US 30
(LANCASTER AVENUE) CORRIDOR STUDY

CREATING LINKAGES *and* CONNECTING COMMUNITIES

DECEMBER 2011

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

CITY OF PHILADELPHIA | HAVERFORD TOWNSHIP | LOWER MERION TOWNSHIP | NARBERTH BOROUGH | RADNOR TOWNSHIP

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The Delaware Valley Regional Planning Commission is dedicated to uniting the region's elected officials, planning professionals, and the public with a common vision of making a great region even greater. Shaping the way we live, work, and play, DVRPC builds consensus on improving transportation, promoting smart growth, protecting the environment, and enhancing the economy. We serve a diverse region of nine counties: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey. DVRPC is the federally designated Metropolitan Planning Organization for the Greater Philadelphia Region — leading the way to a better future.

The symbol in our logo is adapted from the official DVRPC seal and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole, while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for the findings and conclusions herein, which may not represent the official views or policies of the funding agencies.

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

US 30, also known as Lancaster Avenue, is one of the region's most critical transportation corridors. Comprised of a network of important roadways and rail lines, the US 30 Corridor links a series of distinct and historic communities in West Philadelphia, Lower Merion, Haverford, and Radnor, and is home to some of the region's most identifiable places.

Approximately 11 miles in length, the US 30 Corridor Study Area extends from 52nd Street in West Philadelphia to Old Eagle School Road in Radnor Township, near the border between Delaware and Chester counties. The Study Area spans three counties and includes portions of the City of Philadelphia; Lower Merion, Haverford, and Radnor townships; and Narberth Borough.

The US 30 Corridor Study was initiated by DVRPC, with the support of Delaware and Montgomery counties and the City of Philadelphia, to help coordinate transportation and land use investment decisions in a manner that encourages smart growth across the municipalities that line this corridor. By coordinating these efforts, DVRPC seeks to promote a more sustainable region and implement the goals and objectives presented in *Connections: The Regional Plan for a Sustainable Future*.

This report is the result of a two-year planning process, which began in summer 2009. During this time, DVRPC facilitated multiple public participation opportunities and worked extensively with a variety of stakeholders at the state, county, and local level. There was significant public involvement throughout the study which allowed residents to assist in identifing corridor needs and recommend improvement strategies.

The purpose of this study is to develop solutions that will improve safety for vehicles and pedestrians, reduce travel delays, identify and prioritize critical roadway improvements, enhance economic development opportunities, and help manage area stormwater. Furthermore, this document discusses several strategies to help meet the following goals: create distinctive, attractive settings with a strong sense of place; preserve and enhance cultural and historic resources; promote municipal cooperation; encourage smart growth land use and development patterns; create walkable and bikeable communities; enhance access to public transit, and; enhance the sustainability of the corridor.

The planning process revealed many opportunities for developing the corridor in ways that meet the aspirations of its residents and achieves the goals of this study. These include:

- Ensuring new development capitalizes on the corridor's rich transit network and established development centers.
- Repurposing vacant and underutilized parcels to better serve the needs of local populations.
- Implementing newer, more sustainable methods of stormwater management which can help municipalities achieve environmental management goals.
- Implementing recommendations from numerous recent studies and plans conducted for portions of the corridor.
- Enhancing vehicular and pedestrian circulation by defining and consolidating property access points.

These opportunities have all been addressed in this study and an implementation plan has been developed that provides options on how they can be realized.

The US 30 Corridor, as defined in this study, is a large complex area composed of a diverse range

of urban and suburban environments. Much of this study deals with how US 30 operates over its entire length, and a series of corridor-wide recommendations has been developed. These corridor-wide recommendations focus on environmental, land use, and transportation improvements.

In addition, the corridor has been divided into a series of 14 sub-areas in order to examine localized issues that vary from place to place along the corridor. These sub-areas extend along Lancaster Avenue and a stretch of Haverford Road. Specific improvements have been identified for each sub-area.

The focus of the environmental recommendations is stormwater management, as this is the primary cause of water-quality impairment in the Study Area. However, many of these recommendations provide additional environmental, aesthetic, and social benefits, including improved habitat and open space, increased vegetation and tree cover, and improved air quality. A strategic and coordinated approach to stormwater management, using best management practices that retain rainwater on-site and emphasize natural processes of infiltration and biologic uptake, can address all of these problems, while enhancing the community's overall quality of life.

Despite being an established corridor, the land use context of US 30 changes frequently, and often dramatically, as one travels through the Study Area. Lancaster Avenue passes through a diverse range of urban, suburban, and village center environments, each with its own character. This document suggests that the conflicts created by these frequent changes in land use context can be resolved by applying a variety of Smart Growth principles to the corridor. These principles can help guide the future development of US 30 and effectively address corridor-wide land use issues.

The corridor's sidewalks, crosswalks, and trails that make up the pedestrian facilities vary widely in condition and quality throughout the Study Area. In order to enhance pedestrian mobility, it is recommended that a five-foot minimum sidewalk width with a five-foot to ten-foot buffer area is ideal to protect pedestrians from traffic. To comply with the Americans with Disabilities Act (ADA), utility poles and signs must be placed such that a minimum of 36-inches of clear sidewalk width is preserved for pedestrians.

The study also recommends employing Complete Streets principles, where appropriate, to ensure roadways accommodate all users, including motorized vehicles, pedestrians, and cyclists. Many areas in the corridor lack the necessary pedestrian and bicycle infrastructure to make walking and bicycling viable transportation options. Complete Streets, along with improved utilization of the available transit options, will lessen auto dependence and lead to a more balanced transportation system.

In addition to the 86 miles of bicycle routes and trails existing or proposed in the Study Area, an additional 35 miles are recommended to be incorporated into the existing network, which would improve connectivity and safety. The study identified existing and proposed bicycle facilities and ways in which these facilities can be improved to promote connectivity, safety, and convenience. The primary aim is to improve the desirability of bicycle routes by minimizing conflicts between motorized traffic and bicycle traffic.

In making rail stations fully intermodal nodes, they must serve bicyclists better than they currently do along the US 30 Corridor. Beginning with the highest-ridership stations, SEPTA should implement a policy of providing sufficient bicycle parking on both sides of every rail station where feasible. This is beneficial for customer mobility, SEPTA ridership, and environmental sustainability. Bicycle parking racks are simply the endpoints of a broader bicycling network.

Additional transit recommendations include coordination of bus and rail schedules to enable a seamless transfer from one mode to the next. To assist in publicizing the coordination to transit riders, measures such as adding regional rail stations to all bus route schedules and vise versa, would inform riders of intermodal connections. In addition, highly visible wayfinding signs pointing to nearby bus stops at regional rail stations should be installed. These initiatives are very important

in retaining and attracting new riders, as well as connecting individuals to large employment centers.

At a minimum, basic functional and orientation information should be provided on both platforms at rail stations. In addition, the basic elements required for passenger comfort, safety, and protection from the elements should be required at all rail stations and bus stops. While the new generation of SEPTA bus stop signs will show both the route numbers and the terminal point of the route, additional information and amenities are needed at most bus stops.

Commuter rail stations should have better automobile access. Moderate parking benefits may be achieved through better management of existing facilities such as converting some permit spaces to daily spaces that are currently at capacity.

Walking is a critical part of almost every trip, so it is important for a balanced transportation network to provide a safe walking environment. Street crossings in the vicinity of bus stops and rail stations at a minimum should have high visibility crosswalks, pedestrian signals, and design features to protect pedestrians from nearby vehicular traffic. Several intersection and highway segment improvements were identified along Lancaster Avenue and Haverford Road that would not only improve mobility for road users but would improve safety as well. Many of the major intersections along the corridor have access driveways located nearby. Access management techniques such as restricting access to right-in, right-out movement, or relocation of the driveways further away from the intersection, have been shown to reduce the potential for crashes and improve operations. If possible, some driveways on Lancaster Avenue should be closed and moved to the minor street approach in order to reduce conflicts.

This report's recommendations aim to improve highway efficiency, protect and restore environmental resources and enhance the quality of life within the communities of the US 30 Corridor. State, county and municipal agencies and officials are responsible for the prioritization and implementation of these policies that would link transportation investments to land use decisions in a manner that encourages smart growth and a more livable community.

1 INTRODUCTION

SECTION 1

INTRODUCTION

CORRIDOR PLANNING

Corridors form the primary connections between cities, neighborhoods, suburbs, and the region as a whole. Metropolitan planning organizations (MPOs), such as the Delaware Valley Regional Planning Commission (DVRPC), are in a unique position to plan for these critical areas because DVRPC's multicounty jurisdiction enables it to plan across municipal and county boundaries.

Corridor plans can help provide guidance on what future infrastructure improvements are needed and coordinate development efforts along a corridor by building partnerships between numerous public and private agencies and organizations. Corridor plans can also help identify major planning issues prior to project development and protect transportation investments.

Finally, corridor plans can provide the state departments of transportation, local governments, property owners, developers, and residents of an area with an overall vision for the future growth and development of a corridor.

PROJECT BACKGROUND

US 30, also known as Lancaster Avenue, is one of the region's most critical transportation corridors. Comprised of a network of important roadways and rail lines, the US 30 Corridor links a series of distinct and historic communities in West Philadelphia, Lower Merion, Haverford, and Radnor and is home to some of the region's most identifiable places.

The US 30 Corridor Study was initiated by DVRPC to help coordinate transportation and land use planning across the municipalities that line this important corridor. By coordinating these efforts, DVRPC seeks to promote a more sustainable region and implement the goals and objectives presented in *Connections: The Regional Plan for a Sustainable Future*. Like other corridor studies conducted by DVRPC, this planning process has addressed numerous transportation and livability issues. Specific objectives of the study include:

- Mitigating transportation problems,
- Improving access to public transit,
- Identifying roadway improvements,
- Promoting pedestrian and bicycle safety and mobility,
- Encouraging smart growth land use,
- Preserving and enhancing cultural and historic resources, and
- Improving stormwater management.

STUDY AREA

Approximately 11 miles in length, the US 30 Corridor Study Area ("Study Area" or "US 30 Study Area") (Figure 1.1) extends from 52nd Street in West Philadelphia to Old Eagle School Road in Radnor Township, near the border between Delaware and Chester counties. The Study Area spans three counties and includes portions of the City of Philadelphia; Lower Merion, Haverford, and Radnor townships; and Narberth Borough. The Study Area's boundary extends roughly one mile north and south of Lancaster Avenue and includes many stations along SEPTA's Paoli/Thorndale Regional Rail Line and the Norristown High Speed Line.

What we now refer to as US 30 was originally part of the nation's first turnpike, completed in 1795, which connected Philadelphia and Lancaster. Later development was shaped by the construction of the Main Line of the Pennsylvania Railroad and the forces of suburbanization. In 1913, the turnpike was incorporated into the Lincoln Highway, the country's first transcontinental automobile road.

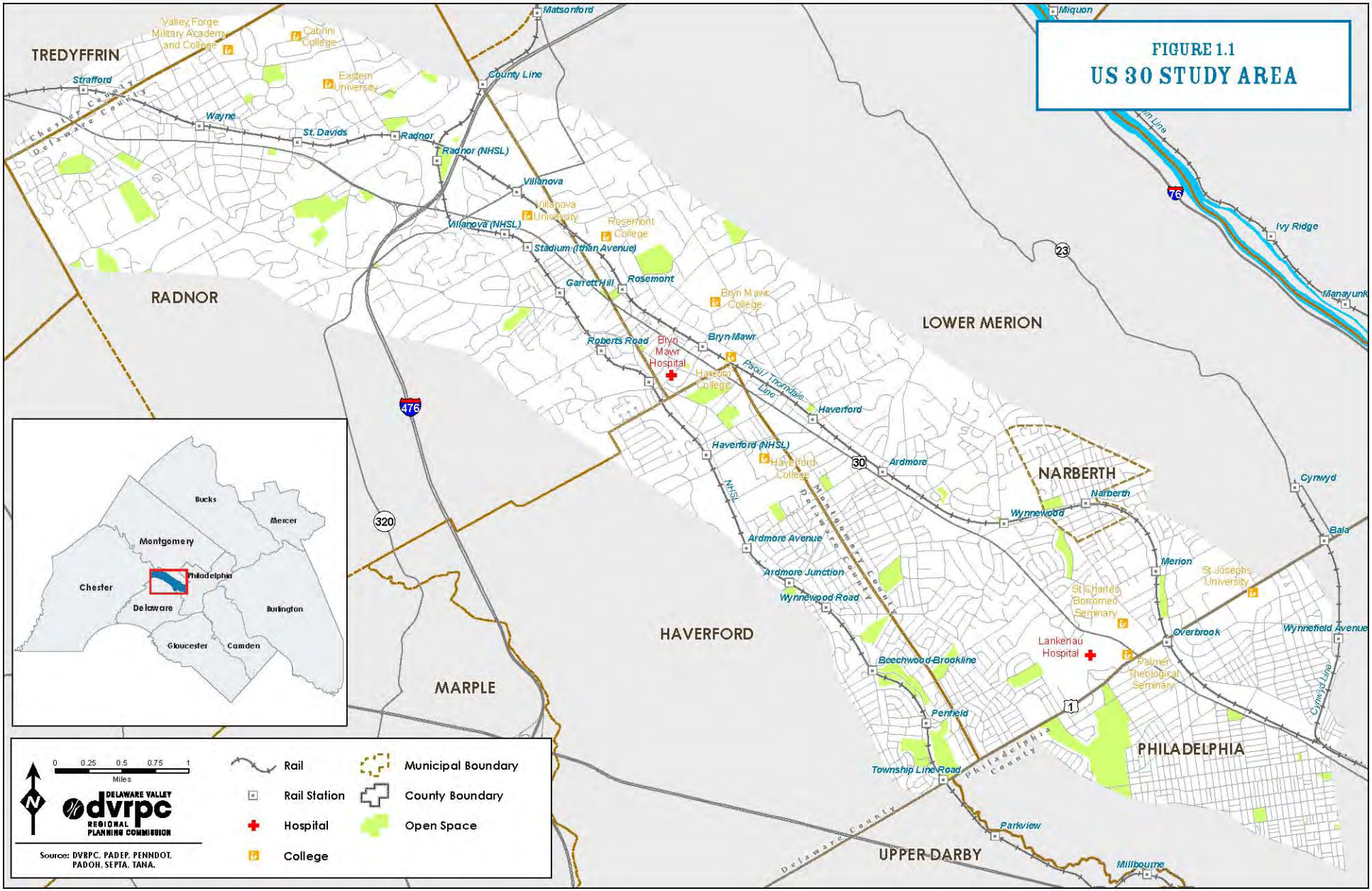


FIGURE 1.1
US 30 STUDY AREA
TREDYFFRIN
RADNOR
LOWER MERION
NARBERTH
HAVERFORD
MARPLE
UPPER DARBY
PHILADELPHIA
Valley Forge Military Academy and College
Cabrini College
Eastern University
Strafford
Wayne
St. Davids
Radnor
Radnor (NHSL)
Matsonford
County Line
Villanova
Villanova University
Villanova (NHSL)
Rosemont College
Stadium (Ithan Avenue)
Garrett Hill
Rosemont
Bryn Mawr College
Roberts Road
Bryn Mawr Hospital
Bryn Mawr
Haverford College
Paoli / Thorndale Line
Haverford
Haverford (NHSL)
Ardmore
Ardmore Avenue
Ardmore Junction
Wynnewood Road
Wynnewood
Narberth
Cynwyd
Bala
Merion
St Joseph's University
St Charles Borromeo Seminary
Overbrook
Wynnefield Avenue
Lankenau Hospital
Palmer Theological Seminary
Beechwood-Brookline
Penfield
Township Line Road
Parkview
Millbourne
Cynwyd Line
Miquon
Ivy Ridge
Manayunk
Bucks
Mercer
Montgomery
Chester
Philadelphia
Delaware
Burlington
Gloucester
Camden
0 0.25 0.5 0.75 1
Miles
DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION
Source: DVRPC, PADEP, PENNDOT, PADOH, SEPTA, TANA.
Rail
Rail Station
Hospital
College
Municipal Boundary
County Boundary
Open Space

Now largely built out, the US 30 Corridor is comprised of a range of established urban and suburban environments. *Connections* designates US 30 as a corridor of regional significance because its transportation infrastructure serves many important population and employment centers. Additionally, DVRPC's Congestion Management Process has also identified US 30 as a congested corridor, which may benefit from multimodal strategies that enhance the mobility of people and goods.

OTHER DVRPC WORK IN THE STUDY AREA

Several DVRPC studies have been conducted within the Study Area. Some of the most prominent studies are briefly described below.

Past Studies

Ambler/Bryn Mawr Rail Station Commuter Sheds Study
December 2009, DVRPC publication 09053

This study includes analysis of SEPTA's Bryn Mawr Regional Rail Station to determine the commuter shed. License plate and intercept surveys were conducted and results were displayed in a series of maps and tables. The study showed strong walk-up ridership, as well as ridership from a great distance along Bryn Mawr Avenue/PA 3. Less ridership was shown from Montgomery Avenue, PA 320, and Morris Avenue.

Conestoga Road – Road Safety Audit
June 2007, DVRPC publication 07059

A road safety audit of Conestoga Road was conducted by DVRPC and PennDOT in May 2007. This study documents the process and findings of the audit. Improvement recommendations were generated for roadway segments that demonstrated a history of, or potential for a high incidence of motor vehicle crashes. Emphasis was placed on low-cost, quick-turnaround safety projects where possible.

Increasing Intermodal Access to Transit – Phase IV
June 2007, DVRPC publication 07017

This phase of a continuing project assessed the pedestrian and bicycle accessibility of five rail stations in the region. The Bryn Mawr Regional Rail Station was included in the analysis. This study used pedestrian level-of-service (PLOS) and bicycle level-of-service (BLOS) model software to make a qualitative examination of access conditions in the immediate vicinity of the station. A summary of recommended enhancements was prepared for the station.

Access Management Along Pennsylvania Highways in the Delaware Valley – City Avenue/US 1 Case Study Corridor
September 2005, DVRPC publication 05019

This study was created in partnership with PennDOT as a case study to illustrate the model access management ordinances available to municipalities. The report highlights US1/ City Avenue between 54th Street and the I-76 interchange ramps. Existing conditions are documented and specific issue areas were identified and studied in more detail. Study recommendations aim to improve congestion and safety along the corridor. A theoretical conceptual plan was prepared and a map of these suggestions is included in the report.

Increasing Intermodal Access to Transit – Phase II
July 2005, DVRPC publication 05022

This study outlines the second phase of a continuing project to assess pedestrian and bicycle accessibility in the area surrounding the Ardmore Junction Station of the Norristown High Speed Line. PLOS and BLOS software was utilized to determine the nonmotorized mobility in the area of the station. Improvements recommended include buffers along sidewalks, striping at intersections, and bicycle racks at the stations.

US 30 (Lancaster Avenue) Traffic Signal Operations Study
2003, No formal publication

This study was conducted by DVRPC on behalf of PennDOT District 6, and it analyzed 26 traffic signals along US 30 between Lankenau Hospital and County Line Road. The goal of the study was to evaluate the performance of a traffic signal

system, coordinate and optimize the traffic signals, and relieve congestion in the Lower Merion section of Lancaster Avenue.

Congestion Management Process (CMP)

In addition to conducting a variety of transportation planning studies, DVRPC also maintains a Congestion Management Process (CMP) for the region. The CMP is a multifaceted approach that facilitates the movement of people and goods through analysis, stakeholder participation, and enhanced coordination.

For planning purposes, congestion is measured using eight criteria: (1) current daily congestion, (2) current peak hour congestion, (3) heavily used roads and intermodal facilities, (4) forecasted daily congestion, (5) forecasted peak-hour congestion, (6) frequent crash-related congestion, (7) intermodal importance, and (8) land use context. The CMP identifies 29 congested corridors in our region. These congested corridors are then segmented into subcorridors, within which similar transportation strategies seem to be appropriate.

US 30 has been identified as Pennsylvania CMP Corridor 7 and is comprised of two subcorridors: east of US 1, the corridor is classified as a dense grid, and west of US 1, the corridor is classified as a dense suburban network. The CMP suggests a variety of appropriate strategies for each of these subcorridor types. These strategies were evaluated for their potential effectiveness during this study and helped to inform the recommendations contained later in this document.

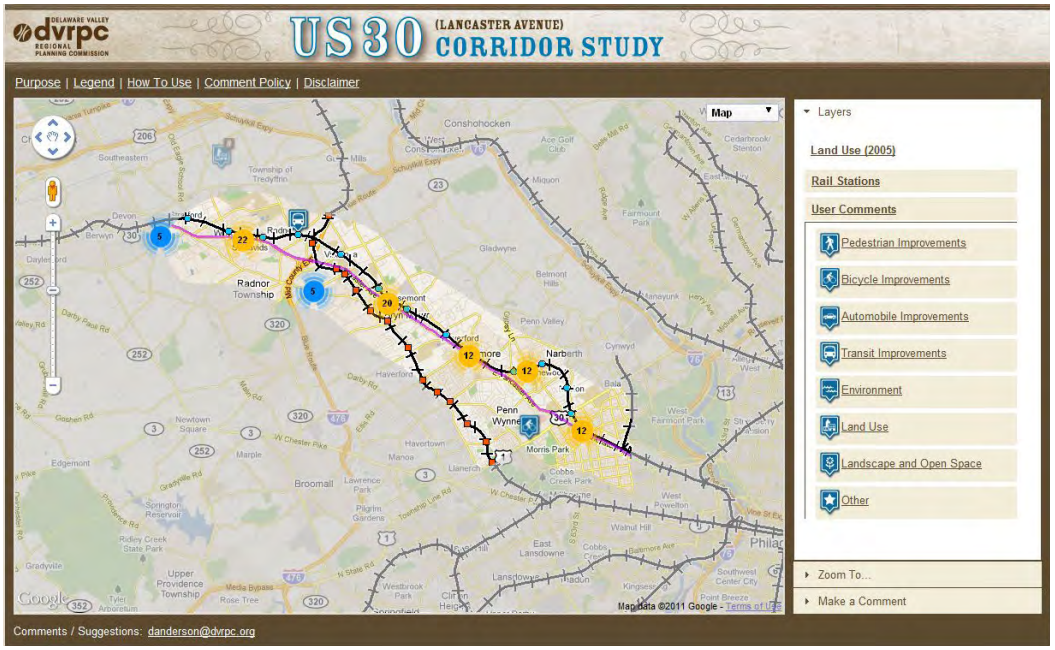
STUDY PROCESS

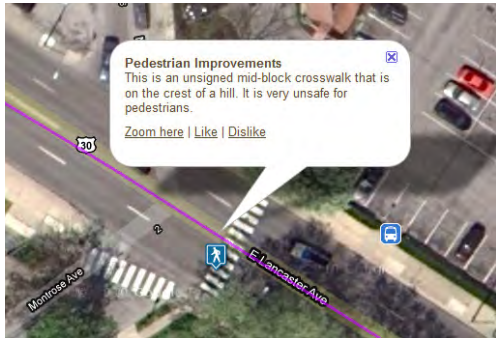
This document is the result of a two-year planning process which began in summer 2009. During this time, DVRPC facilitated multiple public participation opportunities and worked extensively with a variety of stakeholders. A Technical Advisory Committee (TAC) was also created to provide local and technical expertise and help guide the direction of the study. The TAC was composed of professional staff from Delaware and Montgomery counties, the City of Philadelphia, corridor municipalities, and agencies such as PennDOT and SEPTA. Throughout the process, the US 30 study team held numerous meetings with the TAC to review study materials and provide updates on the status of the project.

The US 30 study was divided into two phases. Phase 1 consisted of extensive data collection and fieldwork, existing conditions research and analysis, and the identification of corridor issues and problems. Phase 1 also included a series of three public open houses in spring 2010 that were attended by over 100 residents and stakeholders. These meetings, held in West Philadelphia, Lower Merion Township, and Radnor Township, allowed members of the public to learn about the study and offer their input on corridor issues and problems.

Photos from US 30 Public Meetings held in Philadelphia, Lower Merion, and Radnor.

Public Participation: Online Mapping Application





An innovative online mapping application was created for the US 30 Study. This application allowed users to make place-specific comments and recommendations across a variety of topics.

The main interface (left) shows the overall distribution of comments across the study area. Individual comments covered a range of issues, but enhancing walkability was a common theme. Above, one comment identifies a potentially dangerous pedestrian crosswalk in Lower Merion Township.

Additionally, DVRPC created an online mapping application, which allowed residents to help identify corridor needs and recommend improvement strategies. Users could make place-specific comments in one of eight predefined subject areas: pedestrian, bicycle, automobile, transit, environment, land use, open space, or other. The mapping application was available for roughly six weeks and collected 92 comments and hundreds of page views. Interestingly, 45 of the 92 comments dealt with improvements to the pedestrian environment. Community interest in walkability was echoed throughout the planning process and became one of the themes of the study.

Phase 2 focused on generating context-sensitive solutions designed to address the issues identified in Phase 1. Preliminary recommendations were presented to the TAC and more than 40 members of the public during a series of three public meetings throughout the corridor in fall 2010. The study team also conducted a series of briefings with elected officials to update them on the status of the project. DVRPC refined these recommendations based on feedback from each of these meetings and worked with corridor municipalities to develop priority projects and an implementation plan. The remainder of this document contains an overview of the corridor's existing conditions, a series of goals and objectives from corridor municipalities, corridor-wide and local recommendations, and implementation strategies.

2 EXISTING CONDITIONS

SECTION 2

EXISTING CONDITIONS

PLANNING FRAMEWORK

The existing planning framework for the US 30 Corridor is composed of a variety of regional and local planning documents and policies which have helped guide transportation, infrastructure, and land use decisions within the Study Area. Understanding this framework is critical to creating a unified vision for the corridor in which transportation investments reflect regional needs and the desires of local residents and businesses.

A municipal comprehensive plan guides the decision-making process for the physical and social development of a township or city. These documents provide the vision and rationale for the municipal zoning ordinance and guide future growth. Similar planning processes are often undertaken at the regional, county, and neighborhood scale. This section provides a brief overview of some of the plans that will help shape the future of the US 30 Corridor.

Regional Policy

Connections 2035

As the region's long range plan, *Connections: The Regional Plan for a Sustainable Future* ("*Connections*") provides a blueprint for the future growth of the Greater Philadelphia region, with an emphasis on the transportation system. The Plan sets a number of goals to ensure a sustainable future and outlines which investments and policy steps the region will need to make over the span of the Plan to achieve the vision. Above all, it serves as a collective vision across municipal, county, and state boundaries for how the region should look and function in the future.

Based on the analysis of three possible growth scenarios—Recentralization, Trend, and Sprawl—*Connections* proposes that the Recentralization scenario offers the best solutions for a sustainable future. This scenario offers a superior quality of life by increasing mobility choices, preserving more open space, and reducing demand for energy, which lowers household and business expenses. To achieve the goal of recentralization, *Connections* proposes concentrating most new growth in the form of infill and redevelopment into the region's existing developed areas.

The Plan divides the 353 municipalities of the region into Core Cities, Developed Communities/ Mature Suburbs, Growing Suburbs, and Rural Areas. Also included are specific growth areas and a hierarchy of "centers" of concentrated residential, commercial, and industrial development where future infrastructure will be supported and targeted.

The West Philadelphia portion of the Study Area is identified as part of the region's Core Cities Planning Area. As such, this area may benefit from targeted infrastructure investment, maintenance and rehabilitation, comprehensive neighborhood revitalization, and efforts to reinforce social and educational programs. West of the city, corridor municipalities are identified as Developed Communities/Mature Suburbs. These inner-ring communities have already experienced most of their population and employment growth. The key policies for these communities often focus upon stabilization and revitalization and can include rehabilitation of infrastructure systems and housing stock, economic development activities, and streetscape and signage programs.

Local Policy & Planning Efforts

Philadelphia

The City of Philadelphia has recently prepared *Philadelphia 2035*, the city's first comprehensive plan since 1960. The document includes a long-range citywide plan to establish development patterns based on estimated growth for the entire city. The citywide plan will be followed by 18 district plans, which are designed to recommend specific capital projects and strategic actions throughout the city within a five- to 10-year timeframe. The district plans are expected to be completed in 2015.

Lancaster Avenue itself has received attention in numerous Philadelphia planning studies. The US 30 Study Area is directly addressed in the 2000 Philadelphia City Planning Commission's *Lancaster Avenue Study: 52nd Street to 63rd Street Strategies for Corridor Revitalization*. This study recommends a combination of physical, economic, and social improvements designed to support commercial and community revitalization. Specific recommendations include streetscape improvements, landscaping and fencing strategies, promoting new commercial development, and the redevelopment of blighted or obsolete buildings and uses.

Montgomery County

Shaping Our Future: A Comprehensive Plan for Montgomery County was adopted in 2005. This plan seeks to accommodate projected growth in a way that preserves the existing character of the county. *Shaping Our Future* identifies four major objectives: controlling sprawl; controlling traffic congestion; preserving open space and natural areas; and revitalizing older boroughs and townships. The transportation element of the plan focuses on strengthening the link between land use and transportation and identifies strategies for improving road safety, expanding public transportation, and enhancing bicycle mobility. Specifically, the plan proposes that good sidewalks should be provided in most developed areas of the county and along arterial and major collector roads.

Lower Merion Township

Lower Merion Township is currently in the process of drafting a new comprehensive plan. This process began in 2007 and it is anticipated that specific plan elements will be prepared over several years. In the meantime, the township has developed the *Issues Report* to serve as a framework for discussing the future of Lower Merion. Using input from a wide variety of stakeholders, the report identifies 15 issues—many of which are addressed in this study—facing the township that should be addressed through the preparation of a new comprehensive plan.

In recent years, Lower Merion Township has also undertaken numerous planning studies and enacted multiple ordinances related to land use, transportation, housing, community facilities, stormwater, historic preservation, and open space. Of these, three redevelopment and transportation related studies: *the Ardmore Transit Center Master Plan*, the *Bryn Mawr Transit Revitalization District Plan*, and the *2008 City Avenue Corridor Zoning Recommendations*, most directly influence the future of Lancaster Avenue.

Haverford Township

In 2008, Haverford Township produced a Comprehensive Plan Addendum, subtitled *A Plan to Enhance and Revitalize: Oakmont Village & Eagle Road Corridor and Haverford Road Corridor*, to the Township Comprehensive Plan of 1988. This Comprehensive Plan Addendum contains design guidelines for Haverford Road, a major thoroughfare south of US 30. These guidelines present physical recommendations designed to help revitalize this commercial area and improve pedestrian access and circulation. Specific guidelines deal with design elements such as building location, off-street parking, and sidewalks and crosswalks.

Radnor Township

In 2003, Radnor published the first update to its comprehensive plan since 1988. The update is structured around several topic areas including natural resources, housing, economics and business, land use, and transportation. The Transportation and Circulation Plan strives to maintain efficient circulation patterns and includes an evaluation of vehicular facilities, transit opportunities, and multimodal facilities, and it provides recommendations to address the future needs of the township.

In addition to this township-wide plan, two area plans that pertain to the Study Area have also been completed. *The Wayne Business District Master Plan* grew out of the 2003 Comprehensive Plan Update and establishes guidelines for the future growth and development of the downtown business community. More recently, the *Garrett Hill Master Plan* was created. This plan outlines the community's vision for the future of the neighborhood, and it includes a Zoning Overlay District that establishes zoning and subdivision standards for the commercial core and neighborhood parks.

DEMOGRAPHICS

Land use change is often spurred by population and housing growth. Although much of the US 30 Corridor is built out, demographic forces will be one of the factors that influence future growth and development along the corridor. This can be analyzed by examining both growth in population and the number of households within the corridor.

Population and Housing

The US 30 Study Area includes portions of three counties and five municipalities. Due to the irregular boundaries of the Study Area, DVRPC utilized census tracts to roughly approximate the Study Area for the purpose of gathering population data for the corridor. According to the 2010 Census, the population of the US 30 Study Area is 142,564. As illustrated in Table 2.1, this represents an overall decline of 2.5 percent from 2000.

Table 2.1: US 30 Study Area Population

Corridor Municipalities	2000		2010		% Change 2000-2010	
	Study Area* Population	Total Population	Study Area* Population	Total Population	Study Area* Population	Total Population
Haverford Township	12,060	48,498	12,528	48,491	3.9%	0.0%
Lower Merion Township	38,394	59,850	37,088	57,825	-3.4%	-3.4%
Narberth Borough	4,233	4,233	4,282	4,282	1.2%	1.2%
City of Philadelphia	60,615	1,517,550	57,135	1,526,006	-5.7%	0.6%
Radnor Township	30,878	30,878	31,531	31,531	2.1%	2.1%
Total	**146,180**	**1,661,009**	**142,564**	**1,668,135**	**-2.5%**	**0.4%**

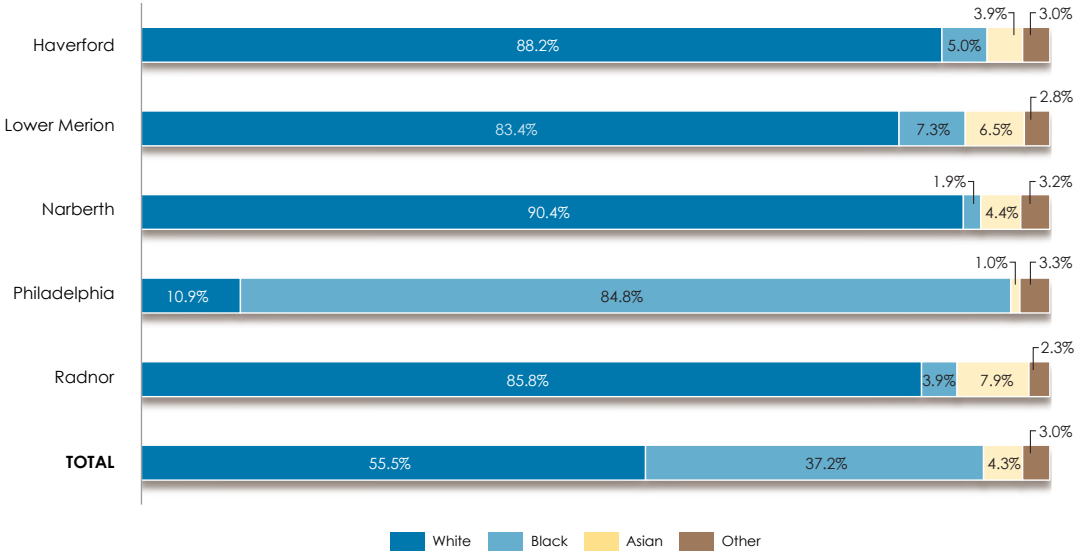
*Census tracts used to approximate US 30 Study Area
Source: US Census Bureau

Table 2.2: US 30 Study Area Housing Units

Corridor Municipalities	2000		2010		% Change 2000-2010	
	Study Area* Housing Units	Total Housing Units	Study Area* Housing Units	Total Housing Units	Study Area* Housing Units	Total Housing Units
Haverford Township	4,668	18,378	4,628	18,350	-0.9%	-0.2%
Lower Merion Township	15,072	23,699	15,288	24,095	1.4%	1.7%
Narberth Borough	1,981	1,981	1,981	1,981	0.0%	0.0%
City of Philadelphia	25,276	661,958	24,827	670,171	-1.8%	1.2%
Radnor Township	10,731	10,731	10,814	10,814	0.8%	0.8%
Total	**57,728**	**716,747**	**57,538**	**725,411**	**-0.3%**	**1.2%**

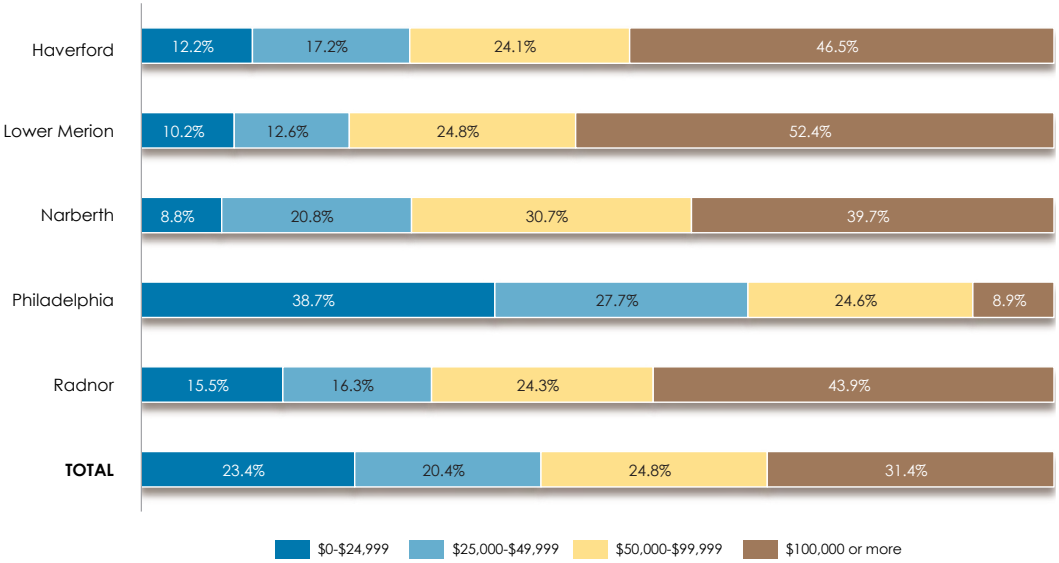
*Census tracts used to approximate US 30 Study Area
Source: US Census Bureau

Figure 2.1: US 30 Study Area Racial Composition (2010)



Source: US Census Bureau

Figure 2.2: US 30 Study Area Household Income (2005-2009)



Source: American Community Survey

However, population change within each of the five corridor municipalities was not uniform.

For example, while the overall population of Haverford Township experienced very little change over the last 10 years, the portions of Haverford within the Study Area grew by 3.9 percent. Narberth Borough and Radnor Township grew by 1.2 and 2.1 percent, respectively, during this time period. Total population and Study Area population are identical for these municipalities because Narberth is comprised of a single census tract while the shape of Radnor's tracts results in the entire township being included in this analysis.

Study Area portions of Lower Merion Township and the City of Philadelphia each experienced population loss over the last decade. Lower Merion's 3.4 percent loss mirrored the loss for the township as whole, while Philadelphia's 5.7 percent loss occurred during a period when the overall city grew by a small amount, 0.6 percent.

In terms of housing, the overall number of housing units within the corridor declined by 176 units or 0.3 percent between 2000 and 2010 (See Table 2.2). Portions of the Study Area in Lower Merion Township and Radnor Township each saw small growth in the number of housing units during this period, while the portions of Haverford Township and the City of Philadelphia saw declines.

Environmental Justice

Title VI of the Civil Rights Act of 1964 and the 1994 President's Order on Environmental Justice (#12898) states that no person or group shall be excluded from participation in or denied the benefits of any program or activity utilizing federal funds. As the Metropolitan Planning Organization (MPO) for the nine-county region, DVRPC is charged with evaluating plans and programs for environmental justice (EJ) sensitivity to historically disadvantaged populations. In response, DVRPC has developed an environmental justice methodology that quantifies levels of disadvantage within the region for eight potentially disadvantaged groups: non-Hispanic minorities, Hispanic, limited English proficiency (LEP) households, persons with a physical disability, elderly over 75 years of age, carless households, female heads of household with children, and households in poverty. Census tracts with a population that exceeds the regional average for any of these defined groups are considered EJ-sensitive. Accordingly, census tracts can be characterized as having zero to eight degrees of disadvantage (DOD). Figure 2.3 displays the DOD for the 38 census tracts that are wholly or partially located within the US 30 Study Area.

Table 2.3 summarizes the presence of EJ-sensitive populations within each corridor municipality and the entire Study Area. This analysis highlights two major concerns along the corridor: the large concentration of potentially disadvantaged populations found in the Philadelphia portion of the Study Area, and the high incidence of elderly population throughout the corridor. Improvement projects recommended in the Study Area should be evaluated based on the extent to which they impact these sensitive populations.

Each of Philadelphia's 17 census tracts contains at least two DOD and 12 of these tracts are characterized by five or more DOD. The only disadvantaged groups not present in larger numbers are Hispanic population and LEP households. For planning purposes, these population characteristics reinforce the need for affordable, safe, and convenient transportation options in Philadelphia and throughout the corridor. For instance, people with physical disabilities often rely on alternative modes of transportation for all mobility needs and accessible streets and sidewalks are especially important to their mobility.

Mobility concerns are also paramount for elderly populations. Twenty-three of the Study Area's 38 census tracts exceeded the regional threshold for population age 75 and over. As the rate of driving decreases with age, mobility for elderly residents is dramatically impacted by the quality and connectivity of the pedestrian network, frequency of transit service, and the accessibility of local services and employment.

Table 2.3: Degrees of Disadvantage Analysis Summary

	Corridor Municipalities					Total
	Haverford	Lower Merion	Narberth	Philadelphia	Radnor	
Number of Census Tracts within Study Area	4	10	1	17	6	**38**
Degrees of Disadvantage (Regional Average)	*Number of Tracts Exceeding Regional Average*					
Non-Hispanic Minority (24.9%)	0	1	0	17	0	**18**
Carless Households (16%)	0	2	0	13	0	**15**
Households in Poverty (10.9%)	1	2	0	13	1	**17**
Persons with Physical Disabilities (7.7%)	0	1	1	11	1	**14**
Female Head of Household with Child (7.4%)	0	1	0	13	0	**14**
Hispanic (5.4%)	0	0	0	0	0	**0**
Elderly, 75 and over (6.6%)	4	6	1	9	3	**23**
Limited English Proficiency (2.4%)	0	0	0	3	1	**4**

Source: DVRPC, US Census Bureau (2000)

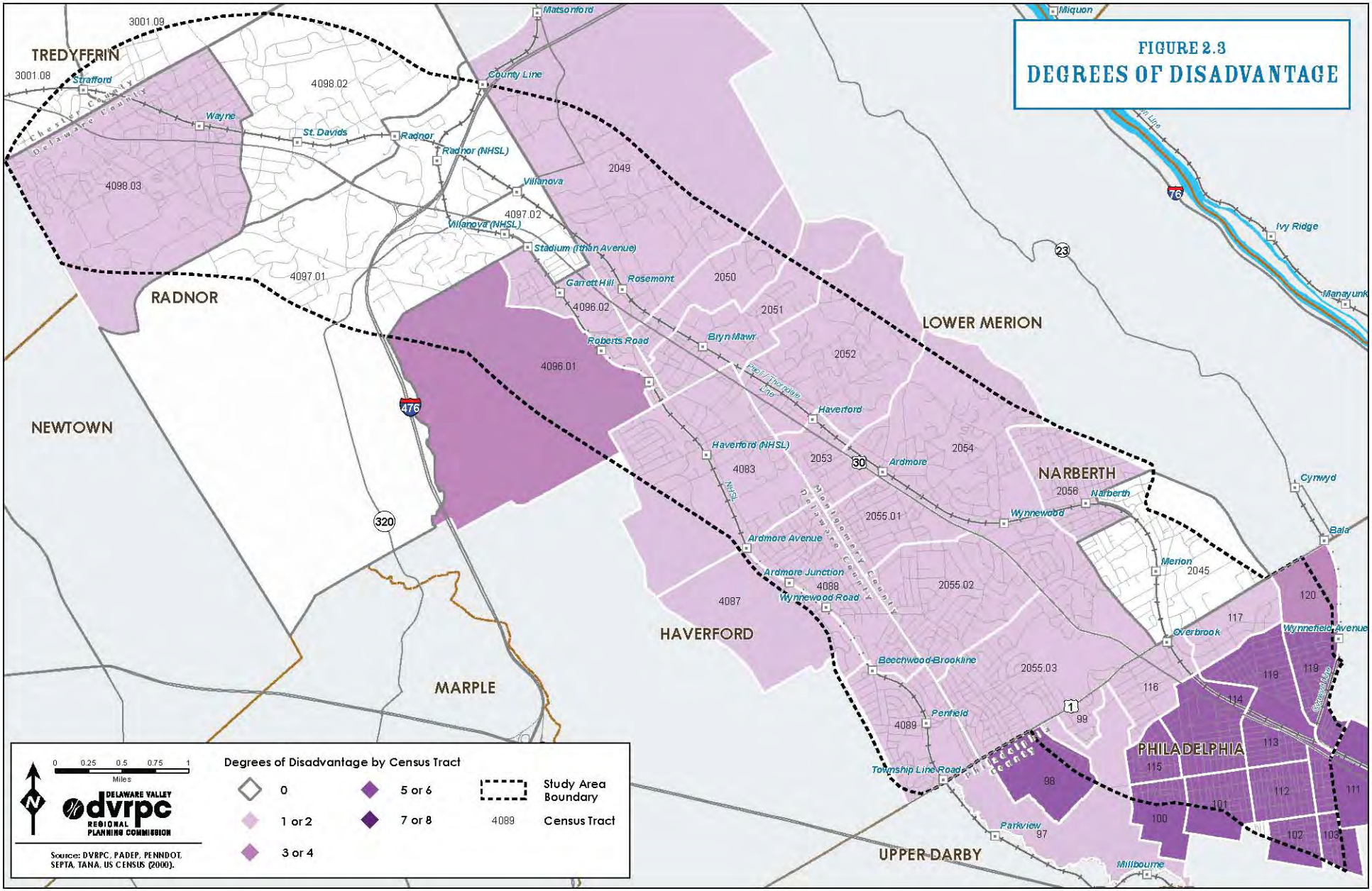


FIGURE 2.3
DEGREES OF DISADVANTAGE
TREDYFFRIN
RADNOR
NEWTOWN
LOWER MERION
NARBERTH
HAVERFORD
MARPLE
UPPER DARBY
PHILADELPHIA
3001.09
3001.08
4098.02
4098.03
4097.02
4097.01
4096.02
4096.01
2049
2050
2051
2052
2053
2054
2055.01
2055.02
2055.03
4083
4087
4088
4089
2056
2045
115
116
117
118
119
120
114
113
112
111
101
100
102
103
99
98
97
Matsonford
Miquon
County Line
Strafford
Wayne
St. Davids
Radnor
Radnor (NHSL)
Villanova
Villanova (NHSL)
Stadium (Ithan Avenue)
Garrett Hill
Rosemont
Roberts Road
Bryn Mawr
Haverford
Haverford (NHSL)
Ardmore
Ardmore Avenue
Ardmore Junction
Wynnewood Road
Wynnewood
Narberth
Merion
Overbrook
Beechwood-Brookline
Penfield
Township Line Road
Parkview
Millbourne
Cynwyd
Bala
Wynnefield Avenue
Ivy Ridge
Manayunk
Delaware County
Chester County
Montgomery County
NHSL
476
320
30
76
23
1
0 0.25 0.5 0.75 1
Miles
DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION
Source: DVRPC, PADEP, PENNDOT, SEPTA, TANA, US CENSUS (2000).
Degrees of Disadvantage by Census Tract
0
1 or 2
3 or 4
5 or 6
7 or 8
Study Area Boundary
4089
Census Tract

WATER RESOURCES

The environmental health and integrity of an area is reflected in the quality and conditions of its water bodies. The land that drains to a particular water body, such as a river, stream, lake, or wetland, is called a watershed. Large watersheds are divided into small subwatersheds, which drain to specific portions of streams. Over 31 miles of streams pass through the Study Area, and precipitation falling on land enters one of these streams depending on the watershed in which the land is located. The Study Area is located within two major watersheds: the Schuylkill River watershed and the Darby-Cobbs Creek watershed. These watersheds are shown in Figure 2.4 Watersheds & Water Quality. Both larger watersheds drain to the Delaware River and eventually empty in the Atlantic Ocean. Within the Study Area, the Schuylkill River watershed is further divided into the Mill Creek and the Schuylkill River subwatersheds, and the Darby-Cobbs Creek watershed is divided into subwatersheds for each creek. These subwatersheds are then further divided into the individual catchment areas for tributaries and portions of waterways, as shown in Table 2.4.

Water Quality Assessment

The water quality of streams is monitored by the Pennsylvania Department of Environmental Protection (PADEP), as required by the Clean Water Act. Impaired water bodies have impacts on drinking water supply, aquatic life, property values, and quality of life for people, wildlife, and the overall environment. Of the 31.3 miles of streams located within the Study Area, 8.5 (27 percent) miles of streams are attaining water quality standards and 22.8 (73 percent) miles are non-attaining, or impaired. Stormwater runoff was a cause of impairment for all of the non-attaining streams. The water quality of the streams in the Study Area is illustrated in Figure 2.4.

Stormwater Runoff

Stormwater runoff is the result of precipitation that is not infiltrated into the groundwater, but is instead drained into a nearby water body. With increased development and more impervious surfaces, less water percolates into the ground and more is carried into the surface waters, either through direct runoff or through stormwater outfalls. Increased stormwater runoff may cause flooding problems, which can cause property damage and be harmful to public health. In addition, high levels of stormwater runoff impair water bodies for a number of reasons, including the following:

- Pollutants on the land are carried to water bodies.
- Groundwater (aquifers) is not recharged.
- Flash flooding destabilizes aquatic life of streams.
- Stream banks are eroded, increasing siltation of water bodies.
- Eroded stream banks are less able to filter further stormwater runoff.
- Stream bank erosion can expose sewer infrastructure, making it more susceptible to damage and leaks.

Although stormwater runoff is affected by many environmental factors, excessive impervious coverage resulting from the urban and suburban development patterns in the Study Area is a primary culprit. Impervious coverage refers to areas like roadways, buildings, parking lots, and other paved areas where rainwater is prevented from infiltrating the soil. Impervious surfaces disrupt natural absorption, filtration, and recharge processes and allow water to flow rapidly into bodies of water.

The installation of storm sewer pipes, which efficiently collect and discharge runoff, also prevent the natural infiltration of rainwater into the soil and underlying groundwater aquifers. Although groundwater recharge is decreased by impervious coverage and storm sewers, groundwater withdrawals have increased in recent years at a higher rate than surface water withdrawals, at least in the Schuylkill River watershed (Conservation Fund 2002). A lower groundwater table in turn reduces the baseflow of surface water, affecting the habitat integrity on land.

Stormwater Management Plans and Initiatives

Well-managed stormwater, through the use of properly constructed and maintained BMPs, can remove pollutants, facilitate ground water recharge through retention and infiltration, provide base flow for surface waters, and maintain the stability and the environmental integrity of waterways and wetlands. To provide long-term protection and sustainability of ground and surface water

Table 2.4: Watersheds of the US 30 Study Area

Watershed	Watershed Division	Subwatershed
Darby-Cobbs	Darby Creek	Little Darby Creek
		Hardings Run
		Ithan Creek
		Browns Run
		Julip Run
		Valley Run
		Kirks Run
		Abrahams Run
		Meadowbrook Run
		Wigwam Run
	Cobbs Creek	Cobbs Creek
		East Branch Indian Creek
		West Branch Indian Creek
		Indian Creek
Schuylkill	Schuylkill River	Schuylkill River
		Gulph Creek
	Rock Run, Mill Creek, Gulley Run, Arrowmink Creek	Mill Creek
		Trout Run
		Gulley Run

Source: PADEP, 2010

resources, stormwater should be managed at the source or origin as an environmental resource to be protected rather than as a waste to be quickly discharged and moved downstream.

Like many environmental planning initiatives, stormwater management should be addressed by a watershed approach, which is considered the most effective framework to address water resource challenges. There have been many plans in recent years regarding water quality and stormwater management in the Study Area. Within the Darby-Cobbs Creek watershed these include:

- Cobbs Creek Park Master Plan (1999)
- Cobbs Creek Integrated Watershed Management Plan (2004)
- Darby Creek Watershed Conservation Plan (2004)
- Darby-Cobbs Watershed Comprehensive Characterization Report (2004)
- Darby-Cobbs Creek Stormwater Management Plan (Act 167).

In the Schuylkill River watershed, plans include:

- Schuylkill Watershed Conservation Plan (2001)
- Report on the State of the Schuylkill River Watershed (2002)
- Source Water Protection Plan (2004)

In addition, municipalities within the Study Area have also planned and implemented a number of stormwater management studies, plans, and ordinances, including the following:

- Green City, Clean Waters: Philadelphia's Combined Sewer Overflow (CSO) Long Term Control Plan Update (2009)
- Radnor Township Comprehensive Drainage Study (2000)
- Comprehensive Stormwater Management Ordinance for the Darby-Cobbs Creek Watershed (2005) (Radnor, Lower Merion)
- Mill Creek Drainage Area Stormwater Management Ordinance (1999) (Lower Merion)
- Lower Merion Township Open Space and Environmental Resource Protection Plan (2005)

These studies evaluated areas of concern within the watersheds and recommended BMPs to reduce stormwater runoff and rehabilitate impaired streams. As recommended, a number of stormwater BMPs have been implemented within the Study Area in recent years, including the following:

- Strafford Office Building (Radnor): pervious pavement and BMP system under parking lots
- Rosemont Business Campus (Radnor): BMP system under parking lots
- Radnor Middle School: BMP system under sports field
- Lower Merion High School: bio-infiltration swales in parking lot and underground cistern
- Wayne Art Center: pervious pavement and filtration system
- Villanova University: Stormwater BMP Demonstration and Research Park
- Rain barrel workshops organized by the Environmental Advisory Committees of both Lower Merion and Radnor
- Ardmore Toyota: rain garden in parking lot
- Bryn Mawr Hospital: rain garden in parking lot
- Aqua America headquarters (Bryn Mawr): rain garden in parking lot

In addition to reducing the amount of stormwater runoff through these and other BMPs, stream bank restoration work has occurred in the Study Area through the planting of vegetation or the creation of natural wetlands in a number of areas, including:

- Fenimore Woods (Radnor): natural stream buffers
- Ashbridge Park (Lower Merion): stream bank stabilization and natural stream buffers
- West Mill Creek Park (Lower Merion): stream bank stabilization and natural stream buffers
- Lankenau Hospital (Lower Merion): 1.5-acre wetland restoration
- Wynnefield Drive (Haverford): channel restoration project

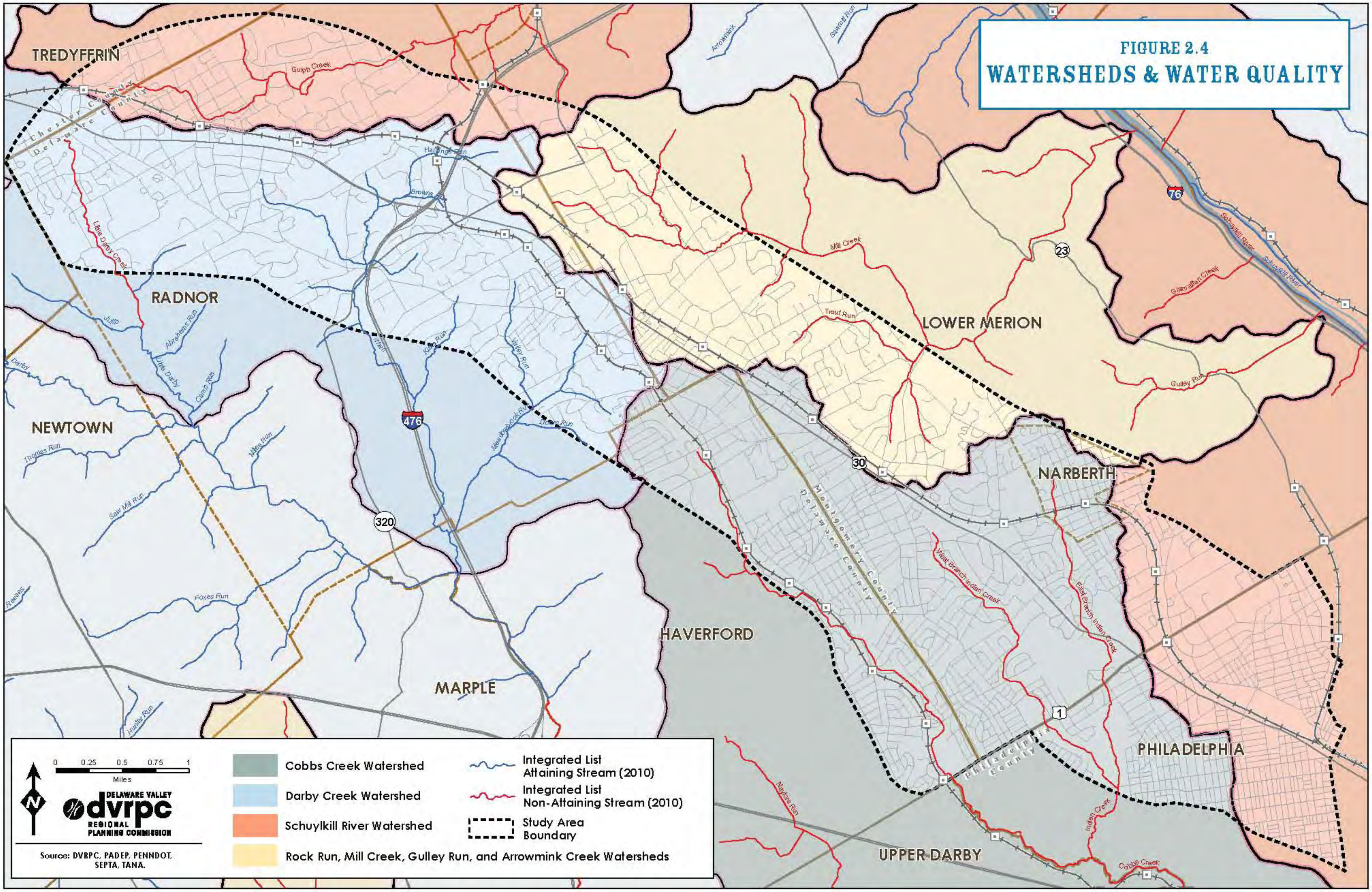


FIGURE 2.4
WATERSHEDS & WATER QUALITY
TREDYFFRIN
RADNOR
NEWTOWN
MARPLE
HAVERFORD
LOWER MERION
NARBERTH
PHILADELPHIA
UPPER DARBY
Chester County
Delaware County
Montgomery County
Delaware County
Philadelphia County
Gulph Creek
Mill Creek
Trout Run
Gulley Run
Schuylkill River
Little Darby Creek
Abrahams Run
Darby Creek
Miles Run
Saw Mill Run
Foxes Run
Thomas Run
Hardings Run
Browns Run
Kirks Run
Valley Run
Darby Run
West Branch Indian Creek
East Branch Indian Creek
Indian Creek
Naylors Run
Cobbs Creek
476
320
30
23
76
1
0 0.25 0.5 0.75 1
Miles
N
DELAWARE VALLEY
dvrpc
REGIONAL PLANNING COMMISSION
Source: DVRPC, PADEP, PENNDOT, SEPTA, TANA.
Cobbs Creek Watershed
Darby Creek Watershed
Schuylkill River Watershed
Rock Run, Mill Creek, Gulley Run, and Arrowmink Creek Watersheds
Integrated List Attaining Stream (2010)
Integrated List Non-Attaining Stream (2010)
Study Area Boundary

SECTION 2

HISTORIC & CULTURAL RESOURCES

Historic resources are an important part of what make communities in the Delaware Valley unique and memorable. These resources can include registered historic districts, national parks, and a wide array of historic buildings and styles of architecture. In many cases, these important resources are located in communities that have changed markedly over time. It is important for planning studies to identify cultural or historic resources that may be impacted by proposed changes to the area's natural and built environments. Historic preservation can be an important tool to ensure that these valuable resources retain their character even as the transportation infrastructure and land use context around them change and modernize.

Every state is required by federal law to maintain a publicly funded state historic preservation office (SHPO). The responsibilities of the SHPOs include identifying historic properties and preparing and updating the statewide preservation plan. SHPOs also provide assistance to government agencies at the federal, state, and local levels, as well as to citizens groups, nonprofit organizations, and the private sector. In Pennsylvania, the Bureau for Historic Preservation, a division of the Pennsylvania Historical and Museum Commission (PHMC), serves as the SHPO.

The US 30 Corridor has a long and storied past. Part of the nation's first turnpike and first transcontinental highway, Lancaster Avenue has played an important part in the development of the region. Accordingly, the US 30 Study Area is home to a wide array of historic and cultural resources. Figure 2.5 displays historic districts and sites listed on the National Register of Historic Places found within the US 30 Study Area.

Currently, there are 11 historic districts within the US 30 Study Area. This number includes both nationally and locally designated districts each with its own set of regulations and guidelines. In addition to the PHMC, each corridor municipality maintains a historical commission and oftentimes other advisory boards to assist with the creation and protection of historic buildings, sites, and districts. Aside from designating local historic landmarks, these bodies often review building permits that may change the appearance of any historical property.

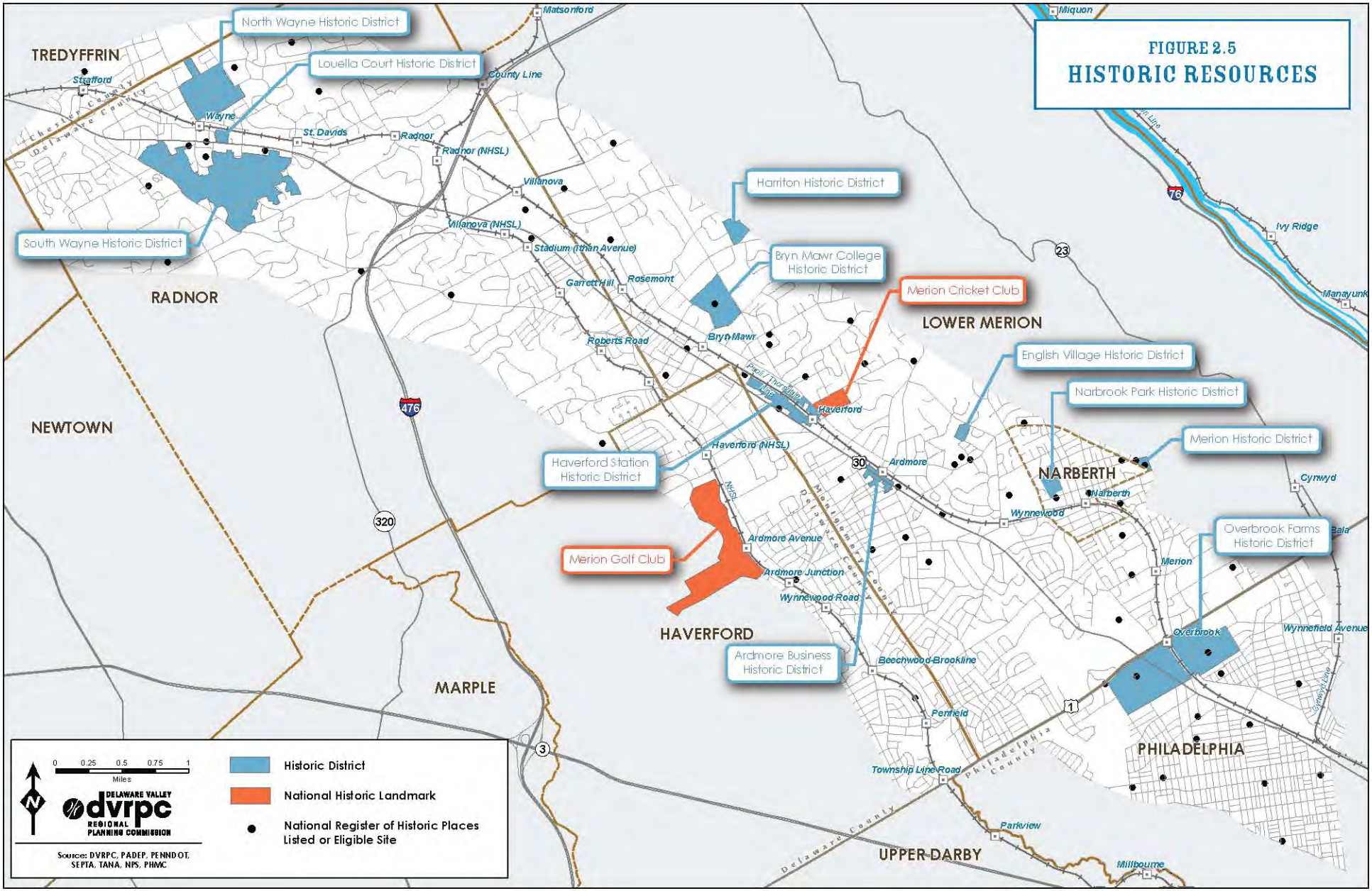


FIGURE 2.5
HISTORIC RESOURCES
North Wayne Historic District
Louella Court Historic District
South Wayne Historic District
Harriton Historic District
Bryn Mawr College Historic District
Merion Cricket Club
English Village Historic District
Narbrook Park Historic District
Merion Historic District
Haverford Station Historic District
Merion Golf Club
Overbrook Farms Historic District
Ardmore Business Historic District
TREDYFFRIN
RADNOR
NEWTOWN
LOWER MERION
NARBERTH
HAVERFORD
MARPLE
UPPER DARBY
PHILADELPHIA
Matsonford
Miquon
County Line
Stafford
Wayne
St. Davids
Radnor
Radnor (NHSL)
Villanova
Villanova (NHSL)
Stadium (Ithan Avenue)
Garrett Hill
Rosemont
Roberts Road
Bryn Mawr
Haverford
Haverford (NHSL)
Ardmore
Ardmore Avenue
Ardmore Junction
Wynnewood Road
Wynnewood
Narberth
Cynwyd
Merion
Overbrook
Wynnefield Avenue
Beechwood-Brookline
Penfield
Township Line Road
Parkview
Millbourne
Ivy Ridge
Manayunk
Chester County
Delaware County
Montgomery County
Philadelphia County
476
320
30
23
76
1
3
0 0.25 0.5 0.75 1
Miles
DELAWARE VALLEY
dvrpc
REGIONAL PLANNING COMMISSION
Source: DVRPC, PADEP, PENNDOT, SEPTA, TANA, NPS, PHMC
Historic District
National Historic Landmark
National Register of Historic Places Listed or Eligible Site

SECTION 2

LAND USE

Creating an inventory of existing land use in a corridor study is important for understanding the context of the transportation network and the relationship of roads and transit to growth centers and jobs. DVRPC maintains land use data and maps for the entire nine-county region, based on digital orthophotography taken every five years, most recently available for 2005. DVRPC asks its member county governments to review the draft land use files for specific errors and revise accordingly. Thus, the land use data is based on both interpretation of orthophotography and local knowledge. Figure 2.6 displays the existing land use for the US 30 Study Area.

Land uses within the Study Area are well established and have developed in response to the regional nature of the transportation infrastructure and the area's suburban relationship to Philadelphia. Accordingly, residential land uses dominate the corridor with just over 68 percent of the Study Area dedicated to housing. While a majority of Study Area housing is composed of single-family detached homes, row homes are common in West Philadelphia and pockets of multifamily development exist throughout the corridor.

The corridor is also shaped by the presence of a relatively high number of community uses. Community uses, which include medical facilities and educational institutions, account for roughly 8 percent of the Study Area. The corridor is home to two major hospitals, Lankenau and Bryn Mawr, and several universities and colleges including: St. Joseph's University, Villanova University, Haverford College, Bryn Mawr College, and Rosemont College, among others.

Commercial uses constitute only approximately 4 percent of the corridor, yet have a disproportionate impact on how the corridor is perceived and experienced. Lancaster Avenue has historically been a center of local activity since its inception in the 1800s and this remains true today. A large portion of the Study Area's commercial development is prominently located on or near US 30. Much of this commercial development is clustered in identifiable, older traditional town centers such as Ardmore, Bryn Mawr, and Wayne. However, an increasing share of retail and office development is located outside of these centers in conventional shopping centers and office buildings. The contrasts between the compact, walkable centers and more auto-oriented shopping centers

Table 2.5: 2005 Land Use (Acres)

Land Use		Corridor Municipalities					Study Area Totals	
		Haverford Township	Lower Merion Township	Narberth Borough	City of Philadelphia	Radnor Township	Acres	%
Agriculture		0.0	0.0	0.0	0.0	34.5	34.5	0.2%
Commercial		43.7	162.8	14.0	72.0	244.6	558.9	3.9%
Community		86.6	482.2	6.5	131.6	518.3	1248.7	8.6%
Light Manufacturing		0.0	0.0	0.0	51.4	0.0	51.4	0.4%
Parking		36.6	320.8	13.4	59.1	304.1	681.2	4.7%
Recreation		166.9	261.4	9.2	40.0	247.6	766.7	5.3%
Residential	Single-family	954.6	3447.2	198.6	317.4	3031.5	8118.1	56.2%
	Row Home	2.6	8.3	2.5	872.5	2.8	888.7	6.2%
	Multifamily	121.1	336.6	48.3	154.1	145.3	824.0	5.7%
Transportation		1.3	72.2	6.8	61.0	85.6	227.8	1.6%
Utility		5.8	0.0	0.0	0.0	0.0	5.8	0.0%
Vacant		2.3	57.5	6.1	8.9	26.4	107.6	0.7%
Water		1.2	8.9	0.0	0.0	12.4	22.5	0.2%
Wooded		178.1	225.3	4.6	123.5	387.1	919.1	6.4%
Total		**1600.9**	**5383.1**	**310.0**	**1891.3**	**5040.1**	**14455.0**	**100%**

Source: DVRPC

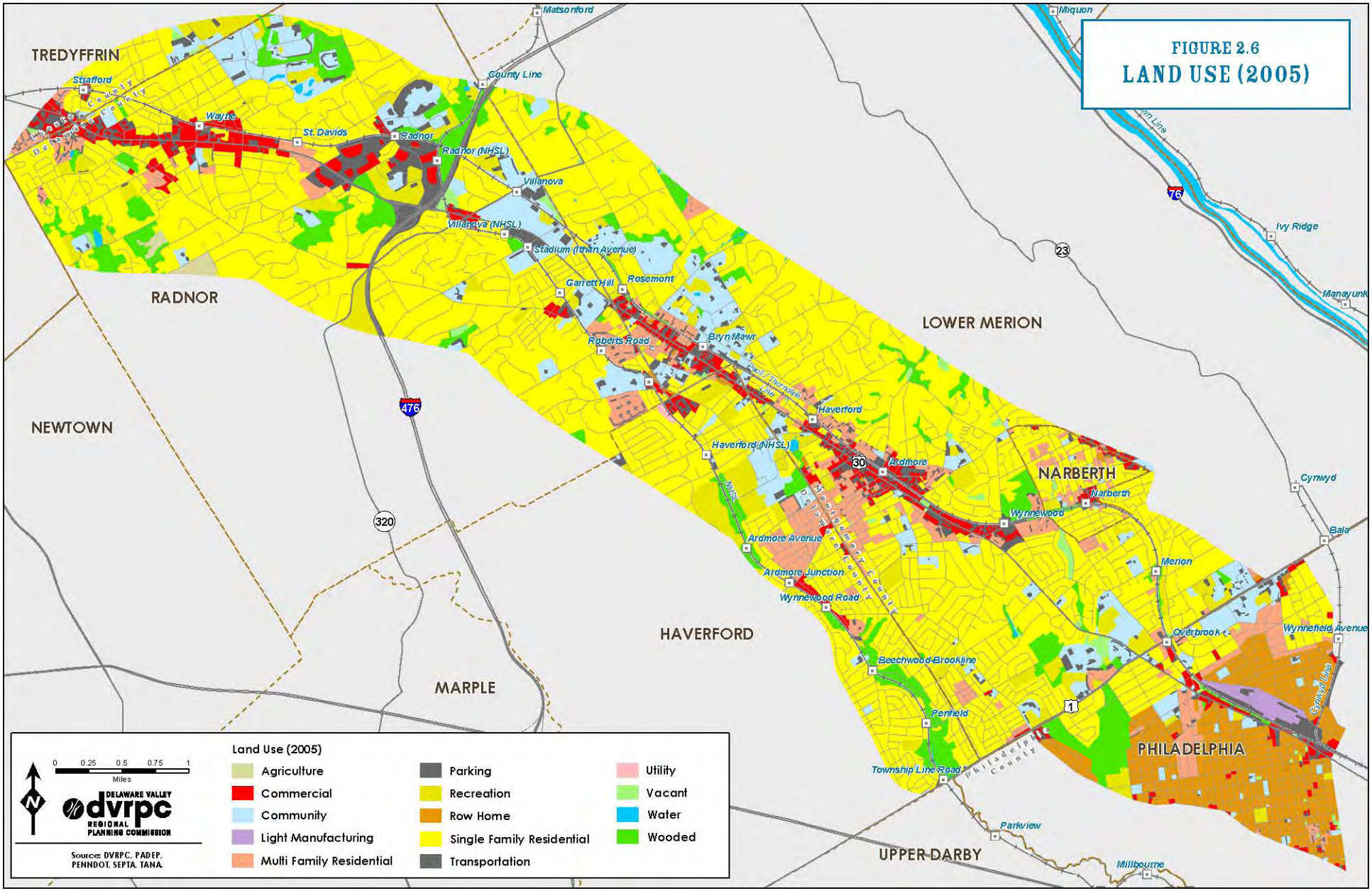


FIGURE 2.6
LAND USE (2005)
TREDYFFRIN
RADNOR
NEWTOWN
LOWER MERION
NARBERTH
HAVERFORD
MARPLE
UPPER DARBY
PHILADELPHIA
Matsonford
Miquon
County Line
Strafford
Wayne
St. Davids
Radnor
Radnor (NHSL)
Villanova
Villanova (NHSL)
Stadium (Ithan Avenue)
Garrett Hill
Rosemont
Roberts Road
Bryn Mawr
Haverford
Haverford (NHSL)
Ardmore
Ardmore Avenue
Ardmore Junction
Wynnewood Road
Wynnewood
Narberth
Merion
Overbrook
Beechwood-Brookline
Penfield
Township Line Road
Parkview
Millbourne
Ivy Ridge
Manayunk
Cynwyd
Bala
Wynnefield Avenue
476
76
30
320
23
1
0 0.25 0.5 0.75 1
Miles
DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION
Source: DVRPC, PADEP,
PENNDOT, SEPTA, TANA
Land Use (2005)
Agriculture
Commercial
Community
Light Manufacturing
Multi Family Residential
Parking
Recreation
Row Home
Single Family Residential
Transportation
Utility
Vacant
Water
Wooded

and residential portions of the corridor contribute to the somewhat incohesive environment found along portions of US 30.

Because of the built-out nature of the Study Area, most growth and change along the corridor will occur as a result of redevelopment. Open space accounts for over 11 percent of the Study Area and is divided roughly equally between wooded areas and recreation uses.

PEDESTRIAN FACILITIES

The pedestrian infrastructure of a particular place is composed of a network of sidewalks, crosswalks, and trails which allow for travel on foot. The quality of these individual components and the completeness of the overall network define an area's pedestrian environment. Because the US 30 Corridor is such a large and diverse area, it is not surprising that the condition and quality of pedestrian facilities vary widely across the Study Area.

Lancaster Avenue is home to several main street-style commercial areas in which the pedestrian environment is well-defined, comfortable, and safe. The combination of wide sidewalks, street trees, pedestrian-scaled lighting, and continuous street wall often makes walking in places such as Overbrook Farms, Ardmore, Bryn Mawr, and Wayne practical, safe, and appealing. Outside of these compact areas, however, the dominance of auto traffic and inadequacy of pedestrian facilities frequently makes walking difficult or unappealing.

When asked to identify issues within the Study Area, pedestrian safety and comfort was one of the most common concerns cited by residents and stakeholders. They identified several factors which detract from the overall function and perception of the Study Area's pedestrian environment, including:

- High vehicular speeds,
- Frequent and large curb cuts for automobile access,
- Insufficient buffer to separate pedestrians from traffic,
- Block length and configuration make some destinations inaccessible,
- Discontinuous sidewalk network, and
- Lack of safe places to cross US 30.

In total, these factors may influence the behavior of residents and visitors alike who tend to rely on automobiles even for short trips due to inadequate pedestrian facilities.

Enhancing pedestrian mobility emerged as one of the most popular themes from the study process for the future of US 30. This will largely require improving the sidewalks and crosswalks along Lancaster Avenue as well as pedestrian connections between residential neighborhoods, transit stations and stops, and commercial areas. Although sidewalks are present along much of the Corridor's

Pedestrians encounter a variety of environments throughout the US 30 Corridor.

length, quality tends to vary from one portion of the Corridor to another. Recommendations found later in this report identify priority areas for new sidewalks as well as locations where the existing sidewalks should be improved.

Signalized intersections with dedicated pedestrian phases and high visibility crosswalks provide the safest crossing points for pedestrians. While some of the traditional downtown areas of the Corridor contain these amenities, most crossing areas contain more basic striping or no markings at all. This report also includes recommendations for enhancing pedestrian crossings through a combination of signalization, signage, and pavement markings.

BICYCLE FACILITIES

The presence of bicycle facilities and amenities (such as lanes, trails, signs, pavement markings, racks, etc.) has a direct link to the number of people who use bicycles as a transportation mode. The design of the facility is closely associated to the citizen's perception of what bicycling experience can be expected.

US 30 experiences heavy vehicular volumes in both directions. In some segments, there is excessive speeding due to topography, roadway design and capacity. In addition, there are very few bicycle-specific accommodations along the roadway to provide a safe and enjoyable experience. However, several parallel and intersecting routes carry far fewer volumes and provide a suitable environment to accommodate on-road bicycle travel.

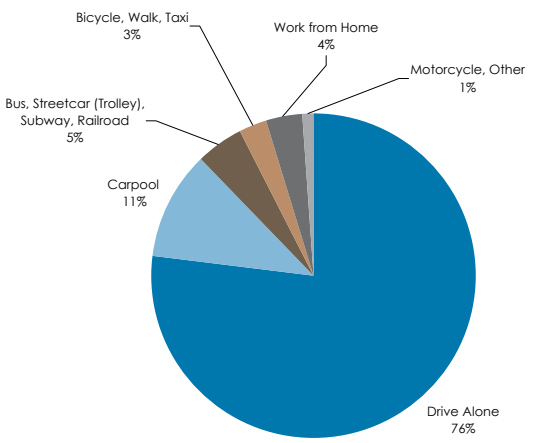
Presently, there are 86 miles of bicycle routes and trails existing or proposed in the Study Area (see Appendix A of the Technical Appendix–Publication 11003C). The majority of bicycle facilities in the Study Area are in the City of Philadelphia. Furthermore, the Philadelphia Bicycle Network has four sets of bike lanes that connect to Lower Merion within or in close proximity to the Study Area. Several roads are currently used by bicyclists in the area as primary access routes. These roads primarily connect residential areas to major destinations such as rail stations, parks and schools. While these are not formalized bike routes, they do carry many bicyclists. Many trails have been proposed or are at the periphery, but the Radnor Trail is the only established trail in the Study Area.

COMMUTING PATTERNS

As part of the investigation of existing conditions along the US 30 Corridor, the study team examined DVRPC travel data from the 2000 census. This data is aggregated by traffic analysis zone (TAZ). Because the US 30 Study Area boundaries do not exactly match the TAZ boundaries, an analysis area that roughly matches the Study Area boundary was used.

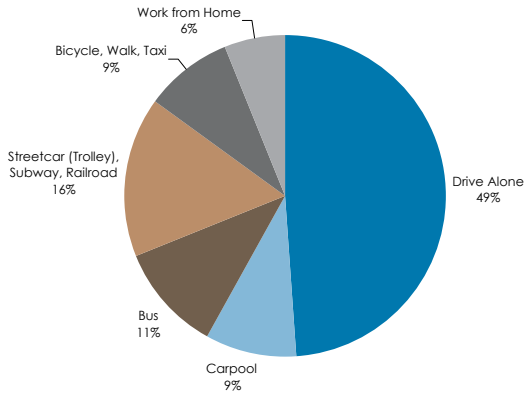
The three largest employment destinations for residents of the Study Area are Center City, West

Figure 2.7: United States Travel Modes



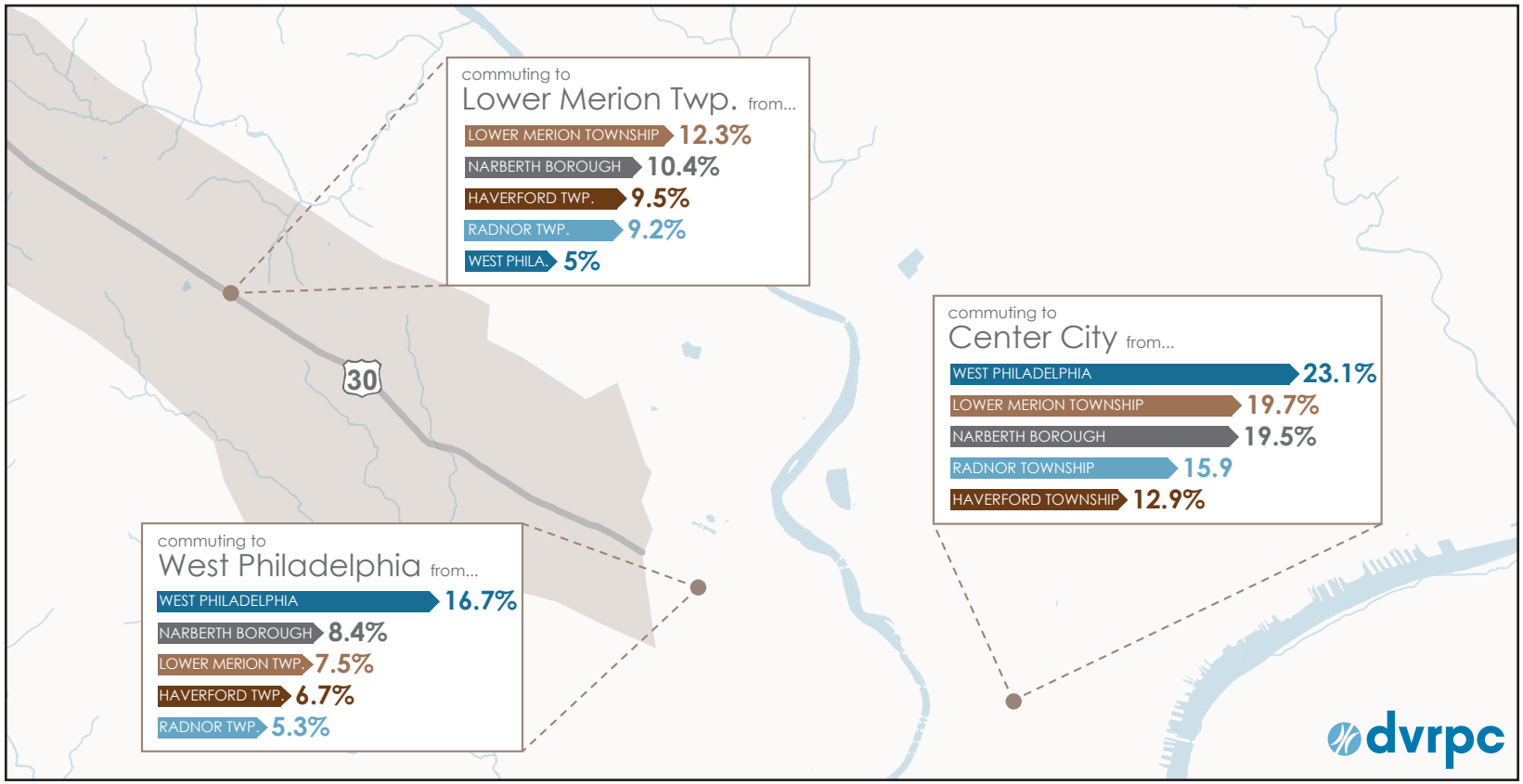
Source: American Community Survey, 2005

Figure 2.8: US 30 Study Area Travel Modes



Source: US Census Bureau, 2000

Figure 2.9: Journey to Work (All Modes)



Source: US Census Bureau, 2000

Philadelphia, and Lower Merion, representing 35 percent of the daily home-based work commutes. The origin and destination of these commutes are illustrated in Figure 2.9 Journey to Work (All Modes). The figure shows the percentage of home-based work trips from the various municipalities in the corridor to the top three workplaces.

The mode choice for travelers traveling to and from work was also investigated. The travel modes pie charts on the previous page show that the most prevalent mode is driving alone, while conventional mass transit (bus, subway, commuter rail, and trolley) accounts for 27 percent of commutes. Carpooling does represent a good portion of the commute, with 9 percent.

These results indicate that the corridor posses an above average use of transit, is on trend with the amount of carpooling, and has markedly less people driving alone than the national average from the 2005 American Community Survey. The conclusions are likely attributed to the relative density and availability of travel options.

TRANSIT FACILITIES

The "Main Line" suburbs developed around the railroad during the late 1800s, and rail service continues to be an integral part of these communities. Current transit service includes two rail lines (one regional Rail Line and one high speed line), 12 bus routes, one trolley route, and shuttle services with connection to the rail service.

Transit's share of commute trips varies considerably in the US 30 Corridor, from five percent near Lankenau Hospital to 51 percent in West Philadelphia. In areas east of City Avenue, transit accounts for around 20 percent of commutes—even more in some tracts. To the west of City Avenue, transit's commute share drops off quickly to about 10 percent. This value is consistent with certain exceptions: transit usage is high in Downtown Ardmore with greater bus service, and the area from Bryn Mawr to Villanova where both Paoli/Thorndale Regional Rail Line and the Norristown High Speed Line (NHSL) trains are available (US Census 2000).

Transit commute times in the corridor are typically around 45 minutes. The areas closer to Philadelphia generally have transit commutes of 30 to 45 minutes, while west of Bryn Mawr, transit commutes are mostly 45 to 60 minutes. Certain areas have concentrations of excellent service, with commutes of less than 30 minutes. These are Villanova University, Bryn Mawr College, downtown Ardmore, and St. Joseph's University. There are parts of West Philadelphia with most transit commutes over an hour. This is suggestive of reverse commuting into the suburbs (Census 2000).

Fifty-six percent of the Study Area, including most of the major activity centers, is within a quarter-mile walking distance of transit service (see Appendix B of the Technicial Appendix–Publication 11003C). Only minor gaps exist from West Philadelphia through Ardmore, though service is mostly limited to the trains west of Ardmore.

Intermodal Connections

The bus and rail services in the more suburban areas do cover major destinations such as the historic downtowns and several employment centers. Intermodal connections exist at the Narberth and Wynnewood Stations on the Paoli/Thorndale line, as well as at the Ardmore Junction Station on the NHSL. The area west of Ardmore is served by the Route 105 and limited Route 106 service, with both routes mostly limited to US 30. Private shuttle buses supplement SEPTA service in this area. Of the nine universities west of Ardmore, five provide shuttles. See Appendix B of the Technical Appendix (Publication 11003C) for a listing of the available campus shuttle services. Many private employers also operate shuttles that connect with the rail stations. Additionally, paratransit services are provided on demand to the elderly, the disabled, and other groups. In Montgomery County paratransit is provided via TransNet Suburban Transit Network, which includes Main Line Transit Service and Norristown Transportation Company. In Delaware County, Community Transit provides paratransit.

Bus and Trolley Service

Twelve bus routes and one trolley route provide service within the US 30 Study Area (see Appendix B of the Technical Appendix–Publication 11003C). Eight of the bus routes and the trolley are limited to the West Philadelphia area east of City Avenue. This area has both dense population and dense transit service. West of City Avenue, where densities are lower, there are five bus routes: Routes 44,103,105, 106, and 115. These five routes all converge at Ardmore Station, making downtown Ardmore a nexus for public transit. However, for much of the Study Area west of Ardmore, the Route 105 is the only bus service available with the Route106 providing limited trips to Paoli Hospital. East of City Avenue, bus and trolley service is concentrated around Malvern Loop and St. Joseph's University. The bus network also provides many connections to regional rail lines such as the Cynwyd, Chestnut Hill West, and the Media/Elwyn lines.

Bus and Trolley Stops

Many bus stops lack the basic amenities for passenger safety, information, and comfort. Bus stops in the US 30 Corridor provide some features for pedestrian safety, but often the pedestrian design is incomplete. Most bus stops have sidewalk

present, but there are some exceptions. Many bus stops have inadequate lighting for safe nighttime usage and safe access via crosswalks. Pedestrian signal phases at crosswalks are also inconsistent.

Signage at bus stops in the corridor is extremely basic: most stops only indicate which routes serve them. Finally, amenities for passenger comfort vary dramatically across Study Area bus stops. Some stops are merely a "pole in the ground," while others provide benches, shelters, garbage receptacles, and newspaper stands. These enhancements help to improve the passenger experience and attract "choice riders."

Commuter Rail Service

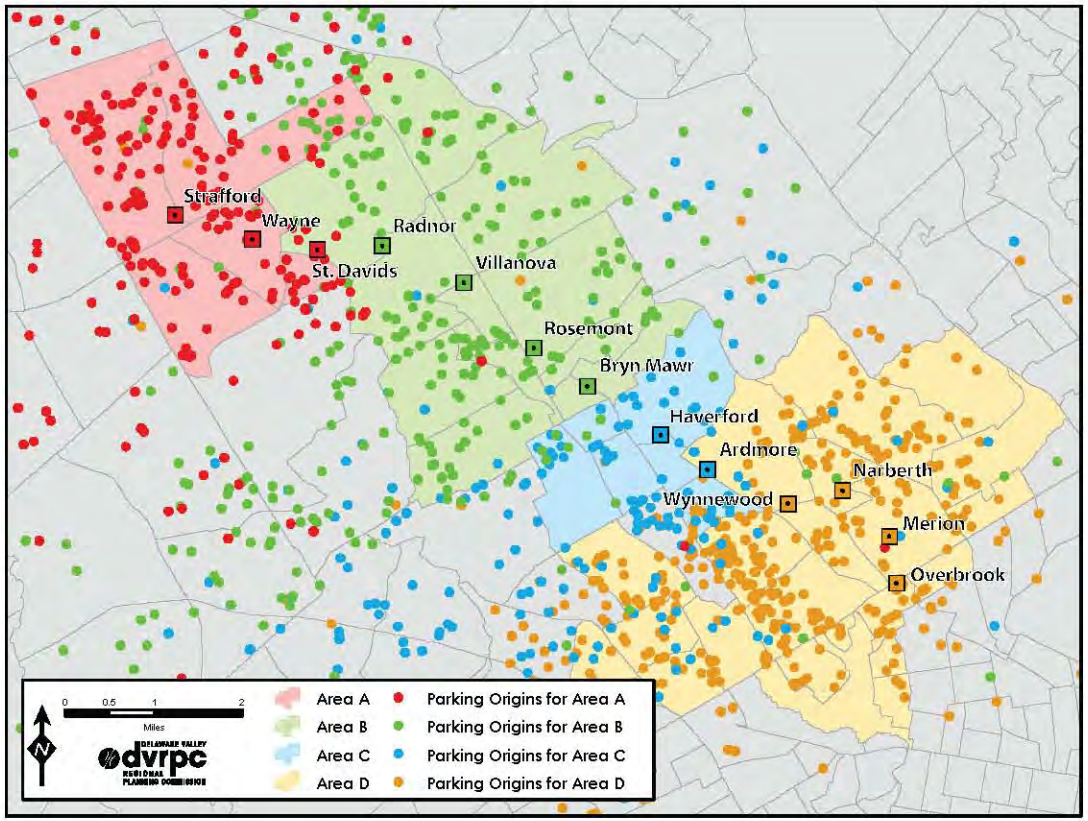
Regional Rail and NHSL Rail Service

The Paoli/Thorndale line was the earliest commuter rail service in the Philadelphia area. It currently runs with approximately half-hour headways and a peak base fare of $3.75. The Norristown High Speed Line (NHSL) was originally constructed as a suburban service connecting Upper Darby to Norristown. It complements the Paoli/Thorndale service, with roughly 15-minute headways. Many stations on these rail lines are more than simply stops for a train. They are intermodal nodes that link automobile drivers, bus and trolley riders in some cases, bicyclists, and pedestrians as part of a diverse and interdependent network.

Automobile Access

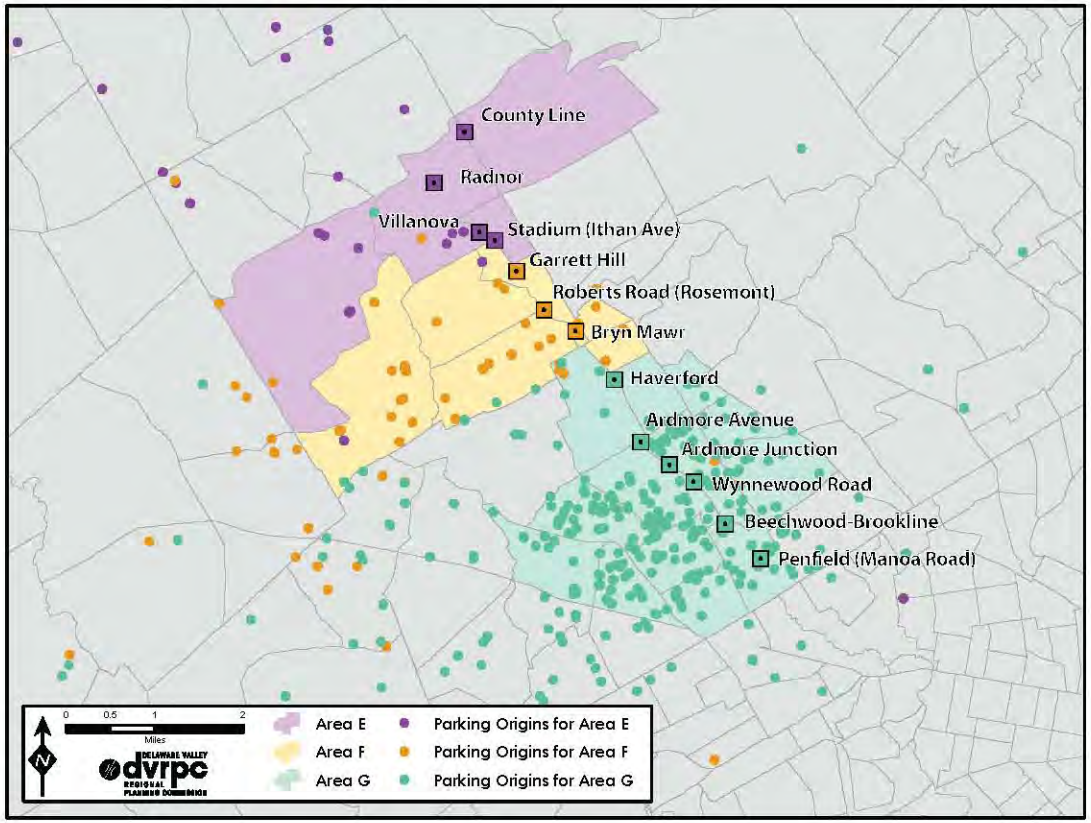
Automobile parking at rail stations in the corridor is highly constrained. Field observations by SEPTA

Figure 2.10: Service Areas for Paoli/Thorndale Line Stations



Source: DVRPC license plate survey, 2009; US Census, 2000

Figure 2.11: Service Areas for NHSL Stations



Source: DVRPC license plate survey, 2009; US Census, 2000

in 2008 and DVRPC in 2009 showed that while a total of 2,748 parking spaces were provided at 20 rail stations in the Study Area, only five stations had parking usage levels significantly below capacity (based on the principle that 85 percent occupancy represents effective capacity).

The five stations effectively below capacity are Radnor, Wayne, and Strafford on the Paoli/Thorndale line, and Haverford and Villanova on the NHSL. In total, they offer about 94 available spaces. See Appendix B of the Technical Appendix (Publication 11003C) for an illustration of the current quantity of parking and its usage levels at the rail stations.

Three NHSL stations in a row have 100 percent usage: Wynnewood Road, Ardmore Junction, and Ardmore Avenue. Every stop on the Paoli/Thorndale line from Wayne to Overbrook, except for Radnor Station) is effectively at capacity.

On the Paoli/Thorndale line in this corridor, there is roughly the same number of spaces available from SEPTA on a daily basis (1,038) as on a permit basis (1,055). SEPTA's daily spaces are utilized at an impressive 96 percent overall, while permit spaces are only utilized at 72 percent. This suggests that some people are buying permit spaces and "hoarding" them while only rarely using the rail station. Currently permits cost just $20 per month. It should also be noted that a small number of municipal or private parking spaces exists (266), and these are utilized at 85 percent overall. Eighty-five handicapped parking spaces are available on

the Paoli/Thorndale line in the US 30 Corridor. There is less parking provided on the NHSL than on the Paoli/Thorndale because it serves a smaller commuter shed and has a larger share of riders walking to stations. Only half of the NHSL stops in the Study Area have any parking; these stations range from 20 to 161 spaces. Despite the lower ridership, parking is constrained here as well. Field observations revealed parking spillover onto neighborhood streets at Penfield Station (Manoa Road), Beechwood-Brookline Station, Garrett Hill Station, and Wynnewood Road Station.

DVRPC surveyed all license plate numbers at rail station parking lots in the Study Area on September 15, 2009, to understand where parkers are traveling from. Figures 2.10 and 2.11 illustrate a summary of where vehicles parked at rail stations originated. The density of origins illustrates several trends. Many areas immediately adjacent to rail stations have low origin densities because of a high percentage of rail riders who walk to the train. Areas with a lack of competing transit and highway routes tend to have higher origin densities. The most concentrated area of rail origins–especially on the NHSL–extends from Havertown through Narberth. In this area, 18.5 percent of commuters are headed to Philadelphia County, and 31.3 percent have destinations within the Study Area. Another significant concentration occurs to the west of I-476 toward Tredyffrin, where 26.6 percent of commuters travel within the Study Area and 21.7 percent go to Tredyffrin. While in part this map is reflective of underlying population densities, it also suggests where passengers are traveling from.

Bicycle Access

Bicycles and trains can operate as complementary elements of a highly sustainable commute. Yet in a 2010 online survey conducted by SEPTA, 77 percent of respondents considered the bicycle accommodations at SEPTA facilities to be inadequate (*Bikes on SEPTA*, conducted January 13 to February 17, 2010). Both the Paoli/Thorndale and the NHSL trains allow bicycles onboard; however, at stations bicycle parking is surprisingly sparse. There are no bicycle racks at NHSL stations. At stations on the Paoli/Thorndale line, existing bicycle parking is well-utilized. Seven of the 11 stations with bicycle racks only provided them on one side of the tracks. Additionally, three stations' bicycle racks (at Merion, Bryn Mawr, and St. Davids) were in disrepair. Bicycles are commonly found creatively locked to railings and benches where there are insufficient bicycle racks.

Pedestrian Access

The areas surrounding rail stations in the Study Area vary significantly. Some stations, such as Ardmore on the Paoli/Thorndale line, are located in downtown areas with major destinations located within walking distance. Other stations, such as Roberts Road (Rosemont) on the NHSL, are situated in more rustic environments where housing is more dispersed.

From 2005 to 2009, there were 175 crashes involving pedestrians or bicyclists within a quarter mile of Study Area rail stations. Ardmore, on the Paoli/Thorndale line, had 27 such crashes within a quarter mile, the largest occurrence. Pedestrian crashes are generally more likely in areas that lack "walkable" facilities such as adequate sidewalks, crosswalks, and pedestrian signals at intersections.

One of the most common issues in the built environment around rail stations is facilitating pedestrian traffic from one side of the track to the other. Six of the stations in the Study Area use pedestrian overpasses. One drawback to this approach is that these are generally not wheelchair compatible. Twelve of the stations in the Study Area have tunnel underpasses for pedestrians. A drawback to these is they are often dank and uncomfortable places. Another 11 stations did not provide any special crossing facilities for rail riders; instead riders must cross along an existing road. This can be very uncomfortable if the sidewalks are narrow or nonexistent.

Stations are sometimes difficult to locate due to inadequate or absent wayfinding signage. Only five out of 13 Paoli/Thorndale stations provided wayfinding signs around the stations.

Finally, the accessibility of rail stations in this corridor for handicapped persons is deficient. Only six of the Paoli/Thorndale stations (less than half) and one of the NHSL stations were compliant with the Americans with Disabilities Act (ADA).

Passenger Information at the Station

Three basic pieces of information are required to use a rail line: where the service goes, a schedule and cost. The Paoli/Thorndale stations include a SEPTA system map to show where the service travels, as well as a route schedule. Some stations also have a small sign indicating the fare schedule. At NHSL stations, a route-specific map exists which also lists the service frequencies at different times. No NHSL fare information is provided. Six NHSL stations are missing route maps on one platform. On the Paoli/Thorndale line, only the Overbrook station has a route map present on both platforms. Rail timetables are more common; they are only missing at the Overbrook station.

Most stations do not have ticket vending machines available for ticket purchases when the ticket office is closed. This forces passengers to purchase their ticket on the train and, in some cases, pay more for the ride. At the Ardmore Station, which is the only Amtrak stop within the Study Area, access to the Amtrak ticket machine is not possible when the station is closed. This practice discourages rail ridership within the corridor.

Signage is important to orient passengers. All stations have the station name posted. All NHSL stations have inbound and outbound direction signed. This information, however, is only provided at four of the Paoli/Thorndale stations.

Strafford and Radnor stations on the Paoli/Thorndale line have LED displays using SEPTA's TrainView technology, which provides real-time information to inform passengers when the next train will arrive. The typical Paoli/Thorndale station provides all of the functional information through its system map, route schedule, and fare sign. However, many stations are missing one or more of these elements. Field visits found that maps are needed on one platform at Merion, Narberth, Wynnewood, Haverford, and Radnor stations. Maps are needed on both platforms at Bryn Mawr, Villanova, St. Davids, and Strafford stations.

The typical NHSL station provides most of the functional information through the system map (which includes frequencies) and the sign labeling the "Push to Stop Train" button. None of the NHSL stations provide fare information.

Bus Route Information at Rail Stations

Seventeen rail stations in the Study Area are served by at least one bus route. However, little bus information is provided at the stations. The Paoli/Thorndale schedule and the NHSL route map both indicate available bus connections only in fine print. The map includes available connections at 69th Street Station and Gulph Mills as well as segments of several intersecting bus routes.

Simply identifying a bus service, however, is not sufficient to use the service. Passengers must also find the bus stop, which is often not located immediately at the rail station. The bus stops that exist at rail stations are quite well-utilized. For example, Route 103 has its peak boardings at the Ardmore Station of the Paoli/Thorndale line. Many private shuttles operate along the line as well, providing "last mile" connections to universities and employment centers. The Study Area as a whole is appropriate for transit service: due to relatively high densities of population and employment, and relatively low vehicle ownership levels. Not only does bus service expand access to rail, but it also reduces station parking demand.

Customer Comfort

Most rail stations in the Study Area offer amenities for a pleasant waiting environment. These include shelters and benches. Adequate lighting is provided at NHSL stations, with lights inside the shelters and flood lights in surrounding areas. At many Paoli/Thorndale stations, however, there is a need for more pedestrian-scale lighting. A few of the stations also provide heating and air conditioning. Newspaper stands and coffee shops can be found at several stations in the corridor. Most stations have trash receptacles, though none have recycling containers.

HIGHWAY NETWORK

US 30 (Lancaster Avenue)

US 30 (Lancaster Avenue) is classified by PennDOT as a principal arterial throughout the Study Area. This corridor is further refined for the purpose of planning as a community arterial, with segments serving as main streets, based on the roadway characteristics outlined within the *Smart Transportation Guidebook.*

Traffic volume data (AADT) recorded over the past five years for the Study Area is shown in Appendix C of the Technical Appendix (Publication 11003C). As the figure illustrates, 2009 volumes along US 30 range between 17,000 in Philadelphia to 34,000 vehicles per day in Radnor.

Major Parallel and Perpendicular Routes

Haverford Road

Haverford Road is a parallel roadway that links Bryn Mawr and Havertown in Lower Merion and Haverford townships. Haverford Road is classified by PennDOT as a minor arterial within the Study Area. The study team considers this roadway to be a regional arterial based on the roadway's characteristics within the categories outlined in the *Smart Transportation Guidebook*. Traffic volumes along Haverford Road range between 11,000 and 20,000 vehicles per day, with the higher volume in the area of the Haverford/Radnor Township line near Bryn Mawr Hospital.

Montgomery Avenue

Montgomery Avenue is another major parallel roadway to US 30, used by many motorists as an alternative route, largely due to the longer distances between traffic signals. Montgomery Avenue is classified by PennDOT as a principal arterial within the Study Area. The study team considers this roadway to also be a regional arterial based on the roadway's characteristics within the categories outlined in the *Smart Transportation Guidebook*.

Conestoga Road

Conestoga Road runs through Radnor Township, linking the Rosemont area with Wayne. The roadway is classified by PennDOT as a minor arterial and experiences traffic volumes of around 12,000 vehicles per day.

US 1 (City Avenue)

US 1 is a major north/south highway along the East Coast. In the Philadelphia region, US 1 links the northeast and southwest suburbs. The roadway, which is classified by PennDOT as a principal arterial, experiences as many as 44,000 vehicles per day in the area of St. Joseph's University.

PA 320 (Spring Mill Road/Sproul Road)

PA 320 is a north/south state highway that runs roughly parallel to I-476. PA 320 is classified by PennDOT as a minor arterial. The most recent traffic count, conducted in 2007, revealed almost 9,500 vehicles per day.

I-476 (Blue Route)

Interstate Route I-476 links southern Delaware County, and the Philadelphia International Airport to areas in the north including major roadways such as the Pennsylvania Turnpike's northeast extension and the Schuylkill Expressway (I-76). The roadway is classified by PennDOT as an interstate highway (principal arterial) and experiences as many as 132,000 vehicles per day.

Regionally Significant Routes

Several of the Study Area roadways serve as official detour routes or alternate routes for everything from temporary road closures due to crashes to emergency evacuations. Three routes in the Study Area are considered to be significant to the regional movement of vehicles and could serve as primary evacuation routes in the event of a regional evacuation. These routes include US 30 (Lancaster Avenue), US 1 (City Avenue), and I-476 (Blue Route). The intersections of these routes are also critical to the transportation network. Within the Study Area, US 30 intersects with US 1 in the eastern third of the Study Area and I-476 in the western third of the Study Area. Additionally, there are other routes that serve as connectors to the primary routes, which are also important to the regional transportation network. These roadways include PA 320 (Spring Mill Road/Sproul Road), Montgomery Avenue, Haverford Road, and Conestoga Road.

Official Detour Routes

There are several routes within the Study Area that serve as primary or secondary detour routes for the interstate highways in the area. PennDOT and DVRPC have created a detour mapping tool to illustrate both primary and secondary detour routes. This tool, called the Interactive Detour Route Mapping or IDRuM was used to identify the detour routes within the Study Area.

The primary detour routes for I-476 (Blue Route) use portions of the roadways in the Study Area. In the event that a closure or other incident were to happen on I-476 in the area north or south of the US 30 interchange, traffic would be detoured from the Blue Route as follows. These detour routes are signed using the colored detour signage.

- I-476
  - Incident north of Lancaster Avenue – detour traffic along US 30 E to PA 320 N
  - Incident south of Lancaster Avenue – detour traffic along US 30 E to PA 320 S

Secondary detour routes for I-476 (Blue Route) and I-76 utilize roadways within the Study Area. In the event that an incident were to occur along the interstate in the specified area, traffic could be detoured along the specified roadways. These are secondary routes, and are therefore not signed.

- I-76
  - Incident between the PA 23 ramps and Belmont Road – detour traffic along US 1 S to US 30 W to I-476 N
  - Incident between I-476 and the PA 23 ramps – detour traffic along PA 320 E to US 30 E to I-476 N
- I-476
  - Incident south of Lancaster Avenue – detour traffic along US 30 E to County Line Road to Bryn Mawr Avenue

Vehicular Travel Patterns

An origin-destination analysis was conducted in order to determine the number of vehicular trips within the Study Area and to find out whether US 30 is used as a cut-through route for travelers living outside of the Study Area to access Philadelphia or Chester County. DVRPC data, broken down into traffic analysis zones (TAZ) from the 2000 Census, was used to determine the travel patterns of those traveling through the Study Area.

Vehicular travel patterns within the US 30 Corridor are illustrated in Figure 2.12: Vehicular Travel Patterns. The grayscale shading in the Study Area shows that trip destinations become more highly concentrated closer to Philadelphia. It is an unsurprising trend, given that population density behaves the same way.

The travel pattern to and from neighboring regions is shown with arrows (note that only flows of at least 15,000 trips per day are shown). West Philadelphia naturally represents a significant region of travel, with about 59,000 daily trips exchanged with the Study Area. Other moderate flow levels (30,000 to 50,000) exist with neighboring regions such as Haverford and Lower Merion townships, as well as Montgomery and Philadelphia counties.

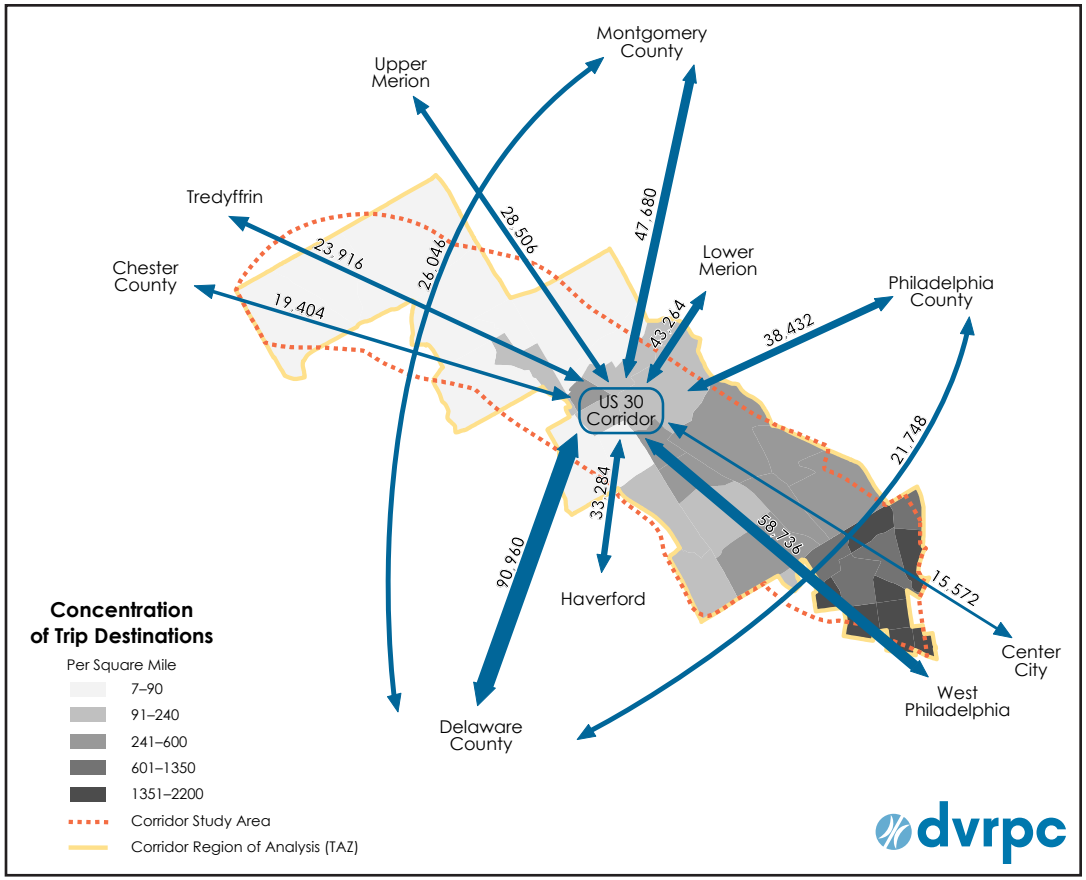
The highest external traffic flow is between the Study Area and Delaware County–a total of about

91,000 trips daily. This is in part because the county covers such a large area, with numerous destinations for employment and commerce. The primary destinations for residents of the US 30 Study Area were within Upper Darby.

Of course, even more US 30 residents travel within the corridor itself–150,800 trips daily. Specifically, downtown Ardmore, Narberth, and Lankenau Hospital had the most concentrated destinations. These are obviously crucial activity centers along the corridor.

Based on this data, cut-through traffic does not appear to be a major feature of the corridor travel patterns. While exact travel paths cannot be determined by origin-destination analysis, there are two primary flows that cross through the Study Area. The first, between Delaware and Montgomery counties, has 26,000 daily trips, and the second, between Delaware and Philadelphia counties, sees 22,000 daily trips. Neither of these flows seems likely to travel via Lancaster Avenue; they would more likely utilize the Blue Route or City Avenue. The only likely "cut-through" traffic pattern along US 30 would be travelers who are accessing the concentrated destinations within the corridor's eastern end.

Figure 2.12: Vehicular Travel Patterns



Source: US Census Bureau, 2000

Safety

There are several tools available to engineers and planners in order to determine safety issues along a corridor. Crash analysis is used to determine crash-cluster locations for further study along a corridor, and as a tool to influence the type of mitigation measures that are proposed for that location. Speed studies can also be used as an analysis tool to determine the safety of the corridor, especially the safety of nonmotorized travelers. Measurement of existing speeds demonstrates the speed that the majority of drivers are comfortable traveling through the corridor. Context-sensitive design tools such as traffic calming can be introduced in order to convey the desired operating speed for the corridor, especially if the speed study results indicate that motorists are traveling at a higher than desirable speed.

High Crash Locations

In order to determine the safety of the existing conditions of the corridor, crash data was obtained for Lancaster Avenue for the most recently available five years. This data was obtained from PennDOT for the years 2004 through 2008, the most recent complete data since the US 30 study began. This data was used to determine the 10 intersections along US 30 with the highest number of crashes. The crash information for these 10 intersections is summarized below in Table 2.6: Intersection Crash Summary – Lancaster Avenue (2004-2008). Crash data for Montgomery Avenue was obtained from the Lower Merion Township Police Department in order to determine if high

Table 2.6: Intersection Crash Summary - Lancaster Avenue (2004-2008)

Intersection	Total Crashes	Two Highest Collision Types	
		Number of Crashes (Percent)	
Wynnewood Road	75	35 (47%)	Angle
		22 (29%)	Rear-End
Haverford Station Road	70	53 (76%)	Angle
		10 (14%)	Rear-End
PA 320	67	33 (49%)	Rear-End
		23 (34%)	Angle
Radnor Chester Road	56	30 (54%)	Angle
		13 (23%)	Rear-End
52nd Street	53	21 (40%)	Angle
		13 (25%)	Rear-End
Aberdeen Avenue	49	30 (61%)	Angle
		8 (16%)	Rear-End
Remington Road	48	33 (69%)	Angle
		8 (17%)	Rear-End
City Avenue	36	16 (44%)	Angle
		11 (31%)	Rear-End
Banbury Way	31	14 (45%)	Angle
		9 (29%)	Fixed Object
59th Street	30	12 (40%)	Angle
		7 (23%)	Rear-End
Total	515		

Source: PennDOT

crash locations exist along this major parallel route. Because of its categorization as a local route not maintained by the state, PennDOT crash-analysis software could not be used to determine the highest crash locations along the length of Montgomery Avenue. Therefore, the study team chose three intersections, which are believed to be key locations along the roadway, for detailed crash analysis. The crash information for these locations is shown below in Table 2.7: Intersection Crash Summary – Montgomery Avenue.

The majority of the crashes along both roadways are occurring during daylight hours and under dry roadway conditions. Angle and rear-end type crashes make up the highest proportion of crash types. These types of crashes are typical of congested areas, where drivers tend to follow too closely, make frequent lane changes to avoid queues, and block the intersection in order to make left turns. Detailed summaries of crash information are included in Appendix D of the Technical Appendix (Publication 11003C).

Speeds

The posted speed limit varies along the length of US 30, ranging from 25 MPH to 40 MPH. The extents of each different speed zone are illustrated in Figure 2.13.

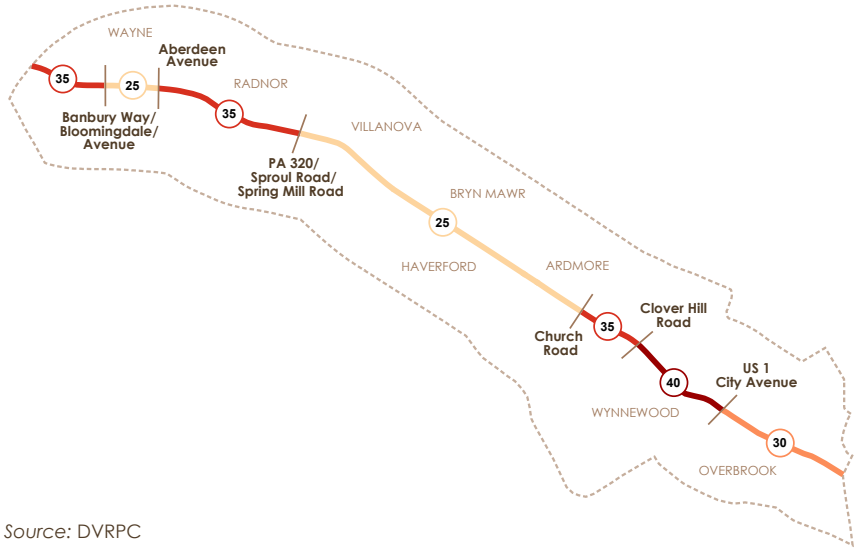
Speed studies were conducted by DVRPC in December 2009 at two locations within the Study

Table 2.7: Intersection Crash Summary - Montgomery Avenue (2004-2008)

Intersection	Total Crashes	Two Highest Collision Types	
		Number of Crashes (Percent)	
Morris Road	26	17 (65%)	Angle
		4 (15%)	Rear-End
PA 320	11	8 (73%)	Angle
		2 (18%)	Rear-End
Church Road	5	2 (40%)	Angle
		-	-
Total	42		

Source: Lower Merion Township Police Department

Figure 2.13: US 30 Corridor Speed Limits



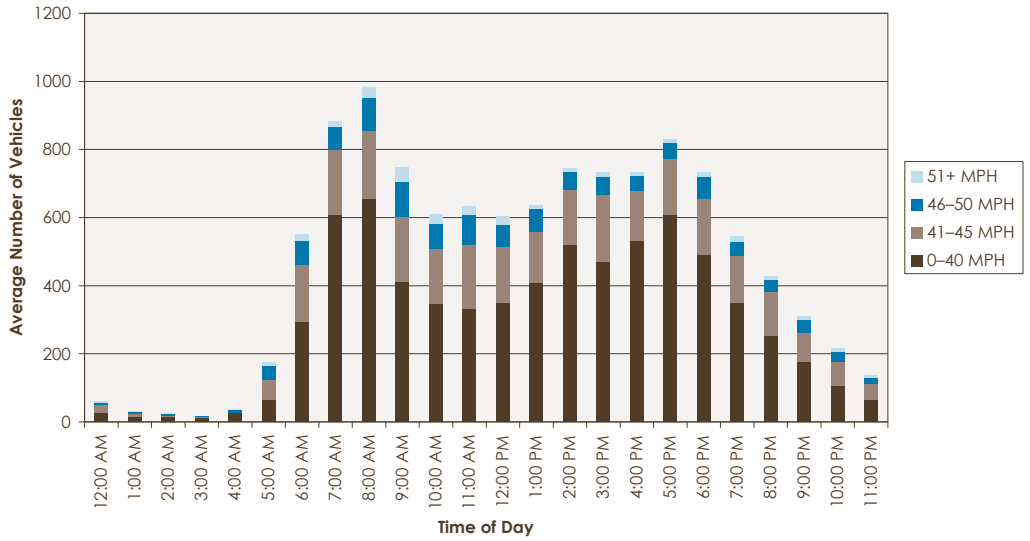
Source: DVRPC

Area. The first was conducted along US 30 in the Wynnewood/Penn Wynne area, just east of Remington Road. The second was in Overbrook/ Wynnefield, along Upland Way between 54th Street and 56th Street. The variation of speed by hour is depicted in Figures 2.14 through 2.17, for US 30 and Upland Way respectively. These charts are broken down by direction of travel, and illustrate the number of vehicles traveling at or below the speed limit (brown), five MPH over the speed limit (dark blue), 10 MPH over the speed limit (medium blue), and 11 or more MPH over the speed limit (light blue).

As part of the speed studies, the 85th percentile speed was determined for each location. This speed, which is used as a measure by engineers, is considered to be the highest speed at which most reasonable drivers travel (85 percent of the vehicles observed were traveling at or below this speed).

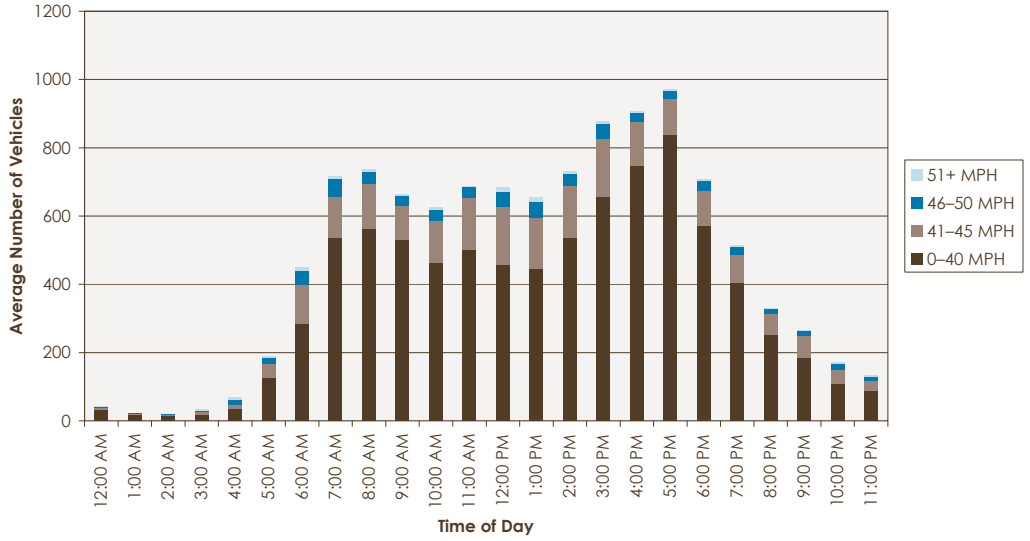
Along US 30, the 85th percentile speed observed was 43 MPH. This is very near the posted speed limit in this segment, 40 MPH. Along Upland Way, the 85th percentile speed observed was 36 MPH. This is well above the speed limit of 25 MPH, however there are no signs posted along the roadway indicating the speed limit.

Figure 2.14: Speed Variation by Hour - Eastbound Lancaster Avenue near Remington Road



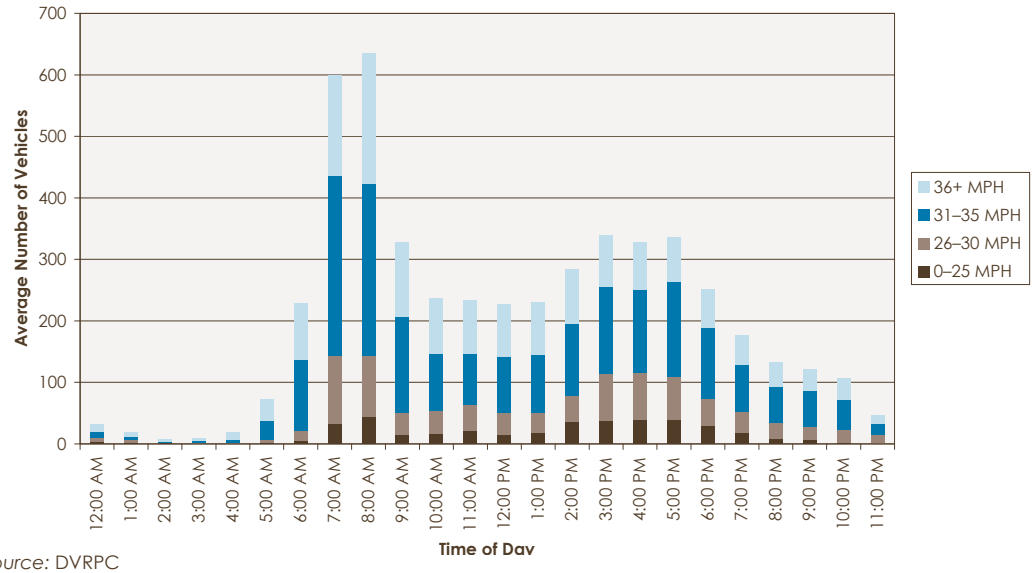
Source: DVRPC

Figure 2.15: Speed Variation by Hour - Westbound Lancaster Avenue near Remington Road



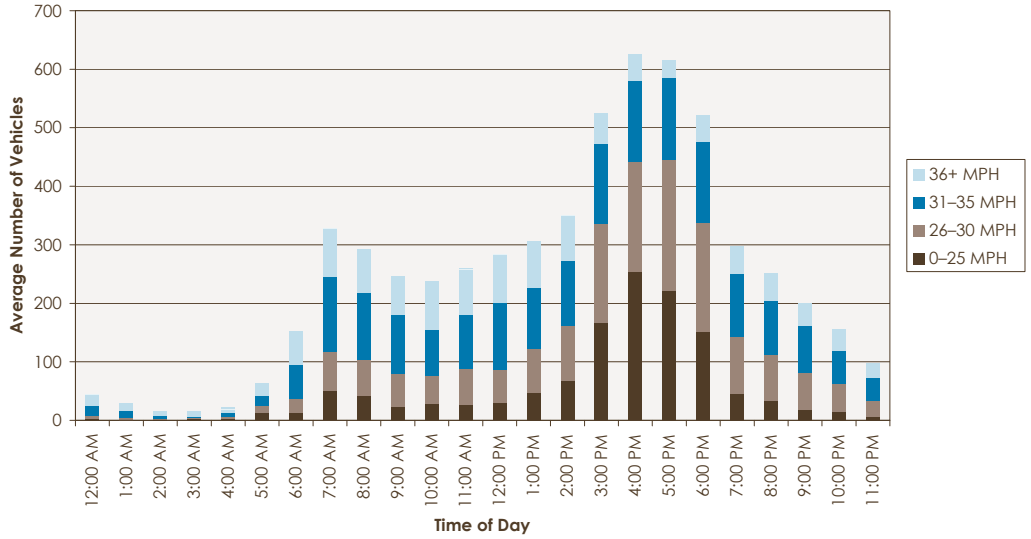
Source: DVRPC

Figure 2.16: Speed Variation by Hour - Eastbound Upland Way near 56th Street



Source: DVRPC

Figure 2.17: Speed Variation by Hour - Westbound Upland Way near 56th Street



Source: DVRPC

3 GOALS & OBJECTIVES

SECTION 3

GOALS & OBJECTIVES

ASSETS, CONSTRAINTS & OPPORTUNITIES

Based on the existing conditions research and analysis summarized in the previous chapter, the study team developed the following list of assets, constraints, and opportunities for the US 30 Corridor. This type of list is often created as part of a planning study to concisely highlight the strengths and weaknesses of a particular area while also identifying potential building blocks for future successes.

Assets

- The corridor contains a robust transportation infrastructure with multimodal travel options.
- The corridor has a rich history and contains many valuable historical and cultural resources.
- The corridor is home to many of the region's most important educational and medical institutions.
- Much of the corridor's population is well educated with incomes significantly higher than the region's median.

Constraints

- Many areas of the corridor lack the necessary pedestrian and bicycle facilities to make walking and biking viable transportation options.
- Despite some well-defined development centers, much of US 30 does not have a coherent identity or sense of place.
- Portions of the Study Area in West Philadelphia have suffered from disinvestment and some traditionally commercial areas now experience high rates of vacancy.
- The narrow roadway width of some sections of US 30 constrains potential pedestrian, bicycle, and vehicular circulation improvements.
- Large areas of impervious coverage exacerbate existing stormwater and flooding issues.
- Parks and open space are not always well connected to residential neighborhoods; many recreation areas are only accessible by automobile.
- The supply and location of parking is inadequate to meet peak demand at several rail stations and within some commercial areas.

Opportunities

- The corridor is well-positioned to continue to develop in a sustainable manner because of its rich transit network and established development centers.
- Traditional town center areas of the corridor represent unique and distinctive places to live, work, and recreate.
- The corridor contains a series of vacant and underutilized parcels that may be repurposed to better serve the needs of local populations.
- Newer, more sustainable methods of stormwater management can help municipalities achieve environmental management goals.
- Numerous recent studies and plans conducted for portions of the corridor form a solid foundation for future recommendations.
- In many places, vehicular and pedestrian circulation can be enhanced by defining and consolidating property access points.
- Resident demand for healthy lifestyle choices and sustainability indicate support for initiatives such as neighborhood walkability.

GOALS AND OBJECTIVES

DVRPC corridor studies provide policy analysis, recommendations, and technical assistance regarding transportation, land use, and environmental issues to municipalities. In particular, this study focuses on linking transportation investments to land use decisions in a manner that encourages smart growth.

The purpose of this study is to develop solutions that will improve safety for vehicles and pedestrians, reduce travel delays, enhance economic development opportunities, create linkages, rationalize land use and manage area stormwater.

With feedback from corridor municipalities, the Technical Advisory Committee, and the public, the US 30 study team has identified the following goals for the US 30 Corridor:

1. **Foster distinctive, attractive settings with a strong sense of place.** The corridor is already home to many of the region's most distinctive destinations. Strengthening the connections between these destinations will enhance the identity of the corridor.

2. **Preserve and enhance cultural and historic resources.** Celebrating the corridor's rich history requires more than preservation. New development should respect the traditional character found in much of the Study Area.

3. **Promote municipal cooperation.** The future of Lancaster Avenue depends on the ability of neighboring communities to work together to solve interrelated land use and transportation issues.

4. **Identify and prioritize critical roadway improvements.** US 30 will remain a critical transportation corridor. Prioritizing projects that will improve circulation can mitigate congestion while enhancing safety.

5. **Create walkable and bikeable communities.** Creating complete streets that accommodate vehicles, pedestrians, and cyclists will lessen auto dependence and lead to a more balanced transportation system.

6. **Enhance access to public transit.** The corridor already contains one of the region's richest transit networks. Improving ADA access is one way to improve the effectiveness of the corridor's public transit and maximize these existing investments.

7. **Encourage smart growth land use and development patterns.** Smart growth practices such as focusing development in town centers, mixing land uses, and providing a range of housing options can reinforce the corridor's sense of place and improve quality of life.

8. **Enhance the sustainability of the corridor.** Many parts of the corridor have already begun to implement environmental best practices. Additional investments in the corridor's green infrastructure can help manage stormwater more effectively, improve water quality, and beautify the Study Area.

Corridor-wide and area-specific recommendations designed to help achieve these goals are presented in subsequent chapters of this report.

SECTION 3

ORGANIZING THE CORRIDOR

The US 30 Corridor, as defined in this study, is a large complex area composed of a diverse range of urban and suburban environments. Much of this study deals with how US 30 operates over its entire length and a series of corridor-wide recommendations is contained in the next chapter of this document.

However, corridor studies must also address the localized issues that vary from place to place along the corridor. For the purposes of this study, the US 30 corridor has been broken into a series of 14 sub-areas. These sub-areas extend along Lancaster Avenue and also include a stretch of Haverford Road. Together, these sub-areas form a framework for discussing the location specific-recommendations that are found in Section 5.

The extent of each sub-area was determined by land use and transportation context, as well as municipal jurisdiction. Some sub-areas correspond to well-known neighborhoods, while others encompass transitional areas and less well-defined locales. Corridor sub-areas are depicted in Figure 3.1.

Land Use Contexts

Figure 3.1 also illustrates the land use context of each sub-area. Understanding the surrounding land use context is essential to planning for the future of any transportation facility. For example, the character of development surrounding a particular roadway can provide guidance as to who will need to use the road and how they will use it. The US 30 Corridor is composed of numerous context areas. A context area is an area of land that contains a unique combination of built and natural characteristics, which can include land uses, architectural styles, urban form, building density, roadway design, topography, and other natural features.

This study seeks to integrate land use and transportation planning by encouraging roadway design that is compatible with a land use context that reflects each community's vision. Each sub-area has been classified according to a land use classification system developed jointly by the New Jersey and Pennsylvania Departments of Transportation in the *Smart Transportation Guidebook*. This system includes seven context areas that range from least to most developed: Rural, Suburban Neighborhood, Suburban Corridor, Suburban Center, Urban Neighborhood, Town Center, and Urban Core. These context areas are illustrated in Figure 3.2 and briefly described below.

Rural: This context area consists of a few houses and structures dotting a farm or forest landscape. The areas are predominantly natural wetlands, woodlands, meadow or cultivated land. Small markets, gas stations, diners, farm supplies, convenience grocers, etc. are often see at the intersections of arterial or collector roads. Rural areas are not found within the US 30 Study Area.

Suburban Neighborhood: Predominantly low-density residential communities, built throughout the region in the last four decades. House lots are typically arranged along a curvilinear internal system of streets with limited connections to a regional road network or surrounding streets. Neighborhoods are primarily residential, but can include community facilities such as schools, churches, recreational facilities, and some store and offices. Within the US 30 Corridor, the Rosemont sub-area largely meets this description.

Suburban Corridor: Typically characterized by commercial strip development, sometimes interspersed with natural areas and occasional clusters of homes. Such areas consist primarily of big box stores, commercial strip centers, restaurants, auto dealerships, office parks, and gas stations. The Radnor sub-area is an example of this land use context.

Suburban Center: Often a mixed-use, cohesive collection of land uses that may include residential, office, retail, and restaurant uses where commercial uses serve surrounding neighborhoods. These areas

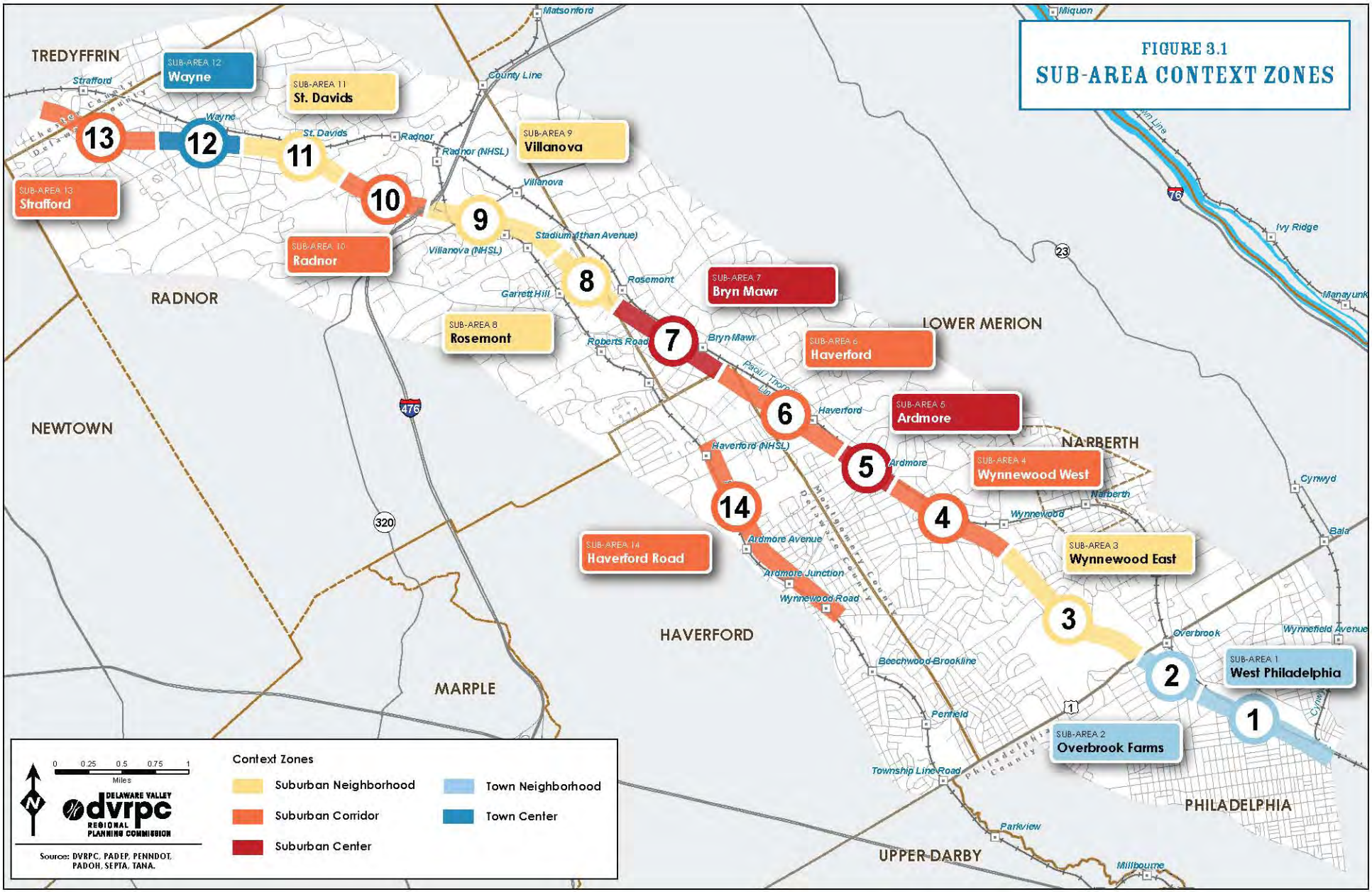


FIGURE 3.1
SUB-AREA CONTEXT ZONES
SUB-AREA 12
Wayne
SUB-AREA 11
St. Davids
SUB-AREA 9
Villanova
SUB-AREA 13
Strafford
SUB-AREA 10
Radnor
SUB-AREA 8
Rosemont
SUB-AREA 7
Bryn Mawr
SUB-AREA 6
Haverford
SUB-AREA 5
Ardmore
SUB-AREA 4
Wynnewood West
SUB-AREA 3
Wynnewood East
SUB-AREA 14
Haverford Road
SUB-AREA 1
West Philadelphia
SUB-AREA 2
Overbrook Farms
TREDYFFRIN
RADNOR
NEWTOWN
LOWER MERION
NARBERTH
HAVERFORD
MARPLE
UPPER DARBY
PHILADELPHIA
Matsonford
Miquon
County Line
Strafford
Wayne
St. Davids
Radnor
Radnor (NHSL)
Villanova
Villanova (NHSL)
Stadium (Ithan Avenue)
Garrett Hill
Rosemont
Roberts Road
Bryn Mawr
Haverford
Haverford (NHSL)
Ardmore
Ardmore Avenue
Ardmore Junction
Wynnewood Road
Wynnewood
Narberth
Cynwyd
Bala
Ivy Ridge
Manayunk
Overbrook
Wynnefield Avenue
Beechwood-Brookline
Penfield
Township Line Road
Parkview
Millbourne
Montgomery County
Delaware County
Philadelphia County
476
320
76
23
1
13
12
11
10
9
8
7
6
5
4
3
2
1
14
0 0.25 0.5 0.75 1
Miles
DELAWARE VALLEY REGIONAL PLANNING COMMISSION
dvrpc
Source: DVRPC, PADEP, PENNDOT, PADOH, SEPTA, TANA.
Context Zones
Suburban Neighborhood
Suburban Corridor
Suburban Center
Town Neighborhood
Town Center

are typically designed to be accessible by car and may include large parking areas and garages. The Ardmore and Bryn Mawr sub-areas fall into this category.

Urban Neighborhood: Predominantly residential neighborhoods sometimes mixed with retail, restaurants and offices. In urban places, residential buildings tend to be set close to the street, with rowhouses fronting the sidewalk. Houses set back with a front garden or lawn are also common in the region. The Overbrook Farms sub-area is an example of this land use context.

Town Center: A mixed-use, high-density area with buildings adjacent to the sidewalk, typically two to four stories tall with commercial operations on the ground floor and offices or residences above. Parallel parking usually occupies both sides of the street with parking lots behind the buildings. Important public buildings, such as the town hall or library, are provided special prominence. This classification applies to the Wayne sub-area.

Urban Core: Downtown areas consisting of blocks of higher-density, mixed-use buildings. Across the region, buildings vary in height from one to 60 or more stories tall, though most buildings date from an era when elevators were new technology and five to twelve stories were the standard. This classification does not apply to the Study Area.

The US 30 corridor is diverse enough to include every context zone except rural and urban core areas. In practice, land uses do not always fit

Figure 3.2: Land Use Context Zones

Source: Smart Transportation Guidebook, PennDOT and NJDOT

neatly into a defined context area and boundaries between these context areas may be difficult to pin down. When classifying sub-areas, the project team chose the classification that most closely matches the existing and proposed land uses. This study uses the land use context of each sub-area as an organizing framework for recommended improvements and the selection of roadway design values. For example, the issues encountered in suburban and urban centers typically differ from those found in suburban neighborhoods and corridors. Recommendations for each sub-area can be found in Section 5 of this document.

4

CORRIDOR-WIDE RECOMMENDATIONS

SECTION 4

CORRIDOR-WIDE RECOMMENDATIONS

WATER QUALITY

The focus of the following environmental recommendations is on stormwater management, as this is the primary cause of water quality impairment in the Study Area. However, many of these recommendations provide additional environmental, aesthetic, and social benefits, including improved habitat and open space, increased vegetation and tree cover, and improved air quality. A strategic and coordinated approach to stormwater management, using best management practices that retain rainwater on-site and emphasize natural processes of infiltration and biologic uptake, can address all of these problems while enhancing the community's overall quality of life. The best way to improve stormwater management is with a combination of various strategies, including structural solutions, the restoration of floodplains and stream corridors, the preservation of open space, improving land management activities, amending township ordinances, and educating the public.

Priority Areas for Stormwater BMPs

Publicly owned land and schools are typically the ideal locations for stormwater BMPs like rain gardens, rain barrels, and green roofs, not only because public entities have control over the land, but also because public locations can serve as learning opportunities for the wider audience. Municipal buildings, public parks, schools, and transportation corridors throughout the Study Area can accommodate a variety of stormwater BMPs.

Along US 30, the priority areas for stormwater BMPs are located in areas of high levels of impervious coverage within subwatersheds that drain to impaired streams. These locations along US 30 are the following:

- Between the western boundary of the Study Area and Doyle Road near Wayne
- Between the eastern boundary of the Study Area and County Line Road near Rosemont

Priority Areas for Stream Bank Restoration

Riparian buffers (stream corridors) should be restored to their natural condition through stream bank (riparian) stabilization techniques and the planting of native vegetation. The Heritage Conservancy conducted an inventory of riparian corridors in southeastern Pennsylvania to prioritize areas with the greatest need for restored stream buffers. Additionally, the Natural Lands Trust

Merion Golf Club.

Karakung Little League Field.

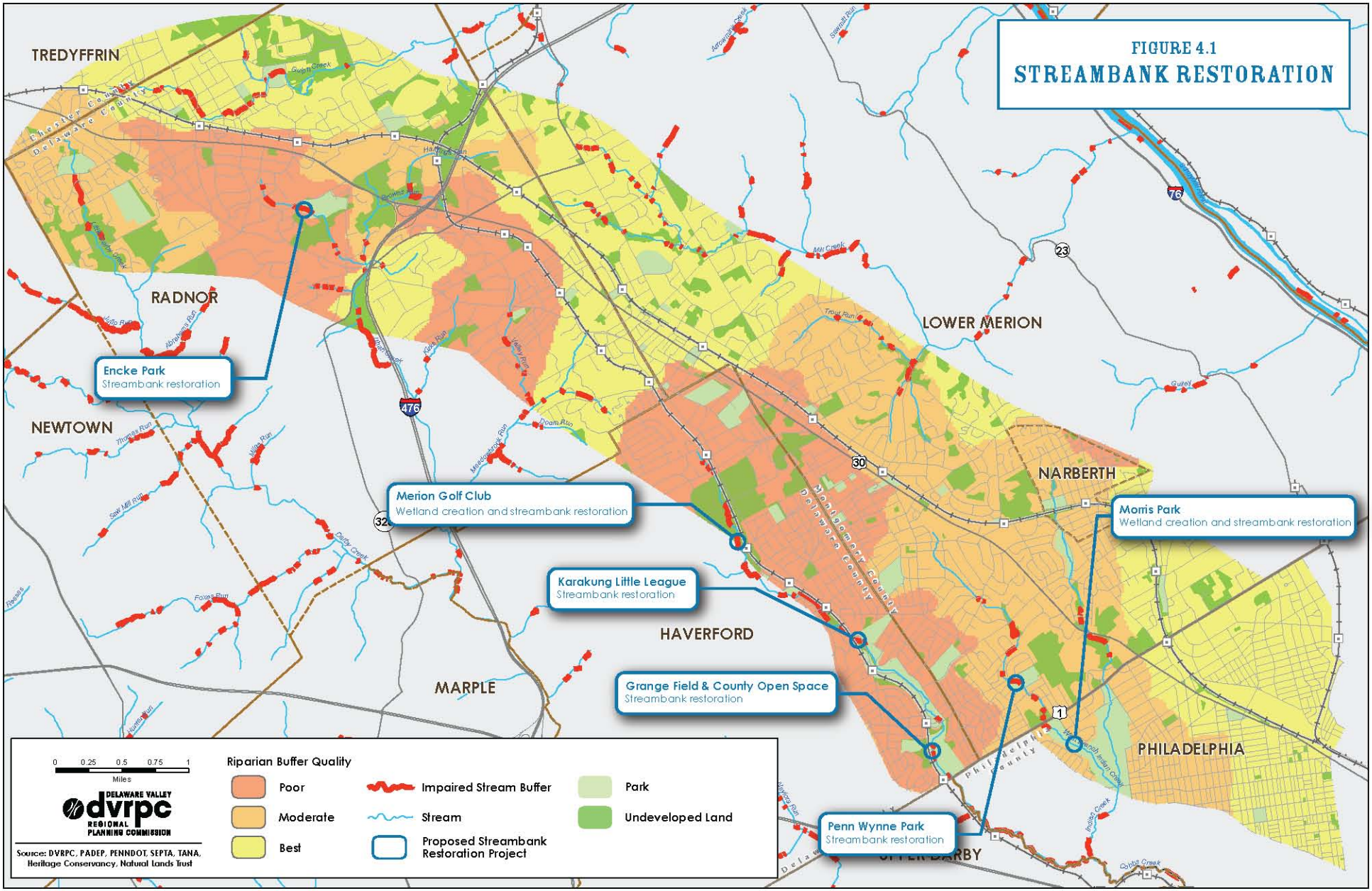


FIGURE 4.1
STREAMBANK RESTORATION
TREDYFFRIN
RADNOR
NEWTOWN
LOWER MERION
NARBERTH
HAVERFORD
MARPLE
PHILADELPHIA
Encke Park
Streambank restoration
Merion Golf Club
Wetland creation and streambank restoration
Karakung Little League
Streambank restoration
Grange Field & County Open Space
Streambank restoration
Morris Park
Wetland creation and streambank restoration
Penn Wynne Park
Streambank restoration
Riparian Buffer Quality
Poor
Moderate
Best
Impaired Stream Buffer
Stream
Proposed Streambank Restoration Project
Park
Undeveloped Land
0 0.25 0.5 0.75 1
Miles
DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION
Source: DVRPC, PADEP, PENNDOT, SEPTA, TANA, Heritage Conservancy, Natural Lands Trust

conducted a study analyzing the riparian buffer quality of subwatersheds. The results of these studies are shown on Figure 4.1: Streambank Restoration.

These studies indicate that, within the Study Area, riparian buffer restoration is most needed in the Haverford Road area. Here, there are multiple areas missing both sides of the riparian buffer, and the stream (Cobbs Creek) is impaired. This area of Cobbs Creek located near the Ardmore Avenue and Ardmore Junction stations of the Norristown High Speed Line is channelized, although localized heavy flooding in recent years has caused the creek to overflow its banks and inundate subgrade garages. The Wynnefield Drive channel restoration project is located within this priority area.

Impaired stream buffers within impaired subwatersheds should have the highest priority for restoration. Within these areas, conducting streambank restoration work on public lands is the most feasible and can have the greatest public impact. Using these criteria, a number of potential streambank restoration locations have been identified and also shown on Figure 4.1: Streambank Restoration. The proposed locations are the following: Merion Golf Club, Karakung Little League, Grange Field and County Open Space, Penn Wynne Park, Morris Park, and Encke Park.

The Merion Golf Club is the only privately owned streambank location that has been proposed, although it is a priority area. Grass is mown along the streambank of Cobbs Creek, allowing runoff to enter unfiltered. Designating no-mow buffer zones along the streambanks and allowing grasses to grow to at least eight inches will help protect the health and water quality of Cobbs Creek.

The portion of Cobbs Creek at the Karakung Little League is channelized. The paved parking lot for the facility connects to the channel, allowing sheets of polluted stormwater runoff to enter Cobbs Creek completely unimpeded. Due to the hydrological complications of restoring a channelized stream, additional scientific studies would be needed. At the very least, stormwater BMPs on the parking lot, such as a filter strip, rain garden, or cistern, could help reduce peak flows into Cobbs Creek at this location.

Grange Field and County Open Space contains the Barnett Environmental Center. Although the portion of the impaired stream adjacent to the rail line was inaccessible, the tributary to Cobbs Creek within the Barnett Environmental Center was highly impaired. This is evident in the extreme erosion conditions at a culvert shown in the photo on this page. One solution would be to retrofit the outfall location with “step pools,” like the ones shown on this page, which would work to slow the velocity of the stream.

The West Branch of Indian Creek running through Penn Wynne Park also exhibits erosion and exposed tree roots. This stream could benefit from

Erosion at Grange Field and County Open Space.

Rock pack and flush cut stream restoration.
Photo: Montgomery County, Marlyland DEP

Step pools outlet retrofit.
Photo: Montgomery County, Marlyland DEP

regrading and stabilization of the banks.

The outfall at Morris Park is extremely impaired. This was identified as a high priority site for streambank stabilization in the Cobbs Creek Park Master Plan. Retrofitting the outfall with a step pool or some other form of restoration, as well as strengthening the streambanks, can protect the stream and prevent further erosion.

Extreme erosion conditions are also evident on the portion of Darby Creek crossing through Encke Park. Severely undercut streams like this one could benefit from rock pack and flush cut stream restoration work like the one shown on the previous page.

Parking Lot Retrofits

Parking lots constitute vast swaths of contiguous impervious coverage, and many are far larger than parking demand necessitates. By encouraging shared parking, providing economic incentives for structured parking, and reducing the ratios of required parking, municipalities can help reduce the amount of surface parking lots. Within existing parking lots, green infrastructure retrofits can mitigate the high-volume stormwater runoff generated by these impervious surfaces. Stormwater BMPs on parking lots may be encouraged on existing developments, or required when substantial repairs or remodeling are proposed.

One strategy is to construct underground detention basins beneath parking lots. These basins are designed to temporarily hold water and gradually release it after storm events, thus reducing peak stormwater flows. Depending on the characteristics of the location, water may exit the basins via a pipe or through groundwater infiltration. Stormwater can enter these storage areas through a grate and pipe system or by infiltrating through porous pavement. More often, porous pavement is underlain by a large stone reservoir (layers of small stones) that itself temporarily holds water before groundwater infiltration, or transport via a pipe during heavy storm events.

Retrofitting or constructing landscaped areas to provide stormwater management functions can reduce runoff while adding attractive vegetation. Landcaped areas in parking lots can be redesigned as bioswales or rain gardens to absorb runoff through stormwater inlets.

Stormwater Outfall Retrofits

Stormwater and combined sewer overflow (CSO) outfalls discharge pollutants directly to a stream and are a primary cause of water quality impairment in the Study Area. Where possible, outfalls can be retrofitted to discharge further up the bank into a wetland or biofiltration area where the pollutant loads can be detained and filtered, protecting the water quality of the stream. Within the Philadelphia portion of the Study Area, there are approximately five CSO outfalls on the east and west branches of Indian Creek within Morris Park. In the other municipalities, stormwater outfalls discharge into streams throughout the Study Area.

Stream Bank Protection

Throughout the Study Area, stream banks can be protected and enhanced through no-mow policies, which allow vegetation around the stream buffer to grow naturally. Radnor established a no-mow policy for streams within township and school district properties, which should be replicated and enforced in all areas. Golf courses in the Study Area often mow to the edge of the stream bank, which is especially a problem since they typically use high levels of pesticides and fertilizers that enter the stream untreated during rain events.

Invasive species like Japanese knotweed, Japanese honeysuckle, and mile-a-minute are very common in the Study Area, and so invasive species management needs to be implemented. An invasive species program is ongoing in Fairmount Park, which could serve as an example for other areas. An invasive species management plan usually requires a three-year commitment to ensure success.

Wetlands Creation and Restoration

Wetlands often function like natural sponges, storing water during floods and slowly releasing it over time, thereby reducing flood heights and volumes of stormwater runoff. They also serve as natural filtration systems, removing pollutants from runoff through biological uptake. Due to urban development, much of the former wetlands in the Study Area have been filled and there are very few wetlands areas left.

Previous plans for the Cobbs Creek watershed have identified three areas in the Study Area that would be suitable for wetlands creation. One location is on Cobbs Creek in the Haverford Road area between the Haverford and Ardmore Avenue stations of the Norristown High Speed Line. Other sites are on both the east and west branches of Indian Creek north of Sherwood Road in Philadelphia. This study recommends that these locations be targeted sites for wetlands creation within the Cobbs Creek watershed.

Increase Tree Canopy

Trees slow stormwater runoff, reducing peak flows by intercepting rainfall that would otherwise fall on impervious surfaces. Rainfall captured on leaves evaporates or is conveyed slowly to the ground along stems and trunks. The tree canopy should be increased through the planting of street trees, as well as the reforestation of undeveloped lands, such as cemeteries, golf courses, parks, and recreational lands.

A tree commission can be one way to run an effective urban forestry program. Some potential responsibilities of a tree commission include initiating tree plantings and maintenance work, developing tree inventories and management plans, and removing hazardous trees. Radnor, Lower Merion, Narberth, and Haverford all have Shade Tree Commissions. In Philadelphia, the Department of Parks and Recreation (formerly the Fairmount Park Commission) is the de facto Shade Tree Commission.

Maintain Open Space

Maintaining open spaces in their natural condition and protecting them from development ensures that they will not generate additional stormwater runoff, and can instead contribute to the overall environmental and civic integrity of the Study Area. Figure 4.2: Open Space shows the existing open space in the Study Area, including woodland, farmland, parks and recreational land, vacant land, and water. The largest public park in the Study Area is Morris Park in Philadelphia, part of the larger Cobbs Creek Park. There are many other smaller public parks throughout the corridor, including the Merion Botanical Park, Shortridge Park, South Ardmore Park, Ashbridge Park, and Encke Park. Preserving and maintaining continuous stretches of green space along stream corridors is especially important, and a number of "greenways" have been proposed throughout the Study Area.

Increase Public Awareness

Public education efforts are needed to inform citizens about the importance of stream corridors, wetlands, floodplains, and open space. Within and around the US 30 Study Area, there are a number of centers that offer public education on environmental issues. These centers should continue to play a leading role in engaging public officials, businesses, organizations, and individuals in efforts to protect the corridor's natural resources.

The Overbrook Environmental Education Center, located at 61st Street and Lancaster Avenue, is a nonprofit community center dedicated to promoting conservation, education, improved health, and renewable energy. There are many green technology features incorporated into the buildings and landscaping, including a green roof, porous pavers and asphalt, swales, a bioretention system, an urban garden and greenhouse, a roof cistern, rain barrels, natural vegetation, solar panels, and recycled building materials. The center was funded in part through grants from the PADEP Growing Greener Fund, the US EPA, and through private and corporate funding. The center offers interactive educational programs about water quality, native plants, animal habitats, renewable energy, and other environmental topics. In addition to the indoor and outdoor learning spaces, the center has numerous other community assets.

Other local centers offering environmental education opportunities include the Riverbend Environmental Center, the Cobbs Creek Community Environmental Education Center, the John Heinz Wildlife Refuge at Tinicum, the Schuylkill Center for Environmental Education, the Fairmount Water Works Interpretive Center, Morris Arboretum, and the Wissahickon Environmental Education Center.

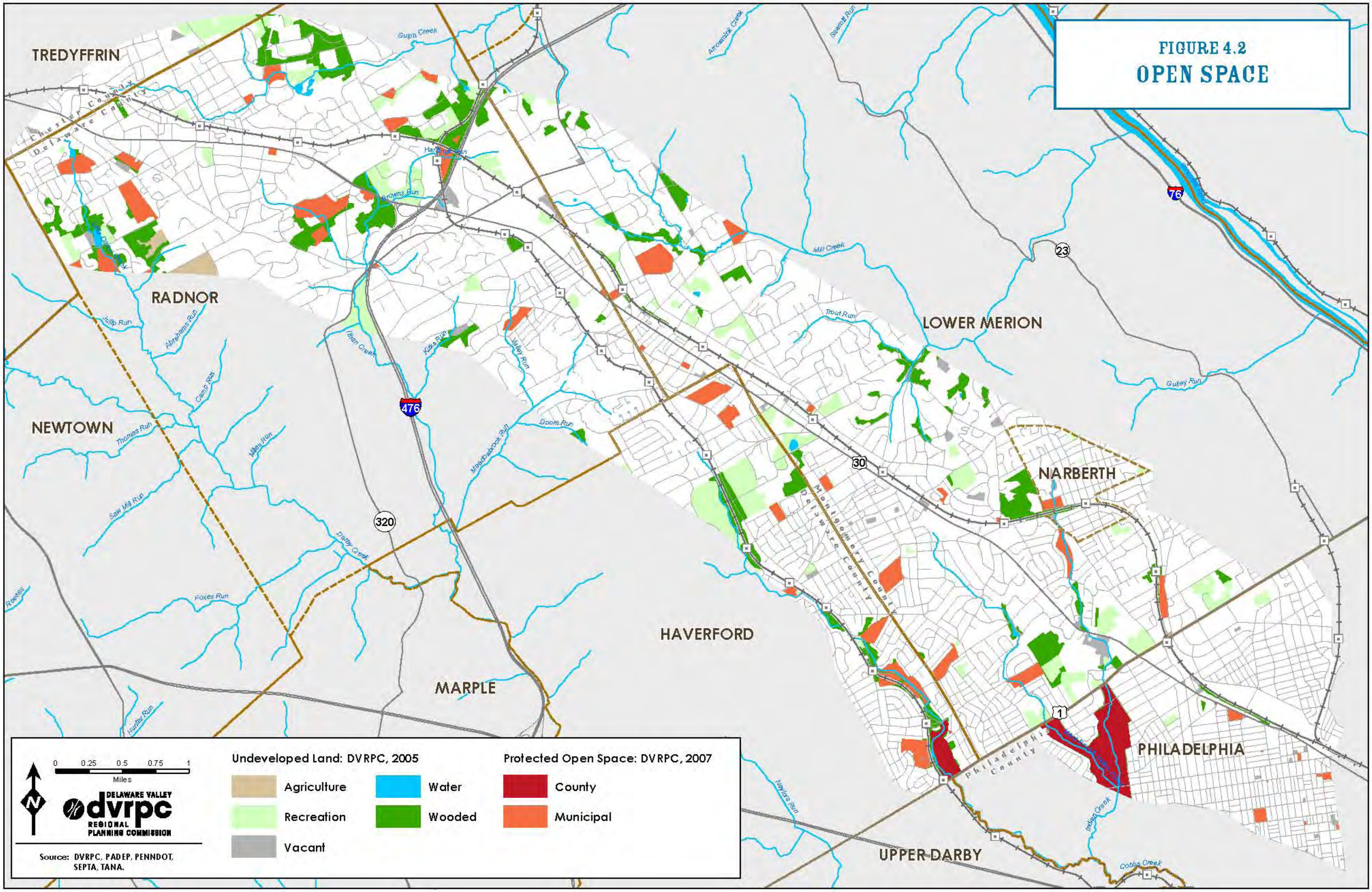


FIGURE 4.2
OPEN SPACE
TREDYFFRIN
RADNOR
NEWTOWN
LOWER MERION
NARBERTH
HAVERFORD
MARPLE
PHILADELPHIA
UPPER DARBY
Chester County
Delaware County
Montgomery County
Philadelphia County
Gulph Creek
Arrowmink Creek
Browns Run
Mill Creek
Trout Run
Ithan Creek
Kirks Run
Valley Run
Darby Creek
Foxes Run
Cobbs Creek
Indian Creek
Naylors Run
Gulley Run
476
76
30
320
23
1
0 0.25 0.5 0.75 1
Miles
DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION
Source: DVRPC, PADEP, PENNDOT, SEPTA, TANA.
Undeveloped Land: DVRPC, 2005
Agriculture
Recreation
Vacant
Water
Wooded
Protected Open Space: DVRPC, 2007
County
Municipal

SECTION 4

LAND USE

The US 30 Study Area is a substantially built-out corridor with infrastructure that is largely established. Many places along the corridor saw the majority of their population growth and development take place in the decades immediately following World War II. However, despite being an established corridor, the land use context of US 30 changes frequently, and often dramatically, as one travels through the Study Area. Lancaster Avenue passes through a diverse range of urban, suburban, and village center environments, each with its own character. Accordingly, place-specific land use concerns and strategies, presented later in this document, vary by both location and the condition of the local environment.

Despite the local nature of many issues, a number of broad corridor-wide land use concerns emerged during the course of this study:

- The corridor lacks safe and attractive pedestrian and bicycle connections.
- In some places, it is difficult to tell where one community ends and the next begins. Additionally, the distinctiveness of centers such as Ardmore, Bryn Mawr, and Wayne is threatened by strip commercial development adjacent to these areas.
- Portions of the Study Area contain pockets of vacant and underutilized land.
- The corridor and its destinations are hard to navigate, especially for visitors.
- Some downtown areas and shopping centers are in need of revitalization.
- Many land uses are segregated from one another and traveling between them by any mode is difficult.

Many of these concerns stem from the dual nature of US 30 as both an important regional highway and the main street for a number of communities. In some places along the corridor, the need to move vehicles safely and efficiently detracts from the pedestrian environment and conflicts with the creation of walkable town centers.

Other issues result from the tension between old and new along the corridor. This is particularly the case in Lower Merion, Haverford, and Radnor. The well-established character of these communities is partly responsible for their long-term success and popularity. Furthermore, many corridor residents worry that the character of their communities will suffer as growth and development pressure continues to increase. Careful planning is essential in these areas to ensure that these communities retain their vitality and character while remaining attractive for future residents and businesses.

Smart Growth Principles

US 30's somewhat incoherent development pattern partially stems from the lack of a unified vision for the corridor. While each Study Area community has drafted planning documents that contain guidance on the development of Lancaster Avenue within its own borders, development over the last few decades has largely occurred independently of any larger comprehensive plan.

Smart Growth is a planning framework that can help guide the future development of US 30 and effectively address the corridor-wide land use issues listed above. Smart Growth is the name given to development that encourages strong neighborhoods, healthy communities, and economic development. It acknowledges that growth will occur and that it can be beneficial to a community. Smart Growth supports the integration of mixed land uses into communities and recognizes that increasing density in strategic locations has the potential to complement community goals of revitalizing commercial areas, providing affordable housing, and preserving historic resources.

Smart Growth also supports the idea that development should not only support basic commercial or housing needs, but should also help create communities that are distinctive and unique. By fostering the type of physical environments that create a sense of civic pride, Smart Growth can support a more cohesive community fabric.

The following Smart Growth principles can be applied to multiple areas along the corridor and provide a foundation for the area specific recommendations presented later in this document.

Focus Growth into Mixed-Use Town Centers

Expensive new infrastructure, the disappearance of open space, and the depletion of our natural resources are often cited as negative consequences of conventional development patterns, sometimes referred to as suburban sprawl. *Connections: The Regional Plan for a Sustainable Future* suggests that we can mitigate these issues through focused redevelopment that creates compact, mixed-use, livable communities within and around our region's core cities, first-generation suburbs, and town centers. *Connections* identifies 100 centers in the DVRPC region that provide a unique sense of place, have existing infrastructure, and offer opportunities for new development and revitalization. The US 30 Corridor contains a number of these unique centers. Places such as Ardmore, Bryn Mawr, Narberth, and Wayne are already identifiable mixed-use core areas that include retail, office, institutional, and residential uses. Concentrating new growth within and around these established centers reinforces historical development patterns, promotes the creation of thriving, pedestrian-friendly communities, and capitalizes on existing infrastructure while reducing strains on natural resources.

In addition to these traditional centers, the Study Area is home to a number of potential or emerging smaller centers. The existing transit infrastructure, development patterns, and revitalization opportunities in the following areas provide a foundation for the creation of additional neighborhood centers:

- 52nd and Lancaster in West Philadelphia,
- Area surrounding the Wynnewood Station of the Paoli/Thorndale line,
- Area surrounding the Haverford Station of the Paoli/Thorndale line,
- Portions of Haverford Road near the Ardmore Junction and Wynnewood Road stations of the Norristown High Speed Line.

Recent development within the Study Area has tended to be spread along Lancaster Avenue in the form of shopping centers and commercial strips. Focusing new growth within existing and emerging centers will require infill and redevelopment. New development within these areas should carefully reinforce the existing mixed-use character of established centers and create new mixed-use patterns where they currently do not exist. Mixing land uses, preferably vertically within individual buildings, in places that are accessible by bike and foot can create vibrant and diverse communities. The diversity of uses may include apartments above retail, professional offices, civic and institutional buildings, and entertainment uses. Providing additional residential dwellings within the corridor's downtowns is essential to the long-term economic viability of local businesses and enhances the vitality and perceived safety of an area.

The existing centers of Ardmore, Bryn Mawr, and Wayne.

Transit-Oriented Development

Transit-oriented development (TOD) may be one of the best techniques for promoting compact, centers-based development along the US 30 Corridor. TOD is generally defined as moderate to high density, mixed-use development within an easy walk of a transit station, usually five minutes or a quarter mile. TODs are designed with the pedestrian in mind and seek to facilitate transit use while reducing dependence on automobiles. Though not all TODs are the same, they share many of the same characteristics. In general, TOD contains a mix of housing types; a variety of retail, service, and office uses; pedestrian and bicycle access; and densities that create a convenient, interesting, and vibrant community.

The appropriateness of TOD within a particular area depends on a variety of physical and situational characteristics. Physical factors that support TOD include compact development patterns, an existing mix of uses, and residential densities greater than typical development. The close proximity of transit stations to the corridor's established and emerging centers suggests that TOD may play an increasingly important role in the future of the Study Area. The benefits of TOD are often cited as extending beyond maximizing transit ridership. A series of TODs along rail corridors like those found in the Study Area may help produce transportation, environmental, and economic benefits.

Ensure New Development is Compatible

The potential impact of new development on the existing character of corridor communities is a common concern among Study Area residents. Ensuring that new infill development matches or complements the character and scale of its surroundings is one way of mitigating potential negative impacts of new development. When designed properly, infill development can help strengthen existing neighborhoods and the overall community.

Compatibility issues are particularly important for higher-density projects and development in historic districts or near historic sites. Appropriate building design and placement is critical to successful infill development in both of these situations. As discussed above, new higher-density development may be appropriate for some of the existing and emerging centers along the US 30 Corridor. In these cases, building and site design will play an important role in preserving community character. Many of the perceived drawbacks of increased density can be mitigated by design standards that control the visual and functional impacts of new buildings on neighboring properties. For example, architectural setbacks can be employed to soften the impact of taller buildings, and specific materials can be required or prohibited as necessary to preserve neighborhood continuity.

Specific architectural styles and characteristics are often the defining characteristic of historic areas. In these areas, it is particularly important

New TOD development in Garwood, NJ.

Kings Court in Haddonfield, NJ was designed to complement the scale and context of its surroundings.

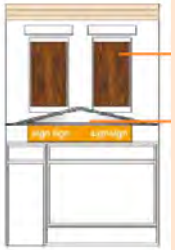
This four story building utilizes step backs to minimize its overall height.

Upper Facade & Building Cornice

Maintain original details of the building facade. As in this example, these details add to the general character and identity of your building.

Existing windows should be kept open and when possible can be used to display merchandise.

Recommended



Upper story windows should not be boarded or covered up. This will make the facade look abandoned and make the corridor unappealing.

False history, a detail that simulates a history that is not that of the original building, makes the builing look awkward and detracts from the architectural character of the facade.

Not Recommended

Design guidelines, like the City of Philadelphia's Guidelines for Commercial Facade Improvements, can help promote predictable and attractive buildings.

that new buildings respect the existing character of the community, which is often established by the consistent placement and proportion of windows and entries, floor heights, and width of individual buildings. New development can blend in with its surroundings by syncing with the established architectural rhythm of a neighborhood. For instance, in cases where new development requires a frontage larger than traditional storefronts or homes, varying façade elements and materials at regular intervals can help reinforce established building design. Other factors to consider when evaluating development in historic areas include building height, orientation, roof style, building articulation, and front yard setback.

Create Walkable Communities

Walkability is a key component of Smart Growth and permeates many of the principles discussed here. Creating walkable communities can enhance mobility, improve environmental conditions, and promote stronger communities by encouraging social interaction. In many parts of the region, it is difficult or impossible for residents to meet their daily needs without relying on an automobile. When walking to destinations is a viable alternative, access to essential services is dramatically improved particularly for portions of the population that are too old, too young, or too poor to drive.

As stated earlier, a community's pedestrian infrastructure has several components including sidewalks, crosswalks, and multiuse trails. While the corridor currently contains a series of walkable, mixed-use centers, safe and convenient pedestrian connections to and between these areas are often lacking. Therefore, enhancing the pedestrian infrastructure of the Study Area requires adding sidewalks where they do not currently exist and improving existing sidewalks that are inadequate or have fallen into disrepair. Subsequent chapters of this document contain recommended locations for new and improved sidewalks within each corridor sub-area.

Design standards can help ensure that new and retrofitted sidewalks meet the needs of pedestrians. Specific design standards might include requiring a minimum width for sidewalks, buffers to shield users from traffic, or edges to clearly mark pedestrian zones. In addition to being legally required, complying with the Americans with Disabilities Act (ADA) provides an excellent way to meet the mobility needs of all people. It can be challenging to retrofit older existing streets to accommodate people with disabilities, so an incremental approach is recommended. Pedestrian access and ADA requirements should be addressed in all new developments and infill projects and incorporated during scheduled street and sidewalk maintenance. Street crossings, for example, should be developed to help people navigate to a crossing point, easily identify the entry and exit of the crossing, and avoid barriers along the way. Making communities walkable not only means providing residents with pedestrian infrastructure, but also maintaining that infrastructure. Sidewalks and crosswalks that are not maintained may act

as a disincentive and safety risk for potential pedestrians.

In addition to extending the pedestrian network along the corridor, corridor municipalities must work to maintain and enhance the pedestrian environment of the Study Area's downtown commercial areas. In these areas, walkability encompasses more than just sidewalks. A truly pedestrian-friendly environment begins with a properly designed streetscape. How buildings relate to the street, including their placement, scale, and massing, help define the public streetscape. Street trees, landscaping, signage, pedestrian scale lighting, and street furniture all add to the pedestrian experience in these locations. Additional Smart Growth principles related to the corridor's commercial areas are included below.

Revitalize and Protect Downtown and Main Street Areas

In addition to being commercial centers, downtowns and main streets throughout the region play an important role in the civic and cultural life of communities. And while many of these areas have retained their vitality, some downtown and main street areas have suffered from the success of shopping centers and malls. As the corridor's downtown areas continue to evolve, they should continue to emphasize the traditional main street character that makes them unique. For places like Ardmore, Bryn Mawr, Narberth, and Wayne, this character is defined by a mix of

Organizing the Streetscape: Sidewalk Zones

Well-designed sidewalks are an essential part of the streetscape. In downtown areas, sidewalks must serve as active public spaces in addition to enabling accessible pedestrian travel. Elements such as landscaping, seating, lighting, and merchandise display can all help to animate a streetscape. However, these elements must be thoughtfully organized to ensure sidewalks function properly.

The **Frontage Zone** is the area adjacent to the property line. Adjoining ground floor spaces may utilize this area for outdoor displays and seating. The **Throughway Zone** is the portion of the sidewalk for pedestrian travel along the street. While accessibility guidelines require a minimum width of four feet, wider dimensions are necessary in many downtown areas. Finally, the **Furnishing Zone** acts as a buffer between the active pedestrian walking area and street traffic. Street trees, landscaping, light and utility poles, street furniture, and transit stops should be consolidated in this zone when possible to keep them from being obstacles in the throughway zone.

uses, distinct sense of place, historic preservation, and pedestrian-friendly design. Several strategies may be appropriate as these areas strive to remain competitive in the future.

Encourage New Housing

New infill housing that matches the character of the neighborhood can help support downtown businesses and improve a neighborhood's image. Municipalities can also encourage new housing by promoting the conversion of vacant or underutilized space above ground floor retail stores into housing.

Maintain and Enhance Downtown Image

The image of downtown affects not only resident and visitor perceptions but also its ability to attract and retain quality businesses. Unlike shopping centers and malls, downtown areas already possess an established sense of place that help make them destinations people want to go. Preserving and enhancing this sense of place can largely be achieved by preserving historic assets, maintaining an attractive streetscape, and promoting appropriate building design.

Historic buildings, monuments, and sites are an essential part of what makes the corridor's downtown distinctive and unique. These assets provide a sense of identity and context that cannot be matched or recreated. Historic structures should be preserved and, when appropriate, reused as part of infill development so that these important buildings can continue to serve the needs of the community.

Successful downtown streetscapes combine generous sidewalks, decorative crosswalks, ornamental streetlights, and benches with landscaping and street trees. Similarly, the design of new buildings can contribute to a downtown's image by promoting a pedestrian-friendly environment. New downtown buildings should replicate the traditional patterns of nearby structures by continuing the existing building line and incorporating a window-to-wall ratio that reflects historic buildings. Placing buildings at the edge of the sidewalk creates a consistent street wall and helps define the public streetscape. Doors that open to the sidewalk and appropriately sized windows make walking interesting while allowing retail establishments to display their wares.

Traffic Calming

Downtown areas are appealing partially because of their pedestrian orientation. Calming traffic in these areas can help make pedestrians more comfortable and street crossings safer. While some engineering traffic calming techniques are not appropriate for the corridor, the use of on-street parking, curb bump outs, and emphasizing the location of crosswalks will continue to be an important strategy for slowing traffic in downtown areas.

Identify Open Space and Greening Opportunities

Throughout the study process, the lack of central gathering places was frequently cited as one of the corridor's limitations. Small-scale parks and plazas strategically located within downtown areas of

Formerly the Media Armory, this builing now houses a grocery store and Veteran's Museum.

This historic marker along the Radnor Trail reminds users of the area's past.

the corridor have the potential to become informal centers of the community. Finding space for gathering places within these downtowns will be challenging because of the built-out nature of these areas. However, future redevelopment and infill projects may present opportunities for the addition of meaningful public spaces. Outside of the corridor's traditional downtowns, emerging centers will benefit from the inclusion of open space in any new development.

Adding green elements to downtown areas of the corridor may prove easier than creating new public spaces. Small touches, such as planters, hanging baskets, and window boxes, enhance the overall attractiveness of the streetscape. Street trees provide a powerful green unifying element for downtown areas and contribute a host of invaluable services: provide shade, filter the air, and reduce reflective heat and stormwater runoff. Many portions of the corridor's downtowns already benefit from the presence of regularly spaced street trees. Continuing this line of trees in peripheral areas is one of the most cost-effective ways of continuing the look and feel of the downtown area. In some cases, additional training for municipal works and community organization may be necessary to ensure that enhanced landscaping and street trees are properly maintained and cared for.

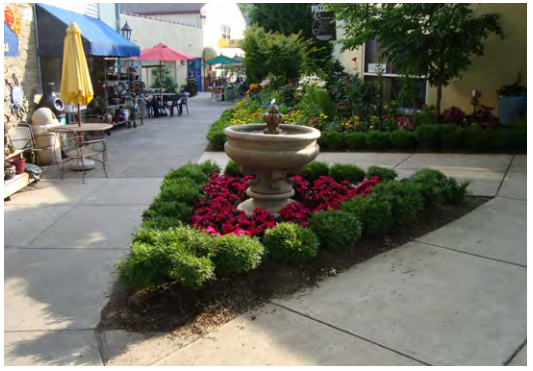
Surface Parking Lots

Downtown areas must balance the needs and comforts of pedestrians with the ability to accommodate parked cars. Surface parking lots should be designed in such a way that they do not detract from the pedestrian environment. Large expanses of parking lot tend to be unattractive and can discourage pedestrian activity. For the most part, parking areas within the core areas of Ardmore, Bryn Mawr, and Wayne are effectively sited. However, the arrangement of parking lots near the periphery of these areas is often inconsistent. Several techniques can be used to mitigate the negative impacts of surface parking lots in these areas and throughout the corridor's downtowns:

- Locate parking behind or to the side of buildings rather than placing parking spaces between the front of a building and the street. Pedestrian connections to parking lots should be well lit, signed, and inviting.
- Avoid parking lots on corner lots located on prominent roadways.
- Existing or unavoidable surface parking lots along pedestrian street frontages should be screened with a combination of decorative fences, walls, and landscaping.
- Explore opportunities for shared parking. Shared parking facilities allow adjacent or nearby property owners to share their parking lots and reduce the number of parking spaces that each would provide on their individual properties.
- Investigate the development of parking structures. Select locations within the Study Area may warrant the construction of parking structures that could potentially serve a combination of downtown businesses, new development, and transit users.

This recently constructed mini plaza acts as a gateway to Ardmore.

Hanging baskets and planters enliven this downtown area.



Small-scale greenery in Chestnut Hill.

Clearly-designated pedestrian walkways make large shopping centers more inviting.

This grocery store uses a combination of landscaping and fencing to screen its parking lot.

This mixed-use garage in Arlington, VA does a good job of blending into the neighborhood.

Retrofit Commercial Strips

As noted above, much of the corridor's recent commercial development has taken the form of shopping centers and commercial strips along Lancaster Avenue. While these commercial areas provide necessary goods and services to local residents, their automobile-oriented design contributes to congestion and detracts from the image and value of nearby neighborhoods. These commercial areas frequently have multiple driveways that may be too close together or hard to see. In some cases, parking spaces back up into the road or block driveways. Additionally, safe pedestrian connections from local transit stops and local neighborhoods are often lacking or nonexistent.

Existing strip commercial areas can be difficult to revitalize because they are already developed and often combine buildings or properties with different owners. While the economic health and appearance of shopping centers along the corridor varies dramatically, some commercial areas may benefit from the retrofitting strategies listed below. In the long term, some strip commercial areas may become candidates for larger scale redevelopment that reimagines what these areas can become.

Walkability

While most shopping centers are not designed for pedestrian access, they can be greatly improved by making it easier for pedestrians to walk within shopping centers, to adjacent roads and transit stops, and to nearby residential areas. This can be accomplished in many ways:

- Ensure that sidewalks are present along adjacent roads,
- Develop a network of internal sidewalks, crosswalks, and pedestrian walkways that provide direct access to and between building entrances, and
- Investigate the feasibility of locating bus shelters within larger retail developments.

Access Management and Circulation

Many commercial properties within the Study Area are isolated and require access directly from Lancaster Avenue, which contributes to congestion. Consolidating access points may be appropriate for smaller and medium sized shopping centers where adequate spacing between driveways is not possible. Similarly, driveways into commercial properties should be long enough to adequately store queues of vehicles waiting to exit, and sited to avoid conflicts between vehicles entering the property and vehicles pulling out of parking spaces. Shopping centers can also benefit by establishing clear vehicular circulation patterns within their parking lots. Designated customer drop-off and pick-up points as well as one-way lanes can help make shopping centers easier to navigate.

Encouraging interconnections between commercial properties can also help alleviate congestion on US 30. Currently, customers must return to Lancaster Avenue in order to travel between adjacent commercial properties because they lack

interconnected parking lots. As opportunities for these types of connections between abutting properties are identified, corridor municipalities will need to consider physical and topographic constraints.

Landscaping

Landscaping can play a large role in improving the look and function of corridor shopping centers and strip commercial areas. Landscaping features such as planting strips and islands containing trees and shrubs can help moderate temperatures, reduce glare, improve stormwater management, and enhance aesthetics. Landscaping can also be incorporated into designated pedestrian walkways to help serve as a buffer from moving vehicles. Finally, landscaping along sidewalks and streets can screen large parking areas from the roadway and contribute to a more pedestrian-friendly streetscape.

Identity and Wayfinding

The potential for creating a more unified identity for the US 30 Corridor was discussed by some residents during public outreach events for this study. Although developing an overall corridor identity strategy was beyond the scope of this study and would likely require the cooperation of adjacent municipalities, this idea may be worth exploring by corridor municipalities. Any unifying theme or treatment for the corridor would likely play on Lancaster Avenue's history. A Lincoln Highway Heritage Corridor has already been established for portions of US 30 through six counties of central and western Pennsylvania. This heritage corridor could potentially be extended to include other portions of the highway including the US 30 Study Area. Once also part of the Philadelphia and Lancaster Turnpike, a similar heritage corridor could be established to highlight the historic connection between Philadelphia and Lancaster. Participation in a heritage corridor of this type could include the placement of unifying signage as well as informational signage at key locations to highlight historical points of interest.

While developing a unified identity for the entire corridor may represent a valid long-term goal, additional steps can be taken to reinforce the corridor as a collection of distinctive communities and village centers. Traditionally, visual cues within the built and natural environment have been an important way for visitors and residents to distinguish one area from another. These cues can include a wide range of elements such as landmark buildings, distinctive landscaping, signage, and various decorative treatments. As strip commercial development has grown up in the areas between the corridor's traditional nodes, some of these cues have eroded. Restoring some of these cues can give shape and definition to neighborhoods and contribute to the unique look and feel of a community. In this way, strengthening the individual identities of the Study Area's existing and emerging centers and residential areas can enhance the experience of traveling along the corridor while maintaining the characteristics that make each Study Area community unique.

Attractive signage directs shoppers to nearby parking.

Gateway design in Radnor's Unkefer Park.

Playful wayfinding signs direct visitors to local attractions in Providence, RI.

Gateways, landmarks, and wayfinding signage can all be used to build and reinforce community identity. Radnor Township's Gateway Enhancement Strategy was established in 1988 to promote neighborhood identity in the wake of the construction of the Blue Route. The strategy combines landscaping treatments and public art that incorporate various facets of the township's origin and development at a variety of locations. These historical themes are woven into the design of Unkefer Park on Airdale Road near the eastern edge of the Radnor Township. The park, which incorporates monolithic rock designs and establishes the use of stone plinths as mile markers, serves as a gateway to Radnor and communicates to travelers that they are entering a new environment. By utilizing materials and themes appropriate to the local context, other communities along the US 30 Corridor can develop gateways and landmarks that enhance neighborhood identity.

Signage can be used to both establish identity and convey information to visitors. For example, Lower Merion Township's Business District Signage Program establishes a hierarchy of signs to help residents and visitors navigate the area. The signage program includes township gateway signs and business district gateway signs and street banners for several of the township's commercial areas. Additionally, the program includes wayfinding signage throughout Lower Merion Township's business districts to direct the public to focal points such as train stations, public parking lots, and local government offices as well as identification signs for these locations to help visitors know when they have reached their destination. While each community along US 30 may not need such an extensive signage system, the goals and structure of Lower Merion Township's program create a sound model for municipalities along the corridor and around the region.

Finally, education and special events can help build awareness of the corridor's unique history, assets, and communities. Thematic walking tours of historic areas can be an effective way to promote community identity and civic pride. For example, each spring, the Overbrook Farms Club sponsors a self-guided walking tour that allows participants to explore the architecture and history of the neighborhood by visiting historic churches and private homes. Other special events can highlight the corridor's creative and cultural offerings. Main Line First Friday is an arts event that takes place on the first Friday of every month in Ardmore, Haverford, and Bryn Mawr. Begun in 2006, the event has helped to revitalize these communities by creating opportunities to experience art in everyday life.

Realizing Smart Growth

It is critical to realize that the goals of Smart Growth will not be achieved by implementing one single policy or strategy in isolation. Using the Smart Growth principles described here in combination with each other is a vital aspect of building and maintaining healthy and vibrant communities. Furthermore, many excellent examples of these principles in action can already be found in communities within the Study Area. For instance, in 2008, Haverford Township created a Comprehensive Plan Addendum containing a broad set of design guidelines intended to enhance the corridor's sense of place and revitalize Haverford Road. In Philadelphia, large portions of the pedestrian infrastructure between 56th and 62nd streets have been recently upgraded to make walking easier and safer. Lower Merion Township's Mixed-Use Special Transportation Overlay District (MUST) was approved in 2006. The MUST is an overlay district that seeks to encourage transit-supportive mixed-use development within 1,500 feet of the Ardmore station of the Paoli/Thorndale line. Similarly, Radnor Township has approved the Wayne Business Overlay District (WBOD) to preserve and enhance the character of downtown Wayne. Among other things, the WBOD includes provisions designed to regulate the appearance and the district's signs, outdoor dining facilities, buildings, and streetscapes.

Site-specific Smart Growth recommendations are provided for each corridor sub-area later in this document.

SECTION 4

ENHANCING PEDESTRIAN MOBILITY

The corridor's sidewalks, crosswalks, and trails that make up the pedestrian facilities vary widely in condition and quality throughout the Study Area. The study team offers the following discussion and recommendations, with focus on the areas of the corridor outside of the more pedestrian-friendly centers of Overbrook Farms, Ardmore, Bryn Mawr, and Wayne.

Along the majority of the corridor, the existing roadway consists of a 40-foot roadway width comprised of four 10-foot lanes without shoulders and narrow four-foot sidewalks. A five-foot minimum sidewalk width with a five-foot to ten-foot buffer area is ideal to protect pedestrians from traffic. In order to be ADA compliant, utility poles and signs must be placed such that a minimum of 36-inches of clear sidewalk width is preserved for pedestrians. Additionally, pedestrian warning signs should be upgraded to fluorescent yellow-green background throughout the corridor (yellow and fluorescent yellow-green signs should not be mixed; therefore all pedestrian warning signage should be upgraded in a comprehensive manner).

Sidewalks and Buffer Areas

Many of the sub-areas along the corridor lack sufficient sidewalk and buffer areas to protect pedestrians from traffic, especially in the more auto-dominant context areas, including the suburban neighborhoods and suburban centers. As illustrated in the previous section, an ideal sidewalk would be five to six feet wide with a five- to ten-foot buffer separating the sidewalk and the adjacent travel lane. At a minimum, the sidewalk should be level, clear of debris and overgrowth, and provide a clear path that is free of impediments, including newspaper boxes, utility poles, and signage.

Specific location recommendations for new sidewalks, as well as sidewalk improvements, are highlighted in the sub-areas section of the report.

Signalized Intersections

In order for the many signalized intersections along the corridor to be more pedestrian friendly, the following amenities should be installed at all signalized intersections:

- Countdown pedestrian signals;
- ADA-compliant curb ramps;
- High-visibility crosswalks;
- Upgraded pedestrian timing to new Manual of Uniform Traffic Control Devices (MUTCD) requirements for walking speed; and
- Consideration of the prohibition of right turns on red to reduce vehicle/pedestrian conflicts.

Crosswalks

There are two schools of thought regarding whether unsignalized and midblock crosswalks should be marked. There are several conflicting studies in existence; some studies of unmarked crosswalks have concluded that they may be safer, potentially because marked crosswalks may give pedestrians a false sense of security. A Federal Highway study states that "in most cases, marked crosswalks are best used in combination with other treatments."[1] With this in mind, the study team offers recommendations for enhancing pedestrian crossings based on typical site conditions for crossings at controlled intersections (signalized), uncontrolled intersections (unsignalized), and midblock locations.

Controlled Intersections (Signalized)

The intersections of Lancaster Avenue with major side-street approaches are typically signalized. These intersections should be improved as discussed above. High-visibility crosswalks can be achieved either through paint or pavement color/texture techniques. More specifically, painted crosswalks should be either continental or bar pair style, which were found to be the most visible in a study conducted by the Texas Transportation Institute.[2] Additionally, colored and textured pavement treatments may be appropriate for marking crosswalks in centers.

Uncontrolled Intersections

The locations where minor side-streets intersect Lancaster Avenue form the majority of the intersections along the corridor. These many uncontrolled intersections are typically two-way stop controlled intersections, which usually have

[1] Federal Highway Administration. *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations: Final Report and Recommended Guidelines*. September 2005.

[2] Federal Highway Administration. *Tech Brief: Crosswalk Marking Field Visibility Study*. October 2010.

Bar pair crosswalk.
Photo: Texas Transportation Institute

Continental Crosswalk.
Photo: Texas Transportation Institute

W11-2

W16-7P

crosswalks that are not marked. The study team recommends that areas with higher-density land uses, and therefore more pedestrians, should have marked crosswalks at these uncontrolled intersections. These areas include Overbrook Farms and the villages of Ardmore, Bryn Mawr, and Wayne. However, in areas outside of the central business districts of these centers where there is currently less pedestrian activity, the crossings should remain unmarked. Of course additional locations along US 30 and Haverford Road should be reevaluated in the future as the land uses adjacent to the roadway change and the number of pedestrians increase.

Marked crosswalks at uncontrolled intersections along the corridor should include the following traffic-control devices:

- ADA-compliant curb ramps;
- High-visibility crosswalk markings; and
- Pedestrian warning signs (W11-2) with arrow plaques (W16-7P).

Midblock Crossings

There are currently several midblock crosswalks within the corridor, two of which, have additional traffic-control devices to call drivers' attention to their location. These are located in Ardmore and Bryn Mawr. Specific recommendations for these two locations are addressed in the sub-areas section of the report. The following recommendations are made for improvement of the remaining midblock crossings, as applicable.

Existing Marked Midblock Crossings

If the municipalities desire to continue marking the remaining midblock crosswalks, it is recommended that additional traffic-control devices be installed in accordance with the MUTCD, including:

- Yield lines at least 20 feet in advance of the midblock crosswalk;
- Parking prohibition in the area between the crosswalk and the yield lines; and
- Installation of "Yield Here To Pedestrians" (R1-5) signs at yield line locations.

A public outreach campaign should accompany these physical modifications in order to alert the public that they should yield at the yield line (in advance of the crosswalk) so that both lanes of approaching traffic are able to see crossing pedestrians. As the MUTCD states, "when drivers yield or stop too close to crosswalks that cross uncontrolled multi-lane approaches, they place pedestrians at risk by blocking other drivers' views of pedestrians and by blocking pedestrians' views of vehicles approaching in the other lanes." This could be accomplished by including the information on the township's website, electronic newsletter, and in the local newspaper.

New Marked Midblock Crossings

If the corridor municipalities are interested in providing additional marked crosswalks at uncontrolled locations, the study team offers the following recommendation and reference to a traffic engineering study required by PennDOT:

- Conduct an inventory of crosswalk locations at midblock and unsignalized intersections along Lancaster Avenue to ensure good spacing and distribution to encourage pedestrian activity and make crosswalks become expected to drivers rather than anomalies.
- Pedestrian warning signs should be used to alert road users in advance of locations where unexpected entries might occur. These installations should include the following:
  - An advance pedestrian crossing sign (W11-2);
  - A supplemental plaque "Ahead" or "xx Feet" (W16-9P or W16-2P);
  - Crosswalk markings; and
  - Warning beacons to provide enhanced sign conspicuity.
- Any new uncontrolled crossings on state highways must meet the PennDOT requirements and include a traffic engineering study of the location.

Pedestrian Refuge Areas and Raised Medians

If the municipalities do not wish to continue marking midblock crosswalks or if PennDOT requirements for new marked midblock crossings are not met, it is recommended that pedestrian refuge areas or raised medians be considered at the crossing location. These crossings should also include pedestrian crossing warning signage and supplemental plaques to alert drivers in advance of the crossing locations. These improvements will allow pedestrians to more safely cross the roadway by allowing the crossing to be made in two stages.

Pedestrian refuge areas and raised medians can improve pedestrian safety by providing a safe location for pedestrians to wait before crossing multilane roadways. Medians without formal pedestrian refuge areas can also serve as safer crossing locations at transit stops, especially those located midblock along busy arterial roadways. In addition to the pedestrian benefits of raised medians, some of the following benefits can also be expected along the roadway:[3]

- Decreased delays for motorists;
- Increased capacity of roadways; and
- Reduced vehicular speeds.

Angled pedestrian refuge area. Photo: Bruce Landis

W11-2

W16-9P

[3] Federal Highway Administration. *Safety Benefits of Raised Medians and Pedestrian Refuge Areas*. 2010.

COMPLETE STREETS

Complete streets accommodate all users, including motorized vehicles, pedestrians, and cyclists, and help to create walkable and bikable communities. Many areas in the corridor lack the necessary pedestrian and bicycle infrastructure to make walking and bicycling viable transportation options. Complete streets, along with improved utilization of the available transit options, will lessen auto dependence and lead to a more balanced transportation system. Some recommendations that are applicable to the entire corridor include:

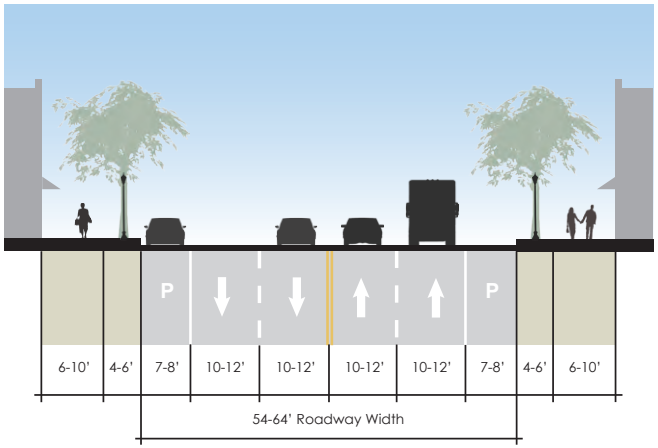
- Incorporate traffic calming and green streets elements into future roadway improvements to promote pedestrian safety and mobility.
- Provide ADA-compliant sidewalks and curb ramps throughout the corridor.
- Install high-visibility crosswalks and pedestrian signals at signalized intersections along the corridor.
- Install "SHARE THE ROAD" signage and route identification signage along bicycle routes.
- Install bicycle racks in recreational and commercial areas, as well as rail stations.
- Maintain existing on-street bicycle facilities through street sweeping and pavement marking upgrades.
- Install streetscape elements, including pedestrian-scale lighting and street furniture, where appropriate.
- Redesign key roadway segments to enhance vehicular and pedestrian circulation in both neighborhoods and centers.

Community Arterial Sections

Examples of how the roadway segments could be redesigned are illustrated below, based on the land use context of the area for a community arterial such as US 30. The first illustrates an idealized section of a community arterial within a center, while the second illustrates an idealized section for a neighborhood or suburban center.

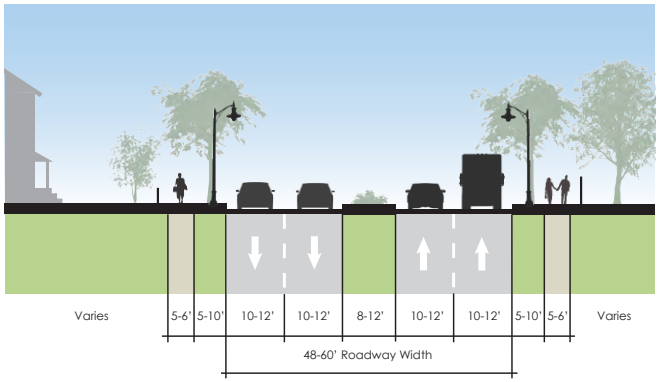
Center/Town Neighborhood/ Town Center

On-street parking and wide sidewalks, complete with street furniture, trees, and pedestrian-scale lighting, create an inviting pedestrian environment. At major intersections, on-street parking can be eliminated to make room for left-turn lanes.



Suburban Neighborhood/ Suburban Corridor

A buffer between pedestrians and vehicles makes walking more comfortable and provides space for trees, signs, and utilities. A planted median enhances the look of a roadway, may reduce speeds, and can become a left-turn lane at major intersections.



Source: DVRPC

BICYCLE RECOMMENDATIONS

In addition to the 86 miles of bicycle routes and trails existing or proposed in the Study Area, an additional 35 miles are recommended to be incorporated into the existing network which would improve connectivity and safety. If all are implemented, there would be approximately 121 miles of bicycle routes and trails in the Study Area. A map of the existing and proposed bicycle network can be found in Appendix A of the Technical Appendix (Publication 11003C).

This analysis seeks to identify existing and proposed bicycle facilities and identify ways in which these facilities can be improved to promote connectivity, safety, and convenience. The primary aim is to improve the desirability of bicycle routes by minimizing conflicts between motorized traffic and bicycle traffic.

This analysis incorporates the goals and objectives of several recent studies in the area. These include:

- The *Delaware County Bicycle Plan* (2009) provides a base on which improvements to the safety and effectiveness of the bicycle as a mode of transportation in Delaware County can be built.
- The *Montgomery County Comprehensive Plan* (2005) outlines a basic strategy for encouraging and accommodating bicycle transportation through a comprehensive network that is safe and provides access to major destinations.
- The *Feasibility Study for the Lower Merion Township-Wide Pedestrian and Bicycle Network* (2004) outlines a conceptual pedestrian and bicycle network and a greenway trail plan for that township.

Corridor-Wide Bicycle Network Improvements

Based in part on guidelines outlined by the Pedestrian and Bicycle Information Center, several factors may improve the accessibility of roads for bicyclists and increase overall bicycle safety and compatibility conditions within the corridor:

- Streets with wider shoulders should be restriped to create bicycle lanes (at least four feet wide in each direction). Where appropriate, right-of-way for a bicycle lane can also be carved from the buffer between the sidewalk and the curb. Additionally, the shoulder could be used to narrow the travel lane for motorists and provide a dedicated area for bicyclists.
- In some cases, general purpose travel lanes can be narrowed to 11 feet or 10 feet on lightly traveled roads to accommodate the added bicycle lanes. The narrowed lanes will reduce vehicle speeds, which can increase safety and raise awareness for bicycle riders' presence. On certain segments, a reduction in lane width and buffer width could provide the required space for a bicycle lane.
- Secure and convenient bicycle parking facilities can be built to better accommodate those who use bicycles for commuting or shopping purposes. Bicycle racks are free-standing structures that provide a secure location for bicycles. A single bike rack can generally provide storage for several bicycles. The inverted "U" style rack is more secure and preferred over the old-fashioned style "dish rack." Areas with bike racks should be well lit and in full view from the surrounding area.
- Enact zoning that permits mixed-use neighborhood centers that are within biking distance of residential areas. Commercial and office development should be permitted to exist closer to residential areas. They should be designed to accommodate bicycling and walking to and within the site.
- Lessen the dependency on motor vehicles by creating linkages between neighborhoods and public services via bicycle lanes.
- Provide safe conditions for bicycling through education to motorists and bicyclists.
- Adopt and implement the appropriate recommendations for action in municipal and county bicycle plans.
- Arterials serving major trip generators, such as rail stations, schools, and recreational facilities, should have bicycle-friendly elements such as signage and striping, where feasible.
- Bike routes should have "Share the Road" signs to alert motorists of the presence of bicycle traffic.

In an effort to provide a denser, interconnected bicycle network, existing plans and studies were analyzed and where appropriate, logical connections recommended. The guiding principles are identifying and connecting missing links to the network; linking major origin and destination points; and providing safer alternatives along routes with less vehicular traffic that have the capacity for a bicycle lane, or have scenic merits.

The proposed routes would provide access to potential bicycling destinations, including: employment destinations (offices, industrial parks), intermodal destinations (transit hubs), shopping destinations (retail centers), recreation destinations (parks), and academic destinations (educational institutions). This network may take the form of a shared travel lane, a wide curb lane, a shoulder or a bike lane depending on the traffic volume and available right-of-way. By providing better accommodations for an alternative mode of transportation, there will be less motorized traffic along US 30.

From Ardmore to Bryn Mawr

The character of the corridor east of Ardmore Avenue is generally dense and pedestrian friendly with safe bike routes that run parallel to Lancaster Avenue between Ardmore Avenue and 52nd Street. West of Ardmore Avenue, conditions change. Between the villages of Ardmore and Bryn Mawr, there are no local streets north of Lancaster Avenue (within Lower Merion Township) that can be linked to form a safe parallel route. The best connection therefore must parallel Lancaster Avenue on its south side (through Haverford Township).

From Ardmore heading west, the safest and most direct route would traverse the campus of Haverford College. This would bring cyclists from Ardmore Avenue west to Railroad Avenue. Railroad Avenue, a quiet neighborhood street, is an ideal access road to the "5-Points" intersection. At 5-Points, cyclists could head north or south on the Bryn Mawr Avenue bike route, or cross to Glenbrook Avenue to continue west. Cyclists can use the pedestrian phase at the 5-Points signals for a safe crossing. Glenbrook Avenue would take cyclists past the Bryn Mawr NHSL station to the signal at the intersection of Glenbrook Avenue, Conestoga Road, County Line Road, and Thomas Avenue.

From Bryn Mawr to Villanova University North of US 30

This section of the corridor is more developed in the eastern half than in the west with compact mixed use development. This mixture of land uses provides this area with many opportunities and destinations for bike riders. Additional connections to the proposed network are as follows:

Heading toward Rosemont, the route would take cyclists to the signal at Thomas Avenue. The combination of Thomas Avenue, Reese Avenue, and Roberts Road would take cyclists to the signal at Roberts Road, Water Street, and Lancaster Avenue. Here, the route would safely cross Lancaster Avenue to Water Street. Water Street leads to the Rosemont Square Shopping Center. Cyclists could use the back of Rosemont Square's parking lot to access Montrose Avenue. At the end of Montrose Avenue, cyclists would cross Airdale Road onto Orchard Way. At the intersection of Orchard Way and County Line Road (which features all-way stop signs), cyclists would turn on to County Line Road heading west. From County Line Road, cyclists would turn left on to Ithan Avenue south to access the main entrance to Villanova University.

From Bryn Mawr to Villanova University South of US 30

This section very much mirrors the northern half in land use and layout. Located in this area is Garrett Hill, a residential community where many Villanova students reside. By targeting roads that would orient connections by bike to local roads, the following modifications were arrived at:

Traveling along Glenbrook Avenue west toward Garrett Hill, cyclists can exit Glenbrook Avenue onto Conestoga Road at the signal. Conestoga Road is a direct conduit to the heart of Garrett Hill Village. While designated on the Delaware County Bike Network Map, Conestoga Road represents a design challenge. It is the only direct route from Bryn Mawr to Garrett Hill. However, it carries a high volume of traffic and has no shoulder. Otherwise, "sharrows" could be used to remind drivers of the presence of a bike route on the narrow roadway. Cyclists would exit Conestoga onto Meredith Avenue, Lowrys Lane, Hickory Lane, Brooklea Road, Meadowbrook Road, and then onto Ithan Avenue to access Villanova University. The connection from Meridith to Lowrys is also an alternate route to the university.

From Villanova University to Wayne Business District

This section of the corridor is suburban in nature. The housing stock is primarily single family detached with a few apartment complexes. Retail commercial is primarily concentrated along US 30. The major destinations are Villanova University and the Wayne business district.

Heading westward from Villanova University, Ithan Avenue to Aldwyn Lane is the best route for cyclists. Aldwyn Lane intersects Lancaster Avenue at a traffic signal. Here, cyclists can enter Lancaster Avenue westbound. In using Lancaster Avenue, cyclists will pass under the NHSL tracks and the Blue Route. The sidewalk at the NHSL underpass is narrow due to the presence of the railroad trestle. Cyclists can remain on Lancaster Avenue to access the Radnor Trail near the Radnor Chester Road and the southern portion of Wayne's business district via Iven Avenue. Alternatively, cyclists may turn onto King of Prussia Road. Installing bike lanes or a mixed-use trail along King of Prussia Road would accommodate cyclists destined to Radnor High School, the corporate center, and the Radnor Paoli/Thorndale and NHSL stations. At the traffic signal at Matsonford Road, cyclists can turn onto Matsonford Road to head toward the Schuylkill River Trails, or head onto Glenmary Road for access to the northern portion of Wayne's Business District.

Improving the Bicycle Network within Wayne

The village of Wayne has a rich history, offering an authentic sense of community, a pedestrian friendly downtown, and easy access to Philadelphia and major metropolitan areas.

The Delaware County Bike Plan has many routes toward the south of Wayne. However, it has minimal connections within Wayne and its surrounding neighborhoods. The environment in this vicinity is very bike friendly, so there are many opportunities to develop routes. At its western end, the Radnor Trail meets Sugartown Road and Old Eagle School Road. Both of these roadways are included as bike routes in the Chester County Bike Plan. Sugartown Road and connecting Chester County routes will carry cyclists to destinations west of Wayne. Old Eagle School Road and connecting routes will carry cyclists to destinations north of Wayne, including Valley Forge National Park and the planned Chester Valley Trail. The goals of the routes selected are as follows:

- A bike route should connect to every entrance of the Radnor Trail.
- Strafford, Wayne, and St. Davids Regional Rail stations should each be served by the bike network.
- In order to promote connectivity between the north and south sides of Wayne, each street that crosses both Lancaster Avenue and the regional rail tracks is a potential bike route (with the exception of Eagle Road/Conestoga Road, due to its high volume and the narrow right-of-way at Lancaster Avenue).
- A bike route that closely parallels Lancaster Avenue should be created on its north side.
- An off-road "loop" route is proposed to connect the campuses of Eastern University, Cabrini University, Valley Forge Military Academy, and St. Davids Golf Club to the rest of Wayne's bike network.

Extending the Cynwyd Trail to the South

The Cynwyd Trail, via its connections with trails along the Schuylkill River, will have excellent connectivity with Manayunk along with Conshohocken and points beyond to the north. While there are no plans that address the potential connections to the south, such connections would provide access to a greater network.

Connect the Cynwyd Trail to 52nd Street in Philadelphia using existing and proposed bike routes. The Cynwyd Trail Master Plan calls for the Cynwyd Trail to end where the active section of the Cynwyd Line begins at Montgomery Avenue in Bala Cynwyd. From this point south to 52nd Street, the Cynwyd Line right-of-way contains room for a trail on one side of the tracks. The Cynwyd Line used to be double-tracked for its length. The second track has since been removed. A separation fence between the tracks and trail is all that is needed to create a unique "rail and trail" right-of-way. This trail could make connections with the street grid at the following locations:

- Cynwyd Station
- Bala Station
- Woodbine Avenue
- Wynnefield Avenue Station

- Parkside Avenue
- Jefferson Street

The extended Cynwyd Trail would provide direct connectivity between the following destinations:

- Main Street commercial district
- Bala Cynwyd's Bala Avenue commercial district
- Saint Joseph's University
- The Mann Music Center (and greater Fairmount Park)
- Parkside's 52nd Street commercial district

The proposed on-street bike network would connect the trail to Center City, University City, and other neighborhoods in Northwest Philadelphia, Lower Merion, and West Philadelphia. Many Saint Joseph's University students live in Manayunk and currently drive to school. Given safe and comfortable bike access, some college students would be able to commute via bicycle rather than via automobile. An extended Cynwyd Trail and connecting on-street bike routes leading to Saint Joseph's would provide a quick and comfortable cycling opportunity between home and school as well as intermediate stops at restaurants and shops in the Bala Avenue shopping district.

Expanding the Network in Haverford Township

The area within Haverford Township, east of Ardmore Avenue, is laid out in a grid-pattern. Within each neighborhood, cyclists can choose from several routes along quiet streets between popular destinations. This bike-friendly fabric is interrupted by the township's busy arterial roadways. Where feasible, it is recommended that the bike network in Haverford Township approach these arterials at signalized intersections.

Routes recommended for Haverford Township in the Delaware County Bike Plan are incorporated. However, there are several routes that, because of their high volumes, high speeds, and inadequate shoulders, are not ideal for cyclists. These routes include:

- US 1
- College Avenue between Coopertown Road and Haverford Road
- Ardmore Avenue/Ellis Road between Golf House Road and Lawrence Road
- Haverford Road between County Line Road and Karakung Drive
- Wynnewood Road/Eagle Road between County Line Road and West Chester Pike

In its "Comprehensive Plan Addendum," Haverford Township plans on transforming two existing strip commercial areas into walkable pedestrian shopping corridors: Haverford Road between Eagle Road and Hathaway Lane, and Eagle Road between Darby Road and Lawrence Road. In the process of achieving these goals, the two roadways themselves must be dramatically changed to allow a more comfortable experience for bikers and pedestrians. Currently, it is not safe to bike on these roadways, as there is no shoulder. This bike plan, looking toward the near future, has intentionally avoided utilizing these roadways.

The bike network in Haverford Township should approach busy arterials at signalized intersections and incorporate bicycle-friendly improvements into the Haverford Road and Eagle Road corridors.

The Trolley Bikeway

Until 1966, Haverford Township was home to the Ardmore trolley line of the Philadelphia Suburban Transportation Company, which operated on tracks in the median of Darby Road and Hathaway Lane, and along a private right-of-way between Haverford Road and County Line Road. Between West Chester Pike and Eagle Road, Darby Road functions as Havertown's "Main Street." It passes the township's government offices, high school, middle school, central library, and plenty of shops and restaurants. Between Eagle Road and Haverford Road, Hathaway Lane's median is occupied by a SEPTA busway. It is possible to have buses and bikes share this space.

- Create a bicycle trail along the length of the former trolley line.
- Install a bikeway along the wide grass Darby Road median. The bikeway would give local residents direct access to all of these community amenities via a bike ride beneath the shade of the median's trees.
- Allow bicycles and buses (with a physical separation between the two modes) to share Hathaway Lane between Eagle Road and Haverford Road, connecting the two commercial areas.

- North of Haverford Road, the busway continues but Hathaway Lane ends. Between Haverford Road and Belmont Avenue, the busway appears wide enough to accommodate both buses and cyclists (but if this is not possible, Lorraine Avenue can be used as a substitute bike route).
- North of Belmont Avenue, the busway narrows considerably. If cyclists cannot be accommodated beyond this point, we recommend that the bike route be split into two segments:

Morris Road would carry cyclists to the signal at Morris and Ardmore Avenue, where cyclists could safely cross Ardmore Avenue to access the cross-Haverford College route, and; Humphreys Road (to Linwood Avenue) would carry cyclists to the bike routes along Spring Avenue and Argyle Road.

The Penfield Station Area

The Delaware County Bike Plan recommends connecting to Lower Merion's bike network via Manoa Road under the NHSL. In that plan, the bike route then turns off of Manoa Road and onto Lawson Avenue to eventually access the schools, churches, and businesses on Brookline Boulevard. This concept faces one major problem: cars tend to speed on either side of the underpass under the NHSL at the location where Lawson Avenue meets Manoa Road.

- Connect the Delaware County and Lower Merion Township bicycle networks via Manoa Road.
- Explore traffic calming techniques and/or stop sign warrants at the intersection of Manoa Road and Lawson Avenue. Unless some traffic safety feature is installed, it would be very dangerous to cross Manoa Road at this location to access its northbound bike lane from Lawson.
- Having cyclists use Manoa Road all the way to Earlington Road (instead of Lawson Avenue) would solve this problem, although it creates a less pleasant bike route as Lawson Avenue carries a much lower volume of traffic than Manoa Road.

Toward 69th Street

The Delaware County Bike Plan recommends the installation of bike lanes along the length of West Chester Pike (PA 3) throughout the county. It is unclear whether this can be completed in Upper Darby Township, where at points, PA 3 may not have the needed right-of-way. However, it is clear that cyclists in Haverford Township should be able to access points located east along PA 3 (like 69th Street Terminal and Center City).

In the northeast corner of Haverford Township, Valley Road (which becomes Park Road and then Brighton Avenue) serves as an excellent gateway for cyclists heading east. It crosses both US 1 and PA 3 at traffic signals, leading cyclists to quieter streets south of PA 3, on which they can safely head eastward.

Cyclists using Earlington Road heading southbound can connect to Devon Road. They will then cross a park on an existing pathway to Landillo Road, which leads to Valley Road. This will enable them to avoid Lynn Boulevard, which has been deemed dangerous for cyclists. Cyclists on Darby Road heading southbound can head off of Darby Road at the signal with Llandillo Road. Llandillo Road will lead them to Valley Road. Although the bike lanes along Darby Road may continue past Llandillo Road, this will help eastbound cyclists avoid the hazardous area near the intersection of Darby Road, US 1, and PA 3.

Mill Road Corridor

Between Eagle Road and Manoa Road, the only crossing of the NHSL is via Mill Road's underpass. A bike route should run through the underpass to create an additional option for cyclists heading to and from Lower Merion along this route. This area also leads to the Haverford High School and popular Manoa Shopping Center.

- Create an additional bicycle connection under the NHSL at Mill Road.
- In Lower Merion, a traffic signal exists at the intersection of Beechwood Road, Argyle Road, and Haverford Road. The Argyle Road bike route should be extended across the signal to Beechwood Road. The bike route would run along quiet streets to an all-way stop sign at Karakung Drive and Lakeside Avenue. Here, bikers would shift to Mill Road via a short segment on Karakung Drive.
- The segment of Mill Road between Karakung Drive and Earlington Road is busy and narrow, so "sharrows" should be installed to remind drivers of the presence of cyclists. After Earlington Road, bike lanes will lead cyclists down Mill Road, past Haverford High School. Crossing Darby Road to Yale Road, cyclists will follow quiet neighborhood streets to Princeton Road. An existing pathway will

take cyclists from the stub-end of Princeton Road to the beginning of Lincoln Avenue, another low-volume street. Cyclists can continue on Lincoln Avenue to the signal at the intersection of Lincoln and Eagle Road. They can safely cross Eagle Road here to access the Manoa Shopping Center.

Access to Haverford Reserve

The following recommendations will allow cyclists to access the Haverford Reserve and the Blue Route Bikeway.

From Lincoln Avenue, cyclists can turn on Virginia Avenue, which will lead them to a signalized intersection at Eagle Road to Lawrence Road. Bike lanes on Lawrence Road lead to Darby Creek Road, which can be used to access the Blue Route Bikeway and the park located at the new Haverford Reserve. Cyclists can also cross West Chester Pike using Lawrence Road for access to Marple Township.

Another option to access Haverford Reserve and the Blue Route Bikeway is a bike route that connects the reserve to the route along Railroad Avenue via the following residential roadways: Williams Road, Meadows Lane, and Buck Lane. This route will also link the Coopertown neighborhood into the general bike network.

PUBLIC TRANSIT

Intermodal Connections

Coordination of bus and rail schedules should be employed where possible to enable a seamless transfer from one mode to the next. These complementary modes should operate on headways in consistent increments in order to make arrivals and departures more predictable for users. Even on lightly traveled routes with long headways, it is better to have a schedule that is in one-hour or half-hour increments that gives some consistency to the customer. This approach is very important in retaining and attracting new riders, as well as connecting individuals to large employment centers. Bearing in mind that the Paoli/Thorndale Regional Rail Line conveys many more passengers than the local bus routes, the bus schedule should, where possible, be coordinated with the rail schedule.

Many train stations in close proximity to a bus route are absent from the bus schedule. Even if the coordination between the two modes is incidental, the connection should be identified, particularly for stations in which parking is at capacity. To assist in publicizing the coordination to transit riders, measures such as adding regional rail stations to all bus route schedules to assist riders with intermodal coordination will help. In addition, highly visible wayfinding signs pointing to nearby bus stops at regional rail stations should be installed.

Bus, High Speed Rail, and Trolley Service

SEPTA should evaluate the feasibility of the following improvements to existing bus services. Some recommendations suggest route and service adjustments. In these cases, the recommended service adjustments should be evaluated as part of SEPTA's Annual Service Plan (ASP) process.

- Add Sunday service on Routes 1, 103, and 106. These three routes within the corridor have no Sunday service. Because people still need to travel during these off-peak times, SEPTA should seriously consider expanding service hours where they are lacking. Along those lines, Saturday service hours should be extended until 11 PM on Routes 44 and 1. There should also be weekday service during the 7 PM to 11 PM gap on Bus Route 1. These improvements can be initiated on a trial basis before made permanent.
- Coordination among PennDOT, SEPTA, and Haverford Township to consider adding signalization and in-pavement detection on the SEPTA busway to allow buses to more easily cross Haverford Road at the Ardmore Junction Station.
- Adjusting bus routes 103 and 106 (as well as short-run trips on Route 105) would avoid the difficult turning movements on Woodside Road. SEPTA should continue working with Lower Merion Township in identifying an alternative terminus at the Ardmore Transit Center that would eliminate the need for these turns.
- Private employers should work with Transportation Management Associations (TMAs) where new shuttle services are desired. Because the western parts of the Study Area have lower densities, increased transit service there should be pursued through

connecting shuttle service. TMAs should evaluate shuttles as a way of extending the reach of the SEPTA system in a cost-effective way without overlapping existing services.

- Where feasible, transit service should be provided to areas with high concentrations of elderly riders.

Bus, High Speed Rail, and Trolley Stops

Amenities for passenger comfort at area bus stops should be improved with benches, shelters, trash receptacles, and newspaper stands. While the new generation of SEPTA bus stop signs will show both the route numbers and the terminal point of the route, additional information and amenities are needed at most bus stops. They are listed below:

- All high-volume bus, high speed rail, and trolley stops in the corridor should provide the following information:
  - Where service travels (description, route map)
  - Fare payment alternatives in addition to cost
  - When service comes (schedule, frequency list)
  - What the fare costs
- SEPTA should work with municipalities in the area to ensure that all bus and trolley stops in the corridor provide pedestrian safety features, including sidewalks, pedestrian lighting, and (where appropriate) crosswalks and pedestrian signals.
- Public-private partnerships should generate investment in passenger amenities, such as shelters, benches, and trash receptacles at bus and trolley stops.
- Improved maintenance is needed to ensure the presence and quality of bus, high speed rail, and trolley stop amenities.

The signage for transit stops in the Study Area should specify where service is provided, when service comes, and the cost of service. Signs simply specifying a route number are insufficient. It would be more useful if an indication of the service headway and the fare were added. At busy trolley stops or transit nodes like Malvern Loop, real-time arrival displays should be considered.

Pedestrian safety should be given special emphasis at bus and trolley stops. Sidewalk and buffer space separate pedestrians from traffic. Pedestrian-scale lighting is important for personal security and safety. Crosswalks and pedestrian signals allow pedestrians to access the bus stop safely. These safety features should be added where they are absent.

The bus stop at the Wynnewood Shopping Center (across the street from Wynnewood Station) is a model that could be employed in the corridor. Through private investment, this bus stop provides a beautiful shelter and benches adjacent to a plaza. This type of investment enhances the nearby businesses and attracts more "choice riders." Opportunities for similar bus stops exist on Lancaster Avenue.

Public-private partnerships can also sell advertising rights as a means to establish more bus shelters. This means that in exchange for installing a bus shelter and garbage receptacles, a private company is given the right to post advertisements. This strategy is appropriate for many of the bus stops in the corridor.

Finally, SEPTA needs to implement a regular inventory, maintenance, and replacement program for its transit stop amenities.

Commuter Rail Service

Automobile Access

Moderate parking benefits may be achieved through better management of existing facilities. As discussed previously, on the Paoli/Thorndale line, daily parking spaces are utilized at a significantly higher rate than are permit spaces. This suggests that if some permit spaces were converted to daily spaces, parking would be utilized more efficiently.

SEPTA has a strategy of pricing the parking that is currently free at its NHSL stations. This is likely to encourage efficient parking utilization, although prices should not be so high as to discourage transit ridership. Increasing the prices of permit spaces would be a disincentive for the "hoarding" of parking spaces by the occasional rider. Some rail stations may increase their parking supply by securing agreements for shared use of parking from adjacent businesses. For example, on the Paoli/Thorndale line, Radnor Station shares parking with a municipal lot, and Villanova Station makes use of the university's parking lot. Strafford Station has an agreement for use of 100 parking spaces at Our Lady Assumption Church. (It should be noted,

Bus shelter at the Wynnewood Shopping Center.

SEPTA permit parking near the Strafford Station.

Ramp leading to the Overbrook Station in Philadelphia.

however, that the linkage from a shared parking facility to the station must be well designed. This might require improvements to sidewalks, roadways, and crosswalks. At the Strafford Station, pedestrian facilities are inadequate). Ideal opportunities for shared parking also exist at the following locations:

- Wynnewood Station on the Paoli/Thorndale line has an opportunity for shared parking at the Wynnewood Shopping Center. This could include exploring the possibility of a parking structure at this location.
- Haverford Station on the Paoli/Thorndale Line has an opportunity for shared parking at the Haverford Square Shopping Center. This could include evaluating the feasibility of a parking structure.
- Radnor Station on the NHSL might share parking at the adjacent office complex. The parking lot at the office complex has excess capacity that could accommodate the rail station parking demand.

Instead of parking at a station, some riders are dropped off at rail facilities via auto. It is recommended that drop-off bays be created at stations where feasible, as one solution to alleviating parking demand and enabling safe access. Situations where this may apply include:

- Karakung Drive near the Beechwood-Brookline Station of NHSL
- Hathaway Lane near the Ardmore Junction Station of NHSL

Parking decisions will depend on the site-specific feasibility of expansion, and where alternatives to new surface lots exist these should be pursued. The existing parking conditions will be another consideration; new parking might be targeted toward facilities with high usage levels and away from small-sized facilities. Service issues such as fare boundaries and which stations receive "limited" service stops are also quite important.

On the Paoli/Thorndale line, stations can be grouped based on origins of vehicles parked at the stations.

- Group A (Strafford, Wayne, St. Davids) is fortunate to have only moderately constrained parking, with usage levels ranging from 72 percent to 86 percent. Wayne could provide this easily if it pursues a TOD. Strafford would also be a logical choice because it is a fare boundary for northbound travelers.
- Group B (Radnor, Villanova, Rosemont, Bryn Mawr) has two extremely parking-constrained stations: Rosemont (96 percent usage) and Villanova (98 percent usage). The largest share of parking, however, should most likely go to Bryn Mawr Station. This location is a fare boundary for travelers going into Philadelphia and receives express service. It is designated as a town center in the *Connections 2035* plan, and it would be very appropriate for TOD.
- Group C (Haverford, Ardmore) Haverford is a strong candidate for parking due to its proximity to a growth center and the possibility of sharing with the adjacent shopping center. Ardmore is also a strong candidate due to its proximity to a growth center and potential for TOD.
- Group D (Wynnewood, Narberth, Merion, Overbrook) Parking should be concentrated

at Narberth Station, which is currently at 100 percent capacity. Narberth is in the center of significant growth, and development here is appropriate due to its Town Center designation. Overbrook Station will also be experiencing tremendous growth concentrated nearby.

On the Norristown High Speed Line:

- Groups E (County Line, Radnor, Villanova, and Stadium (Ithan Avenue)) and F (Garrett Hill, Roberts Road (Rosemont, and Bryn Mawr) are not projected to require new parking to stay above the effective capacity.
- Group G (Haverford, Ardmore Junction, Wynnewood Road, Beechwood-Brookline, Penfield (Manoa Road)) has four stations at full parking capacity: Ardmore Avenue, Ardmore Junction, Wynnewood Road, and Penfield (Manoa Road). The parking projections cannot account for the spillover parking seen at stations such as Beechwood-Brookline; fortunately, at that station, new municipal parking is planned. While demand is high throughout this station group, the new parking in this area should be concentrated at Ardmore Junction–this station receives three types of express service and is a northbound zone boundary. It already has a large 161-car parking facility and is a designated town center.

Bicycle Access

For rail stations to truly become intermodal nodes, they must serve bicyclists better than is done in the US 30 Study Area. Beginning with the highest-traffic stations, SEPTA should implement a policy of providing sufficient bicycle parking on both sides of every rail station on the Paoli/Thorndale line and NHSL, where feasible. As a first step, there are plans to install new bicycle racks at Villanova on the Paoli/Thorndale line and at every station on the NHSL. This is beneficial for customer mobility, SEPTA ridership, and environmental sustainability. Bicycle parking racks are simply the endpoints of a broader bicycling network. Rail stations served by bicycle facilities should make existing bike routes known through the display of maps that include the routes. Many specific streetscape improvements are necessary to make the areas around rail stations more hospitable to bicyclists and pedestrians. Issues such as traffic speed and intersection design must be thoroughly considered to promote the safety of nonmotorized travel.

Pedestrian Access

Walking is a critical part of almost every trip, so it is important for a balanced transportation network to provide a safe walking environment. This need is particularly acute around rail stations which nearby residents often walk to on a daily basis. Reaching a train station requires that sidewalks exist, and any street crossings provide crosswalks, pedestrian signals, and design features to protect pedestrians from nearby vehicular traffic. The following improvements around specific rail stations are recommended:

1. Overbrook (Paoli/Thorndale)
   - Lighting along 63rd Street,
   - Restripe crosswalks on City Avenue,
   - Consider adding a lead pedestrian interval at City Avenue and 63rd Street,

Bikes locked to a railing at the Ardmore Junction Station of the NHSL.

Pedestrian near Villanova University.

Bus stop near the Radnor Station of the NHSL.

- Consider traffic calming measures on 63rd Street.

2. Wynnewood (Paoli/Thorndale)
   - Sidewalks on Penn Road,
   - Crosswalks at Penn Road and Wynnewood Station north parking lot.
3. Ardmore (Paoli/Thorndale)
   - Wayfinding signs for area north of station.
4. Haverford (Paoli/Thorndale)
   - Crosswalk at station exit.
5. Bryn Mawr (Paoli/Thorndale)
   - Crosswalk on north side of Morris Avenue and Lancaster Avenue,
   - Crosswalk at north parking lot entrance,
   - Improve Tango Bistro parking lot entrance south of station as per Bryn Mawr Traffic Study by Gannett Fleming.
6. Rosemont (Paoli/Thorndale)
   - Countdown pedestrian signals at traffic signals,
   - Crosswalks along Airdale Road and along Montrose Avenue,
   - Wayfinding signs along Montrose Avenue identifying Rosemont Square,
   - Complete sidewalks along Montrose Avenue.
7. Villanova (Paoli/Thorndale)
   - Sidewalks along Spring Mill Road.
8. Radnor (Paoli/Thorndale)
   - Wayfinding signage in surrounding areas,
   - Complete the pedestrian path connecting adjacent offices to the station by painting walking routes in the parking lots and improving path signage.
9. St. Davids (Paoli/Thorndale)
   - Crosswalks at Lancaster Avenue and Chamounix Road.
10. Wayne (Paoli/Thorndale)
    - Improved signage identifying parking options.
11. Strafford (Paoli/Thorndale)
    - Traffic calming on Old Eagle School Road,
    - A planted median pedestrian refuge on Old Eagle School Road at church parking lot.
12. West Overbrook (NHSL)
    - Consider creating a walking path connecting the south platform to nearby residences.
13. Penfield (Manoa Road) (NHSL)
    - Crosswalk at Lawson Avenue and Grove Place,
    - Crosswalk at Manoa Road and Old Manoa Road,
    - Crosswalk with bump-outs and centerline rumble strips at Manoa Road and Station.
14. Wynnewood Road (NHSL)
    - Pedestrian countdown signals at Haverford Road and Wynnewood Road.
15. Ardmore Junction (NHSL)
    - Pedestrian warning signage at the midblock crossing on Haverford Road near station,
    - "Pedestrian route" signage at Hathaway Avenue underpass,
    - Paint pedestrian areas in parking lot to direct passengers toward crosswalk,
    - Consider pedestrian trail along the busway and safety improvements at its tunnel.
16. Ardmore Avenue (NHSL)
    - Pedestrian countdown signals at Ardmore Avenue and Haverford Road.
17. Haverford (NHSL)
    - Sidewalk on Haverford Road, south of College Avenue.
18. Roberts Road (Rosemont) (NHSL)
    - Sidewalk on Roberts Road
19. Garrett Hill (NHSL)
    - Sidewalks on Eachus Avenue.
20. Villanova (NHSL)
    - Complete the sidewalks on Aldwyn Lane.
21. Radnor (NHSL)
    - Crosswalks across King of Prussia Road.
22. County Line (NHSL)
    - Sidewalks on County Line Road.

Corridor-wide standards are recommended for the Study Area. Crosswalks that are fading should be replaced with continental designs to increase visibility. Traffic signals at intersections with significant pedestrian traffic should have pedestrian signal heads with countdown timers to inform crossing pedestrians.

Wayfinding signs should be present and highly visible on all approach routes to a station. This is a basic informational need of not only pedestrians and bicyclists, but motorists as well. Visible signs should also be present identifying the station itself and any parking facilities. High-visibility signage is both good customer service and smart marketing for SEPTA.

Pedestrian-specific overpasses and underpasses require good lighting and regular maintenance. These facilities are typically not wheelchair-compatible, and so alternative facilities that are compatible should exist. Walkways enabling rail customers to get from the inbound to the outbound platforms should be robust and continuous. This should include sidewalks along the route, crosswalks if necessary, and some form of barrier to separate the pedestrians from vehicular traffic.

One example of a needed improvement is the County Line Station on the NHSL–in this case the sidewalk on the overpass road is only present on the side opposite of the station, forcing pedestrians to cross a high-speed road without a crosswalk. Ideally, new sidewalk facilities should be added on the near side. Another example for improvement is Ardmore Junction on the NHSL. This station has two underpass tunnels, a near one for Hathaway Lane and a further one for a busway. Because Hathaway lacks sidewalks, pedestrians are supposed to use the bus tunnel, which has a sidewalk. However, pedestrians continue to use the closer tunnel at their peril. Signage and pavement markings could make the correct travel path clearer.

There are 20 stations that are currently not fully ADA accessible. This may require significant reconstruction and investment in ramps in many cases. Access for persons with disabilities may be improved through the installation of high-level platforms. High-level platforms also reduce travel time by reducing station dwell time due to faster boarding and alighting. This platform is present at all NHSL stations. Eventually, it is highly recommended that all Paoli/Thorndale stations have high-level platforms whenever there is major renovation of a station.

Passenger Information at the Station

Where basic functional information and orientation information is not provided on both platforms, it should be added. This includes:

- Where the service travels (route map),
- When the service comes (schedule, headways, real-time display of scheduled trains and delays),
- What the fare costs,
- Prominently posted instructions on how to call for a train stop (NHSL only), and
- Station name.

Additionally, orientation signs, which indicate inbound or outbound train direction, should be provided at all stations in locations visible from the entrance points and the platforms. This may include signs on platforms, stairways, and other locations. Eight Paoli/Thorndale stations are lacking this sort of orientation signage: Merion, Narberth, Ardmore, Wynnewood, Haverford, Bryn Mawr, Rosemont, and St. Davids stations.

Real-time information displays should be provided at all rail stations, beginning where ridership is highest. It is recommended that rail stations in the US 30 Corridor phase in real-time information signs to provide more detailed information for its customers. This is especially useful at NHSL stations, where operations tend to be less consistent. The two real-time displays in use are already valuable tools for passengers. SEPTA should expand this service as other transit agencies have done.

Bus Route Information at Rail Stations

Rail stations are intermodal connection points, and therefore the available connections to bus service should be listed prominently. It is recommended that all stations with connecting bus routes provide the following features:

- Wayfinding signs directing travelers to nearby bus stops and clearly stating which bus routes

are available. At the surrounding approaches, bus stop wayfinding signs should direct travelers by pointing out a bus stop location and list the available routes to bus service at all rail stations where bus service exists nearby.

- Posted maps of the station's surrounding area showing as large a portion of the connecting bus routes is helpful to travelers. The short segments included on the NHSL maps are a good start. A more ideal example of this concept would be to include a small area map at each station, as shown to the right. This example, from the Long Island Railroad commuter rail, shows the adjacent bus routes. Small area maps could also show bicycle routes or nearby attractionsMore prominent signage promoting the available bus service.

Customer Comfort

The basic elements for passenger comfort, safety, and protection from the elements should be required at all rail stations. It should be noted that the rail right of way along the Paoli/ Thorndale line is owned and maintained by Amtrak. Improvements and modification to station structures needs Amtrak's approval. Nonetheless, SEPTA should pursue the following improvements.

- Adequate benches allow passengers to rest, shelters protect travelers from the elements, and lighting quality improves visibility and safety. Specifically, St. Davids Station requires a shelter and benches, and all Paoli/Thorndale stations should be assessed for lighting improvements. Special attention should be given to lighting in pedestrian underpasses. More ideal lighting examples might be found at Ardmore and Bryn Mawr stations.

An example of an area map showing local businesses and nearby bus routes (Source: Metropolitation Transportation Authority, LIRR)

- Heating and air conditioning are good ways to make rail stations comfortable during the winter and summer months. It is recommended that climate control facilities be added to the Paoli/Thorndale stations especially at high boarding stations.
- Other features, such as beverage and newspaper vending, are beneficial to passengers. Trash receptacles are currently satisfactory, but it would be more environmentally responsible to add recycling containers as well.
- Stations should remain open for longer periods of time. Longer hours would allow more passengers to remain inside while waiting for trains.
- Finally, it is recommended that stations with deteriorating infrastructure be subject to regular maintenance. At a minimum, obviously damaged station elements should receive speedy repairs. A more ambitions approach would be to replace old facilities, such as the dilapidated structure at Bryn Mawr Station on the NHSL. Modern state-of-the-art rail stations can be a source of pride for area communities.

HIGHWAY NETWORK

US 30 will remain a critical transportation corridor. Prioritizing critical roadway improvements that will improve circulation can mitigate congestion while enhancing safety along the corridor.

The following corridor-wide recommendations should be implemented comprehensively in the corridor to ensure safety and operations:

1. Vehicular access management at driveways located within the functional area of intersections along Lancaster Avenue.
    - Consider restricting access to right-in, right-out operation
    - Consider relocating access points further from the intersection
2. Simplify and clarify traffic control information for drivers:
    - Install overhead mounted traffic signals with backplates
    - Consider decorative mast arms to enable signals to be mounted overhead and help create a sense of identity for the corridor
    - Conduct a sign inventory and eliminate all unnecessary signage

Specific roadway improvements are highlighted in the sub-areas section of the report.

Safety Analyses

High Crash Locations

As discussed in the previous section, the 10 intersections along Lancaster Avenue with the highest number of crashes were further analyzed. Recommendations for reduction in conflicts and potential elimination of deficient roadway features are discussed here in general. Intersection specific improvements are highlighted in the appropriate sub-area.

The majority of crashes occur during daylight hours and on dry roadways. The highest proportions of crashes are angle and rear-end type crashes, which are typical of intersections in congested areas. Angle type crashes tend to be of higher severity and are often attributed to improper or careless turns or improper entrance to a highway. This shows that drivers may be misjudging the gaps in traffic or becoming impatient and accepting smaller gaps in order to make turns, especially left turns.

One consideration is to add exclusive turn lanes at the intersections to allow turning vehicles to move out of the through traffic lanes while waiting to make the turn. This reduces disruption and delay for through traffic. The *Highway Safety Manual* states that adding left-turn lanes along both major approaches at an intersection may potentially cause a reduction in injury crashes of approximately 17 percent.[1] Alternatively, left turns can be restricted

[1] American Association of State Highway and Transportation Officials. *Highway Safety Manual-Volume 3*. 2010.

during peak hours, when widening is not an option due to constraints. These turns can potentially be accommodated at a nearby intersection. Prohibition of left turns with "NO LEFT TURN" signs may potentially cause a reduction in overall intersection crashes of approximately 68 percent.

An additional consideration is the modification of the traffic signal phasing to allow for a lead phase, or a green arrow indication, in the peak direction. The *Highway Safety Manual* states that a one percent reduction in crashes could potentially be expected at an intersection where left-turn phasing is modified from permissive to protective/permissive.

Rear-end crashes typically occur at signalized intersections where drivers are traveling at higher speeds, are inattentive/distracted and fail to see queued traffic stopped in front of them, or make sudden speed changes to access driveways near the intersection. These crashes could potentially be reduced by addressing the visibility of traffic control devices and eliminating unnecessary visual information near intersections. Additionally, relocation of driveways near the intersections along Lancaster Avenue to the minor street approach could potentially reduce rear-end crashes due to speed changes near the driveways.

Speeds

Many residents and government leaders expressed concern about the speed of vehicles traveling along Lancaster Avenue. The posted speed limit along the US 30 Corridor (see Figure 2.13: US 30 Corridor Speed Limits) were compared to the desired operating speeds suggested in the *Smart Transportation Guidebook*. Along the corridor, the posted speed limit of all but one of the sub-areas falls within the range of desired operating speeds for that particular context area. The Wynnewood East sub-area, which has the land use context of Suburban Neighborhood, has a posted speed limit that is higher than the desired operating speed for the area, and in fact is the highest posted speed along Lancaster Avenue within the Study Area. It is recommended that the posted speed in this sub-area be reduced so that the speeds along Lancaster Avenue appropriately reflect the land use context of the surrounding area. The study team acknowledges that reducing the posted speed alone will not change the operating speed along the corridor, and identifies some design feature changes within the Wynnewood East sub-area recommendations section.

Traffic Calming

Traffic calming typically addresses speeding and cut-through traffic on neighborhood streets. PennDOT allows some traffic calming elements to be applied on arterial roadways within downtown districts and commercial areas[2]. These applications of traffic calming typically include:

- Horizontal deflection (narrowing of lanes or modification of roadway alignment);
- Vertical deflection;
- Obstructions; and
- Traffic control devices.
- Specific examples include bulb-outs, chicanes, gateways (in roadway), parking, pedestrian refuges/medians, roundabouts, textured crosswalks, raised crosswalks/intersections, and turn prohibitions.

These elements should be incorporated into roadway improvement projects where applicable in order to convey the desired operating speed of each sub-area along the corridor.

Access Management

Many of the major intersections along the corridor have access driveways located very near the intersection, within the functional area. The functional area of an intersection is defined as the physical intersection of two roadways, as well as the areas upstream and downstream of the intersection including any auxiliary lanes and their associated channelization. This includes the area where queues are stored and decision and maneuver distance occur. The location of driveways within this area causes friction between through vehicles maneuvering to make turning movements and vehicles entering/exiting the roadway, and can have a negative impact on intersection operations.

Access management techniques such as restricting access to right-in, right-out movement, or relocation of the driveways further away from

[2] Pennsylvania Department of Transportation. *Pennsylvania's Traffic Calming Handbook*. 2001.

the intersection have been shown to reduce the potential for crashes and improve operations. If possible, driveways on Lancaster Avenue should be closed and moved to the minor street approach in order to reduce conflicts. As discussed above, this could potentially reduce rear-end and angle crashes occurring due to driveway access.

Operations Analyses

Level of Service (LOS)

The existing conditions of the corridor were analyzed by DVRPC in order to evaluate the current traffic operations. This evaluation was conducted using the LOS procedure. LOS analysis is a qualitative measure of operational conditions within a traffic stream. There are six defined levels of service, A–F, which describe operations from best to worst for the facility under analysis. These levels are defined in terms of parameters perceived by drivers and a range of operating conditions. LOS for intersections is based on the control delay per vehicle imposed by the intersection. A driver expects a certain level of performance, including some delay at a signalized intersection, as it carries a higher volume of vehicles. Therefore the value of delay is considered in determining the quality of conditions at an intersection.

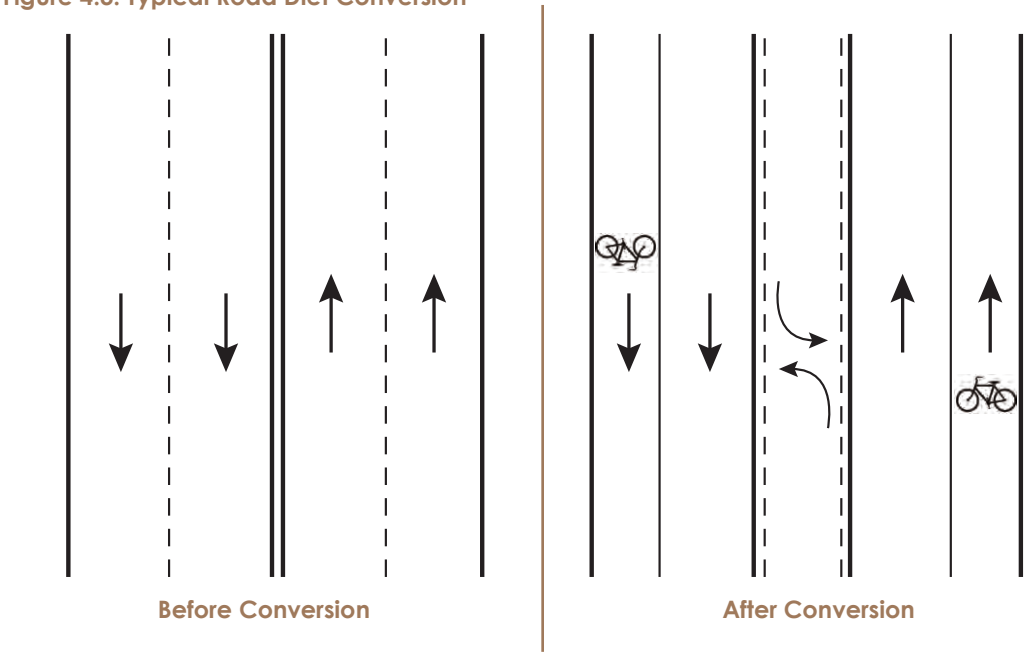
In order to fully understand the operational conditions within the corridor, the AM and PM peak period LOS was evaluated at key intersections within the corridor. Peak hour turning movement counts were conducted by DVRPC in early 2010 at the intersections under study. This volume data as well as traffic signal information obtained from PennDOT was analyzed using Synchro Software to determine the LOS. Detailed operations analysis as well as tables showing the LOS results can be found in Appendix E of the Technical Appendix (Publication 11003C).

Road Diet

Another way to address safety and serve multimodal users along the corridor is to implement a road diet along US 30. In many cases, a road diet is a cost-effective means of satisfying the needs of all users while maintaining an adequate level of service.[3] A road diet modifies the usage of the existing roadway width to better accommodate non-vehicular travelers. This is typically done by converting a four-lane arterial roadway into a three-lane roadway. Most commonly, the conversion consists of one travel lane in each direction, a center turn lane, and bicycle lanes. However, the additional space gained from reallocation of the fourth travel lane can also be used for sidewalks or a buffer area along existing sidewalks.

Along Lancaster Avenue, the study team recommends that a road diet be considered for further analysis in the Wynnewood East sub-area, between City Avenue and Clover Hill Road.

Figure 4.3: Typical Road Diet Conversion



[3] DVRPC. *Municipal Implementation Tool #16: Road Diets*. 2008.

This area has the characteristics of a suburban neighborhood and may be an appropriate location for a road diet demonstration project depending upon the results of additional analysis. The specifics of this recommendation are discussed further in the sub-area recommendations section. An operational analysis of Lancaster Avenue between City Avenue and Clover Hill Road was conducted in order to determine if a road diet along this portion of the corridor could be feasible. Details of this analysis are included in Appendix E of the Technical Appendix (Publication 11003C).

5

SUB-AREA RECOMMENDATIONS

SECTION 5

SUB-AREA 1: WEST PHILADELPHIA

JURISDICTION: CITY OF PHILADELPHIA
CONTEXT ZONE: TOWN NEIGHBORHOOD
EXTENTS: 62nd STREET TO 52nd STREET

Sub-area 1 begins at 52nd Street and Lancaster Avenue, the eastern edge of the US 30 Study Area, and extends just over one mile west to the intersection of 62nd Street and Lancaster Avenue. Traditionally the neighborhood's business center, this stretch of Lancaster Avenue includes many marginal and vacant commercial buildings and properties. Several primarily residential neighborhoods converge within or near the sub-area including Wynnefield, Carroll Park, Cathedral Park, and West Parkside. The area is also home to a number of religious institutions and schools, including Overbrook High School at 59th Street and Lancaster Avenue. Key streets include 52nd Street, which links Lancaster Avenue to the recently completed Park West Town Center and Fairmount Park, and 59th Street, which acts as an important north-south connector. Today, the former Acme Distribution site located north of Lancaster Avenue between 59th Street and the Cynwyd Line railroad tracks sits largely vacant and may represent a revitalization opportunity for the neighborhood.

Issues

- Pedestrian safety and comfort
- Bus and trolley stop access and amenities
- Unsafe interaction between cars, trolleys, and buses
- High vehicular speeds
- Traffic congestion and backups
- Lack of turn lanes at major intersections
- Drivers facing a large amount of visual information
- Effect of potential redevelopment on roadways


FIGURE 5.1
SUB-AREA 1: WEST PHILADELPHIA
Beeber Junior High
Pierce-Phelps
Acme Distribution Site
Overbrook High School
Overbrook Plaza
Mann Music Center
Park West Town Center
Heston Elementary School
PHILADELPHIA
Paoli/Thorndale Line
Cynwyd Line
Upland Way
US Hwy 30
See Figure 5.2 for simulation of this area
0 250 500 750 1,000
Feet
DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.
Intersection Improvement
Gateway or Visual Termination
Revitalization Opportunity
Recent or Planned Pedestrian Improvement
Recommended Pedestrian Improvement
Landmark
Wayfinding
Connector Street
Open Space Opportunity
Bicycle Improvement

- Bicycle infrastructure and maintenance
- Access to rail stations and transit stops
- Vehicular access management

Lancaster Avenue at 52nd Street

- Fifth-highest crash location along the US 30 corridor with 53 crashes between 2004 and 2008.
- Forty percent of the crashes were angle type crashes, which tend to be more severe. Rear-end type crashes accounted for 25 percent of the crash total.
- High volume of eastbound traffic making left turns onto 52nd Street from a shared lane.
- Pavement markings not visible through this complex intersection.

Lancaster Avenue at 59th Street

- Tenth-highest crash location along the US 30 corridor with, 30 crashes between 2004 and 2008.
- Twenty percent of the crashes at this location were pedestrian crashes; 40 percent were angle type crashes.
- The recent streetscape improvements and roadway modifications should address these safety concerns.

Upland Way at 57th Street/59th Street/Berks Street

- High volume of pedestrians crossing to access Overbrook High and Beeber Junior High.
- Vehicles turning right onto Upland Way from 59th Street and directly left onto Berks Street.

Land Use Recommendations

1. Explore reuse and redevelopment options for the former Acme distribution site. The large nature of this site represents a unique opportunity for a neighborhood with few large parcels available. Any efforts to redevelop the site should be coordinated with the Philadelphia Industrial Development Corporation to evaluate its suitability for modern industrial usage.
2. With its intense pedestrian activity and proximity to transit, new development, and several neighborhoods, the intersection of 52nd and Lancaster Avenue deserves special consideration. Renovation and/or redevelopment of properties abutting this intersection can help improve the image of this important gateway location. Aside from making any necessary structural repairs to the Amtrak bridges over 52nd Street, various treatments, including lighting, paving patterns, art installation, and plantings, should be assessed for their potential to improve the experience of traveling along 52nd Street by car or on foot.

Recent commercial development at 59th Street and Lancaster Avenue.

A view of the former Acme distribution site from Upland Way.

New sidewalks were recently installed in portions of Sub-area 1.

3. Encourage the redevelopment of other vacant and underutilized parcels along this stretch of Lancaster Avenue. As observed in the *Lancaster Avenue Study: Strategies for Corridor Revitalization* by the Philadelphia City Planning Commission (2000), the south side of US 30 can better accommodate a mix of uses that includes resident-oriented and pedestrian-oriented shopping and services that cater to neighborhood needs. The north side of Lancaster Avenue, with its shallow lot depths, may remain more automobile oriented, with stores and parking designed to serve motorists. The existing zoning designations for properties along Lancaster Avenue should be reevaluated to ensure that they reflect the type of development envisioned for this area.
4. Improve the look and feel of Lancaster Avenue by beautifying the properties that front on US 30. Reasonable sign and storefront regulations can help make commercial properties more attractive to shoppers, while landscaping and uniform edge treatments can enhance parking lots.
5. Enhance existing green spaces and explore opportunities for new open space. Scrub vegetation should be removed from hillsides and replaced with more formalized plantings which are appealing yet easy to maintain. Irregularly shaped parcels and overgrown areas should be evaluated for their potential as community open spaces.
6. Investigate unique opportunities for placemaking. The restoration and lighting of the stone railroad embankments and tunnel at 56th and Lancaster could transform these existing elements into distinctive landmarks.
7. Install wayfinding signage along 52nd Street to identify destinations such as the Park West Town Center and Fairmount Park amenities.

Pedestrian Recommendations

1. Continue recent streetscape improvements (sidewalks, high-visibility crosswalks, street trees, pedestrian-scale lighting, and street furniture) on US 30 between 52nd Street and 59th Street and along 59th Street as illustrated in the sub-area map.
2. Improve the sidewalks on the bridge over the Paoli/Thorndale line toward Wynnefield and consider refreshing or replacing the mural along the bridge.

3. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
    - Ensure curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist. Pedestrian countdown signals are not in place at the intersections of Lancaster Avenue at 56th Street, and Lancaster Avenue at 57th Street. Crosswalk markings are needed across the 57th Street approach at Lancaster Avenue.
    - Consider prohibiting right turns on red to reduce vehicle/pedestrian conflicts
    - Upgrade pedestrian timing to ensure that new Manual of Uniform Traffic Control Devices (MUTCD) requirements for walking speed are met.

Bicycle Recommendations

1. Implement periodic street sweeping of bicycle lanes to prevent debris build-up.
2. Extend the bicycle lanes along 59th Street between the rail bridge and Upland Way to connect the existing lane network. The lanes currently end just south of Upland Way.
3. Enforce no parking zones at the bicycle lanes in front of the high school.
4. Evaluate the need for bicycle racks at the high school (no racks are visible).

Transit Recommendations

1. Designate key transit stops along the SEPTA Route 10 trolley and Route 52 bus lines and evaluate the potential for transit amenities, such as benches, shelters, trash cans, and route signage at these locations.
2. Explore the feasibility of consolidating transit stops at the intersection of Lancaster Avenue and 52nd Street to permit easy access and transfers. A candidate location is illustrated in Figure 5.2.

Intersection and Roadway Recommendations

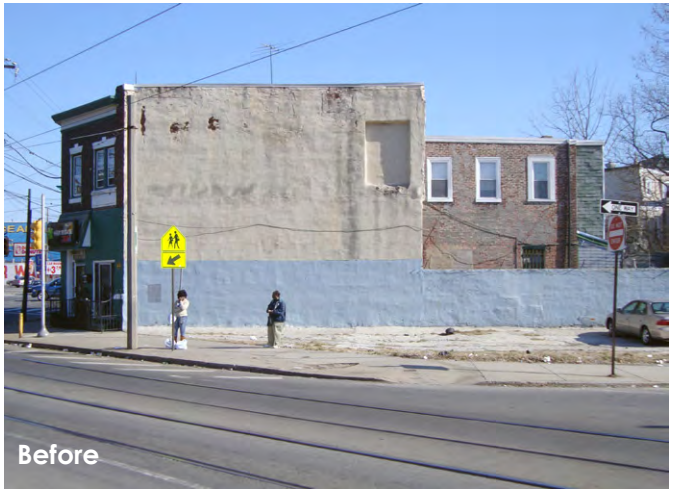
1. Evaluate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
2. Simplify and clarify traffic control information for drivers in order to ensure that crucial information is highly visible.
    - Install pavement markings, including clear lane control markings at all intersections.

Riders boarding the Route 10 Trolley at 52nd Street and Lancaster Avenue.

Shopping center at 56th Street and Lancaster Avenue.

Figure 5.2: West Philadelphia Simulation

The addition of landscaping, public art, and transit amenities can enhance underutilized parcels like this one at the intersection of Landsdowne Avenue, 53rd Street, and Lancaster Avenue. This location is also a candidate for a consolidated transit stop which could include a shelter and informational displays.



- Conduct a sign inventory; upgrade and consolidate essential signage as appropriate and eliminate all unnecessary signage.
- Make traffic signal indications more clearly visible to drivers. Consider upgrading side-mounted traffic signals to mast arm mounted signals. The side-mounted signals add to the visual clutter of the area.

3. Lancaster Avenue at 52nd Street
   - Stripe lane control markings through the intersection to clarify what movements are allowed from which lanes. Explore adding additional time to the eastbound lead signal phase, especially in the AM peak hour.
4. Upland Way at 57th Street/59th Street/Berks Street
   - Restripe the east approach to include an exclusive left-turn lane for Berks Street. This can be accomplished by removing the on-street parking and moving the bicycle lane against the curb between 59th Street and the access drive to the ACME distribution site.
5. Upland Way between Berks Street and 52nd Street
   - Post 25 MPH speed limit signs (R2-1) along Upland Way to inform drivers of the speed limit for this section of the roadway.
   - Explore the potential for traffic calming elements along Upland Way including speed display signage and physical roadway changes.

The intersection of Upland Way, 57th Street, 59th Street, and Berks Street.

SECTION 5

SUB-AREA 2: OVERBROOK FARMS

JURISDICTION: CITY OF PHILADELPHIA
CONTEXT ZONE: TOWN NEIGHBORHOOD
EXTENTS: CITY AVENUE TO 62nd STREET

The Overbrook Farms Sub-area extends from 62nd Street in West Philadelphia to City Avenue along the border between Philadelphia and Lower Merion Township. Much of this area was founded first in 1892 as a planned commuter suburb along the Main Line of the Pennsylvania Railroad. The sub-area includes the Overbrook Farms Historic District and the Overbrook Station of the Paoli/Thorndale line. Residential development includes a combination of single-family homes and apartment buildings, many showcasing turn-of-the-century architectural styles . A small commercial area is located along portions of 63rd Street between Lancaster Avenue and City Avenue.

The Overbrook Farms neighborhood participates in DVRPC's Classic Towns program. Classic Towns is a regional marketing strategy designed to foster the continued growth and success of the region's older communities.

Issues

- Traffic congestion and backups
- High vehicular speeds
- Pedestrian safety and comfort
- Bus and trolley stop access and amenities
- Vehicular access management


FIGURE 5.3
SUB-AREA 2: OVERBROOK FARMS
LOWER MERION
PHILADELPHIA
St. Charles Borromeo Seminary
Palmer Seminary
Our Lady of Lourdes
Overbrook Station
Merrybook Blvd
Merrybook Ln
Wynnewood Rd
Haldon Rd
Blincyd Rd
Overbrook
63rd St
Drexel Rd
US Hwy 1
US Hwy 30
Penn Central Line
Church Rd
Upland Way
Woodbine Ave
Woodcrest Ave
Malvern Ave
Graham St
Sayre St
Bradfield St
Shorewood Rd
Overbrook Ave
To Morris Park
64th St
Intersection Improvement
Gateway or Visual Termination
Revitalization Opportunity
Recent or Planned Pedestrian Improvement
Recommended Pedestrian Improvement
Landmark
Wayfinding
Connector Street
Open Space Opportunity
0 150 300 450 600
Feet
DELAWARE VALLEY REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.

Environmental Recommendations

1. Explore the potential for streambank restoration along Indian Creek in Morris Park. The outfall at this location should also be considered for retrofit with a step pool to prevent further erosion.
2. Investigate the possibility of creating wetlands along the east and west branches of Indian Creek in the area north of Sherwood Road in Philadelphia.

Land Use Recommendations

1. Explore redevelopment options for the vacant land adjacent to PECO substation near the intersection of 62nd and Lancaster Avenue.
2. Install wayfinding signage to identify Overbrook Farms Business District and Overbrook Station on the Paoli/Thorndale line. Utilize signage to help link Lancaster Avenue and nearby neighborhoods to recreational areas such as Morris Park.
3. Restore or replace Overbrook Farms gateway signage at City Avenue and Lancaster Avenue.
4. Implement a comprehensive strategy for revitalizing the 63rd Street Commercial Corridor. The *Master Plan Strategy for 63rd Street* contains a useful framework for discussing land use, streetscape and placemaking elements, traffic calming, and façade improvements.

Pedestrian Recommendations

1. Streetscape improvements (sidewalks, street trees, pedestrian-scale lighting, and street furniture) along Lancaster Avenue, and 63rd Street as illustrated in the sub-area map.
2. Consider pedestrian amenities at key unsignalized intersections, such as Lancaster Avenue and Sherwood Road, to improve pedestrian circulation.
   - Install curb ramps where they currently do not exist.
   - Install high-visibility crosswalk markings along with pedestrian warning signs (W11-2) and arrow plaques (W16-7P).

Pedestrians crossing City Avenue at Drexel Road.

Students waiting for the bus along 63rd Street.

Pedestrian countdown signals were not installed at the intersection of Lancaster Avenue and Overbook Avenue.

The bus stop at the Malvern Loop lacks shelters.

3. Install pedestrian amenities at all signalized intersections along Lancaster Avenue and the signalized intersections of City Avenue at 63rd Street and City Avenue and Drexel Road.
    - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist. Pedestrian countdown signals are not in place at the intersections of Lancaster Avenue at 62nd Street, and Lancaster Avenue at Overbrook Avenue.
    - Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.
4. Implement the strategies outlined in the Overbrook Farms Neighborhood Traffic Study completed by McMahon and KMJ in summer 2011.

Transit Recommendations

1. Install additional shelters over the bus stop benches near the Malvern Loop

Intersection and Roadway Recommendations

1. Evaluate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
2. City Avenue at 63rd Street
    - Explore the addition of a lead pedestrian interval at City Avenue and 63rd Street. This would reduce the potential for vehicle-pedestrian conflicts.

SECTION 5

SUB-AREA 3: WYNNEWOOD EAST

JURISDICTION: LOWER MERION TOWNSHIP
CONTEXT ZONE: SUBURBAN CORRIDOR
EXTENTS: CLOVER HILL ROAD TO CITY AVENUE

The Wynnewood East Sub-area includes portions of Lower Merion Township between City Avenue and Clover Hill Road. The eastern portion of this 1.3 mile stretch of Lancaster Avenue is defined by the large institutional presence of Lankenau Medical Center and St. Charles Borromeo Seminary. Formerly known as Lankenau Hospital, Lankenau Medical Center is a major teaching and research-based medical facility that offers an array of clinical services and programs with over 300 licensed beds. West of these institutions, the sub-area is dominated by single-family detached homes, some of which back directly up to Lancaster Avenue.

Issues

- Traffic congestion and backups
- High vehicular speeds
- Pedestrian safety and comfort
- Lack of turn lanes at major intersections
- Access to rail stations and transit stops
- Vehicular access management

Lancaster Avenue at City Avenue

- This location had 36 crashes between 2004 and 2008, making it the eighth highest along the corridor.
- Forty-four percent of the crashes were angle type crashes, while 31 percent were rear-end type crashes.


FIGURE 5.4
SUB-AREA 3: WYNNEWOOD EAST
LOWER MERION
Western extent of potential road diet
Eastern extent of potential road diet
Shortridge Memorial Park
St. Charles Borromeo Seminary
Lankenau Hospital
Palmer Seminary
Merion
Clover Hill Rd
Clothier Rd
Nicholson Rd
Williams Rd
Remington Rd
Ingeborg Rd
Upper Indian Creek Rd
Indian Creek Rd
Bowman Ave
Charles Ln
Violet Ln
Woodcrest Dr
US Hwy 30
US Hwy 1
Church Rd
Overbrook Ave
Highland Ave
Hazelhurst Ave
Intersection Improvement
Gateway or Visual Termination
Connector Street
Recent Pedestrian Improvement
Recommended Pedestrian Improvement
Priority Pedestrian Improvement
Warning Signage
0 250 500 750 1,000
Feet
DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.

- The majority of the driver actions listed was running red light and improper/careless turn. This is likely due to the fact that left-turning drivers are having difficulty making the maneuver during the permitted phasing.

Lancaster Avenue at Remington Road

- This location had the seventh-highest number of crashes along the corridor, with 48 crashes between the years of 2004 and 2008.
- Sixty-nine percent of the crashes were angle type crashes, which tend to be a higher severity. Seventeen percent of the crashes were rear-end type crashes.
- The driver action listed most often as a contributing factor for the angle crashes was improper or careless turn and running red light. This can be evidence that drivers may be misjudging gaps in traffic or becoming impatient and accepting smaller gaps in order to make turns. Additionally the crash information seems to show that drivers are using the all-red time to make left turns.

The condition of fencing along Lancaster Avenue varies.

Walking in this sub-area is difficult due to insufficient sidewalks such as this one along Lancaster Avenue.

Environmental Recommendations

1. Explore the potential for streambank restoration along the tributary to Cobbs Creek within the Barnett Environmental Center in the Grange Field and County Open Space. The extreme erosion conditions could be improved with the addition of step pools at the outfall.
2. Explore the potential for stabilization of the banks of the west branch of Indian Creek where it runs through Penn Wynne Park.
3. Investigate the possibility of creating wetlands along the east and west branches of Indian Creek in the area north of Sherwood Road in Philadelphia.

Land Use Recommendations

1. Improve maintenance of fences and landscaping along the rear property line of homes along Lancaster Avenue.

Pedestrian Recommendations

1. Complete the sidewalk network by constructing or improving sidewalks along Lancaster Avenue as illustrated on the sub-area map. Improvements are most needed along an approximately 600-foot stretch of sidewalk on the south side of Lancaster Avenue, just west of Indian Creek Lane.

Curb ramps and pedestrian countdown signals are needed at the intersection of Lancaster Avenue and Remington Road.

Consider upgrading these traffic signal heads at Remington Road.

2. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.

Transit Recommendations

1. Designate key transit stops along the SEPTA Route 105 bus line and evaluate the potential for transit amenities such as benches, shelters, trash cans, and route signage at these locations along Lancaster Avenue.
2. Provide transit service to areas with large elderly populations.

Bicycle Recommendations

1. Extend the Cynwyd Trail south from the Cynwyd Station through Lower Merion Township and Philadelphia as described on pages 76 and 77, Extending the Cynwyd Trail to the South.

Intersection and Roadway Recommendations

1. Place edge line pavement markings along this portion of Lancaster Avenue, including striping of catch basins and storm inlets to alert bicyclists of their location.
2. Rationalize the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
3. Lancaster Avenue at City Avenue
   - Install dotted edge line extensions between the two westbound through lanes as they cross over City Avenue. The topography of the intersection makes it difficult for drivers to differentiate how the lanes align on the west side of the intersection.
4. Lancaster Avenue at Remington Road
   - Consider upgrading the traffic signals facing the westbound Lancaster Avenue traffic to mast arm mounted signals with backplates similar to the eastbound direction. Maintain and trim vegetation in the area to ensure adequate sight distance of traffic signal indications. Examine the

possibility of providing exclusive left-turn lanes along Lancaster Avenue as part of the road diet project discussed below.

5. Lancaster Avenue between City Avenue and Clover Hill Road

- Speed Analysis

  As mentioned previously, the Wynnewood East sub-area has a posted speed limit that is higher than the desired operating speed for the area, and in fact is the highest posted speed along Lancaster Avenue within the Study Area. It is recommended that the posted speed in this sub-area be reduced by 5 MPH to 35 MPH. Reducing the posted speed limit alone will not reduce the speed of motorists traveling along this segment of Lancaster Avenue; the roadway itself must also be adjusted so that motorists will travel at the desired operating speed, the proposed posted speed of 35 MPH. Many design features have been found to affect operating speeds; those with the most potential for application in this sub-area include: street trees, boulevard treatments, on-street parking, pedestrian activity, and traffic calming treatments such as curb extensions and roundabouts. Medians have been shown to either increase or reduce vehicle speeds, depending on the study,[1] and are therefore not being recommended alone.

- Road Diet Analysis

  In an effort to improve pedestrian safety and vehicular movement along Lancaster Avenue between City Avenue and Clover Hill Road, a preliminary analysis of the roadway operations under a road diet were conducted by DVRPC. This analysis indicates that implementation of a road diet along this segment of roadway does increase delay and cause some queuing at signalized intersections, but not to the point that vehicles are expected to divert to alternate routes. Additional delay is also introduced at the side-street approaches to the signalized intersections at Clover Hill Road and Remington Road. A detailed description of this preliminary analysis is included in Appendix E of the Technical Appendix (Publication 11003C).

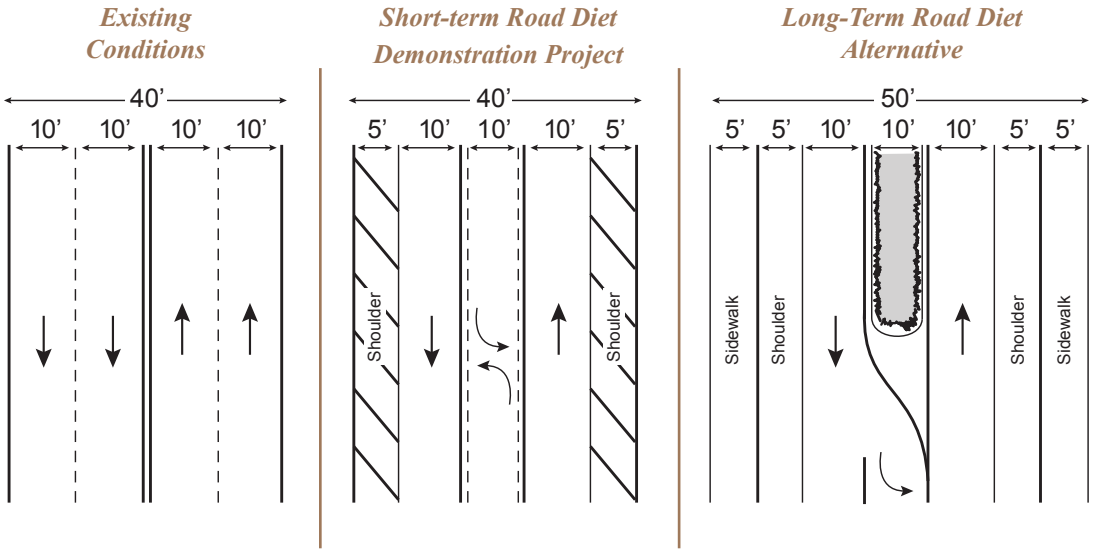
  Additional study is necessary before implementing any changes to the roadway. Depending on the results of this study, a road diet demonstration project may be appropriate for this segment of Lancaster Avenue. Implementing a striping-only demonstration project would allow area residents and drivers to become familiar with the road diet concept while permitting PennDOT and the township to test the operations of the modified roadway. As illustrated on the next page, this could be accomplished by striping a center island (or two-way left-turn lane), two 10-foot

[1] US Department of Transportation, FHWA Safety Program. *Safety Benefits of Raised Medians and Pedestrian Refuge Areas*. 2010.

travel lanes, and five-foot shoulders or buffer areas within the existing 40-foot roadway width. The center island space can serve as exclusive left-turn lanes at major intersections.

In the long-term, roadway modifications such as a planted median island and streetscape improvements (wider sidewalks, street trees, pedestrian scale lighting, and street furniture) can be considered if permanent implementation of the road diet is viewed as a successful strategy for Lancaster Avenue.

Figure 5.5: Conceptual Road Diet Illustration



SECTION 5

SUB-AREA 4: WYNNEWOOD WEST

JURISDICTION: LOWER MERION TOWNSHIP
CONTEXT ZONE: SUBURBAN CORRIDOR
EXTENTS: SIMPSON ROAD TO CLOVER HILL ROAD

Sub-area 4 extends from the intersection of Lancaster Avenue and Clover Hill Road to the intersection of Lancaster Avenue and Simpson Road. Wynnewood West includes the Wynnewood Commercial District which is comprised of a mixture of traditional and convenience retail businesses and services that primarily cater to Lower Merion Township residents. The Wynnewood Station of the Paoli/Thorndale line is located off of Wynnewood Road and across the street from the Wynnewood Shopping Center. Residential areas, including prominent multifamily developments on the south side of Lancaster, abut Wynnewood's commercial development. Lower Merion High School is also located within the Sub-area 4 near the intersection of East Montgomery Avenue and Church Road.

Issues

- Traffic congestion and backups
- High vehicular speeds
- Pedestrian safety and comfort
- Lack of turn lanes at major intersections
- Access to rail stations and transit stops
- Vehicular access management
- Drivers facing a large amount of visual information

Lancaster Avenue at Wynnewood Road

- Highest crash location in the corridor, with 75 crashes between 2004 and 2008.
- Forty-seven percent of the crashes were angle type crashes, while 29 percent were rear-end type crashes.


FIGURE 5.6
SUB-AREA 4: WYNNEWOOD WEST
LOWER MERION
Lower Merion High School
Toyota of Ardmore
Wynnewood Square
Whole Foods
Wynnewood Shopping Center
Wynnewood
Evaluate for potential signalization
See Figure 5.7 for intersection illustration
Coulter Ave
Simpson Rd
Saint Pauls Rd
Church Rd
Marlboro Rd
Kent Rd
Sibley Ave
Lindair Rd
Lindair Cir
Fairhill Rd
Ashley Rd
Gibson Ln
Hathaway Cir
Hathaway Ln
Matson Ln
Penn Rd
Station Rd
Penn Treaty Line
Linwood Ave
Wellington Rd
Chatham Rd
Keyser Rd
Williamsburg Rd
Hood Rd
Lakeside Rd
Midfield Rd
Old Wynnewood Rd
US Hwy 30
Wynnewood Rd
Williams Rd
Cedar Grove Rd
Clover Hill Rd
Ashton Rd
Crothian Rd
Morris Rd
Sutton Rd
Altoona Ave
0 175 350 525 700
Feet
DELAWARE VALLEY REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.
Intersection Improvement
Gateway or Visual Termination
Warning Signage
Priority Pedestrian Improvement
Recommended Pedestrian Improvement
Landmark
Wayfinding
Connector Street
Lower Merion Township High School Walk Zone

- The majority of the driver actions listed was running red light and improper/careless turn. This is likely due to the fact that left-turning drivers are having difficulty making the maneuver during the permitted phasing.

Lancaster Avenue at Wynnewood Square/Wynnewood House

- Unsignalized high-volume access driveways.
- A high volume of pedestrians cross midblock at this location due to the stop locations of the SEPTA Route 105 bus and the commercial uses near this intersection.

Land Use Recommendations

1. Utilize landscaping and edge treatments such as fencing to screen and delineate large parking lots and better delineate sidewalks.
2. Install wayfinding signage to identify the Wynnewood Station on the Paoli/Thorndale line.

Pedestrian Recommendations

1. Complete the sidewalk network by constructing or improving sidewalks along Lancaster Avenue and Penn Road as illustrated on the sub-area map.
2. Install a sidewalk along Lower Merion Township High School's Arnold Field on Church Road to provide a safe pedestrian route for students.
3. Install pedestrian amenities at all signalized intersections along Lancaster Avenue and the signalized intersection of Wynnewood Road at Penn Road.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Upgrade pedestrian signal timing to ensure that new MUTCD requirements for walking speed are met.

Transit Recommendations

1. Construct a bus stop shelter on Lancaster Avenue in front of the Wynnewood Square Shopping Center.

Pedestrians must cross Lancaster Avenue to access the Route 105/106 bus stops.

Pedestrians have created a path along Penn Road south of Sabine Avenue.

An edgeline is needed to delineate the eastbound traffic lanes.

Congestion at the Whole Foods access drive.

2. Improve pedestrian access to the Wynnewood Rail Station (Paoli/Thorndale) by adding a crosswalk across Penn Road at the north parking lot.
3. Improve automobile access to the Wynnewood Rail Station (Paoli/Thorndale)
   - Investigate opportunities for shared parking at the Wynnewood Shopping Center. This could include determining the feasibility of a parking structure.

Intersection and Roadway Recommendations

1. Evaluate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
2. Simplify and clarify traffic control information for drivers in order to ensure that crucial information is highly visible.
   - Conduct a sign inventory, upgrade and consolidate essential signage as appropriate, and eliminate all unnecessary signage.
   - Add lane control signage and pavement markings along the southbound approach of Wynnewood Road to clarify the lane usage. (The curb lane becomes a right-turn-only lane and the auxiliary lane is a left turn/through lane.)
   - Use edge line pavement markings to visually narrow the roadway width along the eastbound lanes between Church Road and Wynnewood House. The wide feel of the roadway from the extra pavement for the pull-in parking and bus pullouts encourages drivers to travel at higher speeds.
3. Lancaster Avenue at Wynnewood Road/Old Wynnewood Road
   - Stripe the eastbound inside lane as an exclusive left-turn only lane. Prohibit left turns during peak hours (7 to 9 AM and 4 to 7 PM) from Hampstead Circle and the Whole Foods driveway. Consider circulation modifications within the Whole Foods parking lot, such as a one-way parking aisle with a righ-in-only island (this reverses the one way traffic flow). Preventing left turns from this aisle where vehicles are queued to exit the shopping center, will improve flow and prevent backups within the lot from spilling into the intersection. Improvements at the intersection of Old Wynnewood Road and Wynnewood Road, such as side street warning signs and traffic calming to reduce the speed of vehicles traveling east on Wynnewood Road may be necessary for these relocated left turns.

- Make the intersection "smaller" by reducing the width between approaches on Lancaster Avenue. This could be accomplished through a textured pavement bump out in the northeast corner of the intersection and/or a pedestrian refuge island for the southbound right-turn lane.
- See the intersection illustration, Figure 5.7, for recommended improvements.

4. Lancaster Avenue at Wynnewood Square Shopping Center/Wynnewood House

   - Install pedestrian warning signs (W11-2) and supplemental distance plaques (W16-2P) along Lancaster Avenue in front of the shopping center to identify this potential crossing location.
   - Evaluate the intersection for potential signalization. If a signal is warranted, combine the access driveways on the south side of Lancaster Avenue into one boulevard-type access driveway, keeping the existing trees, as possible. A signalized intersection at this midpoint of the long block between Church Road and Old Wynnewood Road would assist pedestrians in crossing Lancaster Avenue and ease access/egress to Wynnewood Square.

5. Wynnewood Road at Penn Road/Wynnewood Shopping Center

   - Install pedestrian warning signage (W11-2 signs with W16-9P supplemental plaques) along Penn Road in the area of the Wynnewood Station to warn drivers of pedestrians crossing the roadway from the sidewalk along the west side to the station on the east.
   - Investigate the potential for a lead pedestrian signal phase or an exclusive pedestrian signal phase, as recommended by the LMPD study of the intersection.
   - Relocate pedestrian push buttons closer to the curb ramp areas to make it easier for pedestrians to activate the controller. (The existing push button location on the signal mast arm at the northeast corner is especially far away for pedestrians crossing Wynnewood Road; therefore, it is not being pushed and the pedestrian phase is not being called.)
   - Consider installing a raised intersection at this location to calm traffic and make the area more pedestrian friendly. (Both Penn Road and Wynnewood Road are urban collector roadways with low traffic volumes.)

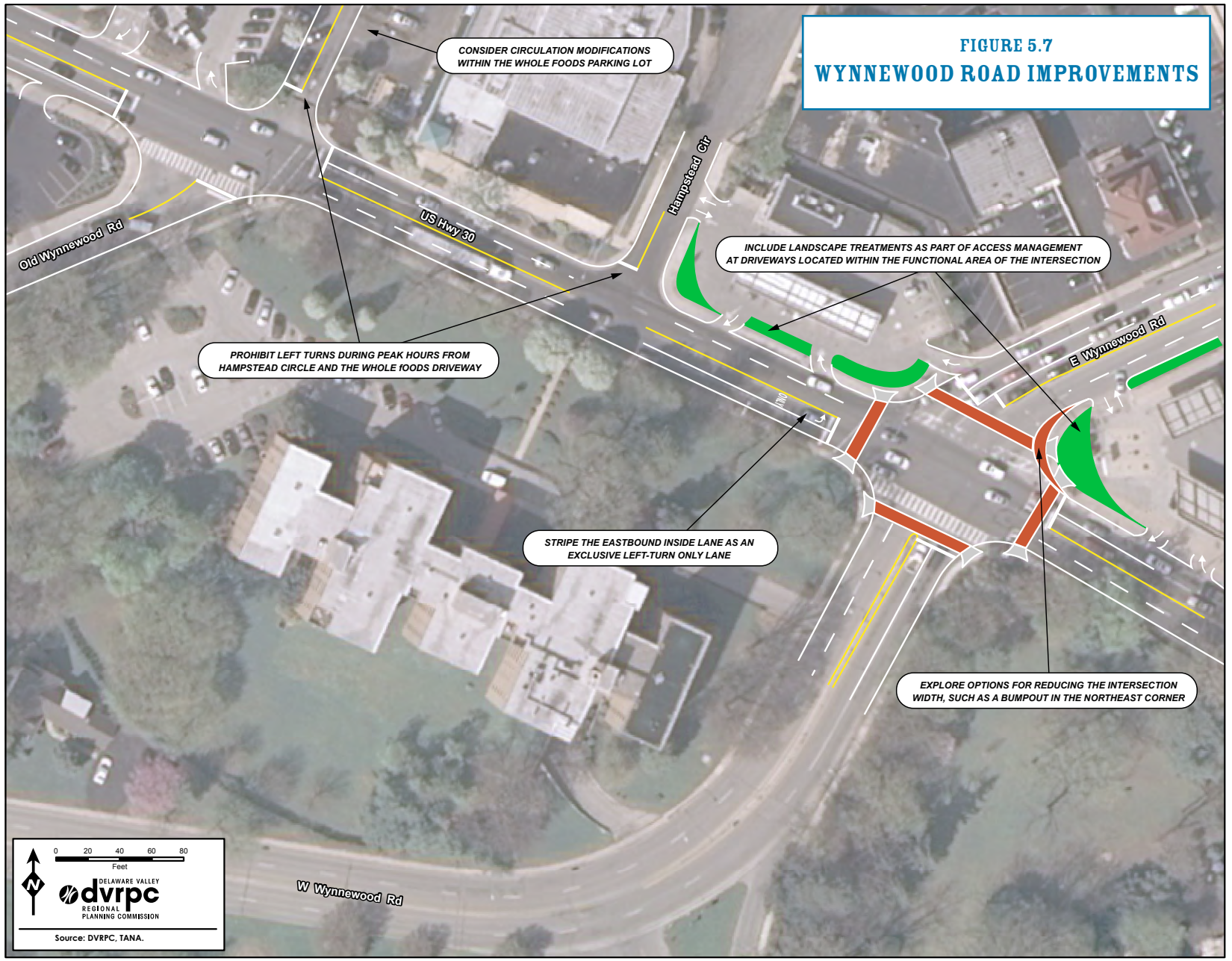


FIGURE 5.7
WYNNEWOOD ROAD IMPROVEMENTS

SECTION 5

SUB-AREA 5: ARDMORE

JURISDICTION: LOWER MERION TOWNSHIP
CONTEXT ZONE: SUBURBAN CENTER
EXTENTS: WOODSIDE ROAD TO SIMPSON AVENUE

Roughly only half a mile long, Sub-area 5 is the smallest sub-area within the US 30 corridor. The sub-area extends from Simpson Road to Woodside Road and includes the Lower Merion Township Building, Ardmore Station of the Paoli/Thorndale line, and the Ardmore Business Historic District which contains numerous restaurants and shops. Ardmore is a mixed-use suburban center and one of the larger business districts in Lower Merion Township. The Ardmore Business Historic District is adjacent to Suburban Square, one of the country's oldest shopping centers. Like Overbrook Farms, Ardmore participates in DVRPC's Classic Towns program. Classic Towns is a regional marketing strategy designed to foster the continued growth and success of the region's older communities.

Sub-area 5 also contains the majority of the Ardmore Redevelopment Area. Recent planning activity in this area has focused on the Ardmore Transit Center Project. This proposed project includes a reconstructed Ardmore train station, new parking garage, and mixed-use building with below-grade parking for tenants. By enhancing transit access and increasing residential density, these improvements have the potential to help establish more of a Town Center context within the sub-area.

Issues

- Traffic congestion
- High vehicle speeds
- Pedestrian safety and comfort
- Lack of turn lanes at major intersections
- Access to rails stations and transit stops
- Drivers facing a large amount of visual information


FIGURE 5.8
SUB-AREA 5: ARDMORE
LOWER MERION
Infiniti of Ardmore
Suburban Square
Ardmore
Lower Merion Township Building
Penny Thousand Line
Montgomery Ave
Ardmore Ave
Station Rd
Coulter Ave
Cricket Ter
US HWY 30
Simpson Rd
Saint Pauls Rd
Wyoming Ave
Holland Ave
Greenfield Ave
Roosevelt Ter
School Ln
Spring Ave
Walton Ave
Butterhouse Rd
Sibley Ave
Church Rd
Cross Rd
Lannair Rd
Valley Rd
Bloebom Rd
Mill Creek
Anderson Ave
Saint Lands Rd
Apple Rd
Griffith Rd
Woodside Rd
Greenfield Ter
Athens Ave
0 125 250 375 500
Feet
DELAWARE VALLEY REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.
Intersection Improvement
Gateway or Visual Termination
Ardmore Redevelopment Area
Connector Street
Recommended Pedestrian Improvement
Landmark
Wayfinding
Warning Signage
Lower Merion Township High School Walk Zone

Land Use Recommendations

1. Enhance eastern entrance into village center at Lancaster Avenue and Simpson Road with an appropriate gateway treatment. A western gateway was recently established at the intersection of Lancaster Avenue and Ardmore Avenue.
2. Install wayfinding signage identifying Ardmore Station on the Paoli/Thorndale line.

Pedestrian Recommendations

1. Ensure that street furniture, utility poles, and signage is organized, and that sidewalks are clear and passable and meet ADA guidelines. Portions of the sidewalk in the area between Station Avenue and Rittenhouse Place could benefit from reorganization following the guidelines depicted on page 64.
2. Streetscape improvements (sidewalks, street trees, pedestrian-scale lighting, and street furniture) along Lancaster Avenue between Ardmore Avenue and Holland Avenue/Woodside Road as illustrated in the sub-area map.
3. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Consider prohibiting right turns on red to reduce vehicle/pedestrian conflicts.
   - Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.
4. Lancaster Avenue at the Philadelphia Sports Clubs (Old Ardmore Theater)
   - Install yield lines at least 20 feet in advance of the midblock crosswalk with "Yield Here To Pedestrians" (R1-5) signs at yield line locations. A public outreach campaign should accompany this recommendation to alert the driving public that they should yield at the yield line (in advance of the crosswalk) so that both lanes of approaching traffic are able to see crossing pedestrians.
   - Consider removing the lane control signage from the mast arm to allow the pedestrian warning sign assembly to be as visual as possible to drivers in the eastbound direction.

Reorganizing street furniture can ensure that sidewalks are passable for all residents.

The lane control signage detracts from the pedestrian warning signage.

Intersection and Roadway Recommendations

1. Evaluate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
2. Simplify and clarify traffic control information for drivers in order to ensure that crucial information is highly visible.
    - Conduct a sign inventory; upgrade and consolidate essential signage as appropriate, and eliminate all unnecessary signage.
3. Church Road at Lancaster Avenue
    - Add a dedicated left-turn lane from eastbound Lancaster Avenue to the Church Road Bridge.
4. Anderson Avenue at Coulter Avenue
    - Consider implementing right-in, right-out access at the Suburban Square West Parking Lot to reduce congestion and improve pedestrian access at this location. This adjustment complements improvements to the intersection of Mill Creek, Montgomery Avenue, and Anderson Avenue detailed in the Ardmore Transit Center Master Plan.

SECTION 5

SUB-AREA 6: HAVERFORD

JURISDICTION: LOWER MERION TOWNSHIP AND HAVERFORD TOWNSHIP
CONTEXT ZONE: SUBURBAN CORRIDOR
EXTENTS: LEE AVENUE TO WOODSIDE ROAD

The Haverford Sub-area takes its name from the Haverford Station of the Paoli/Thorndale line. The sub-area itself, which stretches from Woodside Road to Lee Avenue/Old Lancaster Road, includes portions of both Lower Merion Township and Haverford Township. This diverse sub-area contains a variety of land uses and the context of Lancaster Avenue varies considerably throughout the sub-area. The area's commercial center, Haverford Square, is located near the intersection of Station Road and Lancaster Avenue. This sub-area is also home to educational institutions such as the Haverford School and Haverford College as well as the Merion Cricket Club.

Issues

- Traffic congestion and backups
- High vehicular speeds
- Pedestrian safety and comfort
- Drivers facing a large amount of visual information
- Vehicular access management
- Lack of turn lanes at major intersections

Lancaster Avenue at Haverford Station Road

- Second-highest crash location along the US 30 corridor, with 70 crashes between 2004 to 2008.
- Seventy-six percent of the crashes were angle type crashes, which tend to be of higher severity.
- Improper or careless turn and running red light were the two driver actions most often cited as contributing to the accidents.
- High volume of westbound traffic combined with left turns made from a shared lane.


FIGURE 5.9
SUB-AREA 6: HAVERFORD
Acme
Intersection improvements recently completed by PennDOT
LOWER MERION
HAVERFORD
Merion Cricket Club
Haverford
The Haverford School
Haverford Square
Haverford College
Old Lancaster Rd
Penn Ave
Dayton Rd
Dayton Arc
Spruce Ave
Lee Ave
Montgomery Ave
Rose Ln
Sunset Ln
Booth Ln
Booth Cir
Orchard Ln
Greys Ln
Elbow Ln
Chestnold Ln
Little Ln
Glyntwynne Rd
Barrett Ave
Miller Ave
Manor Ave
Railroad Ave
Peelor Ave
Walnut Ln
Millbrook Ln
Hayes Ln
Orchard Rd
College Ave
Carter Rd
Penfield Rd
Rig Ave
Buck Ln
Township Rd
County Line Rd
Old Buck Ln
Lancaster Rd
Lapsley Rd
Station Rd
Haverford Station
Berkley Rd
Shelton Rd
Dryden Ln
Griffith Rd
College Ln
Wyoming Ave
Lockart Ave
Amesbury Rd
Duck Pond Ln
Holland Ave
Worcester Rd
Winsor Ln
Maison Pl
New Gulph Rd
Avon Rd
Paoli/Thorndale Line
US Hwy 30
0 200 400 600 800
Feet
Intersection Improvement
Recommended Pedestrian Improvement
Revitalization Opportunity
Wayfinding
Connector Street
DELAWARE VALLEY
dvrpc
REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.

Land Use Recommendations

1. Investigate potential locations for a municipal parking lot (or lots) to serve commercial properties in the Haverford Township portion of the sub-area.
2. Install wayfinding signage identifying the Haverford Station on the Paoli/Thorndale line.

Pedestrian Recommendations

1. Complete the sidewalk network by constructing or improving sidewalks along Lancaster Avenue between Penn Street and Martin Avenue and in the vicinity of Old Buck Lane and Old Lancaster Road as illustrated on the sub-area map.
2. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
   - Ensure that curb ramps and high visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Consider prohibiting right turns on red to reduce vehicle/pedestrian conflicts.
   - Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.

Transit Recommendations

1. Improve pedestrian access to the Haverford Rail Station (Paoli/Thorndale) by installing a crosswalk over Haverford Station Road near the station exit.
2. Improve automobile access to the Haverford Rail Station (Paoli/Thorndale).
   - Investigate opportunities for shared parking, including the feasibility of a parking structure, at the Haverford Square Shopping Center. Any analysis would need to consider railroad track area limitations and ROW concerns.

Intersection and Roadway Recommendations

1. Evaluate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.

Completing the sidewalk network will make the area more pedestrian-friendly.

Construction of left turn lanes may be possible at the Buck Lane intersection.

Striping the parking spaces will delineate the travel lanes and encourage drivers to park closer to the curb.

2. Simplify and clarify traffic control information for drivers in order to ensure that crucial information is highly visible.
   - Conduct a sign inventory; upgrade and consolidate essential signage, as appropriate, and eliminate all unnecessary signage
   - Provide continuity of traffic control devices between Lower Merion and Haverford townships (size and location of road name signs and mounting location of traffic signals). This will enable information to be found where drivers expect it.
3. Lancaster Avenue at Haverford Station Road
   - Consider restricting left turns at the intersection during peak hours (7 to 9 AM and 3 to 5 PM) in order to improve intersection operations during these times.
   - Explore the feasibility of constructing exclusive left-turn lanes at the intersection of Buck Lane and Lancaster Avenue to accommodate left turns at this alternate location.
4. Lancaster Avenue at Penn Street/Pennswood Road
   - Investigate adding an eastbound lead signal phase to allow left turns to be made before westbound through traffic receives a green signal indication.
   - Add exclusive left-turn lanes at Penn Street/Pennswood Road by removing on-street parking along the north side of Lancaster and striping left-turn lanes (similar to Old Lancaster/Lee Road intersection). This will enable turning vehicles to move out of the through traffic lanes while waiting to make the turn.
5. Lancaster Avenue between Penn Street/Pennswood Road and Old Lancaster Road
   - Delineate the parking along the south side of Lancaster Avenue in the area between Old Lancaster Road and Penn Street to reduce friction between parked vehicles and through traffic.

SECTION 5

SUB-AREA 7: BRYN MAWR

JURISDICTION: LOWER MERION TOWNSHIP
CONTEXT ZONE: SUBURBAN CENTER
EXTENTS: COUNTY LINE ROAD TO LEE AVENUE

The Bryn Mawr Sub-area stretches from Old Lancaster Road/Lee Avenue to County Line Road and includes the Bryn Mawr Station of the Paoli/Thorndale line, Bryn Mawr Hospital, Bryn Mawr College, and Harcum College. While commercial properties line much of Lancaster Avenue throughout this sub-area, the pedestrian-oriented village core of the commercial district is located between Bryn Mawr Avenue and Merion Avenue. County Line Road serves as the boundary between Lower Merion Township and Radnor Township.

Issues

- Traffic congestion and backups
- High vehicular speeds
- Pedestrian safety and comfort
- Lack of turn lanes at major intersections
- Access to rail stations and transit stops
- Drivers facing a large amount of visual information


FIGURE 5.10
SUB-AREA 7: BRYN MAWR
LOWER MERION
RADNOR
Rosemont
Roberts Road/Rosemont (NHSL)
Bryn Mawr
Bryn Mawr College
Shipley School
Baldwin School
Harcum College
Ludington Library
Bryn Mawr Hospital
See Figure 5.11 for simulation of this area
Paoli/Thorndale Line
Montgomery Ave
Lancaster Ave
Old Lancaster Rd
Conestoga Rd
Roberts Rd
Morris Ave
Merion Ave
Rosemont Ave
Windover Rd
Norwood Ave
Airdale Rd
Franklin St
Walnut St
Penn Rd
Prospect Ave
Summit Grove Ave
Central Ave
Elliott Ave
Yarrow Rd
Orchard Ln
Rednor St
Morris Ln
Town Rd
Lloyd Ave
Sammamish Ave
Bryn Mawr Ave
Charles Dr
Parking Lot
0 175 350 525 700
Feet
DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.
Intersection Improvement
Gateway or Visual Termination
Revitalization Opportunity
Connector Street
Recommended Pedestrian Improvement
Landmark
Wayfinding
Warning Signage

Land Use Recommendations

1. Install wayfinding signage identifying the Bryn Mawr Station of the Paoli/Thorndale line and destinations such as Bryn Mawr Hospital.
2. Encourage redevelopment of Municipal Lot 7. Any development of this site must be held to high design and use standards because of its prominent location. Future development should reinforce the character of a vibrant village center and incorporate ground floor retail on Lancaster and Bryn Mawr avenues. Currently the home of the Bryn Mawr Farmers Market, any redevelopment should consider accommodating this activity or finding a suitable alternative site.
3. Explore redevelopment options for the privately owned Verizon Building and accompanying large surface parking lot on the north side of Lancaster Avenue west of Merion Avenue.
4. Install gateway treatments at the intersection of Lancaster Avenue and Bryn Mawr Avenue in order to better distinguish the village center from adjacent areas.

Municipal Lot 7 at the intersection of Bryn Mawr Avenue and Lancaster Avenue.

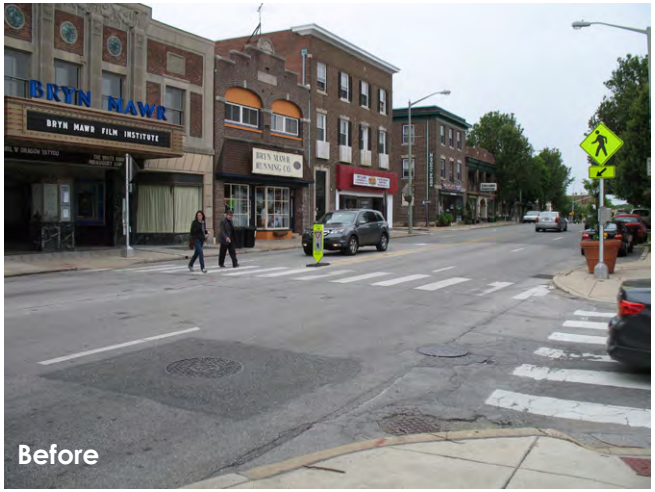
Pedestrian Recommendations

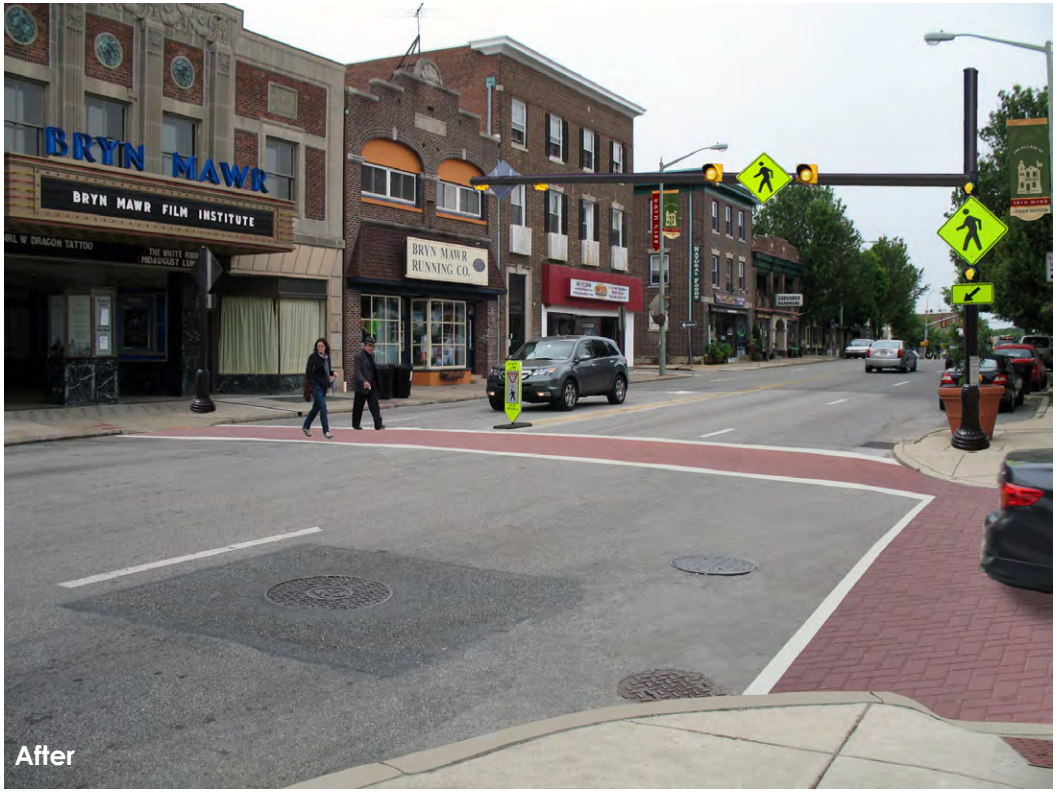
1. Streetscape improvements (sidewalks, street trees, pedestrian-scale lighting, and street furniture) should be considered along Lancaster Avenue for the area between Old Lancaster Road and a point approximately one block west as illustrated in the sub-area map.
2. Consider additional pedestrian amenities at key unsignalized intersections, such as the existing crosswalk locations at Prospect Avenue, Thomas Avenue, and Montrose Avenue to improve pedestrian circulation.
   - Install ADA-compliant curb ramps where they currently do not exist.
   - Install high-visibility crosswalk markings along with pedestrian warning sings (W11-2) and arrow plaques (W16-7P) where they currently do not exist.
3. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Consider prohibiting right turns on red to reduce vehicle/pedestrian conflicts.
   - Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.

Pedestrian warning signage will increase driver awareness of this crossing at Montrose Avenue.

Figure 5.11: Bryn Mawr Simulation

Installing an overhead pedestrian crossing system is one way to improve the safety of uncontrolled crosswalks such as this one near the Bryn Mawr Film Institute. Textured crosswalks and distinctive banners can also help improve the identity of commercial areas.





4. Lancaster Avenue at Morton Road (Bryn Mawr Film Institute)
    - Install side-mounted flashing yellow beacons (or rectangular rapid flashing beacons) along with overhead signage and beacons to the existing pedestrian warning signage to promote driver awareness of its location as illustrated in Figure 5.11. Because of its location, the design of the overhead mast arm should reflect the historic character of the Bryn Mawr Theater.
    - Install yield lines at least 20 feet in advance of the midblock crosswalk with "Yield Here To Pedestrians" (R1-5) signs at yield line locations.
    - A public outreach campaign should be a part of this recommendation to alert the public that they should yield at the yield line (in advance of the crosswalk) so that both lanes of approaching traffic are able to see crossing pedestrians.

Transit Recommendations

1. Improve pedestrian access to the Bryn Mawr Station on the Paoli/Thorndale line by installing a crosswalk at the north parking lot entrance and improving the underpass sidewalks and lighting.
2. Improve pedestrian access to the Rosemont Station (Paoli/Thorndale).
    - Install crosswalks along Airdale Road and Montrose Avenue adjacent to the rail station.
    - Complete the sidewalks along Montrose Avenue.

Intersection and Roadway Recommendations

1. Consolidate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
2. Simplify and clarify traffic control information for drivers in order to ensure that crucial information is highly visible.
    - Conduct a sign inventory; upgrade and consolidate essential signage, as appropriate, and eliminate all unnecessary signage.
3. Morris Avenue at Bryn Mawr Station ("Tango Tangle")
    - Install warning signage (W11-2 signs with W16-7P arrow plaques) and rumble strips to promote driver awareness of this pedestrian-crossing location.
    - Channelize traffic through the intersection and modify the area north of the station as proposed by Gannett Fleming in 2007.

Pedestrian improvements and traffic channelization will improve the safety of the "Tango Tangle."

SECTION 5

SUB-AREA 8: ROSEMONT

JURISDICTION: RADNOR TOWNSHIP
CONTEXT ZONE: SUBURBAN NEIGHBORHOOD
EXTENTS: BARLEY CONE LANE TO COUNTY LINE ROAD

The Rosemont Sub-Area is a largely residential neighborhood that spans from County Line Road to Barley Cone Lane. Although two multifamily buildings are located in the eastern portion of the sub-area, single-family homes on smaller lots are common throughout the neighborhood. This sub-area contains the Rosemont station of the Paoli/Thorndale Line and the Garret Hill station of the Norristown High Speed Line. Located at the intersection of Lancaster Avenue and Airdale Road, Unkefer Park acts as a gateway to Radnor Township.

Issues

- Traffic congestion
- High vehicle speeds
- Pedestrian safety and comfort
- Lack of turn lanes at major intersections
- Access to rails stations and transit stops
- Vehicular access management


FIGURE 5.12
SUB-AREA 8: ROSEMONT
Villanova Stadium
Stadium/ Ithan Ave (NHSL)
Rosemont College
LOWER MERION
RADNOR
Garrett Hill
Rosemont
Unkefer Park
To Garrett Hill
Intersection Improvement
Gateway or Visual Termination
Recommended Pedestrian Improvement
Connector Street
Wayfinding
0 130 260 390 520
Feet
DELAWARE VALLEY REGIONAL PLANNING COMMISSION

Land Use Recommendations

1. Install wayfinding signage identifying the Rosemont Station of the Paoli/Thorndale line.

Pedestrian Recommendations

1. Complete the sidewalk network by constructing or improving sidewalks along Lancaster Avenue in the areas highlighted on the sub-area map.
2. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.

Transit Recommendations

1. Improve pedestrian access to the Garrett Hill rail station (NHSL) by constructing and improving sidewalks along Eachus Avenue.

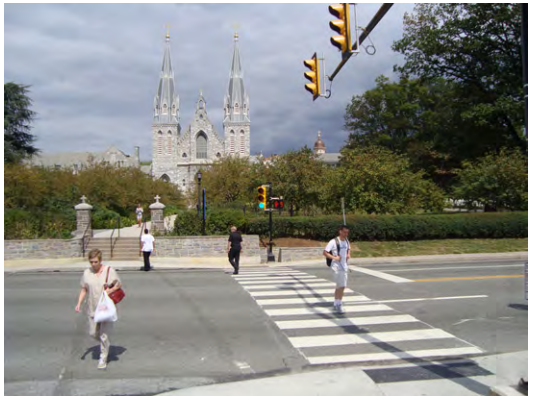
Intersection and Roadway Recommendations

1. Evaluate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
2. Lancaster Avenue at Airdale Road
   - Investigate the potential for adding a lead left-turn phase for eastbound traffic in the AM peak hour. This will ease delay for drivers accessing the Rosemont Station.

A lead left-turn phase will enable eastbound drivers to more easily make the turn at Airdale Road.

SECTION 5

SUB-AREA 9: VILLANOVA



JURISDICTION: RADNOR TOWNSHIP
CONTEXT ZONE: SUBURBAN NEIGHBORHOOD
EXTENTS: I-476 TO BARLEY CONE LANE

Sub-area 9 extends from Barley Cone Lane to I-476 and is influenced by the presence of Villanova University and its proximity to the interstate. While the majority of Villanova's campus lies on the north side of Lancaster Avenue, the university may be looking to redevelop its properties along the south side of US 30 in the future. Spring Mill Road/State Highway 320 is an important north-south connector street that serves to funnel local traffic to I-476. West of Spring Mill Road, a recently completed commercial development is located on the north side of Lancaster Avenue. Sub-area 9 contains the Villanova Station of the Paoli/Thorndale line as well as the Villanova and Stadium stations of the Norristown High Speed Line.

Issues

- Pedestrian safety and comfort
- Traffic congestion and backups
- High vehicular speeds
- Need for transportation demand management to reduce trips and make transit more appealing to students and staff at Villanova.

Lancaster Avenue at Ithan Avenue and Church Walk

- High volume of pedestrians crossing the roadway.
- Congestion during special events.


FIGURE 5.13
SUB-AREA 9: VILLANOVA
LOWER MERION
RADNOR
See Figures 5.15 and 5.16 for Intersection Illustrations
See Figure 5.14 for simulation of this area
Villanova
Villanova University
Villanova (NHSL)
Stadium/Ithan Ave (NHSL)
Norristown High Speed Line
Paoli/Thorndale Line
US Hwy 30
Lancaster Ave
Ithan Ave
Conestoga Rd
Woodstone Ln
Sproul Rd
Trinon Ln
Vassar Cir
Hillside Cir
Quaker Ln
Willowburn Rd
Kingsessing Rd
Raider Rd
Hillside Rd
Ashwood Rd
Kenilworth Rd
Station Way
County Line Rd
Eskridge Rd
Fairfax Rd
Old Oaks Rd
Buckingham Dr
Hawthorne Ln
Elsenhower Ln
Intersection Improvement
Gateway or Visual Termination
Revitalization Opportunity
Connector Street
Recommended Pedestrian Improvement
Landmark
Wayfinding
0 200 400 600 800
Feet
DELAWARE VALLEY REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.

Lancaster Avenue at PA 320 (Spring Mill Road/Sproul Road)

- Complex intersection of six approaches located adjacent to I-476, Villanova University, and Villanova Center.
- The intersection and surrounding area is the third-highest crash location in the corridor, with 67 crashes between 2004 and 2008.
- Forty-nine percent of the crashes were rear-end type crashes, while 34 percent were angle type crashes.
- The majority of the driver actions listed were distracted drivers, driving too fast for conditions, and tailgating.
- The two minor side streets call their phase for only one or two vehicles. This often occurs during each cycle in the peak hours.
- The area south of the intersection consists of a large number of cul-de-sacs that are accessible only from PA 320.

Large numbers of pedestrians cross Lancaster Avenue everyday near Villanova.

Land Use Recommendations

1. Install gateway treatments along Lancaster Avenue at Ithan Avenue and Spring Mill Road to help identify Villanova University as a distinct presence on the US 30 Corridor.
2. Coordinate with SEPTA to explore the possibility of branding and placemaking opportunities such as painting the NHSL overpass (depicted in Figure 5.14.).
3. Consider revising existing zoning regulations to allow the development of Villanova parcels south of Lancaster as described in the Villanova University Campus Master Plan. The Main and Pike parking lots (indicated with solid lines) represent near-term development opportunities, while the area between the Main Lot and Technical Services Building (indicated with dashed lines) represent longer-range development options.

Pedestrian Recommendations

1. Complete the sidewalk network by constructing or improving sidewalks along Lancaster Avenue, Spring Mill Road, and Aldwyn Lane as illustrated in the sub-area map.
2. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist. Extra wide, high-visibility

Figure 5.14: Villanova Simulation

The Norristown High Speed Line bridge over Lancaster Avenue near Villanova University near I-476 represents one of the corridor's many opportunities for placemaking treatments.

crosswalks should be installed, where they currently do not exist, at the intersections of Ithan Avenue and Church Walk to accommodate crossing of large groups of pedestrians.

- Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.

Transit Recommendations

1. Coordination between Villanova and SEPTA to explore transportation demand management options to encourage the use of carpooling, transit, and nonmotorized transportation to reduce the number of single-occupant vehicle trips to campus.
   - Continue and expand the Villanova commuter benefit plan.
   - Continue yearly evaluation of the Wildcat shuttle bus routes.
   - Consider increasing parking fees, reducing the number of parking spaces, and restricting parking by time of day to encourage transit use.
   - Consider implementing a discounted semester-based transit pass through SEPTAs university pass program, or a student fee that allows unlimited access to SEPTA using the Villanova Wildcard.

Intersection and Roadway Recommendations

1. Evaluate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
2. Lancaster Avenue at Ithan Avenue
   - Continue limiting egress from the parking areas between Church Walk and Ithan Avenue. A right-out-only drive from the main parking lot, as recommended in the *Campus Master Plan,* would help to reduce congestion during special events. Access from Ithan Avenue should also be restricted as noted in the plan. Construct full-in, right-out-only islands at the driveways from the Main and Pike parking lots onto Ithan Avenue. These modifications will improve circulation and safety along this stretch of roadway.
3. Lancaster Avenue at Church Walk
   - Limit access and egress from the parking areas west of Church Walk by consolidating driveways and providing shared access and parking, as noted in the campus master plan. These improvements, along with the pedestrian recommendations outlined above, will improve this multimodal connection between the parking area, the NHSL, and south campus.

A right-in, right-out access drive at the Villanova main parking lot would help alleviate congestion after special events.

An exclusive right-turn lane willl alleviate the queues along Spring Mill Road.

4. Lancaster Avenue at PA 320 (Spring Mill Road/Sproul Road)

- Add an exclusive southwest-bound right-turn lane to alleviate the queuing experienced along southbound Spring Mill Road.
- Permit left turns into the Villanova Center only at the signalized access drive and construct a concrete right-in, right-out island at the unsignalized driveway. This should improve circulation and alleviate some of the crashes occurring along the approaches to the PA 320 intersection.
- Explore options for reducing the intersection width and consider adding a pedestrian lead phase to the traffic signal phasing plan. This will make the intersection more pedestrian friendly and allow students and staff to easily access the Villanova Center.
- Modify egress from Fedigan Gate onto PA 320 by constructing a full-in, right-out-only island as noted in the *Villanova University Campus Master Plan*.
- Side Street Alternatives

  In order to increase safety and reduce the delay at this complex intersection, it is recommended that the side streets be eliminated from the traffic signal phasing. In order to accomplish this, it is recommended that access at Kenilworth Road be restricted to right-in, right-out operation. Two alternatives are discussed here for the treatment of Aldwyn Lane. See intersection illustrations, Figures 5.15 and 5.16.

  Alternative One: Realign Aldwyn Lane to the east in order to allow adequate sight distance for restricted access through right-in, right-out operation.

  Alternative Two: Reroute Aldwyn Lane to the southwest, along the NHSL, to create an unsignalized intersection with Sproul Road (PA 320). Add a second northeast-bound exclusive left-turn lane and an exclusive southwest-bound right-turn lane. Reconfigure the Sovereign Bank building lots (owned by Villanova), including relocating parking currently along Sproul Road to the east side of the building and allowing shared parking and access via Sproul Road. This allows the lanes of PA 320 to be more aligned through the intersection and to have all the Villanova property contiguous for potential development if desired in the very long-term future. Modify the northeast left-turn phase to protected-only operation.

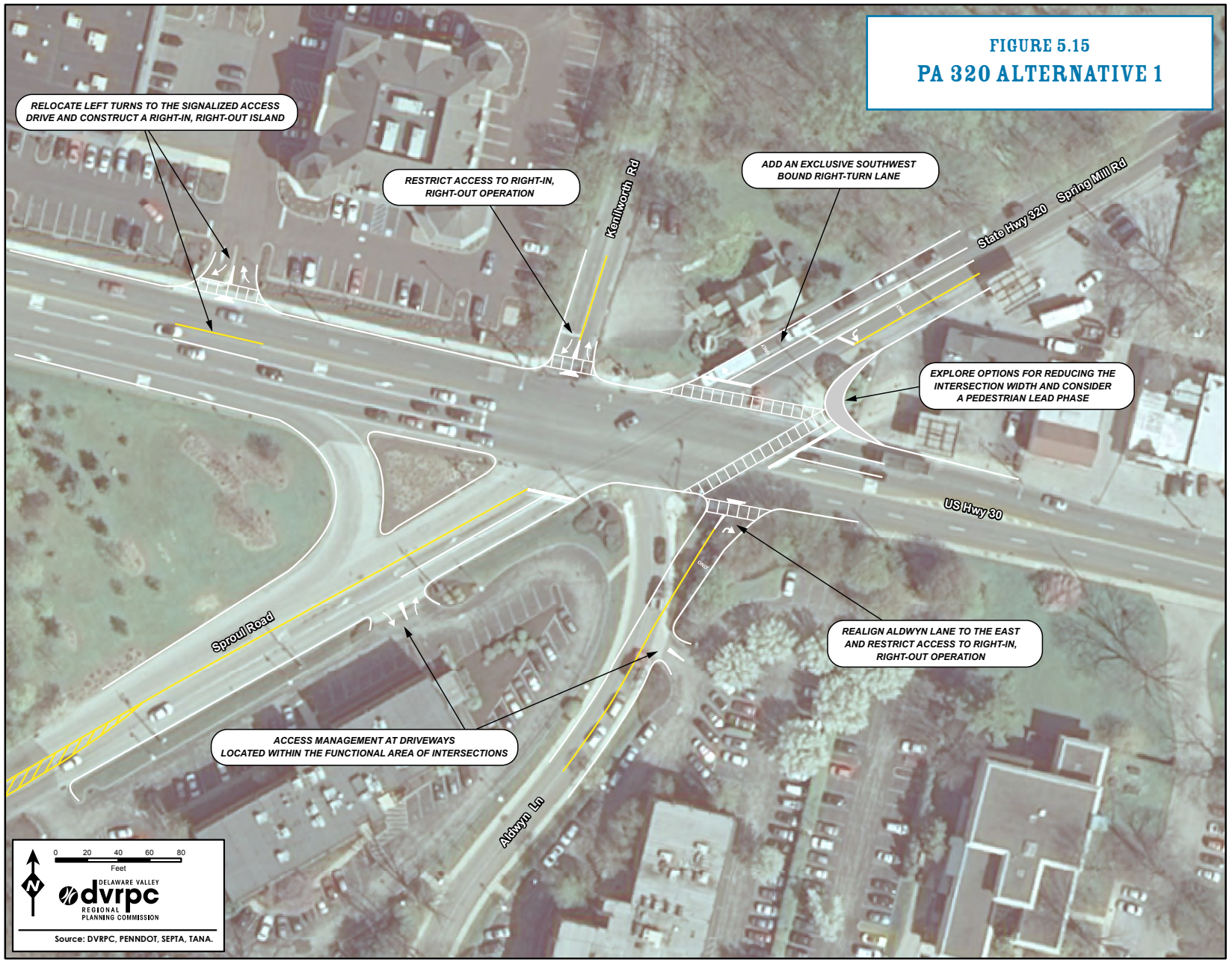
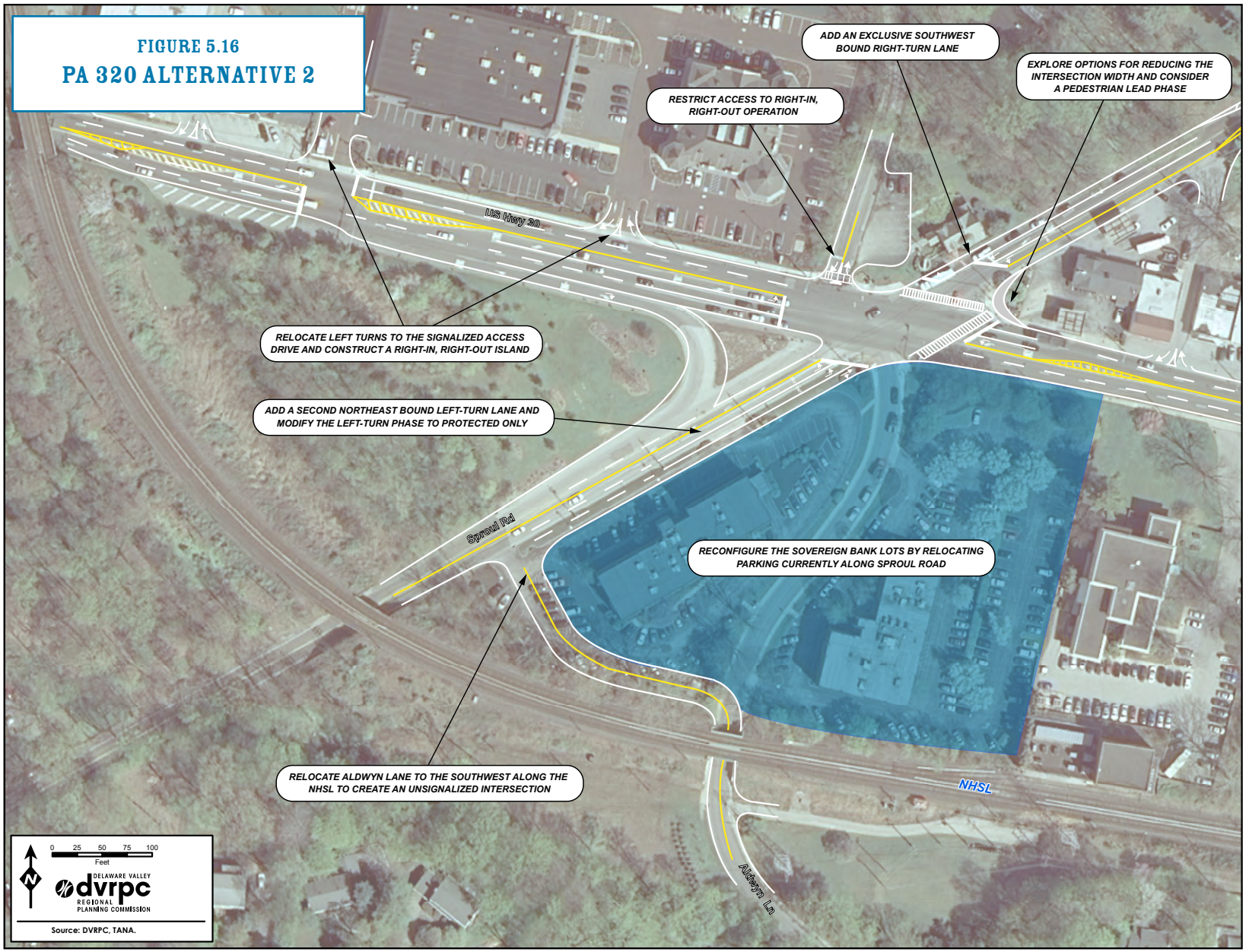


FIGURE 5.15
PA 320 ALTERNATIVE 1
RELOCATE LEFT TURNS TO THE SIGNALIZED ACCESS DRIVE AND CONSTRUCT A RIGHT-IN, RIGHT-OUT ISLAND
RESTRICT ACCESS TO RIGHT-IN, RIGHT-OUT OPERATION
ADD AN EXCLUSIVE SOUTHWEST BOUND RIGHT-TURN LANE
EXPLORE OPTIONS FOR REDUCING THE INTERSECTION WIDTH AND CONSIDER A PEDESTRIAN LEAD PHASE
REALIGN ALDWYN LANE TO THE EAST AND RESTRICT ACCESS TO RIGHT-IN, RIGHT-OUT OPERATION
ACCESS MANAGEMENT AT DRIVEWAYS LOCATED WITHIN THE FUNCTIONAL AREA OF INTERSECTIONS
Kenilworth Rd
State Hwy 320
Spring Mill Rd
US Hwy 30
Sproul Road
Aldwyn Ln
0 20 40 60 80
Feet
DELAWARE VALLEY
dvrpc
REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.

FIGURE 5.16
PA 320 ALTERNATIVE 2



SECTION 5

SUB-AREA 10: RADNOR

JURISDICTION: RADNOR TOWNSHIP
CONTEXT ZONE: SUBURBAN CORRIDOR
EXTENTS: ST. DAVIDS SQUARE TO I-476

The Radnor Sub-area runs from I-476 to St. Davids Square, a large shopping center on the south side of Lancaster Avenue. The sub-area is dominated by the Radnor High School and its athletic fields as well as a large commercial office complex bounded by Lancaster Avenue and Radnor Chester Road. In this area, King of Prussia Road and Radnor Chester Road serve as critical north-south connector streets which provide access to the Radnor Station of the Paoli/Thorndale line.

Issues

- Traffic congestion and backups
- High vehicular speeds
- Pedestrian safety and comfort
- Vehicular access management

Lancaster Avenue at Radnor Chester Road

- This intersection is the fourth-highest crash location in the corridor with 56 crashes between 2004 and 2008.
- Angle type crashes accounted for 54 percent of the total, while rear-end crashes accounted for 23 percent.
- The angle crashes were most often attributed to improper or careless turns or running red light while the rear-end crashes were often attributed to distracted drivers and tailgating.

Lancaster Avenue at St. Davids Square

- There are no pedestrian connections across Lancaster Avenue; Radnor Chester Road is the nearest safe crossing location.


FIGURE 5.17
SUB-AREA 10: RADNOR
St. Davids
Radnor
Radnor (NHSL)
Lincoln Financial Group
The Radnor Hotel
St. Davids Square
Radnor High School
Encke Park
RADNOR
Radnor Trail
Fault Thorndale Line
Glenmary Rd
Gypsy Ln
Chamounix Rd
Fillmore Rd
Cambridge Dr
US Hwy 30
St Davids Park Dr
St Davids Rd
St Midland Cir
Radnor Chester Rd
Radnor Way
King of Prussia Rd
Chilton Way
Rajah Rd
Creek Dr
Shiloh Dr
Chew Ln
Ivon Ave
Eastern
30
476
Hillside Cir
Highfield Rd
Willowburn Rd
Quaker Ln
0 200 400 600 800
Feet
N
DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.
Intersection Improvement
Connector Street
Wayfinding
Recommended Pedestrian Improvement

Environmental Recommendations

1. Explore the potential for streambank restoration along the Darby Creek where it crosses through Encke Park to prevent further erosion at this location.

Land Use Recommendations

1. Improve wayfinding signage to the Radnor Station of the Paoli/Thorndale line and the NHSL along Lancaster Avenue, Radnor Chester Road, and King of Prussia Road as appropriate.

Pedestrian Recommendations

1. Complete the sidewalk network by constructing or improving sidewalks along Lancaster Avenue in the areas highlighted on the sub-area map.
2. Explore opportunities to better connect the Radnor Station of the Paoli/Thorndale line to adjacent commercial development. Distinctive pedestrian walkways through the large parking fields can create a safe and effective connection between office buildings and existing sidewalks.
3. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
    - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
    - Upgrade pedestrian signal timing to ensure that new MUTCD requirements for walking speed are met.

Transit Recommendations

1. Improve pedestrian access to the Radnor Station (NHSL) by installing a crosswalk across King of Prussia Road.
2. Improve automobile access to the Radnor Station (NHSL).
    - Investigate opportunities for shared parking at the office complexes adjacent to the rail station.

Designated pedestrian walkways can help improve connections betwen the Radnor Station and nearby office developments.

Intersection and Roadway Recommendations

1. Consolidate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
2. Explore the possibility of reducing lane widths in this section of Lancaster Avenue from 12 to 11-feet. This would allow a shoulder area to serve as a pedestrian buffer and potentially reduce operating speeds.
3. Lancaster Avenue at Radnor Chester Road
   - Configure the Sinkler Building driveway as a right-in-only access to reduce conflicts in the functional area of the intersection.
   - Install lane control arrows on the northbound approach of Radnor Chester Road to clarify the lane usage.
4. Lancaster Avenue at St. Davids Square
   - Reconfigure the driveway lanes to accommodate a pedestrian refuge area at the continuous right-turn toward the Lincoln Financial Corporation (west and east drives). Install pedestrian bump outs within the existing shoulder/right-turn lane width to provide pedestrians with shorter crossing distances. Bump outs should be installed at the southeast corners of both drives and at the northwest corner of the east drive.

SECTION 5

SUB-AREA 11: ST. DAVIDS

JURISDICTION: RADNOR TOWNSHIP
CONTEXT ZONE: SUBURBAN CORRIDOR
EXTENTS: ABERDEEN AVENUE TO ST. DAVIDS SQUARE

Sub-area 11 extends from the St. Davids Square Shopping Center to Aberdeen Avenue. In this area, Lancaster Avenue includes a mix of residential, small office, and commercial uses. Chamounix Road serves as a critical north-south connector street, which links residential areas north and south of US 30. The St. Davids Sub-area is home to the St. Davids station of the Paoli/Thorndale Line as well as St. Davids Community Park, one of the few public green spaces that front directly onto Lancaster Avenue within the study area.

Issues

- Traffic congestion and backups
- High vehicular speeds
- Pedestrian safety and comfort
- Lack of turn lanes at major intersections
- Access to rails stations and transit stops
- Vehicular access management

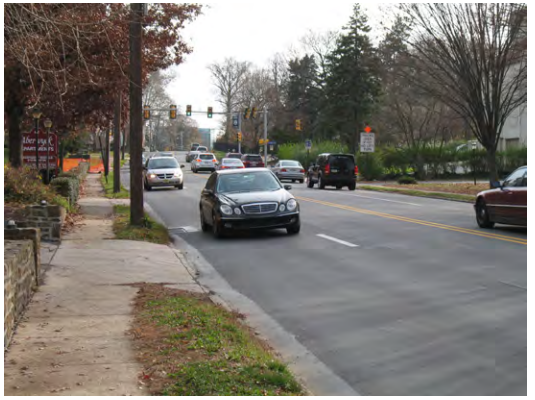



FIGURE 5.18
SUB-AREA 11: ST. DAVIDS
To Eastern College
RADNOR
Acme
Pembroke North
St. Davids
Paoli/ Thorndale Line
See Figure 5.19 for Intersection Illustration
St. Davids Community Park
St. Davids Square
The Radnor Hotel
US Hwy 30
St Davids Park Dr
Saint Davids Ave
Pennsylvania Ave
Chamounix Rd
Midland Ave
Midland Cir
Pembroke Ave
Saint Davids Rd
Aberdeen Ave
Upland Way
Radnor Chester Rd
Iven Ave
0 150 300 450 600
Feet
DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.
Intersection Improvement
Recommended Pedestrian Improvement
Revitalization Opportunity
Wayfinding
Connector Street

Land Use Recommendations

1. Install wayfinding signage identifying the St. Davids Station of the Paoli/Thorndale line.
2. Explore long-term opportunities for redevelopment or redesign of the Acme property east of Aberdeen Avenue. New buildings and a parking configuration should enhance the pedestrian environment along Lancaster Avenue.

Pedestrian Recommendations

1. Complete the sidewalk network by constructing or improving sidewalk along Lancaster Avenue and Chamounix Road in the areas highlighted on the sub-area map.
2. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.

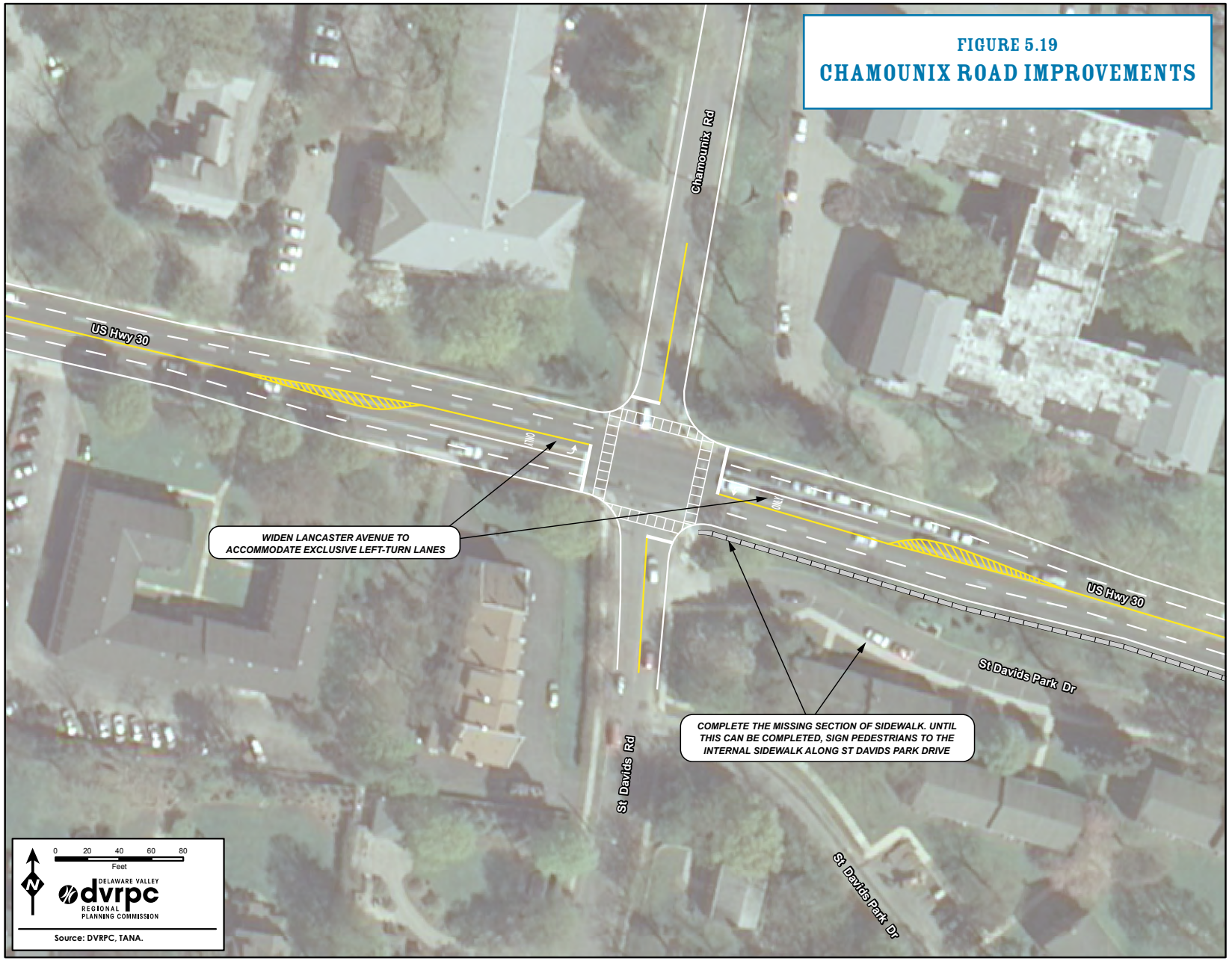
Intersection and Roadway Recommendations

1. Consolidate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points, especially in the western portion of the sub-area.
2. Lancaster Avenue at Chamounix Road/St Davids Road
   - Widen Lancaster Avenue to accommodate 10-foot wide left-turn lanes at the intersection. This would require widening of approximately five feet on each side of the roadway. This will enable turning vehicles to move out of the through traffic lanes while waiting to make the turn. See intersection illustration, Figure 5.19

The lack of sidewalk along Lancaster Avenue, between Chamounix Road and St. Davids Park Drive, hampers pedestrian mobility.

Path leading to Eastern University from Chamounix Road.

FIGURE 5.19
CHAMOUNIX ROAD IMPROVEMENTS



SECTION 5

SUB-AREA 12: WAYNE

JURISDICTION: RADNOR TOWNSHIP
CONTEXT ZONE: TOWN CENTER
EXTENTS: BANBURY WAY TO ABERDEEN AVENUE

The Wayne Sub-area extends from Aberdeen Avenue to Bloomingdale Avenue/Banbury Way and includes the downtown Wayne Business District and portions of three historic districts. Although similar in many ways to Ardmore and Bryn Mawr, Wayne has the most established town center context of any sub-area along the corridor. The business district is home to a wide variety of retail shops, restaurants, commercial properties, and community uses on Lancaster Avenue and North and South Wayne Avenues. The Wayne Station of the Paoli/Thorndale line is in the northern portion of the business district off of North Wayne Avenue.

Issues

- Traffic congestion and backups
- High vehicular speeds
- Pedestrian safety and comfort
- Angle parking areas adjacent to travel lanes
- Vehicular access management

Lancaster Avenue at Aberdeen Avenue

- This intersection is the sixth-highest crash location along the corridor, with 49 crashes occurring between 2004 and 2008.
- Sixty-one percent of the crashes were angle type crashes, while 25 percent were rear-end type crashes.
- Nearly half of the angle crashes were attributed to improper or careless turns.


FIGURE 5.20
SUB-AREA 12: WAYNE
RADNOR
Paoli/Thorndale Line
Wayne
West Ave
Station Rd
See Figure 5.21 for simulation of this area
Wawa
US Hwy 30
Post Office
Sunoco
Radnor Middle School
School Ln
Louella Ave
Midland Ave
Windermere Ave
Wayne Ave
Aberdeen Ave
Pennsylvania Ave
Bellevue Ave
Banbury Way
Francis Ave
Windsor Ave
Lenoir Ave
Eagle Rd
Gravel Dr
Overhill Rd
Oak Ln
Walnut Ave
Woodland Ave
Plant Ave
Aberdeen Ter
Saint Davids Ave
Louella Ct
Waynewood Rd
Kramer Rd
0 125 250 375 500
Feet
N
DELAWARE VALLEY
dvrpc
REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.
Intersection Improvement
Gateway or Visual Termination
Revitalization Opportunity
Connector Street
Recommended Pedestrian Improvement
Landmark
Wayfinding
Parking Reconfiguration

Lancaster Avenue at Banbury Way/Bloomingdale Avenue

- This intersection is the ninth-highest crash location along the corridor, with 31 crashes occurring between 2004 and 2008.
- Angle type crashes accounted for 45 percent of the crash total, while 29 percent were hit-fixed-object-type crashes.
- The majority of the angle crashes were attributed to improper/careless turns, mostly by vehicles traveling southbound or westbound attempting to make left turns.

Land Use Recommendations

1. Enhance western gateway to downtown Wayne at Bloomingdale Avenue/Banbury Way and Lancaster Avenue and develop gateway treatment for eastern gateway at Aberdeen Avenue and Lancaster Avenue.
2. Explore potential for mixed-use, transit-oriented development near the Wayne Station of the Paoli/Thorndale line. Any future development could incorporate structured parking designed to serve the larger Wayne Business District.
3. Improve the physical appearance and pedestrian environment of North Wayne Avenue by installing a planted median with distinctive pedestrian crossing as illustrated in Figure 5.21.

Pedestrian Recommendations

1. Improve sidewalk continuity along Lancaster Avenue throughout the business district by constructing or improving sidewalks in the areas highlighted on the sub-area map.
2. Consider pedestrian amenities at key unsignalized intersections, such as Lancaster Avenue and Bellevue Avenue, to improve pedestrian circulation.
   - Install curb ramps where they currently do not exist.
   - Install high-visibility crosswalk markings, along with pedestrian warning sings (W11-2), and arrow plaques (W16-7P) to draw driver attention to the crossing location.

Restaurants and shops line North Wayne Avenue.

Large curb cuts interrupt Wayne's sidewalk network.

Figure 5.21: Wayne Simulation

Downtown Wayne is already a successful town center. However, improving the aesthetic and pedestrian experience along North Wayne Avenue can make this area even more inviting.

3. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Consider prohibiting right-turns on red to reduce vehicle/pedestrian conflicts.
   - Upgrade pedestrian signal timing to ensure that new MUTCD requirements for walking speed are met.

Intersection and Roadway Recommendations

1. Consolidate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points.
2. Consider back-in angle parking for areas with pull-in angle parking. Back-in angle parking can ease friction and reduce conflicts between through traffic and vehicles making parking maneuvers. Areas for consideration include:
   - North and south sides of Lancaster Avenue from a point just east of Louella Drive to Waynewood Road;
   - South side of Lancaster Avenue between Louella Avenue and Wayne Avenue; and
   - A few spaces along the south side of Lancaster Avenue just west of Wayne Avenue.
3. Simplify and clarify traffic control information for drivers.
   - Conduct a sign inventory; eliminate all unnecessary signage and upgrade existing signage
4. Lancaster Avenue at Aberdeen Avenue
   - Make traffic signal indications on the north and south approaches more clearly visible to drivers. Consider upgrading the side-mounted traffic signals to mast arm mounted signals with backplates.
5. Lancaster Avenue at Banbury Way/Bloomingdale Avenue
   - Place pavement markings along the curbs of the channelized northbound right-turn lane island to increase its visibility. Explore the possibility of relocating the westbound stop bars closer to the intersection to better align left-turning vehicles onto northbound Bloomingdale Avenue. Install centerline markings along Banbury Way north of US 30.

Conflicts between drivers and parkers are not uncommon along this stretch of Lancaster Avenue.

SECTION 5

SUB-AREA 13: STRAFFORD

JURISDICTION: RADNOR TOWNSHIP
CONTEXT ZONE: SUBURBAN CORRIDOR
EXTENTS: OLD EAGLE SCHOOL WAY TO BANBURY WAY

Sub-area 13 extends from Banbury Way to Old Eagle School Road near the boundary between Radnor Township and Tredyffrin Township. The westernmost sub-area, Strafford is primarily a mix of shopping centers and strip commercial development including the Eagle Shopping Center and Lancaster County Farmers Market. The Strafford Station of the Paoli/Thorndale line is located roughly a quarter mile north of Lancaster Avenue on Old Eagle School Road.

Issues

- Traffic congestion and backups
- High vehicular speeds
- Pedestrian safety and comfort
- Angle parking areas adjacent to travel lanes
- Vehicular access management
- Access to rail stations and transit stops

Old Eagle School Road between Fairfield Lane and Forrest Lane

- The Our Lady of the Assumption Church parking serves as the Strafford Station's parking area during the weekdays. There is no continuous sidewalk on the west side of Old Eagle School Road linking the rail station and the parking area, so pedestrians must cross midblock from the parking area to the sidewalk along the east side of Old Eagle School Road.


FIGURE 5.22
SUB-AREA 13: STRAFFORD
TREDYFFRIN
RADNOR
Strafford
See Figure 5.23 for Intersection Illustration
Eagle Village Shops
Lancaster County Farmers Market
Wawa
AT&T
US Hwy 30
Intersection Improvement
Gateway or Visual Termination
Revitalization Opportunity
Connector Street
Recommended Pedestrian Improvement
Landmark
Wayfinding
Open Space Opportunity
Parking Reconfiguration
0 150 300 450 600
Feet
DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.

Land Use Recommendations

1. Consider redesigning the shopping center that includes the Lancaster County Farmers Market near Lancaster Avenue and Eagle Road. The market is a valuable amenity for the community and redesigning this property and the adjacent strip commercial development can enhance this unique destination, while improving vehicle and pedestrian access to the site.
2. Install wayfinding signage identifying Strafford Station of the Paoli/Thorndale line.
3. Explore opportunities to convert existing open spaces into publicly accessible park space. A candidate is the open space adjacent to Citizen's Bank on Lancaster Avenue.

Pedestrian Recommendations

1. Complete the sidewalk network by constructing or improving sidewalks along Lancaster Avenue and Eagle Road as illustrated in the sub-area map.
2. Install pedestrian amenities at all signalized intersections along Lancaster Avenue.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.

Intersection and Roadway Recommendations

1. Evaluate the number and location of access driveways that are located within the functional area of the intersections along Lancaster Avenue to minimize conflict points. Apply shared access and parking through the rear of businesses, as feasible, in the area south of Lancaster Avenue between Conestoga Road and Old Sugartown Road.
2. Consider back-in angle parking for areas with pull-in angle parking. Back-in angle parking can ease friction and reduce conflicts between through traffic and vehicles making parking maneuvers. Areas for consideration include:
   - North side of Lancaster Avenue between Old Sugartown Road and Sugartown Road.

The Lancaster County Farmers Market is open three days a week.

Parking for the Strafford Station is located south along Old Eagle School Road.

3. Old Eagle School Road between Fairfield Lane and Forrest Lane

   - Install a planted median pedestrian refuge to create a crossing area between the parking area and Our Lady of the Assumption Church, as illustrated in figure 5.23. This will serve both parishioners and transit riders.
   - Install pedestrian warning signs (W11-2) with advance location plaques (W16-9P) to alert drivers of the pedestrian crossing location.
   - Prohibit on-street parking in the area of the crossing in order to make pedestrians entering the crossing more visible to drivers.
   - Stripe an edge line on the east side of Old Eagle School Road separating the on-street parking from the through lanes. This will visually narrow the travel lane and potentially reduce vehicle speeds.

FIGURE 5.23

OLD EAGLE SCHOOL ROAD IMPROVEMENTS

SECTION 5

SUB-AREA 14: HAVERFORD ROAD

JURISDICTION: HAVERFORD TOWNSHIP
CONTEXT ZONE: SUBURBAN NEIGHBORHOOD
EXTENTS: BUCK LANE TO KARAKUNG DRIVE

Sub-area 14 is the only sub-area not centered on US 30. Instead, the Haverford Road Sub-area focuses on a section of Haverford Road from Karakung Drive to Buck Lane in Haverford Township. This roughly 1.6 mile stretch of roadway parallels the Norristown High Speed Line and includes four stations: Wynnewood Road, Ardmore Junction, Ardmore Junction, and Haverford. Haverford College through this section includes a mix of auto-oriented commercial uses and residential areas. The sub-area is also home to the Merion Golf Club and Haverford College.

Issues

- Pedestrian safety and comfort
- High vehicular speeds
- Traffic congestion and backups
- Vehicular access management
- Access to rail stations and transit stops

Environmental Recommendations

1. Explore the potential for streambank restoration along Cobbs Creek in the Merion Golf Club. This could be done by designating a no-mow buffer zone along the streambank to allow grasses to grow and help protect the water quality of Cobbs Creek.
2. Explore the potential for putting stormwater BMPs such as a rain garden or cistern into place for streambank protection where the parking lot runoff enters the stream at the Karakung Little League field.


FIGURE 5.24
SUB-AREA 14: HAVERFORD ROAD
HAVERFORD
LOWER MERION
Haverford (NHSL)
Haverford College
Ardmore Avenue
Ardmore Junction
Wynnewood Road
Ardmore
Merion Golf CLub
South Ardmore Park
See Figure 5.25 for simulation of this area
Intersection Improvement
Gateway or Visual Termination
Revitalization Opportunity
Connector Street
Recommended Pedestrian Improvement
Warning Signage
Wayfinding
0 400 800 1,200 1,600
Feet
DELAWARE VALLEY REGIONAL PLANNING COMMISSION
Source: DVRPC, PENNDOT, SEPTA, TANA.

3. Investigate the possibility of creating wetlands along Cobbs Creek along Haverford Road in the area between the Haverford and Ardmore Avenue stations of the NHSL.

Land Use Recommendations

1. Install wayfinding signage to the NHSL stations along Haverford Road.
2. Explore redevelopment opportunities near the Ardmore Junction Station of the NHSL. The existing convenience store and car wash properties at Lancaster Avenue and Hathaway Lane may be an appropriate site for transit-oriented development.
3. Develop gateway treatments for the intersections of Haverford Road at Karakung Drive and Haverford Road at Hathaway Lane to better define the entrance to the Haverford Road Commercial District.
4. Continue to implement design guidelines contained in the Haverford Township Comprehensive Plan Addendum which provide a long-term vision for the Haverford Road as a mixed-use and multimodal corridor that capitalizes on its proximity to the NHSL. A simulation of this long-term vision is shown in Figure 5.25.

Pedestrian Recommendations

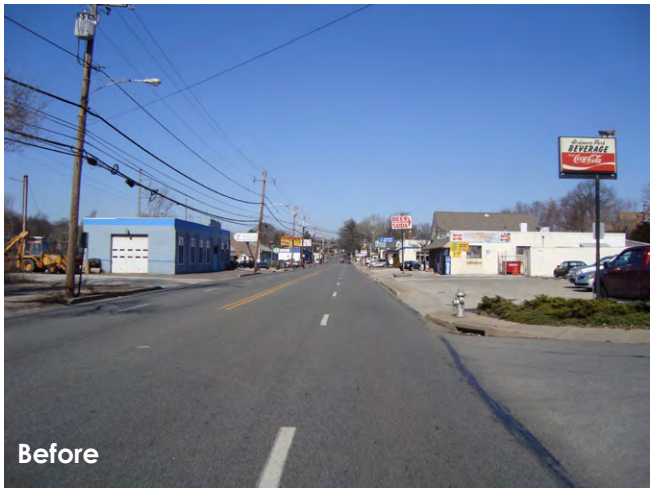
1. Complete the sidewalk network by constructing or improving sidewalks along Haverford Road and Ardmore Avenue as illustrated in the sub-area map.
2. Install pedestrian amenities at all signalized intersections along Haverford Road.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist.
   - Upgrade pedestrian signal timing to ensure that new MUTCD requirements for walking speed are met.
3. Haverford Road at Hathaway Lane (SEPTA private busway)
   - Install warning signage and overhead flashing yellow beacons at this existing midblock crosswalk (W11-2 signs with W16-7P arrow plaques) to promote driver awareness of its location.

Pedestrians encounter numerous obstacles near the Wynnewwod Road NHSL Station.

Haverford Road near Lorraine Avenue.

Figure 5.25: Haverford Road Simulation

The long term vision for Haverford Road includes making the corridor more attractive and functional for all modes of transportation. This simulation illustrates how a continuous street wall, edge treatments, street trees, and paving materials can help transform the corridor.



- Install yield lines at least 20 feet in advance of the midblock crosswalk with "Yield Here To Pedestrians" (R1-5) signs at yield line locations. A public outreach campaign should accompany this recommendation to alert the driving public that they should yield at the yield line (in advance of the crosswalk) so that both lanes of approaching traffic are able to see crossing pedestrians.

4. Haverford Road at Ardmore Avenue
    - Enlarge the island area around the "Christmas Tree" and incorporate ADA-compliant curb ramps to accommodate pedestrians as they wait to cross Haverford Road toward the Ardmore Avenue NHSL station.
    - Install warning signage along Ardmore Avenue to warn drivers of the high pedestrian activity in the vicinity of the Haverford Road and Ardmore Avenue intersection. Pedestrian warning signs (W11-2) and advance location plaques (W16-9P) should be installed.

Transit Recommendations

1. Improve access to the Ardmore Junction Station (NHSL)
    - Improve pedestrian access between the eastbound and westbound platforms. Install "Pedestrian Route" signage with arrows to direct pedestrians to the Hathaway Avenue underpass.
    - Consider adding signalization and detection to allow SEPTA buses to more easily cross Haverford Road at the Ardmore Junction Station. Such a project will require coordination among SEPTA, PennDOT, and Haverford Township.

Intersection and Roadway Recommendations

1. Consolidate the number and location of access driveways that are located within the functional area of the intersections along Haverford Road to minimize conflict points. Areas for consideration should include the commercial areas on either end of the sub-area.
2. Haverford Road at Ardmore Avenue
    - Adjust the location of the stop bars for the southbound Ardmore Avenue approach to ease the right-turn movement from westbound Haverford Road, which is currently difficult to maneuver.
    - Reconfigure the intersection island around the "Christmas Tree" to channelize traffic and accommodate pedestrian amenities as illustrated in Figure 5.26.

FIGURE 5.26
ARDMORE AVENUE IMPROVEMENTS

SECTION 5

OTHER AREAS OF STUDY

In addition to the corridor sub-areas, three additional areas were studied as part of the US 30 Corridor. One of these areas is the Borough of Narberth, which lies just north of Lancaster Avenue and is a stop on the Paoli/Thorndale Regional Rail Line. The other two areas include portions of major roadways that parallel Lancaster Avenue, and therefore serve as alternate routes. In the central portion of the Study Area, Montgomery Avenue links the eastern and western portions of Lower Merion, connecting Villanova and Bala Cynwyd. Conestoga Road lies in the western third of the Study Area, and connects Wayne with Haverford Road and Bryn Mawr.

NARBERTH

Issues

- The major roadway connection between Narberth and Wynnewood is made via a historic railroad tunnel that is not pedestrian-friendly. The existing sidewalk in the tunnel is approximately three-feet wide.
- The area provides access to the Narberth playground and the Narberth rail Station.
- A secondary connection is made (especially to the playground ball fields) via the Thomas Wynne Pathway to the Wynnewood rail station.
- High vehicular speeds
- Pedestrian safety and comfort
- Access to rails stations and transit stops

The historic rail turnnel is not pedestrian-friendly due to the narrow sidewalk.

Pedestrians frequently cross Wynnewood Avenue mid-block to access the Thomas Wynne path.

Adding edge lines will visually narrow the wide roadway and delineate the parking area at the playground.

Pedestrian Recommendations

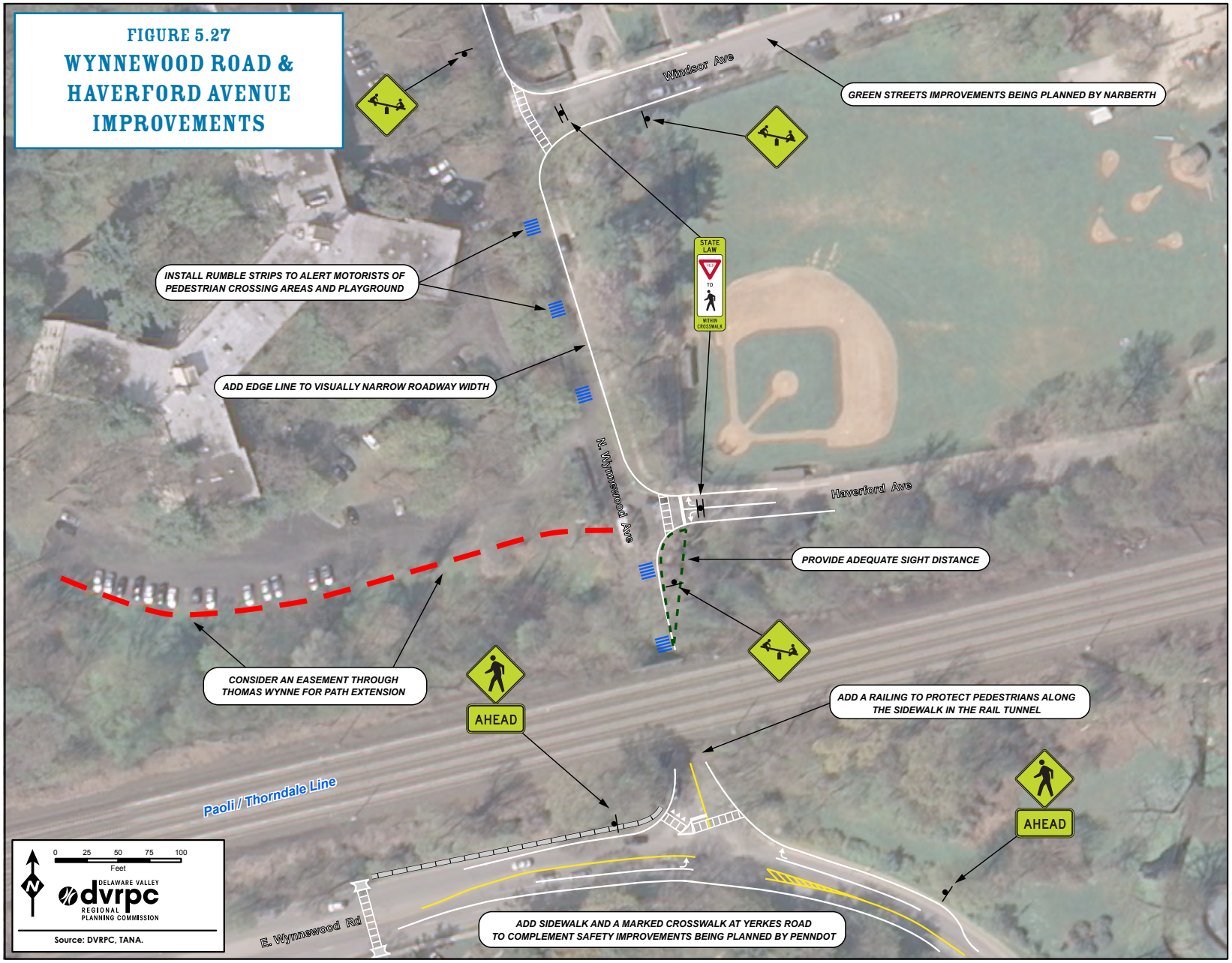
1. Install pedestrian amenities at key unsignalized intersections to improve pedestrian circulation.
   - Upgrade pavement markings at the intersection areas to include high visibility crosswalk markings with in-roadway warning signs (R1-6) at the intersections of Haverford Avenue and Windsor Avenue with North Wynnewood Avenue, as illustrated on Figure 5.27.
   - Install pavement markings or rumble strips and playground warning signs (W15-1) to reduce speeds and alert drivers to the playground area and potential pedestrians crossing the roadway. Upgrade the existing playground warning signs along Windsor Avenue.
   - Consider installing a railing along the sidewalk in the railroad tunnel to separate vehicles and pedestrians.
   - In the longer term, consider upgrading the sidewalks and crosswalks in the playground area with textured concrete or other treatment similar to the pavement treatment in the Narberth Station Circle area. Textured pavement along the entire width of North Wynnewood Avenue between Haverford Avenue and Windsor Avenue should also be considered. Additional areas for consideration include installation of pedestrian scale lighting in the playground area similar to the lighting in the Narberth Station Circle area and an easement through the Thomas Wynne property for an extension of the pathway leading to the Wynnewood rail station.
2. Consider an easement through the Thomas Wynne to formalize the path between the Wynnewood Station and Narberth.

Intersection and Roadway Recommendations

1. North Wynnewood Avenue at Haverford Avenue/Windsor Avenue (Narberth Playground Area)
   - Stripe an edge line on the east side of N. Wynnewood Avenue separating the parking area and visually narrowing the travel lane to reduce vehicle speeds.
   - Maintain and trim vegetation in the area of the railroad tunnel continuously to provide adequate sight distance for drivers exiting Haverford Avenue.
2. North Wynnewood Avenue at East Wynnewood Road
   - Upgrade the pavement markings at the unsignalized intersection of North Wynnewood Avenue and East Wynnewood Road to include yield lines for the southbound right-turn toward the Wynnewood Shopping Center.

- Install curb ramps and crosswalk marking across North Wynnewood Avenue to alert drivers traveling southbound of the pedestrian crossing location at the intersection.
- Consider installing a marked crosswalk at the intersection of North Wynnewood Avenue and Yerkes Road to complement the roadway safety improvements being planned by PennDOT. Install sidewalk, curb ramps, and crosswalk markings along with pedestrian warning signs (W11-2) and advance location plaques (W16-9P) with flashing beacons to alert drivers of the pedestrian crossing location.

FIGURE 5.27
WYNNEWOOD ROAD & HAVERFORD AVENUE IMPROVEMENTS



CONESTOGA ROAD

Issues

- High vehicular speeds
- Pedestrian safety and comfort
- Some recommendations from DVRPC's *Conestoga Road- Road Safety Audit* published in June 2007 have not yet been implemented.

Conestoga Road at Lancaster Avenue

- There are stairs located at the southeast corner of the intersection, which present a challenge for the disabled.
- The crosswalk on the east side of the intersection is extremely long due to the intersection skew.
- The sweeping curve from eastbound approach of Lancaster Avenue to eastbound Conestoga Road allows vehicles to make the right turn at high speeds.
- The pavement markings are faded and the street name signs are not visible.

Conestoga Road at Church Road/Aberdeen Avenue/Iven Avenue

- The complex five-leg intersection is confusing for drivers.
- The signal heads are mounted too high over Aberdeen Avenue.
- There is no delineation or roadway separation between Aberdeen Avenue and Iven Avenue.
- The traffic signal is not visible to drivers on the Conestoga Road approaches due to the curve of the roadway.

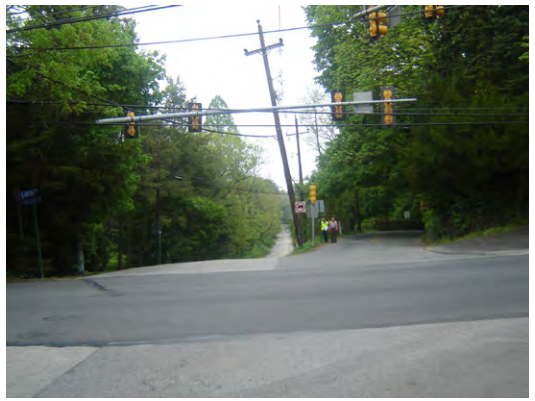
Conestoga Road at Radnor Chester Road

- There is a rear-end crash problem along the eastbound approach of Conestoga Road.
- The traffic signals are side-mounted at the intersection, making them less visible to drivers.
- Pavement markings at the intersection are faded.

Conestoga Road at Roberts Road

- The intersection lacks some pedestrian accommodations and many of the pedestrian amenities are inadequate.
- The retaining wall at the southeast corner of the intersection has broken away and soil is falling onto the narrow sidewalk.
- Utility wires obstruct the view of the traffic signal heads for drivers heading westbound along Conestoga Road.

Historic marker on Conestoga Road.



The Church Road/Aberdeen Avenue/Iven Avenue intersection is complex and can be difficult to navigate.

Improving sidewalks, like this one in Garrett Hill, will make Conestoga Road more pedestrian-friendly.

Pedestrian Recommendations

1. Complete the sidewalk network by constructing or improving sidewalks in the areas where they do not currently exist.
2. Install pedestrian amenities at all signalized intersections along Conestoga Road.
   - Ensure that curb ramps and high-visibility crosswalk markings are in place and install countdown pedestrian signals where they currently do not exist. The skew of crosswalks should be reduced as possible.
   - Install ADA-compliant curb ramps along with countdown pedestrian signals.
   - Upgrade pedestrian timing to ensure that new MUTCD requirements for walking speed are met.
3. Conestoga Road at Lancaster Avenue
   - Remove the stairs and construct an ADA-compliant curb ramp at the southeast corner of the intersection.
   - Relocate utility poles as appropriate or widen sidewalk
   - Consider reorienting the crosswalk to make it shorter, or installing bulb-out
4. Conestoga Road at Roberts Road
   - Add pedestrian amenities such as sidewalks, high-visibility crosswalks, ADA-complaint curb ramps, and countdown pedestrian signals at the intersection and its approaches.

Intersection and Roadway Recommendations

1. Evaluate the number and location of access driveways that are located within the functional area of the intersections along Conestoga Road to minimize conflict points.
2. Simplify and clarify traffic control information for drivers.
   - Conduct a sign inventory; add necessary signage, eliminate unnecessary signage, and upgrade existing signage.
   - Sign additions should include intersection warning signs, Share the Road signs, and street name signs as well as wayfinding signage for NHSL stations and the Radnor Trail.
   - Install stop bars on all side-streets.
   - Perform regular maintenance including vegetation trimming to ensure visibility of all traffic control devices.

3. Tighten the radii of the intersection approaches to eliminate the wide curve radii found at many cross streets.
4. Investigate the possibility of using speed trailers to alert motorists of their actual speeds along the roadway several times throughout the year or use police for targeted speed enforcement.
5. Conestoga Road at Lancaster Avenue
   - Reduce the radius of the approach curve at the southwest corner of the intersection.
   - Ensure that pavement markings are maintained and install overhead street name signs on the existing mast arms at the intersection.
6. Conestoga Road at Church Road/Aberdeen Avenue/Iven Avenue
   - Consider changing the traffic signal phasing so that Church Road and Iven Avenue run concurrently rather than Church Road and Aberdeen Avenue running concurrently. These roadways are better aligned and the change would also improve sight distance.
   - Add directional signage and pavement markings as appropriate on island between Aberdeen Avenue and Iven Avenue.
   - Install "SIGNAL AHEAD" warning signs (W3-3) on both approaches of Conestoga Road prior to the curve in order to warn drivers of the signalized intersection.
   - Maintain and trim vegetation in the area to provide adequate sight distance for drivers along Conestoga Road to see the traffic signal.
7. Conestoga Road at Radnor Chester Road
   - Examine potential alternatives to provide a safer way for motorists to make left-hand turns from eastbound Conestoga Road to northbound Radnor Chester Road. This could be done by utilizing Newtown Road as a far-side jughandle or widening the eastbound approach to allow for a left-turn lane.
   - Investigate the possibility of installing mast arms at the intersection in order to mount the traffic signals overhead.
   - Ensure that pavement markings are maintained at the intersection, especially the stop bars to ensure that drivers are stopping at desired locations.

Installing mast arms at Radnor Chester Road can help improve the visibility of traffic signals.

Sidewalks are needed along Roberts Road south of Conestoga Road.

8. Conestoga Road at Roberts Road

- Add pedestrian amenities, such as sidewalks, high visibility crosswalks, ADA-complaint curb ramps, and countdown pedestrian signals at the intersection and its approaches. Sidewalk is needed along Roberts Road south of the intersection.

MONTGOMERY AVENUE

Issues

- High vehicular speeds
- Pedestrian safety and comfort
- Access to rails stations and transit stops

Montgomery Avenue at Church Road

- This intersection had five reportable crashes between the years of 2004 and 2008.
- Forty percent of the crashes were angle type crashes, which tend to be of a higher severity; this is reflected in the 60 percent injury total.
- One of the angle crashes involved a vehicle attempting to make a left turn from the northbound approach of Church Road.
- This is a prohibited movement due to the phasing of the traffic signal, which allows westbound Montgomery Avenue traffic to proceed at the same time as the northbound Church Road movement.

Montgomery Avenue at Morris Avenue

- This intersection had 26 reportable crashes between the years of 2004 and 2008.
- Angle type crashes accounted for 65 percent of the total.
- Nearly all of the crashes occurred during dry roadway conditions (92 percent) and during daylight (62 percent).

Montgomery Avenue at Spring Mill Road (PA 320)

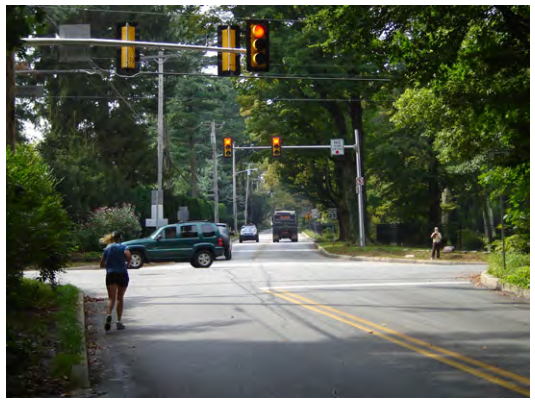
- This intersection had 11 reportable crashes between the years of 2004 and 2008.
- Eight of these crashes were angle type crashes.

Pedestrian Recommendations

1. Montgomery Avenue at Harcum College/Bryn Mawr Presbyterian Church
   - Install additional warning signage for the existing midblock crosswalk (W11-2 signs with W16-7P arrow plaques) to promote driver awareness of its location.

The Church Road intersection was chosen for additional analysis based on its proximity to Lower Merion High School.

Additional signage and markings can make the this mid-block crossing at Harcum College more visible to drivers.



A jogger near Spring Mill Road uses Montgomery Avenue alongside vehicular traffic.

Pavement markings will reinforce the prohibition of left turns from Church Road.

- Install yield lines at least 20 feet in advance of the midblock crosswalk with "Yield Here To Pedestrians" (R1-5) signs at yield line locations. A public outreach campaign should accompany these recommendations to alert the public that they should yield at the yield line (in advance of the crosswalk) so that both lanes of approaching traffic are able to see crossing pedestrians.

Intersection and Roadway Recommendations

- Safety/Crash Analysis

  Similarly to Haverford Road, Montgomery Avenue is a parallel route to US 30 (Lancaster Avenue) and serves as an alternate route, especially during peak hours. Because Montgomery Avenue does not have the signal density as US 30, drivers tend to operate at higher speeds.

  Pedestrian safety and comfort are also especially important along this route. Numerous multifamily residences and apartment homes are located along Montgomery Avenue between Ardmore and Bryn Mawr, as well as private and public prep schools and college campuses. Therefore, many residents and students walk along the roadway to their homes, classes, bus stops, and toward rail stations. Montgomery Avenue provides access to several rails stations via roadway connections between Montgomery Avenue and US 30, especially in the area between the Ardmore and Rosemont stations where Lancaster and Montgomery lie adjacent to the SEPTA Paoli/Thorndale Regional Rail Line.

  A detailed analysis of the crash data obtained, as well as crash diagrams at the three major intersections: Church Road, Morris Avenue, and Spring Mill Road, can be found in Appendix D of the Technical Appendix (Publication 11003C). These locations were chosen based on their proximity to schools and rail stations.

1. Montgomery Avenue at Church Road

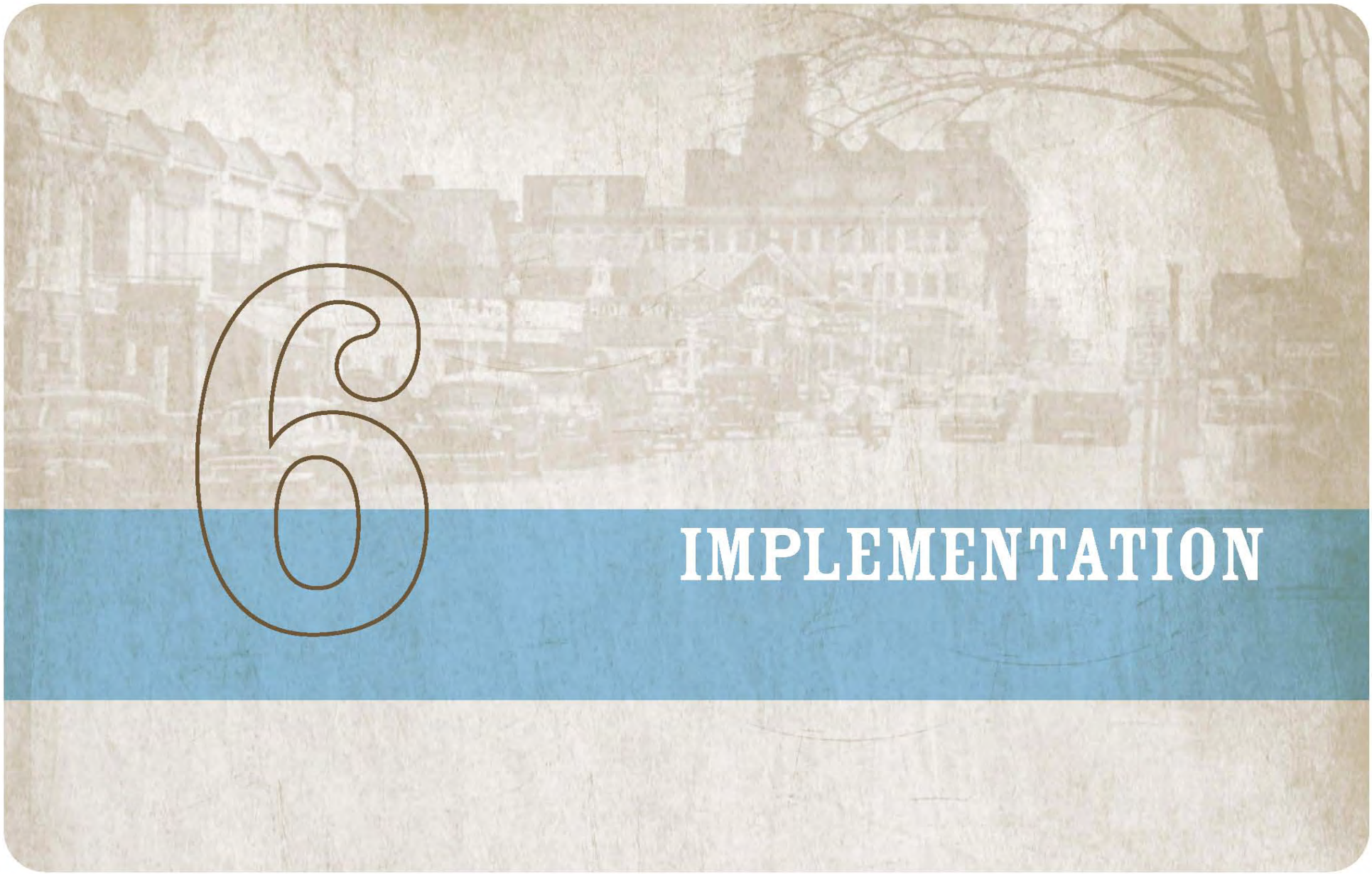
- Install high-visibility crosswalk markings across the Church Road approach of the intersection. Modify the operation of the traffic signal to include this pedestrian phase.
- Construct sidewalk along the east side of Church Road (along Arnold Field) to connect into the existing sidewalk network along Montgomery Avenue and ensure students have a safe walking

route to school.

2. Montgomery Avenue at Morris Avenue
   - Explore the feasibility of adding an eastbound lead left phase to ease the crashes due to the many improper turns currently being made.
   - Consider a pedestrian lead phase in order to allow pedestrians to be more visible when crossing this wide intersection.
3. Montgomery Avenue at Mill Creek Road and Anderson Avenue
   - Realign roadway and intersection to improve traffic flow and safety.
   - Enhance pedestrian crosswalks at this location to improve safety.
4. Montgomery Avenue at Spring Mill Road (PA 320)
   - Investigate the possibility of widening the southern approach to allow for an informal right-turn lane from northbound PA 320 to eastbound Montgomery Avenue.
   - Explore the feasibility of permitting westbound left turns to be made only during a protected phase. Left-turning drivers are possibly confused due to the fact that vehicles proceeding straight through the intersection in the eastbound direction do so in the inner lane, the lane that aligns with the westbound left-turn lane.
   - Relocate the stop bar for the left-turn lane on the westbound approach to the east in order to allow southbound left turns to be made more easily.
   - Adjust the radii at the southeast corner of the intersection and adjust the catch basin to grade. This will allow northbound right turns to be made more easily.
   - Consider adding overhead street name signs to the mast arms and restriping the dotted center line extension in an effort to simplify and clarify information at the intersection.

Consider an eastbound lead left-turn phase at Morris Avenue.

Widening the southern approach to Spring Mill Road would allow right turns to be made while vehicles wait to turn left onto Montgomery Avenue.



6 IMPLEMENTATION

SECTION 6

IMPLEMENTATION

The recommendations presented throughout this study aim to alleviate congestion, improve safety for vehicles and pedestrians, support economic development opportunities, protect environmental resources, and enhance the quality of life within communities along US 30. The process of implementing these recommendations will involve multiple phases over the next several years and will likely require coordination across municipal boundaries. Realizing these objectives will also require the participation of numerous public and private partners.

This section summarizes the sub-area recommendations presented in Section 5. Sub-areas are grouped by municipality and an implementation table has been created for each sub-area. Each recommendation has been evaluated in terms of its priority, projected timeframe, and expected cost. Where possible, the agencies and organization responsible for implementing various recommendations are included in each sub-area table. The following general parameters were used as a guide:

Priority

Specific recommendations are rated as low, medium, or high priority. These ratings reflect the degree of need for a particular project as well as the ability of that project to greatly enhance safety, enhance the quality of life, or spur additional investment.

Timeframe

The timeframes suggested on the implementation tables help distinguish between short- and long-term projects. However, the timing of various improvements is difficult to forecast and is subject to change and is likely to be influenced by economic conditions and municipal priorities. This report uses the following timeframes:

- Short-Term: 0–5 years
- Intermediate: 5–10 years
- Long-Term: More than 10 years

Cost

General cost estimates were included to help approximate the magnitude of various projects and are intended to serve as a guide only. The following cost categories are used:

- Low: $1 million or less
- Moderate: $1 million to $5 million
- High: More than $5 million

A list of potential funding sources is provided at the end of the chapter. More information on these sources, as well as additional funding for locally initiated projects, can be found in DVRPC's Municipal Resource Guide (Publication 09061).

CITY OF PHILADELPHIA

Table 6.1: Sub-Area 1 West Philadelphia Implementation (62nd Street to 52nd Street)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1-3	Redevelop vacant and underutilized parcels in Sub-Area 1	City of Philadelphia, Philadelphia Industrial Development Corporation, Community Groups	High	Intermediate	Variable
4-6	Beautify properties and enhance green spaces along Lancaster Avenue	Landowners, City of Philadelphia, Community Groups	Medium	Short-term	Low
7	Install wayfinding signage	City of Philadelphia	Medium	Short-term	Low
Pedestrian Recommendations					
1	Streetscape improvements on Lancaster Avenue as illustrated in Figure 5.1	PennDOT, City of Philadelphia	Medium	Short-term	Medium
2	Improve sidewalks on 59th Street Bridge	PennDOT,City of Philadelphia	Medium	Short-term	Low
3	Install pedestrian amenties at signalized intersections	PennDOT, City of Philadelphia	High	Short-term	Low
Bicycle Recommendations					
1-2	Bicycle lane maintenance	City of Philadelphia	Medium	Short-term	Low
3-4	Enforce no parking zones and evaluate the need for bicycle storage near Overbrook High School	City of Philadelphia	Medium	Short-term	Low

	Recommendation	Actors	Priority	Timeframe	Cost
Transit Recommendations					
1-2	Install transit amenities as feasible for Route 10 trolley and Route 52 bus and explore feasibility of consolidating transit stops	SEPTA, City of Philadelphia, Business Community	High	Short-term	Low
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, City of Philadelphia, PennDOT	Medium	Intermediate	Medium
2	Simplify and clarify traffic control information	PennDOT, City of Philadelphia	High	Short-term	Medium
3	Lancaster Avenue at 52nd Street intersection improvements	PennDOT, City of Philadelphia	Medium	Short-term	Low
4	Upland Way at 57th/59th/Berks Street intersection improvements	PennDOT, City of Philadelphia	Medium	Short-term	Low
5	Upland Way between Berks Street and 52nd Street roadway improvements	PennDOT, City of Philadelphia, Community Groups	Medium	Intermediate	Low

CITY OF PHILADELPHIA

Table 6.2: Sub-Area 2 Overbrook Farms Implementation (City Avenue to 62nd Street)

	Recommendation	Actors	Priority	Timeframe	Cost
Environmental Recommendations					
1	Explore the potential for streambank restoration along Indian Creek in Morris Park	PADEP, City of Philadelphia, Community Groups	Medium	Short-term	Low
2	Investigate the possibility of creating wetlands along the East and West Branches of Indian Creek	PADEP, City of Philadelphia, Community Groups	Medium	Intermediate	Moderate
Land Use Recommendations					
1	Explore redevelopment options near intersection of 62nd Street and Lancaster Avenue	City of Philadelphia, Business Community	Low	Long-term	Variable
2	Install wayfinding signage	City of Philadelphia	Medium	Short-term	Low
3	Enhance gateway signage	Community Groups, City of Philadelphia	High	Short-term	Low
4	Implement comprehensive strategies for 63rd Street commercial corridor	City of Philadelphia, Business Community, Community Groups	Medium	Intermediate	Variable
Pedestrian Recommendations					
1	Streetscape improvements on Lancaster Avenue and 63rd Street as illustrated in Figure 5.3	PennDOT, City of Philadelphia	Medium	Short-term	Moderate
2	Consider pedestrian amenities at key unsignalized intersections	City of Philadelphia	Medium	Short-term	Low
3	Install pedestrian amenities at signalized intersections	PennDOT, City of Philadelphia	High	Short-term	Low
4	Implement strategies outlined in the Overbrook Farms Neighborhood Traffic Study	PennDOT, City of Philadelphia, Community Groups	Medium	Intermediate	Moderate

	Recommendation	Actors	Priority	Timeframe	Cost
Transit Recommendations					
1	Install additional shelters at the Malvern Loop	SEPTA, City of Philadelphia	High	Short-term	Low
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, PennDOT, City of Philadelphia	Medium	Intermediate	Moderate
2	City Avenue at 63rd Street intersection improvements	PennDOT, City of Philadelphia	High	Short-term	Low

LOWER MERION TOWNSHIP

Table 6.3: Sub-Area 3 Wynnewood East Implementation (Clover Hill Road to City Avenue)

	Recommendation	Actors	Priority	Timeframe	Cost
Environmental Recommendations					
1	Explore the potential for streambank restoration within the Barnett Environmental Center	PADEP, Lower Merion Township, Community Groups	Medium	Short-Term	Low
2	Explore the potential for bank stabilization of Indian Creek in Penn Wynne Park	PADEP, Lower Merion Township, Community Groups	Medium	Short-Term	Low
3	Investigate the possibility of creating wetlands along Indian Creek	PADEP, Lower Merion Township, Community Groups	Medium	Intermediate	Moderate
Land Use Recommendations					
1	Improve maintenance and landscaping along rear property lines of homes along Lancaster Avenue	Landowners, Lower Merion Township, Community Groups	Medium	Short-Term	Low
Pedestrian Recommendations					
1	Complete the sidewalk network along Lancaster Avenue as illustrated in Figure 5.4	Landowners, PennDOT, Lower Merion Township	High	Short-Term	Low
2	Install pedestrian amenities at signalized intersections	PennDOT, Lower Merion Township	Medium	Short-Term	Low
Bicycle Recommendations					
1	Extend the Cynwyd Trail south through Lower Merion Township and Philadelphia	SEPTA, Lower Merion Township, Community Groups	Medium	Intermediate	Low

	Recommendation	Actors	Priority	Timeframe	Cost
Transit Recommendations					
1	Install transit amenities as feasible for Route 105 bus	SEPTA, Lower Merion Township	Medium	Intermediate	Low
Intersection and Roadway Recommendations					
1	Add edge line pavement markings to Lancaster Avenue	PennDOT, Lower Merion Township	High	Short-Term	Low
2	Access management at key intersections	Landowners, Lower Merion Township, PennDOT	Medium	Intermediate	Moderate
3	Lancaster Avenue at City Avenue intersection improvements	PennDOT, Lower Merion Township, City of Philadelphia	Medium	Short-Term	Low
4	Lancaster Avenue at Remington Road intersection improvements	PennDot, Lower Merion Township	Medium	Short-Term	Moderate
5	Lancaster Avenue between City Avenue and Clover Hill Road roadway improvements	PennDOT, Lower Merion Township	Medium	Intermediate	Moderate

LOWER MERION TOWNSHIP

Table 6.4: Sub-Area 4 Wynnewood West Implementation (Simpson Road to Clover Hill Road)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1	Utilize landscaping and edge treatments to enhance pedestrian experience	Lower Merion Township, Landowners	High	Short-term	Low
2	Install wayfinding signage	Lower Merion Township	Medium	Short-term	Low
Pedestrian Recommendations					
1	Improve sidewalks along north side of Lancaster Avenue as illustrated in Figure 5.6	PennDOT, Lower Merion Township	Medium	Intermediate	Moderate
2	Install pedestrian amenities at signalized intersections	PennDOT, Lower Merion Township	High	Short-term	Low
Transit Recommendations					
1	Construct bus shelter at Wynnewood Square Shopping Center	SEPTA, Business Community	Medium	Short-term	Low
2	Add a crosswalk at the Wynnewood Rail Station	PennDOT, Lower Merion Township	High	Short-term	Low
3	Investigate opportunities for shared parking	SEPTA, Lower Merion Township, Business Community	Low	Intermediate	Low

	Recommendation	Actors	Priority	Timeframe	Cost
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, PennDOT, Lower Merion Township	Medium	Intermediate	Moderate
2	Simplify and clarify traffic control information	PennDOT, Lower Merion Township	High	Short-term	Moderate
3	Lancaster Avenue at Wynnewood Road/Old Wynnewood road intersection improvements	PennDOT, Lower Merion Township, Commercial Landowners	Medium	Short-term	Low
4	Lancaster Avenue at Wynnewood Square Shopping Center/Wynnewood House intersection improvements	PennDOT, Lower Merion Township, Commercial Landowners	Medium	Intermediate	Moderate
5	Wynnewood Road at Penn Road intersection improvements	PennDOT, Lower Merion Township	Medium	Intermediate	Moderate/High

LOWER MERION TOWNSHIP

Table 6.5: Sub-Area 5 Ardmore Implementation (Woodside Road to Simpson Road)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1	Enhance the gateway treatments for this village center	Lower Merion Township	Medium	Intermediate	Variable
2	Install wayfinding signage	Lower Merion Township	Medium	Short-term	Low
Pedestrian Recommendations					
1	Ensure sidewalks are clear, passable, and meet ADA guidelines	PennDOT, Lower Merion Township	High	Short-term	Moderate
2	Streetscape improvements on Lancaster Avenue as illustrated in Figure 5.8	PennDOT, Lower Merion Township	Medium	Intermediate	Moderate
3	Install pedestrian amenities at signalized intersections	PennDOT, Lower Merion Township	High	Short-term	Moderate
4	Enhance pedestrian crossing near Philadelphia Sports Club	PennDOT, Lower Merion Township	Medium	Short-term	Low
Intersection and Roadway Recommendations					
1	Access management at key intersections	PennDOT, Lower Merion Township	Medium	Intermediate	Moderate
2	Simplify and clarify traffic control information	PennDOT, Lower Merion Township	High	Short-term	Low
3	Anderson Avenue and Coulter Avenue intersection improvements	PennDOT, Lower Merion Township, Suburban Square	Medium	Short-term	Low

Table 6.6: Sub-Area 6 Haverford Implementation (Lee Avenue to Woodside Road)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1	Investigate locations for municipal parking lot in Haverford Township portion of sub-area	Haverford Township, Business Community	Medium	Short-term	Moderate
2	Install wayfinding signage	Haverford Township, Lower Merion Township	Medium	Short-term	Low
Pedestrian Recommendations					
1	Improve sidewalks along Lancaster Avenue as illustrated in Figure 5.9	Haverford Township, Lower Merion Township	Medium	Short-term	Low
2	Install pedestrian amenities at signalized intersections	PennDOT, Haverford Township, Lower Merion Township	High	Short-term	Low
Transit Recommendations					
1	Add a crosswalk at the Haverford Rail Station	SEPTA, Lower Merion Township	Medium	Short-term	Low
2	Investigate opportunities for shared parking	Haverford Township, Lower Merion Township, Business Community, SEPTA	Medium	Intermediate	Low

	Recommendation	Actors	Priority	Timeframe	Cost
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, PennDOT, Lower Merion Township, Haverford Township	Medium	Intermediate	Moderate
2	Simplify and clarify traffic control information	PennDOT, Haverford Township, Lower Merion Township	High	Short-term	Moderate
3	Lancaster Avenue and Haverford Station Road intersection improvements	PennDOT, Lower Merion Township	Medium	Intermediate	Low
4	Lancaster Avenue and Penn Street/Pennswood Road intersection improvements	PennDOT, Haverford Township	Medium	Short-term	Moderate
5	Lancaster Avenue between Penn Street/Pennswood Road and Old Lancaster Road roadway improvements	PennDOT, Haverford Township	Medium	Short-term	Low

Table 6.7: Sub-Area 7 Bryn Mawr Implementation (County Line Road to Lee Avenue)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1	Install wayfinding signage	Lower Merion Township	Medium	Short-term	Low
2	Encourage redevelopment of Municipal Lot 7	Lower Merion Township, Business Community, Amtrak, Community Groups	Medium	Intermediate	Variable
3	Encourage redevelopment of Verizon building and parking area	Lower Merion Township, Business Community, Verizon, Community Groups	Low	Intermediate	Variable
4	Consider gateway treatments for the intersection of Lancaster Avenue and Bryn Mawr Avenue	Lower Merion Township	Low	Intermediate	Variable
Pedestrian Recommendations					
1	Streetscape improvements on Lancaster Avenue and Montrose Avenue as illustrated in Figure 5.10	Lower Merion Township	Low	Short-term	Low
2	Consider pedestrian amenities at key unsignalized intersections	Lower Merion Township	Medium	Short-term	Low
3	Install pedestrian amenities at signalized intersections	Lower Merion Township, PennDOT	High	Short-term	Moderate
4	Lancaster Avenue at Morton Road pedestrian improvements	Lower Merion Township, PennDOT	High	Short-term	Moderate

	Recommendation	Actors	Priority	Timeframe	Cost
Transit Recommendations					
1	Add a crosswalk at the Bryn Mawr Rail Station	PennDOT, Lower Merion Township	Medium	Short-term	Moderate
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, PennDOT, Lower Merion Township	Medium	Intermediate	Moderate
2	Simplify and clarify traffic control information	PennDOT, Lower Merion Township	High	Short-term	Moderate
3	Morris Avenue at Bryn Mawr Rail Station intersection improvements	Lower Merion Township, Community Groups	Medium	Short-term	Low

Table 6.8: Sub-Area 8 Rosemont Implementation (Barley Cone Lane to County Line Road)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1	Install wayfinding signage	Radnor Township	Medium	Short-term	Low
Pedestrian Recommendations					
1	Complete the sidewalk network along Lancaster Avenue as illustrated in Figure 5.12	PennDOT, Radnor Township, Community Groups	Medium	Intermediate	Moderate
2	Install pedestrian amenities at signalized intersections	PennDOT, Radnor Township	High	Short-term	Low
Transit Recommendations					
1	Add sidewalks near the Garrett Hill Rail Station	Radnor Township, Community Groups	Medium	Intermediate	Low
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, PennDOT, Radnor Township	Medium	Intermediate	Moderate
2	Lancaster Avenue at Airdale Road intersection improvements	PennDOT, Radnor Township	High	Short-term	Low

RADNOR TOWNSHIP

Table 6.9: Sub-Area 9 Villanova Implementation (I-476 to Barley Cone Lane)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1-2	Consider gateway treatments along Lancaster Avenue at Ithan Avenue and Spring Mill Road and at the NHSL overpass	Villanova University, SEPTA, Radnor Township, PennDOT	Medium	Intermediate	Variable
3	Consider revising zoning requirements to allow for redevelopment south of Lancaster Avenue as described in the Villanova Campus Master Plan	Radnor Township, Villanova University	High	Short-term	Low
Pedestrian Recommendations					
1	Complete the sidewalk network along Lancaster Avenue, Spring Mill Road, and Aldwyn Lane as illustrated in Figure 5.13	Radnor Township, PennDOT, Villanova University, Community Groups	Medium	Short-term	Low
2	Install pedestrian amenities at signalized intersections	Radnor-Township, PennDOT	High	Short-term	Low
Transit Recommendations					
1	Explore options to reduce the number of single occupant vehicle trips to campus	Villanova University, SEPTA	High	Short-term	Variable

	Recommendation	Actors	Priority	Timeframe	Cost
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, PennDOT, Radnor Township	Medium	Intermediate	Low
2	Lancaster Avenue at Ithan Avenue intersection improvements	Villanova University, PennDOT, Radnor Township	Medium	Short-term	Low
3	Lancaster Avenue at Church Walk intersection improvements	Villanova University, PennDOT, Radnor Township	Medium	Short-term	Low
4	Lancaster Avenue a PA 320 intersection improvements	Villanova University, PennDOT, Radnor Township, Commercial Landowners	High	Intermediate	High

RADNOR TOWNSHIP

Table 6.10: Sub-Area 10 Radnor Implementation (St. Davids Square to I-476)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1	Install wayfinding signage	Radnor Township	Medium	Short-term	Low
Pedestrian Recommendations					
1	Complete the sidewalk network along Lancaster Avenue as illustrated in Figure 5.17	Radnor Township, PennDOT, Community Groups	Medium	Intermediate	Moderate
2	Enhance pedestrian connections between Radnor station and adjacent commercial development	Commercial Landowners, Radnor Township	Medium	Short-term	Low
3	Install pedestrian amenities at signalized intersections	PennDOT, Radnor Township	High	Short-term	Low
Transit Recommendations					
1	Add crosswalk at Radnor NHSL Station	Radnor Township, PennDOT	High	Short-term	Low
2	Investigate opportunities for shared parking	SEPTA, Commercial Landowners, Radnor Township	Medium	Short-term	Low
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, PennDOT, Radnor Township	Medium	Intermediate	Low
2	Consider reducing lane widths along this section of Lancaster Avenue to 11 feet	PennDOT, Radnor Township	High	Short-term	Low
3	Lancaster Avenue at Radnor Chester Road intersection improvements	PennDOT, Radnor Township	Medium	Short-term	Low
4	Lancaster Avenue at St. Davids Square intersection improvements	PennDOT, Radnor Township, Commercial Landowners	Medium	Intermediate	Low

RADNOR TOWNSHIP

Table 6.11: Sub-Area 11 St. Davids Implementation (Aberdeen Avenue to St. Davids Square)

	Recommendation	Actors	Priority	Timeframe	Cost
Environmental Recommendations					
1	Explore the potential for streambank restoration along the Darby Creek in Encke Park	PADEP, Radnor Township, Community Groups	Medium	Long-term	Low
Land Use Recommendations					
1	Install wayfinding signage	Radnor Township	Medium	Short-term	Low
2	Explore long-term opportunities for redevelopment or redesign of the Acme property	Radnor Township, Landowners	Medium	Intermediate	Variable
Pedestrian Recommendations					
1	Complete the sidewalk network along Lancaster Avenue as illustrated in Figure 5.18	Community Groups, Radnor Township, PennDOT	Medium	Short-term	Moderate
2	Install pedestrian amenities at signalized intersections	Radnor Township, PennDOT	High	Short-term	Low
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, Radnor Township, PennDOT	Medium	Intermediate	Moderate
2	Lancaster Avenue at Chamounix Road/St. Davids Road intersection improvements	Radnor Township, PennDOT	Low	Intermediate	High

RADNOR TOWNSHIP

Table 6.12: Sub-Area 12 Wayne Implementation (Banbury Way to Aberdeen Avenue)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1	Enhance the gateways into the Wayne Business District	Business Community, Radnor Township	Medium	Intermediate	Variable
2	Consider transit-oriented development options near Wayne station of the Paoli/Thorndale line	Radnor Township, Community Groups, Business Community, SEPTA	Medium	Long-term	Variable
3	Enhance North Wayne Avenue with planted median	Radnor Township, Community Groups, Business Community	High	Short-term	Moderate
Pedestrian Recommendations					
1	Improve sidewalks along Lancaster Avenue as identified in Figure 5.20	Radnor Township	Medium	Short-term	Low
2	Consider pedestrian amenities at key unsignalized intersections	Radnor Township	Medium	Short-term	Low
3	Install pedestrian amenities at signalized intersections	Radnor Township, PennDOT	Medium	Short-term	Low
Intersection and Roadway Recommendations					
1	Access management at key intersections	Radnor Township, Landowners, PennDOT	Medium	Intermediate	Moderate
2	Consider back-in angle parking for areas currently using pull-in angle parking	Radnor Township, Business Community, PennDOT, Community Groups	Medium	Intermediate	Low
3	Simplify and clarify traffic control information	Radnor Township, PennDOT	Medium	Short-term	Low
4	Lancaster Avenue at Aberdeen Avenue intersection improvements	Radnor Township, PennDOT	High	Short-term	Low
5	Lancaster Avenue at Banbury Way/Bloomingdale Avenue intersection improvements	Radnor Township, PennDOT	High	Short-term	Low

RADNOR TOWNSHIP & TREDYFFRIN TOWNSHIP

Table 6.13: Sub-Area 13 Strafford Implementation (Old Eagle School Road to Banbury Way)

	Recommendation	Actors	Priority	Timeframe	Cost
Land Use Recommendations					
1	Consider redesign of Lancaster County Farmers Market building and shopping center	Business Community, Radnor Township, Commercial Landowners, Community Groups	Medium	Intermediate	Variable
2	Install wayfinding signage	Radnor Township	Medium	Short-Term	Low
3	Explore opportunities to convert existing open spaces into publicly accessible park space	Radnor Township, Community Groups, Landowners	Medium	Intermediate	Variable
Pedestrian Recommendations					
1	Complete the sidewalk network along Lancaster Avenue and Eagle Road as illustrated in Figure 5.22	Radnor Township, PennDOT	Medium	Short-Term	Moderate
3	Install pedestrian amenties at signalized intersections	Radnor Township, PennDOT	High	Short-Term	Low
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, PennDOT, Radnor Township	Medium	Intermediate	Moderate
2	Investigate back-in angle parking for areas with pull-in angle parking	Radnor Township, Business Community, PennDOT, Community Groups	Medium	Short-Term	Low
3	Old Eagle School Road between Fairfield Lane and Forrest Lane roadway improvements	Tredyffrin Township, Community Groups, SEPTA	High	Short-Term	Low

HAVERFORD TOWNSHIP

Table 6.14: Sub-Area 14 Haverford Road Implementation (Old Eagle School Road to Banbury Way)

	Recommendation	Actors	Priority	Timeframe	Cost
Environmental Recommendations					
1	Explore the potential for streambank restoration along Cobbs Creek in the Merion Golf Club	PADEP, Haverford Township, Community Groups	Medium	Short-term	Low
2	Explore the potential for stormwater BMPs at the Karakung Little League field	PADEP, Haverford Township, Community Groups	Medium	Short-term	Low
3	Investigate the possibility of creating wetlands along Cobbs Creek	PADEP, Haverford Township, Community Groups	Medium	Intermediate	Moderate
Land Use Recommendations					
1	Install wayfinding signage	Haverford Township	Medium	Short-term	Low
2	Explore redevelopment opportunities for properties near the Ardmore Junction NHSL Station	Haverford Township, Landowners, Community Groups, SEPTA	High	Intermediate	Variable
3	Develop gateway treatments for the Haverford Road commercial area	Haverford Township, Community Groups, Business Community	Medium	Short-term	Low
4	Continue to implement Haverford Road Design Guidelines	Haverford Township, Community Groups, Business Community, SEPTA	Medium	Long-term	High
Pedestrian Recommendations					
1	Complete the sidewalk network along Haverford Road and Ardmore Avenue as illustrated in Figure 5.24	Haverford Township, PennDOT, Community Groups	Medium	Intermediate	Moderate
2	Install pedestrian amenties at signalized intersections	PennDOT, Haverford Township	High	Short-term	Low
3	Haverford Road at Hathaway Lane pedestrian improvements	PennDOT, Haverford Township, SEPTA	Medium	Short-term	Low
4	Haverford Road at Ardmore Avenue pedestrian improvements	Haverford Township, PennDOT, Community Groups	Medium	Intermediate	Moderate

	Recommendation	Actors	Priority	Timeframe	Cost
Transit Recommendations					
1	Improve access to the Ardmore Junction station of the NHSL	Haverford Township, SEPTA, PennDOT	Medium	Short-term	Low
Intersection and Roadway Recommendations					
1	Access management at key intersections	Landowners, Haverford Township, PennDOT	Medium	Intermediate	Moderate
2	Haverford Road at Ardmore Avenue intersection improvements	Haverford Township, PennDOT, Community Groups	Medium	Intermediate	Moderate

NARBERTH BOROUGH

Table 6.15: Other Areas of Study - Narberth Implementation

	Recommendation	Actors	Priority	Timeframe	Cost
Pedestrian Recommendations					
1	Install pedestrian amenities at key unsignalized intersections	Narberth Borough, Community Groups	High	Short-term	Low
2	Consider an easement through the Thomas Wynne property	Narberth Borough, Lower Merion Township, Landowners, Community Groups	Medium	Short-term	Low
Intersection and Roadway Recommendations					
1	N. Wynnewood Avenue at Haverfrod Avenue/Windsor Avenue roadway improvements	Naberth Borough, Community Groups	High	Short-term	Low
2	N. Wynnewood Avenue at E. Wynnewood Road intersection improvements	PennDOT, Naberth Borough, Community Groups	Medium	Short-term	Low

RADNOR TOWNSHIP

Table 6.16: Other Areas of Study - Conestoga Road Implementation

	Recommendation	Actors	Priority	Timeframe	Cost
Pedestrian Recommendations					
1	Complete the sidewalk network along Conestoga Road	PennDOT, Radnor Township	Medium	Short-term	Low
2	Install pedestrian amenties at signalized intersections	PennDOT, Radnor Township	High	Short-term	Low
3	Conestoga Road at Lancaster Avenue pedestrian improvements	PennDOT, Radnor Township	Medium	Short-term	Moderate
4	Conestoga Road at Roberts Road pedestrian improvements	PennDOT, Radnor Township	Medium	Short-term	Moderate
Intersection and Roadway Recommendations					
1	Access management at key intersections	PennDOT, Radnor Township, Landownders	Medium	Intermediate	Moderate
2	Simplify and clarify traffic control information	PennDOT, Radnor Township	High	Short-term	Low
3	Modify intersection radii	PennDOT, Radnor Township	Low	Intermediate	Moderate
4	Notify drivers of travel speed through speed trailers or other method	PennDOT, Radnor Township	Medium	Short-term	Low

	Recommendation	Actors	Priority	Timeframe	Cost
5	Conestoga Road at Lancaster Avenue intersection improvements	PennDOT, Radnor Township	Medium	Intermediate	Low
6	Conestoga Road at Church Road/ Aberdeen Avenue/Iven Avenue intersection improvements	PennDOT, Radnor Township	Medium	Short-term	Low
7	Conestoga Road and Radnor Chester Road intersection improvements	PennDOT, Radnor Township	Medium	Intermediate	Moderate
8	Conestoga Road and Roberts Road intersection improvements	PennDOT, Radnor Township	Medium	Intermediate	Low

LOWER MERION TOWNSHIP

Table 6.17: Other Areas of Study - Montgomery Avenue Implementation

	Recommendation	Actors	Priority	Timeframe	Cost
Pedestrian Recommendations					
1	Enhance pedestrian crossing at Harcum College/Bryn Mawr Presbyterian Church	PennDOT, Lower Merion Township, Harcum College	High	Short-term	Low
Intersection and Roadway Recommendations					
1	Montgomery Avenue at Church Road intersection improvements	PennDOT, Lower Merion Township, Community Groups	Medium	Short-term	Low
2	Montgomery Avenue at Morris Road intersection improvements	PennDOT, Lower Merion Township	High	Short-term	Low
3	Montgomery Avenue at Spring Mill Road intersection improvements	PennDOT, Lower Merion Township	Medium	Intermediate	Moderate

POTENTIAL FUNDING SOURCES

The availability and terms of these potential funding sources are subject to change. For more information, please visit the Municipal Resource Guide portion of our website: www.dvrpc.org/MCDResource.

Smart Growth

Business in Our Sites

Eligibility: Pennsylvania municipalities, municipal authorities, redevelopment/industrial development agencies, private developers
Purpose: To empower communities to attract businesses by helping them build an inventory of ready sites
Terms: Grants may not exceed 50% of the total amount of financing provided or $5 million (whichever is less). Site must be previously utilized property or undeveloped property that is planned and zoned for development. Private developers are only eligible for loans, not grants.
Deadline: Open
Contact: Pennsylvania Department of Community and Economic Development
Phone: 800-379-7448
www.newpa.com

Certified Local Governments Grant Program (CLG)

Eligibility: Limited to Pennsylvania Certified Local Governments
Purpose: To promote and protect historic properties and planning for historic districts
Terms: Grants up to 60% of project costs
Deadline: Annual
Contact: Pennsylvania Bureau of Historic Preservation
Phone: 717-787-0771
www.artsnet.org

Community Development Block Grant (CDBG)

Eligibility: Pennsylvania local governments, non-profits, and for-profit developers.
Purpose: Grants and technical assistance for federal designated municipalities for any type of community development
Terms: 70% of each grant must be used for activities that benefit low-moderate income persons. Competitive
Program - $500,000 maximum
Deadline: Quarterly
Contact: Pennsylvania Department of Community and Economic Development
Phone: 866-466-3972
www.newpa.com

Community Revitalization Program

Eligibility: Pennsylvania local governments, redevelopment authorities, industrial development agencies, and non-profits
Purpose: To support local initiatives that promote the stability of communities
Terms: Grants of $5,000-$25,000
Deadline: Three funding rounds during fiscal year
Contact: Pennsylvania Department of Community and Economic Development
Phone: 866-466-3972
www.newpa.com

Economic Development Administration Assistance Programs

Eligibility: Varies with program
Purpose: Provides funds needed infrastructure improvements to spur redevelopment
Terms: Varies
Deadline: Annual
Contact: U.S. Department of Commerce
Phone: 215-597-4603
www.eda.gov

Elm Street Program

Eligibility: Pennsylvania local governments, redevelopment authorities, non-profit economic development organizations, other non-profits, BIDs, neighborhood improvement districts (Elm Street)
Purpose: Grants for planning and improvements to mixed-use areas in proximity to central business districts
Terms: Maximum $50,000 for administrative grants; Maximum $250,000 for development projects and loans.
Deadline: Open
Contact: Pennsylvania Department of Community and Economic Development
Phone: 866-466-3972
www.newpa.com

Growing Greener II

Eligibility: Pennsylvania local governments and non-profits
Purpose: Provides redevelopment grants to municipalities and non-profits to help a community's downtown redevelopment effort, focusing on the improvement of downtown sites and buildings

Terms: No minimum or Maximum; Typical grants average between $250,000 and $500,000
Deadline: Varies
Contact: Pennsylvania Department of Community and Economic Development
Phone: 866-466-3972
www.newpa.com

Land Use Planning and Technical Assistance Program (LUPTAP)
Eligibility: Pennsylvania cities, boroughs, townships, counties or multi-municipal entities
Purpose: For the purpose of developing and strengthening community planning and management capabilities
Terms: 50% of total costs; $100,000 maximum grant per fiscal year
Deadline: Open
Contact: Pennsylvania Department of Community and Economic Development
Phone: 215-560-2256
www.landuseinpa.com

Local Municipal Resources and Development Program (LMRDP)
Eligibility: Pennsylvania local governments and non-profits
Purpose: Provides grants to municipalities for improving the quality of life within the community
Terms: No maximum or minimum
Deadline: Open
Contact: Pennsylvania Department of Community and Economic Development
Phone: 800-379-7448
www.newpa.com

Main Street Program
Eligibility: Pennsylvania municipalities and downtowns
Purpose: Provides funds for administrative costs associated with Main Street Manager positions and offices, physical improvements, and acquisition costs
Terms: $115,000 over a 5-year period. Downtown Reinvestment and Anchor Building components: up to $250,000
or not to exceed 30% of project costs
Deadline: Varies
Contact: Pennsylvania Department of Community and Economic Development
Phone: 866-466-3972
www.newpa.com

Infrastructure

Infrastructure Development Program (IDP)

Eligibility: Pennsylvania municipalities, counties, industrial development authorities, redevelopment authorities, local development districts
Purpose: For specific infrastructure improvements that complement capital investments by private development
Terms: Grant maximum: $1.25 million for public improvements; Loan maximum: $1.25 for private investment
Deadline: Varies
Contact: Pennsylvania Department of Community and Economic Development
Phone: 717-787-7120
www.newpa.com

Public Works and Development Facilities Program (Title I)

Eligibility: Pennsylvania municipalities, political subdivisions, municipal authorities, or Indian tribes
Purpose: To revitalize, expand, and upgrade physical infrastructure to attract new development
Terms: Varies
Deadline: Varies
Contact: Pennsylvania Department of Commerce
Phone: 215-597-4603
www.eda.gov

Transportation

Bikes Belong Coalition

Eligibility: Federal, state, regional, county, and municipal agencies, non-profits, organizations whose mission is expressly related to bicycle advocacy
Purpose: To fund bicycle facilities and paths which encourage facility, education, and capacity building
Terms: $10,000 or less
Deadline: Quarterly
Contact: Bikes Belong Coalition
Phone: 617 -734-2111
www.bikesbelong.org

Community Transportation Development Fund (CTDF)

Eligibility: Non-profit transit providers, public agencies, local and state governments and community organizations
Purpose: To promote better transportation options
Terms: Low interest loans of up to $150,000 per recipient and 75 % of the total project cost

Deadline: Varies
Contact: Community Transportation Association of America
Phone: 202-661-0210
www.ctaa.org

Competitive Congestion Mitigation and Air Quality Program (CMAQ)

Eligibility: Public agencies, incorporated private firms, non-profits, local and county governments
Purpose: For projects that contribute to the attainment of the Clean Air Act standards by reducing emissions
Terms: 80% of costs
Deadline: Temporarily suspended
Contact: Delaware Valley Regional Planning Commission (DVRPC)
Phone: 215.592-1800
www.dvrpc.org

Home Town Streets /Safe Routes to School (HTS/SRS)

Eligibility: Federal or state agencies, Pennsylvania county or local governments, school districts, non-profits
Purpose: To encourage the reinvestment in and redevelopment of downtowns
Terms: 80% of total costs. Projects must be included in the region's Transportation Improvement Program (TIP) and PennDOT's 12-year program
Deadline: Varies
Contact: Delaware Valley Regional Planning Commission (DVRPC)
Phone: 215-592-1800
www.dvrpc.org

Municipal Bus Shelters

Eligibility: Delaware County local governments and businesses
Purpose: To assist municipalities in the provision of safe bus shelters
Terms: Contact County Transportation Management Association
Deadline: Open
Contact: Delaware County Transportation Management Association
Phone: 610-892-9440
www.delcotma.org

Pennsylvania Infrastructure Bank

Eligibility: Pennsylvania local governments and contractors
Purpose: To provide low-cost financing to municipalities and contractors for eligible transportation improvements
Terms: Low-interest loans from $50,000 to $3.9 million through a revolving loan fund for implementation
Deadline: Open
Contact: Pennsylvania Department of Transportation (PennDOT)
Phone: 717-772-1772
www.dot.state.pa.us

Transit Research and Demonstration Program

Eligibility: Pennsylvania local governments, transit operators, university, and transit organizations
Purpose: To fund innovative projects that improves the attractiveness of public transit
Terms: Grants for 80% of funding with a 20% local match
Deadline: Open
Contact: Pennsylvania Department of Transportation
Phone: 717-705-1493
www.dot.state.pa.us

Transit Revitalization Investment District (TRID)

Eligibility: Pennsylvania local governments, counties, transportation authorities, and public transit agencies
Purpose: To encourage private sector investment and revitalization of areas adjacent to transit stations
Terms: 25% match for TRID planning study
Deadline: Open
Contact: Pennsylvania Department of Community and Economic Development
Phone: 717-783-1132
www.newpa.com

Transportation and Community Development Initiative (TCDI)

Eligibility: Eligible municipalities
Purpose: Support local planning projects to improve transportation and encourage redevelopment
Terms: Grants up to $100,000 for single projects and $150,000 for multi-municipal projects; 20% local match required
Deadline: Every two years
Contact: Delaware Valley Regional Planning Commission (DVRPC)
Phone: 215-592-1800
www.dvrpc.org

Transportation Enhancements Program (TE) - Pennsylvania

Eligibility: Pennsylvania local governments, counties, state or federal agencies, non-profits

Purpose: Funds non-traditional projects designed to enhance the transportation experience, to mitigate the impacts of transportation facilities on communities and the environment, and to enhance community character

Terms: 80% to 90% of costs can be funded

Deadline: Varies

Contact: Delaware Valley Regional Planning Commission (DVRPC)

Phone: 215.592-1800

http://www.dvrpc.org

Environmental

Coldwater Heritage Partnership Grants (CHP)

Eligibility: Pennsylvania local governments, counties, and municipal authorities

Purpose: To prepare preliminary watershed assessments

Terms: Grants up to $5,000

Deadline: Varies

Contact: Pennsylvania Department of Conservation and Natural Resources

Phone: 717-787-2316

www.dcnr.state.pa.us

Floodplain Land Use Assistance Program

Eligibility: Pennsylvania local governments

Purpose: Provides grants and technical assistance to encourage the proper use of land and the management of floodplain lands within Pennsylvania

Terms: 50% of the eligible costs

Deadline: Varies

Contact: Pennsylvania Governor's Center for Local Government Services

Phone: 888-223-6837

www.newpa.com

PENNVEST

Eligibility: Pennsylvania municipality, authority, or private entity that is eligible under PENNVEST
Purpose: Infrastructure improvements such as drinking water, wastewater, or stormwater
Terms: Vary
Deadline: Varies
Contact: Pennsylvania Infrastructure Investment Authority
Phone: 717-783-6798
www.pennvest.state.pa.us

Municipal Challenge Grant

Eligibility: Pennsylvania local governments
Purpose: Supports municipal tree inventories, tree planting, and tree care
Terms: Grant range from $1,000 - $5,000; in-kind match required
Deadline: Annual
Contact: Pennsylvania Department of Community and Natural Resources
Phone: 717-727-2757
www.dcnr.state.pa.us

PECO Green Regions

Eligibility: Municipalities in Bucks, Chester, Delaware, Montgomery and Philadelphia counties
Purpose: To protect, acquire, and enhance open space
Terms: Grants of up to $10,000
Deadline: Spring and fall
Contact: Natural Lands Trust
Phone: 610-353-5597
www.natlands.org

Recreational Trails Program

Eligibility: Pennsylvania county and municipal governments, state and federal agencies, private organizations
Purpose: Provide grants for developing and maintaining recreational trails and trail-related facilities
Terms: Local match of 50% is required
Deadline: Annual
Contact: Pennsylvania Department of Conservation and Natural Resources
Phone: 888-727-2757
www.dcnr.state.pa.us

Source Water Protection (SWP) Watershed Protection Grants

Eligibility: Pennsylvania local governments and community water systems
Purpose: To fund watershed activities
Terms: One time grants up to $200,000; 10% local match is required
Deadline: Varies
Contact: Pennsylvania Department of Environmental Protection
Phone: 717-705-5400
www.dep.state.pa.us

TreeVitalize

Eligibility: County and local governments in Southeastern Pennsylvania
Purpose: To develop private-public partnership to address tree coverage in Southeastern Pennsylvania
Terms: Grants and technical assistance
Deadline: Varies
Contact: Pennsylvania Horticultural Society
Phone: 215-988-8874
www.treevitalize.net

Additional Environmental Funding Sources

Bundle into Municipal Construction Projects

One strategy for financing stormwater retrofits is to bundle them into existing municipal capital projects. This bundling may be relatively easy in projects that relate to drainage or stormwater conveyance. Other cases may require much greater interagency education and coordination efforts. However, as many units of local government are now subject to municipal stormwater permits and environmental permitting requirements, bundling retrofits into existing construction projects makes stormwater compliance easier and may meet off-site mitigation needs.

Stormwater User Fees

Financing for stormwater improvements can also be derived from an additional stormwater fee as part of a municipality's standard utility bill. Property owners are charged a user fee based upon their contribution to stormwater, usually attributed to the size of their parcel or the amount of impervious surface on that parcel, under this system. Fees can be collected by the local government or the municipality's stormwater authority and revenue is dedicated to a fund used only for stormwater management improvements.

Grants and Loans

One potential source for funds for stormwater management initiatives is **Growing Greener**, a state grant program administered by PADEP, DCNR, and PENNVEST. These funds are to be used for preserving farmland, protecting open space, maintaining state parks, cleaning up abandoned mines, restoring watersheds, funding recreational trails and local parks, helping communities address land use, and providing new and upgraded water and sewer systems.

The Pennsylvania Infrastructure Investment Authority (**PENNVEST**) also provides loans and grants for various infrastructure projects, including drinking water, wastewater, brownfields redevelopment, and stormwater projects. The PADEP reviews applicants for their Growing Greener grant funding and refers some to PENNVEST that they are not able to accommodate.

The **PA Department of Community and Economic Development** offers several programs that can help with general municipality upgrades within a community including stormwater improvement initiatives. The Pennsylvania Infrastructure Bank provides low-interest loans for the design, repair and construction of public highways, bridges and public transportation systems. The Urban Development Program provides grants for urban development and improvement projects. The Local Government Municipal Resources Development Program provides grants for municipalities that look to improve the quality of life within their communities.

TreeVitalize is a public-private partnership to help restore tree cover, educate citizens about planting trees as an act of caring for our environment, and build capacity among local governments to understand, protect and restore their urban trees. This program funds planting trees along streets, in parks and open space, and in riparian buffers.

A similar program is provided by **Pennsylvania Community Forests**, a nonprofit organization, which offers a grants program that supports education about trees and natural resources, implements tree planting and maintenance projects, and help communities develop long term programs to care for their trees.

American Forest **Global ReLeaf Grants** fund tree-planting projects involving large-scale ecosystem restoration promoting overall biodiversity. Projects must be located on publically-owned or -accessible land where the plantable area is 20 acres or more and where the forest area has been damaged by natural or human causes.

The League of Women Voters of Pennsylvania Citizen Education Fund provides funding through their **Water Resource Education Network**. Projects should be community based educational partnerships that protect and improve the community's watershed through awareness, public policy, and/or behavior change. Two project areas are available for funding: Source Water Protection and Watershed Protection.

The water purveyor American Water administers an **Environmental Grant Program** that offers funds for innovative, community-based environmental projects that improve, restore or protect the watersheds, surface water and/or groundwater supplies in the communities it serves.

The **William Penn Foundation** offers grants for innovative local projects that protect, conserve, and restore water resources as part of its Environment and Communities grant focus area. This program targets riverside communities and water quality improvements to promote the health of the Delaware and Schuylkill Rivers.

The **H2O PA** Act was established in July 2008 and provides single- or multi-year grants to municipalities or municipal authorities to assist with the construction of drinking water, sanitary sewer and storm sewer projects. Funding ranges from a minimum of $500,000 to a maximum of $20 million.

The **Radnor Conservancy** works to protect open space in the Radnor Township Area by working with individual property owners who are interested in permanently protecting their land from development through conservation easements. The Conservancy is also involved in stream restoration efforts.

The **Lower Merion Conservancy** works to protect open space in Lower Merion Township through conservation easements, land donation, and conservation planning. They also implement stream restoration projects, reforestation and invasive species removal, and other conservation activities.

The **Montgomery County Lands Trust** preserves open spaces through the donation of conservation easements and works to implement the Montgomery County Open Space Program.

The **Conservancy of Montgomery County** also has a conservation easement program to protect open space throughout the county.

The **Natural Lands Trust** is a nonprofit that preserves land in the Greater Philadelphia region through direct acquisition and the purchase of conservation easements. They also engage in conservation planning and land management to restore the ecological health of natural lands.

The Federal Clean Water Act **Section 319(h)** Nonpoint Source Management Program offers grant money to states, territories and tribes to mitigate nonpoint source pollution. The funding can be used for technical assistance, financial assistance, education, training, technology transfer, demonstration projects or monitoring.

The **North American Wetlands Conservation Act** provides matching grants to organizations and individuals to implement wetlands conservation projects that involve long-term protection, restoration, and/or enhancement of wetlands and associated uplands habitats.

Publication Title: US 30 (Lancaster Avenue) Corridor Study: Creating Linkages and Connecting Communities

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Geographic Area Covered: City of Philadelphia, Haverford Township, Lower Merion Township, Narberth Borough, Radnor Township

Key Words: Transportation, land use, environment, transit, corridor, smart growth, intersection improvements, multi-municipal, coordinated, US 30, Lancaster Avenue

Abstract: This study was conducted by DVRPC to help coordinate transportation and land use planning across the municipalities that line a portion of US 30. The study focuses on US 30 (Lancaster Avenue) between 52nd Street in West Philadelphia and Old Eagle School Road in Radnor. By coordinating these efforts, DVRPC seeks to promote a more sustainable region and implement the goals and objectives presented in *Connections: The Regional Plan for a Sustainable Future*. This study seeks to address transportation and livability issues such as safety, walkability, traffic circulation, stormwater management, and natural resource protection, while enhancing the existing historic and cultural assets of the corridor. The suggested recommendations promote vehicular, pedestrian and bicycle safety; improved access to transit; and new development that aesthetically and functionally complements the character of the study area.

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CREATING LINKAGES

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CONNECTING
COMMUNITIES

US 30