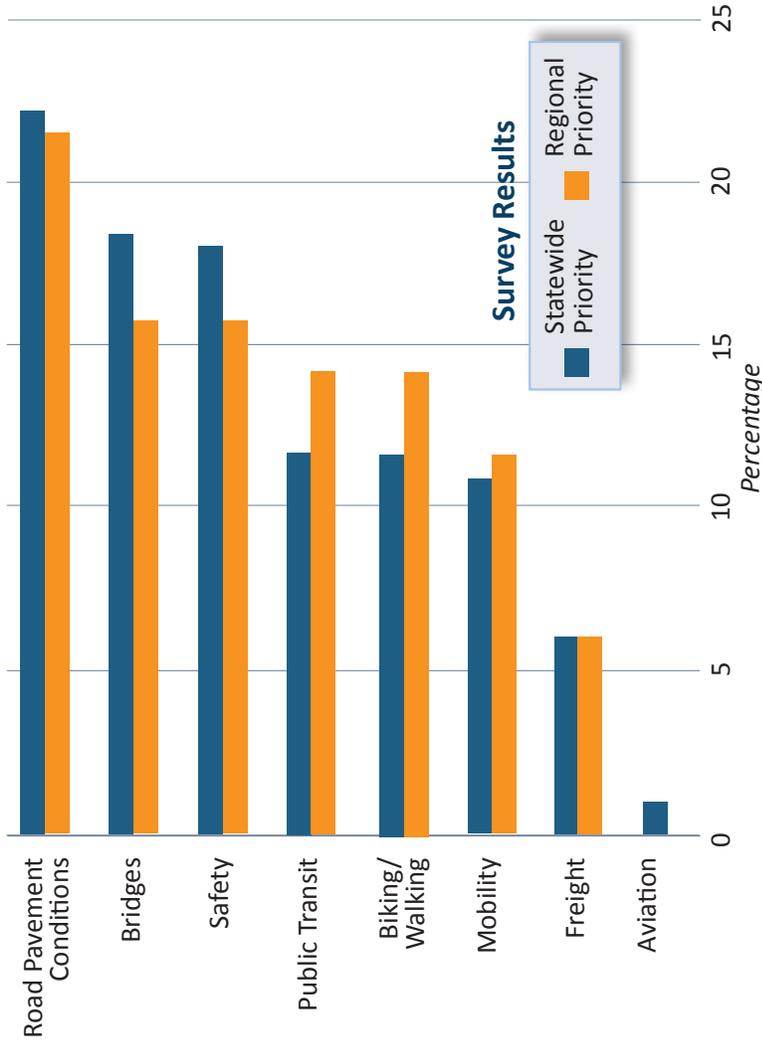
The State Transportation Commission kicked off their six-week open comment period on April 16, 2015 with an online public meeting and survey to invite public input into the Twelve Year Program update. Survey comments for each Planning Partner region were analyzed to understand regional priorities and transportation trends. This report shares the regional results.

Balancing Transportation Priorities and Investment

Participants were asked to rank their top five priorities from a list of eight transportation issues and budget investment for each priority. In general, customers' priorities aligned with investment in each category.



Survey Results: Statewide Priorities vs. Regional Priorities



About the Chart

This chart examines how survey respondents ranked transportation priorities. The top priorities for the statewide and regional level are compared. Survey respondent's location was determined by the location of the issues identified.



Twelve Year Program Update - Survey Results by Region LANCASTER COUNTY TRANSPORTATION STUDY METROPOLITAN PLANNING ORGANIZATION (MPO)

Transportation Issues Identified

Survey participants identified **1,013** transportation issues in the Lancaster MPO region. **Road pavement conditions, biking/walking, and safety** were the most commonly identified issues in the region.

Number of Issues Identified

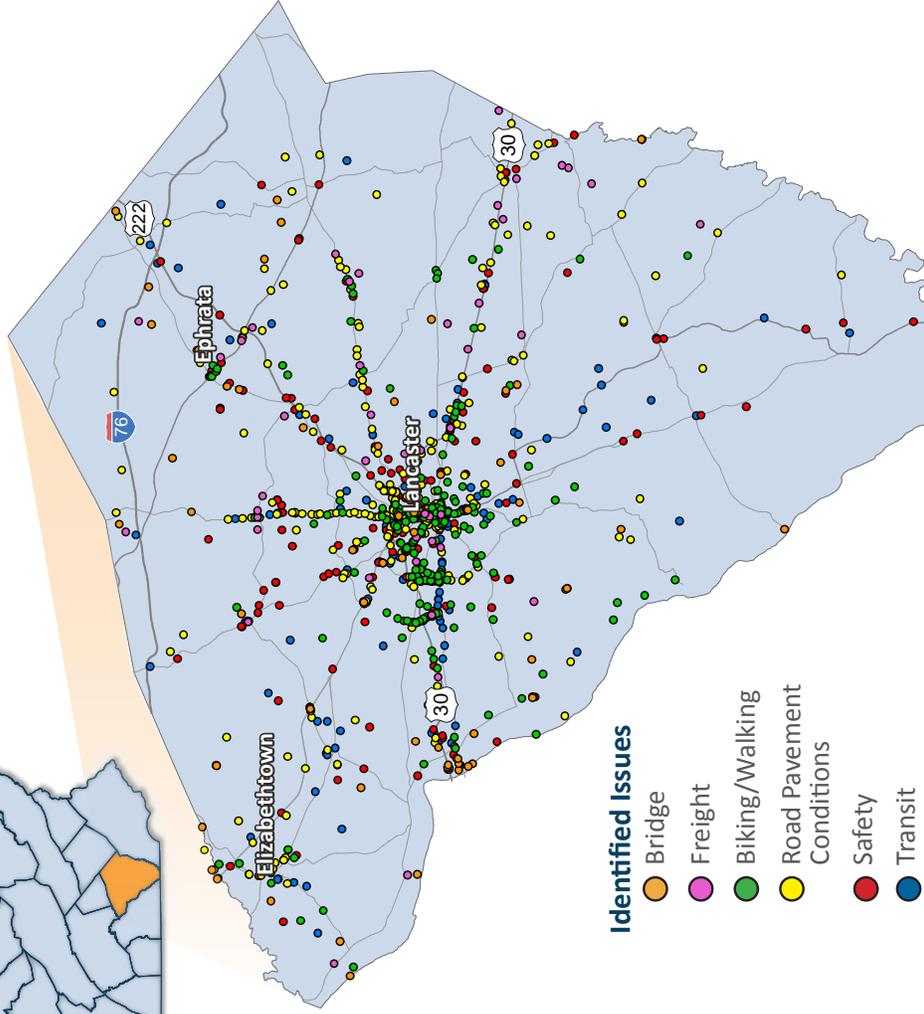
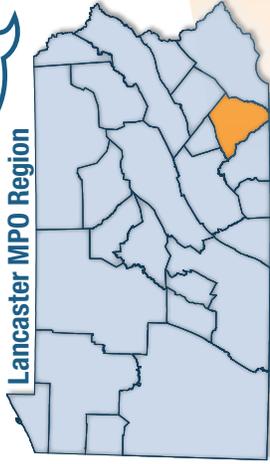


Comment on Safety

"Traffic signals are not linked, traffic is backed up on the bridge [Plaza Blvd.], and motorists often block at the traffic light, those wanting to travel towards Manheim Pike."

- Local Survey Participant

Lancaster MPO Region



Identified Issues

- Bridge
- Freight
- Biking/Walking
- Road Pavement Conditions
- Safety
- Transit

For More Information

Office of the State Transportation Commission

Mail: P.O. Box 3633

Harrisburg, PA 17105-3633

Phone: 717-787-2913 Fax: 717-787-5247

Email: RA-PennDOTSTC@pa.gov

Online: www.TalkPATransportation.com



Explore the map at: www.TalkPATransportation.com/SurveyResults.html



Planning Commission

150 North Queen Street
Suite #320

Lancaster, PA 17603

Phone: 717-299-8333

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www.co.lancaster.pa.us/planning

County Commissioners

Dennis P. Stuckey, Chairman
Scott Martin, Vice-Chairman
Craig Lehman

Executive Director

James R. Cowhey, AICP

Memorandum

To: Municipal managers and planners, business and consumer organizations
From: Harriet Parcels, Senior Transportation Planner
Date: October 20, 2015
Re: Connections 2040 update, Transportation Priorities Survey

The Lancaster County Transportation Coordinating Committee (LCTCC) is in the process of updating the county's Long Range Transportation Plan, Connections 2040. Throughout the update process, we will be seeking public input through surveys, social media and other methods. As an initial step, we have developed a survey to determine whether you think the goals of the current LRTP are still relevant and to obtain your opinion on the state of the county's transportation infrastructure. Those of you who participated in the survey four years ago (over 300 people), you will see that the current survey asks many of the same questions. The reason for this is to enable LCPC to see how the public's perspective on our transportation goals and infrastructure are changing or not changing over time. The survey can be accessed through the Lancaster County Planning Commission website at: <http://www.lancastercountyplanning.org>. On the homepage, under Newsflash, you'll find a link to the Transportation Priorities Survey. The survey should only take 10-15 minutes to complete.

We hope you will take the time to participate and thank you for contributing to the LRTP update process.



Connections 2040 Update Survey

INSTRUCTIONS: The Lancaster County Transportation Coordinating Committee is updating its Long Range Transportation Plan, Connections 2040. We are now reviewing and validating the goals that were established for the last Plan update in 2012. Please take a few minutes to review these goals from the current plan and indicate whether you still agree with them by selecting the appropriate answer. This survey should only take you about 10 minutes to complete and will be available online from October -December 31, 2015.

1. GOAL A: TARGET TRANSPORTATION INVESTMENTS TO SUPPORT THE VISION, GOALS AND STRATEGIES OF THE LANCASTER COUNTY COMPREHENSIVE PLAN AND THE SMART GROWTH PROGRAM.

Not relevant Somewhat relevant Relevant Mostly relevant Very relevant

2. GOAL B: MAINTAIN AND IMPROVE THE COUNTY'S MULTIMODAL INFRASTRUCTURE AND SERVICES TO PROVIDE AN ACCEPTABLE LEVEL OF SERVICE.

Not Relevant Somewhat relevant Relevant Mostly relevant Very relevant

3. GOAL C: IMPROVE SAFETY AND SECURITY FOR ALL USERS OF THE TRANSPORTATION SYSTEM.

Not relevant Somewhat relevant Relevant Mostly relevant Very relevant

4. GOAL D: MANAGE AND OPERATE THE TRANSPORTATION SYSTEM TO REDUCE CONGESTION.

Not relevant Somewhat relevant Relevant Mostly relevant Very relevant

5. GOAL E: ENSURE THAT TRANSPORTATION INVESTMENTS PROTECT THE COUNTY'S AGRICULTURAL, NATURAL, HISTORIC AND CULTURAL RESOURCES AND ENVIRONMENTAL QUALITY.

Not relevant Somewhat relevant Relevant Mostly relevant Very relevant

6. OPTIONAL: If you have any comments on the goals, enter them here.

The following questions ask for your opinion on how well the county's transportation system is performing. Please give a grade (from A-F) to each of the transportation facilities or conditions on them in the County.

1. ROAD SURFACE CONDITIONS

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

2. TRAFFIC SIGNAL OPERATION AND COORDINATION

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

3. AMTRAK SERVICE

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

4. BRIDGE CONDITIONS

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

5. LANCASTER AIRPORT ACCESS

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

6. PEDESTRIAN FACILITIES AND SAFETY

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

7. TRAFFIC CONGESTION

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

8. DRIVER BEHAVIOR

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

9. TRANSIT SERVICE (Red Rose Transit Authority)

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

10. BICYCLE FACILITIES AND SAFETY

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

11. TRAVELER INFORMATION

- A. Excellent
- B. Good
- C. Acceptable
- D. Fair
- E. Poor
- F. Don't know

12. WINTER ROAD MAINTENANCE

- A. Excellent
- B. Good
- C. Adequate
- D. Fair
- E. Poor
- F. Don't know

13. My affiliation is:

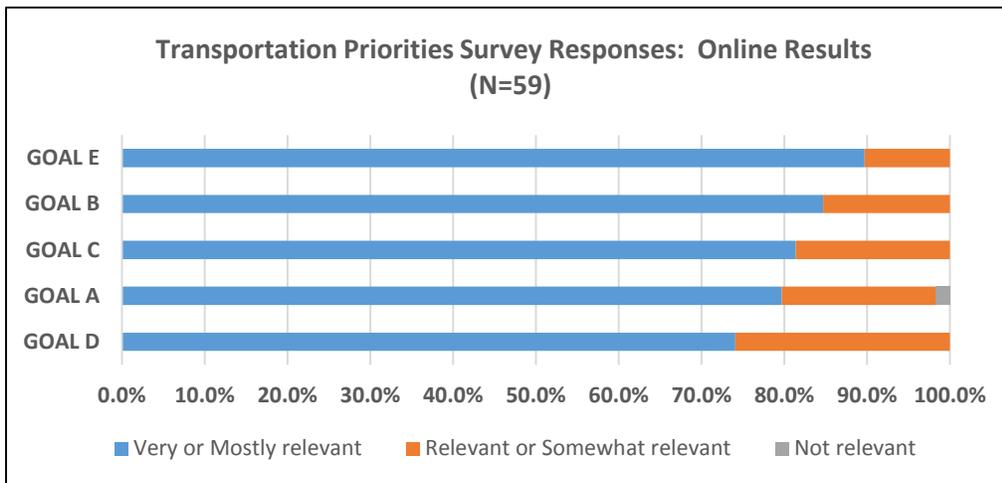
- 1. Municipal or county official
- 2. Municipal/county planner
- 3. Transportation service provider
- 4. Interested citizen

14. Your Municipality of Residence:

Public Responses on the Relevance of the 2012 LRTP Goals

I. Online Survey Results

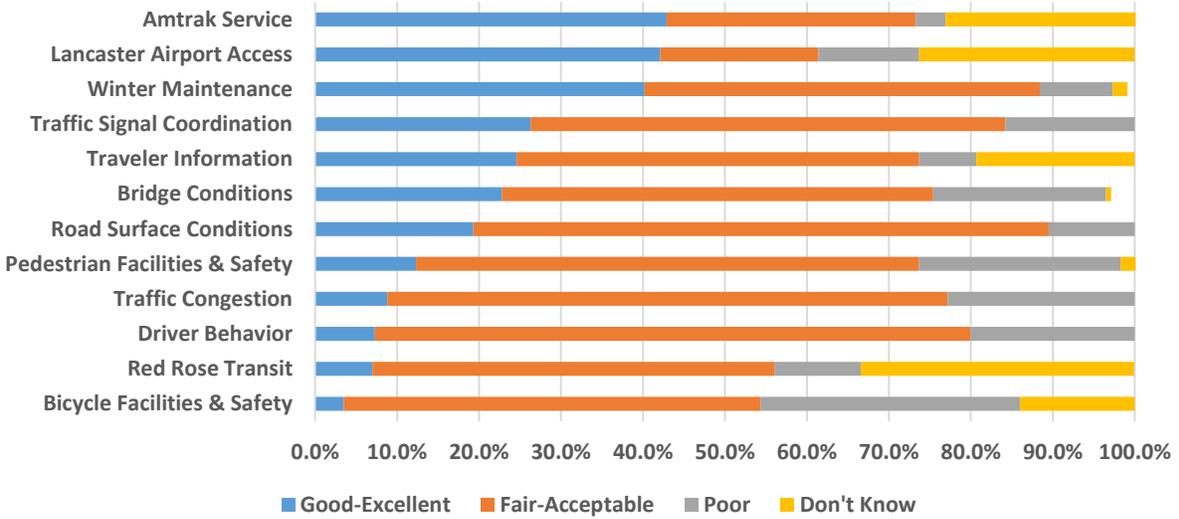
Goal	Very or Mostly Relevant	Relevant or Somewhat Relevant	Not relevant
GOAL D	74.1%	25.9%	0.0%
GOAL A	79.7%	18.6%	1.7%
GOAL C	81.4%	18.6%	0.0%
GOAL B	84.7%	15.3%	0.0%
GOAL E	89.7%	10.3%	0.0%



Quality of the Existing Infrastructure: Online Survey Results

	Good-Excellent	Fair-Acceptable	Poor	Don't Know
Bicycle Facilities & Safety	3.5%	50.9%	31.6%	14.0%
Red Rose Transit	7.0%	49.1%	10.5%	33.3%
Driver Behavior	7.3%	72.7%	20.0%	0.0%
Traffic Congestion	8.8%	68.4%	22.8%	0.0%
Pedestrian Facilities & Safety	12.3%	61.4%	24.6%	1.8%
Road Surface Conditions	19.3%	70.2%	10.5%	0.0%
Bridge Conditions	22.8%	52.6%	21.1%	0.6%
Traveler Information	24.6%	49.1%	7.0%	19.3%
Traffic Signal Coordination	26.3%	57.9%	15.8%	0.0%
Winter Maintenance	40.2%	48.2%	8.9%	1.8%
Lancaster Airport Access	42.1%	19.3%	12.3%	26.3%
Amtrak Service	42.9%	30.4%	3.6%	23.2%

Quality of Transportation Facilities in Lancaster County, Online Results (N=59)



Memorandum

To: Alison Weber
SACA
From: Harriet Parcels
Date: December 16, 2015
RE: Transportation Priorities Survey—Spanish version

Thank you for your review of the Spanish version of the Transportation Priorities Survey which we are conducting as part of the update for the Lancaster County Long Range Transportation Plan (LRTP). It is nearly identical to the survey that we conducted four years ago and we appreciated the support that your organization provided then.

Please distribute the survey to individuals with whom your organization works. I will collect the survey at the end of January-mid February.

Thank you.

To: Teresa Zapata
San Juan Bautista Church
From: Harriet Parcels
Date: December 16, 2015
RE: Transportation Priorities Survey—Spanish version

The Lancaster County Transportation Coordinating Committee (LCTCC), the Metropolitan Planning Organization for Lancaster County, is in the process of updating the county's Long Range Transportation Plan. As part of the update, we developed a Transportation Priorities Survey to gain input from the public on whether they agree with the goals of the existing Plan and how they rate various aspects of the transportation facilities in the county. Four years ago, when we did the last update, we provided your organization with a Spanish version of the survey which you distributed to Spanish-speaking individuals with whom the Church's social service agencies work. Enclosed is a nearly identical survey that has been translated into Spanish.

We would appreciate it if you would again help us get this out to Spanish-speaking people so their views are included in the Plan Update process. I will contact you at the end of January-early February about collecting the completed surveys. I have also given copies to Alison Weber at SACA.

Thank you.

Conexiones 2040 Encuesta de actualización

INSTRUCCIONES: El Comité Coordinador de Transporte del Condado de Lancaster está actualizando su Plan de Transporte a Largo Plazo, *Conexiones de 2040*. Ahora estamos revisando y validando los objetivos que se establecieron para la última actualización del Plan en 2012. Por favor, tome unos minutos para revisar estos objetivos del plan actual e indicar si usted todavía está de acuerdo con ellos, seleccione la apropiada responder. Esta encuesta sólo debe tomar unos 10 minutos para completar y estará disponible en línea a partir de octubre-diciembre 31, 2015.

1. OBJETIVO A: INVERSIONES DE TRANSPORTE DE DESTINO PARA APOYAR LA VISIÓN, OBJETIVOS Y ESTRATEGIAS DEL PLAN INTEGRAL DEL CONDADO DE LANCASTER Y EL CRECIMIENTO INTELIGENTE PROGRAMA.

No relevante Algo relevante Relevante Parcialmente relevante Muy relevante

2. OBJETIVO B: MANTENER Y MEJORAR LA INFRAESTRUCTURA MULTIMODAL DEL CONDADO Y SERVICIOS PARA PROPORCIONAR UN NIVEL DE SERVICIO ACEPTABLE.

No relevante Algo relevante Relevante Parcialmente relevante Muy relevante

3. OBJETIVO C: MEJORAR LA SEGURIDAD Y LA SEGURIDAD PARA TODOS LOS USUARIOS DEL SISTEMA DE TRANSPORTE.

No relevante Algo relevante Relevante Parcialmente relevante Muy relevante

4. OBJETIVO D: ADMINISTRAR Y OPERAR EL SISTEMA DE TRANSPORTE PARA REDUCIR LA CONGESTIÓN.

No relevante Algo relevante Relevante Parcialmente relevante Muy relevante

5. OBJETIVO E: ASEGURAR QUE LAS INVERSIONES TRANSPORTE DEL CONDADO PROTEJAN LOS RECURSOS AGRÍCOLAS, NATURALES, HISTÓRICOS Y CULTURALES Y LA CALIDAD DE AMBIENTE.

No relevante Algo relevante Relevante Parcialmente relevante Muy relevante

6. OPCIONAL: Si tiene algún comentario sobre los objetivos, ingrese aquí.

Conexiones 2040 Encuesta de actualización

Las siguientes preguntas piden su opinión de qué tan eficiente es el sistema de transporte del condado amaestrado. Por favor, dar una calificación (de AF) para cada una de las instalaciones de transporte o condiciones a en el Condado.

1. CONDICIONES SUPERFICIE DE LA CARRETERA

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

2. FUNCIONAMIENTO DE SENALES DE TRAFICO Y COORDINACIÓN

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

3. SERVICIO DE AMTRAK

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

4. CONDICIONES DEL PUENTE

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

5. ACCESO HACIA EL AEROPUERTO DE LANCASTER

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

6. INSTALACIONES DE PEATONES Y SEGURIDAD

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

7. CONGESTIÓN TRÁFICO

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

8. COMPORTAMIENTO DEL CONDUCTOR

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

9. SERVICIO DE TRÁNSITO (Autoridad Red Rose Transit)

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

10. INSTALACIONES DE LA BICICLETA Y SEGURIDAD

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> A. Excelente | <input type="checkbox"/> D. Justo |
| <input type="checkbox"/> B. Bien | <input type="checkbox"/> E. Mala calidad |
| <input type="checkbox"/> C. Aceptable | <input type="checkbox"/> F. No sé |

11. INFORMACIÓN VIAJERO

- A. Excelente
- B. Bien
- C. Aceptable
- D. Justo
- E. Mala calidad
- F. No sé

12. EL SERVICIO EN INVIERNO

- A. Excelente
- B. Bien
- C. Aceptable
- D. Justo
- E. Mala calidad
- F. No sé

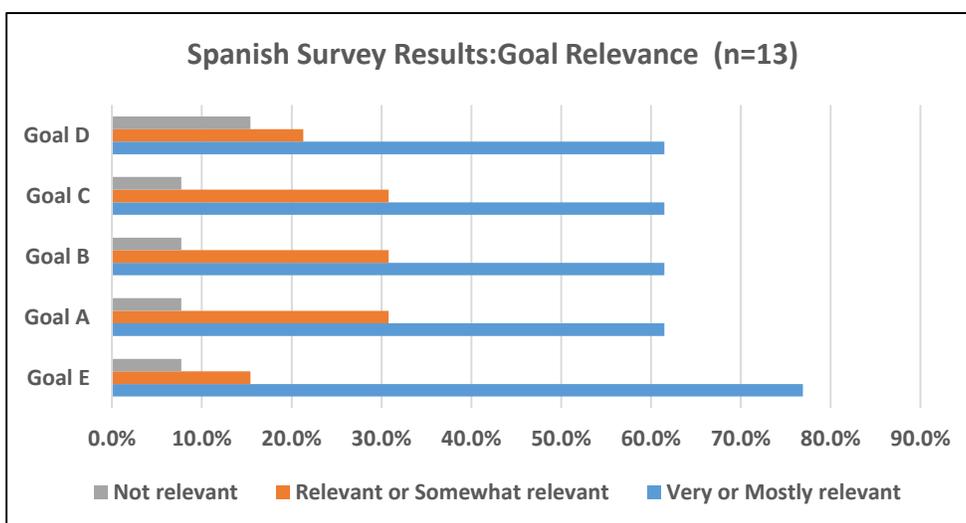
13. MI AFILIACIÓN ES:

- 1. Funcionario municipal o del condado
- 2. Municipal planificador / condado
- 3. Proveedor de servicios Transporte
- 4 Ciudadano interesado

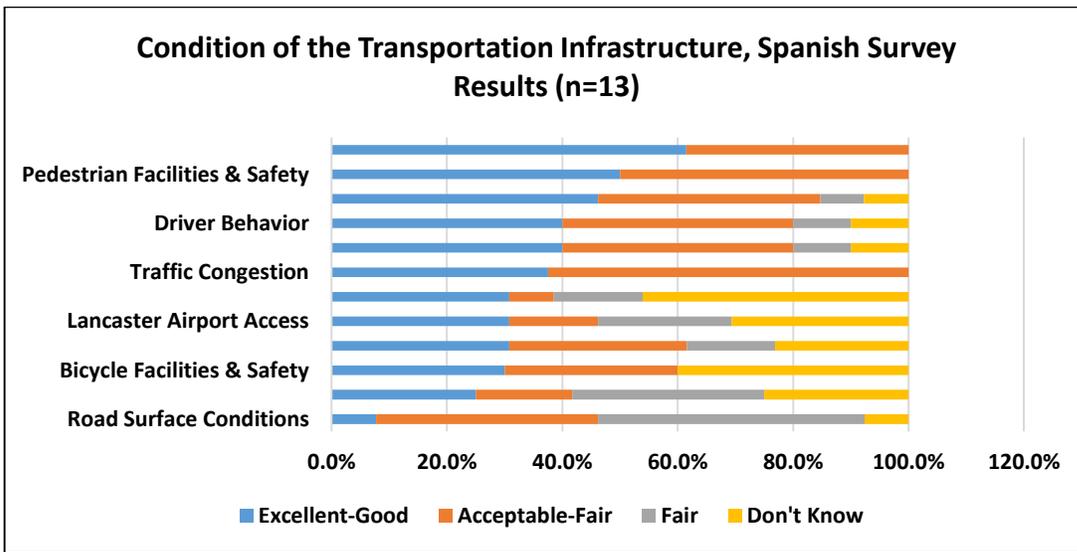
14. TU MUNICIPIO DE RESIDENCIA:

II. Spanish Survey Results

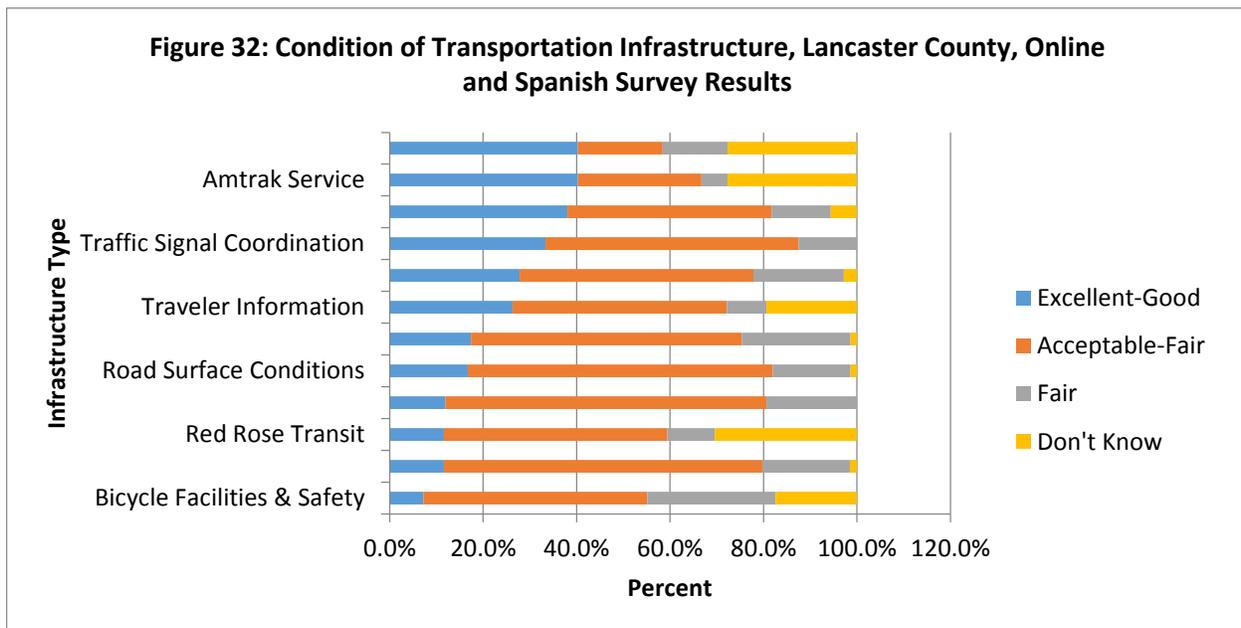
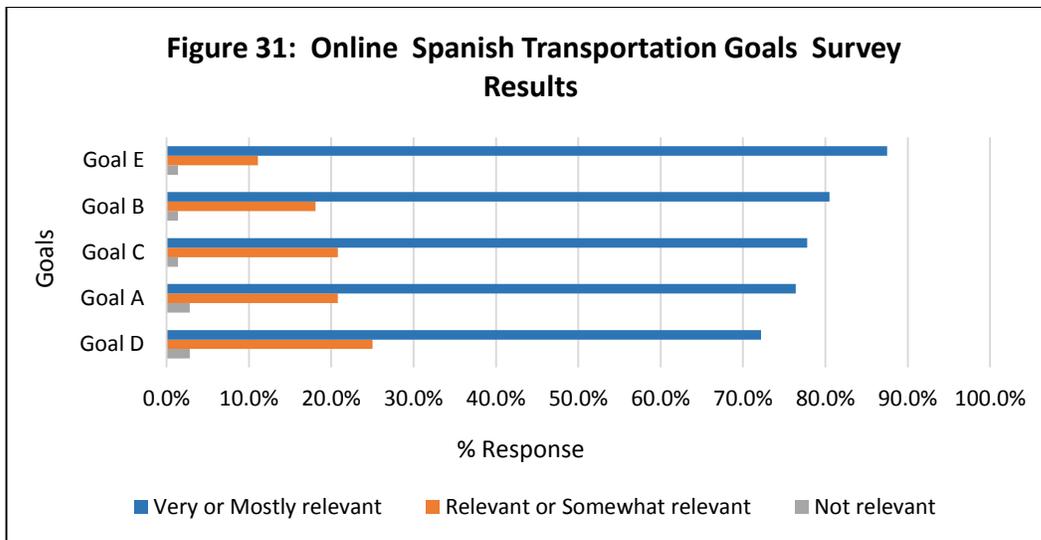
	Very Relevant or Mostly relevant	Relevant or Somewhat relevant	Not relevant
Goal E	76.9%	15.4%	7.7%
Goal A	61.5%	30.8%	7.7%
Goal B	61.5%	30.8%	7.7%
Goal C	61.5%	30.8%	7.7%
Goal D	61.5%	21.3%	15.4%



Condition of the Transportation Infrastructure, Spanish Survey				
Infrastructure Type	Excellent-Good	Acceptable-Fair	Fair	Don't Know
Road Surface Conditions	7.7%	38.5%	46.2%	7.6%
Winter Maintenance	25.0%	16.7%	33.3%	25.0%
Bicycle Facilities & Safety	30.0%	30.0%	0.0%	40.0%
Traveler Information	30.8%	30.8%	15.3%	23.1%
Lancaster Airport Access	30.8%	15.4%	23.1%	30.7%
Amtrak Service	30.8%	7.7%	15.4%	46.1%
Traffic Congestion	37.5%	62.5%	0.0%	0.0%
Red Rose Transit	40.0%	40.0%	10.0%	10.0%
Driver Behavior	40.0%	40.0%	10.0%	10.0%
Bridge Conditions	46.2%	38.5%	7.6%	7.7%
Pedestrian Facilities & Safety	50.0%	50.0%	0.0%	0.0%
Traffic Signal Coordination	61.5%	38.5%	0.0%	0.0%



III. Combined Online and Spanish Survey Results



Lancaster County Chamber of Commerce and Industry 25-Year Transportation Vision for Lancaster County's Mobility

Background

The Chamber formed a task force made up of community and business leaders charged with developing a "vision" for Lancaster County's transportation network and build consensus around priority projects that have the most need and the greatest positive long-term impact.

The 25-Year Vision

The Chamber's mission is to "build Lancaster County into a model of prosperity for 21st Century America." It is our belief that transportation and infrastructure plays a critical role in the mission statement in order for the County to be a model of prosperity. Therefore, our 25-year transportation vision is:

"Moving and connecting people and goods efficiently and responsibly within the County, across the state and throughout the world."

Implementation Strategies

In order to achieve our 25-year vision, certain strategies must be championed that will preserve, modernize, and improve the transportation network. We believe implementing the strategies below will improve the overall mobility of people, goods and services, and improve the quality of life of residents. Delivering on our vision center on five core strategies:

- **Innovation.** The Chamber encourages innovation through new technologies, new modes of transportation, technological advances, and research and development. Further, we encourage a comprehensive and regional approach to transportation planning in order to meet needs from a broader level. Being innovative will reduce costs and improve the efficiency of moving people, delivering products and supplies. Harnessing these advancements is a key part of remaining competitive in the global market.
- **Integration.** Business and residents must have the freedom to make smart and economical transportation choices. The Chamber encourages the integration of a multi-modal network that includes highways, rail, transit, air and bike/pedestrian routes.
- **Inter-connection.** The Chamber encourages inter-connecting multi-modal modes of transportation to regions of the county - both urban and rural - to population centers and to the global economy.
- **Improvement.** Transportation planning must emphasize the need to maintain and improve the existing network with an eye on capacity-adding projects. The Chamber encourages continued investment and planning for construction projects concurrently with other innovative investments to relieve congestion, improve the mass transit system, and increase overall safety.
- **Investment.** Transportation investment boosts productivity and quality of life for the entire community. It is important that adequate funding be allotted to maintain

the existing transportation infrastructure and allow for future improvements to manage growth. A well-maintained and balanced system opens up opportunities for jobs, affordable choices in places to live, recreation and other services.

Policy Recommendations

The transportation funding model at both the state and federal level, which relies on a fuel tax, is simply inadequate to sustain our infrastructure. Therefore, The Chamber encourages common-sense policies that promote a sustainable and diverse funding source for all modes of transportation. The Chamber encourages a dialogue with stakeholders to discuss the feasibility of such policies as:

- Exploring Public-Private Partnerships (P3s).
- Streamlining the transportation planning process.
- Investing in modes of transportation that uses alternative energy sources.
- Investing in cutting-edge technology.
- Investigating and promoting innovation, including cost-saving measures.
- Identifying funding reforms.
- Identifying new funding sources.
- Eliminating/place a moratorium on state prevailing wage rates and federal "Davis-Bacon" wage rates.
- Exploring the viability of Traffic Impact Fees.
- Indexing funding reforms to the Consumer Price Index (CPI).

Capital Project Recommendations

Near-Term

- Route 30 east (896 to 41)
- Harrisburg Pike (from Lancaster City to East Hempfield Township)
- North/South Route (Lititz, Oregon, Manheim and Fruitville Pikes)
- Centerville Road

Long-Term

- Continual system preservation and signal improvements
- Route 23 improvements and possibly a Bypass
- Regional and High Speed Rail

Goals

Short-Term: Advance capital project recommendations and policy recommendations listed above.

Long-Term: A focus on the transportation planning process, with a commitment to identify inefficiencies and recommend a refined and improved methodology for making transportation decisions.

Appendix D

Public Comments on the Draft Plan

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Public Comments and Responses

(Listed in the order the comment was received)

Dee Dee McGuire, West Lampeter Township Manager

Comment: The Willow Street SGT project MPMS 106629 is listed in Providence Township on the Project Narrative. It should be West Lampeter Township.

Response: This is an error that will be corrected when the final TIP is adopted.

Kathy Dimpsey, Federal Highway Administration

Comment: Please note my TIP comment for new bridge starts. (The P3 bridges should be in construction, so the recommendation should only apply to those bridges beginning PE.)

- FHWA is finding PE bridge starts that have MPMS project titles or narratives stating “bridge replacement”. If these are not P3 bridges, the project narratives should be written to state “bridge improvements” or “bridge replacement/rehabilitation” instead of just “bridge replacement”. This is particularly important for bridges that may have historic considerations.

Response: We will update our User Friendly TIP with the suggested wording. We will also coordinate with PennDOT to revise the Project Narrative Summary which is derived from their Multi-Project Management System (MPMS).

Brenda Kauffman

Comment: I appreciate the County Planning Commission’s efforts to lead the county in the development of multimodal transportation. I believe this transition is an investment that is important for this county and all municipalities. I am especially pleased to see the development of the Enola Trail from Quarryville to Christiana as well as the bridge to

connect the Turkey Hill Enola Trail and the southern portion of Enola Trail.

I am pleased to see the work done by the City of Lancaster to promote the concept of complete streets and hope that the county can provide leadership to the municipalities so that they all start to follow the principles. I am concerned about traffic on the north/south corridors like Fruitville, Manheim, Lititz (a little better) and Oregon Pikes. The traffic presents hazards to the increasing numbers of walkers and cyclists who also try to use those roads. Thank you.

Response: Thank you for your comment. We appreciate your interest in the development of Lancaster County’s Long-Range Transportation Plan (Plan), **Connections 2040: 2016 Update**, and the 2017–2020 Transportation Improvement Program (TIP). We will consider your input as we continue to implement the Plan, and develop projects for the TIP.

Greg Paulson

Comment: I strongly support the suggested improvements at Columbia + Race Ave’s at Lanc City + Lanc Tp border. I am in support because of personal experiences and I have heard many neighbors – including the New School. Also supported by Rep. Mike Sturla.

Response: Thank you for your comment. We appreciate your interest in the development of Lancaster County’s Long-Range Transportation Plan (Plan), **Connections 2040: 2016 Update**, and the 2017–2020 Transportation Improvement Program (TIP). We will consider your input as we continue to implement the Plan, and develop projects for the TIP.

Becky Harclerode

Comment: I would like more bike lanes or at least shoulders on roads like Lititz Pike, Columbia Pike, Fruitville Pike, Manheim Pike – these roads that radiate out of Lancaster proper and connect services

—like the hospital suburban campus on Good Dr.—to be bikeable.

Response: Thank you for your comment. We appreciate your interest in the development of Lancaster County's Long-Range Transportation Plan (Plan), **Connections 2040: 2016 Update**, and the 2017–2020 Transportation Improvement Program (TIP). We will consider your input as we continue to implement the Plan, and develop projects for the TIP.

Karl Graybill

Comment: On the USER FRIENDLY HIGHWAY & BRIDGE TIP, please have MPMS#93088 changed as follows:

*Resurfacing on Prince Street from King Street to W. Andrew Street, **Duke Church Street** from South Queen Street to Lime Street, and Duke Street from McGovern Avenue to Orange Street*

This will correct the incorrect description and make it consistent with the map on page 25 in the HIGHWAY & BRIDGE PROJECTS NARRATIVES.

Response: Thank you for making us aware of this error. It will be corrected for the final documents.

Cindy McCormick

Comment: In reviewing the TIP, I didn't see the City and LIMC Bike Plan projects on the draft TIP? Did I overlook them?

Response: You did not overlook them. They are not on the draft 2017 TIP. They are on the current 2015 TIP and the funds will be obligated this year, by August I believe, so they will not be shown on the next TIP.

Brad Stewart

Comment: Is there a reason there are never plans to resurface Harrisburg Avenue within the City of Lancaster? The 1/2 mile stretch, between College

Avenue and N. Prince Street, of Harrisburg Ave has been in terrible condition for at least 8 years.

Response: Thank you for your comment. We appreciate your interest in the development of Lancaster County's Long-Range Transportation Plan (Plan), **Connections 2040: 2016 Update**, and the 2017–2020 Transportation Improvement Program (TIP). We will consider your input as we continue to implement the Plan, and develop projects for the TIP.

Marie Quigg

Comment: I ride Route 12 RRTA bus weekdays from New Holland to Lancaster. I have been doing so for the past 8+ years and am very surprised to hear that ridership is up from what I have experienced and observed.

I have talked with fellow passengers, discussing where we work and why we ride and have discovered that many of them find riding RRTA a punishment that they want to bypass as quickly as possible. There is a stigma of ridership in the negative sense. It means that you cannot afford a car or insurance, or that you have been in prison or arrested for drunk driving. It is a means of transport for the less fortunate, the aged and handicapped. It is an option that does not offer options to the rider. You take what you can get if it is given. Beggars cannot be choosers.

Folks are encouraged with ads to be a rider. Sounds fun and is good for the environment. Sounds too good to be true and is.

If you ride, you might encounter roaches and garbage on your seat. You might receive a shower of water from the leaky roof and windows. The temperature is erratic and windows may not be able to be opened—or may open by themselves. And then there is that lovely diesel aroma in the cabin from the exhaust leaks that the maintenance staff cannot locate.

If you are Amish and bring your scooter, it does not fit on the bike rack so you must bring it into the cabin. This also goes for bikes with wide tires which are so popular now—they just don't fit on the bike rack. Add to the mix a wheelchair or two and moms with strollers and the cabin fills up quickly.

The well-promoted Bus Tracker app, well, leaves something to be desired. It only works when the driver logs onto the system. Buses disappear from it as they approach QSS if they are sent back to the garage, but the rider does not know this until 10 more minutes pass and no bus appears--and has to call the dispatch to see what is going on. Somehow there seems to be no connection between the electronic bus time boards and the Bus Tracker app for you can see a bus moving on the app, moving through the city, and no change on the time board.

With road construction abundant or broken down buses, there needs to be some way to fill in for missing departures so riders can keep their agreement for "TO WORK ON TIME" with their employers. I have heard and seen many start riding only to leave because they cannot depend on RRTA scheduling to deliver them to work on time—or worse—are fired because they cannot make it to work on time. And if you DO want to be on time, you have to ride a bus perhaps an HOUR or more before your work begins because you cannot rely on the timetable to get you there on time.

Time and time again I see no bus for the Route 12 4:45 afternoon bus outbound to New Holland. Those people have to wait until 5:20 for the next and final bus of the day--and we must wait for transfers at 5:20 because it is the last bus of the day (more than the designated 5 minutes—or we turn around and have to go back to QSS because the driver was impatient and left without the transfer).

Buses for the outlying points in our area are few and far between. If you ride to these outlying areas, you often see no sidewalks, no shelters, no lights for the

rider—safety concerns. Imagine, if you will, waiting an hour or more in the winter or in the rain and wind for the bus out in the countryside. It is trying. Or arguing with the driver to let you off where there is no bus stop sign so you don't have to walk 1/2 mile to your road because he/she does not believe what is in the bus manual...

In Lancaster City, passengers must get on and off at marked bus stop signs. Outside Lancaster City, passengers may get on and off along the route, even if there is no marked bus stop sign.

Then imagine waiting at QSS with all the smoking, even though there are signs posted against smoking.

Many more cars and vehicles are on the roads. Many cross roads/intersections/stoplights have been added over the past 20 years, yet most of the time stops on RRTA are the same from 20 years ago. Why haven't things adapted with the changes in Lancaster County roads and travel over the past 20 years?

Don't get me wrong. I WANT RRTA to be a dependable, reliable mode of transportation, but things will have to change. Admin MUST start listening to the riders and addressing their needs. Safety and time issues need to be addressed. Have upper level staff ride the bus during those busy times of the day to see what the rider experiences. Fix what is broken. Work with the county and municipalities to offer safe bus stops and encourage building sidewalks and even additional park and ride lots to increase ridership. But only if buses will keep to a more reasonable schedule with more buses added to the rotations.

RRTA can improve and ridership will grow if you address these problems.

Thank you for listening.

Response: Thank you for your comment. We appreciate your interest in the development of Lancaster County's Long-Range Transportation Plan (Plan),

Connections 2040: 2016 Update, and the 2017–2020 Transportation Improvement Program (TIP). We will consider your input as we continue to implement the Plan, and develop projects for the TIP.

Andy Esbenshade

Comment: It was nice meeting you last week. My primary reason for attending the meeting was to see what is planned for the roadways that are being expanded. I was curious if there were provisions being made for pedestrian traffic. There are a lot of people who commute via public transportation to get to different areas of the county for work and I have noticed that pedestrians have to walk on the roadway to get to a bus stop. With the increased traffic in different areas of the county I think it's very important to take pedestrian traffic into account. It seems like safe access to public transportation and just safe accommodations for pedestrians is important as our county grows. I would love to hear what is in the plans. Thanks.

Response: Thank you for your comment. We appreciate your interest in the development of Lancaster County's Long-Range Transportation Plan (Plan), **Connections 2040: 2016 Update**, and the 2017–2020 Transportation Improvement Program (TIP). We will consider your input as we continue to implement the Plan, and develop projects for the TIP.

Brenda Buescher, Lancaster General Hospital

Comment: Attached is my review of latest health statistics and information from the CDC and the Department of Transportation on health & transportation. My goal was to align it with the rest of the plan so that you could consider using it as a new chapter 5 after the Environmental and Historic Resources overview or incorporate the information into other chapters. Let us know if there's anything else you need.

Here are the key health statistics I included:

- In Lancaster County, 64% of adults, 40% of teens, and 36% of children K–6 are overweight or obese. (Pennsylvania Behavioral Risk Factor Surveillance System, 2012–2014)
- Overall, 9% of adults and 25% of Medicare beneficiaries in Lancaster County have diabetes, a leading cause of death in the United States. (Pennsylvania Behavioral Risk Factor Surveillance System, 2012–2014; Centers for Medicare and Medicaid Services, 2014)
- Heart disease is the leading cause of death in the United States, and stroke is the third leading cause of death in the United States (US Department of Health and Human Services, 2016). In Lancaster County, 12% of adults over age 35 have experienced a heart attack, coronary heart disease, or stroke (Pennsylvania Behavioral Risk Factor Surveillance System, 2012–2014).
- The cost estimate of health care expenses for obesity-related diseases ranges between \$147 billion and \$210 billion per year. In addition, obesity contributes to absenteeism and lower productivity at work, costing employers \$506 per obese worker per year. (Trust for America's Health and the Robert Wood Johnson Foundation, *The State of Obesity*, 2016)
- The percentage of commuters who walk and bike to work is very low: 79.3% of commuters drive alone to work, while only 3.5% of commuters walk to work and 0.8% bicycle to work. (American Community Survey, 2010–2014.)
- Air pollution from motor vehicles continues to harm the environment and contributes to health problems such as asthma and heart disease. In Lancaster County, 15% of adults have asthma (Pennsylvania Behavioral Risk Factor Surveillance System, 2012–2014) and 13.6% of children have asthma (Pennsylvania Department of Health, Division of School Health, 2012–2013).

We would also suggest this edit to the vision for the Lancaster County transportation system in 2040:

Lancaster County will have a transportation system that meets the needs of the 21st century. A truly multimodal system will move people and goods safely and efficiently throughout Lancaster County and promote health and well-being [suggested edit]. The system will support the communities' goals to balance the needs of a growing community and economy with the goal to protect and preserve the rural and agricultural resource areas. The physical and economic environments of Lancaster County will be supported by a framework of transportation alternatives. Mobility and access will be maximized by a balanced system of roadway networks, transit, rail freight, pedestrian, and bicycle modes.

See [Brenda Buescher, Lancaster General Hospital flyer](#).

Response: Comments and materials provided by LGH about the linkage between transportation and health and the need for greater investment in “active transportation” were received and resulted in staff adding a section to **Chapter 3** on Transportation and Health, and some health text was added to **Chapter 1. Appendix E** was added that includes a Health Overview paper submitted by LGH and will be revised to include an updated report, **Transportation and Public Health** that LCPC prepared in 2011 (this portion of the appendix will be provided at the meeting). Wording on health and well-being was added to the Vision Statement.

Candace Hoover

Comment: As an employee of a Manheim business, I support the examination of alternate truck routes through the Borough. Their traffic inadvertently causes an unnecessary safety hazard to residents and visitors alike.

Thank you for slating time to review the Borough of Manheim’s traffic conditions, and for making the effort to compile and review public comment.

Response: Thank you for your comment. We appreciate your interest in the development of Lancaster County’s Long-Range Transportation Plan (Plan), **Connections 2040: 2016 Update**, and the 2017–2020 Transportation Improvement Program (TIP). We will consider your input as we continue to implement the Plan, and develop projects for the TIP.

John Blowers, Chairman, East Lampeter Township Supervisors

Comment: See [John Blowers, Chairman, East Lampeter Township Supervisors letter](#).

Response: LCPC recognizes the importance of the Rt. 30 Streetscape Plan to the county, the township and PennDOT. Following adoption of the TIP, LCPC will work with the township and PennDOT to review the details of the project proposal to identify possible funding sources and project phasing that are most consistent with the types of planned improvements, and for possible addition to the TIP.

Carolyn French

Comment: I would like to suggest that the repaving of South Prince Street extend to Hager Street. It is still quite rough in several spots beyond North Street. Thank you.

Response: Thank you for your comment. We appreciate your interest in the development of Lancaster County’s Long-Range Transportation Plan (Plan), **Connections 2040: 2016 Update**, and the 2017–2020 Transportation Improvement Program (TIP). We will consider your input as we continue to implement the Plan, and develop projects for the TIP.



Key Information on the Lancaster County Draft Long-Range Transportation Plan & Transportation Improvement Program

May 16, 2016

Transportation and Health

The transportation system in Lancaster County has the potential to improve the health and well-being of our community. Transportation planning can help people lead more active lifestyles by increasing the number of opportunities for them to move between places without driving. Health experts recommend that active transportation systems connect the places where people live, learn, work, shop, and play by providing safe and convenient walking and bicycling facilities. Using smart growth design principles can also reduce the distance between destinations people need to travel during their daily activities. When transportation systems do not provide safe alternatives to automobile travel, it is harmful for the most vulnerable members of the community, such as people living in poverty, children, older adults, and those with disabilities.

What is the LRTP? What is the TIP?

Connections 2040 is the long range transportation plan (LRTP) for Lancaster County. It provides the vision, goals, and objectives for our transportation system - including roads, bridges, pedestrian and bicycle pathways, public transportation, freight, and aviation. The 2017-2020 Transportation Improvement Program (TIP) lists the highway, bridge, and transit projects that will have high priority for federal funding over the next four years.

The Lancaster County draft 2017 Transportation Improvement Program (TIP) and 2016 update to the Long-Range Transportation Plan (LRTP) are available for public comment from May 1-31. The Metropolitan Planning Organization (MPO) will vote on approval of the plan at its June meeting.

Vision and Goals in the Draft LRTP

The draft LRTP includes a vision statement for the Lancaster County transportation system in 2040: *Lancaster County will have a transportation system that meets the needs of the 21st century. A truly multimodal system will operate to move people and goods safely and efficiently throughout Lancaster County. The system will support the communities' goals to balance the needs of a growing community and economy with the goal to protect and preserve the rural and agricultural resource areas. The physical and economic environments of Lancaster County will be supported by a framework of transportation alternatives. Mobility and access will be maximized by a balanced system of roadway networks, transit, rail freight, pedestrian, and bicycle modes.*

There are five major goals for Lancaster County's transportation system in the draft LRTP:

- Target transportation investments to support Smart Growth
- Maintain and improve the county's multimodal infrastructure
- Improve safety and security
- Manage and operate the transportation system to reduce congestion
- Protect the county's natural and historic assets

The draft LRTP also includes implementation strategies and performance measures that will be used to track progress.

Active Transportation in the Draft LRTP

The draft LRTP notes that increased demand for bicycle and pedestrian infrastructure is a key trend in recent years. "Lancaster residents have expressed a desire for more bicycle and pedestrian facilities to enable them to walk and bike safely for more of their trips," the plan states. "Lancaster County has responded with implementation of a Smart Growth Transportation Program, through the Transportation Alternatives Program and by funding multi-use trail, shoulder-widening, and streetscape projects on the TIP. The county has embarked on an update of its Bicycle and Pedestrian Plan to plan for improvements on a countywide level of facilities to encourage these modes."

How to Get Involved

We encourage our members to get involved with the transportation planning process! To learn more about how transportation projects are developed and the county's long-range transportation goals and to support better infrastructure for bicycles and pedestrians, please attend the public information meeting:

Thursday, May 19, 2016
4:00 – 7:00 PM
Conference Room 102, Lancaster County Government Building
150 North Queen Street, Lancaster, PA

We also encourage you to submit written comments on the plan to Latoya Westbrook Thomas, LCPC, 150 N. Queen Street, Suite 320, Lancaster, PA 17603 or by email to Lwestbrook@co.lancaster.pa.us.

Like Us on Facebook! www.facebook.com/LightenUpLancaster

EAST LAMPETER TOWNSHIP

2250 OLD PHILADELPHIA PIKE
LANCASTER, PENNSYLVANIA 17602

(717) 393-1567
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May 20, 2016

Ms. Lauri Ahlskog
Lancaster County Planning Commission
150 N. Queen Street, #320
Lancaster, PA 17603

Dear Ms. Ahlskog,

I am writing at this time on behalf of the East Lampeter Township Board of Supervisors in order to provide input on and request an addition to the draft 2017 – 2020 Transportation Improvement Program (TIP) for Lancaster County. East Lampeter Township appreciates this opportunity to be directly involved in the development of the County's TIP.

Last year, as a part of the process for developing the TIP, the County Planning Commission requested input from County municipalities regarding transportation problems which could be addressed by the 2017 – 2020 TIP. East Lampeter Township submitted five (5) problem locations for consideration. While we understand the financial constraints and the maintenance first focus of the program, we are disappointed that not one of these projects is included for any phase of project development in the draft 2017 – 2020 TIP. We are now requesting that the draft TIP be modified to include one or more phases of project development for the one of these projects which we feel is vital to the County and should be a priority for TIP funding. This is the project to complete improvements as recommended by the Rt. 30 Streetscape Plan from the Strasburg Pike intersection to the Oakview Road intersection.

As a top priority from the County's Tourism Plan, East Lampeter Township, Lancaster County and PADOT worked together to prepare the Rt. 30 Gateway Plan which identified a variety of efforts that should be undertaken in order to maintain and improve the vitally important regional tourism corridor along Rt. 30 / Lincoln Highway from Strasburg Pike to Rt. 896. The top priority for action which came out of this Gateway plan, was to prepare a Streetscape plan for the corridor that would provide a conceptual design of improvements for this area. Funding for the preparation of this streetscape plan was then provided by Lancaster County, PADOT and East Lampeter Township. The Rt. 30 streetscape plan was prepared with the direct involvement of business leaders and other property owners from the corridor and upon its completion was approved by the East Lampeter Township Board of Supervisors. The plan was also presented to the County's Transportation Technical Advisory Committee (TTAC) and the Metropolitan Planning Organization (MPO). Upon TTAC's recommendation, the MPO took action to accept the plan report in 2015. The plan has also been presented to representatives of Discover Lancaster, the Economic Development Corporation of Lancaster County and elected state representatives. Private developers who are working in the corridor have reviewed the plan and are incorporating recommended improvements from the plan into their development projects. The plan has

garnered universal support and the Township has been encouraged to pursue implementation of the recommendations in this plan.

Independent from the TIP process, the Township is in the process of working to implement several other priorities from the Rt. 30 Streetscape plan. One of these efforts is the development and creation of an Improvement District in the corridor. Another effort is for the Township to engineer the restriping of the travel lanes and pedestrian crosswalks in the corridor so that these changes can be incorporated into the planned 2017 resurfacing of Lincoln Highway. These implementation efforts which have been initiated and are underway by the Township are very important pieces to the overall plan. However, more must be done as a part of what will have to be a sustained and determined effort to realize the vision of the plan for this significant regional tourism asset.

The Rt. 30 Streetscape Plan identifies many concerns regarding the portion of the corridor located from the intersection of Strasburg Pike through the intersection of Oakview Road. This portion of the corridor currently carries a volume of daily traffic which averages 22,000 vehicles. This portion of the corridor was found to have had a very high number of crashes. The plan reports that this area of the corridor had the highest number of reportable crashes in the corridor accounting for more than one-third of all of the reportable crashes in the corridor. The plan also reports that this area of the corridor is also the portion of the corridor where pedestrian facilities (sidewalks) are completely lacking. Additionally, the plan reports that the busiest of all of Red Rose Transit's routes, Route #14, operates on this corridor.

The planning principles used to guide the development of the Rt. 30 Streetscape Plan include the goals of slowing the speed of traffic to the existing 40 MPH speed limit; to provide multi-modal access along the entire corridor; to reallocate underutilized right-of-way for multi-modal access; to improve safety through the corridor by maintaining consistent through lanes, reducing conflicts and providing protected left turn lanes.

The highway improvements recommended by the plan for the portion of the corridor from the Strasburg Pike intersection to the Oakview Road intersection address all of these above stated goals. Dedicated left turn lanes would be provided at the signalized intersections (4 existing and 1 proposed). Consistent through lanes will be provided in order to eliminate the excessive weaving required currently to navigate this section of the corridor. These improvements will also serve to reduce the number of conflict points. By providing sidewalks in this portion of the corridor, along with appropriate facilities for transit riders, we will make this area more multi-modal. Finally, by redirecting eastbound Lincoln Highway traffic to a signalized (new) intersection with Rt. 30, we will provide Rt. 30 traffic with the opportunity to turn left onto Oakview Road and connect pedestrians on Lincoln Highway with the rest of the corridor. This change will also create a green area just west of Oakview Road that could be used to improve stormwater management, provide a gateway entrance feature and improve the visual impression for visitors.

These recommended improvements, as well as the entire Rt. 30 Streetscape plan, address many of the goals stated in the County's Long Range Transportation Plan (LRTP). Including the following:

Goal A which indicates that transportation investments should support the Comprehensive Plan Vision and Goals and the County’s Growth Management Plan. The plan and these recommended improvements couldn’t be more supportive of this stated goal.

Goal B which calls for us to maintain and improve the County’s multimodal infrastructure and services to an acceptable level of service. These improvements will increase the level of service for pedestrians from an “F” to an acceptable level along this portion of the corridor.

Goal C which calls for us to improve safety and security for all users of the transportation system. These improvements will improve safety for all users and directly address the current high crash rate.

Goal D which calls for us to manage and operate the transportation system to reduce congestion. By providing options for modes of travel in this section of the corridor, we expect congestion to be reduced.

Goal E which calls for us to ensure that transportation investments address protection of the County’s agricultural, natural, historic and cultural resources and environmental quality. The conceptual design for these improvements indicates that they can be completed within the currently existing right of way and would therefore not negatively impact any of these resources.

Essentially, this proposed project meets all of the stated goals of Connections 2040 of 2016.

In addition, this project will address two of the top twenty-five high crash locations listed in 2015 for the MPO. The segment of Rt. 462 beginning with segment 0320 and ending with segment 0310 is Ranked #2 on this list. The segment of Rt. 30 beginning with segment 0330 and ending with segment 0360 is Ranked #12. Locations within this portion of the corridor are also listed as #77 and #246 on the 2015 Statewide High Crash locations.

This project would also address two points of the 2012 Intersection Safety Implementation Plan and the 2012 Roadway Departure Safety Implementation Plan for the portion of Rt. 30 beginning at segment 0310 and ending at segment 0420.

The implementation matrix included in the plan estimates the following costs of the highway improvements recommended in this section of the corridor:

Preliminary Engineering, Final Design and Utility clearance	-	\$ 2,611,272
Right of Way*	-	\$ 870,425
Construction	-	<u>\$17,408,483</u>
Total estimated cost	-	\$20,890,180

*As stated above, we believe that the improvements recommended by the plan for this portion of the corridor can be completed within the existing right of way. However, this cost estimate was included in the plan’s implementation section and so we felt that we must show it here.

We are therefore requesting that the 2017 – 2020 TIP includes the beginning phases of these conceptually designed improvements recommended by the Rt. 30 Streetscape plan from the Strasburg Pike intersection through the Oakview Road intersection. This would involve the addition of \$2,611,272 for Preliminary Engineering, Final Design and Utility clearance work for this project. We understand that the remaining phases of this development would not be funded until after 2020 and would need to be a part of the 2019 – 2022 TIP.

The draft 2017 – 2020 TIP includes reserve line items in the funding categories of Congestion, Mitigation and Air Quality (CMAQ); Highway Reserve; Highway Safety Improvement Program (HSIP) and Surface Transportation Urban (STU). The total dollars allocated to these reserves is \$28,625,290. We therefore believe that there is additional capacity within the available dollars included on the TIP to accommodate this request.

The Township along with the County and PADOT have already put forth a great deal of effort and expense to prepare a well thought out and universally accepted conceptual plan for improving the Rt. 30 corridor as a multi-modal facility that will be safer for all users and better serve the tourism economy of Lancaster County. East Lampeter Township is actively engaged in efforts within our means to implement the recommendations in the Rt. 30 Streetscape plan. However, funding for the highway improvement recommendations included in the plan for this regionally critical corridor will need to be provided as a part of the TIP. We ask for your support to add the initial phases of project development for the highest priority highway project within this plan so that actual construction of the improvements can happen within the next six years.

Township representatives will attend the upcoming TTAC and MPO meetings scheduled for June 13 and June 27 in order to address any questions that there may be regarding this request. If there are any questions that you would like us to address prior to these meetings, please contact us.

Thank you for your consideration. We appreciate and look forward to working with the County and PADOT to successfully complete this project.

Sincerely,

A handwritten signature in black ink, appearing to read "John Blowers", written in a cursive style.

John Blowers
Chairman
East Lampeter Township Supervisors

Cc: Robert Bini, LCPC Dir. of Transportation Planning
Board of Supervisors
Ralph Hutchison, Township Manager

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Appendix E

Health and Transportation

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Community Health Overview

Background

A “health in all policies” approach recognizes that good health is a shared value, and addressing barriers to health is a shared responsibility. Lancaster County embraces a collaborative approach that incorporates health concerns into policies and projects across sectors, with the goal of improving the health of all people.

The transportation system in Lancaster County has the potential to improve health and quality of life while reducing preventable injuries and deaths. Transportation affects health in four major ways: active transportation, safety, air quality, and connections to resources. Designed well, transportation systems can improve the health and well-being of our community. However, negative health effects related to the transportation system often hurt the most vulnerable members of the community, such as people living in poverty, children, older adults, and those with disabilities.¹

Active Transportation and Physical Activity

Physical activity and active transportation have declined compared to previous generations, according to the Centers for Disease Control and Prevention. The lack of physical activity is a major contributor to the steady rise in rates of obesity, diabetes, heart disease, stroke and other chronic health conditions.

In Lancaster County, 64% of adults, 40% of teens, and 36% of children K-6 are overweight or obese.² Obesity is one of the most important contributors to preventable chronic diseases in the United States, including diabetes and heart disease. Overall, 9% of adults and 25% of Medicare beneficiaries in Lancaster County have diabetes, a leading cause of death in the United States.³ Heart disease and stroke are both in the top

three causes of death in the United States.⁴ In Lancaster County, 12% of adults over age 35 have experienced a heart attack, coronary heart disease, or stroke.⁵

The cost estimate of health care expenses for obesity-related diseases ranges between \$147 billion and \$210 billion per year. In addition, obesity contributes to absenteeism and lower productivity at work, costing employers \$506 per obese worker per year.⁶

Currently, the transportation infrastructure across the United States focuses on motor vehicle travel. Many Americans feel that it is unsafe to walk and bicycle in their neighborhoods because of traffic and the lack of sidewalks, crosswalks, and bicycle facilities. Most Lancaster County residents have limited access to other transportation options. The percentage of commuters who walk and bike to work is very low: 79.3% of commuters drive alone to work, while only 3.5% of commuters walk to work and 0.8% bicycle to work.⁷

Transportation planning can help people lead more active lifestyles by increasing the number of opportunities for them to move between places without driving. The CDC recommends that active transportation systems connect the places where people live, learn, work, shop, and play by providing safe and convenient walking and bicycling facilities. Using smart growth design principles can also reduce the distance between destinations people need to travel during their daily activities.

The following strategies are recommended by the CDC for supporting active transportation through transportation policies and practices:

- Promote safe and convenient opportunities for physical activity by improving infrastructure such

1 US Department of Transportation. Transportation and Health <https://www.transportation.gov/mission/health/literature-and-resources>

2 Pennsylvania Behavioral Risk Factor Surveillance System, 2012-2014.

3 Pennsylvania Behavioral Risk Factor Surveillance System, 2012-2014; Centers for Medicare and Medicaid Services, 2014.

4 U.S. Department of Health and Human Services, 2016.

5 Pennsylvania Behavioral Risk Factor Surveillance System, 2012-2014.

6 Trust for America's Health and the Robert Wood Johnson Foundation. The State of Obesity. 2016.

7 American Community Survey, 2010-2014.

as well-lit sidewalks and paths, safe roadway crossings, and bicycle infrastructure.

- Provide incentives for municipalities or regions that reduce vehicle miles traveled per capita and increase walking, bicycling, and use of public transit.
- Provide local officials with tools to implement Complete Streets, which provide safe and convenient options for all street users.
- Bring health, transportation and community planners together to develop pedestrian and bicycle master plans.
- Work with state and local officials to integrate and enforce use of pedestrian and bicycle design guidelines and evidence-based safety standards.
- Explore opportunities for increasing availability of funds for establishing active transportation initiatives.
- Develop and implement policies that encourage transit-oriented and mixed-use developments.

Safety and Injury Prevention

As chapter 3 of this LRTP update describes in detail, motor vehicle crashes are a leading cause of serious and fatal injuries for many age groups. Pedestrians and bicyclists are even more likely to die in crashes compared with those who travel by motor vehicle. Public transportation has historically been safer than highway travel in light duty vehicles, but highway travel is growing more quickly than other modes of travel across the country.⁸ By providing transportation options and improving roadway facilities, transportation agencies can reduce the incidence of motor vehicle crashes.

- Protect pedestrians and bicyclists from motor vehicle crashes by implementing traffic calming measures and designing streets to reduce motor vehicle speeds.
- Implement multimodal level of service indicators as performance measures for roadways that

8 Centers for Disease Control and Prevention. CDC Recommendations for Improving Health Through Transportation Policy, 2015.

include measurements of pedestrian, bicyclists, and public transportation operability.

- Correct existing hazards and enhance infrastructure for pedestrians and bicyclists.
- Coordinate with health officials to consider health impacts as part of transportation planning using health impact assessments (HIAs) and safety audits.

Cleaner Air

Motor vehicle emissions have decreased significantly over the past 30 years. However, air pollution from motor vehicles continues to harm the environment and contributes to health problems such as asthma and heart disease. Air pollution from the transportation system is one of the largest contributors to unhealthy air quality in the United States.⁹ In Lancaster County, 15% of adults¹⁰ and 13.6% of children have asthma.¹¹ Asthma in young children is a serious public health problem and leads to missed days of school, limited activities, emergency department visits, and hospitalizations.

Improving the efficiency of the transportation system and supporting cleaner vehicles and fuels can improve air quality. National and state-level policies can encourage retrofitting of high-emissions vehicles, strengthen vehicle inspections standards, and incentivize consumers to buy more efficient vehicles. The following local and community strategies are recommended to improve air quality:¹²

- Improve active transportation and public transportation modes and encouraging consumers to use these modes.
- Set specific goals to reduce vehicle miles traveled per capita.

9 Centers for Disease Control and Prevention. CDC Recommendations for Improving Health Through Transportation Policy, 2015.

10 Pennsylvania Behavioral Risk Factor Surveillance System, 2012-2014.

11 Pennsylvania Department of Health, Division of School Health, 2012-2013.

12 Centers for Disease Control and Prevention. CDC Recommendations for Improving Health Through Transportation Policy, 2015.

Connectivity and Access to Resources

Having access to jobs, health care, places for social interaction, and healthy foods is important for health.¹³ When communities do not offer convenient alternatives to motor vehicle travel, there is a negative impact on community health. The impact is especially harmful for vulnerable populations such as the poor, elderly, people who have disabilities, and children. For people who are not able to drive, public transportation options are a necessity to be able to live independently.

In Lancaster County, 9.5% of households do not have a car. When other transportation options are limited, people living in a household without a car have a difficult time accessing local services such as supermarkets, post offices, doctors' offices, and hospitals. Low-income households are much more likely to lack access to a car than high-income households. Remaining connected to other people, in addition to resources, is also important for health. Social isolation is as significant as obesity as a health risk, and it is more harmful for people over 65 than for younger people.¹⁴

A well-connected transportation network that includes options for bicycling, walking, and public transit increases people's ability to reach destinations that are important for their health and well-being. Many of the strategies discussed above, including street design, bicycle and pedestrian infrastructure, and safety measures, improve connectivity for all community members. The U.S. Department of Transportation recommends increasing connectivity using these strategies:¹⁵

- Integrating transportation with land use planning to locate major commercial centers in highly accessible areas, such as public transportation hubs and central business districts.

- Reducing distances between key destinations so that walking or bicycling are attractive and practical options for short trips.
- Prioritizing local pedestrian and bicycle infrastructure and parking near key neighborhood destinations.
- Measure access to convenient, healthy, and safe transportation options and ensure that access is available to all people regardless of physical abilities, age, and socioeconomic status.

Implementation Strategies

There are several key strategies to implement a health in all policies approach to transportation planning and decision-making.¹⁶ Integrating health goals and metrics into Lancaster County's LRTP and other transportation policy documents and plans is an important recommended step. In addition, these are other recommended implementation strategies:

- Promote cross-sector data collection and data sharing between the transportation and health sectors.
- Build staff capacity to evaluate the health implications of policy decisions and conduct health impact assessments on proposed policies and projects.
- Provide training on the intersection of health and transportation for local officials, key staff, and community members.
- Collaborate with other sectors to collect public input on decisions that affect health and well-being.

Recommended Performance Measures

The Transportation and Health Tool (THT) was developed by the U.S. Department of Transportation and the Centers for Disease Control and Prevention to enable practitioners to easily measure the health impacts of transportation systems. This tool provides data for Lancaster County and other municipal statistical areas

13 Ibid.

14 Perspectives on Psychological Science. "Loneliness and Social Isolation as Risk Factors for Mortality: A Meta-Analytic Review." 2015.

15 U.S. Department of Transportation. Transportation and Health. 2016.

16 Association of State and Territorial Health Officials. Health in All Policies Implementation Strategies. <http://www.astho.org/Programs/Health-in-All-Policies/Environmental-Health-in-All-Policies/HiAP-Implementation-Strategies/>.

about the transportation environment and safety, active transportation, air quality, and connectivity to destinations. In addition to the indicators in the THT, local data is available for important measures of progress, such as miles of pedestrian and bicycle facilities. In total, there are 8 recommended health metrics to measure the health impact of the Lancaster County transportation system:

- Percentage of commuters using various modes, including bicycling, walking, and use of public transportation;
- Vehicle miles traveled (VMT) per capita;
- Public transportation trips per capita;
- Land use mix index score;
- Road traffic fatalities (motor vehicle, bicycle, and pedestrian) per 100,000 residents;
- Miles of bicycle lanes, sidewalks, and shared use paths;
- Presence of complete streets policies; and
- Use of funds for bicycle and pedestrian improvements.

Transportation and Public Health

*Planning Transportation Systems That Support
Healthy Communities and Individuals*



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Introduction

The investments we make in transportation determine the shape of our communities—whether they are sprawling autocentric places where nearly all trips are made by car or they are more compact communities with a mix of uses and interconnected streets that enable many trips to be made by walking, bicycling and transit. Public policies that heavily favor driving and neglect investment in other modes of transportation contribute to a range of environmental problems such as air pollution, global greenhouse gas emissions and water pollution and, as we are becoming increasingly aware, have adverse impacts on public health.

Until recently, public health was not an explicit consideration in transportation planning or in cost-benefit analyses conducted for transportation projects. Federal and state departments of transportation tended to undervalue policies and investments that could reduce vehicle miles of travel by creating a more interconnected and diversified transportation network. This is changing as the costs to public health of the nation's decades-long focus on automobiles continue to mount. These costs include deaths and injuries from traffic accidents, obesity and the related problems of diabetes, heart disease, strokes and mental health problems such as stress and anxiety.

Smart growth communities that provide a mix of uses and enable many trips to be made by auto alternatives, are not only more energy-efficient and reduce vehicle miles of travel, but they are healthier places to live because they enable people to enjoy more active lifestyles. Transportation policies and investments are critical to achieving this end. Some of the investments that can help communities transition to a more sustainable design are:

- Investments in bicycle and pedestrian infrastructure;
- Investments to improve public transportation and bicycle and pedestrian access to it;
- Implementation of traffic calming techniques;



- Building mixed-use, transit-oriented design (TOD);
- Revitalizing older, walkable neighborhoods;
- Working with state and local officials to incorporate and enforce use of pedestrian and bicycle design guidelines and safety standards; and
- Educating the public on the benefits of smart growth and “active” transportation.

This Transportation and Public Health booklet discusses the cost that the dominant pattern of autocentric communities in the U.S. is taking on people's health and how new communities and developments can be designed, and older communities retrofit, to support a healthier lifestyle. It looks at the steps that Lancaster County is taking to promote healthy communities that offer residents and visitors a range of mobility options.

Means of Transportation to Work, Lancaster County, 2013

	# workers	SOV	Carpool	Transit	Walk	Bike and Other	Work at Home
Lancaster County	247,777	79.3%	9.0%	1.1%	3.7%	1.9%	4.8%
Pennsylvania	5,794,492	76.7%	8.1%	5.4%	3.9%	1.9%	3.8%

How Our Communities Became So Autocentric

Over a period of 50 years, government transportation policies and funding favored construction of freeways, arterials and local roads over public transportation and other modes. Establishment of the Highway Trust Fund in 1956 propelled construction of roads, at the expense of transit, rail and other alternatives. The focus of transportation policy became moving cars, as quickly as possible. When roads got crowded, lanes were widened or new lanes added, often removing sidewalks, crosswalks or other amenities for those who don't drive or prefer not to drive. Government housing policies helped fuel the outward migration of families from more densely populated cities, where many trips had been made by walking, to the auto-dependent suburbs. Local zoning codes favored the separation of uses, with housing in one zoning district and retail stores and businesses in another, requiring residents to get in their cars and drive for nearly all trips.

The result is that Americans choose to travel by car for most local and long-distance trips. In Lancaster County, 88 percent of commute trips are by automobile, with 79 percent of these by solo auto and 9.5 percent by carpool or vanpool. Bicycling and walking together account for 4.3 percent of work trips and transit for 1.1 percent. These commute trends track fairly closely with Pennsylvania state-wide commute trends.

America's focus on roads has brought enormous economic and social benefits, but, over time, it has resulted in unanticipated impacts that are

damaging and costly to the environment and to public health.

Surveys and public opinion polls in recent years suggest that there is a strong latent demand for a more diversified transportation system, one with increased investment in pedestrian and bicycle facilities and transit. In one national survey, 59% of respondents stated that their preference for reducing congestion was "to improve public transportation, including more trains and buses and to make it easier to walk and bike to reduce traffic congestion." Only 38% preferred building more roads and expanding existing roads to help reduce congestion.

In another survey, 20% of U.S. adults said they would sometimes bicycle commute if they had safer bicycling facilities. They also indicated they would bicycle for shorter trips and some errands if safe bicycling facilities were available. In a recent Lancaster County survey that was part of the Long Range Transportation Plan update, the most frequent comments made by citizens were the desire for improved transit service, improved bicycle and pedestrian facilities and increased road capacity in key locations.

Auto Dependence and Rising Public Health Costs

Obesity and Related Diseases

More than two-thirds of Americans are overweight or obese.¹ Of great concern, is the fact

¹ American Public Health Association, "Hidden Health Costs of Transportation," Washington D.C.

The Cost of Transportation-Related Health Problems*

	<i>Cost (Billions \$)</i>	<i>Factors in the Estimate</i>
Obesity and overweight	\$168–190	Health-care costs, lost wages due to illness and disability; future earnings loss from premature death
Air pollution from traffic	\$50–80	Health-care costs, premature deaths
Traffic crashes	\$242	Health-care costs, lost earnings, property damage, travel delays, legal costs, pain and suffering, lost quality of life

* Harvard School of Public Health and American Public Health Association, "Hidden Health Costs of Transportation," Washington D.C., Table 2.

that 35% of adults and 17% of children (ages 2–19) — approximately 91 million — are overweight or obese.² The national cost for treating obesity is estimated to range from \$170–190 billion annually or 16.5% of U.S. health care spending and an estimated \$1,429 per year should be added to an obese individual's health costs compared to a non-overweight person.³ A portion of these costs is attributable to auto-oriented land use patterns that have the effect of limiting opportunities for physical activity. The World Health Organization identified sedentary lifestyle as one of the two most important risk factors for non-communicable disease and early mortality in Western populations, a lifestyle that is associated with the use of cars.

A national study, "Relationship Between Urban Sprawl and Physical Activity, Obesity and Morbidity," found that people living in counties marked by sprawling development are likely to walk less and weigh more than people who live in less sprawling counties. In addition, people in more sprawling counties are more likely to suffer from hypertension (high blood pressure). These results were found to hold true after controlling for factors such as age, education, gender, race and ethnicity.⁴ Other studies, such as the 2010 National Bicycling Benchmark Study, have shown that walking and cycling activity in a region is

inversely related to obesity and related illnesses of diabetes and high blood pressure.⁵

Statistics for Lancaster County indicate that 64% of adults, 40% of teens and 36% of children through grade six are obese or overweight. With an estimated county adult population (age 20 and above) of 378,657, this translates into approximately 242,340 adults in Lancaster County who are obese or overweight.⁶ The healthcare cost to Lancaster County from obese and overweight adults is significant.

Traffic Accidents

Traffic crashes are a major health risk in the United States. In Pennsylvania, there were 1,195 fatalities in 2014, the fourth lowest total crashes since 1950. The estimated cost to society is still very high—\$13.8 billion. In Lancaster County, there were 5,339 traffic crashes that resulted in 62 deaths in 2014, down 10 percent from 2007.⁷

Of great concern, is the fact that traffic crashes are the leading cause of death nationwide in people under the age of 33.⁸ This means that the costs are greater when measured in terms of Potential Years of Life Lost, rather than just deaths. As people spend more and more time in their cars, the likelihood of an accident increases. And, traditional road building practices that have been

2 U.S. Centers for Disease Control website, obesity data, 2011–2012.

3 Obesity Cost from Harvard School of Public Health (website) and Crawley, John and Meyerhoeft, Chad, "Medical Care Costs of Obesity," *Journal of Health Economics*, Vol. 31, Jan. 2012; traffic crash cost from U.S. DOT, NHTSA website; from American Public Health Association, *Op cit.*, p. 2.

4 Smart Growth America Coalition, "Measuring the Health Effects of Sprawl," Washington D.C. 2003.

5 Littman, Todd, "If Health Matters," June 4, 2010.

6 Lancaster Health Improvement Project (2010) with 2014 Census population data Summary report of Health in Lancaster County.

7 PennDOT, Pennsylvania Crash Facts and Statistics, 2014, pp. 60–61.

8 National Traffic Safety Administration, "Traffic Safety Facts, 2009 Data."

designed to move vehicles quickly, mean that accidents happen at higher speeds than in the past and result in more severe injuries.⁹

For pedestrians and bicyclists, the combination of fast-moving traffic and roads that are often designed without wide shoulders, sidewalks and other accommodations for non-motorized traffic, the safety risk is greater. The 153 pedestrian deaths statewide made up nearly 14 percent of the total deaths on the highways in 2014, a disproportionately high percent given the percentage of total trips that walking represents.

Other Health Costs

Air pollution

Another significant health care cost associated with a heavy dependence on driving and autocentric community design is air pollution. The transportation sector accounts for nearly 75 percent of the carbon monoxide emissions, 60 percent of the nitrogen oxide emissions and 40 percent of the emissions of volatile organic chemicals (chemicals that combine in the presence of sunlight to create smog) in the United States. Automobiles and trucks are responsible for the largest share of this. Short-term health problems associated with air pollution include irritation to the eyes, nose and throat, bronchitis and pneumonia. Long-term impacts include chronic respiratory diseases, lung cancer, heart disease and other major ailments. The individuals at highest risk from air pollution are youth, the elderly and people who have respiratory and other health problems.

9 Smart Growth B.C., "Promoting Public Health Through Smart Growth."

Air Quality in Lancaster County

Days Measured	306
Days with Good Air Quality	239
Days with Moderate Air Quality	56
Days with Poor Air Quality for Sensitive Persons	11

Lancaster County is a non-attainment area for the 2008 8-hour ozone standard and a maintenance area for the federal 1997 annual and 2006 24-hour PM_{2.5} standards. It is an attainment area for the 2012 PM_{2.5} (particulates) standard. Because of its non-attainment status, the county is required to conduct air quality analyses of all major new transportation projects proposed for funding to make sure that they will not result in a deterioration of air quality. Computer modeling found that the county's LRTP and its FY 2017–2020 Transportation Improvement Program (TIP) are in conformity with the ozone air quality test for all years tested and particulate emissions conform with the emissions budgets for PM_{2.5}. Emissions of both pollutants are projected to decline significantly by the year 2040.

Global greenhouse gas emissions

Global climate change is one of the most serious public health threats facing our nation¹⁰ and transportation plays a central role in reducing greenhouse gas emissions. Transportation accounts for 28 percent of all global greenhouse gases (GHGs) and 33 percent of all emissions of carbon dioxide (CO₂), the most prevalent global greenhouse gas in the United States. CO₂ is an end product of burning fossil fuels. The only practical way to reduce it is to get vehicles to burn less fuel. Research has shown that emission reductions from technological fixes alone — more fuel-efficient vehicles and cleaner burning fuels — will be overwhelmed by the growth in vehicle miles of travel. An essential strategy to reduce greenhouse gases is to change the design of communities to enable more trips to be made by biking, walking or other alternatives to driving and shortening the length of many trips that are made by car. A guidebook to climate change published by the American Public Health Association and the Centers for Disease Control and Prevention indicates that climate change could lead to numerous adverse public health impacts like heat stress and the spread of infectious diseases. There could also be a longer pollen season which

10 American Public Health Association.

could result in increased respiratory and allergy problems.¹¹

Water Pollution

Sprawling land use patterns also contribute to the degradation of water quality. Lubricants and oils from cars that fall onto the roadway make their way into streams and creeks and auto exhaust contains pollutants that settle into rivers and streams. This pollution impairs the health of aquatic ecosystems, including fish that humans consume. Research also shows that low-density land use patterns have a greater negative impact on water quality than more compact development because sprawl increases the amount of driving, the amount of impervious surface area and presence of lawns and gardens that are treated with fertilizers which contain nitrogen and other chemicals that end up in streams and lakes.

Noise Pollution

Motor vehicle traffic creates noise which can impact health in various ways, including sleep and speech disturbance, increased stress and even reduced productivity at work if the noise includes loud sounds such as engine accelerations, horns and other disturbing noises.

11 American Public Health Association, "Climate Change: Mastering the Public Health Role," Washington D.C., April 25, 2011.



The Need for a New Direction

A new framework for transportation planning and investment is emerging that can reduce the costs to the environment and public health. This framework emphasizes accessibility—designing transportation systems to move people rather than vehicles. The approach gives new priority to linking transportation planning with land use planning and to investments in public transportation and facilities for non-motorized transportation. In a demonstration of the federal government's increased attention to walking and bicycling, the U.S. Department of Transportation issued a "Policy Statement on Bicycle and Pedestrian Accommodation," in March 2010, that stated:

"The United States Department of Transportation (DOT) is providing this Policy Statement to reflect the Department's support for the development of fully integrated active transportation networks. The establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments. Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use..."

Data on the length of trips that people make each day suggest that many trips could be shifted to bicycling, walking or transit if land use patterns and transportation investments supported these modes. More than 25 percent of all trips in urbanized areas are a mile or less and 50 percent are under three miles. Yet, today, most of these trips are made by car.

Walking makes up approximately 3 percent of all trips nationwide. Nationally, cities in the Northeast have the highest percent of people who walk to work (4.7 percent). In the largest Northeast cities, it is about 10 percent; in Lancaster County, the percent who walk to work is 3.7 percent. In the 50 largest U.S. cities, about 1 percent bicycle to work. The number of trips by nonmotorized modes could be significantly increased through better land use patterns and provision of infrastructure to support these modes, particularly in cities and suburbs. This would take millions of auto trips off the roads and represent a cost effective way to create new road capacity and improve public health at the same time.

Two sets of variables are believed to negatively influence a person's decision to walk or bike: personal barriers and environmental barriers. Personal barriers are the subjective considerations that operate on an individual level, like a person's concern that they might need a car at work to run an errand or that it might rain and they would get wet if they walked or biked to work.¹² Environmental barriers, by contrast, are objective factors

that impact on a person's decision-making such as the lack of a bicycle lane or path or lack of a

sidewalk to walk on.¹³ Surveys of people who do not walk or bike frequently, indicate that both sets of barriers are factors.

Public policy and investments can help remove these barriers, especially the environmental barriers, by creating an environment that supports walking and bicycling. A similar case can be made for transit or ridesharing. Public investments that provide safe, reliable transit service, construct sidewalks that lead to and from transit stops and transit shelters for those waiting for the bus and that provide park-and-ride lots and a guaranteed ride home in the event of an emergency, can have a significant impact on a person's decision to use transit or rideshare, especially for individuals who own a car and have the discretion of driving.

Designing Better Communities and Providing Infrastructure to Support Alternative Modes

It has taken over 50 years to build our way into the auto dependent land use patterns around us today and it will take time to complete a course correction to establish more sustainable communities with convenient and safe opportunities to travel by modes other than solo driving. Three aspects of the built environment—density, land use mix and connectivity—have been consistently found to be important predictors of travel behavior and walkability.¹⁴ Communities or neighborhoods with higher levels of density, a mix of compatible land uses within a zoning district and interconnected

More than 25% of all trips in urbanized areas are one mile long or less and fully 50% are under three miles.

¹² Littman, Todd, "If Health Matters," June 4, 2010.

¹³ Smart Growth B.C., "Promoting Public Health Through Smart Growth."

¹⁴ Relationship Between Urban Sprawl and Physical Activity.

streets support increased use of bicycling, walking and transit. The strategies discussed below have proven to be key elements for communities that want to transition to places where walking, bicycling and transit use become more convenient, safe and popular choices for travel.

- 1. Design “Complete Streets” for all users.** The design of a community’s street network can either impede or support alternatives to driving. Streets that are wide, smooth and designed to move cars at high speeds, and lack sidewalks, crosswalks or wide shoulders, will discourage people from walking, bicycling and using transit. By contrast, streets that are designed with sidewalks, pedestrian crosswalks, wide shoulders and incorporate traffic calming measures, such as raised median strips, street narrowing and other measures to slow traffic at key locations, act to encourage walking, bicycling and the use of transit.
- 2. Create an interconnected street network.** An interconnected “grid” network of streets, rather than streets that end in cul-de-sacs, reduces the distance that pedestrians, bicyclists and transit users have to walk or bicycle and helps to encourage the use of these modes.
- 3. Invest in bicycle and pedestrian infrastructure.** Experience in communities



around the country that have invested in bicycle and pedestrian infrastructure, gives credence to the old adage “if you build it, they will come.” The City of Portland, Oregon, made a decision in 1996 to begin constructing a citywide network of bicycle lanes and paths in order to boost the share of trips made by bicycle and reduce traffic congestion. Between 1996 and 2008, Portland built 300 miles of bicycle trails and lanes. As a result of this public policy, the bicycle mode share quadrupled, from 2 percent in 1996 to 8 percent in 2008.¹⁵ Portland has the highest bicycle mode share of any major U.S. city. The value of the city’s 300-mile bicycle network is approximately \$60 million. The same amount of money would construct one mile of urban freeway.¹⁶ Portland’s commitment to bicycles as well as walking and transit has resulted in city residents driving four miles less per day than the national average. While this may not sound like a lot, the result is that Portland residents spend \$1.2 billion less per year on driving than they would if they drove the national average. Other cities across the U.S. that have also made significant investments in bicycle infrastructure have experienced substantial growth in bicycling.

- 4. Build mixed-use developments and communities.** Another key to creating more sustainable and healthy communities

The value of the City of Portland, Oregon's 300-mile bicycle network is approximately \$60 million, roughly the equivalent of building one mile of urban freeway.

¹⁵ Gotschi and Mills, “Active Transportation for America: The Case for Increased Federal Investment in Bicycling and Walking,” Rails to Trails Conservancy, 2008.

¹⁶ Ibid.



is by designing new communities and developments, and retrofitting existing ones where possible, to include a mix of uses in a single zone. Since the late 1920s and the landmark *Euclid vs. Ambler Realty* legal decision, zoning codes have generally created distinct zoning areas for different uses, with residential zones separated from commercial and retail zones and from industrial zones and institutions such as schools and health facilities often distant from homes. However, experience has shown that an appropriate mix of commercial and retail uses (coffee shops, local markets, pharmacies, cleaners, etc) with residential uses, as has historically been the case in older cities and neighborhoods, is not only compatible with health but results in improved health by enabling many trips taken by walking and bicycling. The interest in “smart growth” in recent decades has brought about a rethinking of this Euclidian zoning practice. Counties and communities are making revisions to their zoning codes to allow mixed use developments in appropriate locations.

5. Build Transit-Oriented Development. Transit-Oriented Development (TOD) shares many of the characteristics of mixed use development. In TOD, a major transportation facility such

as a train station or multi-modal station or transit corridor, serves as the focal point around which retail, commercial and residential development is oriented. Streets and walkways are incorporated to enable access to the transportation facility or stops along the corridor by walking, biking or transit.

6. Update zoning codes. Many communities are amending their zoning codes that call for a separation of uses and are replacing them, in entirety or part, with zoning codes that permit mixed use developments and transit-oriented developments.

7. Implement traffic-calming techniques. Traffic calming refers to a broad range of transportation investments implemented at strategic locations to slow or “calm” traffic and make streets safer and more attractive for pedestrians, bicyclists and other non-auto travelers. Traffic calming originated in the Netherlands in the 1970s where the government was committed to making streets safe for all users. In the decades since then, the concept has spread to cities and communities worldwide. Some popular traffic calming techniques that communities have implemented are: traffic circles, angled parking, narrowing of streets at key locations, curb extensions at intersections, raised median

strips to provide pedestrians a safe place in the middle of a wide road they are trying to cross and other methods.

8. Educate the public on the benefits of “Active” Transportation. Public education is critical to getting people to change their behavior and to try walking or bicycling for some trips rather than driving. Public education involves informing the public about the health benefits from greater use of bicycling and walking through workshops, programs at schools, local organizations and other means. It also involves working with the public to demonstrate how to safely use bicycle lanes and other facilities, proper equipment to use, such as helmets, to maximize safety and other helpful information.



Promoting Healthy Communities in Lancaster County

Lancaster County has gained national recognition for its long-standing commitment to smart growth policies that are designed to enable the county to grow while preserving its rich heritage of farmlands, historic towns and buildings, sensitive natural areas and rural landscapes. As a logical extension of its smart growth policies, the county adopted a Smart Growth Transportation Program (SGT Program) on June 27, 2011 and a Complete Streets policy and program in 2014.

Smart Growth Transportation Program

The SGT Program funds transportation projects that are located in the county's Designated Growth Areas (DGAs) and promote the goals and strategies of the County Comprehensive Plan and plans of the areas where the projects are located. The projects must support economic development, reduce congestion, improve safety for pedestrians, bicyclists and transit users and have the potential to leverage private dollars and create new public-private partnerships. The types of projects that are eligible for funding include:

- Preparation of a master plan for the improvement of a major transportation corridor within a Designated Growth Area;
- Non-motorized transportation facilities that provide a transportation and/or recreational benefit (trails, bike networks);
- Investments that make transit service more viable and convenient to project sites and countywide and provide safe connections to access transit (sidewalks, interconnected streets that reduce walking distances);
- Urban streetscape projects that incorporate traffic calming;
- Improved roadway connections that provide a more interconnected transportation network

and reduce distances for motorists, transit users, bicyclists and pedestrians;

- Redevelopment of existing streets into neighborhood streets that enhance a community's quality of life;
- Curb extensions for green infrastructure and ADA accessibility;
- Low-cost investments such as retiming and coordination of traffic signals;
- Turning lanes that provide crosswalks and median strips to keep pedestrians safe; and
- Studies that would result in any of the project types listed above.

Each project that seeks funding under the SGT Program is evaluated against criteria that are in addition to the criteria that all projects that seek funds through the county must meet. Lancaster County commits \$1.5 million annually from the federal funding on its TIP to the SGT program. Funding is awarded to projects every two years and the program has been through three funding cycles. This innovative program will serve as a model for other counties and is an integral part

of Lancaster County's work to create sustainable, healthier places for Lancaster residents to live.

Mixed Use Developments and Transit-Oriented Developments

Lancaster County encourages the construction of mixed-use and transit-oriented developments, as appropriate, within designated growth areas of the county. Some examples of mixed use developments include Florin Hill in Mount Joy Borough, Brighton in Manheim Township and Newport Commons in Warwick Township. Florin Hill was designed to fit into the surrounding neighborhood through connectivity of the street network and walking and biking paths that link the community to nearby parks and a community center. Brighton was developed with brick sidewalks that extend throughout the development, bicycle trails and 22,000 square feet of retail space, including a bakery, cleaners, spa, small gym and boutique clothing store, all within easy walking distance of the homes in the community. Sidewalks with brick crosswalks and a multiuse trail as well as some commercial and retail businesses are within easy walking distance of the homes. Newport



Commons includes a pedestrian/bicycle path and has a convenience store and gas station in the community.

Traffic Calming in Lancaster County

The boroughs in Lancaster County have implemented various traffic calming techniques to slow traffic and make streets safer for pedestrians, transit users and bicyclists. Angled parking, speed bumps and brick crosswalks were implemented on College Avenue in the City of Lancaster, a street that traverses the Franklin and Marshall college campus and on a section of South Duke Street. Angled parking on Main Street in Ephrata Borough serves to slow cars in an area with many shops and walkers. In downtown Lancaster, the city constructed curb extensions and brick crosswalks on busy streets to shorten the distance for pedestrians crossing the streets.

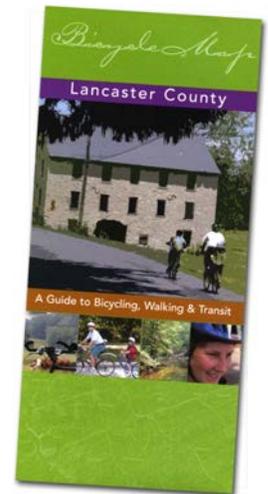
Revise Zoning Codes

Municipalities in the county are updating their zoning codes to include traditional neighborhood design districts and overlay districts that provide for a mix of uses which, through street design, parking and other policies, support greater use of walking, biking and transit. The Lancaster County Planning Commission (LCPC) is also working with municipalities on Complete Streets language that can be included into their SALDOs and zoning codes. Lititz Borough, in addition to its eleven zoning Base Districts, has four Overlay Districts, including a Traditional Neighborhood Overlay District (TNDO) and a Downtown Overlay District (DOD). The TNDO and DOD are designed to be supportive of pedestrians and the use of transit. The TNDO allows for higher-density and higher-intensity mixed use developments that are designed according to special Design Guidelines and Form-Based Code Regulations to ensure that the resulting form incorporates design principles compatible with Lititz Borough's traditional character, form and function. The TNDO applies to developments of at least ten acres of land and must have a Residential Neighborhood Area, Central Residential Area and Neighborhood Storefront Area (NSA) and a maximum overall

density of eight units/acre. The TNDO specifies the types of businesses that are permitted (cafes, pharmacies, music and video stores for example) and maximum floor area for each permitted use. The district must have an interconnected street system to promote walkability and a shorter distance to access transit.

Construct Infrastructure for Non-Motorized Travel

Planning at a countywide level for bicycle and pedestrian facilities is led by Lancaster County's Bicycle and Pedestrian Advisory Committee (BPAC). The BPAC developed a long-range plan for investment in non-motorized facilities throughout the county. The "Lancaster County Bicycle and Pedestrian Transportation Plan, Phase I" was adopted in September 2000. Phase II of the plan documented the existing bicycle and pedestrian conditions in the county and developed a recommended Priority Bicycle and Pedestrian System. This priority system identifies where improvements are needed and includes 850 miles of bicycle facilities and 360 miles of pedestrian facilities. A major product of the planning effort is the *Lancaster County Bicycle Map: A Guide to Bicycling, Walking, and Transit* which provides a rating of roads that bicyclists may use as principal transportation routes throughout the County. The network of bicycle and pedestrian facilities in the county has been steadily expanding. It includes sidewalks, signed on-street bike routes, shoulder widenings and rail-trail conversions such as the Conewago Recreational Trail in the northwest part of Lancaster County, the Lancaster Junction Trail in Landisville, and the Northwest Trail that will extend 14 miles along the Susquehanna River from Columbia Borough to Conoy Township. The trail is nearly complete. The Enola Low Grade Trail will extend 22 miles





across the southern end of the county from the Susquehanna River to the county's border with Chester County. The county also works with its municipalities, local businesses and public institutions such as schools and libraries to encourage them to install bicycle racks and sponsor bicycle safety education programs and workshops. In 2015, LCPC contracted with a consultant to update the county's Bicycle and Pedestrian Plan and develop an Active Transportation Plan.

Adopt Complete Streets Policies

The LCPC and the Lancaster County MPO are educating municipalities about the benefits of Complete Streets and encouraging them to adopt Complete Streets policies to make streets safe for all modes and people of all ages. In 2014, the LCPC and the Lancaster County Transportation Coordinating Committee (LCTCC) each adopted a Complete Streets Policy and program of activities to be carried out over a number of years. Among these activities are: educational workshops for municipal officials and planners on Complete Streets, a Model Municipal Complete Streets Policy, a Complete Streets powerpoint, technical assistance to help municipalities with approving their own policies and a section on the ALPC website with helpful resources.

Construct and Improve Transit and Passenger Rail Infrastructure

Lancaster County is located along the high-speed Keystone Corridor between Philadelphia and Harrisburg. The state of Pennsylvania and Amtrak made substantial investments in the corridor in recent years that improved reliability and speed of service on the corridor and resulted in large gains in rail ridership. To add to these improvements, Lancaster County has been working with the Pennsylvania Department of Transportation (PennDOT) to rehabilitate the three Amtrak stations in the county — Lancaster Amtrak Station, Mount Joy Station and Elizabethtown Station. The \$9 million restored Elizabethtown Station was dedicated on May 3, 2011. The \$14 million restoration of the historic Lancaster Amtrak Station, the second busiest Amtrak station in the state was completed in 2012. The Mount Joy Borough Station is in final design with construction expected to begin in 2016. All three communities have plans to link the improved stations to economic development in their boroughs.

Red Rose Transit Authority (RRTA) is Lancaster County's transit service provider, offering fixed route bus service on 17 routes throughout the county and on-demand Red Rose Access service for elderly and disabled individuals. RRTA

completed construction of a new transit center, Queen Street Station II, in 2012. The center expanded the capacity of Queen Street Station I, located adjacent to it. The project is structured as a transit-oriented development that included a 395-space parking garage and 8,500 sq. ft. of leasable street-level commercial and retail space. RRTA also celebrated the opening in 2010 of its restored headquarters and bus maintenance facility which incorporated state-of-the-art solar panels, geothermal heating and cooling and other energy-saving features.

Concluding Remarks

A growing body of research points to the relationship between transportation and public health. Decades of transportation policy and investments that focused on highway solutions to mobility and neglected alternatives, has resulted in a pattern of sprawling autocentric cities and communities and a sedentary lifestyle that is associated with a range of health and environmental problems. An awareness is emerging of the need to redesign and retrofit our communities to support “active” transportation modes and to increase investments in bicycling, walking and other solo driving alternatives. With over half of all trips in urbanized areas less than three miles long, the potential to

shift many trips to walking, bicycling and transit is achievable. Public opinion polls nationwide and in Lancaster County reveal a strong latent demand for these alternatives.

Lancaster County is continuing its leadership in the area of smart growth through implementation of a new Smart Growth Transportation Program and through actions by municipalities to update their zoning codes to create more pedestrian and bicycle-friendly environments and investments in the infrastructure to support alternatives to driving.

For further information on the smart growth and smart growth transportation in Lancaster County, contact: Harriet Parcels, Senior Transportation Planner, hparcells@co.lancaster.pa.us. Information can also be found on the Lancaster County Planning Commission’s website at www.lancastercountyplanning.org under the Smart Growth Toolbox, the Transportation Planning section of the website (including its publication, “Smart Transportation in Lancaster County”) and the county’s award-winning Growth Management element, *Balance*, of the Lancaster County Comprehensive Plan.



Transportation and Public Health

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Appendix F

Acronyms and Definitions

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ADT – Average Daily Traffic

ADA – Americans with Disabilities Act

APS – Accessible Pedestrian Signal

ARRA – American Recovery and Restoration Act

AQ – Air Quality

BPAC – Bicycle and Pedestrian Advisory Committee

CAAA – Clean Air Act Amendments

CMAQ – Congestion Mitigation and Air Quality

CMP – Congestion Management Process

DGA – Designated Growth Areas

DVMT – Daily Vehicle Miles of Travel

EJ – Environmental Justice

EPA – Environmental Protection Agency

FAST ACT – Fixing America’s Surface Transportation Act

FFY – Federal Fiscal Year, from October 1 through September 30

FHWA – Federal Highway Administration

FO – Functionally Obsolete (bridge)

FTA – Federal Transit Administration

GIS – Geographic Information System

GHG – Global Greenhouse Gases

HIA – Harrisburg International Airport

HSIP – Highway Safety Improvement Program

HUD – Housing and Urban Development

IMS – Intermodal Management System

IRI – International Roughness Index

ITS – Intelligent Transportation System

LCPC – Lancaster County Planning Commission

LCTA – Lancaster County Transportation Authority

LCTCC – Lancaster County Transportation Coordinating Committee (the MPO)

LNP – Linking Planning and NEPA (National Environmental Policy Act)

LRTP – Long-Range Transportation Plan

MAP-21 – Moving Ahead for Progress in the 21st Century

MPO – Metropolitan Planning Organization

NEPA – National Environmental Policy Act

NHS – National Highway System, a federal classification of highways consisting of the Interstate system and other key roadways; 5,479 miles in Pennsylvania

NS – Norfolk Southern (railroad)

OPI – Overall Pavement Index

PennDOT – Pennsylvania Department of Transportation

ROP – Regional Operations Plan

RRTA – Red Rose Transit Authority

SAFETEA-LU – Safe, Accountable, Flexible, Efficient
Transportation Equity Act: A Legacy for Users

SD – Structurally Deficient (bridge)

SGT – Smart Growth Transportation

SOV – Single Occupant Vehicle

STC – State Transportation Commission

TA – Transportation Alternatives

TIP – Transportation Improvement Program. A priority list of transportation projects developed by a metropolitan or rural planning organization which must include documentation of federal and state funding source for each project.

TMA – Transportation Management Area

TND – Traditional Neighborhood Development

TTAC – Transportation Technical Advisory Committee

UGA – Urban Growth Area

USDOT – United States Department of Transportation

UTF – Update Task Force

VGA – Village Growth Area

YOE – Year of Expenditure

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Connections 2040: 2016 Update
THE TRANSPORTATION ELEMENT

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