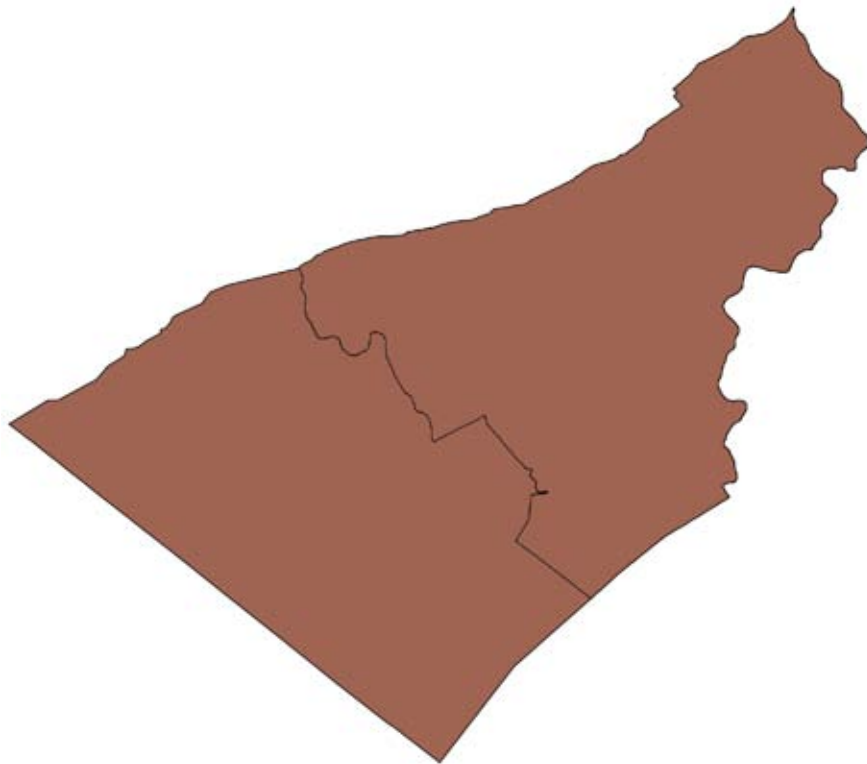


LEHIGH VALLEY SURFACE TRANSPORTATION PLAN

2011 – 2030



**PREPARED BY THE
LEHIGH VALLEY PLANNING COMMISSION
FOR THE
LEHIGH VALLEY TRANSPORTATION
STUDY
OCTOBER 2010**

LEHIGH VALLEY SURFACE TRANSPORTATION PLAN

2011-2030

PREPARED BY THE

LEHIGH VALLEY PLANNING COMMISSION

FOR THE

LEHIGH VALLEY TRANSPORTATION STUDY

OCTOBER 2010

The preparation of this report has been financed in part through grant[s] from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the Metropolitan Planning Program, Section 104(f) of Title 23, U.S. Code.

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of either the U.S. Department of Transportation, Federal Highway Administration (FHWA), Federal Transit Administration (FTA) or the Commonwealth of Pennsylvania at the time of publication. This report does not constitute a standard, specification or regulation.

LEHIGH VALLEY TRANSPORTATION STUDY

COORDINATING COMMITTEE

MICHAEL REBERT, CHAIR	PA DEPARTMENT OF TRANSPORTATION, DISTRICT 5-0
MICHAEL N. KAISER, SECRETARY	LEHIGH VALLEY PLANNING COMMISSION
JOSEPH L. GURINKO (ALTERNATE)	LEHIGH VALLEY PLANNING COMMISSION
RICHARD YOUNG	CITY OF ALLENTOWN
MICHAEL C. HEFELE (ALTERNATE)	CITY OF ALLENTOWN
MICHAEL ALKHAL	CITY OF BETHLEHEM
SALVATORE J. PANTO, JR.	CITY OF EASTON
BECKY BRADLEY (ALTERNATE)	CITY OF EASTON
CINDY FEINBERG	LEHIGH COUNTY
JOHN STOFFA	NORTHAMPTON COUNTY
STEVEN DESALVA (ALTERNATE)	NORTHAMPTON COUNTY
JAMES RITZMAN	PA DEPARTMENT OF TRANSPORTATION
LARRY SHIFFLET (ALTERNATE)	PA DEPARTMENT OF TRANSPORTATION
ARMAND GRECO	LANTA
DENIS MEYERS	LANTA
LARRY KRAUTER	LEHIGH-NORTHAMPTON AIRPORT AUTHORITY

TECHNICAL COMMITTEE

ADAM R. GRIMES, CHAIR	PA DEPARTMENT OF TRANSPORTATION
JOSEPH L. GURINKO, SECRETARY	LEHIGH VALLEY PLANNING COMMISSION
MICHAEL C. HEFELE	CITY OF ALLENTOWN
DARLENE HELLER	CITY OF BETHLEHEM
BECKY BRADLEY	CITY OF EASTON
ARMAND GRECO	LANTA
DENIS MEYERS (ALTERNATE)	LANTA
LARRY KRAUTER	LEHIGH-NORTHAMPTON AIRPORT AUTHORITY
MICHAEL S. DONCHEZ	LEHIGH VALLEY PLANNING COMMISSION
MICHAEL N. KAISER	LEHIGH VALLEY PLANNING COMMISSION
MICHAEL KEISER	PA DEPARTMENT OF TRANSPORTATION, DISTRICT 5-0
AMANDA LEINDECKER (ALTERNATE)	PA DEPARTMENT OF TRANSPORTATION, DISTRICT 5-0

LEHIGH VALLEY PLANNING COMMISSION

Steven L. Glickman, Chair
Robert A. Lammi, Vice Chair
Kent H. Herman, Treasurer

Ron Angle
Norman E. Blatt, Jr., Esq.
Becky Bradley (Alternate)
Dean N. Browning
John B. Callahan
Donald Cunningham
Michael D. D'Amore
John N. Diacogiannis
Karen D. Dolan
Percy H. Dougherty
Liesel Dreisbach
Cindy Feinberg (Alternate)
Charles L. Fraust
George F. Gemmel
Matthew Glennon
Armand V. Greco
Michael C. Hefele (Alternate)
Darlene Heller (Alternate)
Nils Hovik

Benjamin F. Howells, Jr.
Edward D. Hozza, Jr.
Terry J. Lee
Ronald W. Lutes
Earl B. Lynn
Ross Marcus (Alternate)
Jeffrey D. Manzi
Kenneth M. McClain
Thomas J. Nolan
Salvatore J. Panto, Jr.
Edward Pawlowski
Stephen Repasch
Michael Reph
Vincent P. Smith
Ronald E. Stahley
John Stoffa
Glenn M. Taggart
Andrew Twigg
Donna Wright

LEHIGH VALLEY PLANNING COMMISSION STAFF

* Michael N. Kaiser, AICP	Executive Director
Geoffrey A. Reese, P.E.	Assistant Director
* Olev Taremäe, AICP	Chief Planner
* Joseph L. Gurinko, AICP	Chief Transportation Planner
* Thomas K. Edinger, AICP	GIS Manager
* Lynette E. Romig	Senior GIS Analyst
Susan L. Rockwell	Senior Environmental Planner
** Michael S. Donchez	Senior Transportation Planner
David P. Berryman	Senior Planner
* Teresa Mackey	Senior Planner
Travis I. Bartholomew, EIT	Stormwater Planner
* Wilmer R. Hunsicker, Jr.	Senior Planning Technician
Bonnie D. Sankovsky	GIS Technician
Anne L. Esser, MBA	Administrative Assistant
* Alice J. Lipe	Senior Planning Technician
Kathleen M. Sauerzopf	Secretary

**Project Planner
*Staff for this report

October 2010

TABLE OF CONTENTS

	<u>Page</u>
CHAPTER 1: INTRODUCTION	1
Organizational Affiliations	1
Purpose of Lehigh Valley Transportation Plan	2
CHAPTER 2: FACTORS AFFECTING TRAVEL DEMAND	3
Geography	3
Population Growth	3
Population Density	5
Growth in Households	7
Employment	11
Other Indicators of Travel Demand	14
Income	17
Public Transportation	17
Travel to Work	20
Major Traffic Generators	21
Trip Generation	23
Trip Distribution	23
Trip Assignment	23
Summary of Findings	26
CHAPTER 3: TRANSPORTATION INFRASTRUCTURE IN THE LEHIGH VALLEY	27
Public Perception of Transportation in the Lehigh Valley	28
Highways	28
Data and Analytical Tools Available	29
Highway Maintenance	33
Highway Safety	33
Highway Congestion	37
Highway Efficiency	41
Missing Transportation Links	43
Highways and Economic Development	43
Access Management	44
Local Roadway Design Tools Available to Municipalities	45
Bridges	47
Public Transportation	48
Metro	49
Metro Plus	49
System Improvement Plans	50
Data and Analytical Tools Available	55
Inter-regional Transit	56
Rail Freight	58
Bicycles and Pedestrians	61
Transportation Enhancements	62
Land Use Planning Issues	65
Environmental Justice	66

TABLE OF CONTENTS (cont.)

	<u>Page</u>
CHAPTER 4: TRANSPORTATION PLAN	71
Key Findings	71
Goals and Policies	72
General Goals and Policies	72
Highway Goals and Policies.....	73
Transit Goals and Policies	75
Rail Freight Goals and Policies	75
Bicycle/Pedestrian Goals and Policies	76
Projects and Programs.....	77
Transportation Improvement Program (2011-2014)	78
Key Highway Projects (Short Range Element - 2011 to 2014).....	78
Key Transit Projects (Short Range Element).....	80
Key Bike/Ped and Transportation Enhancement Projects (Short Range Element)	80
Mid Range Element (2015-2022).....	83
Long Range Element (2023-2030)	83
Air Quality Conformity	83
Financial Plan.....	86
Future Revenues	86
Short Range (2011-2014) Transportation Improvement Program (TIP).....	86
Mid Range (2015-2022) and Long Range (2023-2030).....	90
Future Costs.....	90
Unmet Needs.....	91
Future Updates and Plan Implementation	93
APPENDICES	
A Glossary of Acronyms	
B Environmental Justice/ Title VI Document	

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1 County Population Trends.....	5
2 The Official LVPC Population Forecast for Lehigh and Northampton Counties	5
3 Criteria for Various Types of Transit	7
4 Household History and Forecasts by Municipality 1990-2030.....	9
5 History and Forecast of Employment by Place of Work Lehigh and Northampton Counties 1970-2030.....	12
6 National Vehicle Miles of Travel.....	14
7 Passenger Car Registrations: 1990-2009.....	15
8 Licensed Drivers: 1990-2009	15
9 Truck Registrations: 1990-2009	16
10 Comparative Growth Rates Lehigh Valley	16
11 Lehigh and Northampton Transportation Authority (LANTA) Total Passenger Trips 1990-2008	19
12 Metro Plus Ridership 1990-2008	19
13 Travel to Work.....	20
14 Daily Person Trips by Trip Purpose	21
15 Trip Generation Rates for Various Land Uses.....	25
16 High Priority Crash Locations	34
17 The Concept of Level of Service (LOS)	37
18 Lehigh Valley Congested Corridors - 2030	38
19 Lehigh Valley Bridge Conditions - State Owned Bridges.....	48
20 Rail Service from 30th Street Station, Philadelphia to Shelly	58
21 Lehigh Valley Transportation Enhancement & Hometown Streets/Safe Routes to School & Pennsylvania Community Transportation Initiative Program Summary of Approved Projects	67
22 Draft Transportation Improvement Program (TIP) 2011-2014.....	79
23 Highways, Bridge and Transit: Mid and Long Range Elements.....	84
24 Transportation Plan Summary.....	89
25 Projected Lehigh Valley Transportation Funding.....	91
26 Comparison of Lehigh Valley Highway and Bridge Needs and Estimated Funding: 2011 to 2030	93

LIST OF MAPS

<u>Map</u>	<u>Page</u>
1 Traffic Analysis Zones (473 Zones)	4
2 Population Density Year 2005 and Year 2030.....	6
3 Change in Number of Households 2010-2030	10
4 Change in Employment 2000-2030.....	13
5 Per Capita Income 1999	18
6 Major Traffic Generators	22
7 Major Travel Distribution Daily Internal Trips	24
8 Road Functional Classifications	31
9 High Priority Crash Locations.....	35
10 Lehigh Valley Congested Corridors - 2030	39
11 LANTA Metro Fixed Route System.....	51
12 Freight Rail Lines	60
13 Multi-Use Paths and Hiking Trails	63
14 Approved Transportation Enhancement Projects	68
15 Highway and Bridge Projects 2011-2014 TIP.....	81
16 Mid and Long Range Element Projects.....	87

LIST OF GRAPHS

<u>Graph</u>	<u>Page</u>
1 Persons Per Household Trends.....	8
2 National Vehicle Miles of Travel.....	14

CHAPTER 1

INTRODUCTION

The history of development in the Lehigh Valley has long been related to the development of transportation facilities. In 1829, the Lehigh Canal and several bridges spanning the Lehigh and Delaware Rivers were constructed. These early transportation improvements were essential to the development and marketing of coal resources north of the Lehigh Valley and mining and quarrying operations of zinc, slate and limestone within the Valley. The extraction and processing of these mineral resources became a major industrial activity by the mid 1800s. In 1855, the Lehigh Valley Railroad was founded and provided improved transportation for extracted minerals. This further stimulated industrial growth and urbanization and drew a large labor force to the area. While the railroads expanded from 1890 to 1930, the canal boat services, facing competition from the railroads, declined. The advent of electric trolleys from 1865 to 1930, and then private automobiles after 1920, encouraged the development of residential and commercial areas outside city limits. Increased mobility, improvements to the existing highway network, availability of large tracts of affordable land and the desire for larger houses to accommodate the “baby boom” generation further spurred suburbanization. Most recently, the completion of I-78, the extension of Route 33 and the Route 222 Bypass aided economic development and eased commutation. Transportation decisions have played a large role in the development of the Lehigh Valley. The purpose of this report is to guide these decisions through 2030.

ORGANIZATIONAL AFFILIATIONS

The Metropolitan Planning Organization (MPO) for Lehigh and Northampton counties is the Lehigh Valley Transportation Study (LVTS). The role of the MPO is to promote transportation projects, plans, programs, and policies that are consistent with the locally adopted Transportation Improvement Program (TIP) and Lehigh Valley Transportation Plan (LVTP) in accordance with Federal law. LVTS was created in 1964 through a legal agreement between the Cities of Allentown, Bethlehem, and Easton; the Counties of Lehigh and Northampton; and the Department of Highways of the Commonwealth of Pennsylvania (now the Pennsylvania Department of Transportation). The LVTS was founded in response to the Federal-Aid Highway Act of 1962, which stated, in part, that any urban area with a population of more than 50,000 must maintain a continuing, comprehensive and cooperative transportation planning process consistent with the comprehensively planned development of the urbanized area in order to be eligible to receive Federal funds for transportation projects. LVTS satisfies this planning requirement and assures the region continued eligibility to receive state and federal funding for highway and transit system capital improvements and operating assistance.

LVTS is made up of two committees — the Technical Committee and Coordinating Committee. The Technical Committee reviews items brought before the group and recommends actions to the Coordinating Committee. The Coordinating Committee is the policy body which formally adopts items reviewed by the Technical Committee. LVTS Technical Committee membership consists of representatives from PennDOT Central Office, PennDOT District 5-0, Allentown, Bethlehem, Easton, Lehigh Valley Planning Commission (LVPC), Lehigh and Northampton Transportation Authority (LANTA) and the Lehigh-Northampton Airport Authority (LNAA). The Coordinating Committee membership consists

of representatives from PennDOT Central Office, PennDOT District 5-0, Lehigh County, Northampton County, Allentown, Bethlehem, Easton, LVPC, LANTA and LNAA.

The transportation planning staff of the LVPC serves as technical staff for the LVTS, preparing plans and programs for MPO consideration. The LVPC consists of 37 members comprised of 19 elected officials (mayors, county executives, a member of the Lehigh County Board of Commissioners, a member of Northampton County Council, and representatives of boroughs and townships) and 18 citizen members. The LVPC and LVTS jurisdictions include 62 municipalities in Lehigh and Northampton counties in the central eastern portion of the Commonwealth of Pennsylvania. The region encompasses 731 square miles and is home to 642,509 persons according to the 2009 U.S. Census estimates.

PURPOSE OF LEHIGH VALLEY TRANSPORTATION PLAN

The purpose of the Transportation Plan is to document the current status of transportation projects in the Lehigh Valley and to recommend solutions to solve long term transportation problems in the Lehigh Valley. Goals and objectives for the plan were derived in part from the *Comprehensive Plan The Lehigh Valley...2030*.

Federal regulations mandate that long range plans be intermodal in scope, cover at least a 20-year period, address seven analysis factors, be financially constrained, include both short- and long-range elements and provide for public involvement. This plan meets all requirements of current Federal legislation. The plan focuses on investment in future transportation infrastructure that will be implemented by PennDOT, LANTA and local governments over the next 20 years. The plan recognizes the interconnection between transportation and land use issues. The LVPC works with local governments in the Lehigh Valley on land use planning issues. Implementation of land use policies is the responsibility of local government under Pennsylvania law. Neither PennDOT nor LVTS have any authority over local land use planning or zoning. The plan does not address issues concerning police enforcement of traffic laws or security issues. Other government agencies are properly assigned to these issues. Finally, the plan is not an advocacy document for special interests. The plan focuses on practical solutions to problems of transportation safety, maintenance, congestion and mobility.

CHAPTER 2

FACTORS AFFECTING TRAVEL DEMAND

This chapter examines the various economic, social and land development factors that affect the growth in travel. The key factors used in the Lehigh Valley traffic model to forecast future trip generation and distribution are household growth and employment growth. Household growth is derived from LVPC forecasts of future population. Employment growth is forecast from the Lehigh Valley economic model. The amount of such growth and its distribution throughout the region has a major impact on the location, severity and duration of traffic congestion.

This chapter uses county forecasts based on the 2000 Census. LVPC demographic forecasts were updated in 2007 based on greater than expected population growth between 2000 and 2005. The new forecasts are in this report. They are used in the current Lehigh Valley traffic model.

GEOGRAPHY

All household and employment data is maintained in accord with traffic zone geography. This geography includes 473 traffic zones (see Map 1) which aggregate to municipal boundaries. In general, urban areas have smaller zones than do rural areas. There are many more trip generating and attracting activities in urban areas than there are in rural areas.

The LVPC created a system for developing population, household and employment forecasts to fit the 473 traffic zone geography. The system involves the use of a regional economic model, purchased from Regional Economic Models Inc. (REMI), to develop a regional forecast of population and employment. Population data from this model is stepped down to create municipal and submunicipal forecasts using local development data and a density model. Household forecasts are created from population forecasts. The regional employment forecasts from the REMI model are disaggregated to the submunicipal level based on census data, local employment surveys, local zoning maps, available land and inspection of aerial photography.

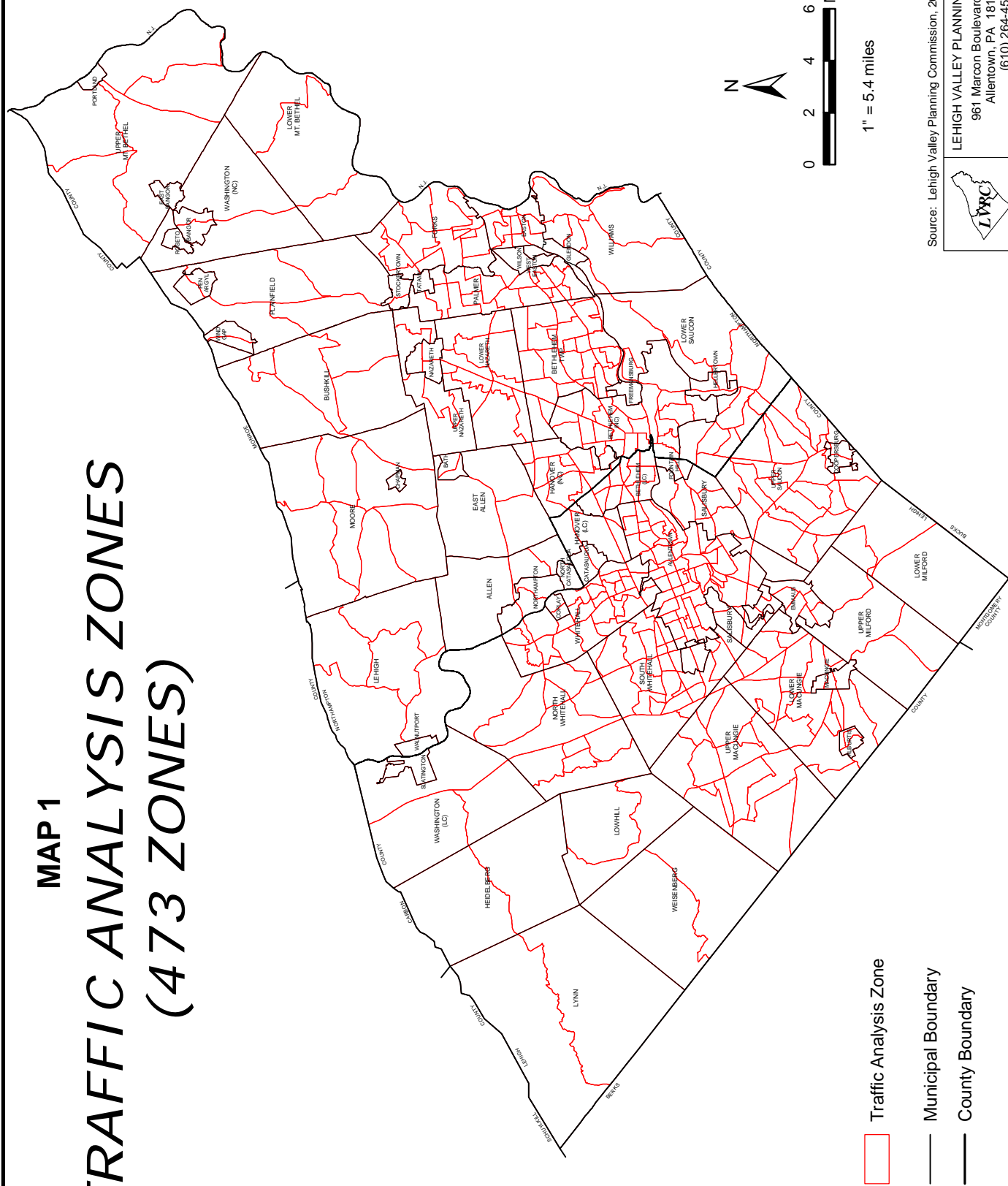
Data management for a large transportation model is a complex process. The LVPC continues to incorporate Geographic Information System (GIS) techniques for improving the database. The Commission has documented its forecasting procedures for socio-economic data and developed a technical report on the Lehigh Valley travel demand forecasting model.

POPULATION GROWTH

The Lehigh Valley has realized a steady increase in population over the last several decades. In the early to mid 1980s, residents of nearby New Jersey communities began to move into portions of the region. This migration continues and is a particularly important component of population growth in Northampton County. Population growth trends are shown in Table 1. Northampton County grew by 8.1% from 1990 to 2000 while Lehigh County grew by 7.2%. From 2000 to 2009 the U.S. Census estimates that Northampton County grew by 11.9% and Lehigh County by 10.1%. Lehigh Valley population growth has accelerated in this decade.

MAP 1

TRAFFIC ANALYSIS ZONES (473 ZONES)



Source: Lehigh Valley Planning Commission, 2005

LEHIGH VALLEY PLANNING COMMISSION
 961 Marcon Boulevard, Suite 310
 Allentown, PA 18109-9397
 (610) 264-4544



TABLE 1
COUNTY POPULATION TRENDS

	1990	2000	% Change	2009	% Change
	(U.S. Census)	(U.S. Census)	1990-2000	(U.S. Census)	2000-2009
Lehigh County	291,130	312,090	7.2%	343,519	10.1%
Northampton County	247,105	267,066	8.1%	298,990	11.9%
Lehigh Valley	538,235	579,156	7.6%	642,509	10.9%
Pennsylvania	11,881,643	12,281,054	3.4%	12,604,769	2.6%

Source: U.S. Department of Commerce, Bureau of the Census.

Population in the region is projected to grow steadily through 2030 as depicted in Table 2. The rate of regional growth is an important factor in future trip making in the region. The distribution of such growth in the region is also important. The distribution of growth is what determines impact in specific communities and the need for transportation improvements. In the coming decades most growth is expected to be in the suburban townships on the perimeter of Allentown, Bethlehem, and Easton. It is also expected that Northampton County will grow faster than Lehigh County due to migration from New Jersey. The Lehigh Valley has become one of the fastest growing parts of Pennsylvania because of its proximity to New Jersey. This trend is expected to continue. This growth will increase the growth of traffic and traffic congestion at all levels in the coming years.

TABLE 2
THE OFFICIAL LVPC POPULATION FORECAST FOR
LEHIGH AND NORTHAMPTON COUNTIES

	2000	2009	2010	2020	2030	% Change 2000-2030
Lehigh County	312,090	343,519	342,932	370,644	399,721	28.08
Northampton County	267,066	298,990	301,416	333,382	368,135	37.84
Lehigh Valley	579,156	642,509	644,348	704,026	767,856	32.58

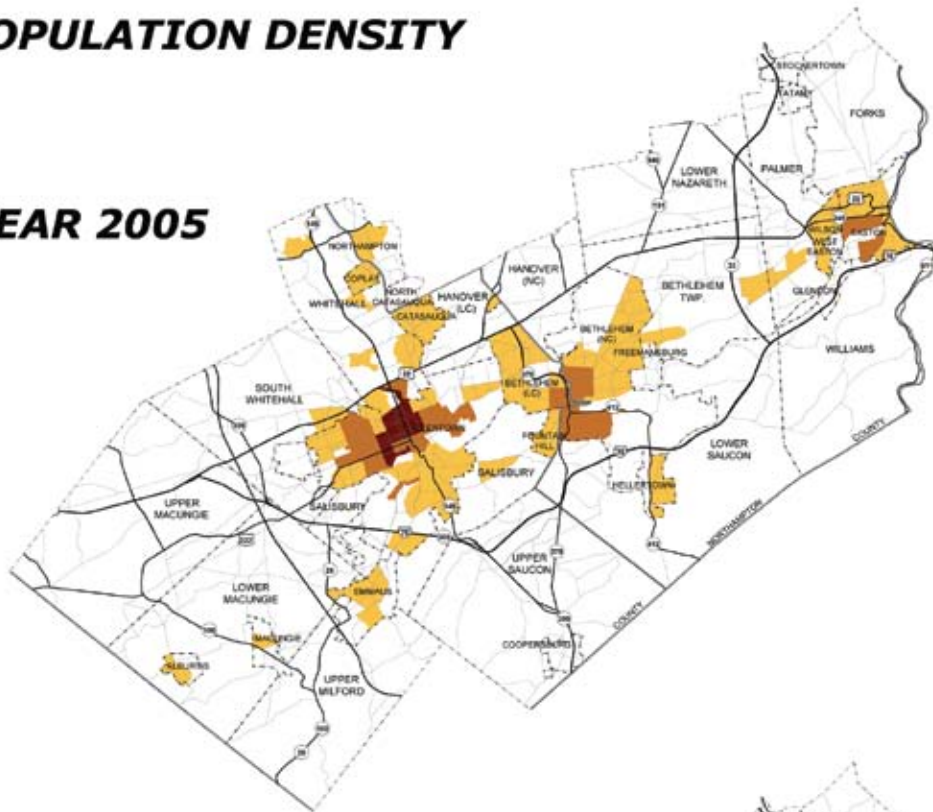
*Source: U.S. Department of Commerce, Bureau of the Census for 2000 data and 2009 estimates;
all other data forecasted by the LVPC.*

POPULATION DENSITY

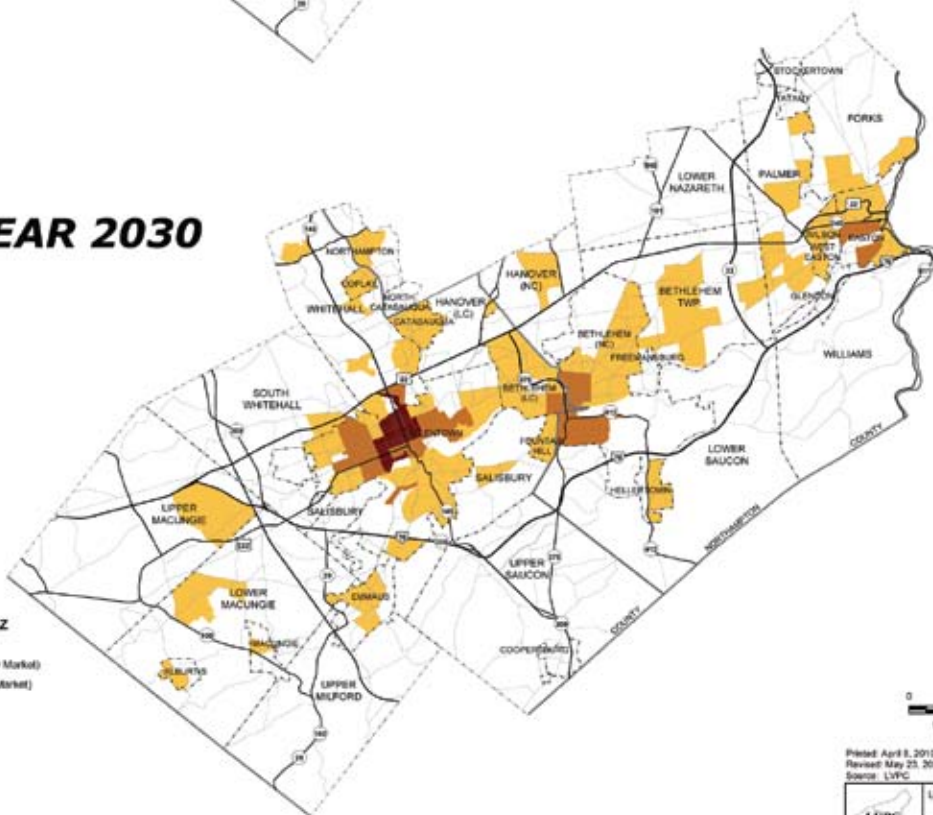
Population density is an important component of transportation planning. As areas are subdivided for residential and employment development, their densities grow. The center city sections of Allentown, Bethlehem and Easton contain the highest densities in the region. Most existing transit routes are concentrated in these areas. Townships located within the urbanized area contain low to moderate densities while the rural township densities are very low. Map 2 shows population densities in the year 2005 and a forecast of density in 2030. Table 3 describes density criteria for three different levels of transit service. Residential density figures have been established as target areas for LANTA service. The lower end of

MAP 2 POPULATION DENSITY

YEAR 2005



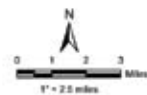
YEAR 2030



Population Per Sq. Mi. By TAZ

- Under 4,000
- 4,000 - 7,999 (Bus - Secondary Market)
- 8,000 - 14,999 (Bus - Primary Market)
- 15,000 or more (Light Rail)

- Major Roads
- Minor Roads
- - - Municipal Boundaries
- County Boundaries



Printed April 8, 2010
Revised May 23, 2007
Source: LVPC

LEHIGH VALLEY PLANNING COMMISSION
901 Maroon Boulevard, Suite 310
Allentown, PA 18109-8387
(610) 264-4544

the density ranges represent the threshold at which LANTA will consider the provision of service. The upper ranges represent densities necessary for high potential patronage levels.

TABLE 3
CRITERIA FOR VARIOUS TYPES OF TRANSIT

Transit Mode	Residential Density		Employment Density (Jobs/Acre)	Corridor Size	Office Space (Million Square Feet)
	Dwelling Units / Residential Acres	Population / Square Mile (Estimated)			
Bus (1 bus/hr.)	4	3,000-6,000	20	•	5-8
Bus (1 bus/30 min.)	7	6,000-8,000	20-50	•	8-20
Enhanced Bus (BRT)	5	8,000-10,000	20-50	•	8-20
Light Rail	9	15,000 - 18,000	50-60	25-100 sq. mi.	35-50

Sources: Population Density: Boris Pushkarev and Jeffrey Zupan, "Public Transportation and Land Use Policy", 1977; Institute of Transportation Engineers; Transportation Research Board, TCRP Report 16, "Transit and Urban Form", 1966. Employment Density: various sources, mainly Puget Sound Regional Council, 1999.

To promote mobility in the Lehigh Valley and provide residents with access to employment, retail establishments, medical services, recreation and other quality of life services, LANTA utilizes a comprehensive set of planning guidelines to establish the location and recommended minimum level of bus service in the Lehigh Valley. The *Moving LANTA Forward* Plan envisions enhanced bus or BRT services along corridors that currently do or are projected to have the highest population densities in the Valley as shown in Map 2. The only areas that currently or are projected to approach the criteria for light rail service is Center City Allentown.

Although future population densities will increase in some suburban areas, it is doubtful that they will increase dramatically without significant changes in local zoning. Density patterns in the Lehigh Valley tend to develop to a level high enough to congest roads but not high enough to facilitate transit. Transit service, land use patterns, and densities are inextricably linked. While aided by high population densities, transit also relies heavily on nearby trip attractors such as shopping centers, government buildings, and hospitals as well as transit supportive site design and the pedestrian environment. The prominence of retailing in Whitehall Township and close proximity to transit-supportive population densities results in the Township being a prime attraction of transit outside of the three cities and a handful of boroughs. In contrast, Bethlehem Township, while beginning to develop attractors such as employment centers, shopping centers, and hospitals, lacks the necessary population densities for productive transit service. In 2009 the Lehigh Valley Planning Commission and LANTA entered into a memorandum of understanding to cooperate in promoting transit and pedestrian friendly land use patterns through the LVPC subdivision review process.

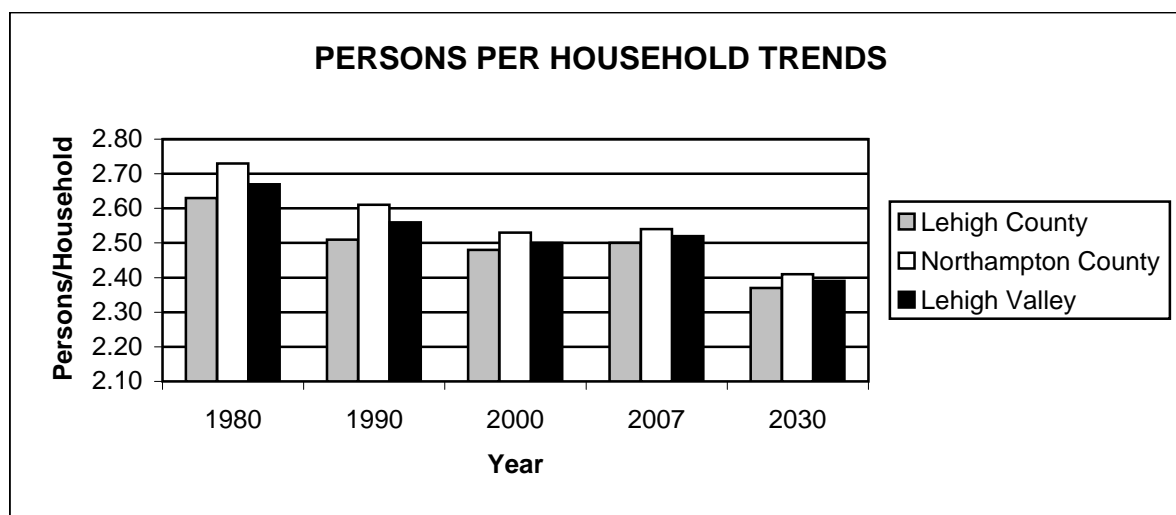
GROWTH IN HOUSEHOLDS

For purposes of transportation planning, growth in households is a key variable for the prediction of future trip generation. Household projections are made for each traffic zone in the Lehigh Valley from projections of population and future household size. The Census defines a household as the person(s) who occupy a house. It is the members of the household who work, shop, recreate and create traffic.

From 1990 to 2000 there was a distinct geographic pattern to household formation in the Lehigh Valley. Over 60% of new household formations were located in ten of the 62 municipalities in the Lehigh Valley. Municipalities with relatively high household growth in Northampton County were Bethlehem Township, Forks Township, Hanover Township, Palmer Township and Lower Saucon Township. In Lehigh County high household growth townships were Whitehall, Upper Macungie, Lower Macungie, North Whitehall and Upper Saucon. These municipalities are all within the urban core of the Lehigh Valley. They were expected to be high growth areas because of their location and their proximity to urban infrastructure. These municipalities continued to experience relatively high rates of household formation from 2000 to 2010. It is likely that these trends will continue in the foreseeable future. Map 3 shows the 2010-2030 projected change in number of households by municipality. Details by municipality are shown on Table 4.

Graph 1 shows that persons per household has declined over the past 20 years. Persons per household are much lower than in the 1980s, thus reflecting a trend toward families with fewer children and two workers. The data also reflects the growth in one person households. This decline is expected to continue.

GRAPH 1



Source: U.S. Department of Commerce, Bureau of the Census for all data up to 2007, LVPC forecast for 2030.

Most of the high capacity transportation infrastructure in the Lehigh Valley is located in proximity to the three cities and in suburban townships bordering the cities. The LVPC supports continued improvement of all types of transportation infrastructure in this area in the future. See areas depicted for urban development on Map 15.

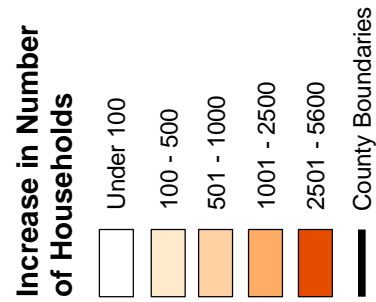
Expansion of excessive household or employment growth in rural areas is a defining characteristic of “urban sprawl”. The LVPC does not support major transportation infrastructure in areas designated for agriculture, natural resource preservation and other rural uses. Most metropolitan parts of the nation are experiencing “urban sprawl” to one degree or another. Most have had a great deal of difficulty in developing transportation solutions that adequately serve this pattern of development or change it. Urban sprawl is a transportation issue in the Lehigh Valley. It will be difficult to change this form

TABLE 4
HOUSEHOLD HISTORY AND FORECASTS BY MUNICIPALITY
1990-2030

Municipality	1990 Households	2000 Households	2010 Households	2020 Households	2030 Households	Change 2000-2030
Alburtis	491	774	836	885	945	171
Allentown	42,775	42,032	43,081	44,041	44,501	2,469
Bethlehem (part)	7,967	8,188	8,524	8,759	8,941	753
Catasauqua	2,546	2,616	2,654	2,705	2,714	98
Coopersburg	935	983	998	1,017	1,020	37
Coplay	1,325	1,431	1,452	1,480	1,485	54
Emmaus	4,674	4,985	5,100	5,197	5,214	229
Fountain Hill	1,866	1,911	1,941	1,977	1,984	73
Hanover Twp.	981	892	910	928	931	39
Heidelberg Twp.	1,051	1,187	1,333	1,502	1,644	457
Lower Macungie Twp.	5,965	7,158	10,517	12,770	16,114	8,956
Lower Milford Twp.	1,125	1,277	1,484	1,806	2,222	945
Lowhill Twp.	554	677	906	1,187	1,523	846
Lynn Twp.	1,154	1,397	1,818	2,391	3,115	1,718
Macungie	1,086	1,366	1,428	1,455	1,459	93
North Whitehall Twp.	3,948	5,250	6,614	8,251	8,906	3,656
Salisbury Twp.	4,836	5,138	5,392	5,565	5,594	456
Slatington	1,776	1,743	1,769	1,802	1,808	65
South Whitehall Twp.	6,521	6,943	7,772	8,622	9,425	2,482
Upper Macungie Twp.	3,226	5,128	7,423	10,094	12,800	7,672
Upper Milford Twp.	2,156	2,514	2,792	2,958	3,033	519
Upper Saucon Twp.	3,249	3,970	5,120	6,090	6,459	2,489
Washington Twp.	2,261	2,512	2,941	3,479	3,830	1,318
Weisenberg Twp.	1,084	1,458	1,880	2,319	2,786	1,328
Whitehall Twp.	9,335	10,376	11,121	11,679	12,111	1,735
LEHIGH COUNTY	112,887	121,906	135,804	148,958	160,563	38,657
Allen Twp.	925	1,001	1,737	2,553	3,500	2,499
Bangor	2,147	2,105	2,168	2,259	2,345	240
Bath	862	1,061	1,154	1,259	1,426	365
Bethlehem (part)	19,301	19,928	20,850	21,278	21,313	1,385
Bethlehem Twp.	5,719	7,619	9,297	10,969	12,764	5,145
Bushkill Twp.	1,819	2,333	2,929	3,493	3,891	1,558
Chapman	90	89	91	93	93	4
East Allen Twp.	1,599	1,864	2,067	2,389	2,633	769
East Bangor	368	387	419	457	462	75
Easton	9,397	9,548	9,785	10,019	10,086	537
Forks Twp.	2,186	3,035	5,162	6,269	7,711	4,676
Freemansburg	880	687	732	748	750	63
Glendon	139	135	138	141	142	8
Hanover Twp.	2,581	3,633	4,117	4,572	5,159	1,526
Hellertown	2,415	2,448	2,511	2,566	2,574	126
Lehigh Twp.	3,267	3,680	4,544	5,685	6,591	2,911
Lower Mt. Bethel Twp.	1,135	1,223	1,334	1,475	1,612	389
Lower Nazareth Twp.	1,448	1,788	2,471	3,656	4,464	2,676
Lower Saucon Twp.	3,046	3,735	4,468	4,998	5,422	1,687
Moore Twp.	3,005	3,303	3,945	4,723	5,443	2,140
Nazareth	2,456	2,560	2,653	2,792	2,958	398
Northampton	3,472	3,869	4,080	4,170	4,183	314
North Catasauqua	1,083	1,136	1,184	1,210	1,213	77
Palmer Twp.	5,521	6,716	7,935	9,156	10,989	4,273
Pen Argyl	1,377	1,427	1,487	1,543	1,596	169
Plainfield Twp.	1,958	2,130	2,632	3,397	4,201	2,071
Portland	212	236	264	318	330	94
Roseto	602	640	659	673	676	36
Stockertown	245	279	314	321	322	43
Tatamy	323	352	405	414	415	63
Upper Mount Bethel Twp.	2,057	2,363	3,085	3,719	4,398	2,035
Upper Nazareth Twp.	1,008	1,327	1,736	2,246	2,666	1,339
Walnutport	757	809	866	885	888	79
Washington Twp.	1,431	1,601	2,113	2,732	3,258	1,657
West Easton	437	452	470	480	482	30
Williams Twp.	1,428	1,657	2,347	2,877	3,242	1,585
Wilson	3,162	3,164	3,270	3,342	3,352	188
Wind Gap	1,097	1,221	1,257	1,285	1,289	68
Bethlehem (Total L&N)	27,268	28,116	29,373	30,037	30,254	2,138
NORTHAMPTON COUNTY	90,955	101,541	116,674	131,162	144,844	43,303
LEHIGH VALLEY	203,842	223,447	252,478	280,120	305,407	81,960

Source: 1990 and 2000 households — U.S. Department of Commerce, Bureau of the Census;
forecasts by the Lehigh Valley Planning Commission, update 2007.

MAP 3



LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

of development in a short period of time, even though the LVPC comprehensive plan has advocated concentrated development, higher housing densities, and strong agricultural preservation measures in rural areas for decades. Hopefully, developers and local municipalities will take steps to change past development patterns.

EMPLOYMENT

The Lehigh Valley has seen significant change in the types of employment in the last 20 years. Heavy manufacturing once dominated the regional employment base. Bethlehem Steel, located in the City of Bethlehem employed about 30,000 persons at its peak. Mack Trucks, a maker of commercial trucks, employed about 6,700 persons as recently as 1984. The garment industry also had a significant presence in the area. Steel-making operations at the Bethlehem Steel plant ceased in 1997. Earlier, Mack Trucks moved most of their operations to South Carolina. Many plants, unable to compete with the lower wages of foreign manufacturers, have gone out of business. The decline of the manufacturing sector is not unique to the Lehigh Valley; this trend is occurring on a national level. In the Lehigh Valley manufacturing employment is projected to decline by 12% from 2000 through 2030 (see Table 5). It has declined 43% between 1970 and 2000. These jobs are being replaced by growth in the service sector. Service sector jobs are projected to increase 46% from 2000 through 2030.

Manufacturing operations in the past were highly concentrated in Allentown, Bethlehem, Easton and some boroughs. This development pattern resulted in predictable trip distributions and convenient service by public transportation. Many employees walked to work. The retail and service jobs created today are geographically dispersed, closely mimicking residential development patterns. Trip distribution patterns are more random and spread out than in the past.

To keep abreast of changing conditions and plan for future needs, the LVPC developed and maintains employment projections through the year 2030. The data is broken down into two separate sectors — retail employment, and all other employment. This information is used as an input to the regional travel model. Employment projections are periodically reviewed as development conditions dictate.

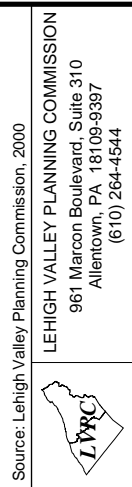
Map 4 shows the projected change in employment from 2000-2030. Most of the significant employment growth is associated with the availability of developable land and quick access to the major transportation network. As depicted in Map 4, major employment gains are anticipated to occur close to the Route 22 corridor. Upper Macungie Township will experience significant growth between Route 22 and Route 222 in the Lehigh Valley West II Industrial Park and in the Route 100 corridor. South Whitehall Township and North Whitehall Township are experiencing growth along the Route 309 corridor. Most new employment in Upper Saucon Township is expected to occur between Route 309 and Route 378 in the Stabler Corporate Center. The relocation of Olympus, a maker of camera and medical imaging equipment, added about 800 jobs to this area. In addition, Lehigh Valley Campus of Penn State (formerly Allentown Business School) is located at this site and a “lifestyle” shopping center has opened. Hanover Township (Northampton County) growth stems primarily from Lehigh Valley Industrial Park IV. LVIP VII is developing at the Bethlehem Commerce Center on the south side of Bethlehem on about 1000 acres of former Bethlehem Steel property. The Sands Casino has also developed on former Bethlehem Steel property on the southside of Bethlehem. Lower Nazareth Township growth is anticipated to occur adjacent to the Route 33/Route 248 interchange while Bethlehem Township’s occurs in Lehigh Valley Industrial Park V and Park VI near the Route 33 extension as well as quadrants around the Route 33/Freemansburg Avenue interchange.

TABLE 5
HISTORY AND FORECAST OF
EMPLOYMENT BY PLACE OF WORK
LEHIGH AND NORTHAMPTON COUNTIES 1970-2030

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030
TOTAL EMPLOYMENT	224,199	238,268	255,973	260,282	289,038	294,061	324,247	327,599	336,785	344,380	352,349	361,378	371,835
Manufacturing	93,923	87,727	88,094	73,726	61,487	56,315	53,109	45,725	44,496	44,279	44,825	45,507	46,490
Durables	51,195	49,542	46,613	37,623	29,932	27,953	29,553	26,791	27,584	28,040	28,826	29,590	30,509
Non-Durables	42,728	38,185	41,481	36,103	31,555	28,362	23,556	18,934	16,912	16,239	15,999	15,917	15,981
Non-Manufacturing	107,355	124,245	141,229	160,265	199,063	207,681	238,765	248,019	257,338	264,540	271,616	279,534	288,425
Mining	604	567	476	577	456	480	494	436	460	485	503	514	523
Construction	10,055	12,615	10,633	11,723	16,038	14,801	17,602	18,071	18,017	17,740	17,482	17,350	17,214
Transport. & Public Util.	11,042	11,383	12,835	13,044	14,237	14,875	18,575	17,501	17,552	17,484	17,508	17,569	17,743
Finance, Ins., Real Estate	10,559	11,868	14,595	14,708	21,269	21,876	23,041	23,742	24,160	24,401	24,558	24,778	25,091
Retail Trade	31,632	35,802	41,256	43,444	48,875	48,861	54,811	55,658	54,305	54,456	54,273	53,951	53,414
Wholesale Trade	8,080	8,741	10,766	10,161	11,890	11,789	13,768	12,363	11,889	11,441	10,904	10,324	9,759
Services	34,774	42,585	49,859	65,230	84,327	92,592	107,488	116,508	126,713	133,614	140,713	148,546	157,262
Agri., For., Fish. Svc.	609	684	809	1,378	1,971	2,407	2,986	3,740	4,242	4,919	5,675	6,502	7,419
Government	20,412	23,695	24,313	24,288	26,866	28,553	30,851	32,391	33,548	34,227	34,639	35,130	35,773
State & Local Govt.	16,231	19,863	20,730	20,249	22,252	23,610	26,187	27,235	28,281	28,838	29,185	29,617	30,163
Federal Civilian	1,550	1,673	1,653	1,730	2,173	2,811	2,834	2,829	2,746	2,791	2,796	2,795	2,812
Federal Military	2,631	2,159	1,930	2,309	2,441	2,132	1,830	2,327	2,521	2,598	2,658	2,718	2,798
Farming	2,509	2,601	2,337	2,003	1,622	1,512	1,522	1,464	1,403	1,334	1,269	1,207	1,147

Source: Lehigh Valley Planning Commission, REMI 2000 Economic Model.

CHANGE IN EMPLOYMENT 2000 - 2030



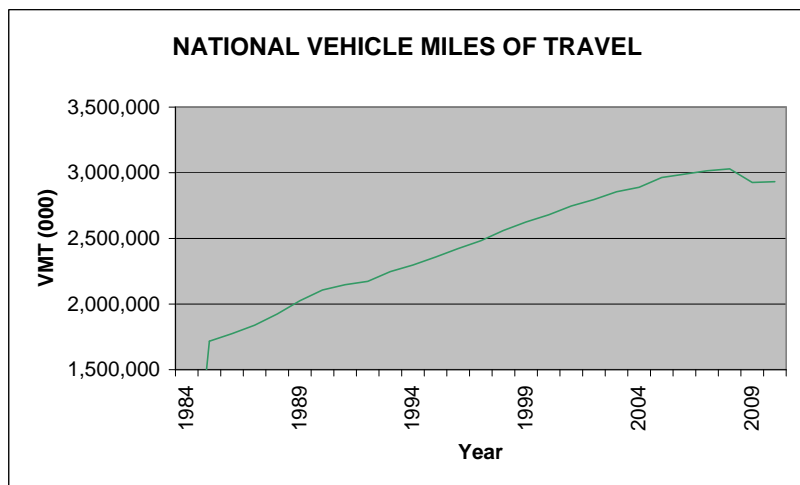
The loss of heavy manufacturing has made land and rail infrastructure available for freight handling at the BethIntermodal facility in south Bethlehem. Due to the Lehigh Valley's proximity to the major metropolitan areas of the eastern U.S. (New York, Philadelphia, Baltimore, Washington, D.C., Boston), major warehousing operations continue to locate in the region. The area has considerable appeal for this type of development because of its convenient access to the major highway network and availability of rail freight capacity.

Increases in employment yield increases in travel and increased levels of congestion. Increases in travel have outpaced the capacity of the existing transportation network and the ability to improve it. The current road network, except for I-78 (completed in 1989) and the Route 33 Extension (completed in 2002), is essentially the same as existed in 1970.

OTHER INDICATORS OF TRAVEL DEMAND

Vehicle miles of travel (VMT) is the Federal Highway Administration's primary measure of travel activity on the nation's highways. Since 1984, travel on the nation's highways has steadily risen from 1,716,779,000 VMT to a peak of 3,029,791,000 VMT in 2007. Then, for the first time in the past 16 years, travel dropped by 3.4% to 2,925,728,000 in 2008 as depicted in Graph 2 and Table 6. This drop coincided with rising gasoline prices and a weak economy. Since the trough of 2008, travel has started to increase slightly to 2,932,374,000 VMT in 2009. This represents a 0.2% increase — the smallest annual increase from 1984 to 2009.

GRAPH 2



Source: Federal Highway Administration.

TABLE 6

NATIONAL VEHICLE MILES OF TRAVEL

Year	VMT (000)	% Change
1984	1,716,770	
1985	1,774,763	3.4%
1986	1,838,240	3.6%
1987	1,924,328	4.7%
1988	2,025,586	5.3%
1989	2,107,040	4.0%
1990	2,147,501	1.9%
1991	2,172,214	1.2%
1992	2,247,152	3.4%
1993	2,296,705	2.2%
1994	2,357,587	2.7%
1995	2,422,776	2.8%
1996	2,482,201	2.5%
1997	2,560,373	3.1%
1998	2,625,363	2.5%
1999	2,679,459	2.1%
2000	2,746,924	2.5%
2001	2,795,548	1.8%
2002	2,855,262	2.1%
2003	2,889,675	1.2%
2004	2,964,167	2.6%
2005	2,989,395	0.9%
2006	3,014,336	0.8%
2007	3,029,791	0.5%
2008	2,925,728	-3.4%
2009	2,932,374	0.2%

Source: Federal Highway Administration

Tables 7, 8, and 9 show trends in passenger car registrations, licensed drivers and truck registrations from 1990–2009. Between 1990 and 2009 passenger car registrations grew 23% in Pennsylvania and 30.4% in the Lehigh Valley (Lehigh and Northampton counties). Licensed drivers grew 11.6% in Pennsylvania and 23% in the Lehigh Valley. Truck registrations grew 31.5% in Pennsylvania and 37.1% in the Lehigh Valley. All of these trends indicate more robust growth in the Lehigh Valley relative to the state as a whole.

TABLE 7
PASSENGER CAR REGISTRATIONS: 1990 - 2009

Year	Pennsylvania		Lehigh County		Northampton County	
	Total	% Change	Total	% Change	Total	% Change
1990	6,345,308		160,680		161,488	
1991	6,391,515	0.73%	161,023	0.21%	162,735	0.77%
1992	6,495,058	1.62%	162,664	1.02%	164,748	1.24%
1993	6,559,139	0.99%	163,649	0.61%	166,747	1.21%
1994	6,679,036	1.83%	165,565	1.17%	170,231	2.09%
1995	6,664,258	-0.22%	164,063	-0.91%	169,385	-0.50%
1996	6,750,733	1.30%	164,923	0.52%	171,791	1.42%
1997	6,952,248	2.99%	168,995	2.47%	177,001	3.03%
1998	7,042,386	1.30%	171,180	1.29%	179,387	1.35%
1999	7,056,986	0.21%	171,555	0.22%	178,342	-0.58%
2000	7,166,668	1.55%	174,968	1.99%	180,122	1.00%
2001	7,340,376	2.42%	182,000	4.02%	185,707	3.10%
2002	7,428,064	1.19%	188,342	3.48%	189,544	2.07%
2003	7,581,661	2.07%	198,689	5.49%	193,862	2.28%
2004	7,653,461	0.95%	211,675	6.54%	190,002	-1.99%
2005	7,721,703	0.89%	216,051	2.07%	193,357	1.77%
2006	7,701,845	-0.26%	214,766	-0.59%	194,179	0.43%
2007	7,774,535	0.94%	216,744	0.92%	196,374	1.13%
2008	7,817,110	0.55%	218,055	0.60%	197,814	0.73%
2009	7,829,113	0.15%	220,563	1.15%	199,834	1.02%

Source: PennDOT Bureau of Motor Vehicles

TABLE 8
LICENSED DRIVERS: 1990 - 2009

Year	Pennsylvania		Lehigh County		Northampton County	
	Total	% Change	Total	% Change	Total	% Change
1990	7,799,455		186,885		187,487	
1991	7,950,800	1.94%	191,616	2.53%	192,858	2.86%
1992	7,993,318	0.53%	192,680	0.56%	194,242	0.72%
1993	8,058,948	0.82%	194,731	1.06%	197,007	1.42%
1994	8,115,168	0.70%	195,793	0.55%	198,955	0.99%
1995	8,154,107	0.48%	196,134	0.17%	200,060	0.56%
1996	8,221,179	0.82%	198,160	1.03%	202,861	1.40%
1997	8,317,729	1.17%	201,242	1.56%	206,111	1.60%
1998	8,404,693	1.05%	204,110	1.43%	209,381	1.59%
1999	8,478,276	0.88%	206,669	1.25%	212,301	1.39%
2000	8,229,493	-2.93%	202,950	-1.80%	206,950	-2.52%
2001	8,254,474	0.30%	204,594	0.81%	209,334	1.15%
2002	8,323,745	0.84%	206,314	0.84%	211,510	1.04%
2003	8,369,579	0.55%	209,250	1.42%	217,238	2.71%
2004	8,430,147	0.72%	212,659	1.63%	221,358	1.90%
2005	8,489,911	0.71%	216,818	1.96%	223,770	1.09%
2006	8,566,282	0.90%	220,421	1.66%	226,278	1.12%
2007	8,627,959	0.72%	223,517	1.40%	228,298	0.89%
2008	8,659,389	1.09%	225,620	2.36%	229,227	1.30%
2009	8,701,682	0.49%	228,910	1.44%	231,489	0.98%

Source: PennDOT Bureau of Driver Licensing

TABLE 9
TRUCK REGISTRATIONS: 1990 - 2009

Year	Pennsylvania		Lehigh County		Northampton County	
	Total	% Change	Total	% Change	Total	% Change
1990	1,443,730		28,494		31,209	
1991	1,463,235	1.35%	29,337	2.96%	31,813	1.94%
1992	1,498,219	2.39%	29,590	0.86%	32,211	1.25%
1993	1,534,222	2.40%	29,743	0.52%	33,197	3.06%
1994	1,597,715	4.14%	30,508	2.57%	34,846	4.97%
1995	1,610,969	0.83%	30,356	-0.50%	35,430	1.68%
1996	1,645,669	2.15%	30,926	1.88%	36,258	2.34%
1997	1,705,350	3.63%	31,873	3.06%	37,383	3.10%
1998	1,718,916	0.80%	32,372	1.57%	37,709	0.87%
1999	1,734,596	0.91%	32,339	-0.10%	37,500	-0.55%
2000	1,842,246	6.21%	33,170	2.57%	38,212	1.90%
2001	1,862,004	1.07%	35,466	6.92%	40,811	6.80%
2002	1,838,197	-1.28%	35,765	0.84%	40,812	0.00%
2003	1,881,050	2.33%	37,737	5.51%	42,210	3.43%
2004	1,905,442	1.30%	39,816	5.51%	41,624	-1.39%
2005	1,920,334	0.78%	40,582	1.92%	42,246	1.49%
2006	1,918,432	-0.10%	40,636	0.13%	42,387	0.33%
2007	1,925,690	0.28%	40,848	0.66%	42,487	0.57%
2008	1,914,988	-0.56%	40,438	-1.00%	42,227	-0.61%
2009	1,898,703	-0.85%	40,229	-0.52%	41,604	-1.48%

Source: PennDOT Bureau of Motor Vehicles

The rate of growth in car registrations in the Lehigh Valley increased from 10.2% from 1990 to 2000 to 18.4% from 2000 to 2009. Licensed drivers grew 9.5% from 1990 to 2000 to 12.3% from 2000 to 2009. The growth of truck registrations slowed down somewhat from the 1990s to the 2000s. These registrations grew by 19.6% from 1990 to 2000 and 14.6% from 2000 to 2009. Except for truck registrations the growth rates during the 2000s was much higher than the 1990s.

Table 10 compares growth in population and employment with growth in car registrations, licensed drivers, and daily vehicle miles of travel. The data indicates a period of robust growth that has occurred in the Lehigh Valley since 2000. The Lehigh Valley is geographically situated in the shadow of two of the country's largest metropolitan areas, New York and Philadelphia. Lehigh Valley residents are of two minds concerning this situation. They take pleasure in the economic and cultural benefits that geography conveys, yet they struggle with the inevitable side effects of such proximity — increasing traffic congestion, regional population growth, increasing school population, and dynamic changes in

TABLE 10
COMPARATIVE GROWTH RATES
LEHIGH VALLEY

	% Increase	% Increase per Year
Population Growth (Est.) (2000 - 2009)	10.94%	1.22%
Job Growth (Est.) (2000 - 2007)	9.30%	1.30%
Passenger Car Registrations (2000 - 2009)	18.39%	2.04%
Licensed Drivers (2000 - 2008)	12.32%	1.37%
Daily Vehicle Miles of Travel (2000 - 2007)	6.45%	0.92%

Source: LVPC and PennDOT

the traditional culture of the Valley. This plan explores the transportation implications of these changes and makes recommendations to help us keep up with growing transportation needs.

INCOME

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

Map 5 shows per capita income in 1999 by census tract. New income data will become available with the release of the 2010 Census. The wealthiest areas in Lehigh County are Upper Milford Township, Lower Macungie Township and Upper Macungie Township. In Northampton County, the wealthiest areas are in Lower Saucon Township, Hanover Township and Williams Township. It is expected that the 2010 census information will show similar distributions of wealth.

The low income areas in the Lehigh Valley are concentrated in Allentown, Bethlehem and Easton. It is in these areas that people are most dependent on public transit and that public transit receives its highest use.

PUBLIC TRANSPORTATION

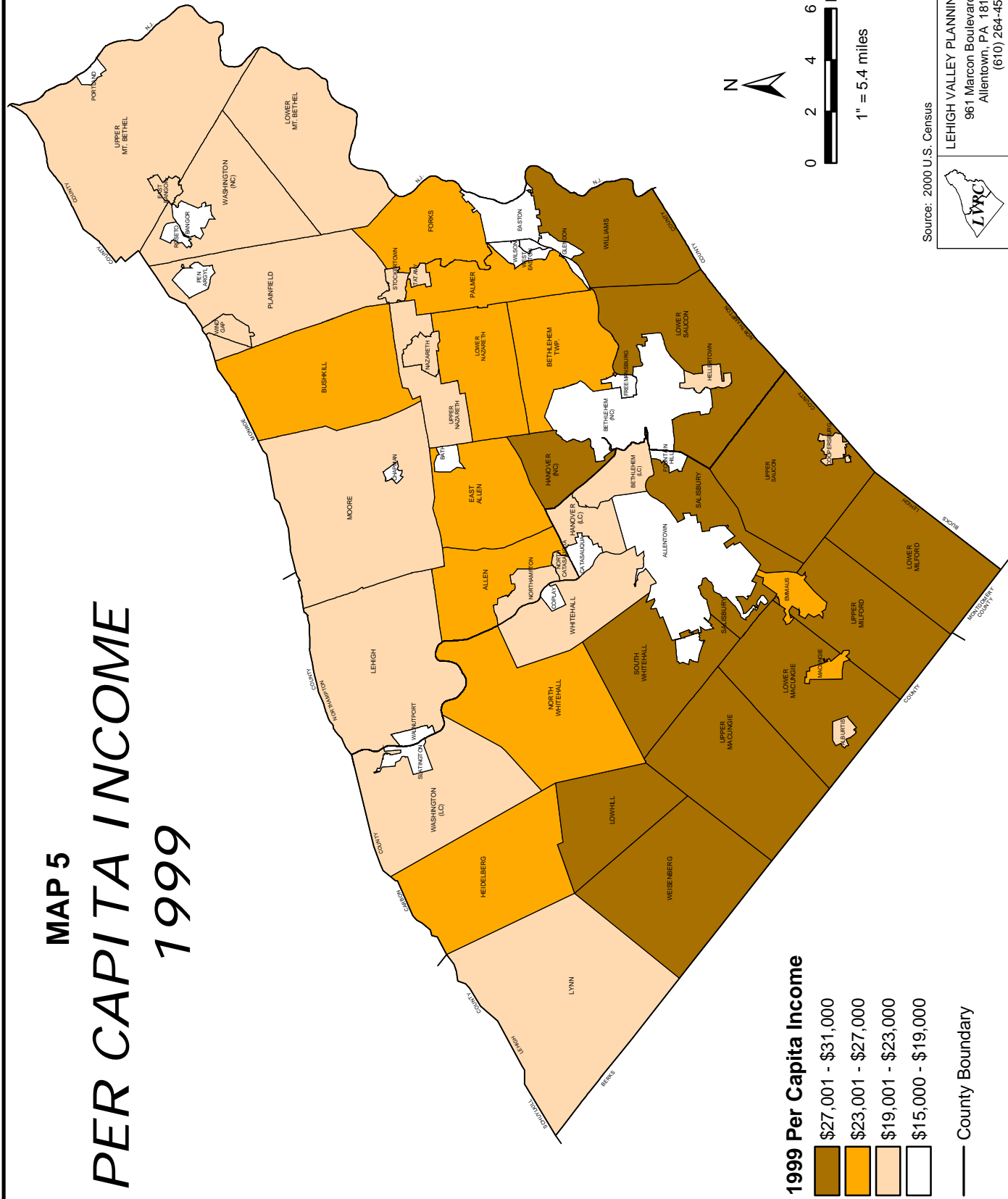
LANTA's Metro fixed-route bus network has seen significant increases in ridership over the past decade with ridership growing by 53% between 1999 and 2009. The Metro Plus demand-responsive system has generally experienced solid, steady growth in ridership through programs such as Shared Ride, Medical Assistance Transportation Program and ADA paratransit. Since 2000, patronage has generally been positive system-wide on both the Metro and Metro Plus systems, reaching about 5.9 million trips annually in 2009. Table 11 shows that public transportation trips in the Lehigh Valley decreased in 1997; this reduction was due mainly to a LANTA fare increase and reduction of service in response to Federal operating assistance reduction. The 8.67% trip increase in 1998 was due to the influx of State funding under Act 3 which permitted the Authority to restore services. The growth experienced since 1997 can be attributed to continued service improvements and adjustments.

LANTA's Metro Plus division provides demand responsive human service transportation through one contractor, Easton Coach Company, a private for-profit organization. Table 12 shows the annual percent growth in Metro Plus ridership since 1990. Growth of 251% has been realized since 1990, primarily due to increased paratransit services and a greater awareness of service provisions resulting from the Americans with Disabilities Act of 1990 (ADA).

Transit ridership increases can be realized through increased service levels or modifications which respond to new travel patterns. Outreach to the public and institutions such as major employers or institutions of higher learning can entice current riders to ride more frequently and attract new riders to the transit system. Public transportation plays a vital role in the Lehigh Valley travel picture, providing approximately 20,000 daily weekday trips in 2008.

MAP 5

PER CAPITA INCOME 1999



Source: 2000 U.S. Census



LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

TABLE 11
LEHIGH AND NORTHAMPTON TRANSPORTATION AUTHORITY (LANTA)
TOTAL PASSENGER TRIPS*
1990 - 2009

Fiscal Year**	Total Passenger Trips	Percent Change
1990	4,504,646	
1991	4,264,482	-5.33%
1992	4,306,831	0.99%
1993	4,092,516	-4.98%
1994	3,933,480	-3.89%
1995	4,056,568	3.13%
1996	3,740,641	-7.79%
1997	3,619,813	-3.23%
1998	3,933,526	8.67%
1999	4,030,676	2.47%
2000	4,111,509	2.01%
2001	4,278,106	4.05%
2002	4,505,356	5.31%
2003	4,768,270	5.84%
2004	4,742,473	-0.54%
2005	4,874,257	2.78%
2006	5,576,457	14.41%
2007	5,710,138	2.40%
2008	5,678,772	1.83%
2009	5,960,020	4.38%

* Includes all Metro passengers and all Metro Plus passengers.

**Fiscal year statistics from July 1 through June 30.

Source: *LANTA*

TABLE 12
METRO PLUS RIDERSHIP
1990 - 2009

Fiscal Year*	Total Metro Plus Passenger Trips	Percent Change
1990	129,454	
1991	269,562	108.23%
1992	269,464	-0.04%
1993	271,134	0.62%
1994	273,480	0.87%
1995	324,962	18.82%
1996	328,707	1.15%
1997	382,086	16.24%
1998	403,241	5.54%
1999	422,721	4.83%
2000	452,722	7.10%
2001	446,669	-1.34%
2002	484,670	8.51%
2003	487,365	0.56%
2004	486,149	-0.25%
2005	472,898	-2.73%
2006	475,585	0.57%
2007	447,708	-5.86%
2008	449,967	-5.39%
2009	454,335	1.48%

* Fiscal year statistics from July 1 through June 30.

Source: *LANTA*

TRAVEL TO WORK

Table 13 shows the method of travel to work for several regions of Pennsylvania. Data on the Lehigh Valley and comparable areas like Bucks County, Montgomery County, and York County are depicted. Philadelphia is also included due to its unique distribution of travel modes to work. 91.3% of workers 16 years and older drove either by driving alone or carpool in the Lehigh Valley. This high share is not unique to the Lehigh Valley given the low population densities, short travel times to work, and the ease and availability of parking at trip destinations. Bucks, Montgomery, and York Counties have comparable shares of driving to work at 90.6%, 87.9%, and 92.5%, respectively. In contrast, only 60.8% of trips to work in Philadelphia were made by driving alone or carpool while 26.2% were made by public transportation. The public transportation share for the other areas depicted range from a low of 1.0% in York County to 4.2% in Montgomery County. Public transit is most effective in the Philadelphia market due to the high population and employment densities located primarily in center city and neighboring suburbs where origins and destinations are closer together and higher traffic congestion levels than other areas shown. The use of car, truck, or van to drive alone or carpool will continue to occupy a large share of travel mode choice unless greater population and employment densities are achieved through development and redevelopment efforts.

TABLE 13
MEANS OF TRANSPORTATION TO WORK
WORKERS 16 YEARS AND OVER

	Lehigh Valley, PA		Philadelphia County, PA		Bucks County, PA		Montgomery County, PA		York County, PA	
	#	% of Total	#	% of Total	#	% of Total	#	% of Total	#	% of Total
2000 Population	579,156		1,517,550		597,635		750,097		381,751	
Land Area (sq. mi.)	725		143		622		487		910	
2000 Population Density	799		10,612		961		1,540		420	
Total:	301,643		568,512		317,236		397,164		214,961	
Car, truck, or van:	275,544	91.3%	345,609	60.8%	287,358	90.6%	349,247	87.9%	198,805	92.5%
Drive alone	247,655	82.1%	290,775	51.1%	261,298	82.4%	316,933	79.8%	179,394	83.5%
Carpooled	27,869	9.2%	54,834	9.6%	26,060	8.2%	32,314	8.1%	19,411	9.0%
Public transportation (excluding taxicab)	5,816	1.9%	148,772	26.2%	8,866	2.8%	16,585	4.2%	2,215	1.0%
Taxicab	77	0.0%	957	0.2%	23	0.0%	96	0.0%	15	0.0%
Motorcycle	581	0.2%	451	0.1%	327	0.1%	438	0.1%	692	0.3%
Bicycle	362	0.1%	7,508	1.3%	507	0.2%	1,064	0.3%	442	0.2%
Walked	7,894	2.6%	46,473	8.2%	5,751	1.8%	12,333	3.1%	4,662	2.2%
Other means	1,227	0.4%	4,141	0.7%	1,337	0.4%	2,091	0.5%	1,573	0.7%
Worked at home	10,142	3.4%	14,601	2.6%	13,067	4.1%	15,310	3.9%	6,557	3.1%

Source: U.S. Census Bureau, 2006-2008 American Community Survey
Land Area courtesy of Wikipedia.org

Table 14 shows the growth in daily person trips by trip purpose from 2005 - 2030. Home-based trips are those trips that have the home of a trip maker as either the trip origin or destination. A trip to work from home or a trip home from shopping would be an example of a home-based trip. Non-home based trips are those trips that don't start or end at home. Commercial/truck trips represent deliveries of goods associated with employment. All of these trips represent internal trips which have both an origin and destination within the Lehigh Valley. In contrast, external trips are those trips having at least an origin or destination outside of the Lehigh Valley. An example would be a person who lives in the Lehigh Valley but commutes to New Jersey for work. While the total number of internal trips will continue to grow between 2005 and 2030, its share of the total number of trips will drop from 83.8% in 2005 to 81.3% in 2030 due to external trip making increasing in absolute value as well as percentage share of total trips. The shift toward greater external trip making means increased travel between the Lehigh Valley

and external areas like New Jersey and has implications for major travel routes in the Lehigh Valley. I-78, Route 22, and Route 33, to name a few, will experience increasing congestion as a result.

TABLE 14
Daily Person Trips By Trip Purpose

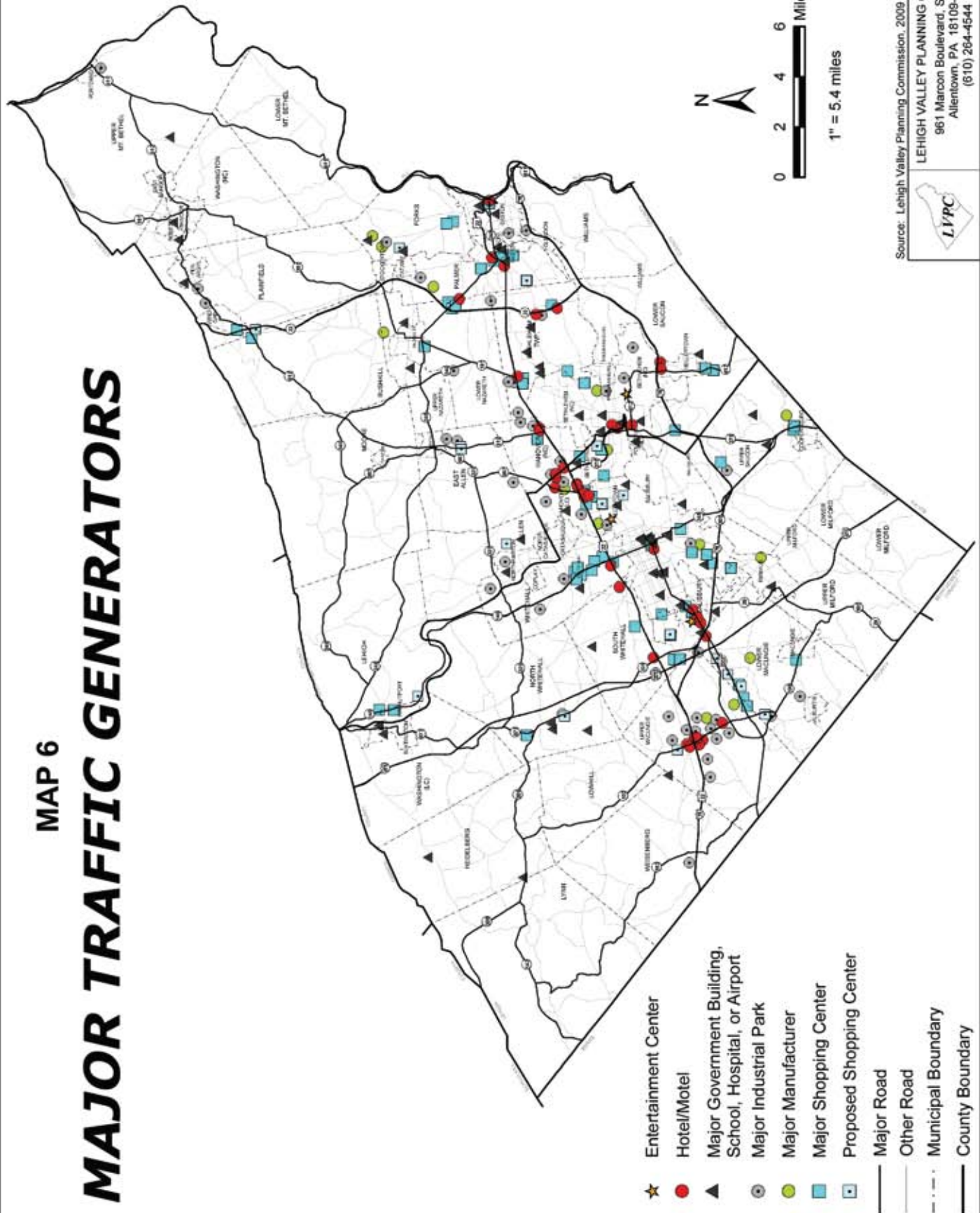
Lehigh Valley Region	Trip Purpose					
	Internal Trips				External Trips	Grand Total
	Home Based	Non-Home Based	Commercial/Truck	Total	Total	
2005 Trips	1,145,075	268,708	224,434	1,638,217 (83.8%)	316,438 (16.2%)	1,954,655 (100%)
2030 Trips	1,426,219	311,790	261,585	1,999,594 (81.3%)	458,805 (18.7%)	2,458,399 (100%)
2005 - 2030 Change	281,144	43,082	37,151	361,377	142,367	503,744
% Change	24.6%	16.0%	16.6%	22.1%	45.0%	25.8%

Source: LVPC

MAJOR TRAFFIC GENERATORS

Map 6 shows major traffic generators in the Lehigh Valley. Included are hotels and motels, major government buildings, schools, hospitals, airports, major industrial parks, major manufacturing and shopping centers, and proposed shopping centers. The distribution of generators is generally oriented east-west along the Route 22 corridor with a high concentration in the part of the corridor from Airport Road west to Route 100. This distribution can be expected to migrate further to the east and west as development pressure rebounds with an improving economic climate. This is illustrated by the new development as far west as the New Smithville Interchange at I-78 and Route 863. To a much lesser degree a number of traffic generators have located in several north-south corridors. The Route 309 corridor through North and South Whitehall townships has experienced development of a major supermarket and shopping center. In Upper Saucon Township major traffic generators are located along the Route 309 corridor. These include several shopping centers, schools, and an office park. The office park has recently added employers such as Olympus, Penn State University Lehigh Valley Campus (formerly Lehigh Valley College), and a lifestyle shopping center. Lehigh Valley Hospital Center (Cedar Crest Campus) undertook a 500,000 square foot expansion which drew increased traffic to the campus. Warehousing pressures in Upper Macungie Township also generate traffic. Despite a lackluster economy, multiple development plan submissions were made by developers in Lower Macungie Twp. along the Hamilton Blvd. (SR 6222) corridor prior to the Township adopting an Act 209 Impact Fee Ordinance. The Lehigh Valley IronPigs, the Philadelphia Phillies top minor league affiliate, now play baseball at Coca-Cola Park in Allentown. Dorney Park in South Whitehall Twp. generates significant traffic during the summer months. In Northampton County, major traffic generators are also located in areas with easy access to the major highway network. The Route 33/Route 248 interchange in Lower Nazareth Township is one example. A regional shopping center now exists at this location and development plans call for the construction of a major hospital. Lehigh Valley Industrial Park VI, located at the intersection of Route 33 and William Penn Highway in Bethlehem Township, is mostly built out. LVIP VII, located in the City of Bethlehem on the former Bethlehem Steel site, is under development and will comprise of about 1,000 acres. The Sands Casino opened in May 2009 on former Bethlehem Steel property. Also, Saint Luke's Hospital medical center is planned for the Route 33/Freemansburg Avenue interchange.

MAP 6 MAJOR TRAFFIC GENERATORS



Traffic generators such as government buildings, major industrial parks, and schools produce trips in defined periods of time during the workday. Hospitals, airports, and shopping centers create trips that are more evenly distributed throughout the course of a day. Special event traffic generators, such as the Musikfest, Allentown Fair and other community fairs are seasonal in nature and may generate significant traffic volumes for a several day duration.

TRIP GENERATION

The amount of traffic generated is highly dependent upon the type of land use. Table 15 shows the variety of average trip generation rates for different kinds of land use. Among the various land uses listed, convenience markets with gasoline pumps generate the most trips followed by convenience markets without gas pumps. However, these two land uses have a lesser impact on traffic than other uses since a significant portion of trips are pass-by, that is trips attracted from passing traffic on adjacent streets. Similarly, fast food restaurants and banks with drive-through windows generate significant vehicle trips, a large portion of which is also of the pass-by variety. Among office-type land uses, government office buildings generate the most trips followed by medical-dental office buildings, general office buildings, research and development centers, and corporate headquarters. Among the residential land uses, single family detached housing generates more trips than apartments.

TRIP DISTRIBUTION

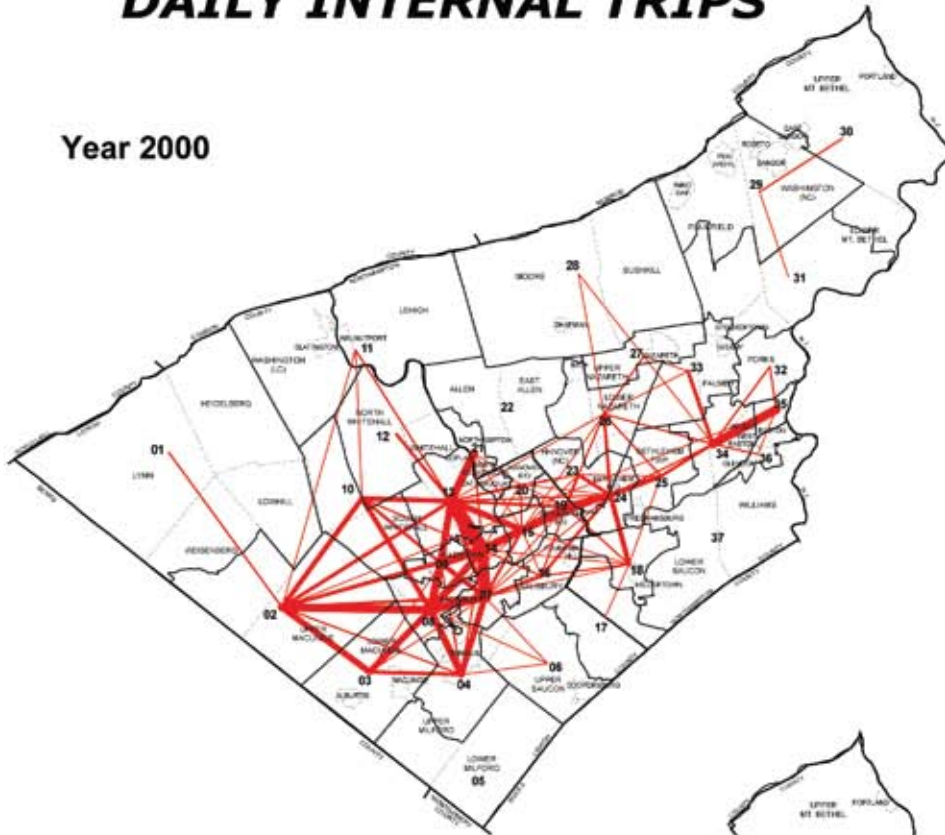
As noted in the previous section, trips are generated or attracted at specific land uses at specific locations. Transportation planners must deal with the movement of people between locations. To do this, travel models include trip distribution equations which measure and predict such movements between different parts of the region. To illustrate such movements the region has been divided into 37 traffic districts as shown on Map 7. The lines connecting the districts measure the volume of trips between the districts. They do not represent specific roads. A large portion of daily travel occurs within the urbanized area along the east-west core of the region extending from Western Lehigh County to Easton. The most intense area of trip making occurs between districts 13, 14 and 7 (South Whitehall/Whitehall Township region to Allentown to south Allentown). Daily trip-making is also heavy from district 14 to 9 (central Allentown to Allentown's west end). Both maps show growth in Western Lehigh County and the Route 33 corridor in Northampton County. Many trips will still be made in the Allentown, Bethlehem core area in 2030. In the past when land uses were more concentrated than they are today, there was much more travel within traffic districts than between travel districts. As Map 7 shows, trip distribution is moving outward from the cities to more rural parts of the region located to the north and south of Allentown and Bethlehem.

TRIP ASSIGNMENT

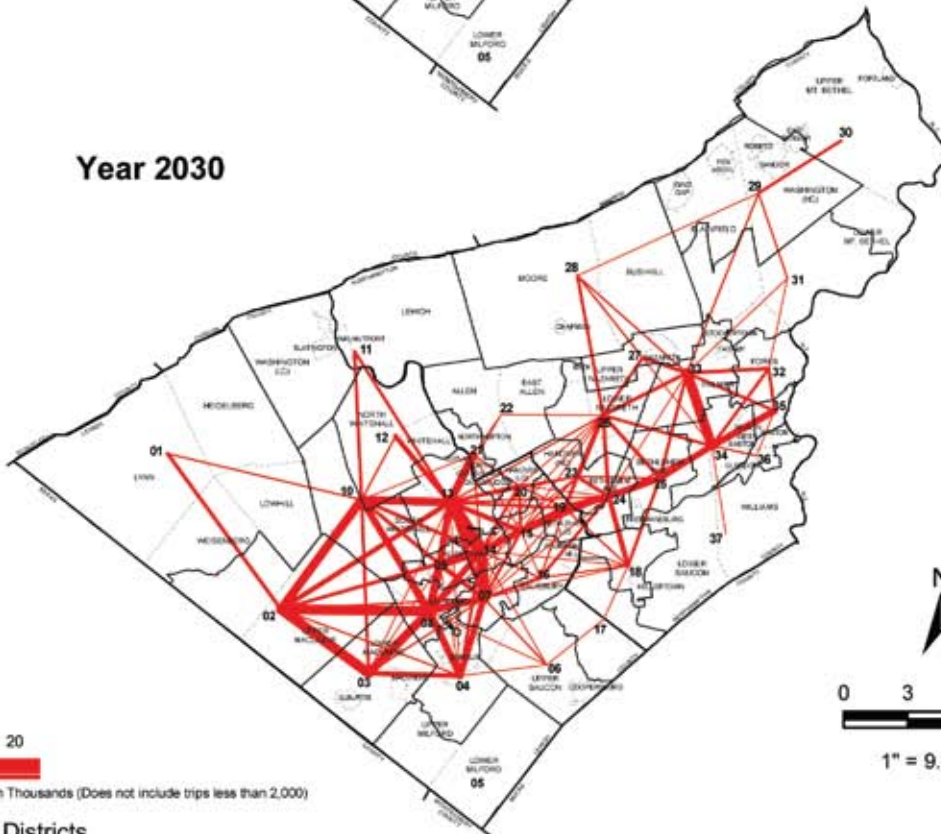
The next step in predicting how people will choose to make their trips is trip assignment. Trip assignment considers the available network (e.g. highway, transit) and determines how the user will get to the destination using the network, typically dependent upon the shortest time path between an origin and destination. Trip assignment determines the amount of activity on specific roadways and along specific bus routes. The physical characteristics of the network (e.g. available highway capacity, frequency of bus service along a fixed route) will impact route selections made by the user.

MAP 7 **MAJOR TRAVEL DISTRIBUTION** **DAILY INTERNAL TRIPS**

Year 2000

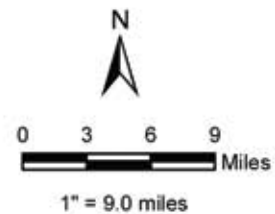


Year 2030



5 10 15 20
 Number of Vehicle Trips in Thousands (Does not include trips less than 2,000)

- Traffic Districts
- - - Municipal Boundary
- County Boundary



Source: Lehigh Valley Planning Commission, 2005



LEHIGH VALLEY PLANNING COMMISSION
 961 Marcon Boulevard, Suite 310
 Allentown, PA 18109-9397
 (610) 264-4544

TABLE 15 TRIP GENERATION RATES FOR VARIOUS LAND USES		
<u>Land Use</u>	<u>Trips/Weekday/Independent Variable</u>	<u>Independent Variable</u>
Residential		
Single Family Detached	9.57	D.U.
Apartment	6.65	D.U.
Industrial		
General Light Industrial	6.97	1000 Sq.Ft.
Industrial Park	6.96	1000 Sq.Ft.
Manufacturing Facilities	3.82	1000 Sq.Ft.
Warehousing	3.56	1000 Sq.Ft.
Institutional		
University/College	2.38	student
High School	1.71	student
Medical		
Nursing Home	6.55	employee
Hospital	5.20	employee
Office		
Government Office Building	68.93	1000 Sq. Ft.
Medical-Dental Office Building	36.13	1000 Sq. Ft.
General Office Building	11.01	1000 Sq. Ft.
Research & Development Center	8.11	1000 Sq. Ft.
Corporate Headquarters Building	7.98	1000 Sq. Ft.
Retail*		
Convenience Market with Gas Pumps	845.60	1000 Sq. Ft.
Convenience Market	737.99	1000 Sq. Ft.
Supermarket	102.24	1000 Sq. Ft.
Free-Standing Discount Superstore	53.13	1000 Sq. Ft.
Electronics Superstore	45.04	1000 Sq. Ft.
Specialty Retail Center	44.32	1000 Sq. Ft.
Home Improvement Superstore	29.80	1000 Sq. Ft.
Pharmacy/Drugstore without Drive-Through Window	90.06	1000 Sq. Ft.
Shopping Center	42.92	1000 Sq. Ft.
Discount Club	41.80	1000 Sq. Ft.
Furniture Store	5.06	1000 Sq. Ft.
Services		
Drive-in Bank	148.15	1000 Sq. Ft.
Fast-Food Restaurant with Drive-Through Window	496.12	1000 Sq. Ft.
High-Turnover Sit-Down Restaurant	127.15	1000 Sq. Ft.
Quality Restaurant	89.95	1000 Sq. Ft.
* Certain retail establishments, particularly banks, service stations, and convenience markets, generate a significant amount of pass-by trips (trips are attracted from passing traffic on nearby streets).		

Source: *Institute of Transportation Engineers Trip Generation Manual, 8th Edition, 2008.*

SUMMARY OF FINDINGS

1. Vehicle miles of travel nationally continues to grow but at a lesser rate than early in the decade. The Lehigh Valley continues to grow economically. This growth will continue to tax the transportation network.
2. Although 60% of new households were in the urban core, households are becoming more dispersed. Employment growth remains highly concentrated in the Route 22 corridor. The Route 33 corridor in Northampton County and the Route 222/100 corridor in Lehigh County will be important employment centers in the next twenty years. The daily work trips will continue to have a great impact on traffic problems, particularly during the morning and afternoon peak hours.
3. Low income concentrations are primarily in the cities of Allentown, Bethlehem and Easton. Access of low income residents to suburban employment is a transportation issue.
4. Transit ridership in the Lehigh Valley has increased 69% since 1997, to nearly 20,000 trips on an average weekday. Metro Plus ridership has grown 116% since 1990. Transit ridership increases can be realized through increased service levels or modifications which respond to new travel patterns.
5. Urban growth is spreading into rural parts of the Lehigh Valley. With a few exceptions, municipal zoning is amended to accommodate urban uses. Pennsylvania planning laws do not convey authority to county and regional planning agencies to manage growth in the region. Therefore, the land use component of this plan is primarily based on forecasts of development trends and municipal zoning.

CHAPTER 3

TRANSPORTATION INFRASTRUCTURE IN THE LEHIGH VALLEY

Travel infrastructure within the Lehigh Valley includes highway, transit, rail freight, air, bicycling, and pedestrian facilities. The highway network is by far the dominant system of travel infrastructure. It serves passenger vehicles, trucks, and public bus transportation needs in the region. In 2008, there were 13,390,000 daily vehicle miles of travel on the regional highway network. In 2030, this figure is anticipated to grow to 19,600,000. According to the 2006-2008 American Communities Survey, work trips averaged 24 minutes for Lehigh County residents and 27 minutes for Northampton County residents.

Compared with the automobile, public bus transportation is limited in the number of persons it impacts. Yet it has a significant impact on the lives of people who cannot drive or do not own a car. The bus system handles the transportation needs of lower income groups through the Metro fixed route bus system, and the elderly/disabled through the Metro Plus demand responsive bus system. These systems provide transportation for employment, medical, vocational, and recreational purposes. Public transportation is playing an increased role since the ADA legislation was passed. Greater numbers of disabled persons are aware of the availability of public transportation services to meet their needs. This has resulted in significant annual Metro Plus ridership increases. Non-medical trips are growing as people realize greater independence resulting from the provision of this service.

Rail service is limited to the movement of freight. Norfolk Southern acquired trackage in the Lehigh Valley and northeastern U.S. with the breakup of Conrail. Additionally, the conversion of a portion of the former Bethlehem Steel plant to an intermodal terminal resulted in increased rail freight service in the region. Norfolk Southern estimates 200,000 freight containers annually could eventually move through the terminal. Economically, the Lehigh Valley and northeastern U.S. stand to benefit from the impact of the intermodal facility and rail service.

The presence of air transportation in the region has an impact on economic, social, and recreational issues. Business and corporate aviation are becoming increasingly important users of airport facilities. Both Lehigh Valley International Airport (LVIA) and Queen City Airport are utilized for business and corporate travel. A system of good general aviation airports is important to accommodate some of the needs of corporate aviation to meet regional economic growth demands. Commercial flights occur only out of LVIA. Direct flights are offered to destinations with numerous other destinations accessible through transfers. Easton Airport, Slatington Airport, and Flying M Aerodrome function as general aviation facilities catering to small business and recreational flights.

Based upon the 2006 – 2008 American Community Survey, bicycle and pedestrian travel in the region constitutes 0.2% and 2.7%, respectively, of Lehigh Valley commuter trips. These trips are limited mostly to the cities of Allentown, Bethlehem, and Easton and their immediate surrounding environs. Biking is an important form of recreation and sport entertainment in the Lehigh Valley but accounts for very few non-recreational trips. The LVPC has published guides to recreation riding in the Valley; numerous municipalities have developed bike trails; the Lehigh Valley Velodrome is an internationally known site for bike racing.

PUBLIC PERCEPTION OF TRANSPORTATION IN THE LEHIGH VALLEY

In February 2010, the LVPC conducted a sample survey of registered voters to gauge public opinion on issues such as land use, growth, and transportation.

When asked what the most significant consequences of growth have been since the year 2000, nearly 79% of respondents stated increased traffic congestion. This was the number one response, followed by the loss of open space mentioned by 60% of respondents. This same question was asked in a 1999 public opinion survey and revealed that increased traffic congestion ranked first, although at a significantly lesser rate (39%).

When asked to rank the most important transportation improvements in the Lehigh Valley, improving inter-city commuter services by expanding bus service or building commuter rail facilities between the Lehigh Valley, New Jersey, New York and Philadelphia received the most first place votes. This was followed by widen and improve existing roadways to reduce congestion and build new roads to reduce congestion. The public recognizes that it is necessary to provide improvements that address congestion relief.

When asked to rank the best long-term options for Route 22, adding more travel lanes received the most first place votes followed by building a by-pass around the congested portions of Route 22 and improving interchanges.

When asked what they like most about living in the Lehigh Valley, the top three responses were: the close proximity to New York City, Philadelphia, and shore points; convenience and good access to many amenities; diversity, variety, and balance between city and rural.

Traffic congestion, crime and drug problems, and too much development and sprawl were the top three responses as to what respondents liked least about living in the Lehigh Valley.

HIGHWAYS

Highways are classified according to their function as depicted in Map 8. The classifications consist of freeways and expressways, arterials, collectors (urban, rural major, and minor), and local streets. Each of these facility types serves a mobility function, land access function, or some combination of both. Freeways and expressways are developed primarily for mobility. Access on these roads is limited to interchanges. The Lehigh Valley is served by six expressways, two of which are Interstate highways. The Interstate roads are I-78 and I-476. Other expressways are Route 22, Route 33, a portion of Route 309, and a portion of Route 378 through the City of Bethlehem. Traffic exiting freeways and expressways is transferred to arterials — roadways that serve primarily a through-traffic function and provide access to collectors and local roads. Examples of principal arterial roads in the region include Route 309, Route 145, Route 222, Route 29, Route 248, and Route 378. Still more roads are identified as minor arterials. Arterial traffic is transferred to collectors — roadways that provide both access and traffic circulation service within residential, commercial, and industrial areas. Some examples of collectors include Oakland Road in Bethlehem Township and Jacksonville Road in Hanover Township, Northampton County. In Lehigh County, Walbert Avenue in South Whitehall Township and Fullerton

Avenue in Whitehall Township constitute collectors. Collector traffic is transferred to local roads that primarily provide access to individual properties.

The Lehigh Valley contains 57 miles of interstate highways, 33 miles of freeways/expressways, 191 miles of principal arterials, 223 miles of minor arterials, 420 miles of major collectors, 106 miles of minor collectors, and 2,986 miles of local roads for a total of 4,018 miles.

The Pennsylvania Mobility Plan, the statewide long-range transportation plan, sets direction for transportation investments through 2030. The Mobility Plan builds upon the previous statewide long-range plan, PennPlan MOVES!, and updates it for the 2006-2030 planning horizon. The Mobility Plan was developed in layers, starting with one broad, overarching vision through increasingly specific goals, objectives, strategies, and nearly 90 actions to reach the vision. The plan lists the following goals and objectives:

- Goal 1:** Move people and goods safely and securely
 - Objective: Reduce the number of fatalities and crashes
 - Objective: Ensure the uninterrupted operation of vital transportation services
- Goal 2:** Improve quality of life by linking transportation, land use, economic development, and environmental stewardship
 - Objective: Direct resources to support economic and community development
 - Objective: Integrate land use and transportation
 - Objective: Preserve natural, historical, and cultural resources
 - Objective: Promote energy conservation
- Goal 3:** Develop and sustain quality transportation infrastructure
 - Objective: Advance a program to achieve desired maintenance cycles
 - Objective: Accelerate the use of innovative construction techniques, better materials, and improved maintenance practices
- Goal 4:** Provide mobility for people, goods, and commerce
 - Objective: Improve connectivity and accessibility throughout the transportation network
 - Objective: Improve transportation system operating efficiency
 - Objective: Improve transportation system reliability
- Goal 5:** Maximize the benefit of transportation investments
 - Objective: Improve transportation investment decision-making
 - Objective: Focus statewide planning and investments on a Core PA Transportation System
 - Objective: Secure funding to preserve Pennsylvania's transportation infrastructure and to make strategic capacity improvements
 - Objective: Improve project delivery to expedite project development and reduce cost

DATA AND ANALYTICAL TOOLS AVAILABLE

Aspects of highway planning such as major investment studies, congested corridor analyses, and evaluation of projects for inclusion into the Long Range Plan are dependent upon various data and analytical

tools. The most important tool for highway planning is the Lehigh Valley regional travel model. It is a computer model of the Lehigh Valley road network that simulates trips based upon socio-economic data inputs. The region is divided into 473 geographical areas or “zones”. Each zone contains current and projected data on a variety of social and economic variables that are used to predict trip generation data. A four step modeling process is used and includes trip generation, trip distribution, mode choice, and trip assignment. Trip generation forecasts the number of trips made. Trip distribution shows the number of trips between traffic zones. Mode choice predicts how the trips will be divided among the available modes of travel (highway, transit, carpool, etc.). Trip assignment predicts the routes the trips will take. The model utilizes an iterative trip assignment process, assigning and reassigning trips to the network until the overall shortest travel time is reached for each trip. Data outputs from the model include highway traffic volumes, highway operating conditions by measuring congestion and level-of-service (LOS), transit ridership, carpooling, vehicle miles traveled, lane miles, and trip orientation.

The travel model was used in the long range study of Route 22 to test the effectiveness of potential solutions to congestion along the corridor. Over 40 transportation alternatives were tested. The model was also used for the American Parkway project where 20 different scenarios were evaluated. For this report, the travel model was used to prioritize congested corridors and also to aid in the prioritization of transportation projects. Demographic data used in the traffic model is periodically updated with the last update occurring in 2007.

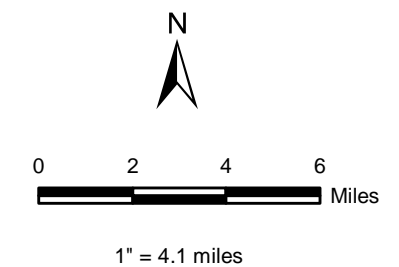
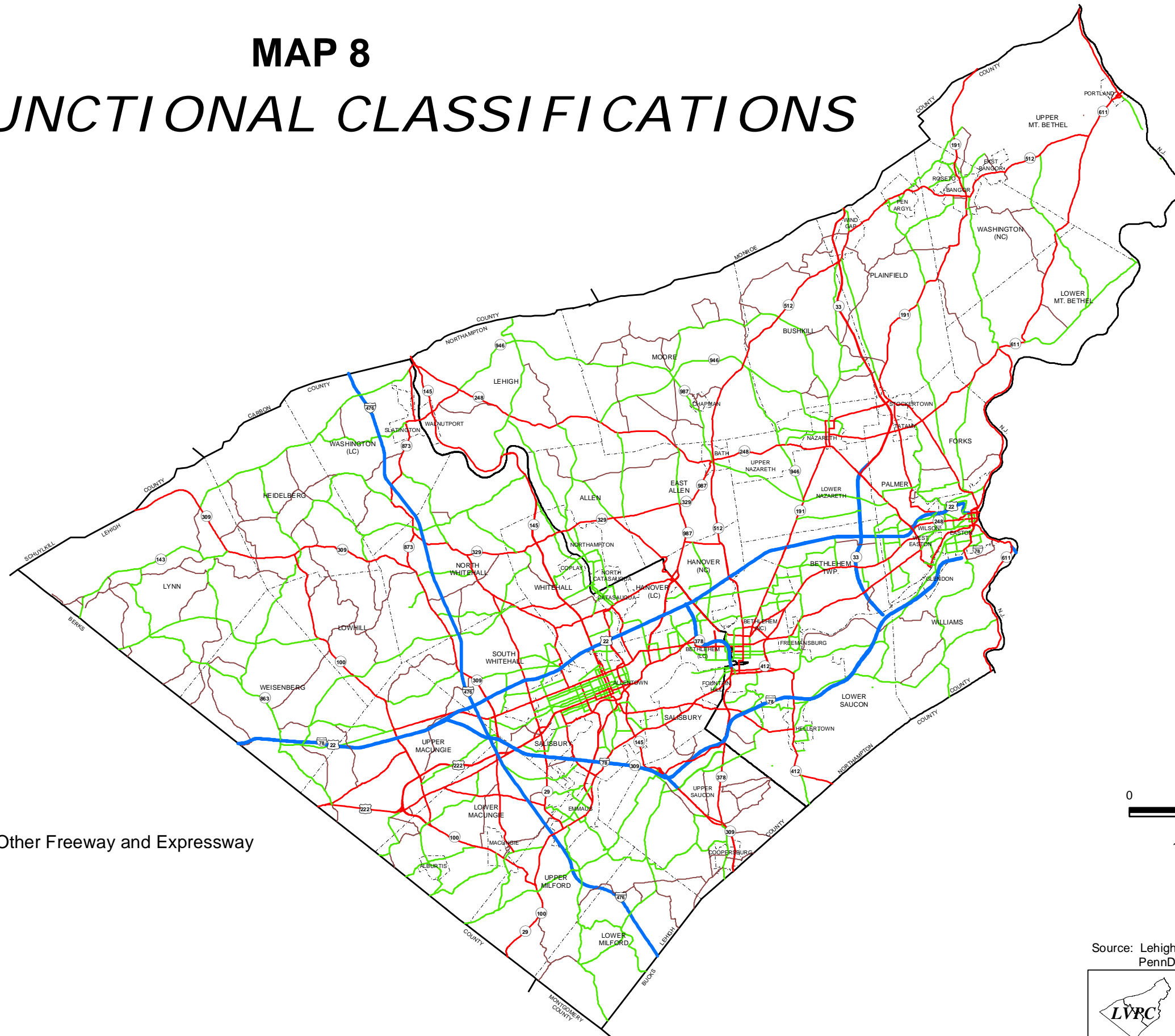
Another tool available for use is the Transportation Geographic Information System (GIS-T). It is a tool used to assist in performing various transportation analyses and consists of multiple layers of PennDOT databases. Some examples of data available are traffic volumes, bridge load limits, bridge ownership, bridge sufficiency ratings, functional classifications of roads, Level Of Service, pavement type, road ownership, road roughness index, and speed limit. The GIS-T has been used most recently to develop the report Traffic Safety in the Lehigh Valley 2004 – 2008 and to respond to various information requests from the public.

The last data resource available is the Highway Performance Monitoring System (HPMS) program. The program consists of two elements, traffic counting and the roadway segment inventory. Annually, about 100 traffic counts are conducted under a contract with PennDOT. The data gathered is used in monitoring traffic flows, determining traffic background growth rates, projecting future traffic volumes, determining road design, determining Federal funding allocations, for conducting air quality conformity determinations, congestion management systems, determining funding priorities for transportation improvement projects, and for validating the regional travel demand forecasting model. The model is currently validated based upon year 2000 traffic count data. The second element involves conducting a roadway segment inventory which involves collecting data on the physical characteristics of the road such as speed limits, percentage of traffic signal green time, number of traffic signals and stop signs, and surface type and condition to name a few. This information is used to measure and monitor the condition, performance, usage, and operating characteristics of the nation’s highways for use by policy decisionmakers and Congress in developing and evaluating Federal-aid highway programs and funding levels.

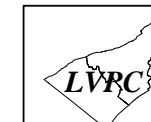
MAP 8

ROAD FUNCTIONAL CLASSIFICATIONS

- Interstate Highway; Other Freeway and Expressway
- Arterial
- Collector
- Local Road
- Municipal Boundary
- County Boundary



Source: Lehigh Valley Planning Commission, 2010;
PennDOT, 2009



LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

HIGHWAY MAINTENANCE

Maintenance of the existing highway network is a top priority item. Federal and state funds are used for maintenance. State funds are allocated at the county level for maintenance based on a statewide formula determined by the Pennsylvania legislature. Only very large maintenance projects come before the Lehigh Valley Transportation Study Technical and Coordinating Committees for programming. The \$70 million 22 Renew project completed in 1999 is an example of such a project. Smaller projects such as surface overlays, pothole patches, etc. are typically planned and programmed by PennDOT outside of the Transportation Improvement Program and long range plan. However, PennDOT is developing an asset management program that will be incorporated into future long range transportation plans and will address maintenance projects.

PennDOT develops its program of priority projects for highway maintenance by using the International Roughness Index (IRI), life expectancy of maintenance improvements, and other inspection techniques. The IRI is used to identify the condition of a roadway by quantifying general roughness. The measure incorporates the characteristics of the roadway deformation and surface deterioration such as surface cracking, pavement separation, potholing, and patching. Lower IRI values translate to better roads. The higher the value, the greater the need for improvement. Locally, IRI values have gone down over the past five years due to an influx of funding from the Smooth Roads Initiative and Act 44. These additional funds were distributed to PennDOT District Offices to address maintenance of rougher roads. PennDOT District 5, which has jurisdiction over Berks, Schuylkill, Carbon, Monroe, Lehigh, and Northampton Counties, has the 3rd highest median IRI values in the state. 234 miles of roads in Lehigh County and 224 miles of roads in Northampton County are classified as either fair or poor and thus will need to be repaved in 3 – 5 years. Based upon a conservative paving cost of \$200,000 per mile, the combined 458 miles of roads translates into a \$91 million need to address pavement surfaces. This information was derived from PennDOT's "State of Engineering District 5-0".

HIGHWAY SAFETY

The LVPC incorporates safety into its planning process through SAFETEA-LU legislation that was signed into federal law in 2005. This legislation included with some important changes in the MPO process, including an added emphasis on improving safety by reducing the number of crashes, fatalities and injuries on roadways. The LVPC has published several reports on traffic safety in the region; the most recent in 2009 titled *Traffic Safety in the Lehigh Valley 2004 to 2008*. The report includes an analysis of crash types (e.g. head-on, run-off-road), crash contributing factors (e.g. aggressive driving) and general recommendations to mitigate crashes. The report analysis shows over the 5-year time period an average of 70 fatalities and 7,949 vehicle crashes per year in the region. The 2008 traffic fatality rate (deaths per hundred million vehicle miles traveled) in Pennsylvania and Lehigh Valley was 1.35 and 1.29, respectively). The state goal was to achieve a rate of 1.00 by 2008, but neither the state nor Lehigh Valley achieved this goal. In summary, the report analysis shows a reduction in crashes, fatalities and injuries for many crash characteristics. Emphasis safety areas continue to be on reducing fatalities, motorcycle crashes, and pedestrian and bicyclist injuries.

As mentioned above the federal SAFETEA-LU legislation expanded emphasis on safety. One of the ways this is established is through the Highway Safety Improvement Program (HSIP) which is a core-funded program to reduce the number of crashes, fatalities and injuries on roadways. HSIP projects are eligible for 100% federal funding and are targeted for highway safety improvement projects on any

public road (state or non-state). The HSIP provides states with the flexibility to target their most critical safety needs. In Pennsylvania, these safety needs are identified in PennDOT's Strategic Highway Safety Plan (SHSP) released in 2009 titled "*drive safe in PA*". The "vital seven" focus areas of the SHSP include reducing aggressive driving, reducing impaired driving (DUI), increasing seat belt usage, providing infrastructure improvements, improving the crash records system and improving motorcycle and mature driver safety. Recognition and support of these focus areas will require cooperation and support from a variety of regional and local stakeholders representing the four "Es" of transportation safety: Education, Enforcement, Engineering, and Emergency Response. The LVPC is focusing on engineering (or infrastructure improvements) to improve safety as part of a regional safety action plan. The plan emphasizes cooperation and support from a variety of stakeholders to improve safety.

The regional safety action plan focuses on identifying severe and high frequency crash locations. Map 9 shows these locations designated as high priority corridors and intersections. High frequency corridors contain crashes at a rate greater than 2.5 times the statewide average rate for a class of roadway and severe corridors contain 4 or more fatal and major injury crashes per mile of roadway. The corridors are distributed fairly evenly between urban and rural areas. Table 16 includes a list of these locations

TABLE 16
HIGH PRIORITY CRASH LOCATIONS

Map #	Name	From	To	Municipality	On TIP
	Lehigh County				
	Corridors				
1	Route 863	Rt. 222	U. Macungie Twp. Line	Upper Macungie Twp.	No
2	Schantz Rd.	Rt. 222	Rt. 863	Upper Macungie Twp.	No
3	Kernsville Rd.	Columbia Blvd.	Roth Rd.	North Whitehall Twp.	No
4	Old Post Rd.	Spring Valley Rd.	Rt. 873	Washington Twp.(LC)/N. Whitehall Twp.	No
5	Mauch Chunk Rd.	Levans Rd.	Old Post Rd.	North Whitehall Twp.	No
6	Route 145	Columbia St.	Rt. 329	Whitehall Twp.	No
7	Hamilton St.	Rt. 222	15th St.	Allentown	No
8	Rt. 29	I-78	Fish Hatchery Rd.	Salisbury Twp.	No
9	Rt. 29	Indian Creek Rd.	Chestnut Street	Emmaus Boro.	Yes
10	Lehigh St.	Union St.	S. 12th St.	Allentown	No
11	Union Blvd./Tilghman St.	N. Plymouth St.	Front St.	Allentown	No
12	Rt. 22	Rt. 378 ramps	Airport Rd.	Hanover Twp. (LC/NC)	No
13	Schoenersville Rd.	Catasauqua Rd.	Airport Rd.	City of Bethlehem/Hanover Twp. (LC)	No
14	Airport Rd.	Grove Rd.	Schoenersville Rd.	Hanover Twp. (LC)	No
15	Rt. 145	Rt. 309	South Pike Ave.	Upper Saucon Twp.	No
	Intersections				
16	Rt. 100/Clausville Rd.			Lowhill Twp.	Yes
17	Rt. 100/Tilghman St.			Upper Macungie Twp.	No
18	Mauch Chunk Rd./Cedar Crest Blvd.			North Whitehall Twp.	No
19	Rt. 309/Saucon Valley Rd.			Upper Saucon Twp.	Yes
20	Rt. 309/Station Ave.			Coopersburg Boro.	No
	Northampton County				
	Corridors				
21	Rt. 145	Alder Dr.	Old Main St.	Lehigh Twp./Walnutport Boro.	No
22	Rt. 248	Walnut Dr.	Mountain View Dr.	Lehigh Twp.	No
23	Rt. 987	Jade Ln.	Rt. 329	East Allen Twp.	No
24	Daniels Rd.	Rt. 248	Bushkill Twp. Line	Upper Nazareth Twp./Bushkill Twp.	No
25	Belvidere Rd.	Richmond Rd.	Mount Pleasant Rd.	Lower Mt. Bethel Twp.	No
26	Butler St.	Peach St.	Freemansburg Ave.	Easton/Wilson Boro.	Yes
27	Center St.	Church St.	Elizabeth Ave.	City of Bethlehem	No
28	Rt. 412	Cherry Ln.	Spruce St.	Hellertown Boro.	No
	Intersections				
29	Route 378/Seidersville Rd.			Lower Saucon Twp.	No
30	Rt. 329/Howertown Rd.			Allen Twp.	No
31	Rt. 248/Rt. 33			Lower Nazareth Twp.	No

Note: Locations are not listed in priority order

Source: PennDOT BHSTE, LVPC.

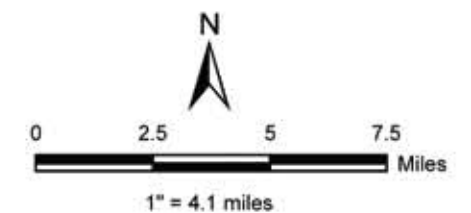
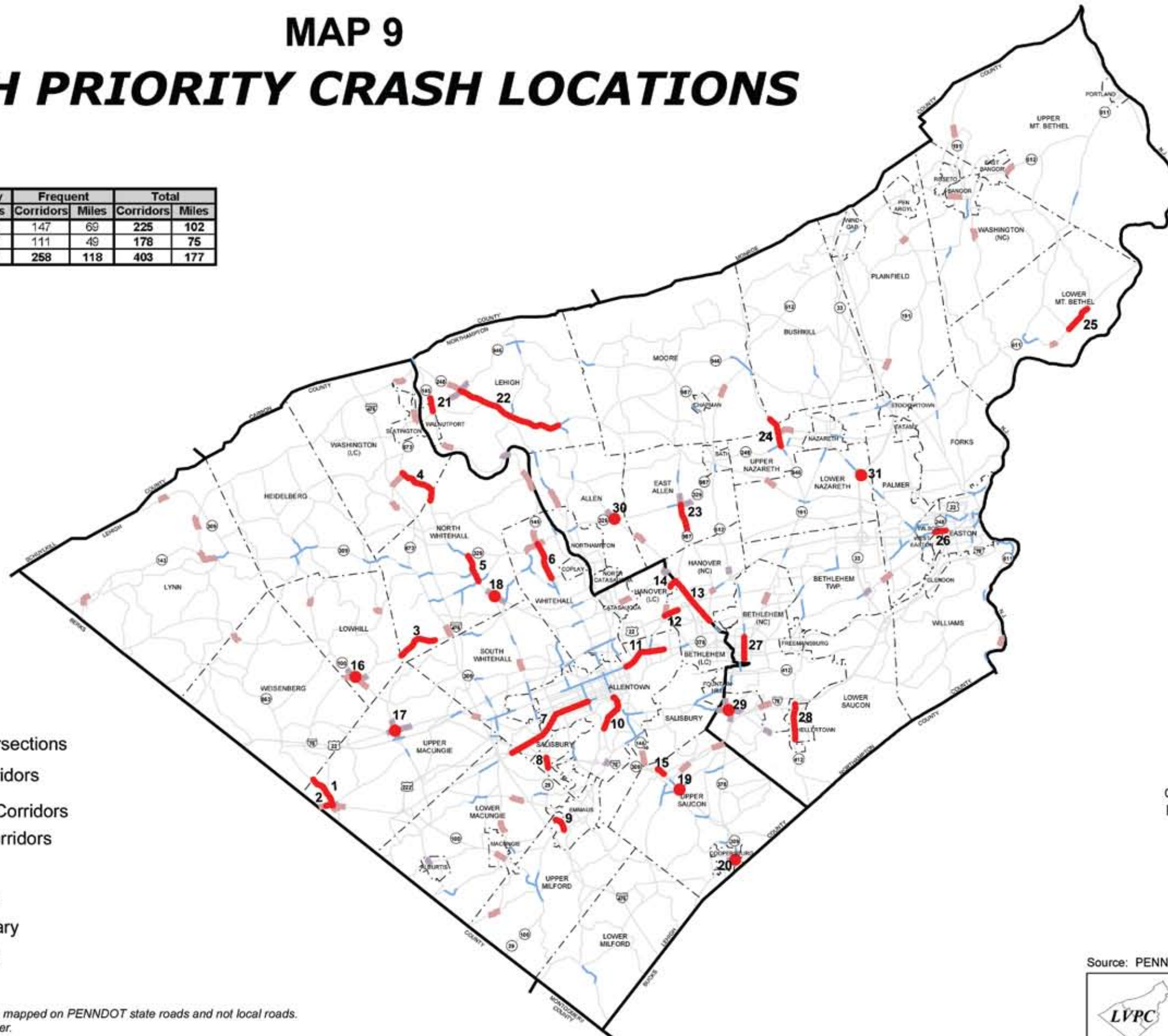
MAP 9

HIGH PRIORITY CRASH LOCATIONS

County	Multiple Injury		Frequent		Total	
	Corridors	Miles	Corridors	Miles	Corridors	Miles
Lehigh	78	33	147	69	225	102
Northampton	67	26	111	49	178	75
Total	145	59	258	118	403	177

- High Priority Intersections
- High Priority Corridors
- High Frequency Corridors
- Multiple Injury Corridors
- PennDOT Roads
- - - Municipal Boundary
- County Boundary

Note: Crash corridors are only available to be mapped on PENNDOT state roads and not local roads.
Locations are not labeled in priority order.



Source: PENNDOT BHSTE, January 2004 - December 2008, LVPC



LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

based on PennDOT data used in the plan. The plan consists of an implementation component that focuses on working with PennDOT and other safety professionals in the region to identify and prioritize safety issues and to conduct Roadway Safety Audits and other safety studies for recommending safety improvements. These safety studies serve as a proactive approach in identifying and prioritizing safety needs in the region.

In addition to large scale engineering improvements using HSIP funding, PennDOT has been very successful at implementing low-cost safety improvements. Examples of improvements include curve warning signs, tree cutting and installing anti-skid treatments. These improvements are characterized by high benefit-cost ratios and short implementation times.

HIGHWAY CONGESTION

Although congestion in the Lehigh Valley is becoming more widespread, it is generally short in duration. It occurs primarily during the morning (7:30 to 8:30 a.m.) and evening peaks (5:00 to 6:00 p.m.). Congestion and traffic delays on major highways such as Route 22 and I-78 are increased by incidents (i.e. crashes, police activity, motorists in need of assistance). Lehigh Valley congestion typically is also associated with intersection delay, particularly in the rapidly growing suburban areas. Intersections in suburban areas are the primary areas of recurring congestion. Many intersections prove difficult to improve due to the presence of environmental or cultural resources.

LVTS defines congestion as Level of Service (LOS) “D” or worse. LOS is a value that reflects driver comfort. It ranges from “A” (best) to “F” (worst). Table 17 shows volume to capacity relationships and operating conditions for various levels of service. A volume/capacity ratio is a measure of the volume of traffic carried on a road segment divided by its capacity.

TABLE 17
THE CONCEPT OF LEVEL OF SERVICE (LOS)

Level of Service	Volume/Capacity Ratio	Operating Condition
A	0.00-0.50	Free Flow
B	0.51-0.70	Free Flow
C	0.70-0.80	Stable Flow, Reduced Maneuverability
D	0.81-0.90	Stable Flow, Reduced Speed, Reduced Maneuverability
E	0.91-1.00	At Capacity, Flow Disruption, Some Queueing
F	Greater than 1.00	Fully Congested, Flow Breakdown

Source: Garmen Associates, Lehigh Valley Travel Model

The analysis of congestion in the Lehigh Valley is done by LVPC as part of the regional Congestion Management Process (CMP). Thirteen corridors have been identified as eligible for inclusion in CMP. Each corridor was required to be at least a mile long and have an average LOS of “D” or worse, have a functional classification of at least a minor arterial, be located within the area recommended for urban development in the LVPC’s regional comprehensive plan, and not have had publicly-funded capacity improvements over the last 20 years. This last requirement was instituted because LVTS did not want to revisit recently improved corridors before addressing other congestion needs. Future congestion conditions were modeled assuming that the projects in the *Transportation Improvement Program* would be built. Corridors were prioritized using a rating system, approved by LVTS, that takes into account future LOS, future traffic volume, the current crash rate as compared to the statewide crash rate for that facility type, and corridor length. Table 18 lists the 13 corridors in priority order (see Map 10 for locations).

TABLE 18
LEHIGH VALLEY CONGESTED CORRIDORS — 2030

Map #	Corridor Name
1	Route 22 (I-78 to Route 33)
2	Cedar Crest Blvd. (Route 22 to Chestnut St.)
3	I-78 (Route 22 to Route 100)
4	I-78 (Route 309 to Route 33)
5	Rt. 309 (Shankweiler Rd. to Walbert Ave.)
6	Lehigh St./E. Harrison St. (31st St. to 5th St.)
7	25th St. (Newburg Rd. to Freemansburg Ave.)
8	Route 191 (Route 22 to Newburg Rd.)
9	Route 378 (Seidersville Rd. to Center Valley Parkway)
10	Rt. 100 (Lowhill Twp. line to Schantz Rd.)
11	American Parkway/S. 4th St./Basin St. (Gordon St. to I-78)
12	Broadway/E. 4th St. (Susquehanna St. to Fillmore St.)
13	Morgan Hill Rd./Phila Rd./Saint John St./Rt. 611 (I-78 to vicinity of Paxinosa Ave.)

Source: LVPC Regional Travel Model.

The congested corridors identified largely consist of roadways extending from the urban core to the employment areas located in the suburbs. Little congestion exists in the downtown areas. This is a major change from thirty and forty years ago. Movement of commercial and industrial land uses from the downtowns to the suburbs have resulted in a similar shift in congestion.

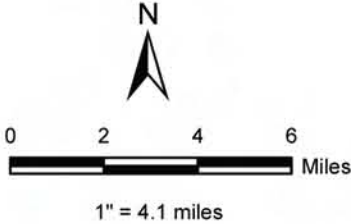
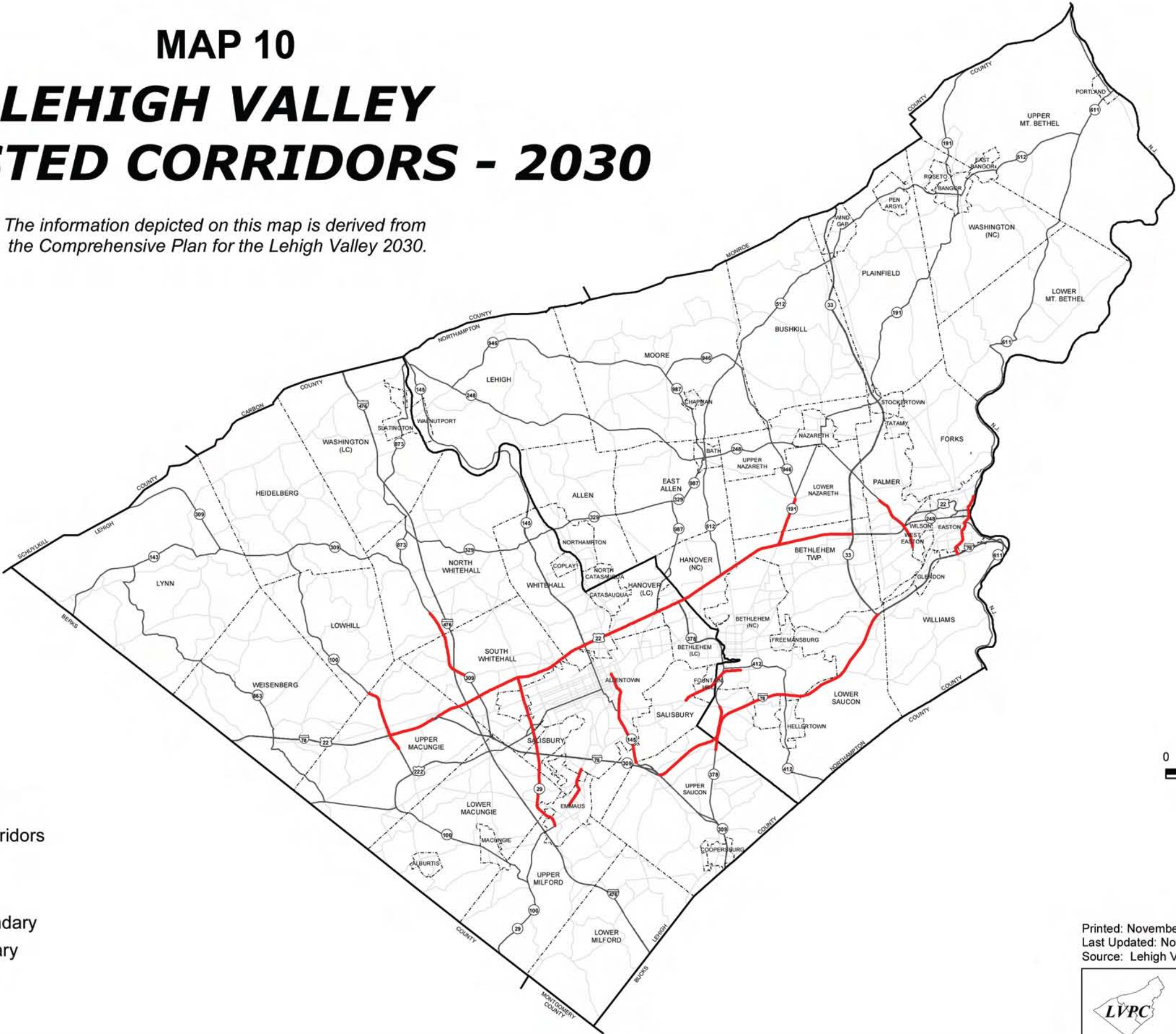
The CMP sets planning priorities for the congested corridors. Route 22 remains a top priority corridor despite fiscal constraints responsible for the project’s downsizing. It’s status as the Lehigh Valley’s “Main Street” requires that improvements be made to mitigate the congestion that occurs daily. Route 22 provides access to the three cities, major employers, major shopping areas and medical facilities. Not addressing Route 22 congestion will have a significant negative economic impact on the Lehigh Valley over the life of this plan.

Other corridors identified under the CMP may not have the impact on the regional level of a Route 22 but are important locally for providing access (e.g. Cedar Crest Boulevard to Lehigh Valley Hospital


MAP 10 LEHIGH VALLEY CONGESTED CORRIDORS - 2030

The information depicted on this map is derived from the Comprehensive Plan for the Lehigh Valley 2030.

-  Congested Corridors
-  Major Roads
-  Other Roads
-  Municipal Boundary
-  County Boundary



Printed: November 18, 2008
 Last Updated: November 18, 2008
 Source: Lehigh Valley Planning Commission, 2003



LEHIGH VALLEY PLANNING COMMISSION

961 Marcon Boulevard, Suite 310
 Allentown, PA 18109-9397
 (610) 264-4544

Center) and improving safety (e.g. I-78 corridors). For the purposes of the long range transportation plan, further studies must take place on these corridors to identify implementable solutions.

PennDOT's Highway Occupancy Permit (HOP) program is a successful program at providing relief of congestion caused by land development. If a land use requires access to a state-owned road, an HOP must be acquired. Under this program, developers are required to mitigate the impact of their development by providing roadway improvements. Most highway improvements made around major retail facilities and office buildings are funded privately. Lehigh Valley examples include improvements at I-78/Cedar Crest Boulevard interchange (Lehigh Valley Hospital Center) and Route 33/Route 248 interchange (Northampton Crossings and Wegmans).

HIGHWAY EFFICIENCY

To improve highway efficiency LVTS/LVPC has attempted to implement various Transportation Demand Management (TDM) strategies over the past three decades. Three rideshare programs were implemented. The first two programs (1974 and 1979) were instituted in conjunction with Lehigh Valley businesses. Both programs were implemented at a time when oil prices were increasing significantly and supply was in question. Even with those circumstances, the experience in both cases was disappointing at best. The 1974-1975 effort resulted in only 23 individuals that might have joined or formed car pools. The 1979 program, in which the LVPC assisted 17 major Lehigh Valley employers in setting up car pool programs, was somewhat more successful, mainly due to carpooling programs at Air Products and Bethlehem Steel. Of the 913 carpools formed, 767 were at these companies. Though it might seem that this would have a significant impact on travel, in fact it did not. The LVPC estimated a 0.8% reduction in work-related vehicular miles traveled and a 0.2% reduction in hydrocarbon emissions. A 1982 follow-up survey found that the programs were reduced or eliminated. Commuters had adjusted to higher fuel costs and resumed driving alone. The 1984 program was available to the public and advertised on billboards along major highways. It was implemented at a time when construction on Route 22 and impending construction on Route 309 (construction of I-78) would have a serious impact on highway performance in the Lehigh Valley. The program was suspended in 1986. Approximately 30 people participated. Most participants had a trip end outside the Lehigh Valley such as New Jersey, New York, Philadelphia and Harrisburg.

More recently, the higher gasoline prices of the late 2000s did little to spark interest in formal rideshare programs within the Lehigh Valley. The best prospects for ridesharing in the Lehigh Valley involve long daily trips to destinations outside of the Lehigh Valley such as New Jersey, New York, Philadelphia and Harrisburg. Indeed the popularity of the Hellertown Park and Ride facility supports this observation. The Hellertown facility serves as a bus stop for interstate bus traffic and as a staging area for people who carpool to work in New Jersey and New York. The facility receives heavy use on a daily basis. PennDOT intends to expand it from 100 parking spaces to about 260. A fall 2009 site visit revealed 138 vehicles using this lot. A second park and ride facility is located at the intersection of William Penn Highway and Route 33. It too serves New Jersey and New York commuters. It is so heavily used that capacity will be increased by about 1000 spaces from 220. A fall 2009 site visit to this lot showed 263 vehicles present. A 132-space park and ride lot associated with the Route 222 Corridor Improvements was opened in early 2009. 99 vehicles were using the lot during a fall 2009 site visit.

Other TDM strategies have also been attempted. In 1983, a park and ride lot was sited at a church along Route 873, which carries LANTA service from Allentown to Slatington. The purpose of the park and ride lot was to intercept workers from Carbon County going to Allentown and transferring that trip to public transportation. No one used the service. In 1989, the LVPC report *Staggered Work Hours – An Evaluation of Peak Hour Travel Reduction in the A.B.E. Airport/LVIP Area* (LVPC, June 1989) concluded that staggering work hours of a few major employers in LVIP III would temporarily reduce the need for improvements at a number of key intersections in the study area. Discussions with those employers proved fruitless. The findings were presented to five employers and although they agreed with the findings, they expressed little interest in implementing a staggered work hour program. Problems such as labor union approval, coordination with other departments and customer service commitments were cited as reasons why staggered work hours were not adopted.

Most past TDM projects in the Lehigh Valley have been unsuccessful. Reasons for this are varied, but a few circumstances in the Lehigh Valley almost certainly address the reasons for these failures. First, according to the 2006 – 2008 American Community Survey, the average commute time in Lehigh County was 24 minutes while Northampton County was 27 minutes. People don't park and ride for short commutes. Second, development patterns in the Lehigh Valley are not dense enough to support many of these strategies. Third, due to the Lehigh Valley air quality non-attainment status, many strategies that are mandatory in areas with worse air quality are voluntary in the Lehigh Valley.

Intelligent Transportation Systems (ITS) strategies represent a technology-based approach to increasing efficiency on existing networks. Much of the basis for this approach focuses on real time information to the motorist. ITS strategies include variable message signs, queue detection, ramp metering, highway advisory radio, etc. An ITS early development study for the Lehigh Valley was adopted by LVTS in February 2000. Example components of the recommended system include placement of additional variable message signs (VMS) on limited access highways, numerous queue detectors, and ramp meters. These strategies were used successfully during the maintenance of traffic for the 22/Renew project, a rehabilitation project which ran from the Lehigh River Bridge to Route 191. An ITS architecture plan was adopted by LVTS in April 2005. Components of the plan that are currently operational include: freeway service patrol, variable message signs, closed circuit TV monitors, and an operations center at the PennDOT District offices. It is expected that these other ITS projects will be continuously monitored and expanded as needed in the future.

LVTS adopted PennDOT's Regional Operations Plan (ROP) during the summer of 2007. The plan identifies, defines, and prioritizes regional projects that focus on transportation infrastructure operations. The plan is a guide for operational activity and interaction between PennDOT and MPO/RPOs. Projects identified in the plan will feed the long range plan and Transportation Improvement Program. The top three projects identified in the ROP in District 5 are:

- Identify ITS Technology Gaps; Deploy New Equipment
- Develop/Update Incident Management Plans & Procedures
- Explore Expanded Use of Freeway Service Patrols

The Freeway Service Patrol is being expanded using Congestion Mitigation (Air Quality) funds in the short term element of this plan.

MISSING TRANSPORTATION LINKS

The Route 33 extension opened to traffic in January 2002. With the completion of that regional link, the only missing link is the American Parkway Project. This project consists of a 1.5 mile roadway and bridge over the Lehigh River from Front Street to Airport Road. A portion of this project associated with improved access to Agere's (now LSI) new office has been completed. The project will provide quick access to downtown Allentown from Route 22 and help to reduce traffic volumes on Route 22. The improved access should aid redevelopment efforts in the City. Final design is now underway. Construction is expected to begin in late 2011.

HIGHWAYS AND ECONOMIC DEVELOPMENT

Economic development is a major issue in the Lehigh Valley because of the loss of employment in major manufacturing industries since the early 1980s. Although manufacturing employment has been replaced by service and retailing, salary levels in service and retailing are much lower than most of the manufacturing that used to dominate the economy. In 2005 unemployment levels in the region range between 4.5-5.5%. As of November 2009, the unemployment rate for Lehigh County was 9.4% while Northampton County was at 9.1%, according to PA Department of Labor and Industry. Business and governmental agencies are very supportive of private and public efforts to generate jobs.

Economic development interests merge with community development in the cities and many small boroughs. Like many other old manufacturing centers across the country the Lehigh Valley has many abandoned or underused industrial sights from bygone eras. Brownfield redevelopment is an important development issue in the Lehigh Valley, particularly in the three cities and many of the boroughs.

Major transportation projects are almost always linked with economic development. For the past 50 years many jobs have located in industrial parks and on business sites in the Route 22 corridor. Since the 1980s the Route 100/I-78 corridor in western Lehigh County has been a strong development center. The Route 33 link between Route 22 and I-78 in Northampton County is rapidly becoming another center for employment, retailing and services. In a study conducted for the LVPC in 1986 C.E. Maguire, Inc. estimated some 25,000 direct and indirect jobs would be created in the corridor as a result of the completion of Route 33.

Transportation projects cannot be expected to have much economic impact if sewer and water infrastructure are not available, if developable sites do not exist, if good developers are not doing business in the area, or if there are no beneficial geographic attributes that can be enhanced by good transportation. The interstate highway system runs through many parts of the U.S. that are unaffected by its presence because other attributes are not available. Without the Route 33 Extension to Route 22, I-78 would have a minimal economic impact in Northampton County because there is an absence of other infrastructure and good sites in Williams and Lower Saucon Township. The geographic location of the Lehigh Valley with respect to the New York and Philadelphia metropolitan areas and transportation facilities serving these areas is a major factor in the attraction of people and certain businesses to the Lehigh Valley.

Major road improvement projects in the plan that have a direct relationship to economic development are:

1. **The Route 22 Section 400** project involves the widening to six lanes and interchange upgrades from Airport Road to 15th Street.
2. **The American Parkway** project in Allentown will improve access to the downtown areas, the LSI site and provide some congestion relief for Route 22.
3. **The Route 412 project in South Bethlehem** will improve access to the Bethlehem Works and Bethlehem Commerce Center projects on Bethlehem's Southside. These projects involve redevelopment of the Bethlehem Steel brownfields site.

American Recovery and Reinvestment Act (ARRA) funds were utilized most recently to both improve highways and bridges and support economic development through job creation and retention. A number of other projects related to economic development also appear in this plan. Although the projects have not been prioritized by LVTS, they are listed in the plan to take advantage of earmarked funds obtained from Federal and state sources and to account for their potential air quality impacts. If these projects require additional financial resources as they are completed, funding sources other than transportation funds allocated to LVTS will have to be used since these projects have no priority within the MPO's plans and programs.

Economic development is one of a number of justifications for transportation improvement projects. Crash reduction, congestion relief, maintenance improvements and traffic management are other factors important in the transportation planning process. In some instances transportation improvements may be undesirable because of their impacts. Certainly major traffic capacity improvements are undesirable in an area planned for agriculture or natural resource preservation. Emphasis on improvements in urban places rather than rural locations may help to expedite the redevelopment process in urban areas and slow the pace of growth in suburban or rural areas. Transportation improvements can and should relate to the overall development goals of the region as expressed in the regional comprehensive plan. In the Lehigh Valley such a plan was adopted by Lehigh and Northampton Counties in June 2005. A major goal of the LVPC is to coordinate transportation and land use planning in the region.

ACCESS MANAGEMENT

Decisions involving access to the highway network play a major role in the performance of the highway network. As discussed previously, each road in the network has a "function", i.e. mobility, access, or a combination of the two. Generally, roads that provide access (local roads, collector roads) are designed to handle lower speeds than those that provide mobility (arterials, expressways) because turning movements are more frequent. The roads that provide mobility are designed to allow safe traffic movement at higher speeds. Problems occur when numerous driveways are allowed on roads that are designed for mobility. The conflict in purpose usually results in an unsafe road that performs far below standards. Examples of poor access management practices can be found on nearly every arterial with a lot of curb cuts for commercial development. Higher functional class roads, particularly arterials, must be preserved for their traffic carrying capabilities.

Preserving traffic carrying capacity is only one reason for developing an access management program. Research done by the FHWA, the National Highway and Traffic Safety Administration and other state

Departments of Transportation indicates that access management programs can enhance safety, improve roadway efficiencies and protect both private and public investments.

- Access management programs can reduce crashes by up to 50% by decreasing conflicts between transportation system users.
- Capacity can be increased by 23-45%.
- Travel time and delay can be reduced by 40-60%.

In Pennsylvania both PennDOT and local municipalities have responsibility for access management. PennDOT requires that an access permit be acquired by anyone who wishes to access a state road from a driveway or intersection. Local municipalities can control access through their subdivision and zoning regulations. PennDOT's authority includes ensuring that capacity and safety are sufficient in newly created intersections, safety issues as they relate to the adjacent stretches of highway, and drainage issues. However, PennDOT does not have the authority to deny access because a roadway has insufficient capacity (unless it is directly tied to the site of the development). Most of the PennDOT actions deal with access improvements in relationship to the comprehensive plan, increases in traffic, drainage, and design issues. Their powers are not limited to improvements recommended by PennDOT. Municipal powers are in addition to those of PennDOT. Most municipalities are either not aware of their powers or have opted not to use them.

Access management is not working as well as it can or should in Pennsylvania. One reason is that local municipalities are not involved in access management. They rely completely on PennDOT actions through their Highway Occupancy Permits. Fortunately, this situation may change in the coming years. PennDOT has developed a statewide study of access management and a model municipal ordinance. They have also conducted a statewide road show to present it to municipalities. In April 2005 LVPC conducted a workshop on the subject for Lehigh Valley officials. The workshop was taught by Mr. Dane Ismart, a nationally recognized expert on the subject. The LVPC has worked with Bethlehem Township, Plainfield Township and Moore Township to develop local access management regulations, using the PennDOT model and/or other similar models. Hopefully, this will bring effective access management measures to the Lehigh Valley.

LOCAL ROADWAY DESIGN TOOLS AVAILABLE TO MUNICIPALITIES

Most of the local roads built in the past 30 years have been built by developers according to local subdivision ordinance requirements. These roads channel traffic to and from individual lots. Developer involvement in capacity improvements to the collector and arterial roads that connect with local roads is rare. Most collectors and arterials are owned and maintained by PennDOT. Most of the money for improvement of these roads comes from Federal and State sources. There is not enough Federal and State money to deal with all capacity problems generated by local development.

The design of roads within subdivisions focuses on maximizing building opportunities, minimizing improvement costs to the developer, and meeting the technical standards in subdivision ordinances. Rarely does the design characteristics of roads take into account the overall municipal circulation pattern. Street layouts in residential subdivisions are often deliberately designed to discourage traffic circulation. To create the impression of quiet residential streets, subdivision designs have sought to make through travel within subdivisions difficult if not impossible. This is apparent in subdivisions utilizing an abun-

dance of cul-de-sacs where few connections between internal roads exist. These practices usually do not serve the traffic needs of the community. In 1996 the LVPC completed a report entitled “Creating Better Traffic Circulation.” Some of the major recommendations of that report follow.

To address circulation issues, municipalities should develop and implement a local transportation plan that is part of their comprehensive plan. This element should contain pertinent data on existing and future traffic conditions and should identify deficient intersections and road segments to show where improvements are or might be needed. Proposed improvements to alleviate problems should be identified and programmed in a local capital improvement program.

An official map should be used as a land use regulatory tool to create a coordinated network of collector and arterial roads, direct the location of new roads as future development and subdivision activity occurs, and reserve the rights-of-way for needed roads. The official map should depict the rights-of-way for new, extended, or widened roads as set forth in the circulation plan section of the comprehensive plan.

Subdivision and land development ordinances (SALDOs) should be used to improve local traffic circulation. The LVPC’s *Suggested Municipal Subdivision and Land Development Ordinance* has been widely used as a model for municipal SALDOs. It contains the following relevant street design standards:

- Proposed streets should be properly related to the road and highway plans of the state, county, and municipality. Local streets should be designed to provide adequate vehicular access to all lots or parcels and with regard for topographic conditions, projected volumes of traffic, and further subdivision possibilities in the area.
- The street system of a proposed subdivision or land development should be designed to create a hierarchy of street functions which includes arterial, collector, and local streets.
- Proposed local streets should be designed so as to discourage through traffic and excessive speeds. However, the developer should give adequate consideration to provision for the extension and continuation of arterial and collector streets into and from adjoining properties.
- Where it is desirable to provide for street access to adjoining property, streets should be extended by dedication to the boundary of such property. Distances between access points to adjoining property should be based on block length standards set forth in the Subdivision and Land Development Ordinance.
- Where a subdivision abuts or contains an existing or proposed arterial traffic street, the municipality may require marginal access streets, reverse frontage lots, or other such treatment as will provide protection for abutting properties, reduction in the number of intersections with the arterial street, and separation of local and through traffic.

These standards allow municipalities to improve traffic circulation by coordinating the road networks of adjoining properties and allowing the implementation of plans for collector and arterial roads. In addition municipalities should coordinate their circulation plans with those of adjacent municipalities to improve the efficiency of the network. Unfortunately, connectivity has not been a priority issue with Lehigh Valley municipalities.

Finally, transportation impact fees should be used to augment funding for traffic improvements. The collection and use of impact fees was authorized by Act 209 of 1990. This legislation provides a basis for requiring developers to contribute funds for off-site improvements. Off-site improvements include improvements outside the site being developed excluding improvements to roads directly abutting the development site if the development necessitates that improvement. Currently, only a handful of municipalities have adopted impact fee ordinances. Of the 62 municipalities in the Lehigh Valley, only Hanover Township and Bethlehem Township, in Northampton County, and Lower Macungie Township, Upper Macungie Township, Upper Saucon Township, and Whitehall Township in Lehigh County have adopted ordinances. The greatest potential for benefiting from impact fees lies with rapidly developing areas since they are likely to generate significant amounts of revenue. A municipality cannot require off-site improvements as a condition of a land development or subdivision approval without an impact fee ordinance in place.

The impact fee legislation contains numerous provisions making its application cumbersome and difficult for municipalities. The attractiveness of impact fees to municipalities has been reduced by the rules set in the legislation. The legislature should amend this legislation to make it simpler to use by municipalities.

BRIDGES

There are more than 1,000 bridges in the Lehigh Valley. Maintenance of bridges is an ongoing priority at the local, state, and national levels. In some cases, new bridges are important in the Lehigh Valley since many of the highway network bottlenecks occur at river crossings.

Numerous entities own bridges in the Lehigh Valley. The Commonwealth of Pennsylvania, Lehigh County, Northampton County, municipalities, Pennsylvania Turnpike Commission, Delaware River Joint Toll Bridge Commission, and railroads all own bridges in the two counties. Bridges with high traffic volumes in the area include the Route 22 Lehigh River Bridge, Hamilton Street and Tilghman Street bridges in the City of Allentown, Hill-to-Hill, Fahy, and Minsi Trail bridges in the City of Bethlehem, 25th Street Bridge in Palmer Township, and the 3rd Street Bridge in the City of Easton.

The average age of a bridge in the Lehigh Valley is approximately 50 years old. As bridges age they deteriorate physically. A structurally deficient bridge typically requires significant maintenance and repair to remain in service and eventual rehabilitation or replacement to address deficiencies. As an interim measure to prolong the life of the structure and provide safe passage, structurally deficient bridges are often posted with weight limits to restrict the gross weight of vehicles using the bridges to less than the maximum allowable weight. Table 19 shows the number of state owned bridges judged to be structurally deficient as of March 2010. Because of the overall state of bridge disrepair, PennDOT will not consider bridge replacement unless the bridge is structurally deficient.

Maintaining the bridge network is important because of diversions in travel created when bridges are posted or closed. Not only is the movement of goods and people diverted and delayed, emergency vehicle response time can be increased greatly due to bridge restrictions.

TABLE 19
LEHIGH VALLEY BRIDGE CONDITIONS - State Owned Bridges

	Lehigh		Northampton		Lehigh Valley	
	Co.	%	Co.	%		%
Total	350	100	310	100	660	100
Structurally Deficient	73	21	66	21	139	21

Source: PennDOT District 5. March 2010

PennDOT District 5 is promoting preventive maintenance activities on bridges to extend their useful life. These activities include scour protection, minor bridge deck rehabilitation, and spot painting. PennDOT now devotes a portion of the bridge budget to these activities in order to extend the life of the bridge.

PennDOT has also been placing an increased emphasis on accelerating bridge repairs through the Governor's Accelerated Bridge Program, which utilizes stimulus funds for these infrastructure improvements. As of May 2010, PennDOT let 920 of the 1,145 projects statewide. Locally, in Lehigh County, the Landis Mill Bridge and Saucon Creek Bridge (Upper Saucon Twp.), and Hosensack Bridge in Lower Milford Twp. received funding through this program to replace the structures. In Northampton County, the Lower Saucon Valley Road Bridge and Henry's Woods Bridge replacement projects received funding.

Bridges eight feet and longer in length are inspected on a two-year cycle. This review is used as input to determine a sufficiency rating. Sufficiency ratings range from 0 (poor) to 100 (excellent). Federal Highway Administration (FHWA) policy dictates that bridges with a sufficiency rating between 50 and 80 are eligible for rehabilitation. Bridges with a sufficiency rating below 50 are eligible for replacement. Bridges with a sufficiency rating above 80 are not eligible for Federal Critical Bridge funds. LVTS, with a few exceptions, relies on PennDOT District 5 bridge priorities and these sufficiency ratings in programming decisions for the TIP and Long Range Plan. PennDOT maintains a policy to have no closed or posted bridges on the National Highway System (NHS). Any bridges on the NHS that are in poor repair and in danger of being closed or posted will receive a high priority in the TIP.

The state created the Billion Dollar Bridge Bill in the early 1980s to address deficiencies in bridge funding. In order for PennDOT to use state funding, a bridge must be listed on the Billion Dollar Bridge Bill. Additions to the Bill are made through the legislative process.

The current resources for this bridge problem can only address rehabilitation and replacement of a portion of the state's structurally deficient bridges. The financial resources available in Pennsylvania will not eliminate the backlog of deficient bridges or take care of the additional bridges that will become deficient in the future.

PUBLIC TRANSPORTATION

LANTA is a bi-county authority created in 1972 to operate local public transit services. In 1986, the Authority introduced its "Metro" fixed route system of service with routes linked to provide better access through the urbanized area and a more user friendly system of information using color-coded route maps, signs and schedules. In 1988, the Authority established its "Metro Plus" division to meet the growing need for demand responsive human service transportation.

The Authority currently operates two Lehigh Valley services including:

METRO

LANTA operates the *Metro* system, illustrated in Map 11, a network of 30 fixed bus routes throughout the Lehigh Valley providing daily, later evening, Saturday, and Sunday services. More than 380,000 people live within walking distance of a *Metro* route.

There has been a 70% increase in ridership since 1997: currently more than 5.5 million rides are taken on the Metro system annually. *Metro's* 80 vehicle bus fleet has been continually modernized so that passengers may ride to work, school, shopping and medical services in safety and comfort. Transit fares have been maintained at reasonable levels, with discount tickets - including a \$2.50 day pass good for unlimited rides all day - are available to all riders.

The *Metro* system is concentrated in the urbanized area of the Cities of Allentown, Bethlehem and Easton and surrounding boroughs and townships. A set of "shuttle" routes provides services in areas at the edge of the urbanized area and a "Starlight" set of routes, operating in an abbreviated urban setting, runs until about midnight, Monday through Saturday.

METRO PLUS

LANTA's *Metro Plus* Division, a brokerage operation, arranges special door-to-door transportation services for people with disabilities and the elderly who cannot access the regular *Metro* transit system. The 118 accessible vans and mini-buses available to *Metro Plus* customers are dispatched daily. More than 420,000 trips were arranged by *Metro Plus* last year. *Metro Plus*, acting as a broker, contracts with Easton Coach Company, Inc. of Forks Township to provide these services to customers.

LANTA's services act as an important element of the economic development and quality of life in the Lehigh Valley. A rider survey conducted as part of this study effort showed that:

- Approximately 50% of LANTA Metro service riders use the service to travel back and forth to work. This represents approximately 10,000 work commutes daily.
- The remaining 50% use LANTA Metro service for shopping, medical/dental appointments, personal business and other quality of life needs.
- On any given day, approximately 2,000 seniors will use LANTA Metro service allowing them to maintain independence and age in place. Allowing seniors to age in place helps to create more stability in the local real estate market.

LANTA's newest service, the LOOP, was implemented in the summer of 2009. It is a circulator route connecting the Sands Casino and Southside Bethlehem Shopping District with the Bethlehem Historic Shopping District on the north side. The service is funded through the Jobs Access-Reverse Commute (JARC) program and by the City of Bethlehem.

In order to reach certain destinations, riders may be required to transfer to another bus. Metro transfer centers are major bus stop hubs that allow for timed transfers among several Metro bus routes. LANTA provides for five transfer center locations. Allentown locations include 6th and Linden Street. The Beth-

Lehigh location is at Broad and Guetter Streets. Easton area transfer centers are at Center Square and the Palmer Park Mall. Whitehall Township has transfer centers at two locations — the Lehigh Valley Mall and Whitehall Mall.

SYSTEM IMPROVEMENT PLANS

In February 2010, LANTA adopted the Moving LANTA Forward: Regional Public Transportation Plan for the Lehigh Valley. The planning effort was undertaken to respond to the significant increase in LANTA ridership over the past decade, the rapid development experienced in the Valley over the past twenty years and to present a transit plan that supports the regional vision communicated in the Comprehensive Plan – The Lehigh Valley 2030. The year-long study that resulted in this plan establishes a transit vision for the Lehigh Valley that will guide the authority's operating and capital decisions for the next decade. Through a comprehensive planning process that involved input from a study advisory committee, rider survey, resident survey, expert panel, LANTA employees and drivers, board workshops, and public meetings, the study identified areas where system improvement should be sought and a broad range of goals to achieve the strategic vision:

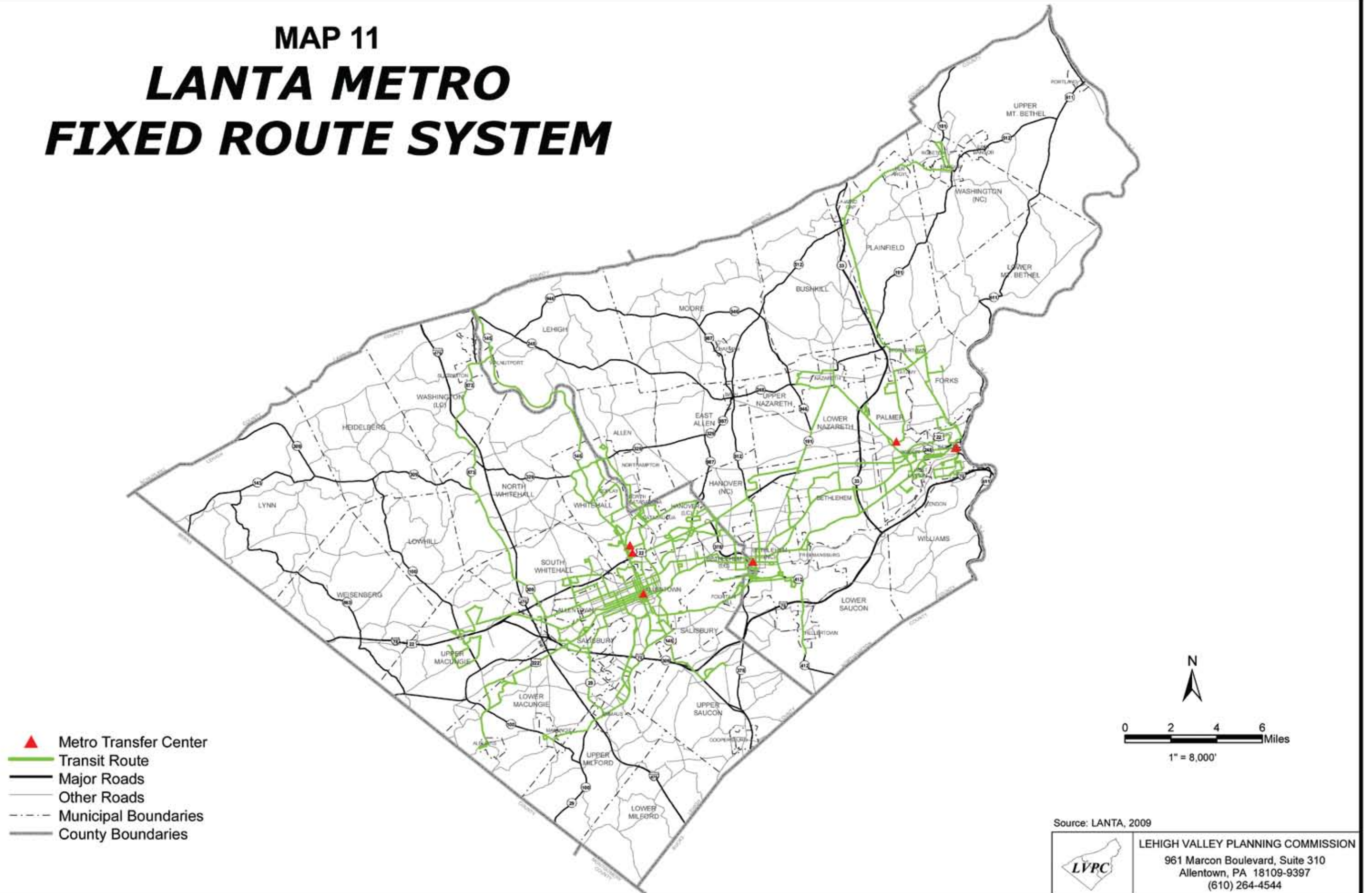
- Address identified unmet public transportation needs in the region;
- Expand mobility and access to employment opportunities;
- Increase the visibility and convenience of the public transportation service in the region;
- Improve and build upon the fundamentals of the public transportation network in the region; and
- Establish a blueprint towards higher modes such as Bus Rapid Transit.

LANTA's plan identifies four primary elements to address the transportation needs and input received. The four elements are as follows:

1. Core Service Area Improvements – These improvements are designed to enhance and improve LANTA fixed route services within its core service area by establishing a tiered system of corridors and service levels for each corridor type. Frequency of service would vary from 15 minutes to 60 minutes based upon whether the corridor was designated as a trunk, urban, or suburban corridor and the time of day. Additionally, the current route structure in the core area would be redesigned to improve user-friendliness through streamlined routes and a new route classification system, reduce complexity through route schedules with few or no variations, provide more direct connections through new and increased through-routing patterns, and allow for re-timing of routes and increase the reliability of running times. Evening service would be improved by eliminating Starlight routes and replacing them with regular fixed routes that operate during the evening hours. Service improvements would be made to existing and emerging employment centers such as the Sands Casino, retail developments along Route 248 in Lower Nazareth and Palmer Townships, and the new Airport Center retail development off of Airport Road. Intra-regional connections would be improved including improved service on limited stop services such as the Silver Line. Connections would be improved with long distance commuter bus services through more frequent fixed route service to intermodal connection points. Mobility options would be improved through new crosstown routes such as Cedar Crest Blvd.
2. Service Coverage Expansion Plan – This element outlines a model for the expansion of LANTA service into the more suburban and rural areas that are either currently not served by the Metro

MAP 11

LANTA METRO FIXED ROUTE SYSTEM



fixed route system or are infrequently served. The plan recommends the establishment of a network of satellite hubs at major employment locations and traditional urban centers; the enhancement of fixed route and flexible services to intermodal connection points including the Wescosville Park & Ride, Route 33/William Penn Highway Park and Ride, and Trans-BridgeLines in LVIP I; the use of flexible service models to serve outlying areas and act as feeders to fixed routes at hub locations. One candidate location for this model would be to establish a flexible zone in the Macungie/Ancient Oaks area which allows residents to make reservations to be taken to long distance commuter bus services at the Wescosville Park & Ride and allows for connections to LANTA trunk services at the Lehigh Valley Medical Center or Emmaus hubs.

3. Bus Rapid Transit Plan – This element of the service plan identifies corridors with the potential to become Bus Rapid Transit (BRT) corridors at some future time as the transit system in the region develops. A BRT corridor would be characterized as having a high service frequency in addition to transit first improvements to the corridor. This multi-year strategy recommends: building upon established trunk corridors in the core service area; targeting capital improvements such as roadway improvements and transit amenities to trunk corridors; coordinating capital and service improvements with local transportation and economic development plans; pursuing transit first improvements along trunk corridors such as traffic signal prioritization; and implementing north-south and east-west BRT services along trunk corridors.
4. Rail Modes Planning – Although the Moving LANTA Forward transit plan does not address the feasibility of commuter rail in the region, the service plan does include the following recommendations:
 - LANTA should continue to participate in planning efforts for future rail modes
 - The transit system should be prepared to modify bus service to respond to potential commuter rail services

Development trends in the region have not favored public transportation. The vast majority of new residential, retail, office, and industrial development has occurred outside LANTA's traditional market and fixed route service areas in low density suburban and rural locations. The development of the Lehigh Valley over the past several decades has favored the single occupant vehicle.

In response, the Moving LANTA Forward Plan builds upon the Memorandum of Understanding between LANTA and the LVPC and establishes a program for outreach to the land use planning and development community in the Lehigh Valley. The land use element of the Moving LANTA Forward study focused on providing LANTA with two important tools. First, a Land Use Toolkit document was developed which provides a specific list of policy and ordinance stipulations that would be supportive of public transportation in general, as well as policies that would specifically support the service enhancements recommended as part of this plan. The second tool represented a presentation that explains the relationship between land use and public transportation and summarizes the policy recommendations outlined in the Land Use Toolkit document. LANTA and LVPC plan to present the Land Use Toolkit presentation to local planning bodies to raise awareness of the potential for public transportation in the Lehigh Valley and educate them on their role in implementing the vision developed as part of this planning effort.

The Land Use Toolkit document provides recommendations for how each community's planning documents and ordinances can support public transportation. This includes the:

- Comprehensive Plan;
- Zoning Ordinance;
- Subdivision and Land Development Ordinance (SALDO); and
- Subdivision and Site Plan Review.

As noted above, the Land Use Toolkit provides some general recommendations for how to make land use and development decisions that are supportive of transit service, while other recommendations respond specifically to service enhancement recommendations developed as part of the *Moving LANTA Forward* study. Most importantly, the Land Use Toolkit provides numerous SALDO and Site Plan recommendations for developments along corridors envisioned for higher levels of service. In addition, the Land Use Toolkit recommends the adoption of a Transit Corridor Overlay Zone (TCOZ) along identified “trunks” which the service plan envisions for potential higher modes such as Bus Rapid Transit (BRT).

The overall goal of the land use element of the Moving LANTA Forward study is to provide LANTA with the tools that will allow the agency to take a continuous, active and effective role in shaping the environment which it must serve. The Implementation Requirements section of this report identifies specific land use policy actions that should be taken to support the recommended implementation phasing of the service plan.

The land use element of the Moving LANTA Forward plan also builds on the 1995 report published by the LVPC entitled *Community Planning and Transit: A Case for Transit Supportive Design*. This report points out that in many parts of the Lehigh Valley development density is too low to allow transit to operate efficiently. The report advocates increased densities in transit served areas, greater use of mixed land uses and numerous other techniques for improving the potential for transit.

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

The relationship between land use density and transit service feasibility is well known by planners and the transit industry. Transit service in low density corridors is less feasible since the number of potential riders is insufficient to make service financially feasible. The *Comprehensive Plan – The Lehigh Valley ... 2030* states that “higher density housing and employment facilities should be developed along transit service routes. In the portions of the LANTA market area recommended for urban development, a minimum density of five dwelling units per acre should be developed.” Residential development has been occurring at densities far below that minimum density recommendation and has substantially impeded transit feasibility.

Public transportation usage may also be supported by siting land uses likely to generate the highest ridership closest to the transit routes, while uses likely to generate least ridership are sited further away. The use with the greatest ridership potential, the office building, for example, is sited closest to the transit stop while uses with lower ridership potential such as a warehouse are sited further from the stop. Municipalities can support these land use arrangements by reviewing and amending their zoning ordinances where the change is appropriate and consistent with the other objectives of the ordinance.

Minimizing the distance between the transit stop and the building generating the trip is beneficial for good transit service. Buildings should be brought closer to the transit served road by utilizing a build-to line rather than a setback line which would require buildings to be constructed at the line. This would allow the building to be conveniently located relative to the transit stop minimizing the walking distance between the stop and the building. Vehicle parking lots should be placed behind buildings rather than between the road and the building. The adoption of requirements in zoning ordinances and site plan requirements in subdivision and land development ordinances would make this a reality. Additionally, locating buildings close to the transit route would allow for direct routing of buses. Direct routing from a transit system design perspective allows for faster service from origin to destination.

In addition, the use of public transportation is greatly facilitated through the provision of a safe and convenient pedestrian environment. Roads should be furnished with sidewalks on both sides where transit service is provided and buildings should be connected to sidewalks by a separated pedestrian walkway. Intersections should be furnished with marked crosswalks and to the greatest extent possible, pedestrian phases should be instituted into traffic signals.

As noted above, the LVPC and LANTA have entered into a Memorandum of Understanding to further these efforts. Its purpose is to establish an understanding between parties relative to the evaluation of land use planning and land use and its impacts on the implementation of effective and efficient public transportation through the Lehigh Valley. The understanding outlines the relationship between the LVPC and LANTA to insure that the parties are able to work toward meeting the goals set forth in the Comprehensive Plan for the Lehigh Valley and the goals of Moving LANTA Forward: Regional Public Transportation Plan for the Lehigh Valley.

DATA AND ANALYTICAL TOOLS AVAILABLE

Aspects of transit planning (system performance evaluation, rider perception of service, route development) are dependent upon various data that are either collected by or available to LANTA. LANTA compiles operating statistics for both their Metro fixed route and Metro Plus demand responsive systems on a monthly basis. The Authority has also adopted a set of operating standards. The system-wide standard for standard fixed route service was 26 passengers/revenue service hour and 12 passengers/revenue service hour for shuttle routes. Urban area routes averaging less than 60% of the system average will be evaluated by either core or shuttle route standards. The information is used in the evaluation of system performance and includes both scheduled and actual service mileage and service hours, total service crashes, vehicle crashes, customer crashes, road calls for maintenance, on-time performance, complaints, compliments, weekday and Saturday ridership, unscheduled trip requests, carrier no shows, customer no shows, customer cancellations, passengers per revenue service hour, and others.

To improve productivity, the use of marketing techniques to improve the community awareness of service, changing a route's location, increasing or decreasing the time span of service, eliminating unproductive sections of routes, adjusting the service frequency to better reflect ridership demand, supplementing revenue from local municipalities and private sources, and as a last resort, eliminating service on the route may be considered. Routes where productivity is greater than 150% of the route system average will become candidates for additional hours of service.

Other tools available to LANTA include an auto stop announcement system and Intelligent Transportation System (ITS) technologies. The ADA set forth the legal requirement for bus operators to announce major stops and transfer points. All LANTA Metro buses are outfitted with an automatic stop announcement system that lets riders know the route destination, what stops are approaching and where they can get off and transfer to other routes. By the end of 2010, LANTA will have implemented its Automated Transit Management System (ATMS). The ATMS involves furnishing LANTA's entire fixed route fleet with automated vehicle locator (AVL) and automated passenger counter (APC) technology. This technology will allow for the continuous collection of operating and ridership data which will be used to make informed planning and policy decisions. In addition, the technology will allow for more effective control and supervision of LANTA's on-street operation. In addition, the ATMS will allow LANTA to make significant improvements in public information by providing riders with real time information regarding the location of buses either through electronic signage at major transit stops, through an internet website or through mobile communication devices. AVL technology was installed on Metro Plus vehicles which provides for real time arrival/departure and scheduling data. To improve customer and employee security and safety, LANTA bus fleet had security cameras installed.

LVPC has the capability to perform transit modeling. In the *22 Tomorrow—A Corridor Planning Study*, several different transit scenarios were modeled for their impact on highway network traffic volumes. Three express bus scenarios with the current Metro system operating on 10 minute peak hour headways and 20 minute off peak headways as well as two light rail transit scenarios were modeled. All scenarios assumed a 2020 network in place (all projects listed in the 2005 TIP are considered completed). Although these transit scenarios were used for highway planning purposes, future model outputs may be used strictly for transit purposes. These outputs may include but not be limited to daily ridership by route as dependent on headway spacing, route selection and bus travel times between stops.

LANTA's ATMS program as well as the AVL and mobile data terminal technology installed on Metro Plus vehicles will provide an extensive amount of data that could be used for various types of GIS analyses moving forward.

INTER-REGIONAL TRANSIT

Two inter-regional metropolitan areas are of major importance when addressing ground transportation issues in the Lehigh Valley – New York City and Philadelphia. Linkages between the Lehigh Valley and these two destinations have been the subject of past planning studies. This section summarizes existing service and the findings of the most recent planning studies.

Currently in the Lehigh Valley to New York City corridor, a total of 53 trips per weekday are provided by Trans Bridge Lines and Carl R. Bieber Tourways to New York City. No passenger rail service exists in the Lehigh Valley. A 1990 study of public ground transportation for the Lehigh Valley to New York corridor conducted by Barton-Aschman Associates, Inc. was updated in 2010 by SYSTRA Consultants. In April 2010 the Pennsylvania Component of the Central New Jersey/Raritan Valley Transit Study was released by the Lehigh Valley Economic Development Corporation, Lehigh County and Northampton County. The study evaluated two bus alternatives and one rail alternative for providing transit service to central New Jersey and New York City. The first bus alternative would provide express bus service to New York City from Easton, South Bethlehem and the Allentown Central Business District. Bus service would depart from each city and proceed to the Port Authority Bus Terminal in Midtown Manhattan. The

second bus option would provide new express service from the William Penn/Route 33 park and ride and the Easton Intermodal Terminal to employer sites in Bridgewater, Raritan and Somerville, New Jersey. The commuter rail service would connect with the current terminus of rail at High Bridge, New Jersey and then proceed to New York City. In Pennsylvania the service would follow the Norfolk Southern alignment south of the Lehigh River with station stops in Allentown, Bethlehem, and Easton.

Average daily 2030 express bus ridership to New York is estimated to total 484 riders from the three cities. The 2030 express Bridgewater ridership is projected to be 100 riders. Rail ridership from Allentown, Bethlehem, and Easton in 2030 is projected to be 800 riders plus 395 riders from Phillipsburg, Bloomsbury and Hampton, New Jersey. The 2010 operation and maintenance costs for the service are estimated to be \$14.90 million dollars with a 22% farebox recovery. This nets out to \$11.6 million in public subsidies. Capital costs for the Pennsylvania portion of the study total \$658.9 million. The trip duration to New York by bus is estimated to be 2.2 hours from Allentown, 1.9 hours from Bethlehem, and 1.7 hours from Easton. Rail time estimates are 2.6 hours from Allentown, 2.4 hours from Bethlehem, and 2.1 hours from Easton. At this point, commuter bus service seems the best option for transit between New York, New Jersey and the Lehigh Valley.

The SYSTRA study provides valuable data for planners, public officials, and the public at large to consider. The data reveals a number of problems with the rail alternative that will need to be resolved if rail is to be expanded in the future.

- To date New Jersey has made no commitment to extend rail west of High Bridge, New Jersey.
- There are no public funds committed to pay capital or operating costs. The per mile cost for this 16.94 Pennsylvania miles is \$35 million per mile. According to SYSTRA projects being considered for federal funding have capital costs that are under \$20 million per rail mile.
- No work has been done to identify who would operate a rail service or who would subsidize operating costs.
- At this stage there is no commitment or agreement with Norfolk Southern for use of their facilities.
- Ridership forecasts for 2030 are low and rail travel times are longer than present bus service.

Clearly much needs to be resolved if the rail alternative is to be implemented in the future. Although there is always the possibility the Federal and State funding policies may change, it is also clear that for any rail options to succeed there will need to be a potential for much larger ridership than shown in the SYSTRA analysis. More intensive development at each of the Pennsylvania station sites would be necessary. The Lehigh Valley Planning Commission will research various Transit Oriented Development (TOD) sites in eastern cities in the U.S. to get a better idea of the magnitude, cost, and composition of development that might have potential in the Lehigh Valley in the future.

Service to Philadelphia is provided by Carl R. Bieber Tourways, Greyhound, and Susquehanna Trailways, all privately owned bus operations. These three carriers provide a total of nine round trips between Philadelphia and different parts of the Lehigh Valley region, serving many smaller communities along Route 309 and Route 611 in Bucks and Montgomery counties. Trans-Bridge Lines provides service between the Lehigh Valley and Doylestown. Demand for service to Philadelphia is low relative to New York.

A study of the Lehigh Valley to Philadelphia corridor was conducted by Parsons Brinckerhoff in 1997. Entitled *Amtrak Thruway Bus Lehigh Valley Connections to Philadelphia Rail Services*, it examined the potential for commuter bus service between Bethlehem and Philadelphia's 30th Street Station where commuters could then board Amtrak for destinations elsewhere. Projections estimated between 176 to 230 total trips per day. Based upon these estimates, Trans Bridge provided service to 30th Street Station starting in May 1998. Service lasted at reduced frequencies until September 1999. The service was terminated after the runs produced substantially less than projected ridership.

The most recent study of restoration of passenger rail service to Philadelphia was conducted by Parsons Brinckerhoff in association with Norman Day Associates and KKO & Associates in July 2000 for the Bucks County Planning Commission. The lead alternative (Alternative 2) would provide diesel rail service between Shelly in Richland Township, Bucks County and 30th Street Station in Center City Philadelphia. Table 20 shows statistical data in comparison with two other alternates. Alternative 2A would be powered by Dual-Power (AC catenary) locomotive and 2B by a Dual-Power (DC Third Rail) locomotive.

TABLE 20
RAIL SERVICE FROM 30TH STREET STATION, PHILADELPHIA TO SHELLEY

	Alternative 2		Alternative 2A and 2B	
	Low Range	High Range	Low Range	High Range
Weekday Trips	2,620 trips	4,267 trips	4,181 trips	6,809 trips
New Trips	1,703 trips	2,773 trips	1,965 trips	3,200 trips
Capital Costs	\$180,217,035	—	\$214,582,189 (A)	\$211,334,407 (B)
Annual Operation Deficit	\$1,926,767	—	\$1,565,172 (A)	\$1,896,026 (B)

Source: Parsons Brinckerhoff, Final Report, Quakertown - Stony Creek Rail Restoration Study, July 2000

Although the consultants considered the proposal feasible "... in terms of operating ratio and other financial and operational measures of public transportation performance", it was acknowledged that SEPTA, the counties and Commonwealth would need to consider the significant costs in light of other priorities and financial needs of the region. To date this project has not been implemented.

In June 2005 the Bucks County Transportation Management Association received a \$15,000 grant from the Pennsylvania Department of Community and Economic Development to prepare a business plan to implement a portion of this proposed line extending from Norristown to Lansdale to Shelly which is located north of Quakertown. A revised service plan yielded ridership estimates of 1,200 to 2,000 weekday passenger trips, an estimated capital cost of \$95 million and annual operating costs of \$4.3 million. No recent proposals have been made to extend the line further north to the Lehigh Valley. There does not seem to be much interest among officials in the Lehigh Valley to support such an extension. In light of financial issues facing public transportation in the SEPTA service area and the Commonwealth in general it is difficult to imagine that much progress on this project will be made in the near future.

RAIL FREIGHT

The Lehigh Valley is served by two class one railroads. Six short line railroads operate within Lehigh and Northampton Counties. Map 12 shows the locations of the eight railroads in the Lehigh Valley which either own track or operate in the area.

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

The late 1990s saw a major infrastructure program that boosted the competitiveness of the Norfolk Southern main lines in the region. With funding assistance by the Commonwealth of Pennsylvania, Norfolk Southern increased vertical clearances along both the Lehigh Main Line and the Reading Main Line. The new clearances allow the lines to handle "double-stack" intermodal containers.

CP Rail is the second class one carrier serving the Lehigh Valley. CP Rail uses trackage rights along Norfolk Southern's Lehigh Main Line to provide service. CP Rail provides service to the former Bethlehem Steel site in Bethlehem. The availability of two carriers serving this site serves as a competitive advantage for shippers at this site and assists in the ongoing development.

Lehigh Valley Rail Management Railroad, as successor to the Bethlehem Steel subsidiary railroad Philadelphia, Bethlehem and New England Railroad, provides rail service for Bethlehem Works and for the Lehigh Valley Industrial Park VII, both of which involve the redevelopment of the Bethlehem Steel site. The Lehigh Valley Rail Management Railroad also provides service to the BethIntermodal Terminal, the region's intermodal facility. The terminal consists of two components, the intermodal terminal itself and the Triple Crown Service terminal. Previously each of these components used separate facilities within the Bethlehem Steel site.

Since its acquisition of Conrail in 1999, Norfolk Southern has altered its approach for providing Triple Crown Service to the metropolitan New York City area. These changes have implications for the Lehigh Valley's transportation network. Containers bound for the metropolitan New York area were formerly transported by rail to a facility in New Jersey, proximate to New York City. At present, these containers are delivered by rail to the BethIntermodal Terminal in Bethlehem. From there, they are trucked to the metropolitan New York area and other destinations.

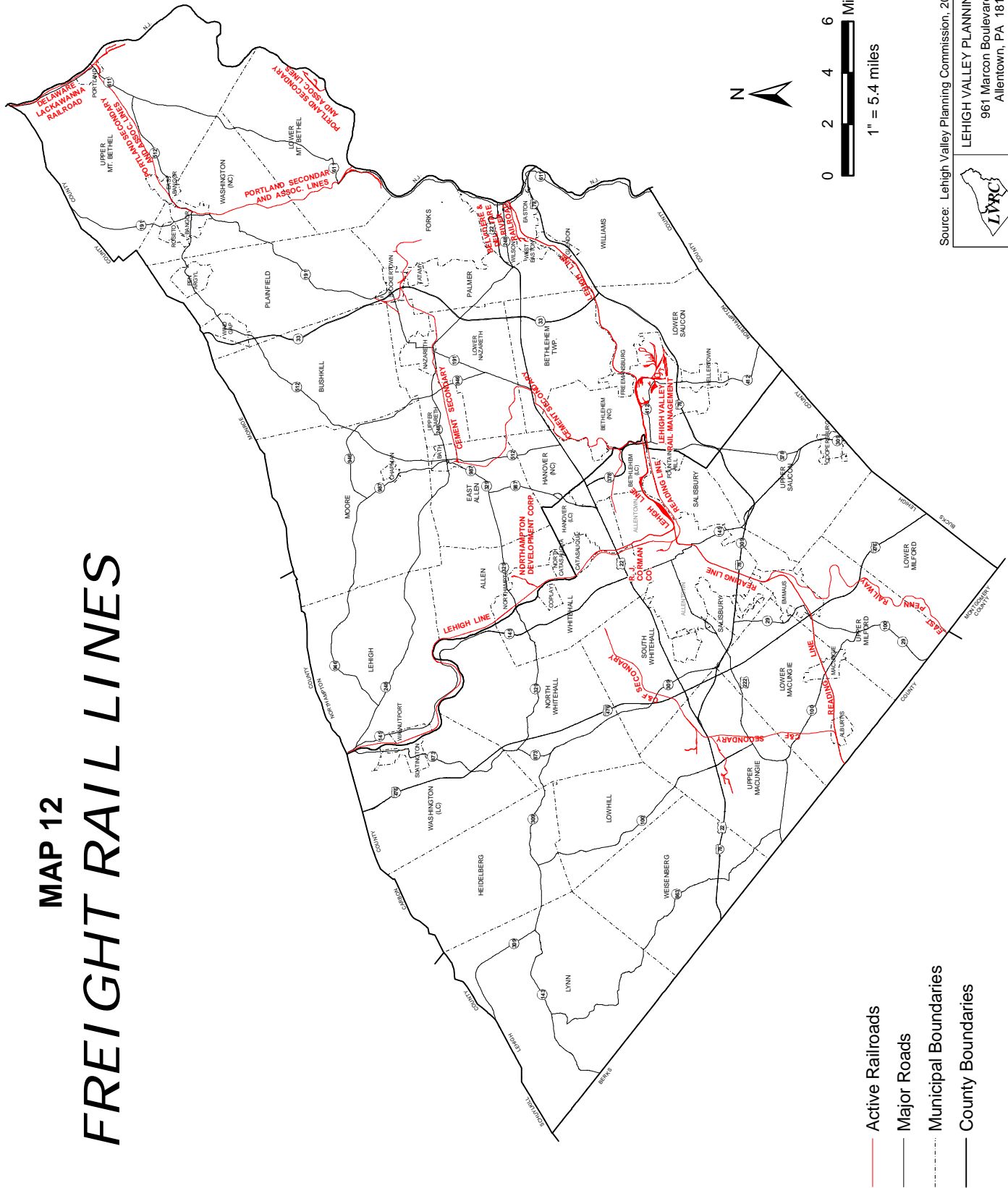
Route 412 to Interstate 78 has been the route used for the Triple Crown Service movements as well as other intermodal movements from the BethIntermodal Terminal. The Lehigh Valley Transportation Study considers the improvements that have been programmed for Route 412 as a High Priority project. The construction of these improvements is scheduled to begin in 2011. Chapter 4 includes more information about the Route 412 improvements.

In addition to the three railroads mentioned in the previous text, five others operate in the area. They are the Belvidere & Delaware River Railroad, the Delaware & Lackawanna Railroad, the East Penn Railroad, the Northampton Development Corporation Railroad and the RJ Corman Railroad.

Rail-highway crossings with passive protection exist in the Lehigh Valley. Upgrades to active protection are needed for some of these crossings, particularly where circumstances such as the average daily traffic on the road or the number of trains have increased significantly. Such increases can be found along the Reading Line in the area of Lower Macungie Township between Alburtis and Macungie.

MAP 12

FREIGHT RAIL LINES



- Active Railroads
- Major Roads
- Municipal Boundaries
- County Boundaries

Some of the industries seeking to locate in the area need a facility with rail service. Sidings are needed for greenfield sites abutting rail lines in order to take advantage of the rail service. In other cases, improvements to sidings are needed for brownfield sites to allow their redevelopment or continued use. Financial assistance would increase the feasibility of these development efforts.

Rail service north of West Catasauqua (Lehigh County) along the former Lehigh Valley Railroad main line ended in the late 1980s. Lehigh County has been working to establish a hiking and bicycling trail along this right of way from West Catasauqua to the Carbon County line. At this writing, parts of the trail have been acquired and developed for recreational use. Lehigh County is continuing its efforts to acquire and/or secure rights for other parts needed to complete the trail.

The City of Bethlehem has acquired most of the former Norfolk Southern Bethlehem Secondary for the South Bethlehem Greenway Trail. Future plans include acquisition of the remaining parts south to Hellertown. The City is in the process of developing the trail.

SEPTA has entered into a 30 year lease for the portion of the former Bethlehem Branch with the four municipalities through which it passes. Hellertown, Coopersburg, Lower Saucon Township, and Upper Saucon Township intend to develop the right of way as the Saucon Rail Trail. SEPTA has retained its rights to reestablish rail service.

BICYCLES AND PEDESTRIANS

The 2000 census estimated 10,300 commuters that walked to work and another 550 that biked to work, representing 3.8% and 0.2%, respectively, of all Lehigh Valley commuters. About 72% of commuter walking is done in Allentown, Bethlehem, Easton, Emmaus, Nazareth and Northampton. Biking has little significance as a travel mode in the Lehigh Valley. Recent estimates from the 2006 – 2008 American Community Survey show declines in the number of persons both walking and bicycling to work. Only 362 persons bicycled to work while 7,894 walked to work.

Pedestrian safety is an issue in the Lehigh Valley. From 2004 to 2008, 38 pedestrian deaths occurred in the region resulting from pedestrian/motorist crashes. Pedestrian fatalities account for 11% of the transportation-related deaths over that five-year period. Pedestrian injuries remained relatively stable over the period. The Lehigh Valley experienced 263 pedestrian injuries in 2004, 266 in 2005 and 2006, 240 in 2007, and 268 in 2008.

The Bicycle/Pedestrian (B/P) network is made up of two distinct components. The first encompasses the highway and sidewalk network. Bicycles and pedestrians are allowed on the current highway network with the exception of expressways. Sidewalks are part of the pedestrian network as well. Most sidewalks in the Lehigh Valley are in the cities and boroughs. Highways can be made more B/P friendly by widening and stabilizing shoulders on roadways and keeping them clean to allow for safe bicycling. Existing and potential B/P usage should be taken into account when designing a new road or widening an existing road. In urban and suburban areas without sidewalks, municipalities can mandate installation in new subdivisions in the future. Sidewalks must be present, continuous, well designed, meet Americans with Disabilities Act standards, and maintained to provide for a safe and usable network. Consideration should be given to pedestrian crossing phases for traffic signals located in urban areas. The retrofitting of non-ADA compliant curb cuts is appropriate. In some residential neighborhoods it

may be appropriate to consider traffic calming measures to lessen the dominance of the automobile and increase safety. Suburban townships on the perimeter of the three cities would be the best candidate for improved sidewalk connections to nearby areas.

The second component of the B/P network consists of multi-use non-motorized paths, distinguished from the previous network by protected rights-of-way. This network is developing slowly in the Lehigh Valley. The parts in place (See Map 13) have come about primarily through efforts of local municipalities such as Whitehall Township, Palmer Township, Plainfield Township, Northampton County (Nor-Bath Trail) and the Delaware and Lehigh Canal and State National Heritage Corridor (D&L Trail). These facilities are primarily recreational. Most Lehigh Valley communities and PennDOT need to be more active in addressing B/P issues in subdivision site design and in the design of major roadways in the region.

TRANSPORTATION ENHANCEMENTS

The Transportation Enhancements Program was created under ISTEA and is part of SAFETEA-LU. The objective of this innovative program is to fund activities that go beyond the normal or historic elements of a TIP. The intent was to creatively integrate transportation facilities into their surrounding communities and the natural environment. 12 categories of projects are eligible for transportation enhancements funding. These include:

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

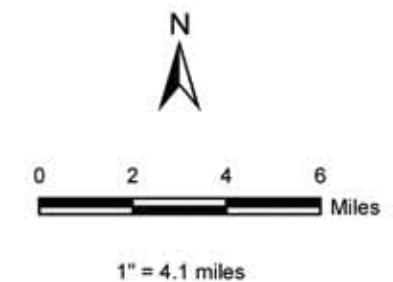
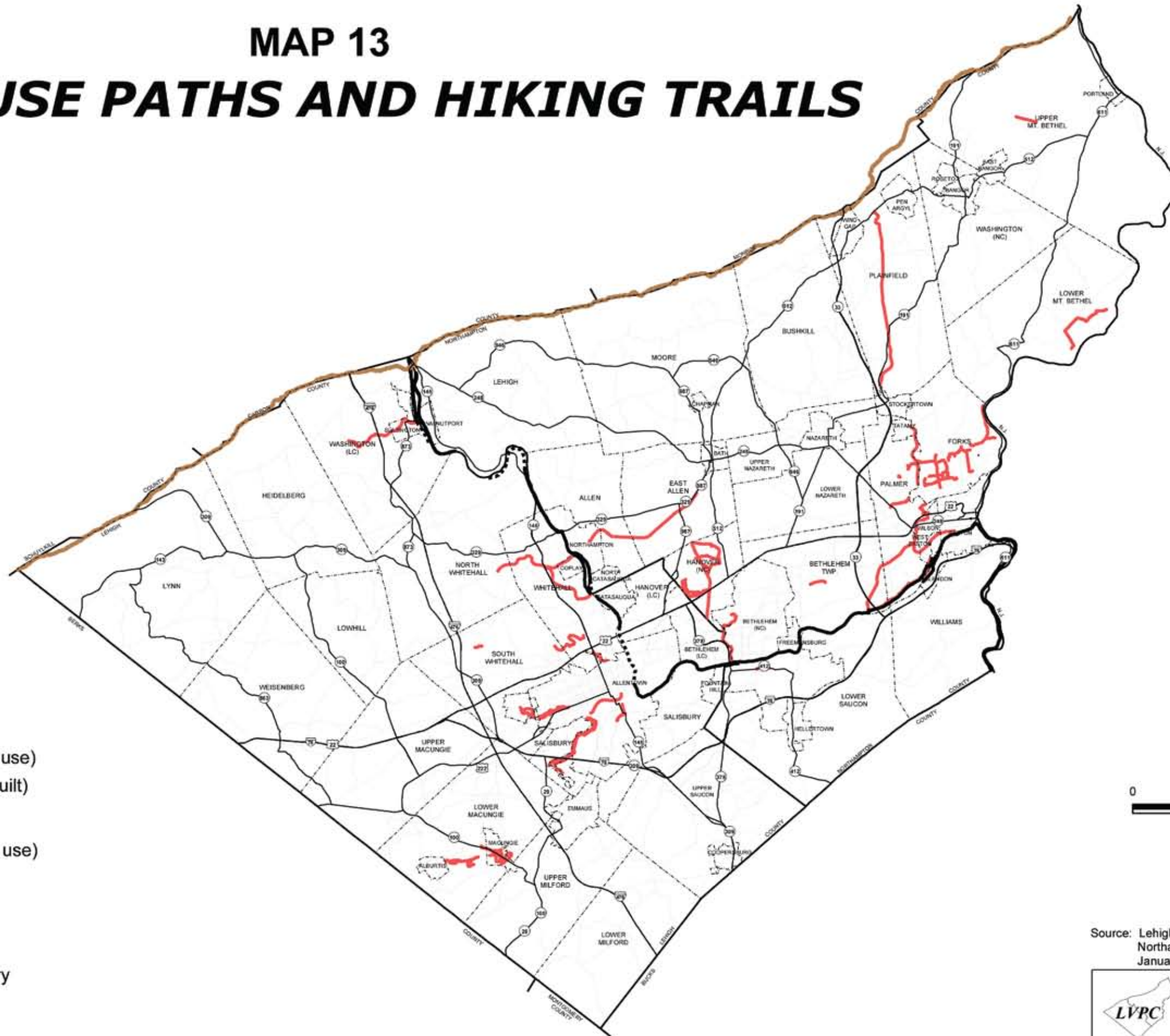
The LVTS Technical Committee reviews project eligibility and rates eligible applications. The Technical Committee considers the applications and makes recommendations for funding to the LVTS Coordinating Committee. The Coordinating Committee makes the final decision as to which projects are selected for funding. Since 2000, each region has been given a transportation enhancement allocation after an initial 20% was withheld for the Secretary's discretion. Final project selection became the responsibilities of the MPOs and RPOs.

The LVPC staff has a strong preference for projects that add to the recreation and trails system in the region and support the Delaware and Lehigh National Heritage Corridor. Action projects are favored over passive projects. It is important for a project to be clearly relevant to transportation and recreation. Map 13 shows the current bike paths and hiking trails in the Lehigh Valley.

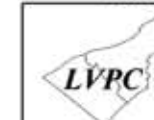
MAP 13

MULTI-USE PATHS AND HIKING TRAILS

-  Appalachian Trail
- D & L Trail**
 -  Existing (Open for use)
 -  Proposed (To be built)
- Other Trail**
 -  Existing (Open for use)
-  Major Road
-  Other Road
-  Municipal Boundary
-  County Boundary



Source: Lehigh County Tax Assessment Office, January 2008;
Northampton County, Dept. of Fiscal Affairs, GIS Division,
January 2008; Lehigh Valley Planning Commission, 2010



LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

In 2004 US DOT and PennDOT initiated the Hometown Streets/Safe Routes to School program. This is a program aimed at streetscape improvements that can help reestablish downtown and commercial centers and improvement of pedestrian and bicycle access to schools. PennDOT prepared the guidelines for rating projects out of this program. After screening out ineligible projects the LVPC and the LVTS technical and coordinating committees gave highest priority to project applications submitted by each of the Lehigh Valley's three cities and six boroughs. A total of \$2,539,000 was allocated for the four year period of the program.

In 2009, PennDOT started the Pennsylvania Community Transportation Initiative (PCTI) program to fund Smart Transportation projects that promote collaborative decision-making, advance the integration of land use and transportation decisions, and promote regional and multi-municipal cooperation. \$60 million was made available statewide over the first two years of the 2009 Transportation Improvement Program. Applicants could be awarded up to \$5 million for the construction of eligible projects or \$300,000 for planning activities. The Lehigh Valley had 30 applicants apply. Four were awarded funding totaling \$5.5 million.

Historically, implementation of transportation enhancement projects has been poor at the local, state, and national levels. There were numerous reasons for this, including the complexity of the projects and obtaining clear title on right-of-way acquisition that may date back to the mid-1800s. Funding for these projects come from the Federal surface transportation program, meaning that sponsors must document the impacts to the natural, built, and cultural environments. Also, experience has shown that enhancement projects often are not aggressively pursued once they have been chosen for funding. In response to these circumstances, LVTS has implemented policies as part of this plan to ensure that enhancement projects move forward in an expedient manner. If progress is not being made on a project, LVTS will substitute another enhancement project in its place. Project delivery and implementation has improved since PennDOT retained a consultant to provide managerial services for the program. Transportation enhancement programs are generally conducted every two years or as determined by funding availability. Table 21 lists all Lehigh Valley Transportation Enhancement/Hometown Streets/Safe Routes to School/Pennsylvania Community Transportation Initiative projects that have been funded. Map 14 shows their location.

LAND USE PLANNING ISSUES

In Pennsylvania most major decisions concerning land use are made at the local municipal level. In the Lehigh Valley this means land use and development decisions are vested in each of the 62 local cities, boroughs and townships in the region. On the other hand most major transportation decisions are made by PennDOT in concert with regional MPOs such as the LVTS. This situation results in a lack of coordination that makes compatible land use and transportation planning difficult.

Development almost always out paces the capacity to deliver transportation infrastructure. In areas of rapid growth, major highway and transit construction projects developed in the 1970s are inadequate to handle current traffic. In moderate growth areas such as the Lehigh Valley, traffic and congestion problems are at a lower level, but they exist. If transportation improvements do not keep up with new development, congestion will continue to grow.

There are few regions in the United States that have successfully dealt with coordinating land use and transportation issues. Many are now trying to deal with it through the adoption of growth management strategies and transportation strategies that are assumed to be compatible with growth management. The most important strategies focus on increasing density and transit opportunities in urban cores or urban corridors and preserving open space in rural areas. Map 15 shows the general land use plan for the Lehigh Valley. The Lehigh Valley Planning Commission intends to steer highway capacity projects to areas designated for urban growth.

PennDOT has embarked on a Smart Transportation effort. Municipal decisions on land use often result in development which the road network can not adequately handle. Conversely, the development of new or expanded transportation facilities may expose areas to added development pressure. Smart Transportation recommends a new approach to roadway planning and design where transportation investments are tailored to the unique specific needs of each project. The different contexts of each project, such as financial, community, land use, transportation, and environmental resources, determine the design solution. Context sensitive design, network connectivity, access management and corridor management are all considered workable elements of Smart Transportation. To promote Smart Transportation, LVPC and PennDOT jointly conducted a Smart Transportation course in January 2009 for municipal officials, planners, and engineers. PennDOT has made efforts at furthering Smart Transportation through the Linking Planning and NEPA/New Project Development Process, implementing context-sensitive solutions, the development of a Smart Transportation Guidebook, and revisions to both design manuals and the highway occupancy permit (HOP) process. Additional efforts will focus on seeking municipal buy-in on Smart Transportation by further promotion of these principles.

Most local municipal plans do not link land use and transportation. In fact many local plans don't contain a transportation element. Municipal involvement in transportation deals primarily with the regulation of local streets through the subdivision review process. Very few municipalities have taken advantage of the transportation impact fee process in the current municipalities planning code. Fewer still undertake access management procedures or plan for new or expanded road infrastructure in capital improvement programs. The Pennsylvania Municipalities Planning Code (MPC) conveys authority on municipalities to do much, but they choose to do little. Without changes to the MPC, PennDOT and regional planning agencies are not likely to achieve their goals.

ENVIRONMENTAL JUSTICE

Presidential Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed on February 11, 1994. The Order requires Federal agencies to achieve environmental justice by identifying and addressing disproportionately high and adverse human health and environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations. On April 15, 1997, the U.S. Department of Transportation issued its Order to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 5610.2) to summarize and expand upon the requirements of Executive Order 12898 on Environmental Justice.

Consequently, State DOTs and MPOs are responsible for identifying and addressing Environmental Justice issues. Specifically, MPOs must:

TABLE 21

**LEHIGH VALLEY TRANSPORTATION ENHANCEMENT & HOMETOWN STREETS/SAFE ROUTES
TO SCHOOL & PENNSYLVANIA COMMUNITY TRANSPORTATION INITIATIVE PROGRAM
SUMMARY OF APPROVED PROJECTS**

Project #	Project Name	Program Year	Grant Request	Total Cost
1	D & L Trail	1992	\$ 1,324,000	\$ 1,716,250
2	Canal Restoration, Section 8, Lehigh Canal	1992	\$ 170,000	\$ 250,000
3	Bike Racks on LANTA Metro Buses	1992	\$ 10,000	\$ 15,000
4	Ironton Railroad Right-of-way Acquisition	1994	\$ 206,000	\$ 262,500
5	Lehigh Canal Locks #23 and #24	1994	\$ 40,000	\$ 50,000
6	Bicycle Racks (Bethlehem)	1994	\$ 16,000	\$ 20,000
7	Downtown Easton Pedestrian Pathways Program	1999	\$ 296,000	\$ 309,500
8	Ground Hog Locks Restoration	1999	\$ 1,500,000	\$ 1,800,000
9	Phase IV - Regional Bike/Ped Trail (Palmer Twp.)	1999	\$ 253,551	\$ 253,551
10	Ironton Rail Trail Construction	1999	\$ 329,800	\$ 360,000
11	The Riverwalk at Lehigh Landing	2000	\$ 550,000	\$ 619,500
12	Nor-Bath Trail - Phase IV	2000	\$ 100,000	\$ 400,000
13	Emmaus Downtown Streetscape Improvements	2000	\$ 97,000	\$ 105,000
14	Plainfield Township Recreation Trail	2000	\$ 195,779	\$ 212,079
15	Restoration of Lehigh Canal - Section 8	2000	\$ 420,000	\$ 488,270
16	Tatamy Borough Trail	2002	\$ 106,369	\$ 212,738
17	Lehigh Canal Heritage Bridge	2002	\$ 211,200	\$ 264,000
18	Lehigh Canal Restoration - Easton	2002	\$ 209,300	\$ 209,300
19	West Easton Rails-to-Trails	2002	\$ 360,000	\$ 405,000
20	Lehigh County Historical Society A & B Building	2002	\$ 300,000	\$ 1,387,250
21	Bethlehem Southside Streetscape Program	2002	\$ 250,000	\$ 785,000
22	Bath Streetscapes	2002	\$ 280,160	\$ 396,583
23	Lehigh Canal Restoration, Outlet Lock & Section 8	2004	\$ 430,100	\$ 516,176
24	City of Allentown Beautification Project - Phase II	2004	\$ 345,000	\$ 391,000
25	Transportation Enhancement Project - Emmaus	2004	\$ 384,882	\$ 429,282
26	Macungie Walkable Community Initiative - Phase I	2004	\$ 517,912	\$ 575,045
27	South Bethlehem Right-of-way Acquisition	2004	\$ 200,000	\$ 300,000
28	Allentown 7th Street Revitalization	2004**	\$ 476,100	\$ 501,300
29	Bangor Downtown Improvements	2004**	\$ 491,309	\$ 526,196
30	Bath Streetscapes & Safe Routes to School	2004**	\$ 230,000	\$ 380,000
31	Easton Streetscape Enhancement Project	2004**	\$ 483,661	\$ 571,097
32	N. Lehigh Downtown Revitalization & Streetscape Enhancement Project	2004**	\$ 225,400	\$ 677,000
33	Emmaus Safe Routes to School 2005-06	2004**	\$ 349,390	\$ 385,390
34	Bethlehem City Safe Routes to School	2004**	\$ 248,657	\$ 355,380
35	Wilson Safe Crosswalks to School Project	2004**	\$ 34,483	\$ 40,483
36	2005 - 2006 Emmaus Transportation Enhancement Project	2006	\$ 355,845	\$ 391,845
37	Bethlehem Elm Street Plan Streetscape Improvements	2006	\$ 249,895	\$ 315,655
38	Expansion of L.V. Bicycle Education Program	2006	\$ 80,200	\$ 80,200
39	Freemansburg Community Gateway & Main Street Project	2006	\$ 54,625	\$ 61,925
40	Northampton Gateway Beautification Project	2006	\$ 154,045	\$ 261,224
41	West Ward - Northampton Street Gateway Streetscape Improvements	2006	\$ 303,000	\$ 358,200
42	7th Street Hometown Streets, Completion of N. 7th Street	2006	\$ 563,500	\$ 599,500
48	South Bethlehem Greenway	2006	\$ 800,000	\$ 1,600,000
43	Creation of Safe Student Walking Routes to Pen Argyl Schools	2006**	\$ 317,400	\$ 367,080
44	Manassas-Guth Covered Bridge	2006**	\$ 230,000	\$ 230,000
45	Hellertown Home Town Streets	2006**	\$ 306,993	\$ 355,045
46	Lehigh River Waterfront Development	2009***	\$ 300,000	\$ 300,000
47	Hellertown Walkable Communities Initiative	2009***	\$ 90,500	\$ 90,500
48	South Bethlehem Greenway	2009***	\$ 1,640,000	\$ 1,640,000
49	Larry Holmes Drive Traffic Calming	2009***	\$ 3,500,000	\$ 3,840,000
TOTAL - LEHIGH VALLEY TRANSPORTATION ENHANCEMENT PROGRAMS			\$ 10,864,163	\$ 14,801,573
TOTAL - LEHIGH VALLEY HOMETOWN STREETS/SAFE ROUTES TO SCHOOL PROGRAM			\$ 3,393,393	\$ 4,388,971
TOTAL - PENNSYLVANIA COMMUNITY TRANSPORTATION INITIATIVE PROGRAMS			\$ 5,530,500	\$ 5,870,500

Source: LVPC.

Footnote: The \$360,000 from the West Easton Rails-to-Trails project was deprogrammed. Funds were allocated to year 2004 enhancement applications.

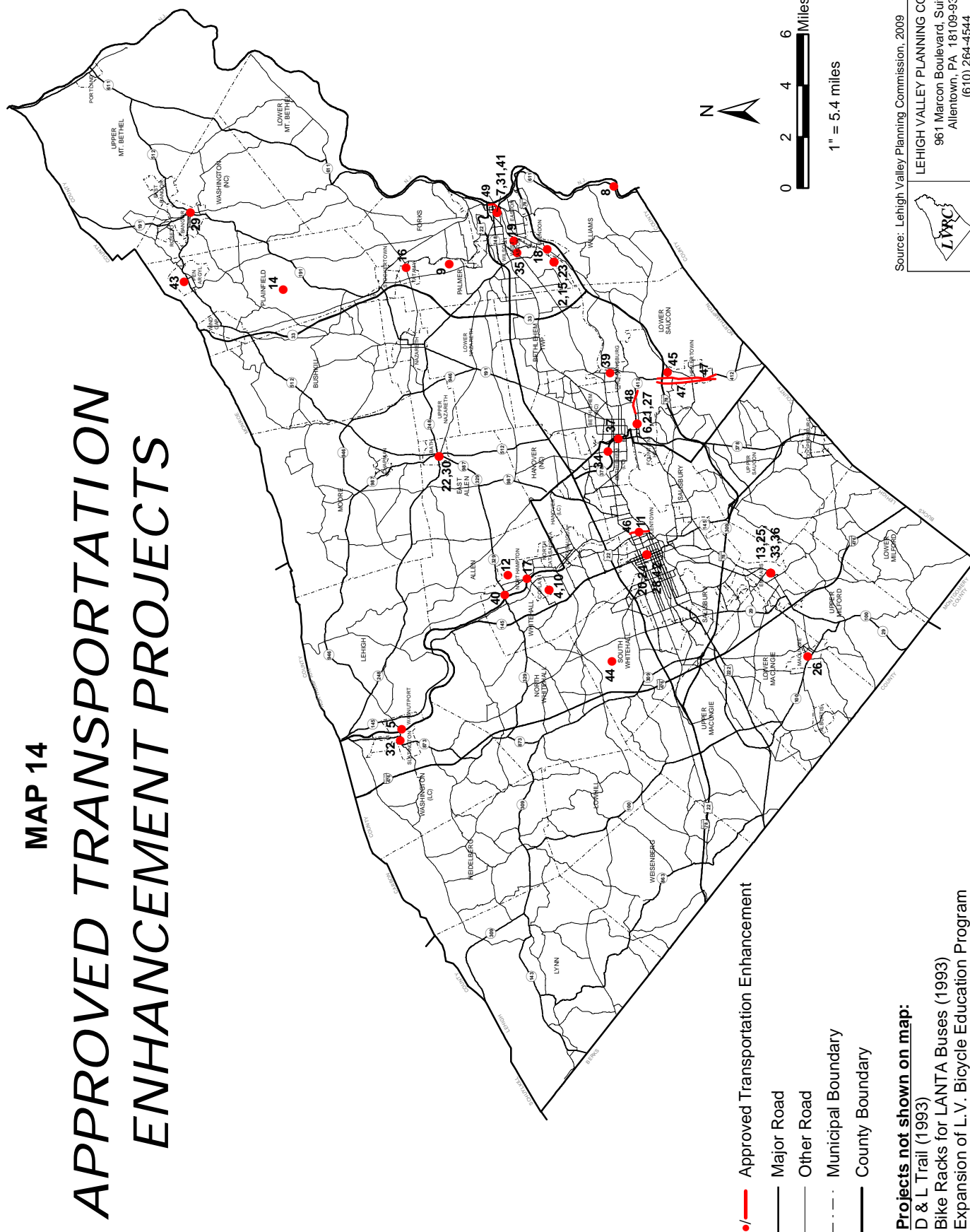
** = Hometown Streets/Safe Routes to School Program Projects

*** = Pennsylvania Community Transportation Initiative Program Projects

Project numbers refer to Map 14.

MAP 14

APPROVED TRANSPORTATION ENHANCEMENT PROJECTS



Source: Lehigh Valley Planning Commission, 2009

LEHIGH VALLEY PLANNING COMMISSION
 961 Marcon Boulevard, Suite 310
 Allentown, PA 18109-9397
 (610) 264-4544

- Enhance their analytical capabilities to ensure long range transportation plan and TIP compliance with Title VI/Environmental Justice;
- Identify residential, employment, and transportation patterns of minority and low-income populations to identify and address their needs;
- Evaluate and improve, if necessary, the public involvement process to eliminate participation barriers and engage minority and low-income populations in the transportation decision making process.

The LVPC, as a member of the MPO, has taken proactive steps to address issues associated with environmental justice. In 1998, a Lehigh County Welfare-to-Work Study was undertaken. It identified the location of welfare recipients, licensed day care centers, employers, and LANTA's fixed route system. The spatial relationships of these groups were mapped to show proximity to the bus system. During development of the 2005–2008 TIP, staff identified, through a series of maps, the locations of Black, Hispanic, and Asian populations as well as income below poverty level. LANTA developed a Region-wide Job Access & Reverse Commute Transportation Plan in 2001 which: identifies the geographic distributions of welfare recipients, low-income persons, and employment centers in the region; identifies the existing public, private, non-profit, and human service transportation services in the region; identifies transportation gaps between the geographic distributions of groups; and identifies a prioritized list of projects addressing these gaps in service. The plan was completed in April 2001. Projects selected for implementation and funding should become self-sustaining within several years after service introduction. A mobility manager position was developed as a result of LANTA's Job Access & Reverse Commute Transportation Plan and staffed by the Private Industry Council. The main task of this position is to serve as a one-stop shopping source for transportation information and assistance that reacts to individual client needs and provides a central point of contact. In addition, LANTA enhanced Saturday bus service and reinstated Sunday service. Moving LANTA Forward – the Regional Public Transportation Plan for the Lehigh Valley, adopted February 2010, will benefit the minority and low-income populations groups as a result of the improvements recommended in the plan which, in part, include core service improvements – concentration of service on major corridors to maximize service frequency; more direct connections to minimize the need for passengers to transfer; increased service duration; and improved public information regarding services offered.

Most recently, an Environmental Justice report was developed in February 2009 which identifies the distribution of highway, bridge, transit, and transportation enhancement projects contained within the 2007 – 2030 long range plan and 2009 – 2012 Transportation Improvement Program relative to the locations of minority and low-income populations. The report was done to identify the benefits and burdens of proposed transportation investments on minority and low-income populations to ensure that they are not disproportionately impacted as a result of the transportation planning process. The report demonstrated that the plan and program as a whole does not create a disproportionately high and adverse impact on low-income and minority populations based upon the distributions cited and that the plan and program is consistent with Executive Order 12898 and the Department of Transportation Order to Address Environmental Justice in Minority Populations and Low-Income Populations.

LVTS has supported and continues to support projects in EJ communities that will provide long-term benefits without disproportionate adverse impacts. These projects include but are not limited to transit intermodal centers in the cities of Allentown, Bethlehem, and Easton; Route 412 Improvements; replacement of the Linden Street Bridge in Allentown; replacement of the 4th Street/Daly Avenue and Lynn Avenue bridges in Bethlehem; and the retrofitting of curb to obtain ADA compliance.

The report does not analyze the benefits or burdens of individual projects – a task that generally had been conducted during the preliminary engineering phase as more project-specific details, such as proposed design alternatives, right-of-way impacts, etc. become available. The project-level analysis takes into account a more detailed look at determining any potential disproportionately high and adverse impacts.

Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency (LEP), was issued on August 11, 2000. The order directs federal agencies to break down language barriers by implementing consistent standards of language assistance across agencies and among all recipients of federal financial assistance. Under this flexible standard, agencies and recipients must take reasonable steps to provide meaningful access to their programs and activities. Among factors to be considered are the number or proportion of LEP persons in the eligible service population, the frequency with which LEP persons come in contact with the program and the available resources. In addition to activities conducted to meet Environmental Justice mandates, the LVPC began an LEP analysis identifying both households linguistically isolated and Spanish households linguistically isolated. These groups are identified on the maps located in Appendix B.

Issues relating to environmental justice are addressed and considered in the transportation planning process. Staff will continue to undertake additional activities to ensure compliance with Executive Order 12898. As LANTA and the LVPC review the impacts of increasing service frequency along certain routes and providing express bus routes, environmental justice issues will be addressed to ensure compliance. Also the LVPC will provide socio-economic data for documentation of LANTA's Title VI compliance. These additional activities can be found in Appendix B.

CHAPTER 4

TRANSPORTATION PLAN

The long range transportation plan recommends policies and projects that will be studied, designed and built over the next 20 years. Under federal law the plan is updated every 4 years in air quality non-attainment areas.

This chapter is divided into six parts. First, we have summarized some of the key findings that will influence future transportation in the region. Second, we present the goals and policies that form the foundation for future action. Third, Tables 22 and 23, Maps 15 and 16, and accompanying text present the project recommendations. The fourth part of the chapter includes a brief statement on air quality conformity. The fifth part of the chapter presents a long range financial plan for this transportation plan. The section is concluded with a discussion on plan implementation.

KEY FINDINGS

Chapters 2 and 3 present data, findings from past studies and experiences that impact goals, policies and project recommendations in this report. Many of the transportation issues facing the Lehigh Valley are similar to those found in other regions. Peak hour congestion, increasing vehicle miles traveled, low transit patronage, safety and maintenance issues are common transportation problems. Continuing growth in passenger car registrations and vehicle miles of travel demonstrates the public preference for driving over other transportation modes. Following are some of the features that are important in planning future transportation in the Lehigh Valley.

- a) According to a voter's survey conducted by the Lehigh Valley Planning Commission in 2010, traffic congestion is perceived as a major issue in the Lehigh Valley. When asked to rank the most important transportation improvements needed, voters give highest priority to improving inter-city commuter services by expanding bus service or building commuter rail facilities to New Jersey, New York and Philadelphia. Voters also supported the widening of Route 22 when asked for the best long-term option for fixing the road.
- b) Low density, dispersed development patterns and the absence of a strong central downtown with high employment and a high concentration of business activity leads to increased dependence on automotive travel and diminishes the role of transit.
- c) Housing is spreading into rural areas while employment is highly concentrated in the Route 22 corridor and access roads to Route 22. Traffic congestion in this corridor will grow in the future and safety problems will multiply unless measures are taken to add capacity and improve interchanges.
- d) LANTA provides approximately 20,000 trips per weekday, an increase of 69% since 1997. Further increases in transit usage could be facilitated with wider use of transit friendly site design and location of major developments along transit corridors. Service enhancements planned in the *Moving LANTA Forward* document could also result in increased patronage.

- e) The network of major regional roads is connected and access to Lehigh Valley communities is greatly improved. Completion of the American Parkway and Route 412 will assure excellent access within the Lehigh Valley.
- f) Park and ride facilities that serve New Jersey, New York and Philadelphia commuters, implementation of ITS strategies, and access management by municipalities are measures that can help manage traffic, reduce crashes and increase road capacity.
- g) Presently, the most cost effective method of providing interregional transit is via privately operated buses. To date, studies of restoring intercity rail point to high capital and operating costs and low levels of ridership.
- h) Land use decisions made by 62 units of local government and private developers determine the location and intensity of development in the Lehigh Valley. These decisions are the primary factors influencing trip generation, distribution of traffic and the success or failure of transit. In Pennsylvania they are not controlled to any substantial degree by PennDOT, the metropolitan planning organization or the regional planning commission.

GOALS AND POLICIES

To be placed in the Transportation Plan, projects originating at the MPO level must pass through a screening process to determine how the project addresses transportation problems. The screening seeks to determine if a proposed project is in accord with LVTS Goals and Policies. It is this screening process that differentiates a plan from a wish list. The major policies involved in placement of projects in the long range plan are outlined in one or more of the policy statements listed under goals and policies.

GENERAL GOALS AND POLICIES

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

Policies

- In general, the entry point for a project shall be a study of need developed by any of the following parties – PennDOT, the MPO, LVPC, LANTA, local municipalities in the Lehigh Valley, a credible private organization.
- The MPO may periodically consider and act upon placement of projects on the long range element, medium range element or short range element. Such placement may be based on immediacy of need, status of studies, and financial constraints of the Transportation Improvement Program and Long Range Plan.
- Plan Consistency- Projects must comply with the transportation goals and policies of the LVTS and *Comprehensive Plan The Lehigh Valley...2030* adopted by Lehigh and Northampton Counties in June 2005.
- Financial – Projects must be on the Federal Aid System or they must be a state road to be eligible for Federal or state funds unless Federal safety funds are used, in which case all public roads are eligible. Projects other than transportation enhancements must have a cost

- greater than \$100,000. The cost of procuring Federal funds for projects less than \$100,000 is prohibitive.
- Highest priority shall be assigned to those projects that are essential for safety, maintenance of the transportation system, and/or relief of congestion.
 - Functional classifications of the regional highway network should be coordinated with the corresponding designations of bordering regions and states.

HIGHWAY GOALS AND POLICIES

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

Policies

- Give high priority to projects that upgrade unsafe roads and intersections, rehabilitate or replace deficient bridges, and upgrade existing highways that are deficient.
- Upgrade unsafe roads and intersections to current design standards.
- Conduct planning studies on high priority congestion and safety corridors and program appropriate improvements.
- Safety projects shall be identified based on the high priority safety corridors shown on Map 9 and Table 13 or from other credible, documented safety analyses.
- Maintenance Projects – Maintenance priorities will be determined through a combination of life cycle considerations and road condition (IRI values). Priority will be given to roads that have high traffic volumes and a high level of regional importance. Priorities will be revisited at least every two years.
- Bridges – Bridges with a sufficiency rating of 0 to 50 are eligible for replacement. Bridges with a sufficiency rating of 50 to 80 are eligible for rehabilitation. Bridges posted or judged to be structurally deficient will also receive priority treatment. All other bridges are eligible for preventive maintenance improvements only.
- Access Management – Access management practices should be initiated in accord with recommendations of the LVPC report entitled *Access Management on Arterial Roads*.

3. *Goal – To reduce traffic congestion and to provide access to major traffic generators.*

Policies

- Support highway capacity improvements only in areas designated for urban development in the *Comprehensive Plan The Lehigh Valley...2030*.
- Congestion Relief Projects – Projects with a congestion relief (mobility) justification must have documented evidence of existing congestion or forecasts of future congestion. They must be identified in the LVTS Congestion Management Process.
- New/Expanded Facilities – Facilities involving capacity improvements must be justified primarily on the basis of current or future congestion or safety problems. Additional factors such as access improvement and economic development may be given consideration to the degree that they support the goals and policies of *Comprehensive Plan The Lehigh Valley...2030* and that the financial resources are available.
- Congestion relief and access improvement projects shall address intermodal connections where such connections are appropriate.

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

Policies

- Preserve arterial roads for their through traffic carrying function by reducing on-street parking and curb cuts for driveways through access management techniques.
- Highway improvements should be scaled to needs that result from reliable and documented travel forecast procedures.
- Improvements to existing highways at current locations are generally preferred over relocations and bypasses.
- Improvement of existing interchanges on Route 22, I-78, the Pennsylvania Turnpike and Route 33 to resolve major safety and capacity problems will be supported if sufficient funds are available. Interchanges at new locations are not recommended unless there is a compelling and well documented need that cannot be met by upgrading an existing interchange.
- This plan supports strategies for transportation system management, intelligent transportation systems, access management practices, and context sensitive design in appropriate situations.
- Travel demand on existing facilities should be met to the greatest degree possible by programming low cost safety and mobility improvements.
- Support development of park and ride lots where there is documented demand for such facilities.
- Improve sidewalk, trail, and local street connectivity to reduce the number of vehicle trips taken on the major highway network.
- Municipalities should adopt impact fee ordinances to help finance highway improvements.
- When feasible transit should be used to mitigate short term, high volume traffic destinations such as special events rather than building permanent capacity improvements.
- Fixed route transit service should be provided only in those areas where there is a market for such service and it is financially feasible through operating revenues and necessary subsidies.
- The use of private contractors for the provision of transit service should be considered when such service is provided at equivalent service levels with lesser public subsidies.
- Replace buses on a regular basis based upon life-cycle costs and LANTA's financial capacity.

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

Policies

- Major highway and bridge projects should be studied, designed and constructed in accordance with the most recent environmental regulations.
- Through-traffic should be diverted away from existing residential areas to the degree that alternatives are technically and financially feasible.
- Hydrocarbon, nitrogen oxide and small particulate matter emissions from automobiles should not exceed the prevailing Federal standards for clean air.

- Principles of contextual design that include aesthetic considerations should be applied during design.
- Major highway and interchange projects should not be located in areas designated for natural features or agricultural preservation in *Comprehensive Plan The Lehigh Valley...2030*.

TRANSIT GOALS AND POLICIES

6. *Goal – Support the enhancement of the transit system to provide adequate mobility to area residents and promote transit use as an alternative to single occupancy driving.*

Policies

- Provide convenient and reliable fixed-route service between higher-density residential areas, major employment concentrations, important shopping areas, key government facilities, medical facilities, and other activity areas.
- Maintain and update facilities to keep up with new technologies.
- Provide coordinated specialized public transportation for people who cannot use conventional bus services.
- Meet basic transportation needs, support desired economic and environmental goals, and appeal to an increasing number of people.
- Shopping, workplace, government, and housing facilities designed for the transit dependent should be sited at locations where transit service exists or is feasible.
- LANTA should continue to offer and improve a wide range of service options to meet a variety of mobility needs in the Lehigh Valley.
- Higher density housing and employment facilities should be developed along transit service routes. In the LANTA market area, a minimum density of five dwelling units per acre should be developed.

7. *Goal – To have a sufficient supply of convenient inter-city public ground transportation available to popular destinations such as New York City and Philadelphia.*

Policies

- This service should be met through unsubsidized privately owned bus operators, to the degree possible.
- New publicly subsidized service should not be established unless established unsubsidized bus operators are unwilling or unable to supply a sufficient convenient service.
- Adequate and convenient terminals should be available for inter-city buses.
- Service opportunities to important destinations outside of the Lehigh Valley should be reviewed on a regular basis or as significant changes dictate.
- Rail rights-of-way should be preserved for future rail reuse if analysis shows that the reestablishment of future service is warranted and financially feasible.

RAIL FREIGHT GOALS AND POLICIES

8. *Goal – To have available and dependable rail freight service available to existing and potential incoming businesses.*

Policies

- Provide competitive rail freight service through private capital investment in rail facilities.
- Public investment in acquiring, upgrading, or operating lines proposed for abandonment should be limited to those instances where the investment is cost effective relative to employment opportunities and tax revenues and/or is a cost effective way of reducing highway travel.
- Land near rail lines which meets the Comprehensive Plan's criteria for industrial siting should be designated for industrial uses.
- Support increasing rail clearances in the Lehigh Valley to accommodate double stack rail cars and wide loads.
- Plan, program and build intermodal transportation improvements to accommodate current and future travel demand.
- Support access to facilities and freight terminals that are otherwise compatible with the regional comprehensive plan.
- Provide safe at-grade crossings by upgrading to current safety standards.

BICYCLE/PEDESTRIAN GOALS AND POLICIES

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

Policies

- Rail rights-of-way proposed for abandonment should be acquired if analysis shows that they are desirable for recreation, road ROW, utility ROW or other uses.

10. ***Goals – To support bicycle and pedestrian activity and to provide safe access to the transportation system for cyclists and pedestrians in the Lehigh Valley.***

Policies

- Promote transportation infrastructure improvements such as shoulder improvements, sidewalks, and crosswalks to resolve bicycle and pedestrian safety issues. The appropriateness of bicycle facilities should be considered as part of all road projects.
- Support the development of regulations in local municipalities that mandate construction of sidewalks and pathways to serve pedestrian and other non-motorized traffic.
- Support the construction of rails-to-trails projects for use in both recreation and transportation.
- Promote the construction of missing links in the bicycle and pedestrian networks.
- Support future development patterns conducive to non-motorized travel.
- Replace transportation enhancement projects that significantly fall behind performance milestones set at the time a project is funded.
- Provide safe, convenient bicycle parking and storage facilities in urban areas.
- PennDOT should adopt B/P design and performance standards. Consideration of pedestrians and bicyclists should be given when designing and locating traffic control devices, signs, and crosswalks.

11. **Goals** – *To ensure that air quality in the Lehigh Valley meets the National Ambient Air Quality Standards for ozone and small particulate matter ($PM_{2.5}$).*

Policies

- Highway improvement projects that have a negative impact on air quality should not be programmed (as mandated by the Clean Air Act Amendments of 1990).
- Transportation control measures such as carpooling and encouraging increased transit usage should be implemented, where feasible, to reduce vehicle miles traveled and emissions.

PROJECTS AND PROGRAMS

The plan is divided into three time intervals as follows:

2011-2014 (Short Range Element): This segment is also referred to as the Transportation Improvement Program (TIP). It includes the highest priority projects for the region. Most projects on the TIP have advanced to at least the environmental assessment/preliminary design stage (with the exception of corridor studies). Most are scheduled for construction during the four year period. Projects must be on the TIP to receive Federal funding.

2015-2022 (Medium Range Element): Projects in this category are generally in the early stages of study. Most of these projects originate in studies of congestion and or safety conducted by the Lehigh Valley Planning Commission and others. Some will have advanced to the environmental and engineering analysis stage. In most cases, specific funding requirements for projects in this phase will be very preliminary. The medium term includes the second and third four year segments of Pennsylvania's Twelve Year Program. Major capital projects must be on the Twelve Year Program to receive State funding.

2023-2030 (Long Range Element): These are projects that address long term congestion and or safety issues. There is no guarantee that all projects in the long term phase of the plan will be built. Projects on the long range plan will require substantial further analysis and funding commitments before they can move forward to environmental assessment, preliminary design, final design and construction.

Projects in the transportation plan are determined by the various technical analyses of PennDOT, LANTA and LVPC (serving as technical staff for the LVTS). In some cases, the plan recommends and supports numerous projects that have been brought to the attention of LVTS by local municipalities and others. Typically, projects pass through a preliminary screening process conducted by the Lehigh Valley Transportation Study (LVTS) before they are placed in the plan. Exceptions to this process, such as Congressionally mandated "High Priority (Demonstration) Projects," are also included. Normally, projects start in the long range plan element and then move through the medium and short range elements of the plan as more detailed studies and design elements are completed.

Information from local municipalities is valuable in identifying projects. Presentations are frequently made to the LVTS Technical Committee at the request of the municipalities to express project needs in their community.

TRANSPORTATION IMPROVEMENT PROGRAM (2011-2014)

The TIP is the locally endorsed list of high priority highway and transit projects proposed to be implemented with Federal assistance. The Federal and State Governments designated the LVTS as the body responsible for preparing the TIP for Lehigh and Northampton Counties. The Federal government requires that the TIP shall: (1) consist of improvements from the locally developed transportation plan; (2) cover a period of not less than three years; (3) indicate the area's priorities; (4) include realistic estimates of the total cost and revenues for the program period; and (5) conform to air quality regulations. Both highway and transit projects proposed to be implemented with Federal assistance must be included in an approved TIP as a condition to Federal review and approval. A defining characteristic of the TIP is that it must be constrained to the level of funding that can be "reasonably expected to be available." PennDOT provides each MPO in Pennsylvania with specific guidance regarding funding. Funds are allocated to the MPOs by PennDOT based on a formula that considers population, lane miles of eligible roads, and vehicle miles of travel. Table 22 and Map 15 show highway, bridge and transit projects on the short term element (TIP) of the transportation plan.

KEY HIGHWAY PROJECTS (SHORT RANGE ELEMENT – 2011 TO 2014)

American Parkway Extension – The proposed four lane extension of American Parkway from Front Street to the existing roadway on the east side of the Lehigh River will provide an additional Lehigh River crossing and should reduce congestion along the highest volume section of Route 22. Construction for this project is now fully-funded. New England Avenue, which will provide a new connection between Hanover Avenue and Dauphin Street, is currently under construction.

In 1999, PennDOT earmarked \$8.5 million of "spike" and "economic development" transportation funds to build the portion of the extension from Lehigh Street to Airport Road when Lucent Technologies (now LSI) announced plans to construct a new office/research facility in Hanover Township, Lehigh County. This portion of the project was completed in 2002. It is estimated that construction will start on this project in late 2011.

Route 412 Improvements – The redevelopment of 1,700+ acres of Bethlehem Steel property on the south side of Bethlehem will significantly increase future traffic volumes in the area. To negotiate the efficient movement of goods and persons, improvements to the Route 412 corridor from I-78 extending west to Route 378 will be needed. The plan includes widening Route 412 from I-78 to the Minsi Trail Bridge. Construction is scheduled to begin in late 2010.

22/Tomorrow – A Corridor Planning Study – A planning study of the Route 22 corridor from I-78 to Route 33 was completed in 2001 by the LVPC. The study identifies five project needs: improve safety on Route 22; reduce congestion; not increase congestion on feeder and parallel roads; reduce the impacts of incidents on traffic flow; and support land use and redevelopment goals in the regional comprehensive plan. The Lehigh Valley Planning Commission analyzed 42 potential improvement scenarios. These scenarios included widening Route 22, by-pass alternatives, existing network improvements, public transit improvements, non-construction improvements and various combinations of improvements. The scenarios that best meet future needs all involve widening Route 22 and improving the interchanges. However, due to limited financial resources, this project has been downscoped to two interchange improvements that focus on safety issues only. The proposed new Rt. 22 Section 400 Phase I project

TABLE 22
DRAFT TRANSPORTATION IMPROVEMENT PROGRAM (TIP)
2011 - 2014

Highways			Bridges			Transit		
Project	Phases	Cost (\$000)	Project	Phases	Cost (\$000)	Project	Cost (\$000)	Cost (\$000)
American Parkway	FD/UR/C	\$ 49,687	Cedar Crest Blvd. over Cedar Creek	U/R/C	\$ 3,861	Purchase Vans/Minibuses (80)		\$ 5,480
Bath Streetscape	C	\$ 230	Chapman Bridge	FD/UR/C	\$ 8,954	Heavy Duty Bus Purchase (30)		\$ 11,251
D & L Trail (Phases 3/4/5)	C	\$ 1,332	Cold Springs Bridge	U/R/C	\$ 5,050	ITS and Security Projects		\$ 1,600
Lehigh Avenue Retaining Wall	FD/R/C	\$ 1,141	Coplay-Northampton Bridge	FD/UR/C	\$ 9,627	JARC Program		\$ 1,000
Manassas Guth Covered Bridge	C	\$ 230	Eighth Street Bridge	FD/UR/C	\$ 8,375	New Freedom Program		\$ 1,000
22 Sec. 400 - Phase 1 (145)	FD/UR/C	\$ 15,518	Haines Mill Road over Cedar Creek	U/R/C	\$ 872	Allentown Garage Replacement		\$ 2,000
22 Sec. 400 - Phase 2 (LRB)	FD/UR/C	\$ 40,487	Hunters Hill Road Bridge	C	\$ 1,352	Easton/Bethlehem Garage		\$ 500
Rt. 100/Claussville Rd. Intersection	C	\$ 3,120	Lehigh Street Bridges	C	\$ 12,547	Heavy Duty Bus Purchase (20) Hybrid Power		TBD
Rt. 100/Rt. 29 Intersection	PE	\$ 250	Lehigh St./Coplay Creek Bridge	C	\$ 2,392	Signs and Shelters		\$ 1,600
Rt. 145 Safety Project	C	\$ 11,128	Ontelaunee Creek Bridge - Donats Rd.	U/R/C	\$ 3,440	Enhancement Projects 2011 - 2014		\$ 413
Rt. 222 Tixelertown Section 002	C	\$ 1,956	Phaon Bittner Bridge	U/R/C	\$ 3,206	General Miscellaneous		\$ 4,175
Rt. 248 Realignment/Intersection Improvement	C	\$ 570	Schantz Road Realignment	C	\$ 352	Preventative Maintenance 2011 - 2014		\$ 23,750
Rt. 309/Sand Spring Rd. Intersection	FD/R/C	\$ 2,600	Schlitchers Covered Bridge	FD/UR/C	\$ 2,418	ADA Paratransit Service Capitalization		\$ 4,125
Schantz Road Realignment	C	\$ 1,406	Slatedale Bridge	C	\$ 1,040	Planning/Program Development		\$ 1,800
Second Street Extension (Catasauqua)	FD/UR/C	\$ 7,248	Spring Creek Road Bridge	FD/UR/C	\$ 3,129	Service Vehicle Replacements		\$ 200
Seventh Street Rail Crossing Upgrade	C	\$ 220	T-787 W. Grant Street	C	\$ 624	Total - Transit Element		\$ 58,894
Sixth Street Rail Crossing Upgrade	C	\$ 220	Tighman St. Bridge over Lehigh River	FD/UR	\$ 3,245			
31st Street Rail Crossing Upgrade	C	\$ 315	Union Street Bridge	FD/UR/C	\$ 3,370			
Newburg Rd/Country Club Intersection	C	\$ 250	Ward and 15th Street Bridges	C	\$ 4,680			
Rt. 33/Freemansburg Interchange (1)	C	\$ 4,905	Indian Creek Bridge	U/R/C	\$ 793			
Rt. 412 Improvements	C	\$ 37,545	LMBT Oughoughton Tributary	U/R/C	\$ 1,180			
Rt. 412 Second St. Ramp	C	\$ 1,685	Lynn Avenue Bridge	FD/UR/C	\$ 6,111			
Freeway Service Patrol	C	\$ 300	Maple Drive Bridge	U/R	\$ 140			
Project Delivery Assistance	PE	\$ 1,040	Messinger Street Bridge	U/R/C	\$ 6,199			
CMAQ Line Item		\$ 781	Mountainview Drive Bridge	U/R	\$ 109			
Highway Reserve Line Item		\$ 673	Northampton County Bridge #102	FD/UR/C	\$ 1,414			
Betterment Reserve Line Item - NHS/Urban/Non NHS Rts.		\$ 16,942	Northampton County Bridge #189	FD/UR/C	\$ 2,147			
Rail/Highway Line Item		\$ 1,143	Northampton County Bridge #191	FD/UR/C	\$ 1,724			
Transportation Enhancement Line Item		\$ 3,321	Oughoughton Creek Bridge	U/R/C	\$ 1,639			
Transportation Enhancement Management		\$ 104	Rt. 191 Bridge over NS-Broad Street	U/R/C	\$ 1,243			
Urban Line Item		\$ 993	Rt. 611 Bushkill Creek Bridge	FD/UR/C	\$ 5,772			
Total - Highway Element		\$ 207,350	SR 4007 Hokendaqua Creek	PE/FD/UR/C	\$ 964			
			24th Street Bridge	C	\$ 1,144			
			Washington Street Bridge	FD/UR/C	\$ 2,988			
			Bridge Review Assistance		\$ 539			
			LVTS Bridge Review Management		\$ 862			
			Bridge Reserve		\$ 1,798			
			Bridge Preservation Line Item		\$ 1,000			
			Total - Bridge Element		\$ 116,300			

Phase Abbreviations:
PE - Preliminary Engineering
FD - Final Design
U - Utility
R - Right-of-way Acquisition
C - Construction

Note: (1) indicates that the project is placed on the TIP to take advantage of special (earmarked) Federal or State funding. By including the project on the TIP, LVTS has made no commitment to allocate TIP funding to these projects. Any additional funding needed as a result of non-Federal match requirements or cost overruns will have to come from funding sources other than the TIP.

would revamp the MacArthur Road interchange. Two ramps would be eliminated in an effort to make weaving movements at the entrance/exit points safer. The MacArthur Road Bridge would be replaced as part of this project. If approved, construction is expected to begin in 2011.

The Rt. 22 Section 400 Phase II project lengthens acceleration and deceleration ramps at the Fullerton Avenue interchange with Rt. 22 and replaces the Rt. 22 bridge over the Lehigh River, in part to accommodate the new ramps. The project would also widen the span under the Fifth Street Bridge in Whitehall Township, again to accommodate a longer acceleration ramp onto Rt. 22. Construction of this project would begin in 2014 and extend into the mid-range element.

As of June 2010, the interchange proposals noted above are still under consideration. Widening of Rt. 22 is not included in the plans for either phase.

Route 33/512 Interchange – The Route 33/512 Interchange in Plainfield Township, Northampton County has been considered a high priority project since March 1995 when it was presented to the State Transportation Commission for inclusion into the 12 year program. The interchange ramps are currently below design standards and will be reconfigured to current standards. Work is scheduled to begin in 2010 and be completed in 2011.

Other Road and Bridge Projects – In addition to the above, the following projects are scheduled for completion by 2014: Route 100/Claussville Road safety improvements (signalization, add turning lanes on Rt. 100); intersection improvements at the Sand Spring Road/Route 309 intersection; and safety improvements in the Route 145 corridor. On the bridge side, plans to replace the 15th Street/Ward Street Bridges in Allentown, the Lehigh Street Bridges in Whitehall Twp. and the Rt. 611 Bushkill Creek Bridge in Easton highlight a bridge program that includes funding for the improvement of 34 bridges in Lehigh and Northampton counties.

KEY TRANSIT PROJECTS (SHORT RANGE ELEMENT)

Purchase 60 Heavy Duty Buses – LANTA's newly-adopted strategic plan *Moving LANTA Forward* identifies service expansion opportunities along their trunk routes. This bus purchase consists of bus replacements and also provides additional buses for limited expansion in the short range element.

Purchase 80 Vans/Minibuses - The Metro Plus fleet, now totaling more than 100 vehicles, provides service to the elderly and people with disabilities in Lehigh and Northampton counties. Maintaining this fleet in optimal condition requires a replacement program. These vehicles will replace vehicles in the fleet which have reached or exceeded their useful life in terms of miles (greater than 250,000) and years (greater than 7 years).

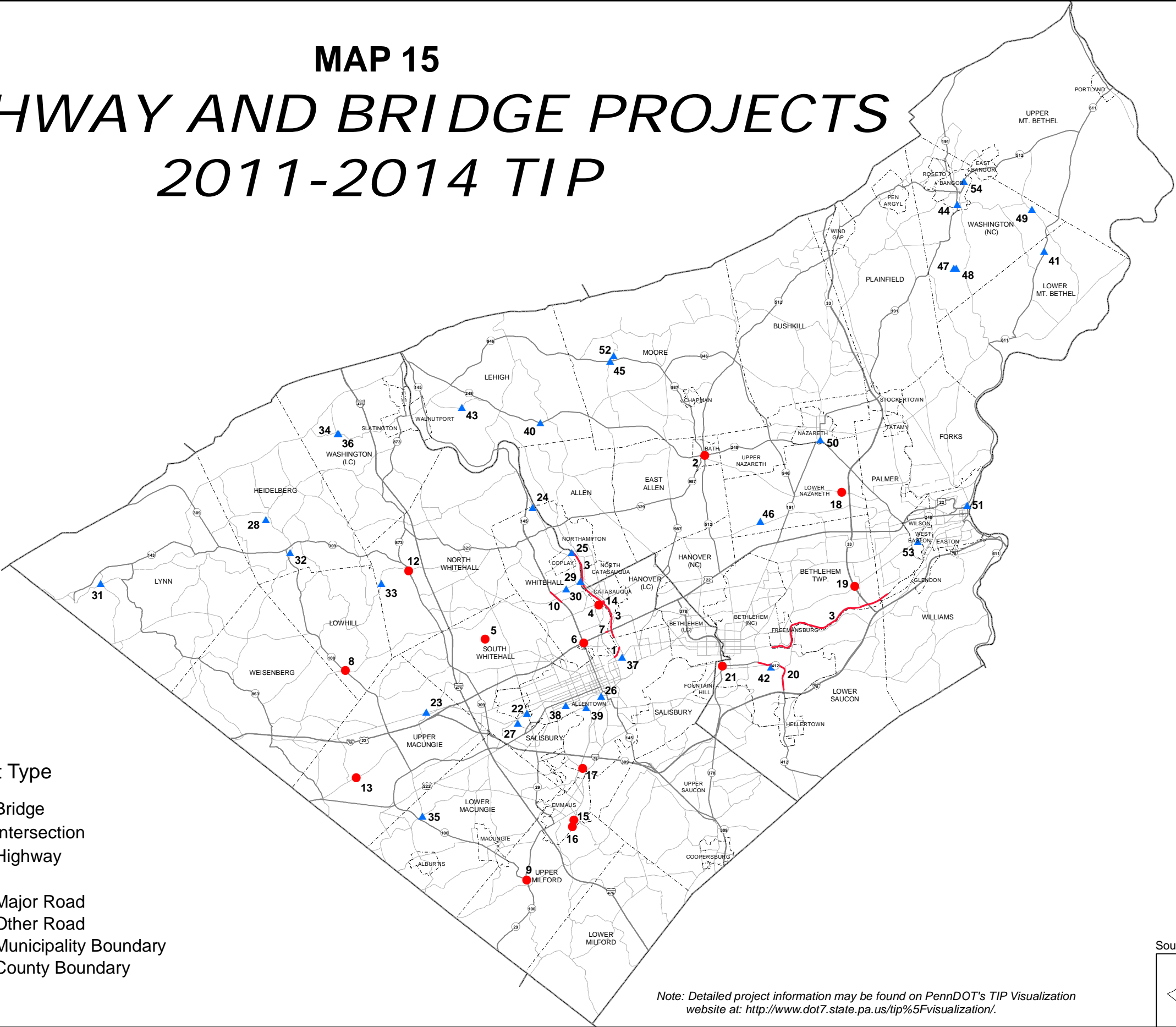
KEY BIKE/ PED AND TRANSPORTATION ENHANCEMENT PROJECTS (SHORT RANGE ELEMENT)

Delaware and Lehigh Canal National Heritage Corridor (D&L Trail) – The D&L Trail was established by an act of Congress in 1988, in part to “assist...in developing and implementing integrated cultural, historical and natural resource policies and programs...” (Public Law 100-692, November 18, 1988). The trail is approximately 150 miles long starting in Bucks County, following the Delaware River to the

MAP 15

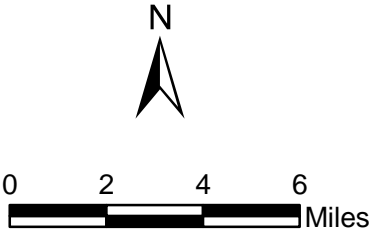
HIGHWAY AND BRIDGE PROJECTS

2011-2014 TIP



- Project Type
- ▲ Bridge
 - Intersection
 - Highway
 - Major Road
 - Other Road
 - - - Municipality Boundary
 - ==== County Boundary

Map #	Project Name
1	American Parkway
2	Bath Streetscape
3	D & L Trail (Phases 3/4/5)
4	Lehigh Avenue Retaining Wall
5	Manassas Guth Covered Bridge
6	22 Sec. 400 - Phase 1 (145)
7	22 Sec. 400 - Phase 2 (LRB)
8	Rt. 100/Claussville Rd. intersection
9	Rt. 100/Shimersville Hill (SR 29)
10	Rt. 145 Safety Project
11	Rt. 248 Realignment/Intersection Improvement
12	Rt. 309/Sand Spring Rd. Intersection (SR 4010)
13	Schantz Road Realignment
14	Second Street Extension (Catasauqua)
15	Seventh Street Rail Crossing Upgrade
16	Sixth Street Rail Crossing Upgrade
17	31st Street Rail Crossing Upgrade
18	Newburg Rd/Country Club Intersection
19	Rt. 33/Freemansburg Interchange
20	Rt. 412 Improvements
21	Rt. 412 Second St. Ramp
22	Cedar Crest Blvd. (SR 1010) over Cedar Creek
23	Chapman Bridge
24	Cold Springs Bridge
25	Coplay-Northampton Bridge
26	Eighth Street Bridge
27	Haines Mill Road (SR 2009) over Cedar Creek
28	Hunters Hill Road Bridge
29	Lehigh Street Tri-Bridges
30	Lehigh St./Coplay Creek Bridge
31	Ontelaunee Creek Bridge - Donats Rd.
32	Phaon Bittner Bridge
33	Schlichers Covered Bridge
34	Slatedale Bridge
35	Spring Creek Road Bridge
36	T-787 W. Grant Street
37	Tilghman St. Bridge over Lehigh River
38	Union Street Bridge
39	Ward and 15th Street Bridges
40	Indian Creek Bridge
41	SR 611 over Oughoughton Tributary
42	Lynn Avenue Bridge
43	Maple Drive Bridge
44	Messinger Street Bridge
45	Mountainview Drive Bridge
46	Northampton County Bridge #102 (T-436)
47	Northampton County Bridge #189
48	Northampton County Bridge #191 (T-667)
49	Oughoughton Creek Bridge
50	Rt.191 Bridge over NS-Broad Street
51	Rt. 611 Bushkill Creek Bridge
52	SR 4007 Hokendauqua Creek
53	24th Street Bridge
54	Washington Street Bridge



Source: Lehigh Valley Transportation Study

LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

Note: Detailed project information may be found on PennDOT's TIP Visualization website at: <http://www.dot7.state.pa.us/tip%5Fvisualization/>.

City of Easton, then following the Lehigh River to Wilkes-Barre. The regional nature of the trail makes it a high priority project for the LVPC. The trail also serves as a “spine” for other path development in the Lehigh Valley. The 2011 TIP contains 3 projects that are related to the D&L Trail development in Lehigh and Northampton counties.

MID RANGE ELEMENT (2015–2022)

Table 23 and Map 16 show highway, bridge and transit projects for the mid and long range elements of the transportation plan. One major project extends beyond the short range element into the mid range element for completion – Rt. 22 Section 400 Phase II. The main focus of the project list is maintenance of the highway and bridge network. The mid range element will also focus on initiating and completing a program of small scale projects dealing with safety and further improvements in the Rt. 22 corridor. A transit program to replace LANTA’s heavy duty bus fleet with hybrid vehicles will be the primary transit focus.

LONG RANGE ELEMENT (2023–2030)

The main focus of the project list continues to be maintenance of the highway and bridge network. The mid range element will also focus on initiating and completing a program of small scale projects dealing with safety and further improvements in the Rt. 22 corridor, the region’s top priority corridor. A transit program to replace LANTA’s heavy duty bus fleet with hybrid vehicles will be the primary transit focus.

AIR QUALITY CONFORMITY

The Clean Air Act Amendments of 1990 (CAAA) mandate improvements in the nation’s air quality. The CAAA directs the U.S. Environmental Protection Agency (EPA) to implement regulations, which will provide for reductions in pollutant emissions.

Three main pollutants are covered under the CAAA. They include ozone, carbon monoxide, and particulate matter. The Lehigh Valley MPO area is in compliance with standards set for carbon monoxide and large particulate matter emissions, but needs to demonstrate transportation air quality conformity for ozone and fine particulate matter. The Lehigh Valley MPO is a maintenance area for ozone and in non-attainment for fine particulate matter.

Since vehicular emissions contribute to ozone violations, the Act requires transportation planners in non-attainment and maintenance areas to perform a regional emissions analysis to consider the air quality impacts of their proposed plans, programs, and projects. These activities, if subject to federal involvement, must be shown to conform to the applicable State Implementation Plan (SIP). The SIPs are state issued, EPA approved, regulations for meeting clean air National Ambient Air Quality Standards (NAAQS) and CAAA requirements.

Ozone is a secondary pollutant, meaning it is not directly discharged into the atmosphere. Instead, it is produced by the reaction of several emissions in the presence of sunlight. Volatile organic compounds (VOC) and nitrogen oxides (NO_x) are primary reactants. As of June 15, 2004, the Environmental Protection Agency (EPA) designated Lehigh and Northampton counties as “Basic” non-attainment areas

TABLE 23

Highways, Bridges, & Transit Mid and Long Range Elements

revised 6/15/10

New/Expanded Facilities									
Map #	Road Name/Project	Improvement	County	Municipality	Cost	Mid Range	Long Range		
1	Route 33/Freemansburg Ave. Interchange	Expand Interchange	Northampton	Bethlehem Twp.	\$ (1)	C			
SUBTOTAL									
Mobility Projects/ITS & Congested Corridors									
Map #	Road Name/Project	Improvement	County	Municipality	Cost	Mid Range	Long Range		
2	Line item for Future Rt. 22 Corridor Improvements	Capacity improvements to Rt. 22	Lehigh/Northampton	Various	\$ 209,039,600	C	C		
3	Rt. 248 Realignment	Reassign traffic rt. thru Boro and upgrade intersec.	Northampton	Bath Borough	\$ 321,000	C			
	Freeway Service Patrol	Reduce Congestion Due to Incidents	Lehigh/Northampton	Various	\$ 9,256,400	C	C		
	Intelligent Transportation Systems	Deploy ITS Strategies	Lehigh/Northampton	Various	\$ 26,448,000	C	C		
			SUBTOTAL		\$ 245,065,000				
Safety Projects									
Map #	Road Name/Project	Improvement	County	Municipality	Cost	Mid Range	Long Range		
4	Rt. 22 Section 400 Phase II	Improve Fullerton Interchange and Lehigh R. Br.	Lehigh	Whitehall Twp.	\$ 56,206,000	C			
5	Rt. 29/Rt. 100 Intersection	Add turn lanes	Lehigh	U. Milford Twp.	\$ 1,600,000	C			
6	Bath Connector	New road between Rts. 329 & 512	Northampton	Bath	\$ 7,285,000	C			
7	Newburg Rd./Country Club Rd. Intersection	Signalization	Northampton	L. Nazareth Twp.	\$ 321,000	C			
	Safety Improvements	Engineering improvements @ high priority locs.	Lehigh/Northampton	Various	\$ 48,363,000	C	C		
	Candidate Corridors/Intersections								
8	Rt. 863 - Rt. 222 to Weisenberg Twp. Line	High Priority Crash Corridor	Lehigh	U. Macungie Twp.					
9	Schantz Rd. - Rt. 222 to Rt. 863	High Priority Crash Corridor	Lehigh	U. Macungie Twp.					
10	Kernsville Rd. - Columbia Blvd to Roth Rd.	High Priority Crash Corridor	Lehigh	N. Whitehall Twp.					
11	Old Post Road - Spring Valley Rd. to Rt. 863	High Priority Crash Corridor	Lehigh	Washington/N. Whitehall					
12	Mauch Chunk Road - Levens Rd. to Old Post Rd.	High Priority Crash Corridor	Lehigh	N. Whitehall Twp.					
13	Rt. 145 - Columbia St. to Rt. 329	High Priority Crash Corridor	Lehigh	Whitehall Twp.					
14	Hamilton Street - Rt. 222 to 15th St.	High Priority Crash Corridor	Lehigh	Allentown					
15	Rt. 29 - I-78 to Fish Hatchery Rd.	High Priority Crash Corridor	Lehigh	Salisbury					
16	Rt. 29 - Indian Creek Rd. to Chestnut St.	High Priority Crash Corridor	Lehigh	Emmaus					
17	Lehigh Street - Union St. to S. 12th St.	High Priority Crash Corridor	Lehigh	Allentown					
18	Union Blvd/Tilghman St. - N. Plymouth St. to Front St.	High Priority Crash Corridor	Lehigh	Allentown					
19	Rt. 22 - Rt. 378 ramps to Airport Rd.	High Priority Crash Corridor	Lehigh	Hanover Twp.					
20	Schoenersville Road - Catasaqua Rd. to Airport Rd.	High Priority Crash Corridor	Lehigh/Northampton	Bethlehem City/Hanover (L)					
21	Airport Road - Grove Rd. to Schoenersville Rd.	High Priority Crash Corridor	Lehigh	Hanover Twp.					
22	Rt. 145 - Rt. 309 to S. Pike Ave.	High Priority Crash Corridor	Lehigh	U. Saucon Twp.					
23	Rt. 100/Tilghman Street intersection	High Priority Crash Intersection	Lehigh	U. Macungie Twp.					
24	Mauch Chunk Road/Cedar Crest Blvd.	High Priority Crash Intersection	Lehigh	N. Whitehall Twp.					
25	Rt. 309/Saucon Valley Rd.	High Priority Crash Intersection	Lehigh	U. Saucon Twp.					
26	Rt. 309/Station Ave.	High Priority Crash Intersection	Lehigh	Coopersburg					
27	Rt. 145 - Alder Dr. to Old Main St.	High Priority Crash Corridor	Northampton	Lehigh Twp./Walnutport					
28	Rt. 248 - Walnut Dr. to Mountainview Dr.	High Priority Crash Corridor	Northampton	Lehigh Twp./Walnutport					
29	Rt. 987 - Jade Ln. to Rt. 329	High Priority Crash Corridor	Northampton	East Allen Twp.					
30	Daniels Rd. - Rt. 248 to Bushkill Twp. Line	High Priority Crash Corridor	Northampton	U. Nazareth/Bushkill Twps.					
31	Belvidere Rd. - Richmond Rd. to Mt. Pleasant Rd.	High Priority Crash Corridor	Northampton	L. Mt. Bethel Twp.					
32	Butler St. - Peach St. to Freemansburg Ave.	High Priority Crash Corridor	Northampton	Easton City/Wilson Boro					
33	Center St. - Church St. to Elizabeth Ave.	High Priority Crash Corridor	Northampton	Bethlehem City					
34	Rt. 412 - Cherry Ln. to Spruce St.	High Priority Crash Corridor	Northampton	Hellertown Boro					
35	Rt. 378/Seidersville Rd.	High Priority Crash Intersection	Northampton	Northampton					
36	Rt. 329/Hovertown Rd.	High Priority Crash Intersection	Northampton	L. Saucon Twp.					
37	Rt. 248/Rt. 33	High Priority Crash Intersection	Northampton	Allen Twp.					
	Low Cost Safety Improvements		Northampton	L. Nazareth Twp.	\$ 13,224,000	C	C		
	RR Warning Devices	Address Highway Rail Crossings	Lehigh/Northampton	Various	\$ 7,399,000	C	C		
	Lehigh Valley Bike/Ped. Safety Program Line Item	Address Bike/Ped. Safety Issues	Lehigh/Northampton	Various	\$ 5,821,000	C	C		
			SUBTOTAL		\$ 140,219,000				

Highways, Bridges, & Transit Mid and Long Range Elements

revised 6/15/10

Maintenance Projects						
Map #	Road Name/Project	County	Municipality	Cost	Mid Range 2015 - 22	Long Range 2023 - 2030
	Maintenance Line Item - State Roads	Lehigh/Northampton	Various	\$ 331,700,000	C	C
	Maintenance Line Item - Local Roads	Lehigh/Northampton	Various	\$ 64,000,000	C	C
	SUBTOTAL			\$ 395,700,000		
Bridge Projects						
Map #	Road Name/Project	County	Municipality	Cost	Mid Range 2015 - 22	Long Range 2023 - 2030
	Bridge Projects/Preventive Maintenance - State Bridges	Lehigh/Northampton	Various	\$ 370,717,000	C	C
	Bridge Projects/Preventive Maintenance - Long range element	Lehigh/Northampton	Various	\$ 106,765,000	C	C
	SUBTOTAL			\$ 477,482,000		
Bicycle/Pedestrian Projects & Enhancements						
Map #	Road Name/Project	County	Municipality	Cost	Mid Range 2015 - 22	Long Range 2023 - 2030
	Trans. Enh./Hometown Sis. - SRTS Program Line Item	Lehigh/Northampton	Various	\$ 23,197,000	C	C
	SUBTOTAL			\$ 23,197,000		
Transit Projects						
Map #	Road Name/Project	County	Municipality	Cost	Mid Range 2015 - 22	Long Range 2023 - 2030
	1. Replacement - Heavy Duty Transit Buses	Lehigh/Northampton		\$ 51,110,000	X	X
	a. Alternative Propulsion System Add-on	Lehigh/Northampton		\$ 32,435,000	X	X
	2. Expansion - Heavy Duty Transit Buses	Lehigh/Northampton		\$ 8,350,000	X	X
	a. Alternative Propulsion System Add-on	Lehigh/Northampton		\$ 5,210,000	X	X
	3. Replacement - Metro Plus Minibuses	Lehigh/Northampton		\$ 32,600,000	X	X
	4. Expansion - Metro Plus Minibuses	Lehigh/Northampton		\$ 4,440,000	X	X
	5. Preventive Maintenance	Lehigh/Northampton		\$ 81,900,000	X	X
	6. ADA Paratransit Service Capitalization & New Freedoms	Lehigh/Northampton		\$ 27,740,000	X	X
	7. Planning/Program Development	Lehigh/Northampton		\$ 11,740,000	X	X
	8. Transit Enhancement Projects	Lehigh/Northampton		\$ 2,280,000	X	X
	a. Bus Stop Signage and Shelter Maintenance	Lehigh/Northampton		\$ 1,450,000	X	X
	9. ITS Projects					
	a. Metro Farebox/Collection System Replacement	Lehigh/Northampton		\$ 2,400,000	X	X
	b. Metro AVL/Realtime Passenger Info. System	Lehigh/Northampton		\$ 1,830,000	X	X
	c. Metro On-Board Security Camera System	Lehigh/Northampton		\$ 2,200,000	X	X
	d. Metro Plus - MDT/Radio System Replacement/Upgrade	Lehigh/Northampton		\$ 3,000,000	X	X
	e. Miscellaneous	Lehigh/Northampton		\$ 2,400,000	X	X
	10. Intermodal Facilities - Updates	Lehigh/Northampton		\$ 4,000,000	X	X
	11. Transit Hubs Program	Lehigh/Northampton		\$ 2,240,000	X	X
	12. General Facility/Equipment/Miscellaneous Projects	Lehigh/Northampton		\$ 3,050,000	X	X
	13. Computer Hardware/Software Replacement/Upgrade	Lehigh/Northampton		\$ 1,450,000	X	X
	14. Service Vehicles Replacement	Lehigh/Northampton		\$ 950,000	X	X
	15. Allentown Garage/Office Renovation/Expansion	Lehigh/Northampton		\$ 12,500,000	X	X
	16. Easton Garage Renovations	Lehigh/Northampton		\$ 2,000,000	X	X
	17. JARC Program	Lehigh/Northampton		\$ 6,590,000	X	X
	18. Associated Capital Maintenance/Capital Lease	Lehigh/Northampton		\$ 22,800,000	X	X
	19. Future Transit Capital Projects	Lehigh/Northampton		\$ 9,954,000	X	X
	SUBTOTAL			\$ 336,619,000		
				COST		
SUBTOTAL - HIGHWAY PROGRAM				\$ 804,181,000		
SUBTOTAL - BRIDGE PROGRAM				\$ 477,482,000		
SUBTOTAL - TRANSIT PROGRAM				\$ 336,619,000		
GRAND TOTAL				\$ 1,618,282,000		

Note: (1) indicates that funding is wholly contained in the short range element. However, based on the current schedules, these projects will not go to construction prior to the mid-range element
C = Construction

Source: LVPC and PennDOT.

under the ozone standard. Subsequently, on March 4, 2008, EPA approved a State Implementation Plan revision requesting that the Allentown-Bethlehem-Easton ozone non-attainment area be re-designated as attainment/maintenance for the 8-hour ozone standard. However, the planning requirements of an attainment/maintenance area are virtually the same as a basic non-attainment area. Regional plans and programs must meet ozone emissions budgets established as part of the maintenance plan.

PM_{2.5} are fine particulates emitted directly by motor vehicles as a result of tailpipe emissions, brake wear and tire wear. Effective October 8, 2009, EPA designated Lehigh and Northampton counties as non-attainment areas with regard to the daily (24-hour) PM_{2.5} air quality standard. Lehigh Valley regional plans and programs must meet PM_{2.5} emission levels as part of the State Implementation Plan.

The conformity test was conducted under the requirements of 40 CFR Parts 51 and 93. The Final Transportation Conformity Rule (Sect 51.428 (b) (5)) states that, “an emissions analysis shall be performed for any years in the time span of the transportation plan provided they are not more than ten years apart and provided the analysis is performed for the last year of the plan’s forecast period.” For ozone, 2015, 2018, 2025 and 2030 are used as analysis years for conformity determination. The analysis must demonstrate that a conforming TIP and LRTP will fall within the emissions budgets (2015, 2018) established for the region. For the PM_{2.5} analysis, 2008, 2015, 2025 and 2030 are analyzed. The analysis for PM_{2.5} must show that emissions in future years are equal to or less than 2008 levels. For the Lehigh Valley MPO area, emissions generated from the LRTP/TIP meet this requirement. The complete air quality conformity determination is a separate document entitled *Air Quality Conformity Analysis Report for the Lehigh Valley MPO Ozone Maintenance Area (Under the 8-hour Ozone NAAQS) and 24-hour PM_{2.5} Nonattainment Area* (Volumes 1 & 2).

FINANCIAL PLAN

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

The following sections document our methods for projecting future revenues, calculating future costs and reconciling the plan with projection of future revenues. Before proceeding a few comments on the uncertainties in this process are in order. The process involves the calculation of costs and revenues over a 20 year period. On the cost side the estimates are made without the kind of engineering detail that is required for precise cost data. Secondly, costs reflect future rates of inflation which can only be estimated. On the revenue side estimates are based on projections of future revenues for the Federal Transportation Acts that have yet to be passed, including the reauthorization of SAFETEA-LU which expired September 2009. It is known that Federal money is the biggest single factor in financing transportation infrastructure. It accounts for approximately 75% to 80% of such revenues. Likewise future revenues depend on money raised by the state from gas taxes, motor license fees, registrations, etc. These rates depend on future actions of the legislature that LVTS cannot predict.

FUTURE REVENUES

Table 24 shows projections of future revenues by time period and category.

MAP 16

MID AND LONG RANGE ELEMENT PROJECTS

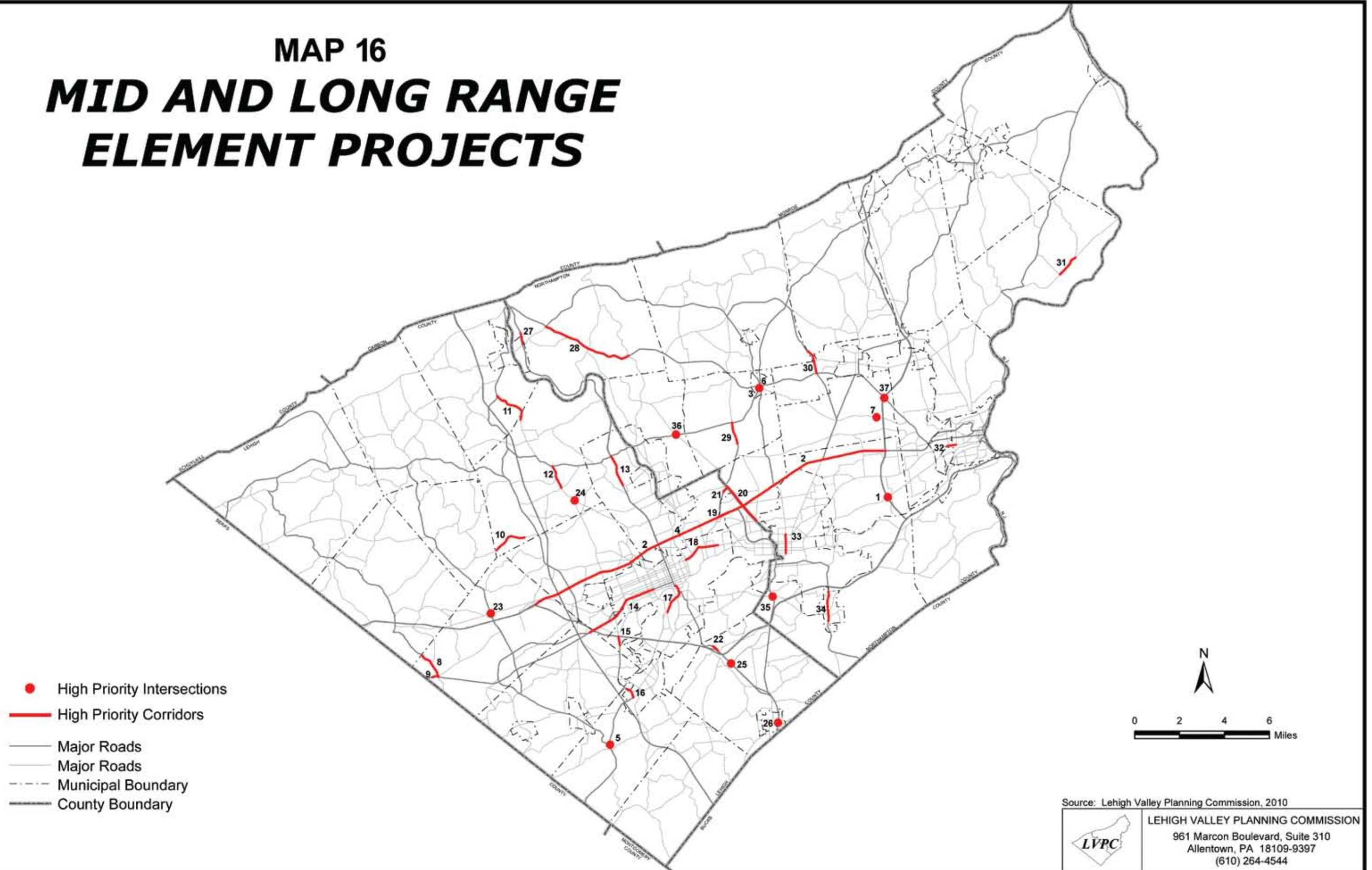


TABLE 24
TRANSPORTATION PLAN SUMMARY

Element	Short Range (2011-2014)	Mid Range (2015-2022)	Long Range (2023-2030)	Totals
Estimated Highway Funds	\$ 209,006,000	\$ 345,067,000	\$ 459,119,000	\$ 1,013,192,000
Estimated Bridge Funds	\$ 113,303,000	\$ 213,675,000	\$ 263,807,000	\$ 590,785,000
Estimated Transit Funds	\$ 58,893,000	\$ 129,778,000	\$ 206,841,000	\$ 395,512,000
Estimated Total Funds	\$ 381,202,000	\$ 688,520,000	\$ 929,767,000	\$ 1,999,489,000

Source: PennDOT.

SHORT RANGE (2011–2014) TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

\$381,202,000 will be available for the TIP that extends from 2011–2014. All federal and state capital funding anticipated between 2011 and 2014 are included. Funding to Pennsylvania’s 14 metropolitan areas (including LVTS) and 11 rural areas is done by formula developed by a statewide ad hoc committee under PennDOT’s Value Added Management (VAM) program. The key elements in this formula are the region’s population, lane miles of highway, and vehicle miles traveled. Lane miles and vehicle miles of travel are based on roadway mileage that is eligible for state and Federal funding. Local road mileage is not included in the allocation formula. Federal formula programs such as urban earmarked surface transportation dollars and congestion mitigation/air quality (CMAQ) funds are distributed according to the Federal formulas.

Not all funds are subject to this allocation method. Since 2007, PennDOT has maintained the Interstate system on a statewide basis. Previously this was the responsibility of MPOs and RPOs that had Interstate highways in their area. However, it was felt that the Interstates could be managed more efficiently if the function was centralized. Funding needed to maintain the interstate system is set aside from the funding pool. In addition, \$25 million annually is reserved for economic development opportunities statewide. These dollars are allotted at the discretion of the Secretary of Transportation. An additional \$25 million annually is reserved to flex to transit agencies in accordance with agreements reached under Pennsylvania Act 3. Twenty percent of the balance is reserved for distribution by the Secretary of Transportation, in consultation with the State Transportation Commission, to offset the impact of high cost projects or programs which are beyond a region’s allocation. These funds are referred to as “spike funds.”

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

Bridge funding is allocated based on need factors identified in PennDOT's Bridge Management System. Square feet of deck area of structurally deficient bridges is used, with posted and closed bridges being weighted more heavily in determining the distribution. Each area has the option to transfer 50% of its Federal bridge funding to highway dollars if the situation warrants it.

After much debate and discussion at the state level, it was decided that Transportation Enhancement/Hometown Streets/Safe Routes to School funds would be allocated on the same basis as highway dollars, i.e. based on population, lane miles, and vehicle miles traveled. The PennDOT Secretary has authority to allocate 20% of the State's Transportation Enhancement allocation at his discretion.

In all, the Lehigh Valley receives approximately 3% of all funds allocated to MPOs and RPOs in Pennsylvania.

Transit funding includes Federal, state, and local dollars. PennDOT guidance outlines Federal and state guarantees. LANTA provides information on discretionary funds that are captured by the Lehigh Valley.

MID RANGE (2015–2022) AND LONG RANGE (2023–2030)

Revenues for the mid range years are projected to be \$688,520,000 and \$929,767,000 for the long range. These figures are substantially larger than the TIP because they each cover 8 years rather than four years covered by the TIP. Following are the methods used for computing future revenues for the mid and long range portion of this plan.

Funding assumptions at the Federal and State level were supplied by PennDOT. Federal highway and bridge funds are expected to grow at an annual rate of 4% per year. State revenues are projected to decline by 1% per year over the life of the plan. The reason for this decline is two-fold. Funding under Act 44, passed in 2008, is expected to hold steady at \$450 million per year due to U.S. DOT's decision to not allow tolling on I-80. Also, bond issues for transportation funding are not assumed past 2014.

A projection of federal, state and local transit dollars was developed by LANTA. Federal formula funds were assumed to grow at a similar rate to the growth in funds under TEA-21. Operating assistance from the state general fund was anticipated to grow at the historical rate of inflation. Dedicated funding from Pennsylvania under Act 26 is distributed by formula and is expected to grow at a rate of 4% per year. Operating assistance under Pennsylvania's Act 3 is capped at \$2,700,000 but the maintenance portion of Act 3 is growing at 30% per year, on average. In all, the average historical and projected growth for the combined was more than 7.5% per year. Since some of LANTA's funding comes from grant applications filed by the Authority which may not be available in the future, a more conservative figure of 6% growth was used in projecting future revenues in this plan.

A summary of dollars available by plan element by year is shown in Table 25.

FUTURE COSTS

Since the update of this plan corresponds with a TIP update all costs used in the TIP are based on updated current cost estimates for projects listed in the TIP. All costs in the mid and long range parts of the plan

TABLE 25
PROJECTED LEHIGH VALLEY TRANSPORTATION FUNDING
(\$000)

	Highway		Bridge			
Year	Federal	State	Federal	State	Transit	Total
TIP	\$ 193,356	\$ 15,650	\$ 57,222	\$ 56,081	\$ 58,893	\$ 381,202
2015	\$ 34,252	\$ 3,813	\$ 15,479	\$ 9,021	\$ 13,112	\$ 75,677
2016	\$ 35,622	\$ 3,775	\$ 16,099	\$ 8,980	\$ 13,899	\$ 78,375
2017	\$ 37,047	\$ 3,738	\$ 16,742	\$ 8,939	\$ 14,733	\$ 81,199
2018	\$ 38,529	\$ 3,700	\$ 17,412	\$ 8,899	\$ 15,617	\$ 84,157
2019	\$ 40,070	\$ 3,663	\$ 18,109	\$ 8,860	\$ 16,554	\$ 87,256
2020	\$ 41,673	\$ 3,627	\$ 18,833	\$ 8,821	\$ 17,547	\$ 90,501
2021	\$ 43,340	\$ 3,590	\$ 19,586	\$ 8,782	\$ 18,600	\$ 93,898
2022	\$ 45,074	\$ 3,554	\$ 20,370	\$ 8,743	\$ 19,716	\$ 97,457
2023	\$ 46,877	\$ 3,519	\$ 21,185	\$ 8,705	\$ 20,898	\$ 101,184
2024	\$ 48,752	\$ 3,484	\$ 22,032	\$ 8,668	\$ 22,152	\$ 105,088
2025	\$ 50,702	\$ 3,449	\$ 22,913	\$ 8,630	\$ 23,481	\$ 109,175
2026	\$ 52,730	\$ 3,414	\$ 23,830	\$ 8,593	\$ 24,890	\$ 113,457
2027	\$ 54,839	\$ 3,380	\$ 24,783	\$ 8,557	\$ 26,384	\$ 117,943
2028	\$ 57,033	\$ 3,346	\$ 25,774	\$ 8,521	\$ 27,967	\$ 122,641
2029	\$ 59,314	\$ 3,313	\$ 26,805	\$ 8,485	\$ 29,645	\$ 127,562
2030	\$ 61,687	\$ 3,280	\$ 27,877	\$ 8,449	\$ 31,424	\$ 132,717
Total	\$ 940,897	\$ 72,295	\$ 395,051	\$ 195,734	\$ 395,512	\$ 1,999,489
	\$ 1,013,192		\$ 590,785			

Source: LVPC.

were inflated at a rate of 4% per year compounded. This inflation rate was used after consulting with PennDOT and FHWA. Since it is impossible to predict the year within the mid range or long range plan elements in which a project will be completed, inflation rates were applied up to the mid-year within the time frame. This calculated to an inflation factor for the mid range projects of 1.395 (4% inflation compounded and averaged over 8 years) and for long range projects the inflation factor was 1.9105 (4% inflation compounded and averaged over 16 years). Thus projects constructed in the first half of a range will probably be less costly than projected while those that are developed in the second half of the range will be more expensive.

UNMET NEEDS

Throughout this plan, great care was taken to develop and document systematic procedures that identify and prioritize projects. Maintenance, safety, and capacity priorities were identified as a result of this planning process. Studies of high priority safety corridors are also included. The results of these studies will be recommendations that will be eligible for inclusion as they are identified.

Line items are also included in Table 23. Line items commit financial resources to certain types of improvements although specific projects have yet to be identified. Funding in line items will be committed to specific projects as needs are identified through the planning process.

Financial constraint impacts the ability to address most of the priority congestion, safety and maintenance corridors. While the planning process will identify the highest priorities within these areas and those projects will be programmed accordingly, the paucity of funding does not allow for the proper maintenance of the network nor significant upgrades to be completed. Table 26 summarizes some of the more critical needs over the 20 year timeframe, the amount of funding expected given the previously discussed limitations at both the Federal and State level, and identifies the shortfall of funding over the 20 year life of the plan. The identified shortfall of more than \$1.7 billion is a conservative estimate, since improvement cost estimates are not available for all projects such as congested corridors and safety locations.

In terms of public transportation, projected short and mid-range funding sources would accommodate various aspects of the *Moving LANTA Forward* program. This would include critical activities such as the timely replacement of transit vehicles along with the expansion of the transit fleet to support service enhancements. However, if the current cost differential continues between standard propulsion and alternative propulsion transit vehicles, there will be insufficient funds to support the purchase of additional alternative propulsion vehicles in the short and mid-range periods.

Another critical project for which projected funding sources will not support in the short or mid-range is the modernization of LANTA's Allentown facility. LANTA recently completed a Facilities Master Plan in which it was determined that the current location of LANTA's Allentown Operating and Maintenance Facility continues to be an optimal location for LANTA in terms of operating efficiency. In addition, it was determined that the current facility can accommodate anticipated growth of LANTA's operations for the next 25 years.

However, the current facility consists primarily of a building which was constructed in 1908 along with a maintenance garage added in 1953 and various renovations throughout the years. Heavy maintenance work for LANTA's entire 83 bus fleet is performed at the Allentown facility. Although the current garage is well maintained it is functionally and size deficient. Modernizations to the garage are required to improve circulation and maintenance efficiencies.

FUTURE UPDATES AND PLAN IMPLEMENTATION

Implementation steps for projects contained in the long range plan have been standardized on a state-wide basis. Projects must be identified in the long range plan and move up to the local and statewide Transportation Improvement Program as their priority increases. The project must also be included in the State Transportation Commission's Twelve Year Program. Each project must follow PennDOT's 10 step project development process. This process includes documenting project need, identifying alternatives, evaluating alternatives against project need, assessing impacts to the built and natural environment, and selecting the best alternative. This process is currently undergoing review and may be changed as a result. However, the basic steps will still be involved; an emphasis may be placed on developing planning and environmental studies prior to programming rather than after a project is programmed. As projects go through this process, some will drop out for a variety of reasons such as impacts being too great or lack of community support. As a successful project meets these requirements, the funding for the project must be in place in the TIP, which serves as the local capital plan for transportation projects.

**TABLE 26
COMPARISON OF LEHIGH VALLEY HIGHWAY AND BRIDGE NEEDS AND
ESTIMATED FUNDING: 2011 TO 2030**

Needs	Estimated 2011 to 2030 Costs (2010 \$s)
Maintenance	\$ 1,880,407,000
TIP Maintenance projects	\$ 17,164,000
State highway maintenance needs	\$ 331,700,000
Local highway maintenance needs	\$ 64,000,000
TIP Bridge Projects	\$ 116,302,000
State bridge needs	\$ 1,049,100,000
Local bridge needs	\$ 302,141,000
Mobility (see congested corridors box at bottom of page)	\$ 1,174,382,000
TIP Mobility Projects	\$ 102,512,000
Rt. 22 Section 400 Widening	\$ 150,000,000
Rt. 22 Tomorrow Remainder	\$ 900,000,000
Rt. 248 Realignment	\$ 270,000
Freeway Service Patrol	\$ 5,600,000
ITS Deployment	\$ 16,000,000
Safety	\$ 213,046,000
TIP Safety Projects	\$ 84,105,000
Rt. 22 Section 400 Phase II Completion	\$ 40,278,000
Rt. 29/Rt. 100 Intersection	\$ 1,150,000
Bath Connector	\$ 2,550,000
Newburg Rd./Country Club Rd. Intersection	\$ 270,000
Mauch Chunk Road	\$ 12,000,000
Safety engineering improvements	\$ 53,294,000
Low Cost Safety Improvements	\$ 8,000,000
Railroad Warning Devices	\$ 7,399,000
Bike/Ped Safety Program	\$ 4,000,000
Transportation Enhancements	\$ 28,435,000
TIP TE Projects	\$ 5,217,000
LRTP TE Projects	\$ 23,218,000
TOTAL COST OF HIGHWAY/BRIDGE NEEDS*	\$ 3,296,270,000
ESTIMATE OF HIGHWAY/BRIDGE FUNDING	\$ 1,603,977,000
20 YEAR SHORTFALL	\$ (1,692,293,000)

***CONGESTED CORRIDORS** - The Lehigh Valley long range transportation plan identifies 13 corridors as being congested and in need of further study. 2 of those corridors have been studied and improvements identified. The remaining 11 corridors are in need of improvements yet to be determined. These 11 corridors have a demonstrated need for improvement but are not included in the "Highway Needs" section above.

1. I-78 from Rt. 22 to Rt. 100
2. I-78 from Rt. 309 to Rt. 33
3. Rt. 309 from Shankweilers Rd. to Walbert Ave.
4. Lehigh St./E. Harrison St. from 31st St. to 5th St.
5. 25th St. from Newburg Rd. to Freemansburg Ave.
6. Rt. 191 from Rt. 22 to Newburg Rd.
7. Rt. 378 from Seidersville Rd. to Center Valley Parkway
8. Rt. 100 from Lowhill Twp. Line to Schantz Rd.
9. American Prkwy/S.4th St./Basin St. from Gordon St. to I-78
10. Broadway/E. 4th St. from Susquehanna St. to Fillmore St.
11. Morgan Hill Rd./Old Philadelphia Rd./St. John St./Rt. 611 from I-78 to Park Rd.

Source: LVPC.

In summary, this plan identifies but does not provide solutions for all known transportation needs as they exist at the time of adoption. Furthermore, money is committed to as yet unidentified projects to account for future needs in certain priority areas. This plan lists priorities and time frames within which projects are likely to occur. The program of projects will be implemented if PennDOT's ten-step project development process is satisfied and the financial resources assumed in the plan are in place.

It is important to note that after the plan is adopted, it is not a static document. Under current planning regulations, this plan must be updated on a four-year cycle. During these "full" updates, project schedules, costs, and priorities will be reviewed. As needs are identified in the future, project priorities will be revisited. As financial resources are committed, funding assumptions will be revisited as well. Supplements will also include new socio-economic information, as it becomes available (e.g. Census data).

APPENDIX A

GLOSSARY OF ACRONYMS

GLOSSARY OF ACRONYMS

ACM	Agency Coordination Meeting
ADA	Americans with Disabilities Act (1990)
AQCD	Air Quality Conformity Determination
B/P	Bicycle/Pedestrian
CAAA	Clean Air Act Amendments of 1990
CE	Categorical Exclusion
CMAQ	Congestion Mitigation and Air Quality
CMS	Congestion Management System
CON or C	Construction
Conrail	Consolidated Rail Corporation
D&L Trail	Delaware and Lehigh Canal National and State Heritage Corridor
DEIS	Draft Environmental Impact Statement
E or FD	Engineering or Final Design
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
GIS	Geographic Information System
GIS-T	Transportation Geographic Information System
HPMS	Highway Performance Monitoring System
HTS	Hometown Streets
I/M	Inspection and Maintenance Program
IRI	International Roughness Index
ISTEA	Intermodal Safety Transportation Efficiency Act of 1991
ITS	Intelligent Transportation Systems
JARC	Job Access-Reverse Commute
JPC	Joint Planning Commission Lehigh and Northampton Counties (presently LVPC)
LANTA	Lehigh and Northampton Transportation Authority
LDD	Local Development District (Rural Equivalent to MPOs) (Now RPOs)
LEP	Limited English Proficiency
LNAA	Lehigh-Northampton Airport Authority
LOS	Level of Service
LRP	Long Range Plan
LVIA	Lehigh Valley International Airport
LVIP	Lehigh Valley Industrial Park
LVPC	Lehigh Valley Planning Commission (formerly Joint Planning Commission Lehigh and Northampton Counties)
LVTP	Lehigh Valley Transportation Plan

LVTS	Lehigh Valley Transportation Study
MPC	Municipalities Planning Code (PA)
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act (1969)
NHS	National Highway System
NOx	Nitrogen Oxides
PaDEP	Pennsylvania Department of Environmental Protection
PE	Preliminary Engineering
PennDOT	Pennsylvania Department of Transportation
PTAF	Public Transportation Assistance Funds
REMI	Regional Economic Models, Inc.
RFAP	Rail Freight Assistance Program
ROD	Record of Decision
ROW or R	Right-of-Way
RPO	Rural Planning Organization
SAFETEA- LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SALDO	Subdivision and Land Development Ordinance
Section 5310	Federal Grant Program for Transit Service to Elderly and Disabled Communities (formerly Section 16)
SEPTA	Southeastern Pennsylvania Transportation Authority
SIP	State Implementation Plan
SR	State Route
SRTS	Safe Routes to School
STP	Surface Transportation Plan
STU	Surface Transportation Plan- Urban
SXF	Federal Transportation Dollars Earmarked for a Specific Project
TANF	Transportation Assistance for Needy Families
TCM	Transportation Control Measure
TDM	Transportation Demand Management
TE	Transportation Enhancements
TEA-21	Transportation Equity Act for the 21 st Century
TEAC	Transportation Enhancement Advisory Committee
TIP	Transportation Improvement Program
TIS	Traffic Impact Study
TMA	Transportation Management Area
TSM	Transportation Systems Management
USEPA	United States Environmental Protection Agency
UTIL or U	Utility Relocation
VAM	Value Added Management
VAST	Valley Association for Specialized Transportation
VOC	Volatile Organic Compounds
VMS	Variable Message Sign

APPENDIX B

ENVIRONMENTAL JUSTICE

TITLE VI

LIMITED ENGLISH PROFICIENCY

AMERICANS WITH DISABILITIES ACT OF 1990

PUBLIC INVOLVEMENT

ENVIRONMENTAL JUSTICE

Presidential Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed on February 11, 1994. The Order requires Federal agencies to achieve environmental justice by identifying and addressing disproportionately high and adverse human health and environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low income populations. On April 15, 1997, the U.S. Department of Transportation issued its Order to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 5610.2) to summarize and expand upon the requirements of Executive Order 12898 on Environmental Justice. Consequently, State DOT's and Metropolitan Planning Organizations (MPOs) are responsible for identifying and addressing Environmental Justice issues. Specifically, MPOs must:

- Enhance their analytical capabilities to ensure long range transportation plan and Transportation Improvement Program compliance with Title VI/Environmental Justice;
- Identify residential, employment, and transportation patterns of minority and low-income populations to identify and address their needs;
- Evaluate and improve, if necessary, the public involvement process to eliminate participation barriers and engage minority and low-income populations in the transportation decision making process.

The Lehigh Valley Planning Commission, as a member of the MPO, has taken proactive steps to address issues associated with environmental justice. In 1998, a *Lehigh County Welfare-to-Work Study* was undertaken. It identified the locations of welfare recipients, licensed day care centers, employers, and LANTA's fixed route bus system. The spatial relationships of these groups were mapped to show proximity to the bus system. During development of the 2005–2008, 2007–2010, 2009–2012, 2011 – 2014 Transportation Improvement Programs (TIPs), Lehigh Valley Surface Transportation Plan 2007 – 2030, and now the Lehigh Valley Surface Transportation Plan 2011–2030 (long range transportation plan), staff identified, through a series of maps, the locations of Black, Hispanic, and Asian populations as well as income below poverty level. LANTA developed a *Regionwide Job Access & Reverse Commute Transportation Plan* in 2001 which: identified the geographic distributions of welfare recipients, low-income persons, and employment centers in the region; identified the existing public, private, non-profit and human service transportation services in the region; identified transportation gaps between the geographic distributions of groups; and identified a prioritized list of projects addressing these gaps in service. The plan was completed early in April 2001. Several projects were selected for implementation and funding. A mobility manager position was developed as a result of LANTA's *Job Access & Reverse Commute Transportation Plan* and staffed by the Private Industry Council. The main task of this position is to serve as a one-stop shopping source for transportation information and assistance that reacts to individual needs and provides a central point of contact. In addition, LANTA enhanced Saturday bus service and reinstated Sunday service. More recently, a *Coordinated Public Transit – Human Services Transportation Plan for the Lehigh Valley: 2007* was completed. This plan was developed to fill the mobility gaps in public transportation for people with disabilities and persons who are financially disadvantaged. This plan identified the gaps in existing public transportation services and sought solutions to fill these gaps through a Request for Proposals process.

Data from the 2000 U.S. Census confirms the growth and locations of minority groups. Among Lehigh County's 312,090 persons, 3.6% are Black/African American while 10.2% are Hispanic/Latino. The City of Allentown had both the highest number and percentage of these minority groups. 7.8% of the city's 106,632 persons are Black/African American while 24.4% are Hispanic/Latino. Other Lehigh County municipalities with high minority concentrations include the City of Bethlehem, Fountain Hill Borough, and Whitehall Township. Among Northampton County's 267,066 persons, 2.8% are Black/African American while 6.7% are Hispanic/Latino. The City of Easton had the highest percentage of Blacks/African Americans at 12.7% of its 26,263 persons. The largest Hispanic/Latino percentage is attributable to the City of Bethlehem at 21.6% of its 52,300 persons. This concentration occurs mostly in South Bethlehem. Other municipalities with less sizeable but significant concentrations include Palmer Township, Wilson Borough, and Freemansburg Borough.

See the attached maps depicting the concentrations of EJ populations by census tracts and the accompanying Population/Racial Distribution Table.

An analysis of this data at the census tract level depicts the majority of highway and bridge projects contained on the 2011 TIP and Lehigh Valley Surface Transportation Plan 2011 – 2030 not adversely impacting EJ populations. There are several projects which traverse census tracts with EJ populations. These projects include Route 22 Section 400, American Parkway, and the Route 412/3rd Street Improvements, all of which are located in urban areas. These projects, as they progress into the preliminary engineering phase, will undergo a more rigorous analysis that takes into account a finer level of census data (block or block group level data) and the projects' preferred alternative alignment for a more detailed look at any potential impacts.

Title VI of the Civil Rights Act of 1964

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin in programs and activities receiving Federal financial assistance. Specifically, Title VI provides that "no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." (42 U.S.C. Section 2000d).

Executive Order on Limited English Proficiency

Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency (LEP), was issued on August 11, 2000. The order directs federal agencies to break down language barriers by implementing consistent standards of language assistance across agencies and among all recipients of federal financial assistance. Under this flexible standard, agencies and recipients must take reasonable steps to provide meaningful access to their programs and activities. Among factors to be considered are the number or proportion of LEP persons in the eligible service population, the frequency with which LEP persons come in contact with the program, and the available resources. In addition to activities conducted to meet Environmental Justice mandates, the LVPC conducted an LEP analysis identifying total households linguistically isolated, Spanish households linguistically isolated, other Indo-European households linguistically isolated, Asian and Pacific Island households linguistically isolated, and other household linguistically isolated through the creation of a set of maps. These maps also identify the geographic proximity of these groups to highway and bridge projects contained on

the 2011 – 2014 Transportation Improvement Program and the Lehigh Valley Surface Transportation Plan 2011 – 2030. These groups are identified on the accompanying maps.

An analysis of this data at the census tract level depicts the majority of highway and bridge projects contained on the TIP and long range transportation plan not adversely impacting linguistically isolated populations. There are several projects which traverse census tracts with LEP populations. These projects include Route 22 Section 400, American Parkway and New England Avenue, and the Route 412/3rd Street Improvements, all of which are located in urban areas. These projects, as they progress into the preliminary engineering phase, will undergo a more rigorous analysis that takes into account a finer level of census data (block or block group level data) and the projects' preferred alternative alignment for a more detailed look at any potential impacts.

Staff will continue to undertake additional activities to ensure compliance with Executive Order 12898. This will include but not be limited to the provision of socio-economic data for documentation of LANTA's Title VI compliance.

Americans with Disabilities Act of 1990

The Americans with Disabilities Act of 1990 (ADA) prohibits discrimination and ensures equal opportunity and access for persons with disabilities. The Act provides a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities and provides a clear, strong, consistent, enforceable standards addressing discrimination against individuals with disabilities.

Public Involvement

The best method of addressing environmental justice issues is to provide for full public involvement opportunities allowing minority groups a voice in the transportation planning process. The following is a comprehensive list of public involvement techniques used during the development of the Lehigh Valley Surface Transportation Plan 2011 – 2030:

- Sent public meeting notices to Morning Call.
- Posted the draft plan and the public meeting notice that appeared in the Morning Call to LVPC web site.
- Placed public notices on LANTA's and PennDOT's website with links to the LVPC website.
- LVTS utilized PENNDOT District 5 press officer for additional outreach to their contact list recipients.
- Recipient of the LVPC Newsletter were kept informed of the long range plan development process by articles appearing in several issues.
- Sent notices to tribal nations with potential interests in Lehigh and Northampton Counties. This list includes the following tribes:
 - Onondaga Indian Nation
 - Eastern Shawnee Tribe of Oklahoma
 - Absentee-Shawnee Tribe of Oklahoma

- Delaware Nation Oklahoma
 - Stockbridge-Munsee Band of the Mohican Nation
 - Shawnee Tribe
- Sent out brief 20 to 30 second public service announcements to the following local radio stations:
 - WAEB AM 790
 - WCTO Cat Country 96.1
 - WDIY 88.1
 - WEEX AM 1230
 - WGPB Sunny 1100
 - WKAP
 - WLEV 100.7
 - WODE 99.9
 - WTKZ AM 1320
 - WZZO Z-95
 - WSEL 93.1
 - Sent out notices on the draft long range plan public meetings scheduled for September 9 to Service Electric Cable T.V., RCN, and Blue Ridge Cable for posting to their community bulletin boards.
 - Sent news Release to WFMZ TV 69 Spanish News for broadcast.
 - Sent public meeting notices on the draft long range plan to each of the following organizations to reach out to underrepresented persons:
 - Casa Guadalupe Community Center
 - Salvation Army Temple Corps
 - Council of Spanish Speaking Organizations
 - Hispanic American Organization
 - Center for Coordinated Social Services
 - Private Industry Council Workforce Development Center Mobility Manager
 - Community Action Committee of the Lehigh Valley
 - Tri-City African American Chamber of Commerce
 - Greater L.V. Chamber of Commerce
 - Hispanic Chamber of Commerce of the Lehigh Valley
 - Allentown Housing Authority
 - Bethlehem Housing Authority
 - Allentown Rescue Mission
 - Child Care Information Services
 - Community Services for Children
 - Easton Housing Authority
 - Keenan House
 - Lehigh County Assistance Office
 - Lehigh Carbon Community College
 - New Bethany Ministries
 - Northampton County Assistance Office
 - Northampton County Housing Authority
 - Northampton Community College
 - Pathways
 - Project of Easton
 - Third Street Alliance

- Treatment Trends Inc.
 - Turning Point of the Lehigh Valley
 - Lehigh County Council of Churches
- Sent public meeting notices on the draft plan to the following organizations to assure good coverage of a cross section of the public:
 - TransBridge Lines, Inc.
 - Ways to Work
 - United Way of the Greater Lehigh Valley
 - Easton Coach Co.
 - Visual Impairment and Blindness Services
 - Lehigh Valley Traffic Club c/o Westgate Global Logistics
 - Lehigh Valley Rail Management
 - South Bethlehem Neighborhood Center
 - Community Action Development Corporation of Allentown/NAACP Allentown Chapter
 - Lehigh County Aging and Adult Services
 - Northampton County Area Agency on Aging
 - EMS Environmental, Inc.
 - Good Shepherd Rehabilitation Services
 - Lehigh Valley Center for Independent Living
 - ShareCare
 - ARC of Lehigh and Northampton Counties, Inc.
 - VIA of the Lehigh Valley, Inc.
 - Accessible Transportation for the Disabled, Inc.
 - American Red Cross of the Greater Lehigh Valley
 - NAACP Easton Chapter
 - NAACP Bethlehem Chapter
 - Northampton County Executive
 - Logistics Transportation
 - A series of maps illustrating an analysis of environmental justice issues was developed. These maps depict the percent of population below the poverty level, median household income, disabled population, aged population, Hispanic or Latino population, African-American population, Asian-American population, total households linguistically isolated, Spanish households linguistically isolated, Asian and Pacific Island households linguistically isolated, other Indo-European households linguistically isolated, and other households linguistically isolated.

POPULATION/RACIAL DISTRIBUTION TABLE

2000 Census Data

Census Tract	Total Population		Black Population		Hispanic/Latino Population		Asian Population		American Indian & Alaska Native Population		Total Minority Population	
	#	%	#	%	#	%	#	%	#	%	#	%
1	7412	100	409	5.5	966	13.0	223	3.0%	11	0.1%	1609	21.7%
2	589	100	40	6.8	64	10.9	0	0.0%	3	0.5%	107	18.2%
3	6867	100	632	9.2	2344	34.1	80	1.2%	20	0.3%	3076	44.8%
4	3431	100	184	5.4	1181	34.4	108	3.1%	22	0.6%	1495	43.6%
5	2252	100	338	15.0	1336	59.3	27	1.2%	19	0.8%	1720	76.4%
6	5766	100	358	6.2	1609	27.9	171	3.0%	20	0.3%	2158	37.4%
7	3449	100	415	12.0	1391	40.3	74	2.1%	22	0.6%	1902	55.1%
8	3615	100	400	11.1	1873	51.8	82	2.3%	22	0.6%	2377	65.8%
9	1655	100	186	11.2	939	56.7	28	1.7%	11	0.7%	1164	70.3%
10	2819	100	425	15.1	1639	58.1	33	1.2%	35	1.2%	2132	75.6%
11	882	100	129	14.6	403	45.7	1	0.1%	6	0.7%	539	61.1%
12	2213	100	530	23.9	819	37.0	60	2.7%	11	0.5%	1420	64.2%
13	2047	100	272	13.3	858	41.9	18	0.9%	8	0.4%	1156	56.5%
14.01	6398	100	417	6.5	928	14.5	201	3.1%	23	0.4%	1569	24.5%
14.02	2146	100	43	2.0	93	4.3	39	1.8%	6	0.3%	181	8.4%
15.01	6033	100	469	7.8	1678	27.8	225	3.7%	20	0.3%	2392	39.6%
15.02	6042	100	402	6.7	527	8.7	265	4.4%	9	0.1%	1203	19.9%
16	3259	100	414	12.7	1301	39.9	50	1.5%	2	0.1%	1767	54.2%
17	4006	100	348	8.7	1296	32.4	110	2.7%	16	0.4%	1770	44.2%
18	4043	100	517	12.8	1559	38.6	15	0.4%	15	0.4%	2106	52.1%
19	4001	100	178	4.4	537	13.4	40	1.0%	5	0.1%	760	19.0%
20	4479	100	449	10.0	1119	25.0	47	1.0%	12	0.3%	1627	36.3%
21	6075	100	473	7.8	1003	16.5	191	3.1%	27	0.4%	1694	27.9%
22.01	4410	100	94	2.1	170	3.9	57	1.3%	2	0.0%	323	7.3%
22.02	4017	100	102	2.5	193	4.8	43	1.1%	6	0.1%	344	8.6%
23.01	5686	100	73	1.3	139	2.4	190	3.3%	0	0.0%	402	7.1%
23.02	3040	100	73	2.4	93	3.1	43	1.4%	3	0.1%	212	7.0%
51	4434	100	63	1.4	90	2.0	17	0.4%	9	0.2%	179	4.0%
52	6588	100	14	0.2	64	1.0	27	0.4%	5	0.1%	110	1.7%
53	7128	100	18	0.3	72	1.0	19	0.3%	6	0.1%	115	1.6%
54	6013	100	28	0.5	71	1.2	24	0.4%	3	0.0%	126	2.1%
55.01	7839	100	42	0.5	105	1.3	43	0.5%	5	0.1%	195	2.5%
55.02	6892	100	81	1.2	139	2.0	63	0.9%	8	0.1%	291	4.2%
56.01	4522	100	51	1.1	75	1.7	37	0.8%	3	0.1%	166	3.7%
56.02	5199	100	70	1.3	130	2.5	48	0.9%	6	0.1%	254	4.9%
57.01	7537	100	233	3.1	366	4.9	613	8.1%	6	0.1%	1218	16.2%
57.02	4119	100	55	1.3	105	2.5	40	1.0%	0	0.0%	200	4.9%
57.03	3519	100	273	7.8	413	11.7	164	4.7%	17	0.5%	867	24.6%
58	3387	100	53	1.6	77	2.3	11	0.3%	3	0.1%	144	4.3%
59.01	6588	100	78	1.2	233	3.5	39	0.6%	22	0.3%	372	5.6%
59.02	1913	100	106	5.5	117	6.1	90	4.7%	1	0.1%	314	16.4%
60.01	4613	100	58	1.3	65	1.4	52	1.1%	2	0.0%	177	3.8%
60.02	5107	100	47	0.9	74	1.4	169	3.3%	0	0.0%	290	5.7%
61.01	4016	100	43	1.1	93	2.3	90	2.2%	3	0.1%	229	5.7%
61.02	4292	100	36	0.8	40	0.9	62	1.4%	1	0.0%	139	3.2%
62.01	9203	100	118	1.3	175	1.9	503	5.5%	4	0.0%	800	8.7%
62.02	4692	100	46	1.0	60	1.3	85	1.8%	1	0.0%	192	4.1%
63.02	3641	100	12	0.3	33	0.9	42	1.2%	3	0.1%	90	2.5%
63.03	3039	100	41	1.3	41	1.3	64	2.1%	2	0.1%	148	4.9%
63.04	3663	100	11	0.3	29	0.8	275	7.5%	8	0.2%	323	8.8%
63.05	5540	100	25	0.5	87	1.6	217	3.9%	8	0.1%	337	6.1%
63.06	8493	100	71	0.8	161	1.9	324	3.8%	4	0.0%	560	6.6%
64	7234	100	17	0.2	76	1.1	80	1.1%	6	0.1%	179	2.5%
65	5608	100	44	0.8	113	2.0	49	0.9%	6	0.1%	212	3.8%
66	5360	100	29	0.5	52	1.0	123	2.3%	1	0.0%	205	3.8%
67.01	4671	100	98	2.1	132	2.8	41	0.9%	1	0.0%	272	5.8%
67.02	2908	100	68	2.3	89	3.1	23	0.8%	4	0.1%	184	6.3%
67.03	5919	100	38	0.6	68	1.1	136	2.3%	0	0.0%	242	4.1%
68	4614	100	176	3.8	495	10.7	42	0.9%	9	0.2%	722	15.6%
69.02	2582	100	18	0.7	46	1.8	44	1.7%	2	0.1%	110	4.3%
69.03	4968	100	41	0.8	68	1.4	50	1.0%	3	0.1%	162	3.3%
69.04	6971	100	42	0.6	60	0.9	85	1.2%	4	0.1%	191	2.7%
70	3617	100	6	0.2	25	0.7	20	0.6%	9	0.2%	60	1.7%
91	3242	100	26	0.8	98	3.0	72	2.2%	2	0.1%	198	6.1%
92	3700	100	81	2.2	92	2.5	116	3.1%	2	0.1%	291	7.9%
93	3213	100	56	1.7	130	4.0	36	1.1%	4	0.1%	226	7.0%
94	3929	100	146	3.7	758	19.3	43	1.1%	5	0.1%	952	24.2%

Census Tract	Total Population		Black Population		Hispanic/Latino Population		Asian Population		American Indian & Alaska Native Population		Total Minority Population	
	#	%	#	%	#	%	#	%	#	%	#	%
95	4945	100	168	3.4	606	12.3	53	1.1%	9	0.2%	836	16.9%
101	3659	100	153	4.2	301	8.2	129	3.5%	11	0.3%	594	16.2%
102	3929	100	29	0.7	44	1.1	139	3.5%	1	0.0%	213	5.4%
103	3297	100	48	1.5	137	4.2	34	1.0%	3	0.1%	222	6.7%
104	4894	100	168	3.4	237	4.8	98	2.0%	5	0.1%	508	10.4%
105	4428	100	378	8.5	2631	59.4	29	0.7%	21	0.5%	3059	69.1%
106	6672	100	104	1.6	636	9.5	76	1.1%	9	0.1%	825	12.4%
107	4824	100	130	2.7	445	9.2	85	1.8%	15	0.3%	675	14.0%
108	2632	100	82	3.1	215	8.2	39	1.5%	7	0.3%	343	13.0%
109	3334	100	301	9.0	1263	37.9	23	0.7%	16	0.5%	1603	48.1%
110	5633	100	225	4.0	901	16.0	322	5.7%	18	0.3%	1466	26.0%
111	427	100	23	5.4	31	7.3	46	10.8%	1	0.2%	101	23.7%
112	5395	100	342	6.3	2766	51.3	113	2.1%	38	0.7%	3259	60.4%
113	3176	100	136	4.3	1711	53.9	132	4.2%	16	0.5%	1995	62.8%
141	5348	100	147	2.7	137	2.6	90	1.7%	5	0.1%	379	7.1%
142	5714	100	577	10.1	544	9.5	118	2.1%	9	0.2%	1248	21.8%
143	4324	100	727	16.8	751	17.4	60	1.4%	15	0.3%	1553	35.9%
144	2420	100	276	11.4	271	11.2	46	1.9%	10	0.4%	603	24.9%
145	2950	100	651	22.1	351	11.9	77	2.6%	11	0.4%	1090	36.9%
146	3053	100	628	20.6	410	13.4	20	0.7%	6	0.2%	1064	34.9%
147	2454	100	332	13.5	106	4.3	26	1.1%	7	0.3%	471	19.2%
151	6642	100	42	0.6	108	1.6	35	0.5%	8	0.1%	193	2.9%
152.01	6972	100	29	0.4	111	1.6	23	0.3%	10	0.1%	173	2.5%
152.02	979	100	2	0.2	5	0.5	0	0.0%	1	0.1%	8	0.8%
153	4152	100	2	0.0	28	0.7	4	0.1%	3	0.1%	37	0.9%
154	3228	100	22	0.7	32	1.0	8	0.2%	2	0.1%	64	2.0%
155	5668	100	21	0.4	38	0.7	16	0.3%	1	0.0%	76	1.3%
156	3615	100	17	0.5	44	1.2	20	0.6%	4	0.1%	85	2.4%
157	2812	100	13	0.5	45	1.6	19	0.7%	1	0.0%	78	2.8%
158	6982	100	13	0.2	70	1.0	27	0.4%	17	0.2%	127	1.8%
159.01	5472	100	21	0.4	69	1.3	8	0.1%	2	0.0%	100	1.8%
159.02	3435	100	11	0.3	20	0.6	10	0.3%	2	0.1%	43	1.3%
160.01	5448	100	22	0.4	36	0.7	9	0.2%	15	0.3%	82	1.5%
160.02	4280	100	13	0.3	36	0.8	8	0.2%	4	0.1%	61	1.4%
161	2043	100	8	0.4	31	1.5	24	1.2%	7	0.3%	70	3.4%
162.01	5348	100	15	0.3	117	2.2	30	0.6%	4	0.1%	166	3.1%
162.02	4057	100	18	0.4	47	1.2	11	0.3%	1	0.0%	77	1.9%
163	2814	100	13	0.5	51	1.8	13	0.5%	1	0.0%	78	2.8%
164	2630	100	5	0.2	29	1.1	2	0.1%	2	0.1%	38	1.4%
165	4903	100	24	0.5	84	1.7	27	0.6%	4	0.1%	139	2.8%
166	2678	100	40	1.5	47	1.8	18	0.7%	1	0.0%	106	4.0%
167	4426	100	27	0.6	65	1.5	18	0.4%	5	0.1%	115	2.6%
168	6023	100	33	0.5	57	0.9	24	0.4%	5	0.1%	119	2.0%
169	5259	100	47	0.9	73	1.4	63	1.2%	9	0.2%	192	3.7%
170	1617	100	3	0.2	11	0.7	2	0.1%	3	0.2%	19	1.2%
171	8419	100	189	2.2	173	2.1	117	1.4%	4	0.0%	483	5.7%
172	6367	100	116	1.8	254	4.0	118	1.9%	5	0.1%	493	7.7%
173	2467	100	47	1.9	100	4.1	14	0.6%	1	0.0%	162	6.6%
174.01	4640	100	96	2.1	131	2.8	109	2.3%	2	0.0%	338	7.3%
174.02	3870	100	68	1.8	108	2.8	47	1.2%	4	0.1%	227	5.9%
175.01	3790	100	61	1.6	76	2.0	52	1.4%	1	0.0%	190	5.0%
175.02	4509	100	135	3.0	78	1.7	100	2.2%	3	0.1%	316	7.0%
176.01	8311	100	216	2.6	370	4.5	253	3.0%	5	0.1%	844	10.2%
176.02	9009	100	206	2.3	268	3.0	184	2.0%	6	0.1%	664	7.4%
176.03	3851	100	94	2.4	202	5.2	28	0.7%	3	0.1%	327	8.5%
177.01	7422	100	78	1.1	183	2.5	294	4.0%	10	0.1%	565	7.6%
177.02	2141	100	12	0.6	54	2.5	34	1.6%	0	0.0%	100	4.7%
178	1897	100	53	2.8	282	14.9	9	0.5%	6	0.3%	350	18.5%
179.01	3383	100	14	0.4	96	2.8	10	0.3%	3	0.1%	123	3.6%
179.02	2223	100	3	0.1	43	1.9	1	0.0%	1	0.0%	48	2.2%
180.01	3923	100	11	0.3	110	2.8	18	0.5%	5	0.1%	144	3.7%
180.02	5961	100	44	0.7	143	2.4	101	1.7%	11	0.2%	299	5.0%
181	4837	100	39	0.8	55	1.1	47	1.0%	2	0.0%	143	3.0%
Totals	579156	100%	18497	3.2%	49749	8.6%	10209	1.8%	961	0.2%	79416	13.7%

YEAR 2000 CENSUS TRACTS

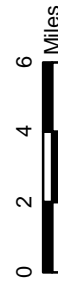
Source: U.S. Census 2000

LEHIGH VALLEY PLANNING
961 Marcon Boulevard
Allentown, PA 18101

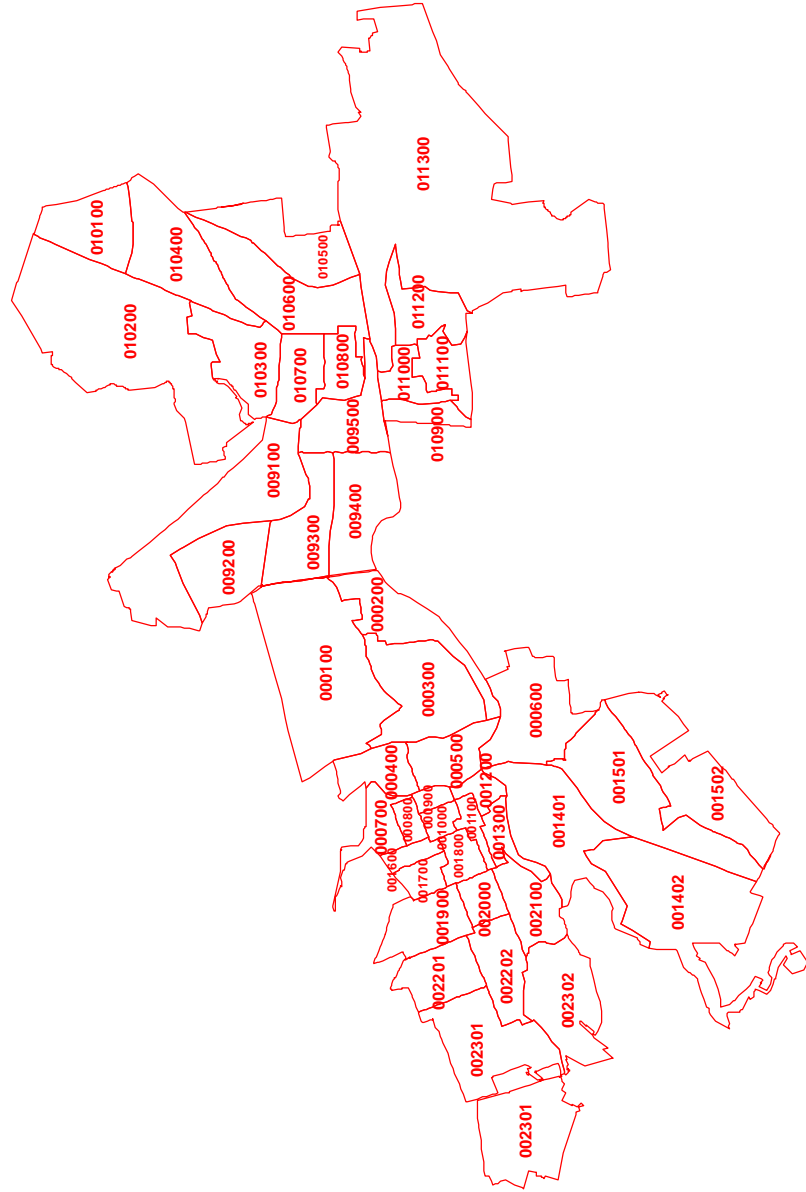
2000 Census Tracts
Boundaries shown on separate map



☐ Census 2000 Tracts
☐ Cities shown on separate map




YEAR 2000 CENSUS TRACTS



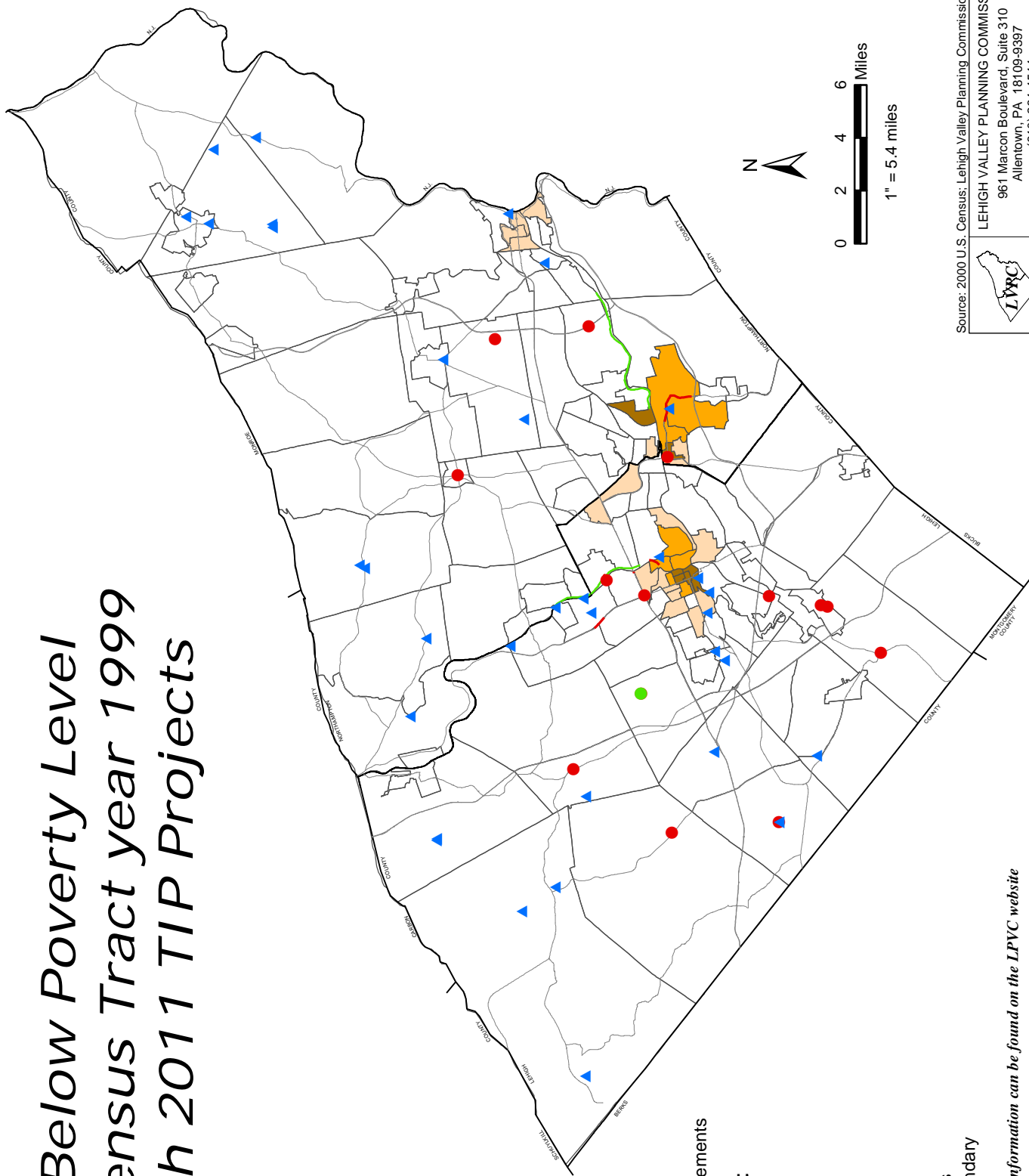
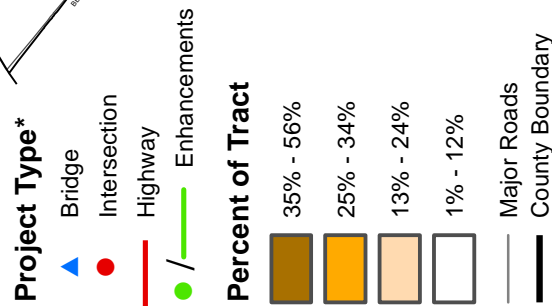
Source: U.S. Census 2000



LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

 Census 2000 Tracts

% Below Poverty Level by Census Tract year 1999 with 2011 TIP Projects



1" = 5.4 miles



Source: 2000 U.S. Census; Lehigh Valley Planning Commission
LEHIGH VALLEY PLANNING COMMISSION
 961 Marcon Boulevard, Suite 310
 Allentown, PA 18109-9397
 (610) 264-4544

*Note: Detailed project information can be found on the LVPC website
 at www.lvpc.org.

Median Household Income by Census Tract Year 1999 with 2011 TIP Projects

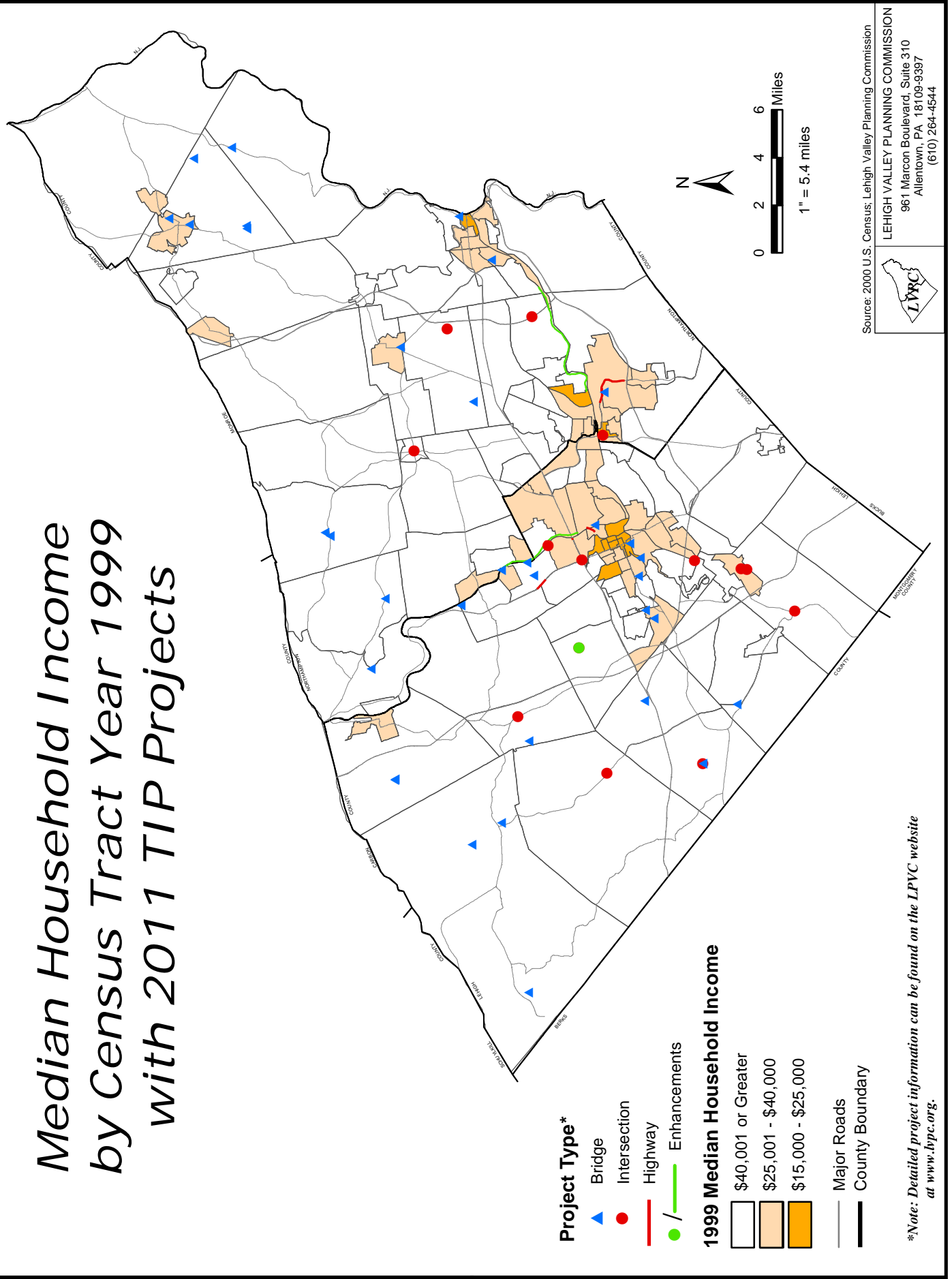
- Project Type***
- ▲ Bridge
 - Intersection
 - Highway
 - / Enhancements

1999 Median Household Income

- \$40,001 or Greater
- \$25,001 - \$40,000
- \$15,000 - \$25,000

- Major Roads
- County Boundary

*Note: Detailed project information can be found on the LPVC website at www.lpvc.org.

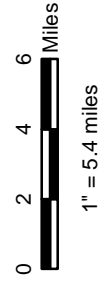
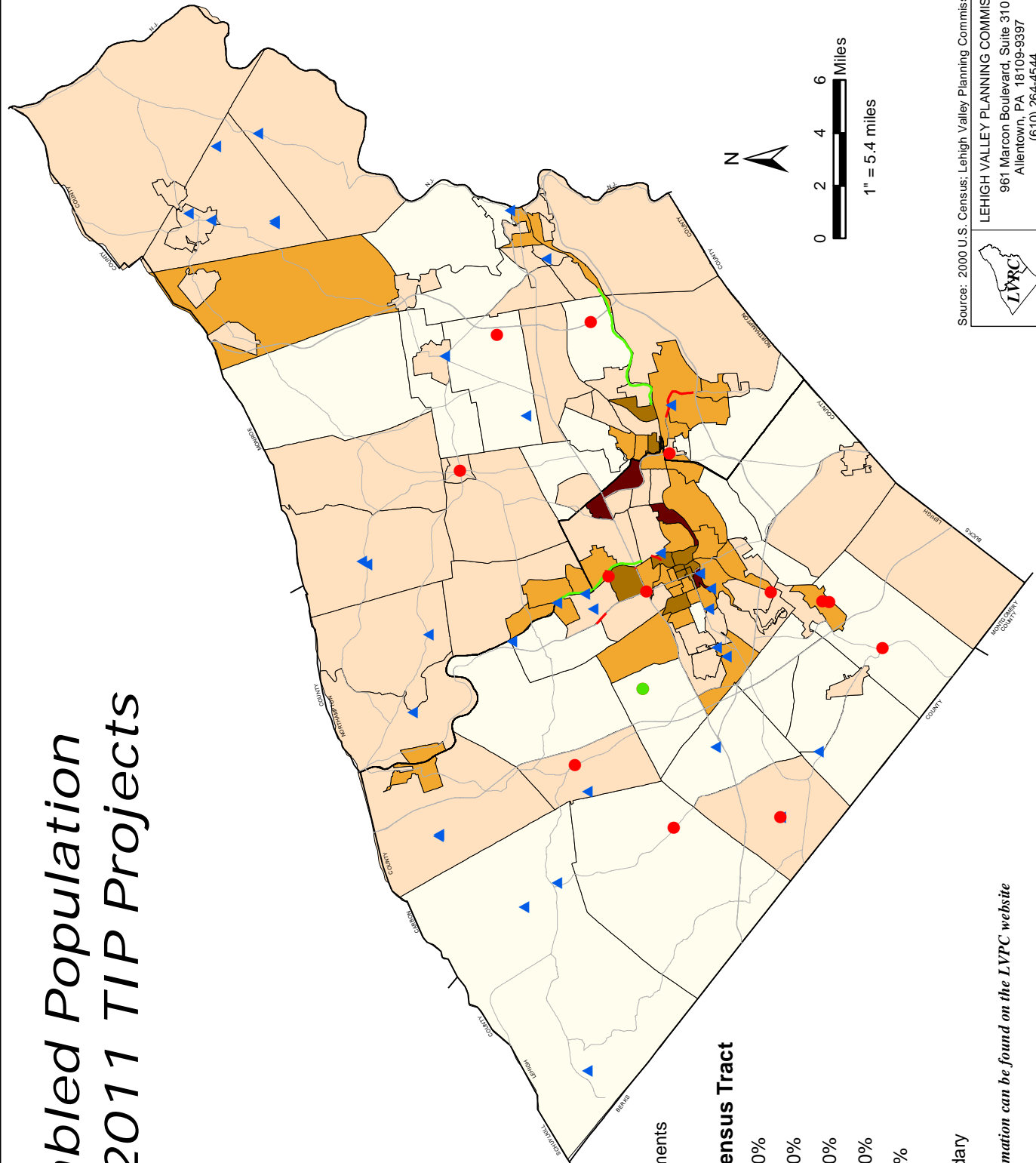
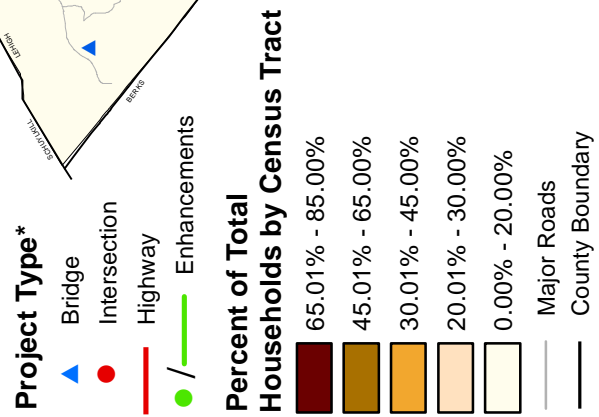


Source: 2000 U.S. Census; Lehigh Valley Planning Commission

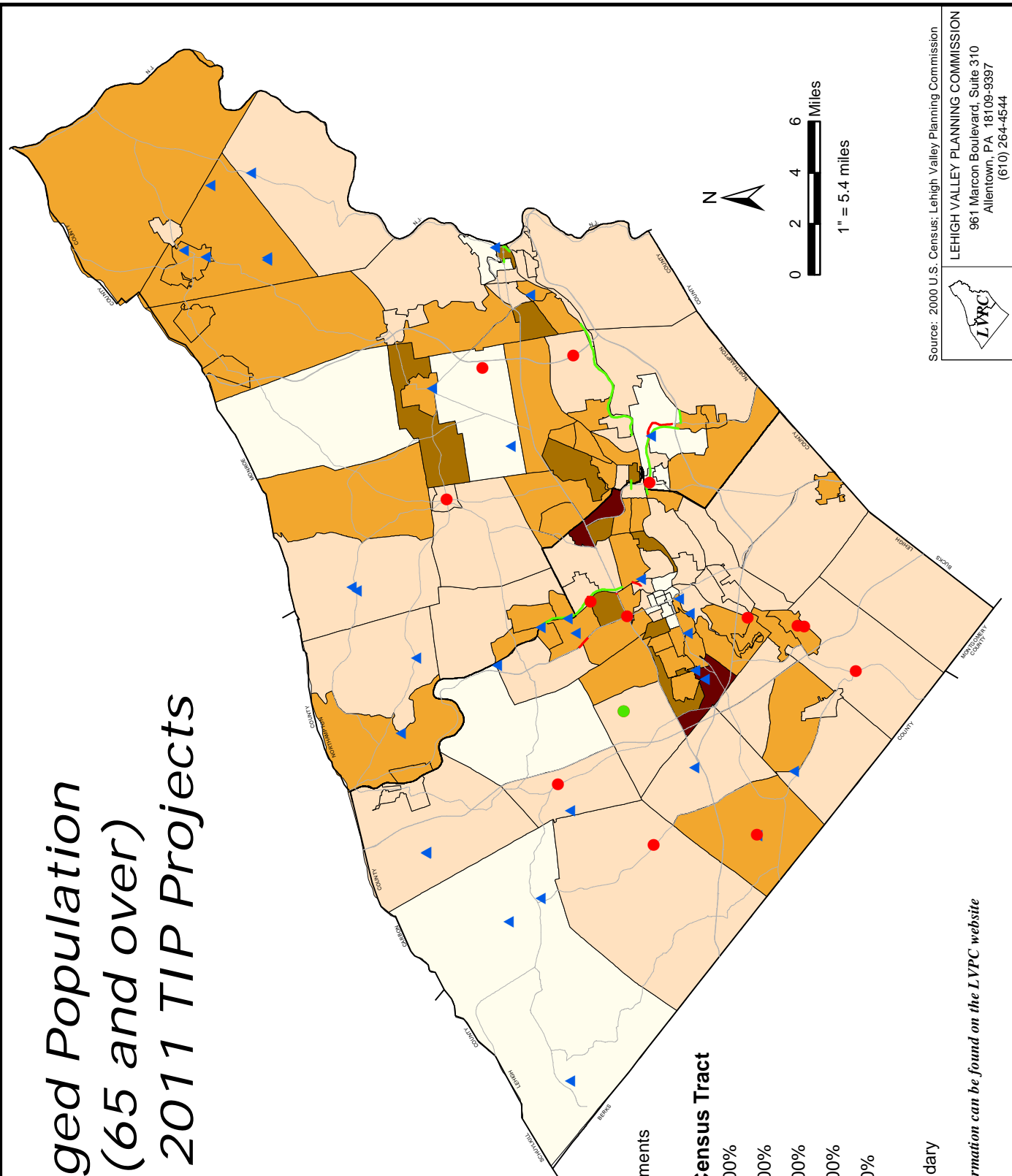
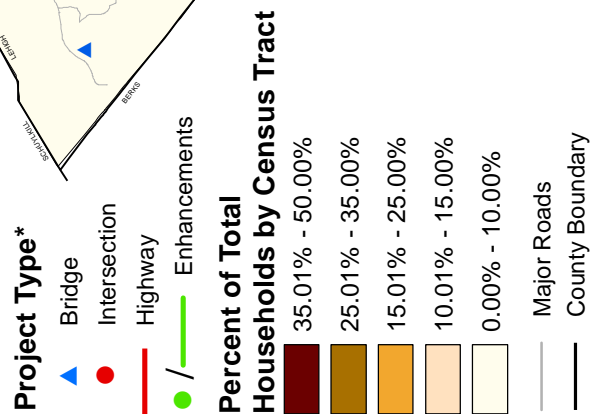


LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

Disabled Population with 2011 TIP Projects



Aged Population (65 and over) with 2011 TIP Projects



*Note: Detailed project information can be found on the LVPC website at www.lvpc.org.

Hispanic or Latino Population by Census Tract Year 2000 with 2011 TIP Projects

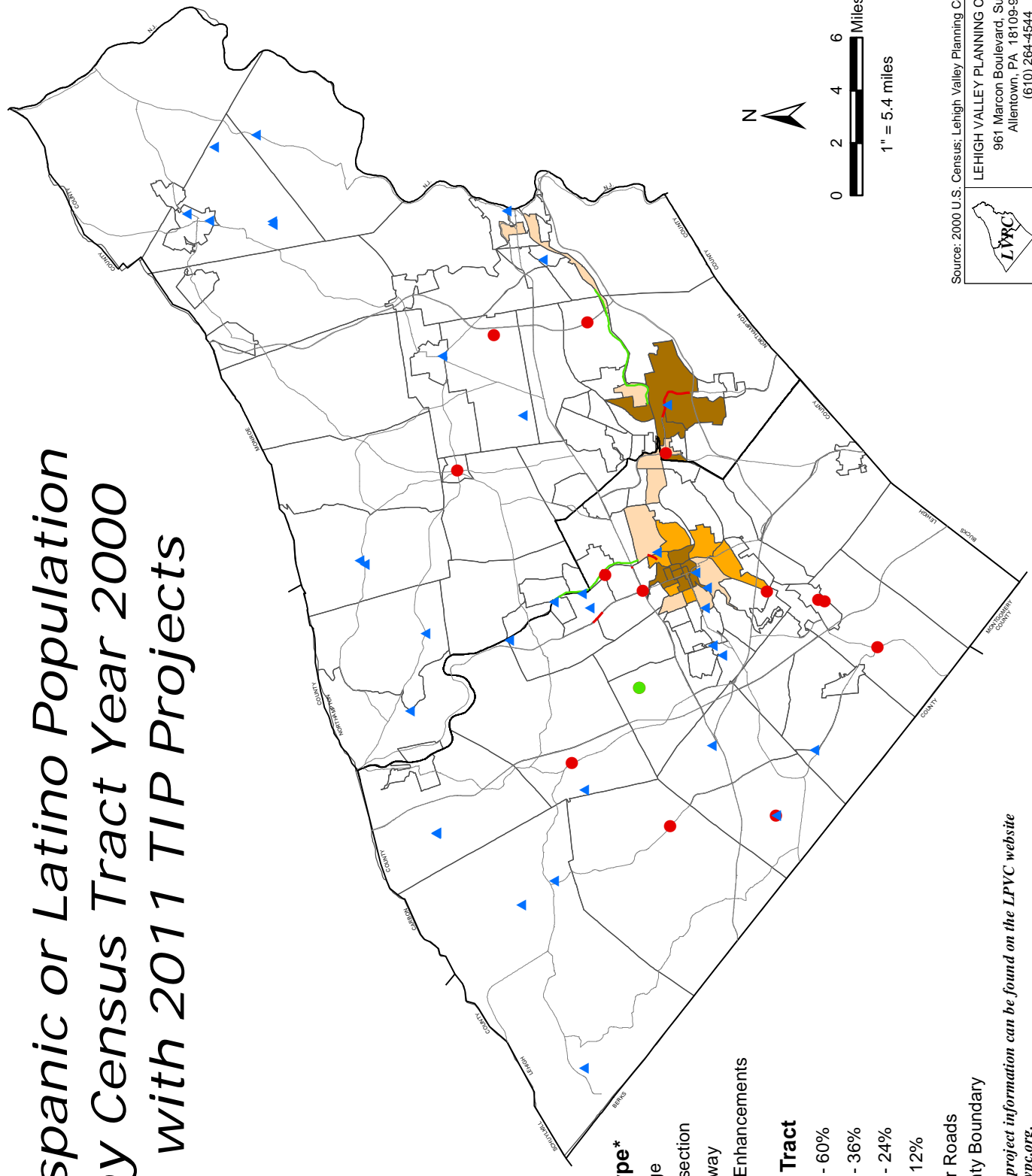
Project Type*

- ▲ Bridge
- Intersection
- Highway
- Enhancements

Percent of Tract

- 36% - 60%
- 24% - 36%
- 12% - 24%
- 0% - 12%

- Major Roads
- County Boundary



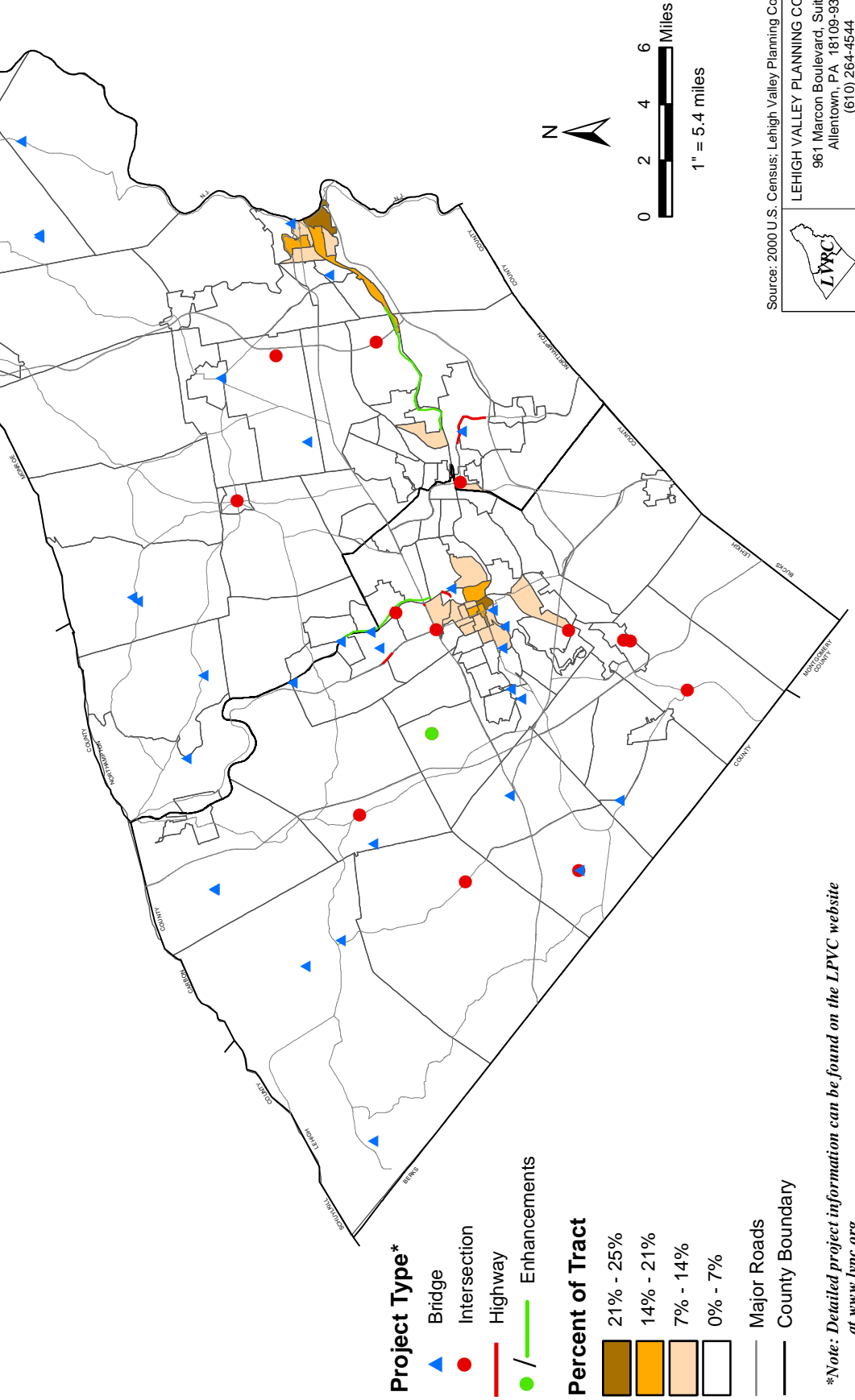
*Note: Detailed project information can be found on the LPVC website at www.lpvc.org.

Source: 2000 U.S. Census; Lehigh Valley Planning Commission

LEHIGH VALLEY PLANNING COMMISSION

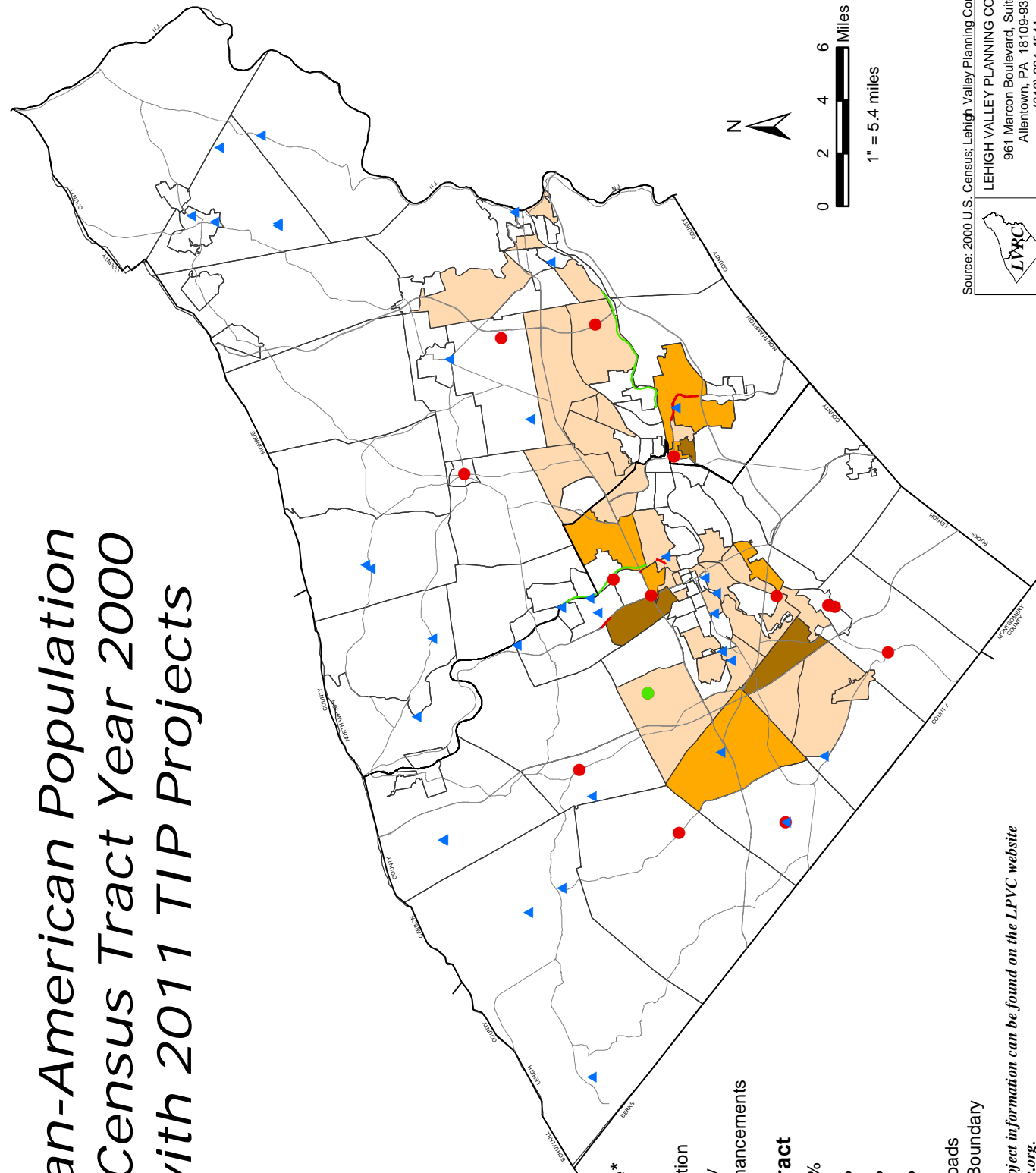
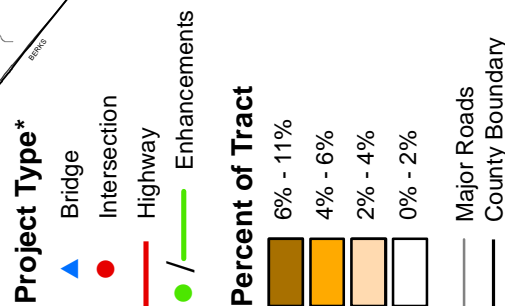
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

African-American Population by Census Tract Year 2000 with 2011 TIP Projects



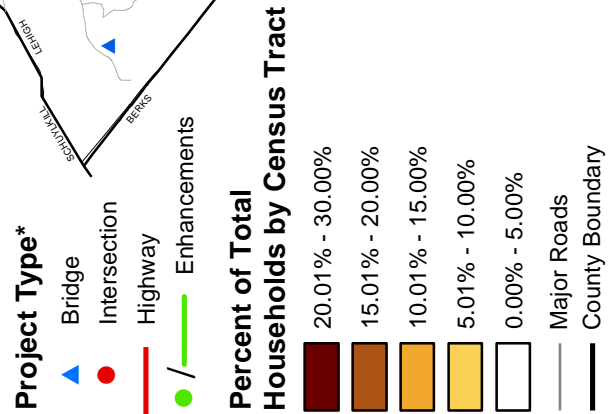
*Note: Detailed project information can be found on the LPVC website at www.lpvc.org.

Asian-American Population by Census Tract Year 2000 with 2011 TIP Projects



*Note: Detailed project information can be found on the LPVC website at www.lpvc.org.

Total Households Linguistically Isolated with 2011 TIP Projects

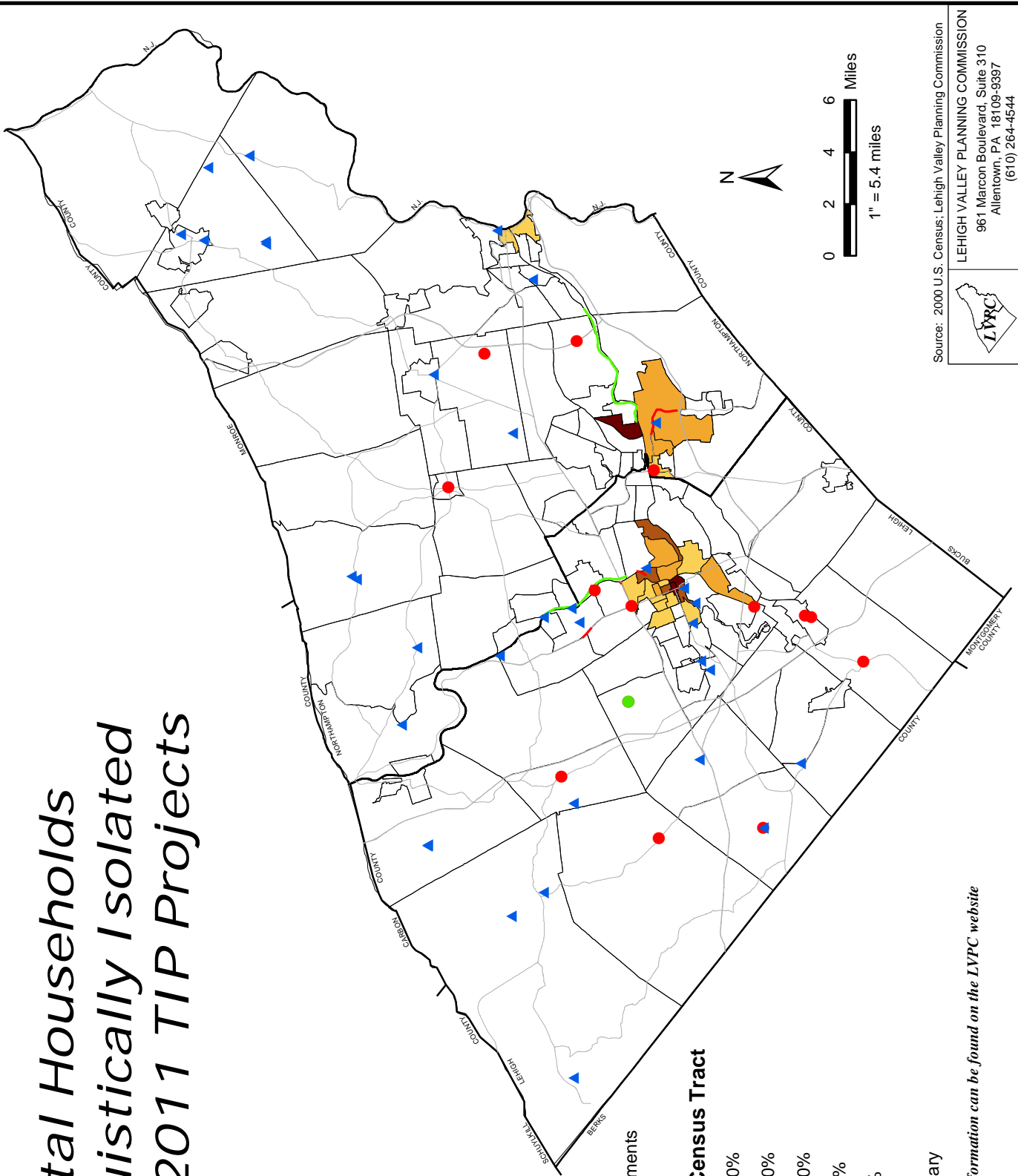
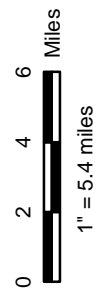


*Note: Detailed project information can be found on the LVPC website at www.lvpc.org.

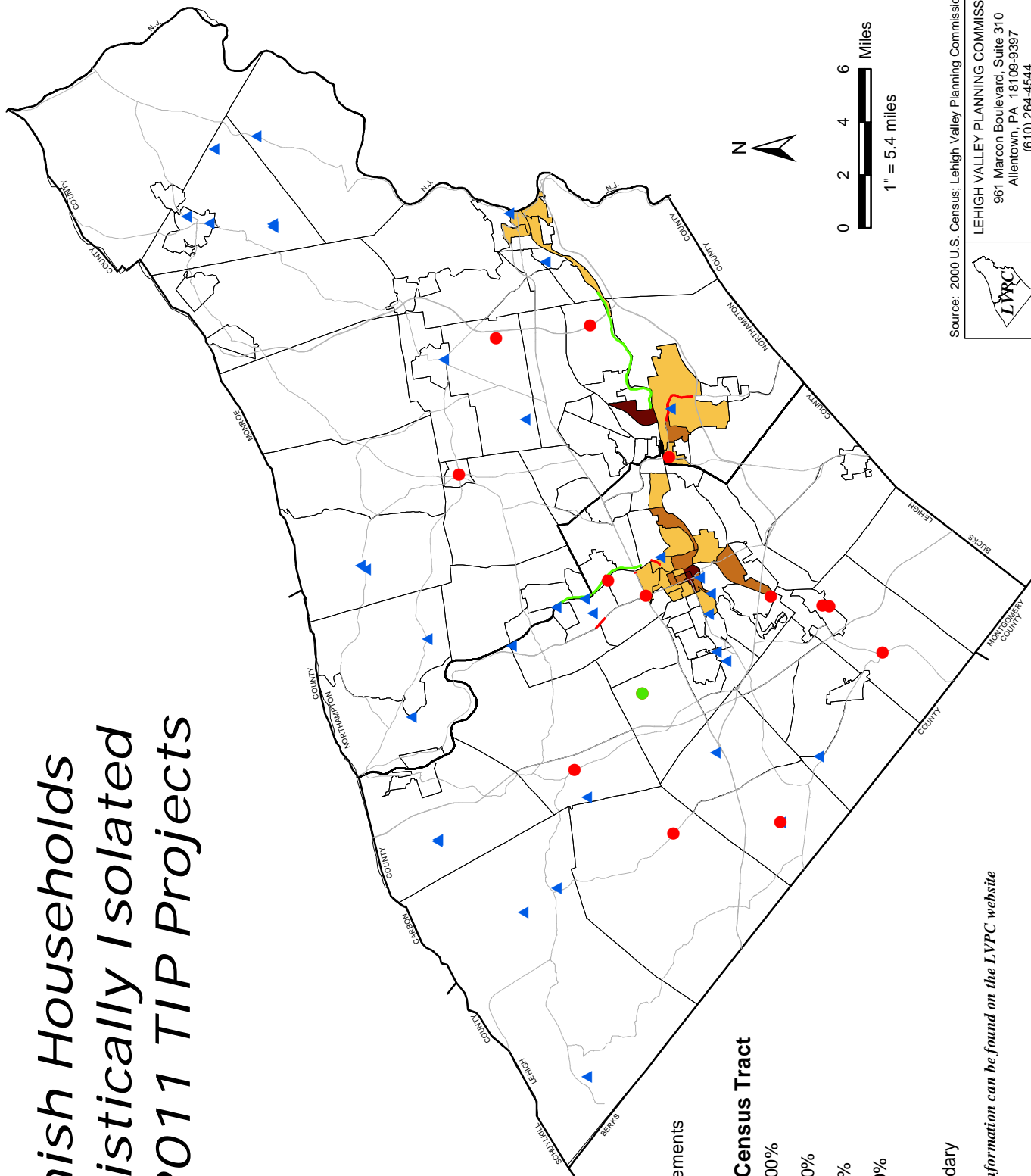
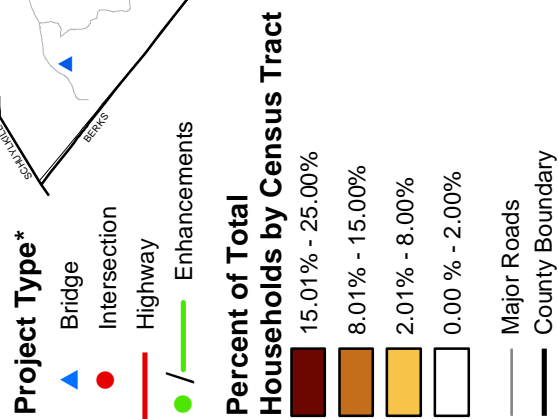


Source: 2000 U.S. Census; Lehigh Valley Planning Commission

LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544



Spanish Households Linguistically Isolated with 2011 TIP Projects



*Note: Detailed project information can be found on the LVPC website at www.lvpc.org.

Source: 2000 U.S. Census; Lehigh Valley Planning Commission

LEHIGH VALLEY PLANNING COMMISSION
 961 Marcon Boulevard, Suite 310
 Allentown, PA 18109-9397
 (610) 264-4544

Asian & Pacific Island Households Linguistically Isolated with 2011 TIP Projects

Project Type*

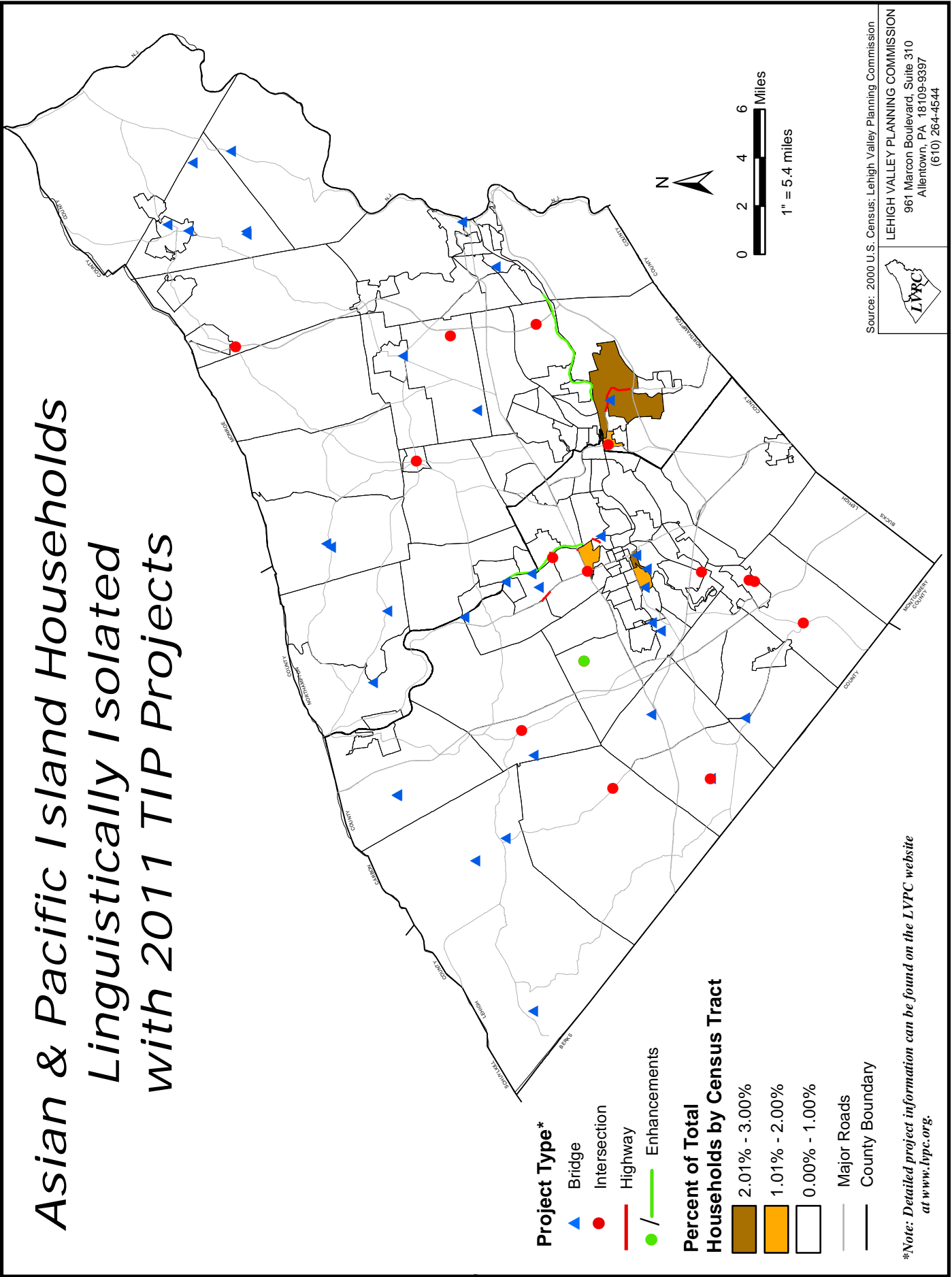
- ▲ Bridge
- Intersection
- Highway
- / — Enhancements

Percent of Total Households by Census Tract

- 2.01% - 3.00%
- 1.01% - 2.00%
- 0.00% - 1.00%

- Major Roads
- County Boundary

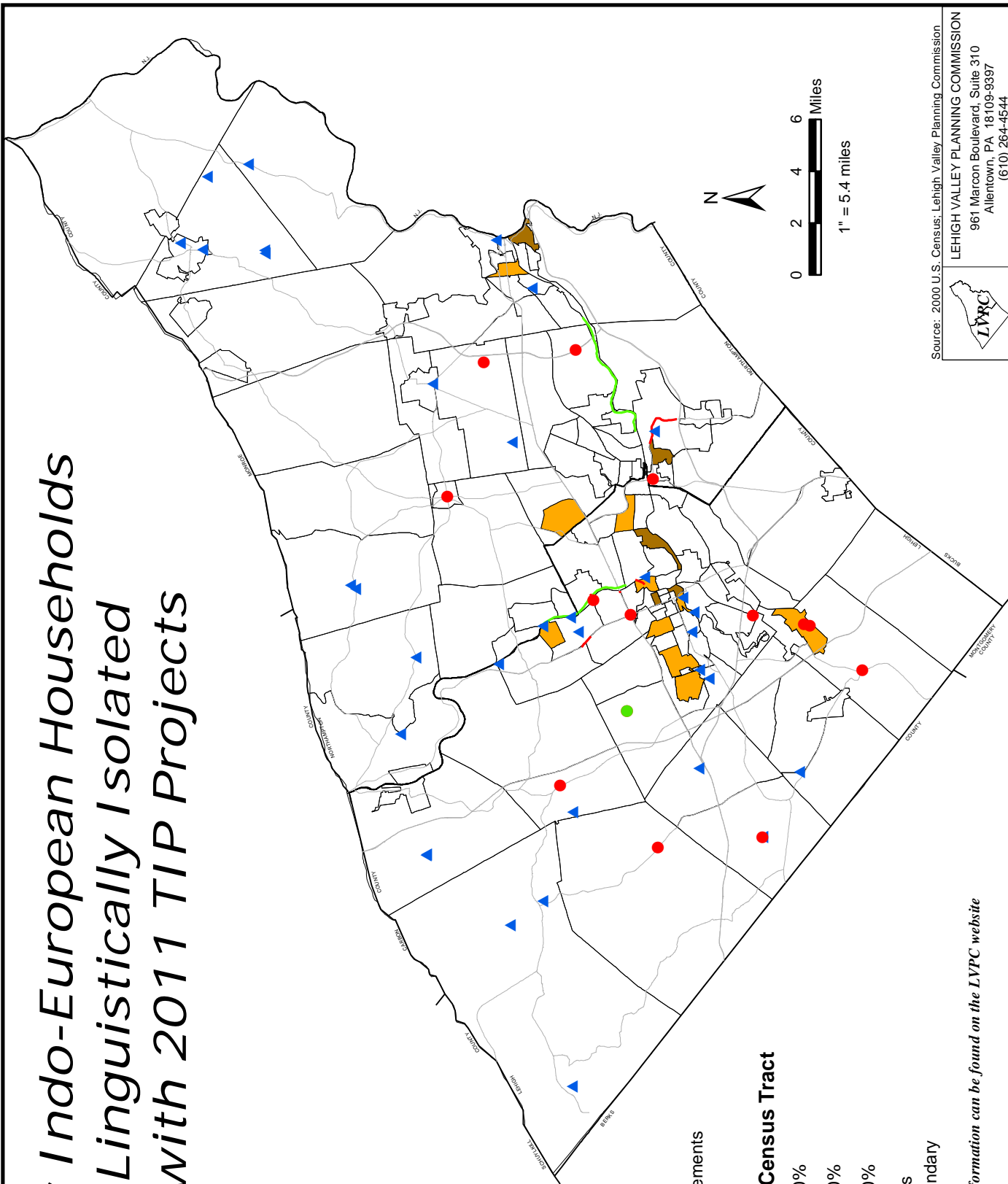
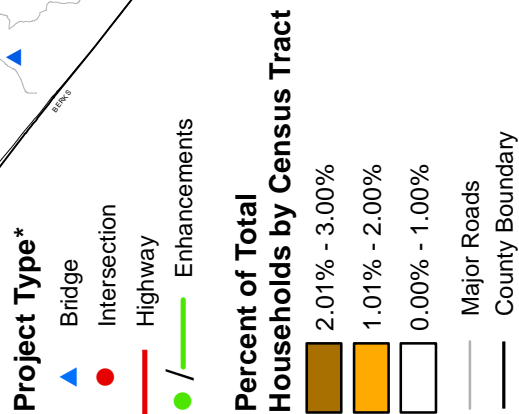
**Note: Detailed project information can be found on the LVPC website at www.lvpc.org.*



Source: 2000 U.S. Census; Lehigh Valley Planning Commission

LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

Other Indo-European Households Linguistically Isolated with 2011 TIP Projects

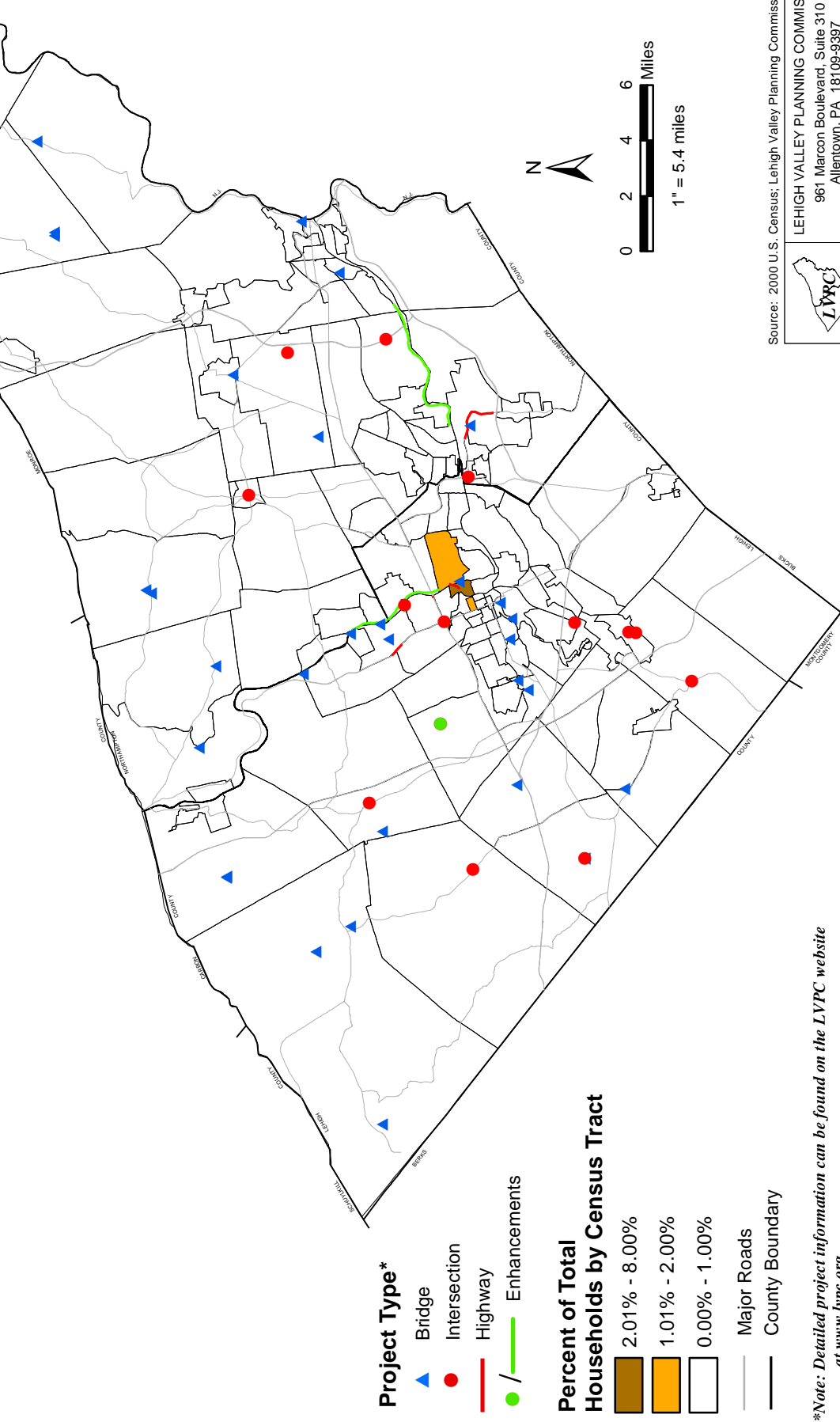


*Note: Detailed project information can be found on the LVPC website at www.lvpc.org.

Source: 2000 U.S. Census; Lehigh Valley Planning Commission

LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

Other Households Linguistically Isolated with 2011 TIP Projects

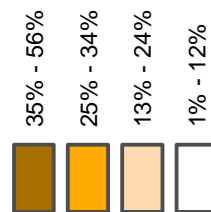


*Note: Detailed project information can be found on the LVPC website at www.lvpc.org.

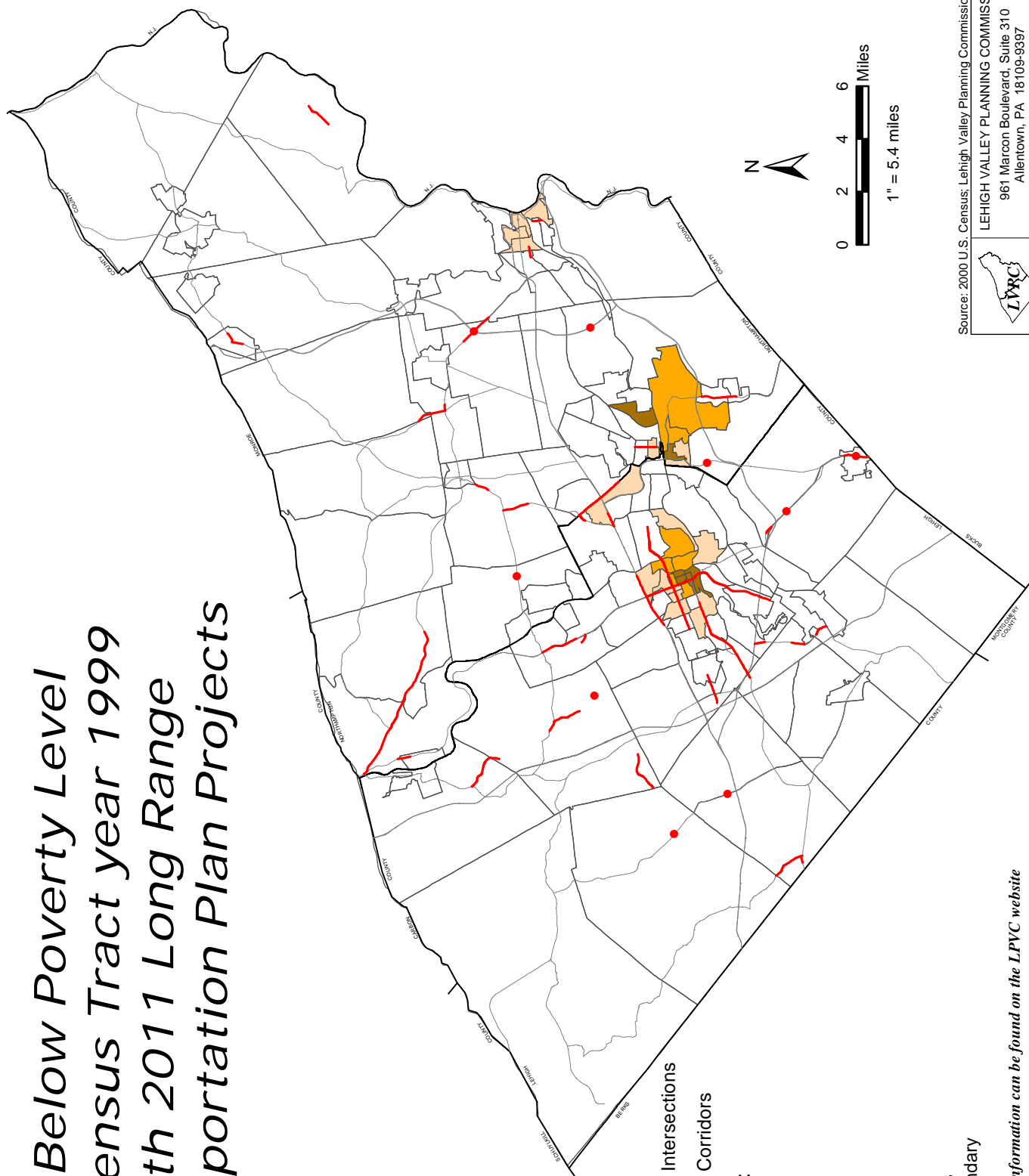
% Below Poverty Level by Census Tract year 1999 with 2011 Long Range Transportation Plan Projects

- High Priority Intersections
- High Priority Corridors

Percent of Tract



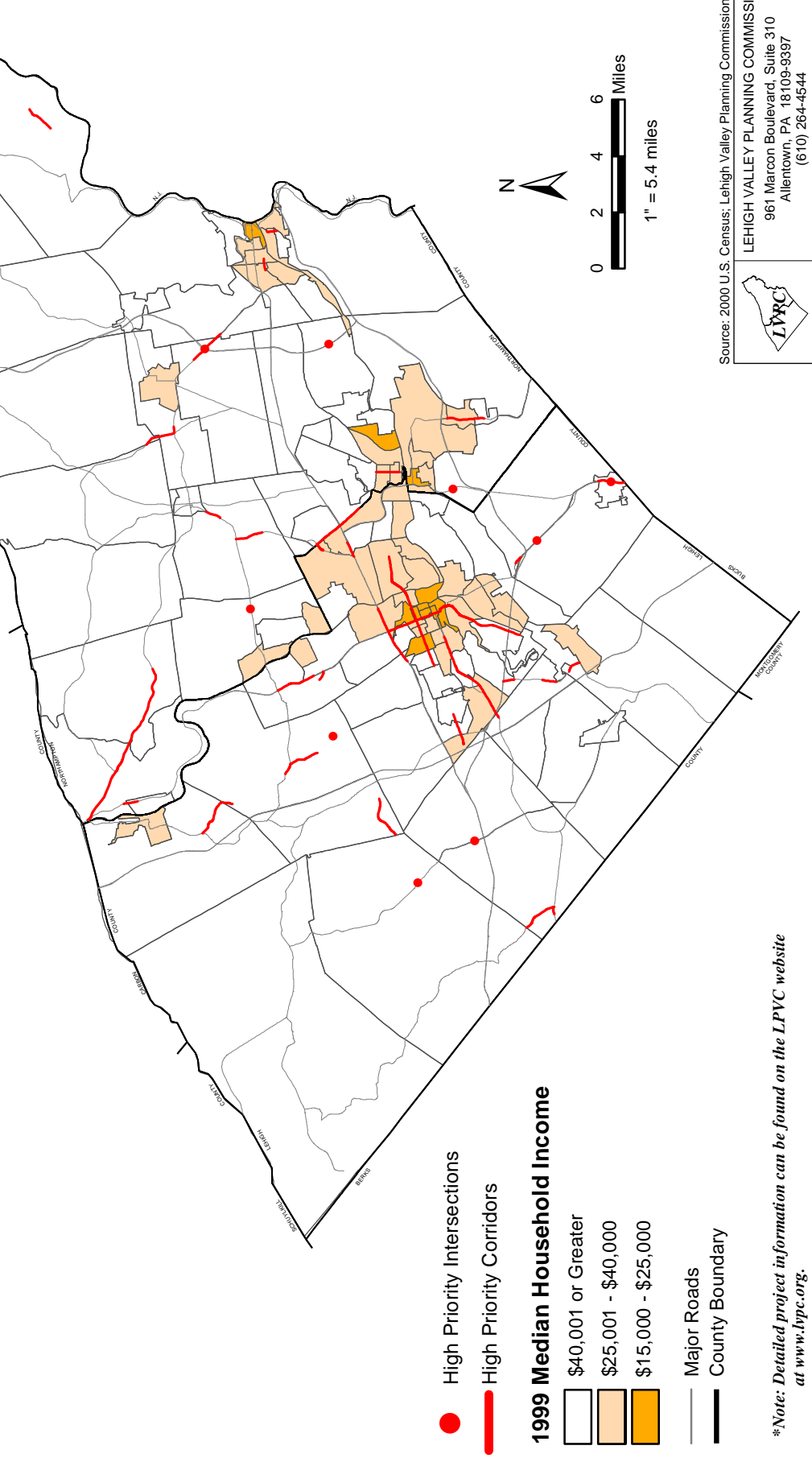
- Major Roads
- County Boundary



*Note: Detailed project information can be found on the LPVC website at www.lpvc.org.



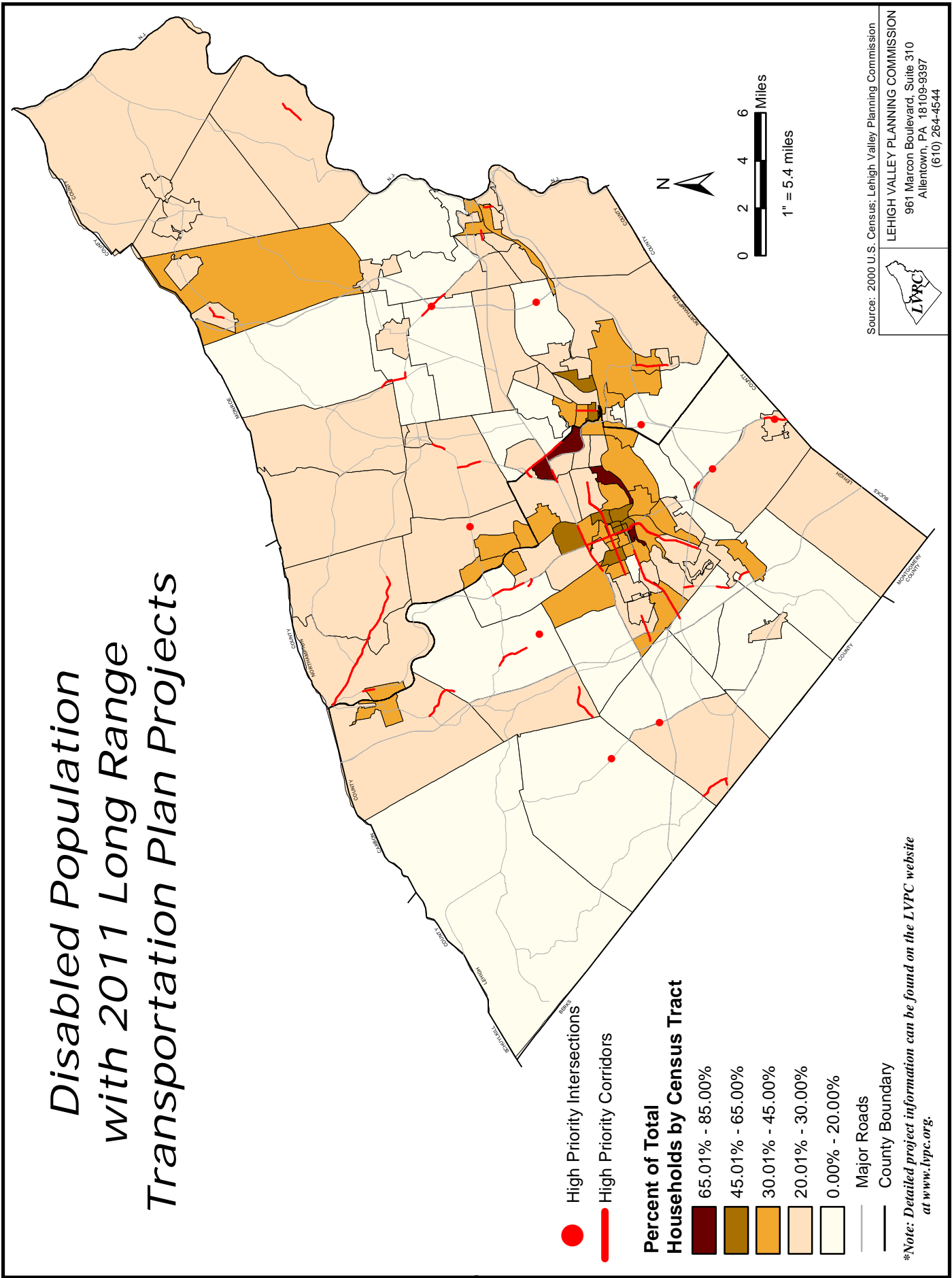
Median Household Income by Census Tract Year 1999 with 2011 Long Range Transportation Plan Projects



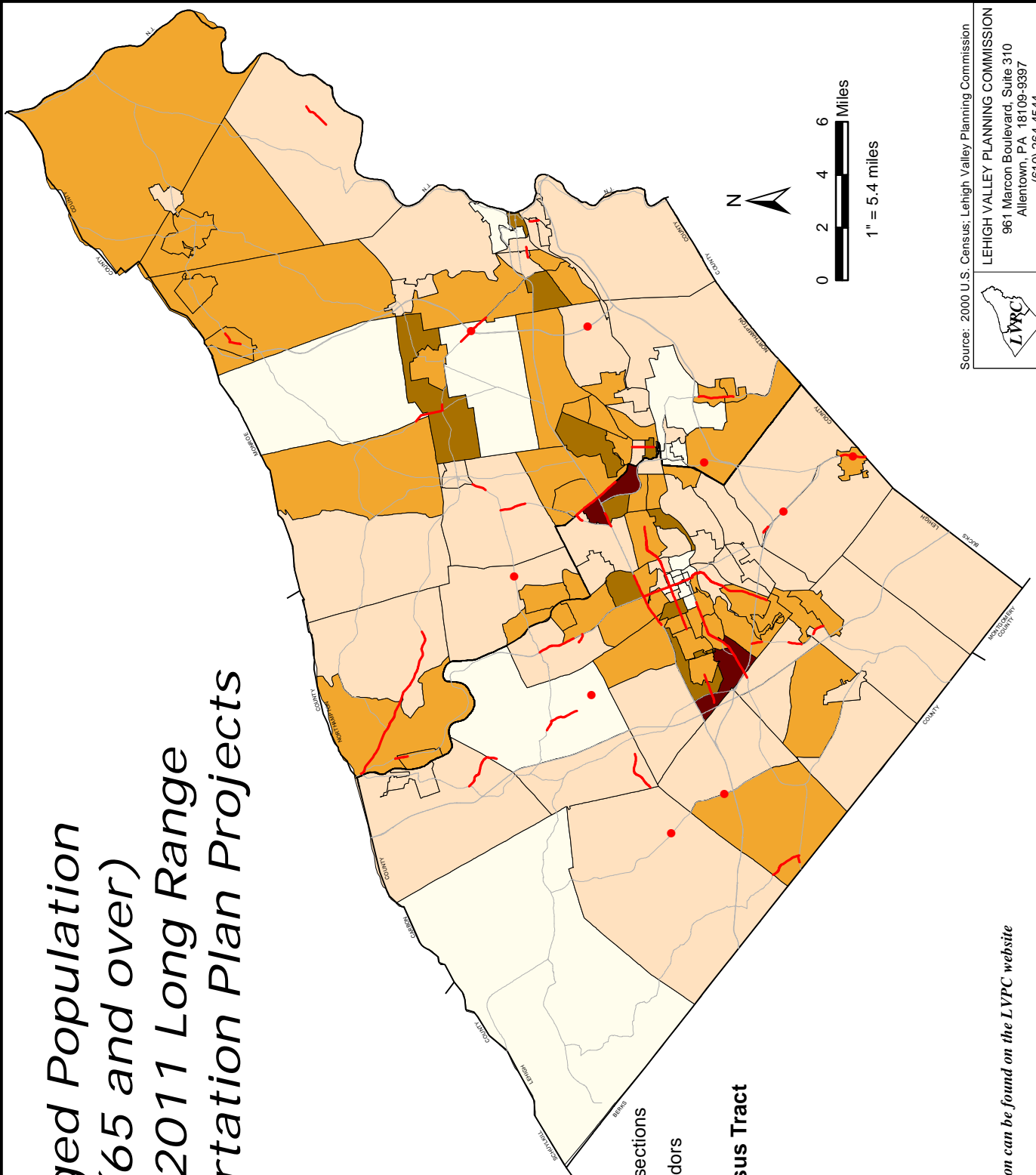
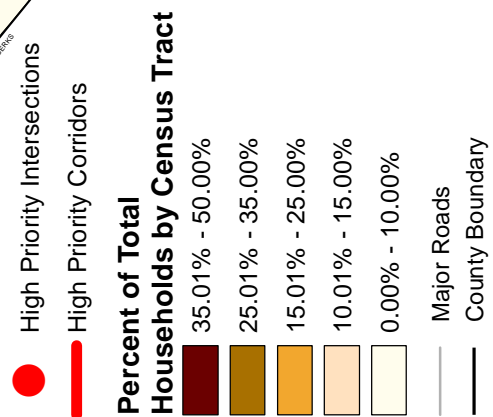
Source: 2000 U.S. Census; Lehigh Valley Planning Commission
LEHIGH VALLEY PLANNING COMMISSION
 961 Marcon Boulevard, Suite 310
 Allentown, PA 18109-9397
 (610) 264-4544

*Note: Detailed project information can be found on the LPVC website at www.lvpc.org.

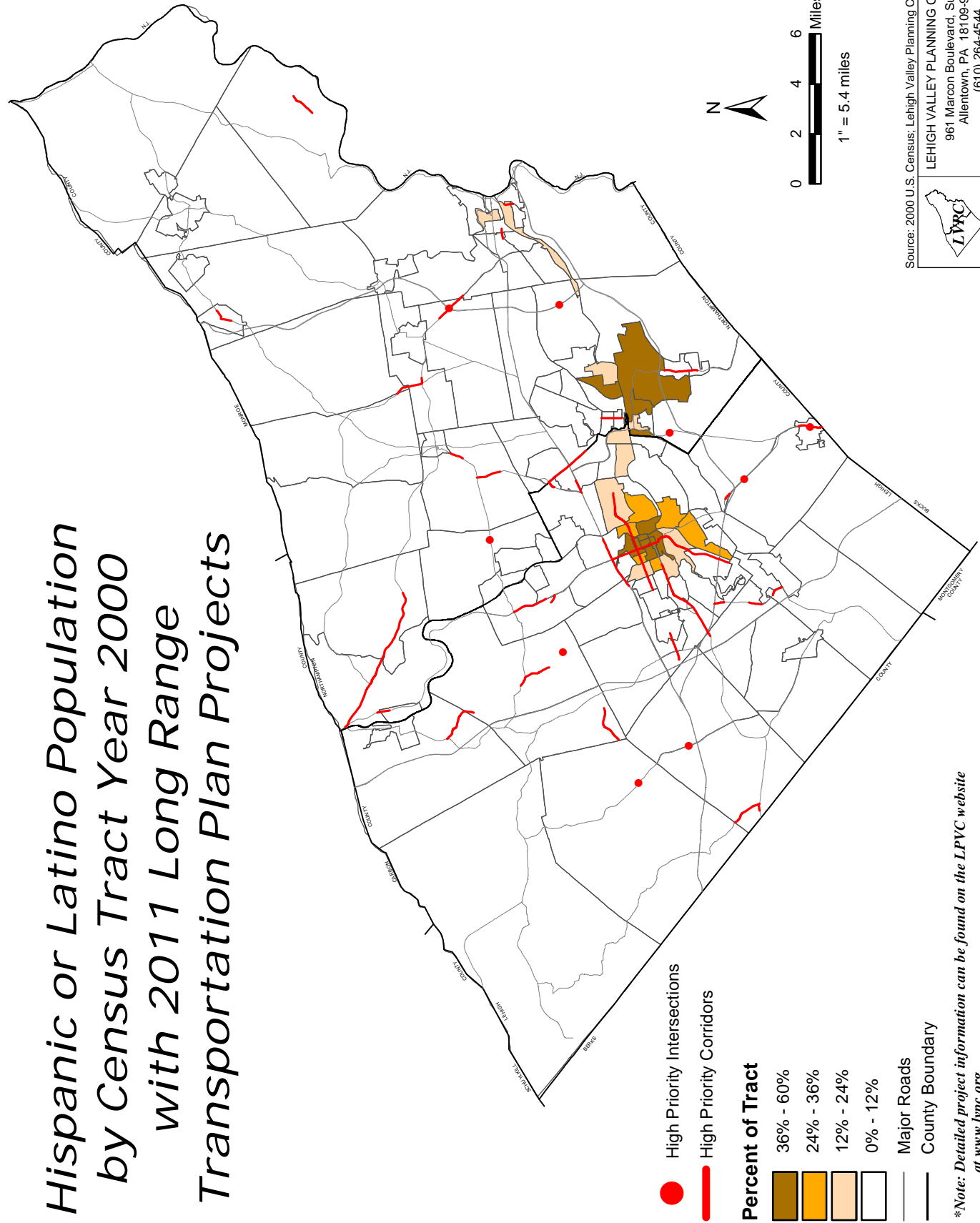
Disabled Population with 2011 Long Range Transportation Plan Projects



Aged Population (65 and over) with 2011 Long Range Transportation Plan Projects



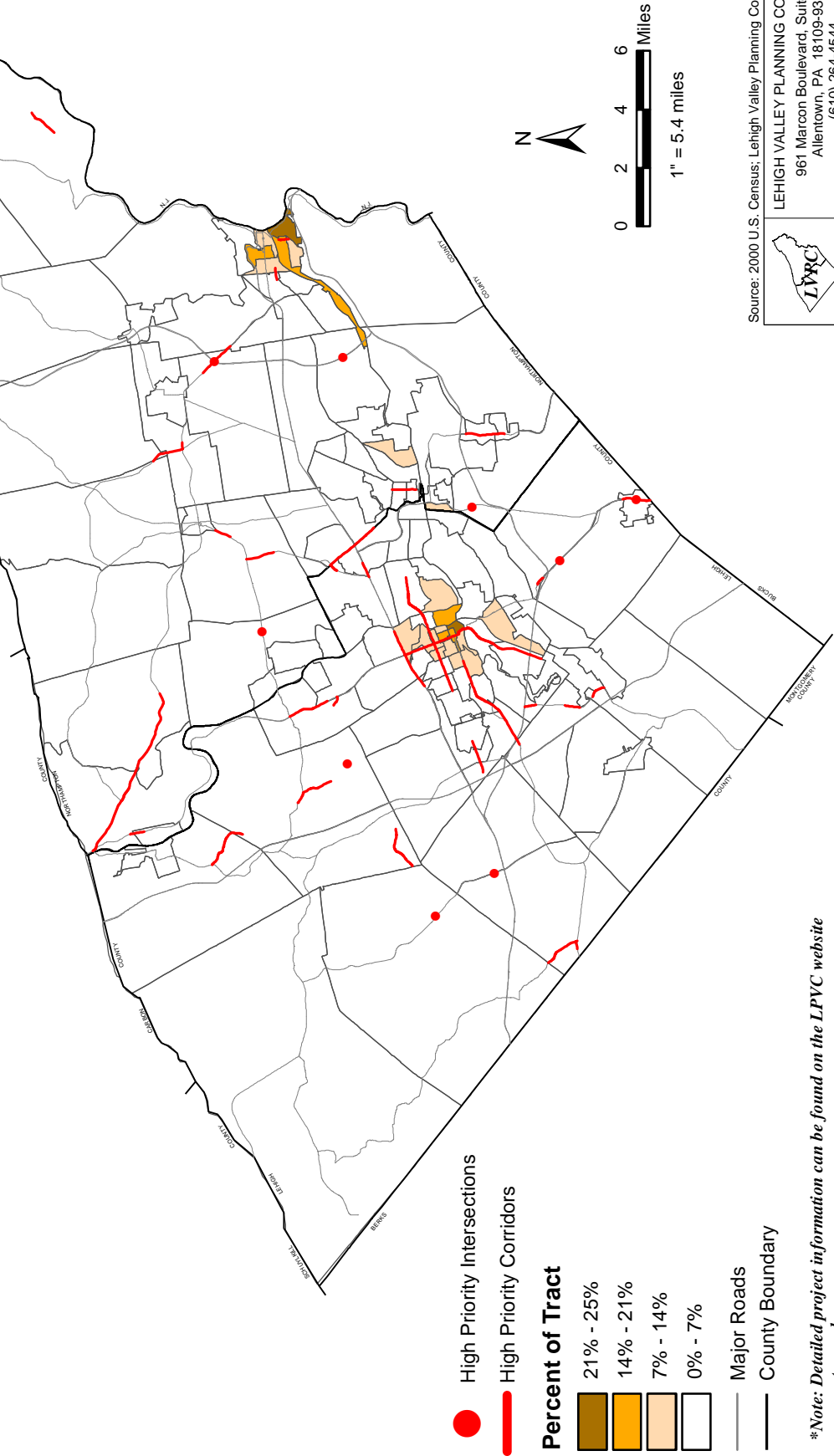
Hispanic or Latino Population by Census Tract Year 2000 with 2011 Long Range Transportation Plan Projects



Source: 2000 U.S. Census; Lehigh Valley Planning Commission
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

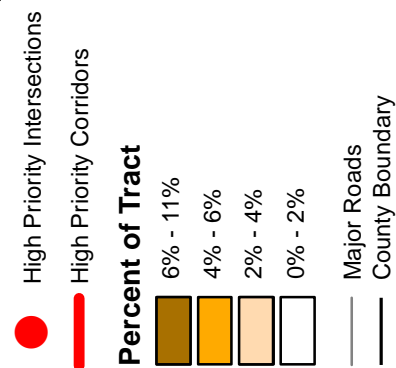
*Note: Detailed project information can be found on the LPVC website at www.lpvc.org.

African-American Population by Census Tract Year 2000 with 2011 Long Range Transportation Plan Projects




**Hispanic-American Population
Census Tract Year 2000
with 2011 Long Range
Transportation Plan Projects**

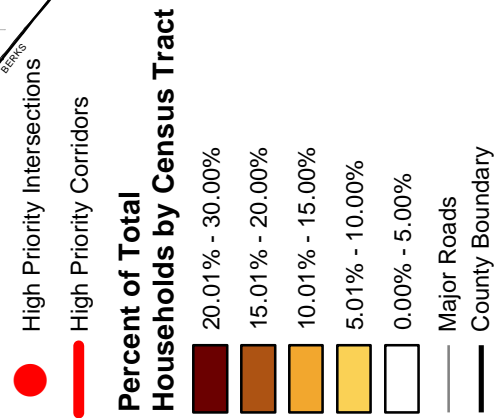
Source: 2000 U.S. Census; Lehigh Valley Planning Commission
Project information can be found on the LPVC website
c.org.



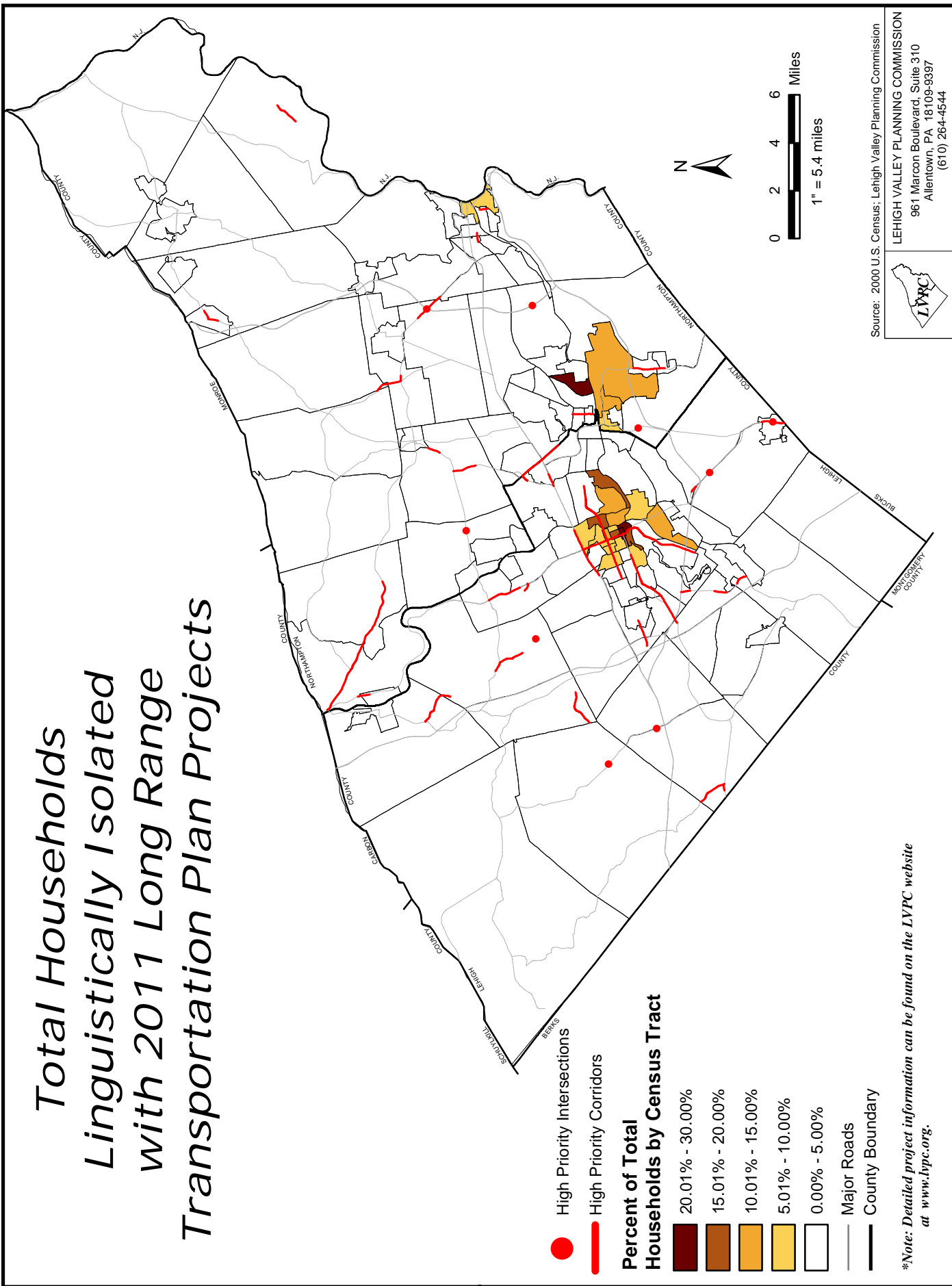
**Note: Detailed project information can be found on the LPVC website at www.lpvc.org.*

Source: 2000 U.S. Census; Lehigh Valley Planning Commission	 <p>LEHIGH VALLEY PLANNING COMMISSION 961 Marcon Boulevard, Suite 310 Allentown, PA 18109-9397 (610) 264-4544</p>
-------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Total Households Linguistically Isolated with 2011 Long Range Transportation Plan Projects



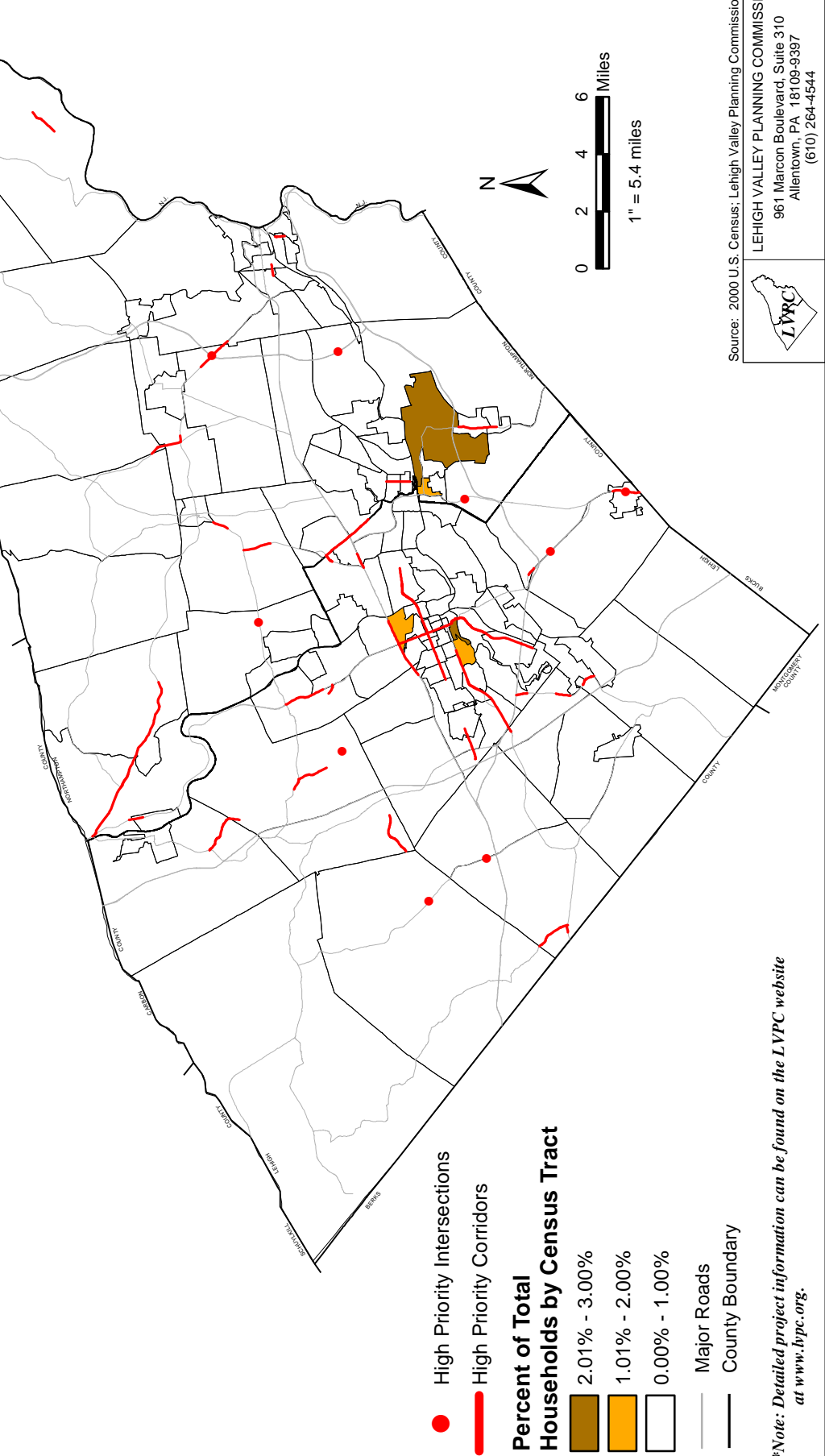
**Note: Detailed project information can be found on the LVPC website at www.lvpc.org.*



Transportation Plan Projects



Asian & Pacific Island Households Linguistically Isolated with 2011 Long Range Transportation Plan Projects



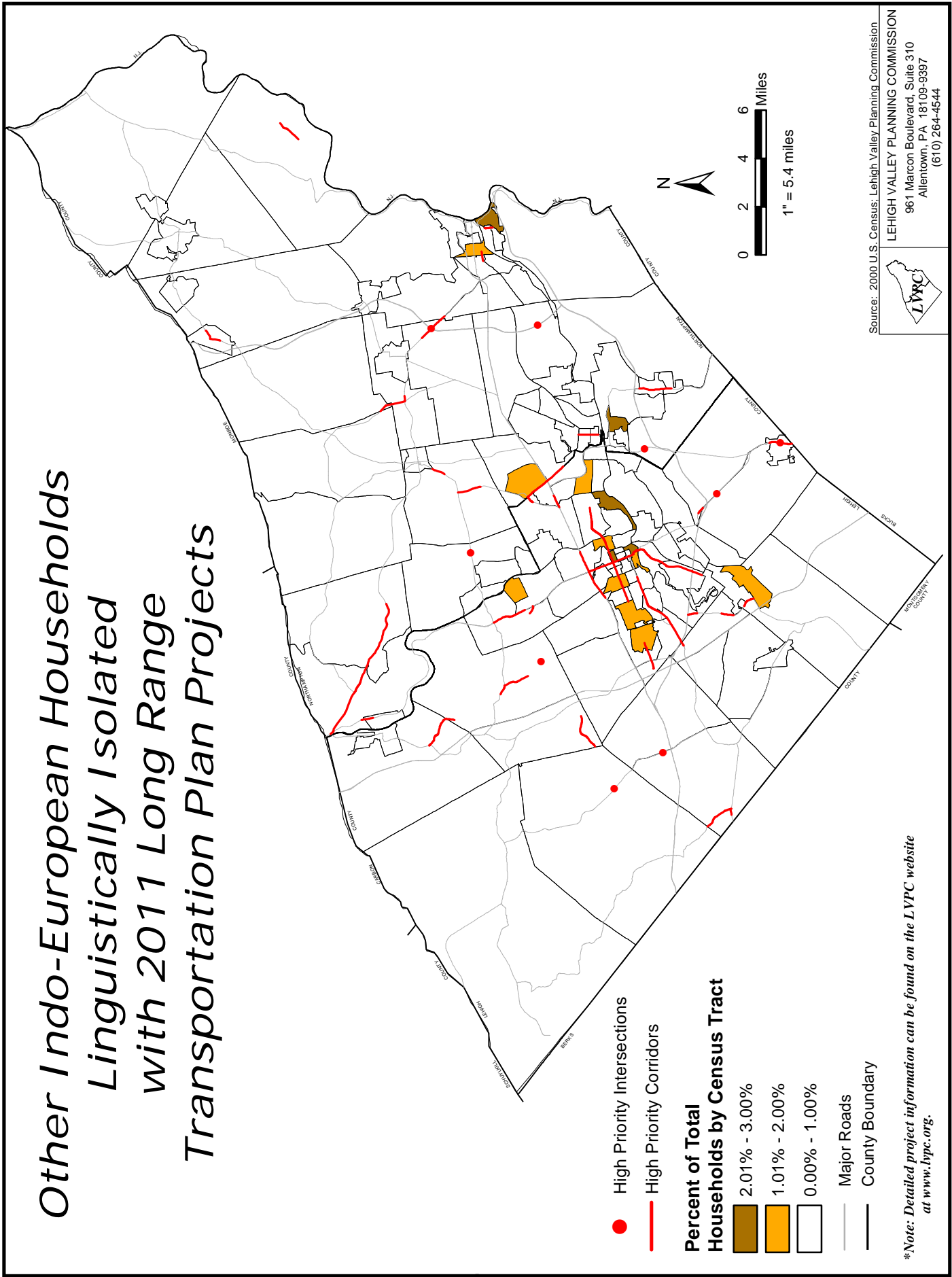
*Note: Detailed project information can be found on the LVPC website at www.lvpc.org.

Source: 2000 U.S. Census; Lehigh Valley Planning Commission



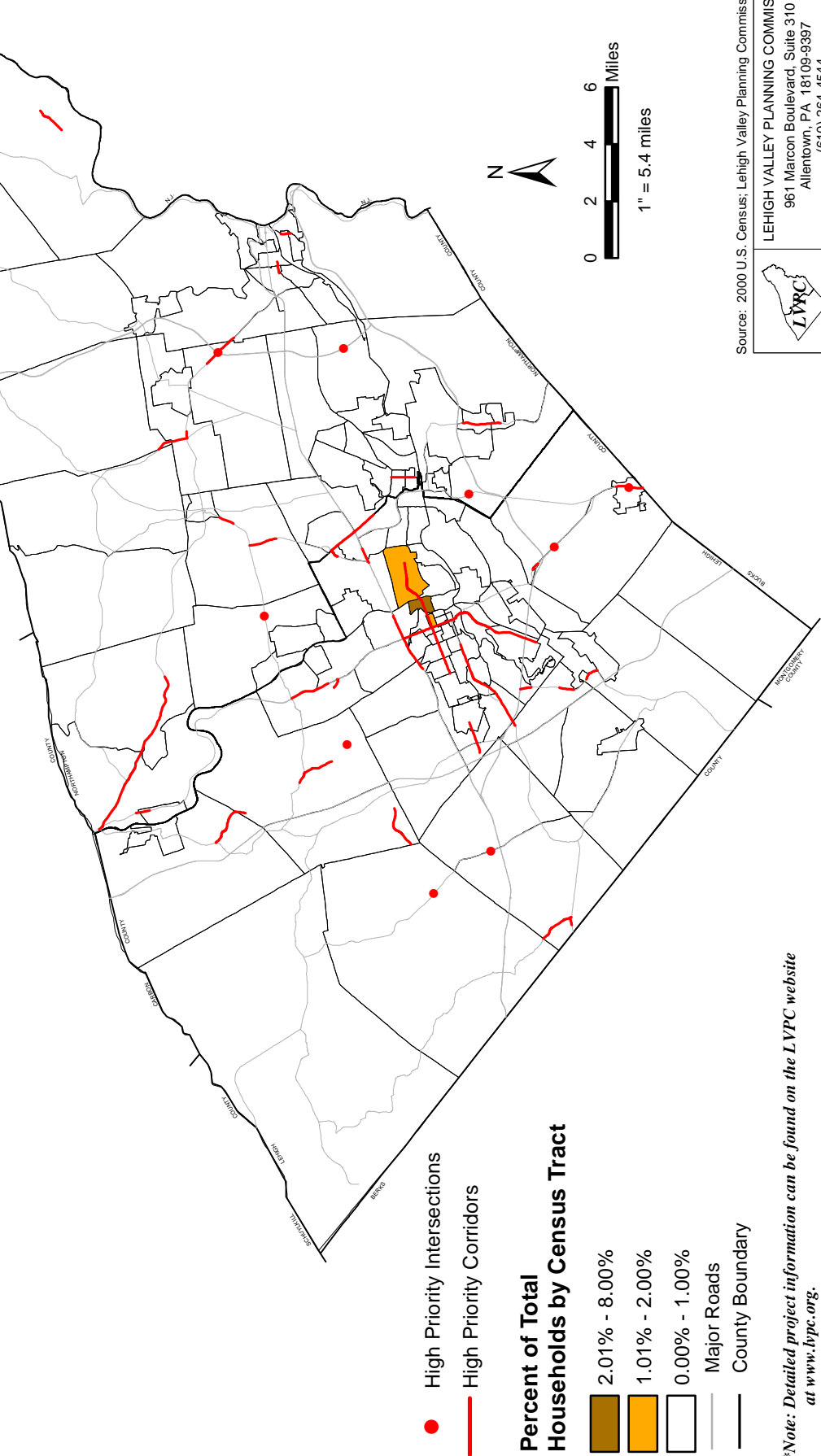
LEHIGH VALLEY PLANNING COMMISSION
961 Maroon Boulevard, Suite 310
Allentown, PA 18109-9397
(610) 264-4544

Other Indo-European Households Linguistically Isolated with 2011 Long Range Transportation Plan Projects



*Note: Detailed project information can be found on the LVPc website at www.lvpc.org.

Other Households Linguistically Isolated with 2011 Long Range Transportation Plan Projects



*Note: Detailed project information can be found on the *LYPC* website at www.lypc.org.

