PHILADELPHIA WALK BIKE

PEDESTRIAN AND BICYCLE PLAN

PCPC

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PHILADELPHIA CITY PLANNING COMMISSION • APRIL 2012

PHILADELPHIA

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CHAPTER 1
INTRODUCTION, BACKGROUND, PLAN DEVELOPMENT

INTRODUCTION

Walking and bicycling are important facets of a city's mobility, economic development, public health, and environmental sustainability. They are especially important modes of transportation for children, the elderly, and people who cannot afford to own and maintain a car. According to the 2010 U.S. Census, one-third of all households in the City of Philadelphia are zero-car households. Walkability and bikeability are also important in attracting tourists and new residents. Walking, biking and other active modes of transportation provide many people with an affordable way of incorporating physical exercise into their daily routine, helping to fight obesity and related chronic diseases. Walkable and bikeable communities also make it more convenient for people to know their neighbors, and add more "eyes on the street" to make them safer. When people walk or bike instead of driving, less air pollution is the result, and everyone can breathe more easily.

Many sections of Philadelphia are traditionally walkable, and the existing network of bike lanes, trails, and other facilities has improved the safety and comfort of bike travel. Nevertheless, there are still gaps in the pedestrian and bicycle networks. Improving the connectivity of these networks will provide more direct, convenient and safe travel routes for walking and bicycling; provide more travel choices and reduce dependency on automobiles; and strengthen the community by increasing opportunities for neighbors to interact.

This Plan is Philadelphia's first Pedestrian Plan, and it serves as an update to the City's Bicycle Network Plan, completed in 2000.

Today, there are more than 230 miles of existing bike lanes throughout the City. The new bike lanes, together with the expansion of the Schuylkill River Trail, have helped to support a significant growth of bicycling in recent years, as discussed in detail in Chapter 3.

The Plan encompasses the entire City of Philadelphia. The recommendations were developed in two distinct phases. As shown in Map 1, the first phase included Center City, South Philadelphia, North Philadelphia, and Northwest Philadelphia and the second phase included West Philadelphia, Southwest Philadelphia, Olney/Oak Lane, the River Wards, and Northeast Philadelphia. It identifies strategies to increase the number and frequency of people walking and bicycling in the City by improving the connectivity, safety, convenience, and attractiveness of the pedestrian and bicycle networks. Pedestrian-oriented recommendations promote a safe, comfortable, efficient, and attractive pedestrian transportation system. The proposed expanded bikeway network will make bicycling safer and more convenient, and will help to promote a wider recognition and acceptance of bicycling as a transportation mode.

Beyond recommendations for improvements to the walking and bicycling networks, the Plan presents a framework for pedestrian and bicycle planning, development and maintenance that includes:

- A street classification system with design standards for sidewalks, which reflects the interplay between roadway function, pedestrian activity, and adjacent land use;
- A set of policies and programs to enhance pedestrian and bicycle facilities and to support walking and bicycling through improved maintenance, monitoring, enforcement, encouragement, and safety education; and
- Strategies for implementing bicycle and pedestrian network recommendations.

MAP 1:
Study Area Map

BACKGROUND

Philadelphia is a leader in addressing non-motorized transportation needs and is well positioned to make further strides in the coming years. A rich policy context and set of on-going programs provide a strong foundation for the implementation of the recommendations in this Plan. This will be accomplished through ongoing collaboration between the City, State, and advocacy organizations such as the Bicycle Coalition of Greater Philadelphia.

POLICY CONTENT

The Plan builds on and will support several major City policy and planning initiatives, including Complete Streets, Greenworks Philadelphia, and Philadelphia 2035:

Mayor Nutter announces Complete Streets policy and Philadelphia receives Bicycle-Friendly Community award in 2009.

Complete Streets Executive Order

In June 2009, Mayor Nutter laid the policy foundation for a transportation system that balances the needs of all users with the Complete Streets Executive Order. It directs all City departments and agencies to give full consideration to the safety and convenience of all users of the transportation system, including pedestrians, bicyclists, public transit users, and motor vehicle drivers. It places a high priority on the safety of those traveling in the public right-of-way, particularly the safety of children, the elderly, and persons with disabilities. The Mayor's Office of Transportation and Utilities (MOTU) will develop and publish a Complete Streets Design Manual, which will draw from, and build upon the recommendations in this Plan.

Greenworks Philadelphia

Released by the Mayor's Office of Sustainability in April 2009, Greenworks Philadelphia is an ambitious, comprehensive framework to make Philadelphia the greenest city in the United States by 2015. It sets 15 targets to improve the City's environment and encompasses more than 150 initiatives. Together, they are intended to reduce the City's vulnerability to rising energy prices, limit its environmental footprint, and reposition its workforce and job development strategies to build on Philadelphia's competitive advantages in the emerging green economy. Non-motorized transportation modes are included in or affected by several of Greenwork's targets, as noted in Table 1.

TABLE 1: GREENWORKS PHILADELPHIA PEDESTRIAN AND BICYCLE RELATED TARGETS

NUMBER	TARGET
6	**Improve Air Quality toward Attainment of Federal Standards** (Increase number of bike racks)
9	**Provide Park and Recreation Resources within 10 minutes of 75% of Residents** (Includes riverfront trail projects)
11	**Increase Tree Coverage toward 30% in all Neighborhoods by 2025** (Street trees provide buffer and shade for pedestrians but may compete for limited sidewalk space)
12	**Reduce Vehicle Miles Traveled by 10%** (Initiatives include Pedestrian/Bicycle Plan, on-and-off-street bicycle facilities, expanded bike parking, increased traffic calming)
13	**State of Good Repair to achieve 70% of City assets in good repair** (Street repaving important for smooth biking surfaces; upgraded bridges include sidewalks)

Philadelphia 2035

The Comprehensive Plan is part of an integrated planning and zoning process. Organized around three major themes – Thrive, Connect, and Renew – this "blueprint for the future" includes a long-range citywide plan and 18 strategic district plans.

The Philadelphia 2035 District Plans are "in process" and will be for the next several years, but the larger citywide document was completed in June 2011.

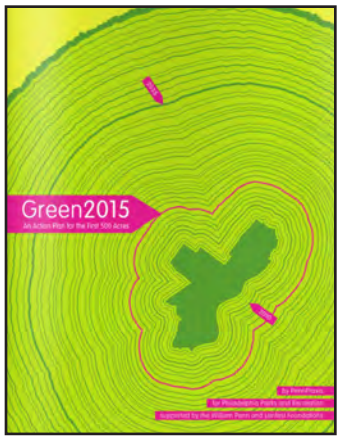
The Zoning Code Commission completed its revision of the new Zoning Code, and it was adopted by City Council in December 2011. The district plans will provide the basis for zoning remapping, using the new zoning classifications and following the goals, principles, and recommendations of the Comprehensive Plan. Transportation recommendations in Philadelphia 2035 are informed by the recommendations in this Plan.

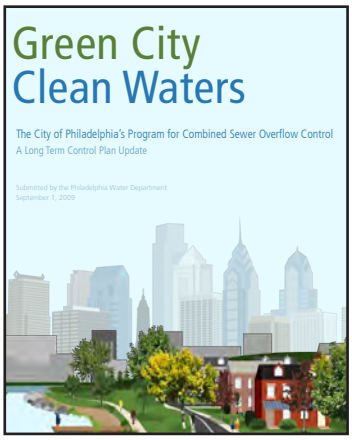
CONCURRENT PROJECTS AND PROGRAMS

In addition to the policy initiatives described above, Philadelphia's pedestrian and bicycle networks are affected by a number of other concurrent and complementary planning and development efforts.

GreenPlan Philadelphia and Green 2015

Green 2015 is the action plan of the Philadelphia Department of Parks and Recreation to add 500 acres of new open space by 2015. Philadelphia has a long-range plan to connect residents, workers, and visitors with sustainable green open space. Improvements and access to the trail system were a focus of public comments on the plan.





Green City, Clean Waters (Stormwater Management Plan)

The Philadelphia Water Department is developing strategies for dealing with rainwater "where it lands"[1] in order to avoid the cost of boring large stormwater tunnels or greatly expanding sewage plants to hold the overflow for subsequent treatment. As part of this effort, Philadelphia proposes to invest $1.6 billion within 20 years to manage rainwater through "green infrastructure" comprised of rain gardens, green roofs, porous pavement, planted curb extensions, vegetated parking-lot swales and new trees. As demonstrated in Figure 1, green infrastructure can complement pedestrian and bicycle needs. For example, curb extensions that improve street crossings for pedestrians can also include vegetation and aid in traffic calming.

"Get Healthy Philly"

In 2010, the Philadelphia Department of Public Health was awarded $15 million from the U.S. Department of Health and Human Services to promote healthy nutrition and increased physical activity. The grant has been used to make healthy foods more available and affordable, and to promote increased bicycling and walking in a variety of ways, including bicycle and pedestrian safety education, implementation of additional bike lane conversions, bicycle directional signage, and pedestrian and bicycle counts. The grant also funded a portion of the development of this Plan.

Curb Ramp Installation

Philadelphia is partnering with PennDOT to replace non ADA-compliant curb ramps.

Neighborhood Plans and Studies

Existing neighborhood plans and studies provide a context for recommendations in this Plan, demonstrating the need for new policies as well as physical changes to improve walking and bicycling at the neighborhood level. These plans are discussed in more detail below, and a summary of the reviewed plans is provided in the Appendix.

DVRPC Bicycle-Bus Conflict Area Study

The Bicycle-Bus Conflict Area Study identified ways to make bicycle use and bus ridership in Philadelphia more compatible. It reviewed how other cities resolve bus/bicycle conflicts and offered a related design and policy recommendation. More information on the study and its impact on future bicycle facilities is included in Chapter 7.

PLANNING, BUILDING AND MAINTAINING THE PEDESTRIAN AND BICYCLE NETWORKS

Three City agencies share the primary responsibilities for the planning, design, and maintenance of the City's pedestrian and bicycle networks:

- *The Mayor's Office of Transportation and Utilities* (MOTU) is responsible for coordinating all improvements to the pedestrian and bicycle networks. The City's full-time Pedestrian and Bicycle Coordinator, hired in 2008, is housed in this office.

[1] http://smartgrowth.org/news/article.asp?art=7286&state=39

- *The City Planning Commission*, in addition to being responsible for the development of this Plan, integrates proposed changes to the pedestrian and bicycle networks with development proposals and with neighborhood and district level planning efforts.

- *The Streets Department* is responsible for the construction and maintenance of the pedestrian and bicycle network in the public right-of-way, as well as for permitting alterations to the right-of-way by private property owners. The department's responsibilities include engineering of roadway and bridge improvements; design of traffic controls including signals, signs, and pavement markings; and maintenance of roadways and bridges (including plowing and salting), as well as traffic controls and street lights.

These three agencies work together on projects with shared objectives. A good example is the *Spruce and Pine Crosstown Bicycle Connector Pilot Project*, which provided buffered bike lanes on one-way paired streets in Center City. While the Mayor's Office of Transportation and Utilities was the lead agency for the project, the City Planning Commission and the Streets Department collaborated in the selection and design of the route, as well as in community outreach, implementation of the lanes, and assessment of the impact for both bicyclists and motorists. Another example of a highly collaborative project is the bicycle directional signage program. Ongoing coordination and collaboration of the three agencies, with regards to the successful implementation of projects, is discussed in more detail in Chapter 8.

Other agencies directly affect walking and bicycling including the City's Police Department, Parks and Recreation, and Water Departments; the Delaware Valley Regional Planning Commission (DVRPC), the Southeastern Pennsylvania Transportation Authority (SEPTA), and the Pennsylvania Department of Transportation (PennDOT).

Accessibility for People with Disabilities
Various agencies and departments in Philadelphia are responsible for planning for people with disabilities. The City's pedestrian planning efforts are influenced by the Federal Americans with Disabilities Act (ADA). The ADA's implementing regulations require that all new and altered facilities—including sidewalks, street crossings, and related pedestrian facilities in the public right-of-way—be accessible to and usable by people with disabilities. The Americans with Disabilities Act Accessibility Guidelines (ADAAG) provide guidance for the design and construction of accessible pedestrian facilities. The United States Access Board anticipates issuing Public Rights-of-Way Access Guidelines (PROWAG) that will provide greater guidance on how issues of accessibility should be addressed along existing streets and highways.

FIGURE 1:
GREEN INFRASTRUCTURE

The City Water Department 's Green City, Clean Water plan will add "green infrastructure" to streets and sidewalks. Street trees can provide an important environmental and aesthetic asset to city streets, but proper installation is important to ensure that trees do not create pinch points or tripping hazards. Techniques include: using walkable tree grates; placing trees in curb extensions; and using structural soil to allow more room for roots to grow under the sidewalk.

PLAN DEVELOPMENT

The Plan is a collaborative effort of the City of Philadelphia, the project Steering Committee, and citizens who provided input at public meetings and through a range of other venues.

Steering Committee
The planning process for the Philadelphia Pedestrian and Bicycle Plan was guided by a Steering Committee representing City agencies, DVRPC, SEPTA, the Bicycle Coalition of Greater Philadelphia, and other stakeholders. Steering Committee members and stakeholder groups are listed at the beginning of the Plan. This group met throughout the planning process, both as a committee of the whole and in sub-committees focused on specific policy recommendations. At the outset of the plan, the Steering Committee members were asked "*If this Plan could only accomplish one thing, what would it be and why?*"

Out of the responses, five themes emerged and were developed by the Steering Committee into a vision statement, goal statements and measures for each goal. These themes are listed in Table 2 and discussed in more detail in Chapter 2. The Steering Committee actively participated in all aspects of the planning process, from the pedestrian and bicycle demand and needs analysis, through the development of street types, and pedestrian and bicycle network recommendations.

EXISTING CONDITIONS PHASE

Existing Studies

More than seventy plans and studies that document existing conditions and propose pedestrian and bicycle-related recommendations were reviewed as part of this planning process. These include: Walking Reports and Studies; Bicycling Reports and Studies; Shared-Use Trail Plans and Studies; Neighborhood/Area Plans and Studies; Corridor Plans and Studies; and Policy and Strategic Plans. Recommendations for pedestrian improvements, bicycle facilities, and access to transit described in these documents provided a rich source of information for developing and refining recommendations in this Plan. A complete summary of the plans and studies is included in Appendix A.

TABLE 2: PROJECT THEMES
Improve **Safety** for all pedestrians and bicyclists.
Encourage walking and bicycling to promote healthy, active living and to enjoy the associated economic and environmental benefits.
Increase the **Connectivity** of the bikeway and walking networks.
Promote and enhance the role of sidewalks and streets as the **Public Realm**.
Garner **Recognition** for Philadelphia as a leader in pedestrian and bicycle achievement.

Field Work

In addition to gathering information on existing conditions from recent plans and studies, field work was undertaken as part of the development of this Plan to determine the status of the current bicycle network and to identify opportunities to expand the network.

During these field surveys, elements affecting bicyclists such as: roadway width, the presence of on-street parking, connectivity issues and concerns, and interactions with transit were evaluated. Following the selection of locations for Pedestrian Priority Area analysis, the study team visited each of these locations to gather information for the development of detailed pedestrian recommendations.

The Importance of Public Input

Philadelphia residents participated in developing the Plan in several ways. As noted in Table 3, fourteen open houses created extensive opportunities for public input. The sessions were held across the city to enhance access. At the beginning of each phase of the project, meetings were held that focused on existing conditions, barriers and obstacles, and pedestrian and bicycle needs.

At the end of each phase, draft pedestrian, bicycle and street type recommendations were presented and feedback was collected and incorporated.

A project website was available for the duration of the project, which included information on public meetings, as well as draft maps, PowerPoint presentations, and other material. An on-line survey, completed by more than 2,000 respondents, was also conducted to gather walking and bicycling related insights.

TABLE 3: COMMUNITY WORKSHOPS AND OPEN HOUSES

DATES	PHASE
April 16, 2009	PHASE 1
April 21, 2009	
May 18, 2009	
May 20, 2009	
April 19, 2010	
April 20, 2010	
October 4, 2010	PHASE 2
October 5, 2010	
October 20, 2010	
October 21, 2010	
October 11, 2011	
October 12, 2011	
October 25, 2011	
October 26, 2011	

PLAN OUTLINE

The Plan is comprised of eight chapters. Chapter 2 outlines the vision, goals and measures for pedestrian and bicycle travel in Philadelphia. Chapter 3 describes existing conditions for walking and bicycling in Philadelphia, including the extent and condition of facilities, crashes, and the demand for walking and bicycling in different areas of the City.

Chapter 4 presents a new set of Street Types that use adjacent land use characteristics, levels of pedestrian activity, and other factors to inform new sidewalk design standards. Chapter 5 summarizes the new policy recommendations for pedestrian and bicycle facilities; health and safety programs and activities; and managing and monitoring the non-motorized transportation system.

Pedestrian related recommendations are outlined in Chapter 6 through a series of general improvements for a select number of corridors and individual locations. Bicycle recommendations follow in Chapter 7 and include a description of facility types and a discussion of issues to consider when implementing bicycle facilities. Chapter 8 focuses on implementation. Additional information is provided in the Appendix, including the Policy Papers, and more detailed pedestrian and bicycle recommendations for specific locations throughout the city.

CHAPTER 2
PLAN VISION, GOALS AND MEASURES

The plan establishes the following vision for travel on foot and by bicycle in a livable and vibrant Philadelphia:

> *The Pedestrian and Bicycle Plan envisions a Philadelphia in which walking and biking are an integral part of daily life, and vital components of a first class multi-modal transportation system. Philadelphia residents, workers and visitors consider traveling on foot or by bike to be a safe, effective, and accessible choice; one of the benefits of being in the City. Our transportation system supports other City goals for sustainability, active living, economic and community development.*

The project Steering Committee crafted this vision, along with five goals relating to safety, encouragement, the public realm, connectivity, and recognition. Measures were identified for each goal, and a more limited set of targeted outcomes was established to track progress over time. The targeted outcomes are listed in Table 4. The ultimate measures of success will be increased rates of bicycling and walking, and reduced incidence of pedestrian and bicycle crashes. A system for tracking and reporting on Plan goals will need to be established because information and data for the measures may not be readily available in a single agency or City department.

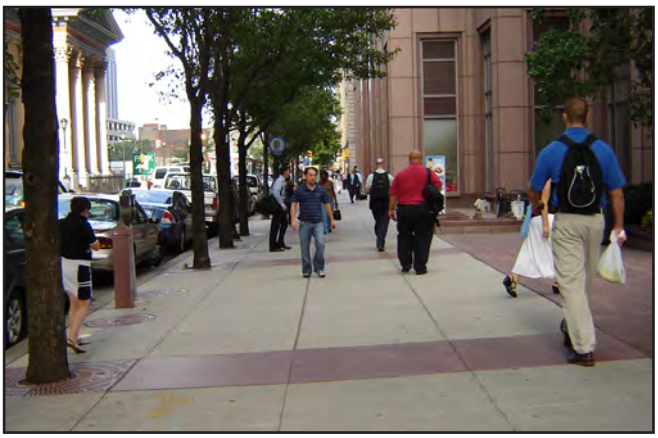
Goal 1: Improve SAFETY for pedestrians and bicyclists.
Philadelphia's recently adopted Complete Streets Policy requires that all transportation facilities be designed with attention to the needs of all users, especially the most vulnerable. Improvements to the design, operation, and maintenance of streets, sidewalks, and intersections will reduce pedestrian and bicycle crashes. Public safety campaigns, combined with enforcement, can foster a higher level of predictability among all users of the roadway. Bicyclists should feel safe riding in the street as the law requires.

Measures
- Number of bicycle and pedestrian crashes:
  - Reduce fatalities 50% by 2020.
  - Reduce injuries 50% by 2020.
- Number of pedestrian and bicyclist education programs in schools.
- Number of traffic safety education programs for all users and enforcement authorities.

Goal 2: ENCOURAGE biking and walking to promote healthy, active living and to enjoy the associated economic and environmental benefits.
Philadelphia's sidewalks and bikeways should be inviting to existing and potential walkers and bikers. Walkable neighborhoods that provide access to daily destinations such as schools, stores, and recreation within a short distance of home have demonstrated economic benefits. Many short auto trips could be replaced by biking or walking trips, with resulting benefits for residents' health and fitness and reductions in air pollution.

Measures
- Increase in the commuting mode share for:
  - Bicycling from 1.6% to 6.5% by 2020.
  - Walking from 8.6% to 12% by 2020.

- Regular pedestrian and bicyclist counts:
  - Triple bicyclist volume at key locations
  - Increase pedestrian volume at key locations by 50%
- DVRPC Household Travel Survey:
  - Increase total of Walk, Bicycle, and Transit by 10%



Goal 3: Promote and enhance the role of sidewalks and streets as the PUBLIC REALM by re-envisioning them as public spaces for people to enjoy.

Sidewalks are the part of the street environment where pedestrians should feel safe from vehicles and free to move in comfort. The level of pedestrian amenities, maintenance and management should be raised to make the sidewalks and streets a vital part of the City's civic life and accessible to all.

Measures

- Rate of violations found during sidewalk audits.
- Level of public and private funding committed to sidewalks.

Goal 4: Increase the CONNECTIVITY of the bikeway and walking networks.

Filling in the gaps in the sidewalk and bicycle lane networks will make it easier to walk or bicycle to neighborhood destinations such as stores, schools, parks, recreation centers, and libraries, and to make connections with the transit system. Extending the networks, including separated paths and trails, will also enable more Philadelphians to commute to work on foot or by bicycle.

Measures

- Miles of bike lanes added.
- Critical sidewalk gaps connected.
- Miles of off-road trails added (exclusive of sidepaths).
- Crossing improvements.
- Number of pedestrian and bike network connections with off-road network.

Goal 5: Garner RECOGNITION for Philadelphia as a leader in bicycle and pedestrian achievement.

Philadelphia has received recognition for its pedestrian and bicycle leadership from external entities and from those who live and work in the City. Many Philadelphia neighborhoods are already acknowledged as among the most walkable and bikeable in the country. However, the City can gain higher levels of recognition by increasing connections between its various travel modes and by trying or pioneering new engineering practices and policies.

Measures

- Reach League of American Bicyclists platinum level by 2013.
- Seek a higher level of Walk Friendly Community designation from the Pedestrian and Bicycle Information Center in 2015.
- External "mentions" and references in news articles, blogs, magazines, etc.

TABLE 4: TARGET OUTCOMES

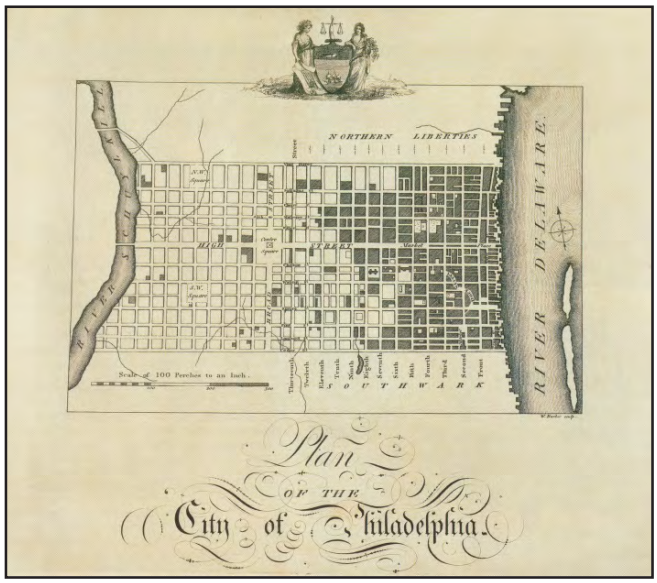
MEASURE	TARGET OUTCOME
Number of bicycle and pedestrian crashes	Reduce fatalities 50% by 2020
	Reduce injuries 50% by 2020
Increase in the commuting mode share	For bicycling, from 1.6% to 6.5% by 2020
	For walking, from 8.6% to 12% by 2020
Regular pedestrian and bicyclist counts	Triple bicyclist volume at key locations
	Increase pedestrian volume at key locations by 50%
DVRPC Household Travel Survey	Increase total of Walk, Bicycle, and Transit by 10%

CHAPTER 3
EXISTING CONDITIONS

This chapter highlights existing conditions for walking and bicycling in Philadelphia. It provides information on the extent, quality, and condition of pedestrian and bicycle facilities, an analysis of demand for walking and bicycling in different areas of the city, and pedestrian and bicycle crash data.

Overview

A city's history plays a significant role in how we move through it. William Penn and Thomas Holmes' grid for Center City Philadelphia, created in the 17th century, still exists today and is in many ways the streetscape's most defining characteristic. Philadelphia has one of the most walkable downtowns in the nation, with nearly 17,000 people walking to work on a daily basis. Much of the city replicates the grid layout, which provides a rich network of connections for vehicles and pedestrians alike. Parts of the city that were developed before World War II are well-supplied with sidewalks. In these areas, the majority of the streets are narrow and relatively easy to cross on foot. While narrow streets are more pedestrian-friendly, they pose real challenges in terms of developing an on-road bikeway network, as there is limited space to provide bike lanes without removing either traffic lanes or on-street parking.



Areas of the city that were developed after World War II tend to be less pedestrian friendly. Here the roads are wider, with more lanes and longer blocks, less well-connected, and often missing sidewalks. Although the roads often are wide enough to accommodate bike lanes, these neighborhoods are not necessarily more bicycle-friendly, because traffic speeds are typically higher and the intersections may be large, complex, and intimidating.

Besides the post-war neighborhoods, the parts of the City that are the most difficult for walking and bicycling are industrial areas. Some of these, especially along the waterfront, are being redeveloped for residential and commercial uses that could generate much more pedestrian and bicycle activity.

Transportation Network

Philadelphia's transportation network is used by 1.5 million residents, plus commuters and tourists. Nearly 26% of all trips are walk trips (based on DVRPC's 2000 Philadelphia Household Travel Survey, see figure 2) and about 8% of work trips are walk-only. Most other work trips, particularly transit trips, have a walking component. Safe pedestrian access to transit is critical for all residents and visitors who want to or must use transit. Transit access is particularly important for the young and elderly population, who have less access to vehicles.

Bicycling is the fastest growing mode of transportation in Philadelphia. According to the American Community Survey, the citywide bicycle commuting mode share for 2009 was 2.16%, twice the rate of any other big city in the U.S. Bicycle commuting in Philadelphia increased 151% from 2000 to 2009, and this dramatic increase is confirmed by bicycle counts taken over the years by the Bicycle Coalition. In fact, according to BCGP's 2011 report, *Mode Shift*, "Between 1990 and 2009, the number of bicyclists crossing the Schuylkill River grew by 361%" (see figure 3).

Roadway Classification

Philadelphia's streets provide the basic network for walking and bicycling throughout the city. This network is defined using a classification system similar to the U.S. Federal Highway Administration's functional classification system, which must be used for certain funding purposes. A summary of the characteristics of each roadway class, excluding expressways, and the total linear miles in Philadelphia is included in Table 5.

A major recommendation of this Plan, presented in the following chapter, is the addition of a new street classification system. The new street classification is more context sensitive, incorporating adjacent land use and levels of pedestrian activity along with vehicular function, and will serve as the basis for new sidewalk design standards.

Trail Connections

Trails make an important contribution to the connectivity of the existing pedestrian and bike networks. The substantial existing trail network in Philadelphia serves as a complement to the on-street pedestrian and bicycle networks, with entrances on major roadways, such as Market Street, Walnut Street, Race Street, and Main Street in Manayunk. The following improvements to the Schuylkill River Trail, Delaware River Trail, and new connections between the trails and Center City have recently been built or are planned. These connections serve recreation and commuting needs alike.

- Walnut Street Gateway: enhancing the Walnut Street Bridge for bicyclists and pedestrians.
- Improved at-grade rail crossings at Race and Locust Streets to the Schuylkill River Trail.
- A grade-separated crossing over the CSX tracks at 25th and Spruce Streets.
- Extension of the Schuylkill River trail south from Locust Street to South Street via a boardwalk.
- The Grays Ferry Crescent section of the Schuylkill River Trail.
- The Delaware River Trail along Allegheny Avenue and Delaware Avenue in Port Richmond.
- Several trail/neighborhood links, such as the Cherry Street connector and the Race Street connector.

Many of the planned projects will be funded through $17.2 million in TIGER grants awarded to the City of Philadelphia in 2009. A *Philadelphia Trail Master Plan* is currently being developed by the Planning Commission, which will incorporate the recommendations in this Plan, while focusing on the off-road trail network.

TABLE 5: ROADWAY MILES IN PHILADELPHIA BY FUNCTIONAL CLASSIFICATION

FUNCTIONAL CLASSIFICATION		MILES
	LOW-SPEED RAMP On- and off-ramps connecting expressways to street network.	19
	MAJOR ARTERIAL Provides service to through or long trips. Typically a multi-lane road and usually divided. High traffic volumes.	259
	MINOR ARTERIAL Provides service for moderate length trips. Medium to high volume traffic.	362
	COLLECTOR Provides traffic circulation within neighborhoods and small areas. Connects local roads to arterial system. Lower traffic volumes than arterials.	874
	LOCAL Mainly provides access to abutting properties. Low traffic volumes.	1,103
	NON TRAVEL Roads that are closed to traffic or cannot be driven on.	35

FIGURE 2:
Philadelphia Travel Modes, All Trips, 2000

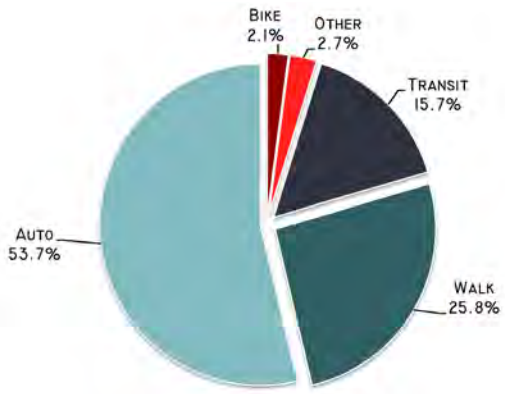
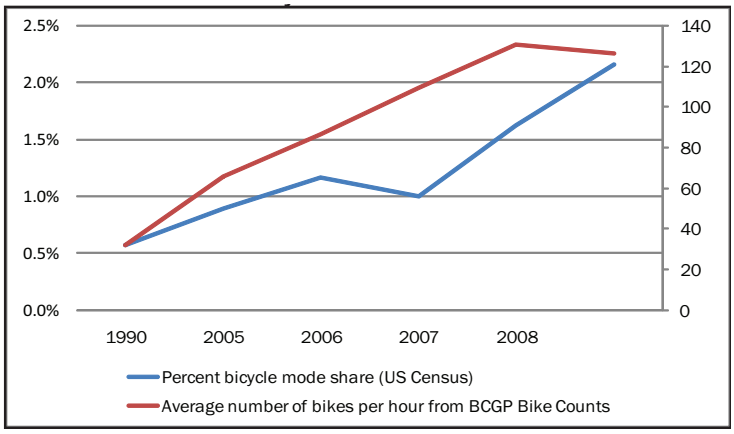


FIGURE 3: Bicycle Travel Trends
(Source: Bicycle Coalition of Greater Philadelphia)



A WALKABLE CITY

Philadelphia is considered to be a walkable city, compared to most other cities. In 2011, Philadelphia was awarded a silver level Walk Friendly Community designation by the Pedestrian and Bicycle Information Center. For the past several years, WalkScore has ranked Philadelphia as the 5th most walkable large city in America.

Five major factors contribute to Philadelphia's walkability:

- The mixed land use of Philadelphia neighborhoods means that destinations are often within walking distance.
- The sidewalk network is extensive, particularly in older parts of the City.
- Most streets are narrow, making crossing easier.
- The typically short (60-second) traffic signal cycles reduce pedestrian wait time at street crossings.
- Block lengths in many neighborhoods are short (400' or less), allowing for direct foot access to destinations.

This picture of Philadelphia's walkability was confirmed by those completing the web-based questionnaire conducted as a part of this Plan. For example, in response to the question "What do you like MOST about walking in Philadelphia?" nearly 80% of respondents said they were within walking distance of important destinations and over 60% indicated that the City's character offered an interesting walking environment. A good network of sidewalks and paths was cited by 45% of respondents as what they liked most about walking in Philadelphia. A complete summary of the web-based questionnaire is included in *Appendix B*.

According to the questionnaire responses, Philadelphians most often use the pedestrian network to get to the bus stop or transit station, to shop and complete other errands, and to see friends and family. The mode share of commuting to work on foot varies across the City, generally depending on the density of jobs and residences.

Existing Pedestrian Facilities

Philadelphia's pedestrian transportation system includes sidewalks and streets, curb ramps, crosswalks, signals, signs, and trails. The pedestrian environment is shaped by this infrastructure, as well as by elements like parks, civic land uses, the availability of transit, and private development. The quality of the pedestrian environment is also a function and result of land use, urban design, and the age and characteristics of a particular sidewalk or intersection.

Sidewalks are the backbone of the pedestrian network. Most Philadelphia streets have sidewalks on at least one side; however, sidewalks are missing on some streets and the connectivity of the sidewalk network is limited by gaps, obstructions, pinch points, and by sidewalks in very poor condition. Where sidewalks are missing, inadequate, or blocked by parked cars or other obstructions, pedestrians walk in the street. A sidewalk inventory was completed as part of the development of this Plan. This inventory included a GIS-based assessment of whether sidewalks exist or are missing along all arterial and collector streets outside of Center City. The inventory also captured whether the sidewalk is in poor or very poor condition, or exhibits gaps that limit connectivity. A more detailed description of the sidewalk inventory, and a discussion of the database that was developed as a result of it, is provided in Chapter 6.

The pedestrian experience can be broken down into two distinct categories. The first is the pedestrian experience walking along roadways, and the second is the experience crossing roadways. Selected elements that impact this experience in Philadelphia are described in Figures 4 and 5 on pages 13 and 16. A number of these elements, particularly those in Figure 5, also affect bicyclists.

Pedestrian Issues

The sidewalk is the part of the street where pedestrians should be able to move freely and comfortably without fear of vehicular conflicts. However, Philadelphia sidewalks are relatively narrow and many, especially on older, narrow streets, are cluttered with encroachments or parked vehicles.

FIGURE 4: PEDESTRIAN CONDITIONS ALONG THE ROADWAY

A pedestrian's experience walking along the streets and roadways in Philadelphia is influenced by a variety of factors, such as:

- *Sidewalks:* Sidewalks are the central component of the pedestrian network. Sidewalks and walkways should provide a continuous system of accessible paths for pedestrians.
- *Buffers:* A pedestrian's safety and comfort in the roadway environment is significantly affected by the width and quality of the buffer between the sidewalk and the roadway, on streets with heavy traffic volumes. Buffers such as on-street parking, street trees, bike racks, and landscaping can enhance the pedestrian experience by separating the vehicular traffic lanes from the pedestrian space on the sidewalk.
- *Obstructions:* Items reducing the clear width for pedestrian travel along sidewalks affect sidewalk functionality. Food carts, street trees, planters, café tables and retailers' merchandise can contribute to a lively and attractive pedestrian environment, but appropriate space for these items is needed.
- *Access to Transit:* Sidewalk connectivity in the proximity of bus stops provides access to these stops for all riders, especially important to older residents and those with disabilities.
- *Vehicular intrusions:* Sidewalks are often interrupted by driveways and lay-by lanes. The former introduce conflict zones into the sidewalk, while the latter reduce the sidewalk width, in most cases substantially. Illegal sidewalk parking is common in many parts of Philadelphia, often forcing walkers into the street.
- *Construction Zones:* Current construction zones range from complete sidewalk closure to fully protected access.
- *Bridges:* Bridges can serve as either connections or barriers in the pedestrian network.
- *Access to Trails:* There are 41 miles of major multi-use trails in Philadelphia. Pedestrian access to trails is predominantly provided via street crossings and at trailhead locations.
- *Pedestrian Bridges/Underpasses:* Pedestrian bridges and underpasses separate pedestrian traffic from motor vehicle traffic, allowing pedestrians to cross busy streets by eliminating potential conflicts. However, pedestrians are often reluctant to use them, either because of the extra time it would take, or because of security concerns.

The quality of Philadelphia's sidewalk network has not kept pace with the needs of pedestrians over the past 30 years. Property owners in the State of Pennsylvania are responsible for the maintenance and repair of sidewalks that abut their property. Although this law is not unusual, it means that sidewalks are the only major element of the public right-of-way that is not a public responsibility. The laws requiring property owner maintenance are seldom enforced. Thus, routine sidewalk maintenance is often neglected, although new development or redevelopment typically includes sidewalks. The city has neither a dedicated source of funding for sidewalk repair nor a line item in the capital budget, even for publicly-owned sidewalks (except those in Fairmount Park),although sidewalks in commercial corridors sometimes receive public funds as part of targeted streetscape projects.

Public input, including open houses and the questionnaire, revealed a number of concerns regarding sidewalks and street crossings in Philadelphia. These concerns include:

- Drivers not yielding or stopping for pedestrians.
- Unattractive streets and sidewalks.
- Sidewalk encroachments including construction, food trucks and cafes.
- Poor sidewalk surface quality and ADA-compliance issues.
- Drivers running red lights.
- Diagonal streets forming wide asymmetrical intersections.
- Parked vehicles obstructing sidewalks.

Public input also highlighted many locations in need of improvements, including neighborhood streets, highway interchanges, sidewalks on bridges or overpasses, major streets with heavy pedestrian traffic, and areas near destinations such as transit stations, schools, parks and recreation facilities, shopping and retail locations, and tourist destinations.

Pedestrian Demand

A pedestrian demand analysis was conducted in order to assess the relative amounts of pedestrian activity that are anticipated in different parts of the city. Evaluating potential pedestrian demand will allow the City to focus investments in locations that will benefit the greatest number of people. This information informed the selection and prioritization of a range of pedestrian improvements such as sidewalks and intersection improvements.

Population and employment densities were incorporated into the demand analysis as general proxies for home-based and work-related trips. Additional destinations were added, which were determined to be pedestrian generators, including colleges and universities, tourist attractions, schools, transit facilities, retail corridors, community services, and parks.

The demand analysis includes high, medium and low generators, reflecting the assumption that different types of destinations will generate different levels of activity. For example, SEPTA and PATCO stations are likely to generate more pedestrian traffic than places of worship.

The analysis also accounts for the distance people are willing to walk to and from different types of destinations. It recognizes that these distances are not the same for all pedestrian generators. For example, people may be more likely to walk farther to a transit station than to a coffee shop.

Table 6 shows the types of generators used to determine pedestrian demand. The generators were grouped by the expected volume of pedestrian trips (high, medium and low), while accounting for assumptions about how far pedestrians would walk to or from the generator..

Map 2 shows the result of the pedestrian demand analysis. Areas with higher scores, i.e., greater pedestrian demand, considered "hot spots", are shown as the darker green areas on the map.

Pedestrian Crashes

According to the 2012 Benchmarking Report by the Alliance for Biking and Walking, Philadelphia is the 9th safest city (of 51) for pedestrians. Dangerous by Design ranks the Philadelphia metro area as the 15th safest of 52 major regions. Both use the Pedestrian Danger Index, which compares the average pedestrian fatality rate with the percent of residents who walk to work. These indices, the following discussion, and crash maps, are all based on traffic crashes where a pedestrian or bicyclist was involved in a collision with a motor vehicle.

The Mayor's Office of Transportation and Utilities Bicycle and Pedestrian Crash Report 2004-2008 indicates that pedestrian crashes decreased 24% from 2004 to 2008 and pedestrian fatalities fluctuated between 30 and 39 fatalities per year over the same period. While people under 18 account for a disproportionate share of pedestrian crashes, the crash rate for this population has been declining faster than average: 35% from 2004-2008. The issue of pedestrian safety remains at the forefront of planning efforts in the City. For example, pedestrian and bicycle safety is included in the emphasis areas for DVRPC's Regional Safety Action Plan, and the City formed a Bicycle and Pedestrian Safety Task Force in 2010 to analyze crash patterns and study countermeasures. Map 3 shows pedestrian crashes in the City between 1990 and 2005.

The City of Philadelphia's Streets Department has also researched long-term trends in pedestrian crashes. One study tracked pedestrian injuries and fatalities over a 75-year period. It highlighted significant traffic engineering

TABLE 6: PEDESTRIAN DEMAND ANALYSIS, PEDESTRIAN GENERATORS AND WEIGHTING VALUES

PEDESTRIAN GENERATORS	DESTINATIONS		WEIGHT		
			1/8 MILE	1/4 MILE	1/2 MILE
	High Generator	University or College	15	10	5
		Major Generators / Tourist Destination	15	10	5
		SEPTA Rail Station & PATCO; Greyhound Bus Station	10	7	5
	Medium Generator	School	7	5	1
		Major Retail and entertainment	7	5	1
		Medium Tourist Destination	7	5	1
		Hospital	5	1	0
		Community Service	7	5	3
		Major Park Entrance	7	5	3
	Low Generator	Places of Worship	2	1	0

initiatives that helped contribute to the reduction in crashes over the last century, such as:

- All-way stop signs installed in the 1970s, resulting in a 50% decline in pedestrian fatalities and 40% decline in pedestrian injuries in the City.
- Removal of unwarranted traffic signals (that had been installed in the 1960s) and replacement with all-way stops.
- Signing the perimeter of all elementary schools for No Parking During School Hours, which helped reduce dart-out injuries among children age 5 to 9 from 14 per week to 3 per week
- Thermoplastic pavement markings, including continental crosswalks.
- Adjustment of traffic signal timings in 1994-1995 to include all-red phases and adequate pedestrian crossing times.

The Department also did an analysis of 54 intersections in the City that each had more than 2 pedestrian crashes per year in the early 1990's. These intersections typically had one or more of the following characteristics:

- Traffic volumes 20,000 per day or higher (46 locations).
- At least one intersecting street 60 feet or wider (42 locations).
- SEPTA surface lines intersect (42 locations).
- Commercial shopping strip (35 locations).
- SEPTA Subway/Elevated stop (23 locations).
- 3 or more streets intersect (9 locations).

That being said, the number of crashes does not necessarily reflect the safety of an intersection. The crash rate more accurately captures the concept of safety, as it reflects the number of crashes as a proportion of pedestrian traffic. Many of the high crash locations are associated with high pedestrian concentrations.

Broad Street (particularly North Broad) was the location of the largest number of the high pedestrian volume/high crash intersections, and Market Street had the second highest number. DVRPC prepared a crash analysis of a four-mile stretch of North Broad Street from Lehigh Avenue to Old York Road using the Pedestrian and Bicycle Crash Analysis Tool developed by the National Highway Traffic Safety Administration. Key findings of the North Broad Street crash analysis were that 40% of crashes happened "when a motorist, either moving straight or turning, failed to give way to a pedestrian crossing the roadway in either a marked or unmarked crosswalk. Such crashes occur disproportionately after dark." Based on this, the DVRPC study suggested that "significant reductions in pedestrian crashes might be achieved by enhancing the lighting of crosswalk areas and targeting enforcement of yield-to-pedestrian laws".

Other Pedestrian Needs Assessments

A range of pedestrian needs analyses were undertaken to determine where the pedestrian network most needs improvement. Certain existing conditions that may create unsafe conditions for pedestrian travel were scored and mapped. The needs analyses focused on conditions at intersections using factors such as intersection width, the distance between signalized or all-way stop intersections, intersection signal control, and pedestrian crashes at intersections. This served as an additional way to evaluate pedestrian conditions throughout the city and informed the selection of pedestrian priority areas and other recommendations in this Plan.

FIGURE 5: PEDESTRIAN CONDITIONS ACROSS THE ROADWAY

In addition to continuous sidewalks, safe street crossings are a critical component of an accessible pedestrian network. Important factors in determining a pedestrian's experience crossing a roadway include intersection geometry and the character of the road.

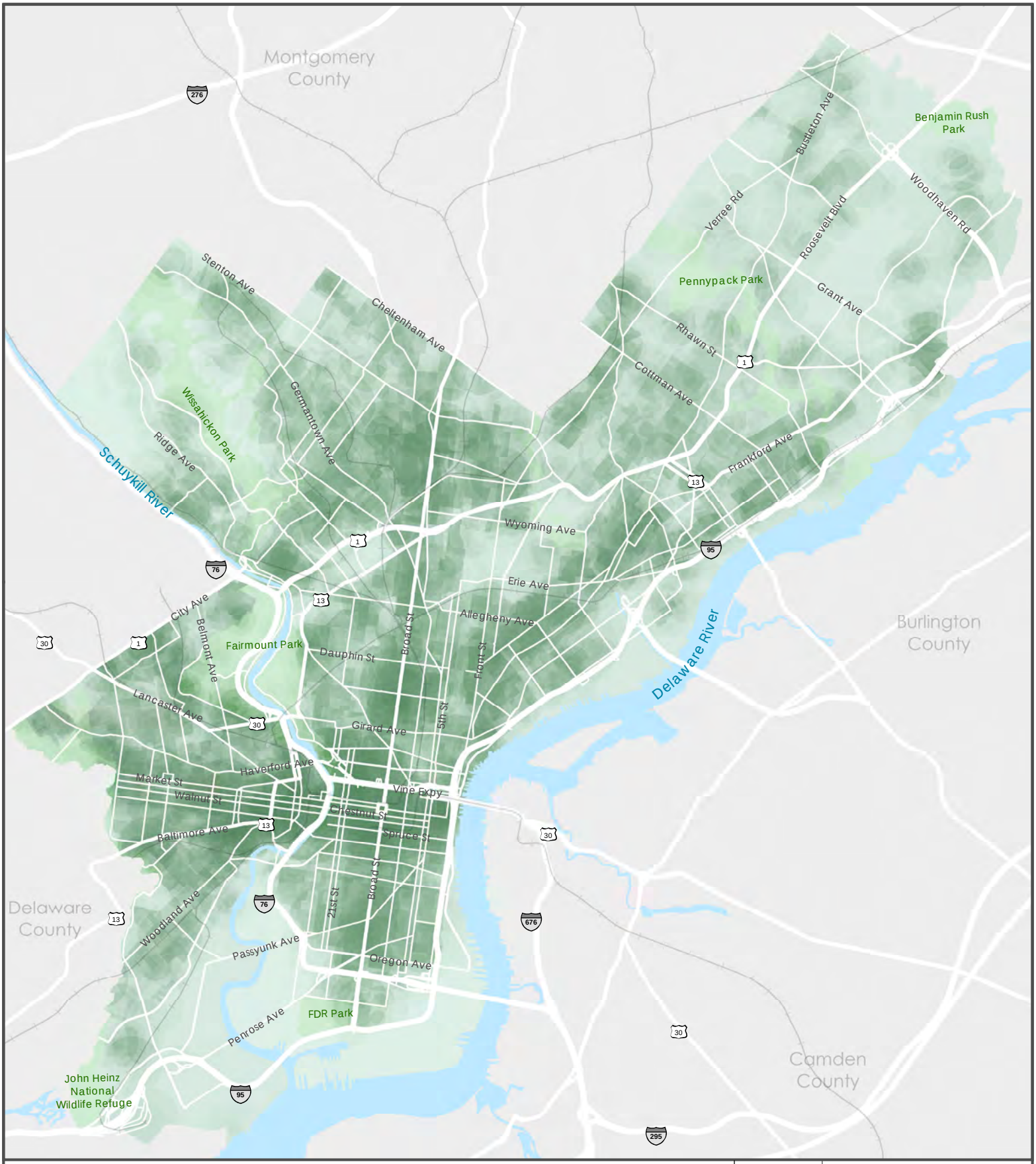
The following is a general synthesis of intersection considerations that affect pedestrians.

- *Intersection Geometry:* Intersection geometry is a critical element affecting accessibility and pedestrian comfort crossing streets. Skewed intersections that result in obtuse angles (larger than 90 degrees) allow motorists to make right turns across the pedestrian travel way at higher speeds, while often interfering with pedestrians' ability to see turning traffic.
- *Crosswalks:* Crosswalk markings are used to alert motorists to locations where they should expect pedestrians and to identify a designated crossing location for pedestrians. A crosswalk may be marked or unmarked since, legally, crosswalks exist at all intersections, unless specifically prohibited.
- *Pavement Condition:* The pavement condition of crosswalks, curb ramps and corners also affect pedestrian safety and comfort. All pavement areas should be ADA-compliant, using PROWAG recommended standards.
- *Curb Ramps:* ADA-compliant curb ramps ensure the pedestrian network is accessible for all users and creates a more useful network for pedestrians traveling with strollers, rolling luggage and carts.
- *Width and Number of Lanes:* The wider the road that must be crossed, the longer the pedestrian is exposed to the possibility of being hit while crossing. Multiple travel lanes create the possibility of "multiple threat" crashes, where one vehicle yields but blocks the view of another vehicle that then hits the pedestrian.
- *Pedestrian Crossing Islands:* In locations with longer crossing distances (i.e., more than two lanes) and/or higher vehicle speeds, pedestrian crossing islands benefit pedestrians by providing a refuge. In particular, pedestrian crossing islands have been shown to increase safety for pedestrians crossing multi-lane roadways at un-signalized crossings[2].
- *Curb Extensions:* Curb extensions (or curb bumpouts) shorten the distance pedestrians must cross, while at the same time increasing their visibility to motorists. By narrowing the curb-to-curb width of a roadway, curb extensions help reduce motor vehicle speeds and improve pedestrian safety.
- *Traffic Signals and Stop Signs:* Traffic controls have a significant impact on a pedestrian's experience crossing the roadway. Particularly important is the distance between controlled intersections, since few pedestrians will walk very far to reach an official crosswalk.
- *Signal Timing:* It is essential to provide signals that are phased and timed to allow pedestrians of all abilities to cross the roadway, including those who are typically slower (children, senior citizens, people with limited mobility). At the same time, signal delay must be minimized in order to reduce the amount of illegal and unsafe crossing that occurs when pedestrians get impatient waiting for the signal to change.
- *Lighting:* Pedestrians can be adversely affected by low-light conditions. In fact, two-thirds of pedestrian fatalities occur between dusk and dawn[3]. Lighting is important at intersections and mid-block crossings, particularly in locations near transit stops.
- *Signage and Striping:* Signage and striping support other infrastructure and signal elements of the pedestrian's travel across the roadway. They inform pedestrians of the crossing location and alert motorists of the presence of pedestrians. Stop bar placement is intended to create appropriate space between motor vehicles stopped at a controlled intersection and pedestrians walking in the crosswalk. Overall, signage and striping should be well-placed and conform to current MUTCD standards.

Other factors affecting the pedestrian network in Philadelphia include the presence of bicycle facilities along and across the roadway, and whether a street is one-way or two-way.

[2] Zegeer et al, February 2002

[3] http://www.tfhrc.gov/safety/pedbike/pubs/03042/part2.htm



Pedestrian Demand | Map 2

Legend

Pedestrian Demand Score

0 - 22
23 - 30
31 - 37
38 - 50
51 - 96

N

Miles
0 1 2

PCPC

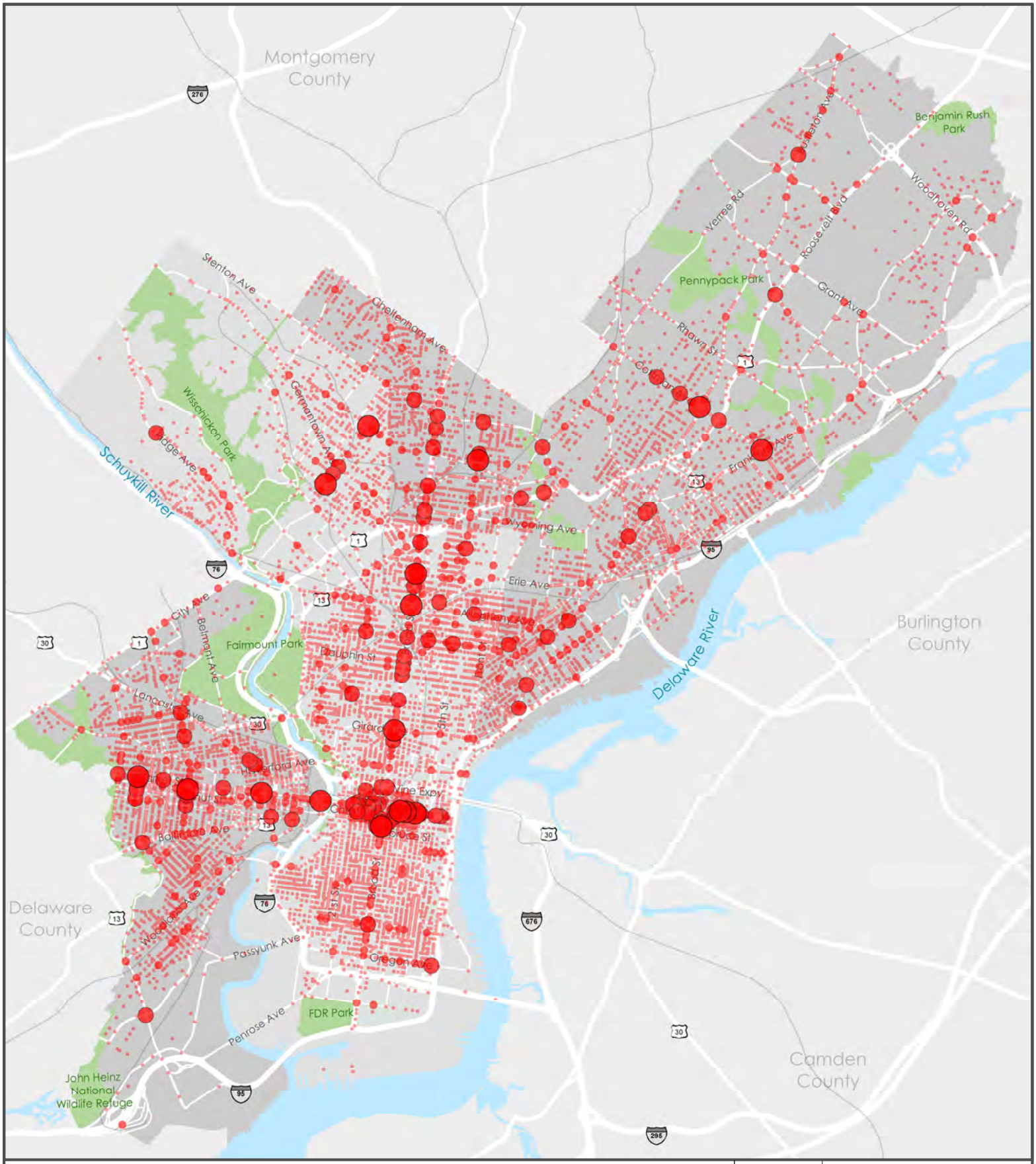
GET HEALTHY PHILLY

Base Data Source: City of Philadelphia

No warranties of any sort, including accuracy, fitness or merchantability, accompany this product.

Toole Design Group

Philadelphia Pedestrian and Bicycle Plan | March 2012


Montgomery County
Burlington County
Delaware County
Camden County
Schuylkill River
Delaware River
Benjamin Rush Park
Pennypack Park
Fairmount Park
Wissahickon Park
John Heinz National Wildlife Refuge
FDR Park
Stenton Ave
Cheltenham Ave
Germantown Ave
Ridge Ave
City Ave
Belmont Ave
Lancaster Ave
Haverford Ave
Baltimore Ave
Woodlandave
Passyunk Ave
Penrose Ave
Oregon Ave
Bruce St
Girard
Dauphin St
Allegheny Ave
Erie Ave
Wyoming Ave
Rhawn St
Grant Ave
Roosevelt Blvd
Verree Rd
Woodhaven Rd
Bustleton Ave
Frankford Ave
Broad St
Front St
5th St
12th St
Vine Expy
Cottman
Cedar
Erdrick
Bleigh
Ashburner
Ashburner
Ashburner

A BIKEABLE CITY

In 2009, Philadelphia received a Bronze Bicycle-Friendly Community Award from the League of American Bicyclists, and Mayor Nutter set a goal of winning a Platinum award by 2013. Progress towards these goals is due in no small measure to the efforts of the Bicycle Coalition of Greater Philadelphia, which was named the 2010 Advocacy Organization of the Year by the Alliance for Biking and Walking.

Existing Bicycle Facilities

The 2000 City of Philadelphia Bicycle Network Plan identified a network of recommended bike lanes and bicycle friendly streets. Bike lanes were recommended primarily on collector and arterial streets where sufficient width existed. Most of these bike lanes were established without removing parking or significantly impacting motor vehicle capacity. Many of the facilities were developed through the City's street resurfacing program. Existing bicycle facilities are shown in Map 4 and the total linear miles of each type of facility is indicated in Table 7.

While more than 230 miles of streets have been marked with bike lanes since 1993, the lanes are often interrupted when a street narrows or conditions change. As a result, bicycle facilities are discontinuous in many parts of the city. Partly as a result of the limited number of options available to designers of the day, the improvements to bicycle-friendly streets identified in the 2000 plan were limited to the installation of "Share the Road" signs. Since the completion of the previous plan, new design standards for accommodating bicycles in the roadway have been developed that can help close these gaps in the original network, as discussed in Chapter 7.

TABLE 7: TOTAL MILEAGE OF EXISTING BICYCLE FACILITIES

Existing On-Road Bikeway	LANE MILES	STREET MILES
Conventional Bike Lane	407	222
Buffered Bike Lane	11	11
Contra-flow Bike Lane	0.1	0.1
Marked Shared Lane	10	6
Climbing Lane	0.3	0.3
Total	**428**	**239**

Bicycle Issues

Input from the Steering Committee, the public open houses, and the web-based questionnaire revealed a number of general concerns regarding bicycling in Philadelphia. These include the following:

- Lack of direct long-distance routes.
- Driver behavior.
- Poor road surfaces.
- Sidewalk cycling, wrong-way riding, and running red lights.
- Concerns about safety in traffic.
- Lack of bike parking.

A complete summary of the web-based questionnaire is provided in Appendix B.

TABLE 8: BICYCLE DEMAND ANALYSIS, BICYCLE GENERATORS AND WEIGHTING VALUES

BICYCLE GENERATORS	DESTINATIONS		WEIGHT		
			1/2 MILE	1 MILE	1 1/2 MILE
	High Generator	University or College	15	10	5
		Major Generators / Tourist Destination	15	10	5
		SEPTA Rail Station & PATCO; Greyhound Bus Station	10	7	0
		Major Park Entrance	15	10	5
	Medium Generator	School	7	5	0
		Major Retail and entertainment	7	5	1
		Medium Tourist Destination	7	5	1
		Hospital	5	1	0
		Community Service	7	5	1
	Low Generator	Places of Worship	2	1	0

Bicycle Demand

A bicycle demand analysis, similar to the one conducted for the pedestrian mode, was undertaken to provide a snapshot of bicycle demand based on the density of presumed bicycle trip generators. Typically, bicyclists will travel to destinations beyond the distance that most people would walk, with distances of up to three miles being within a relatively comfortable bicycling range.

Table 8 shows the types of generators used to determine bicycle demand. The generators were grouped by the expected volume of bicycle trips (high, medium and low), then scored by how far bicyclists would travel to or from the generator. Map 5 shows the result of the bicycle demand analysis. Areas with higher scores, i.e., greater demand, considered "hot spots", are shown as the darker purple areas on the map.

Bicycle Crashes

Philadelphia was ranked 14th safest for bicycle safety by the 2012 Benchmarking Report, using an index that compares bicycle crash rates to bicycle commuting.

This index is based on traffic crashes where a pedestrian or bicyclist was involved in a collision with a motor vehicle. It should be noted that these crashes do not cover the entire "universe" of bicycle injuries.

In fact, an analysis of hospital emergency department data concluded that "as many as 31 percent of bicyclist injuries…would not be captured by State crash data." [4] Bicycle crashes caused by poorly maintained roadway surfaces, for example, are not included in the traffic data.

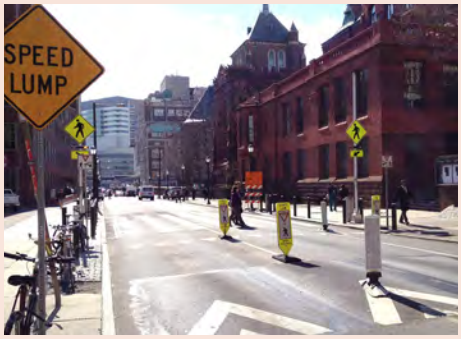
According to the Mayor's Office of Transportation and Utilities Bicycle and Pedestrian Crash Report 2004-2008, annual bicycle crashes decreased 29% from 2004 to 2008. Bicycle fatalities fluctuated between two and five over the same time period. Considering the dramatic increase in the number of people bicycling, the rate of bicycle crashes has dropped. Nevertheless, bicycle safety remains an important transportation priority. In 2011, the City undertook an education and enforcement effort, Give Respect, Get Respect, aimed at clarifying the rights and responsibilities of drivers, bicyclists, and pedestrians.

Other Bicycle Needs Assessments

Field studies were conducted to assess general conditions for bicycling citywide and to analyze areas that need new connections to key destinations (e.g. trail access point, universities, etc.) and improved access across barriers (e.g. hills, rivers, expressways, rail lines, utility corridors, etc.). Recommendations for improving the bicycle network are provided in Chapter 7. These recommendations were developed with input from City staff, the Steering Committee, and the public.

FIGURE 6: EMERGING PRACTICES

The City of Philadelphia is utilizing innovative designs and strategies to increase the safety and effectiveness of the bicycle and pedestrian networks. Examples of emerging practices include rapid flash beacons, speed lumps, green bike lanes, conflict zone bike lane striping, on-street bicycle parking, and traffic signal controls timed to encourage lower speeds. Practices such as speed lumps, conflict zones, and slow-speed traffic signal control are employed in areas with high volumes of non-motorized as well as motorized traffic, to increase safety and predictability for all users of the right-of-way. On-street bicycle parking and green bicycle lanes are pilot projects and the City is currently looking for support to expand both strategies.



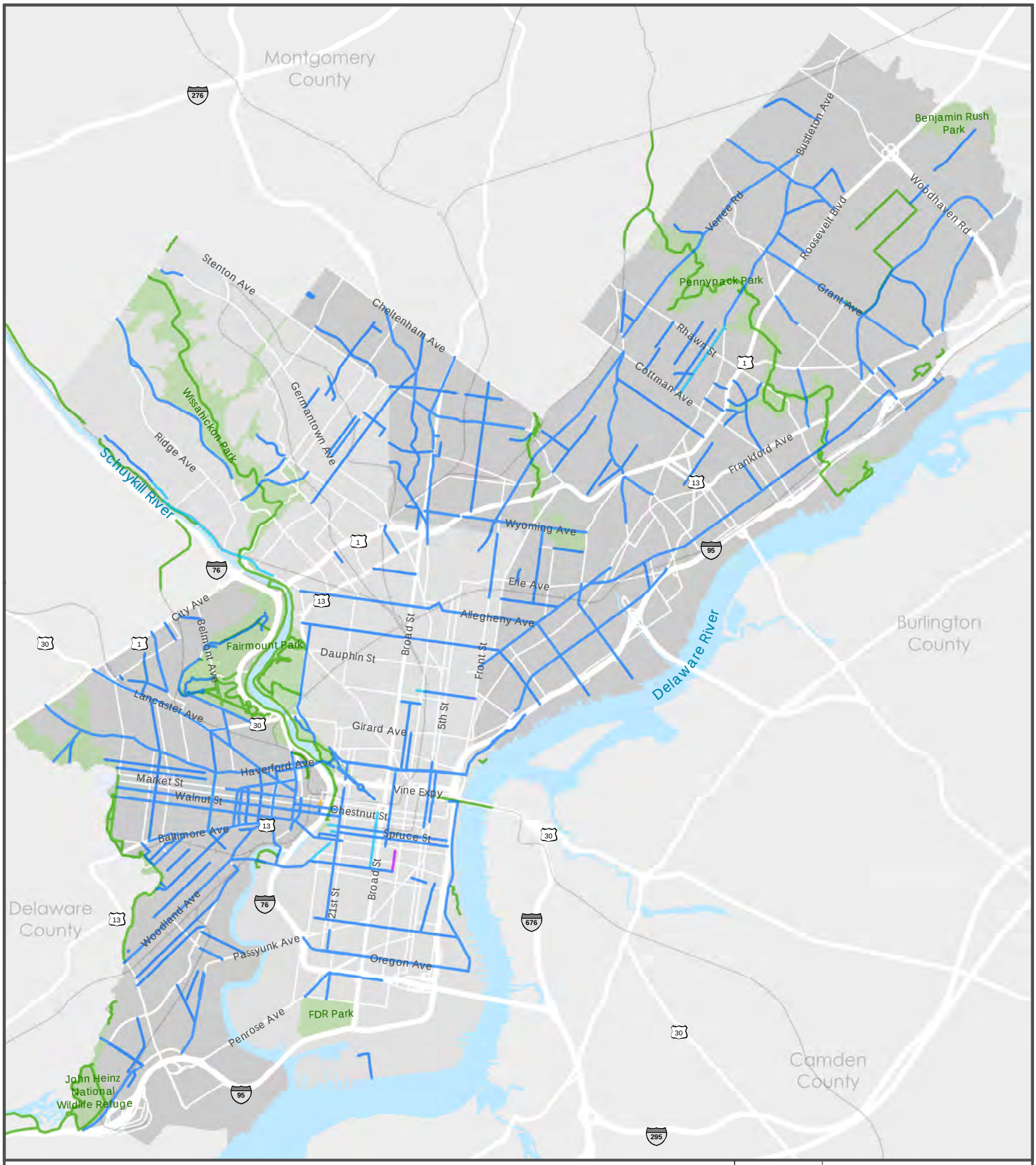
Rapid Flash Beacon, Speed Lumps

Conflict Zone Striping, Green Bike Lanes

On-Street Bicycle Parking Corral

Buffered Bike Lane,
Signal Timing for Traffic Control

[4] Injury to Pedestrians and Bicyclists: An Analysis Based on Hospital Emergency Department Data, USDOT, FHWA-RD-99-78, Tables 64 and 65



Legend

- Bike Lane
- Contraflow Bike Lane
- Climbing Lane
- Marked Shared Lane
- Trail

Existing Bicycle Facilities | Map 4

N

Miles 0 1 2

PCPC

GET HEALTHY PHILLY

Base Data Source: City of Philadelphia

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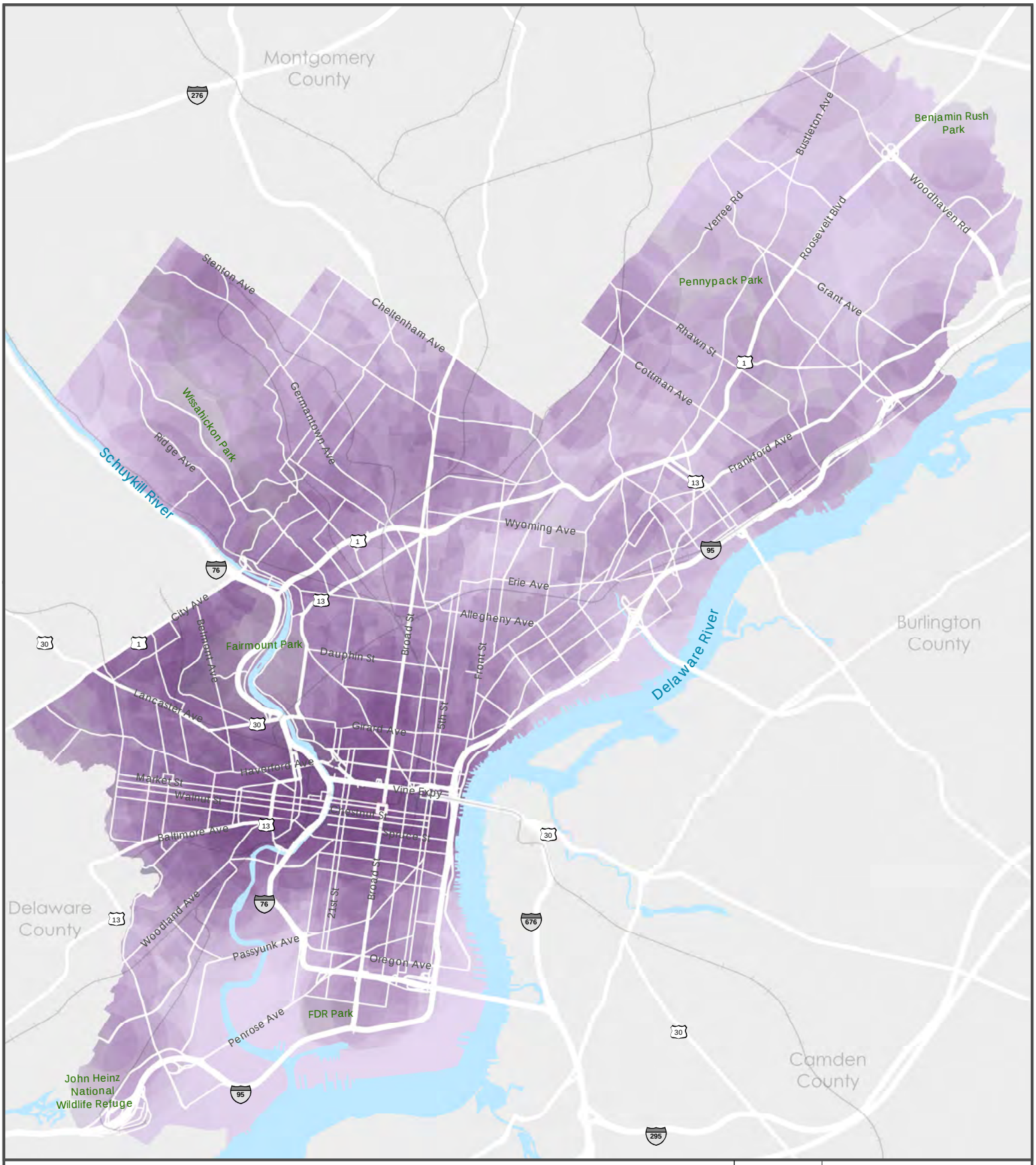
Toole Design Group

Philadelphia Pedestrian and Bicycle Plan | March 2012



Bicycle Demand | Map 5

Legend

Bicycle Demand Score

0 - 40
41 - 53
54 - 62
63 - 78
79 - 112

N

Miles
0 1 2

Base Data Source: City of Philadelphia

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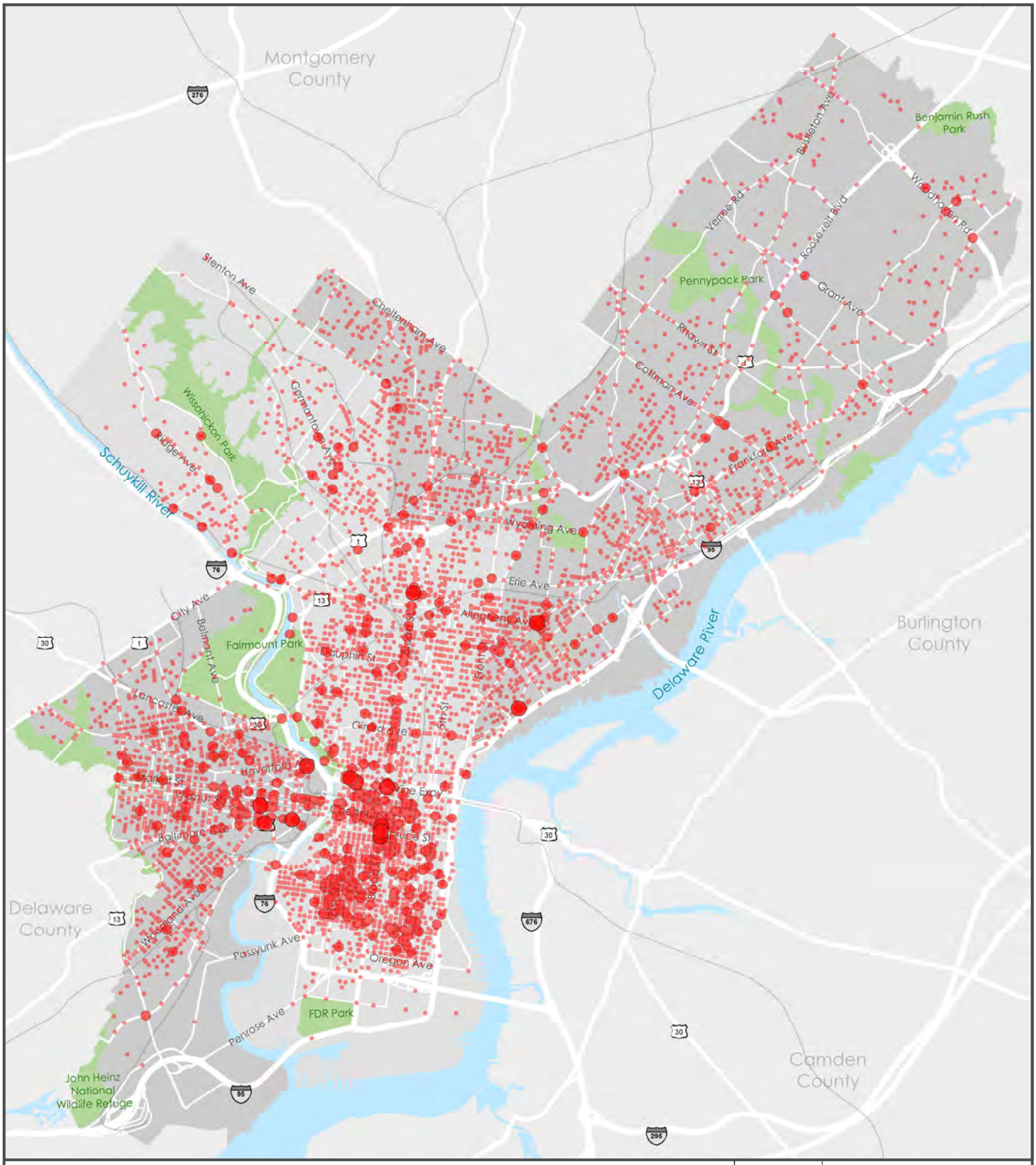
Philadelphia Pedestrian and Bicycle Plan | March 2012



Bicycle Crashes (1990-2005) | Map 6

Legend

Bicycle Collision Count

- 9-13
- 4-9
- 1-4

N

Miles 0 1 2

PCPC

GET HEALTHY PHILLY

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CHAPTER 4
STREET TYPES AND SIDEWALK DESIGN STANDARDS

This chapter presents a new street classification system to facilitate pedestrian planning and serve as the basis for citywide sidewalk design standards. Many communities have found it useful to adopt similar street classification systems, which are broader than the traditional functional classification. As described in Chapter 3, the existing functional classification of roadways is based primarily on the needs and characteristics of motor vehicle travel. Adoption of a new street classification system does not mean that the functional classification is abandoned; rather that a more context-sensitive street classification is being added as a supplementary planning tool. The new classification system takes into account the traditional roadway classification, but adds land use, pedestrian activity, and several other factors.

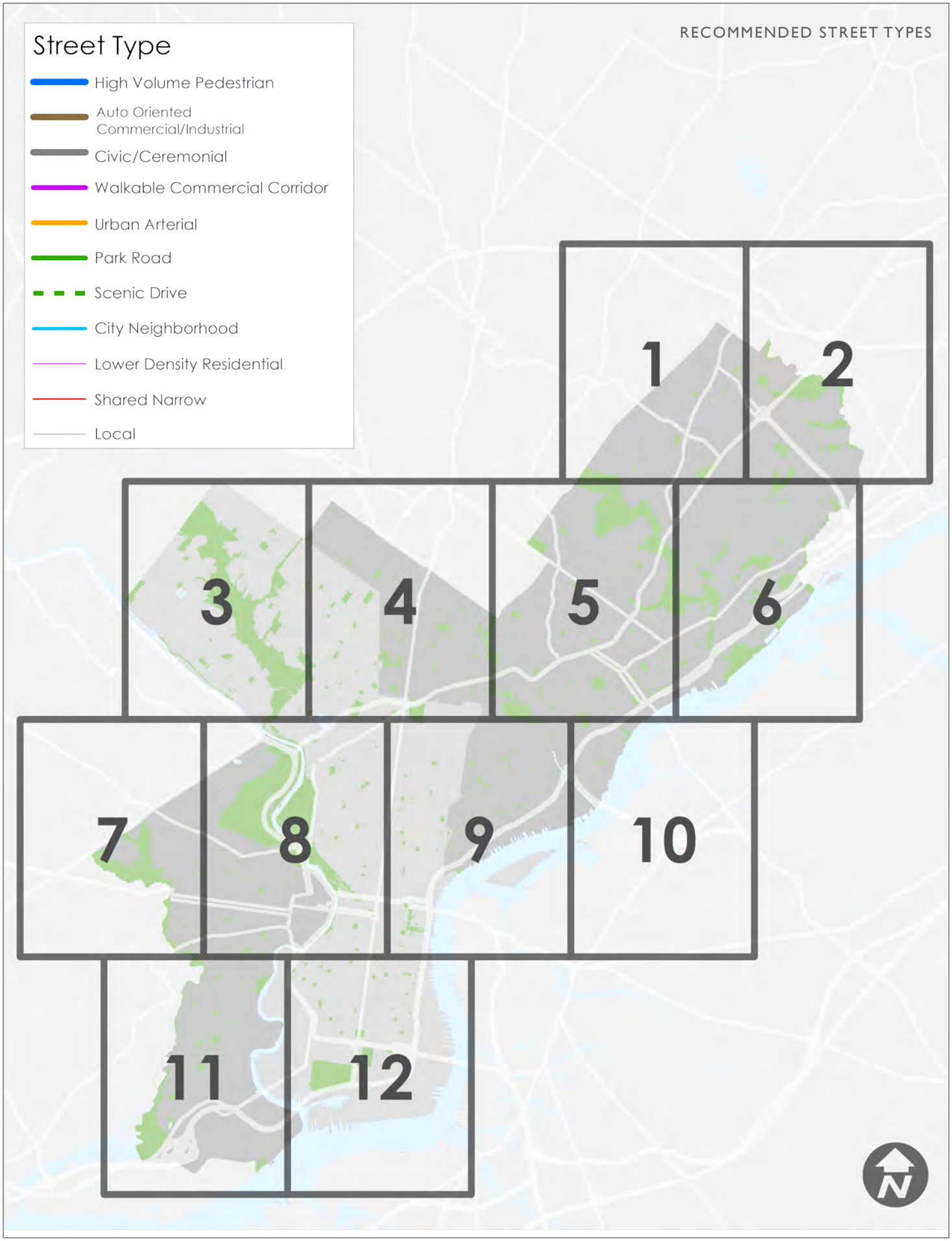
TABLE 9: STREET TYPE MILEAGE

STREET TYPE	MILES
High-Volume Pedestrian	5
Civic/Ceremonial Street	13
Walkable Commericial Corridors	37
Urban Arterial	384
Auto-oriented Commercial/Industrial	64
Park Road	21
Scenic Drive	26
City Neighborhood	678
Lower Density Residential	517
Shared Narrow	24
Local	842

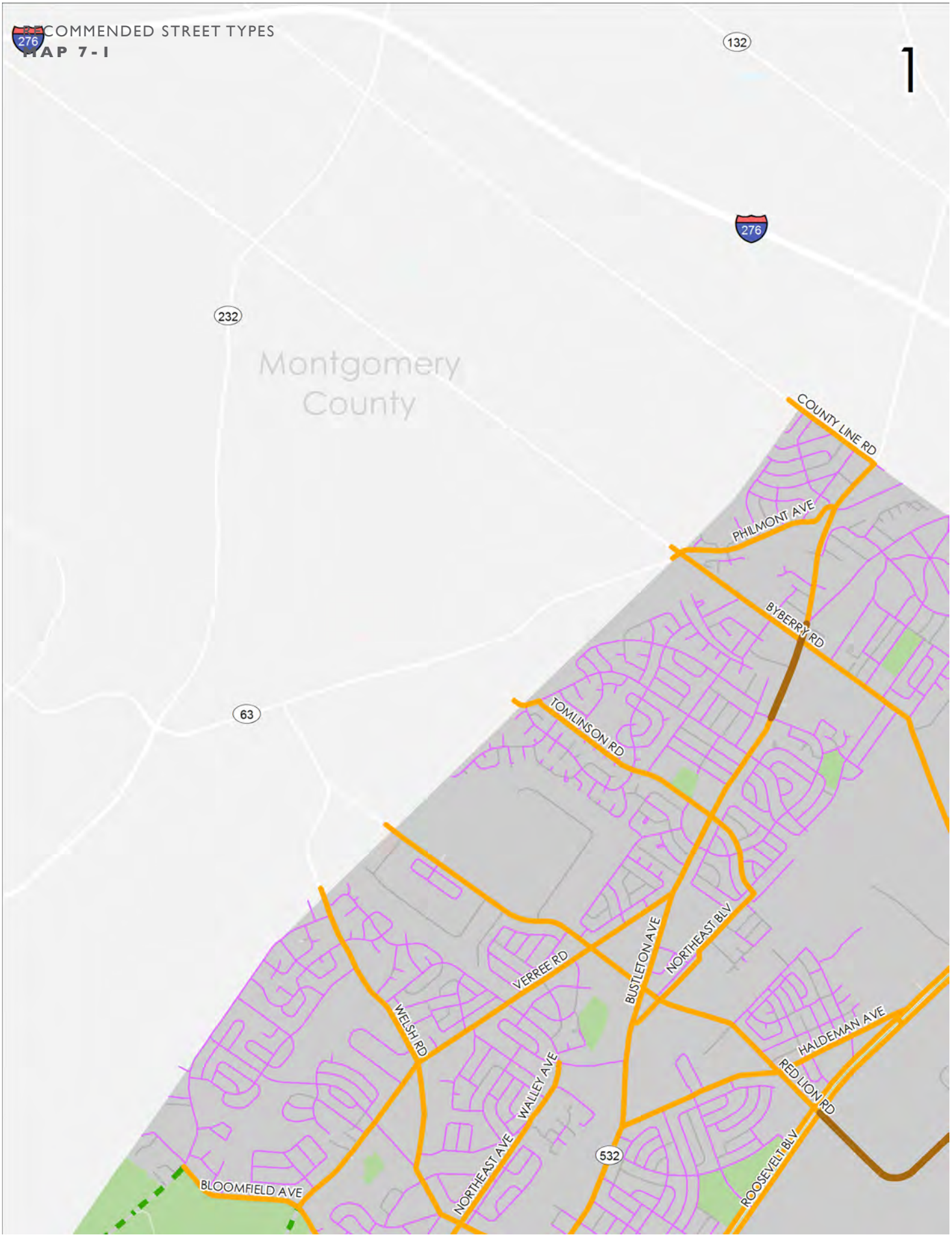
Eleven street types are included in the new classification: Civic Ceremonial, High-Volume Pedestrian, City Neighborhood Street, Walkable Commercial Corridor, Urban Arterial, Auto-Oriented Commercial/Industrial, Scenic Drive, Park Road, Low Density Residential, Local, and Shared Narrow Street. Table 9 shows the number of miles by street type; Table 10 describes the characteristics of each street type, along with the recommended sidewalk width standards. Each street type also has a designation of pedestrian or vehicle significance: from high to low.

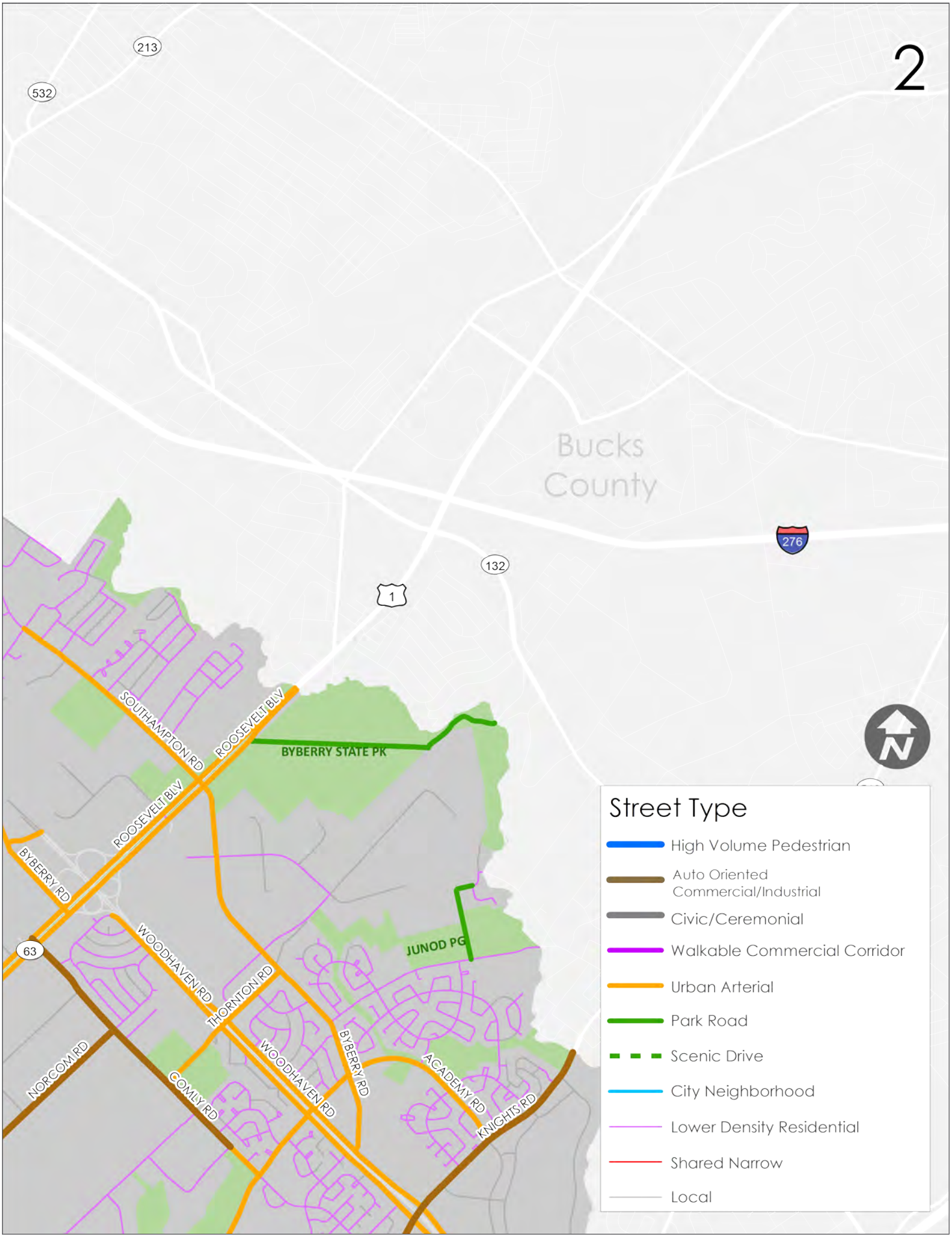
These designations are intended to provide guidance when choices must be made between vehicular and pedestrian needs. The street types and sidewalk design standards have been incorporated into the new *Complete Streets Handbook* in order that City practices will acknowledge and support pedestrian needs.

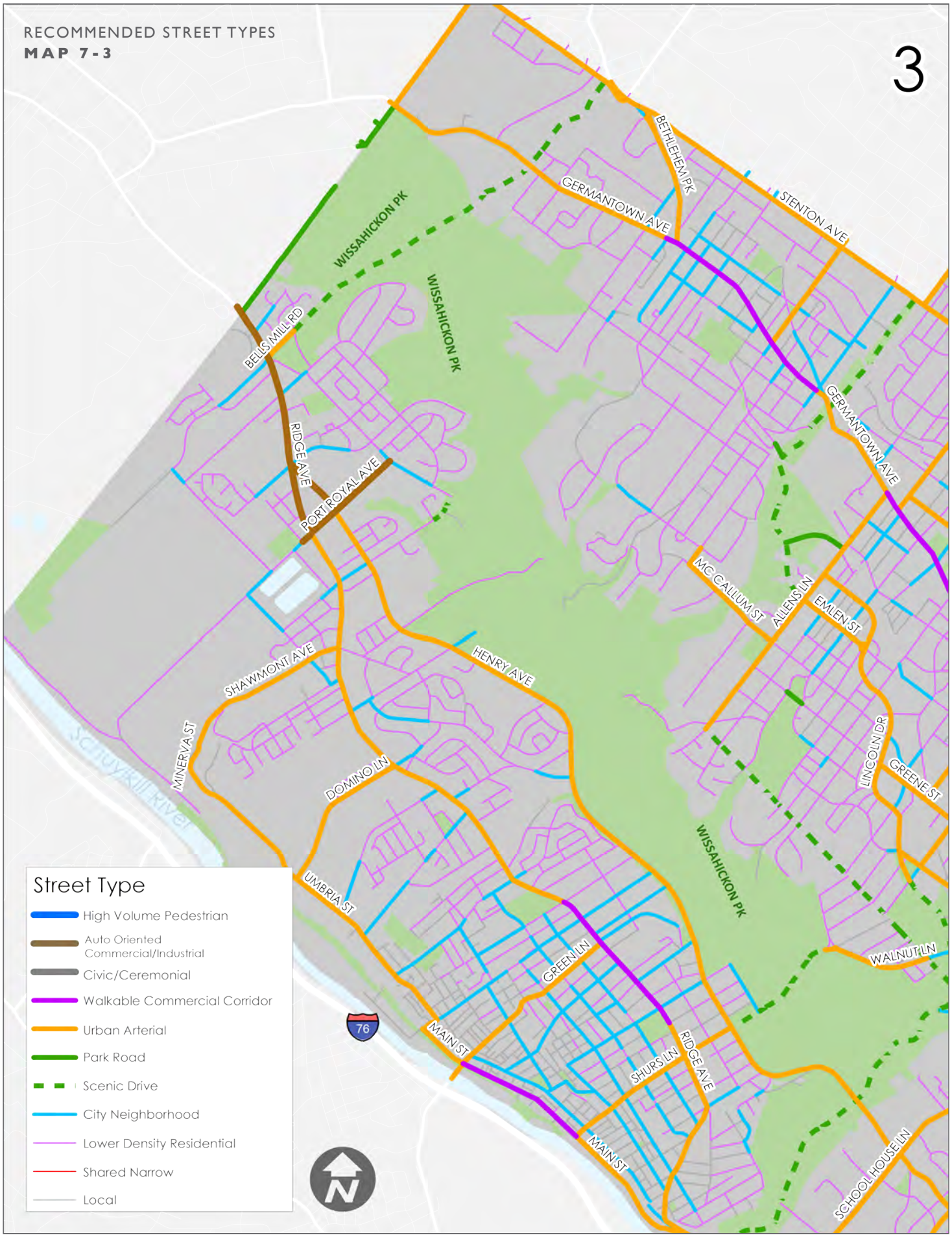
The maps on the following pages show the City's new street type network. A street's type may change from one block to the next. For example, the Walkable Commercial Corridors type only applies to the length of a street with a minimum amount of commercial use. Similarly, the Civic/Ceremonial designation only applies to streets that have a civic, symbolic, or ceremonial function, for example the length of the Mummers Parade route on South Broad Street.

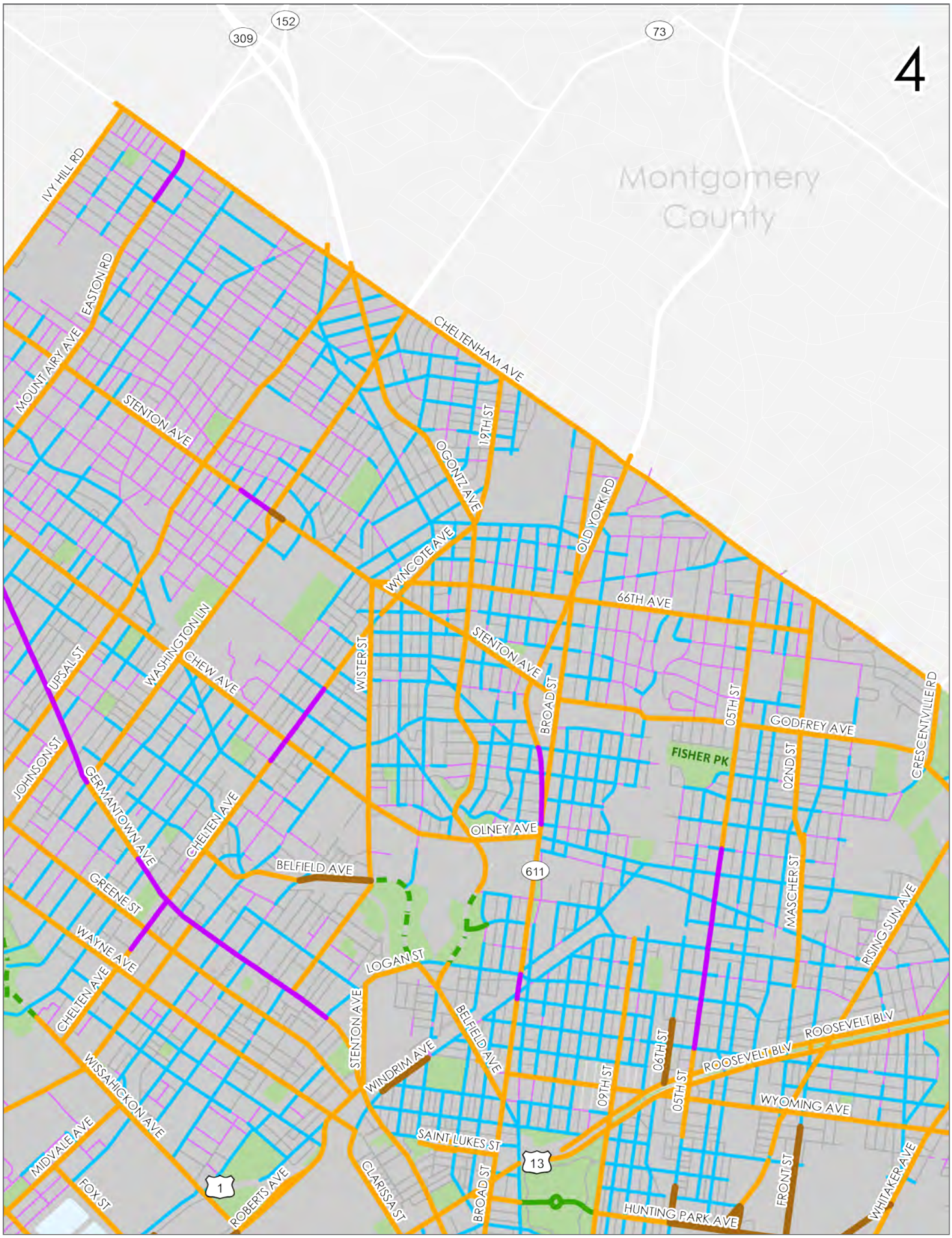

RECOMMENDED STREET TYPES
Street Type
High Volume Pedestrian
Auto Oriented Commercial/Industrial
Civic/Ceremonial
Walkable Commercial Corridor
Urban Arterial
Park Road
Scenic Drive
City Neighborhood
Lower Density Residential
Shared Narrow
Local
1
2
3
4
5
6
7
8
9
10
11
12
N

RECOMMENDED STREET TYPES
MAP 7-1

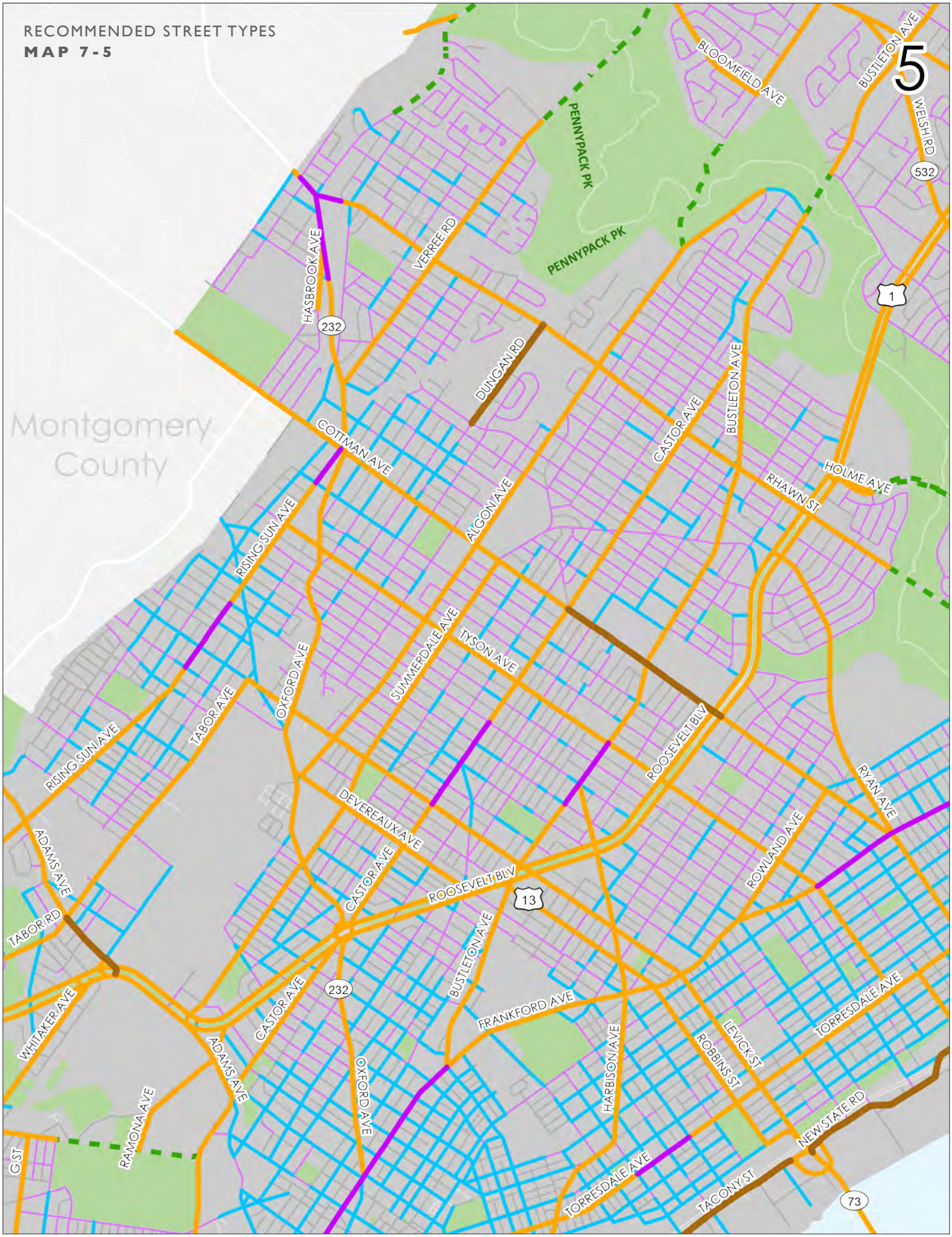


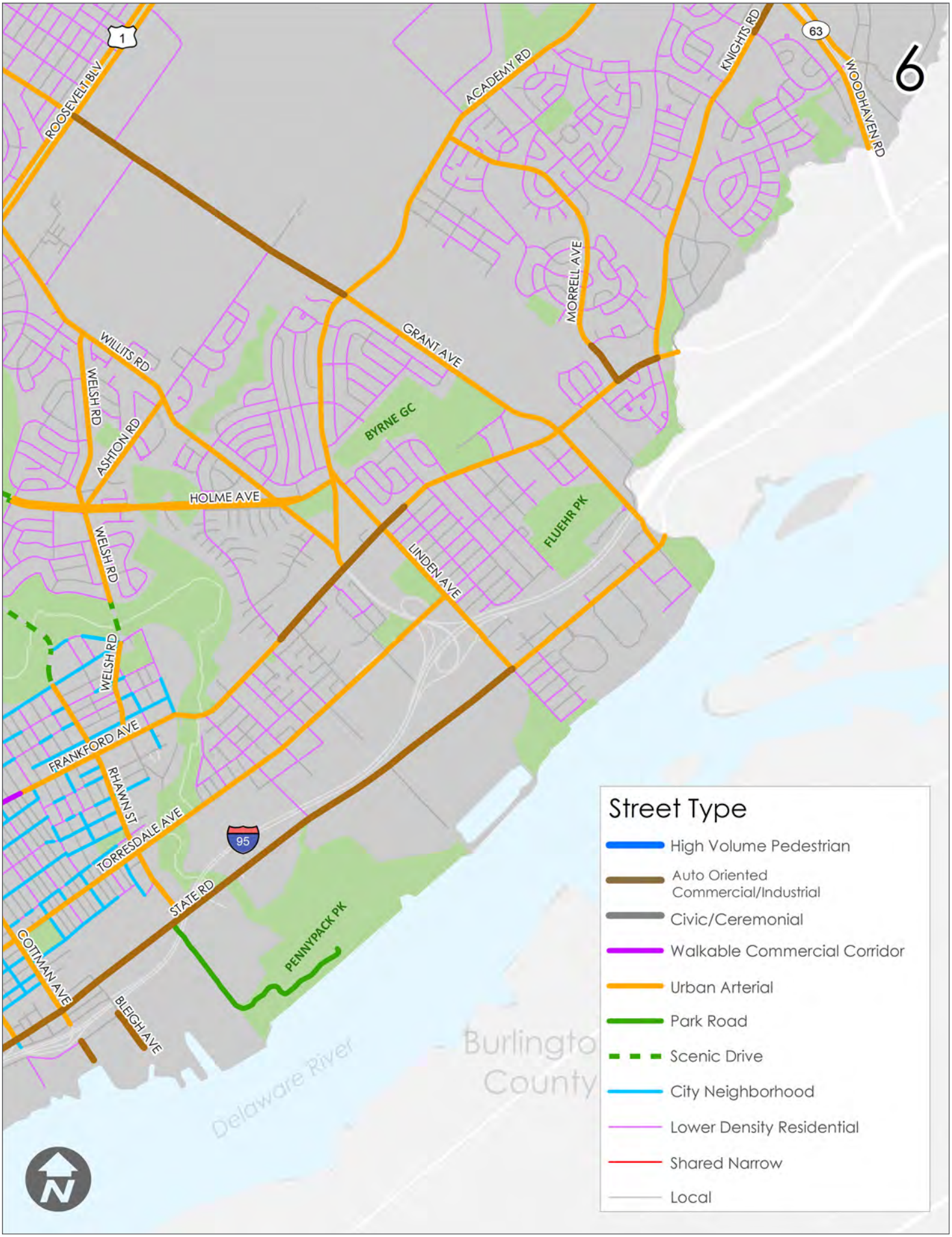

2
213
532
Bucks County
276
132
1
SOUTHAMPTON RD
ROOSEVELT BLV
BYBERRY STATE PK
ROOSEVELT BLV
BYBERRY RD
63
WOODHAVEN RD
THORNTON RD
JUNOD PG
NORCOM RD
COMLY RD
WOODHAVEN RD
BYBERRY RD
ACADEMY RD
KNIGHTS RD
Street Type
High Volume Pedestrian
Auto Oriented Commercial/Industrial
Civic/Ceremonial
Walkable Commercial Corridor
Urban Arterial
Park Road
Scenic Drive
City Neighborhood
Lower Density Residential
Shared Narrow
Local


RECOMMENDED STREET TYPES
MAP 7-3
3
WISSAHICKON PK
WISSAHICKON PK
BELLS MILL RD
RIDGE AVE
PORT ROYAL AVE
BETHLEHEM PK
GERMANTOWN AVE
STENTON AVE
GERMANTOWN AVE
MC CALLUM ST
ALLENS LN
EMLEN ST
HENRY AVE
SHAWMONT AVE
MINERVA ST
DOMINO LN
LINCOLN DR
GREENE ST
WISSAHICKON PK
UMBRIA ST
GREEN LN
WALNUT LN
76
MAIN ST
SHURS LN
RIDGE AVE
MAIN ST
SCHOOL HOUSE LN
Street Type
High Volume Pedestrian
Auto Oriented Commercial/Industrial
Civic/Ceremonial
Walkable Commercial Corridor
Urban Arterial
Park Road
Scenic Drive
City Neighborhood
Lower Density Residential
Shared Narrow
Local
N


4
Montgomery County
309
152
73
IVY HILL RD
EASTON RD
MOUNT AIRY AVE
STENTON AVE
CHELTENHAM AVE
19TH ST
OGONTZ AVE
OLD YORK RD
WYNCOTE AVE
66TH AVE
STENTON AVE
WISTER ST
WASHINGTON LN
CHEW AVE
UPSAL ST
JOHNSON ST
GERMANTOWN AVE
CHELTEN AVE
BROAD ST
05TH ST
GODFREY AVE
FISHER PK
02ND ST
CRESCENTVILLE RD
OLNEY AVE
611
BELFIELD AVE
GREENE ST
WAYNE AVE
MASCHER ST
RISING SUN AVE
LOGAN ST
CHELTEN AVE
STENTON AVE
BELFIELD AVE
ROOSEVELT BLV
WINDRIM AVE
06TH ST
09TH ST
05TH ST
WISSAHICKON AVE
WYOMING AVE
SAINT LUKES ST
13
MIDVALE AVE
FOX ST
1
ROBERTS AVE
CLARISSA ST
BROAD ST
HUNTING PARK AVE
FRONT ST
WHITAKER AVE

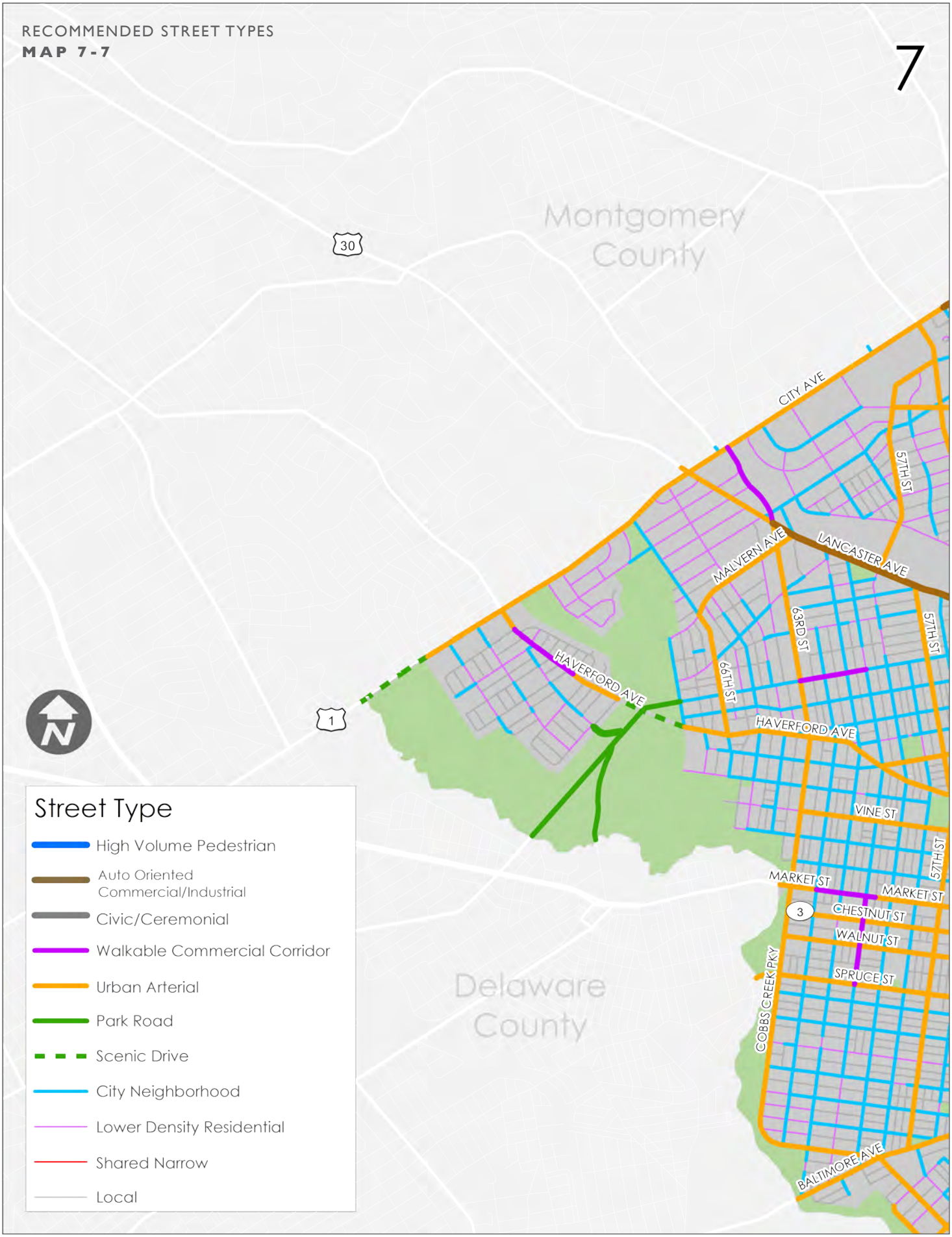
RECOMMENDED STREET TYPES
MAP 7-5

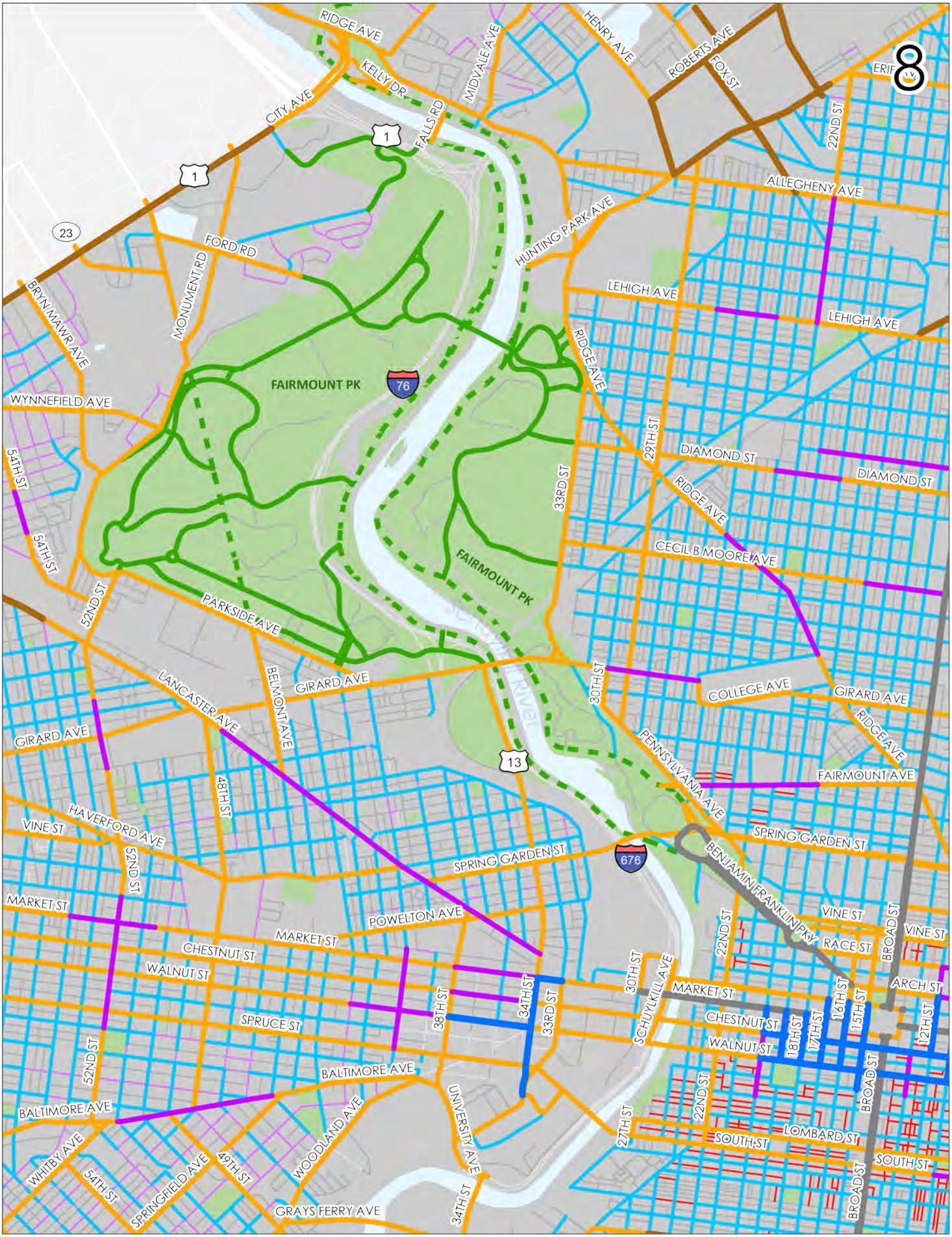


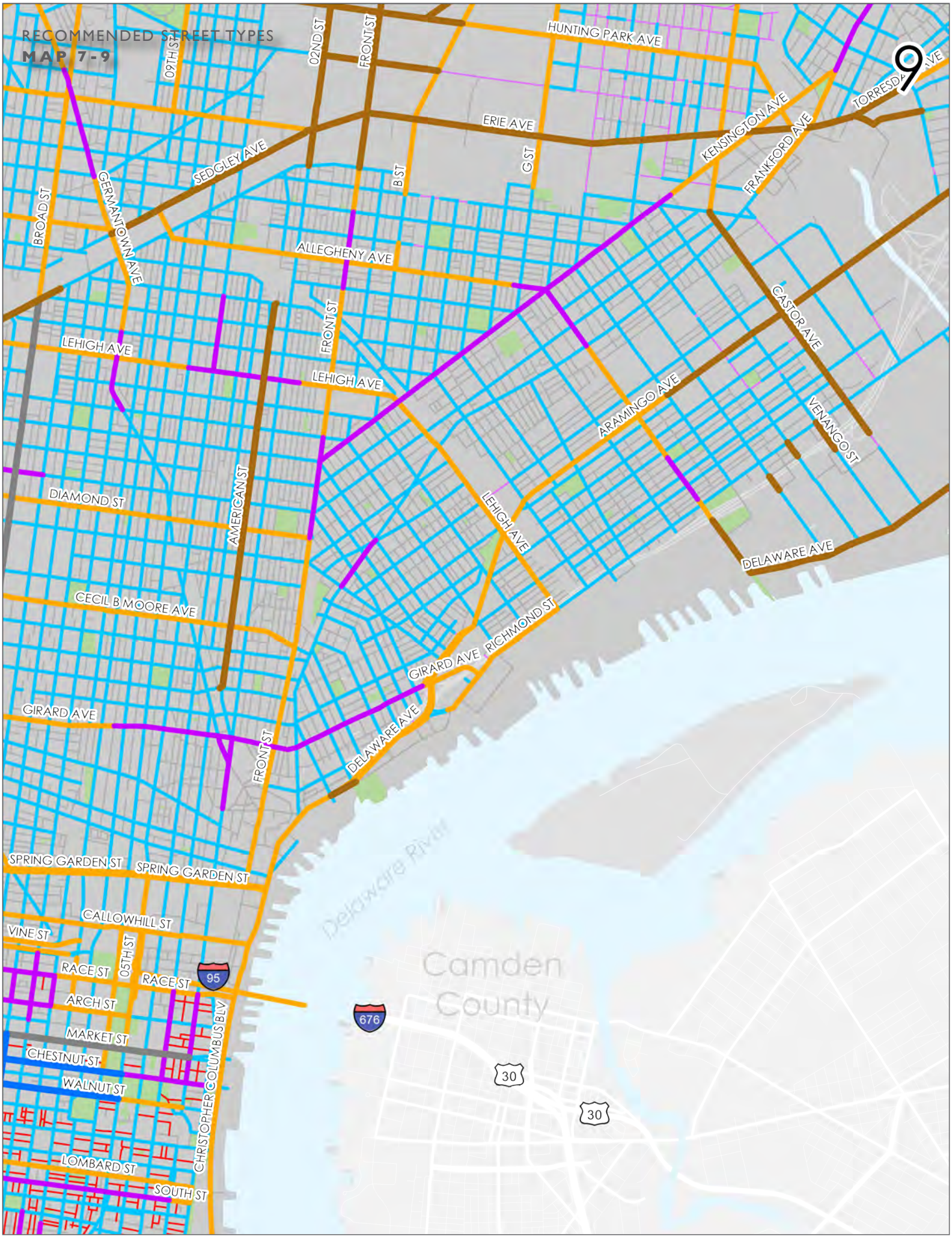

6
ROOSEVELT BLV
1
ACADEMY RD
KNIGHTS RD
63
WOODHAVEN RD
MORRELL AVE
GRANT AVE
WILLITS RD
WELSH RD
ASHTON RD
BYRNE GC
HOLME AVE
FLUEHR PK
LINDEN AVE
WELSH RD
WELSH RD
FRANKFORD AVE
RHAWN ST
TORRESDALE AVE
95
STATE RD
PENNYPACK PK
COTTMAN AVE
BLEIGH AVE
Delaware River
Burlingto
County
Street Type
High Volume Pedestrian
Auto Oriented Commercial/Industrial
Civic/Ceremonial
Walkable Commercial Corridor
Urban Arterial
Park Road
Scenic Drive
City Neighborhood
Lower Density Residential
Shared Narrow
Local

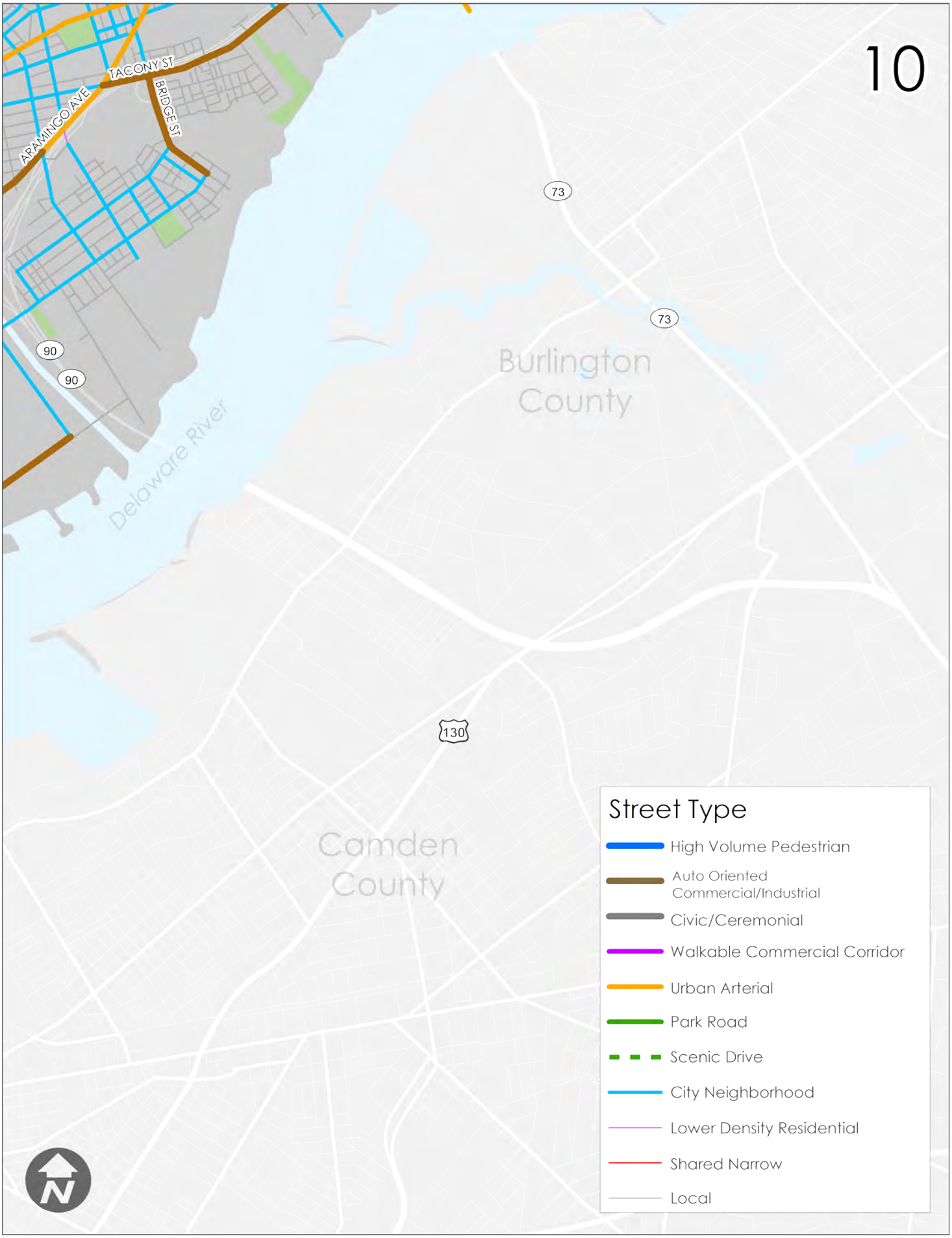
RECOMMENDED STREET TYPES
MAP 7-7

7

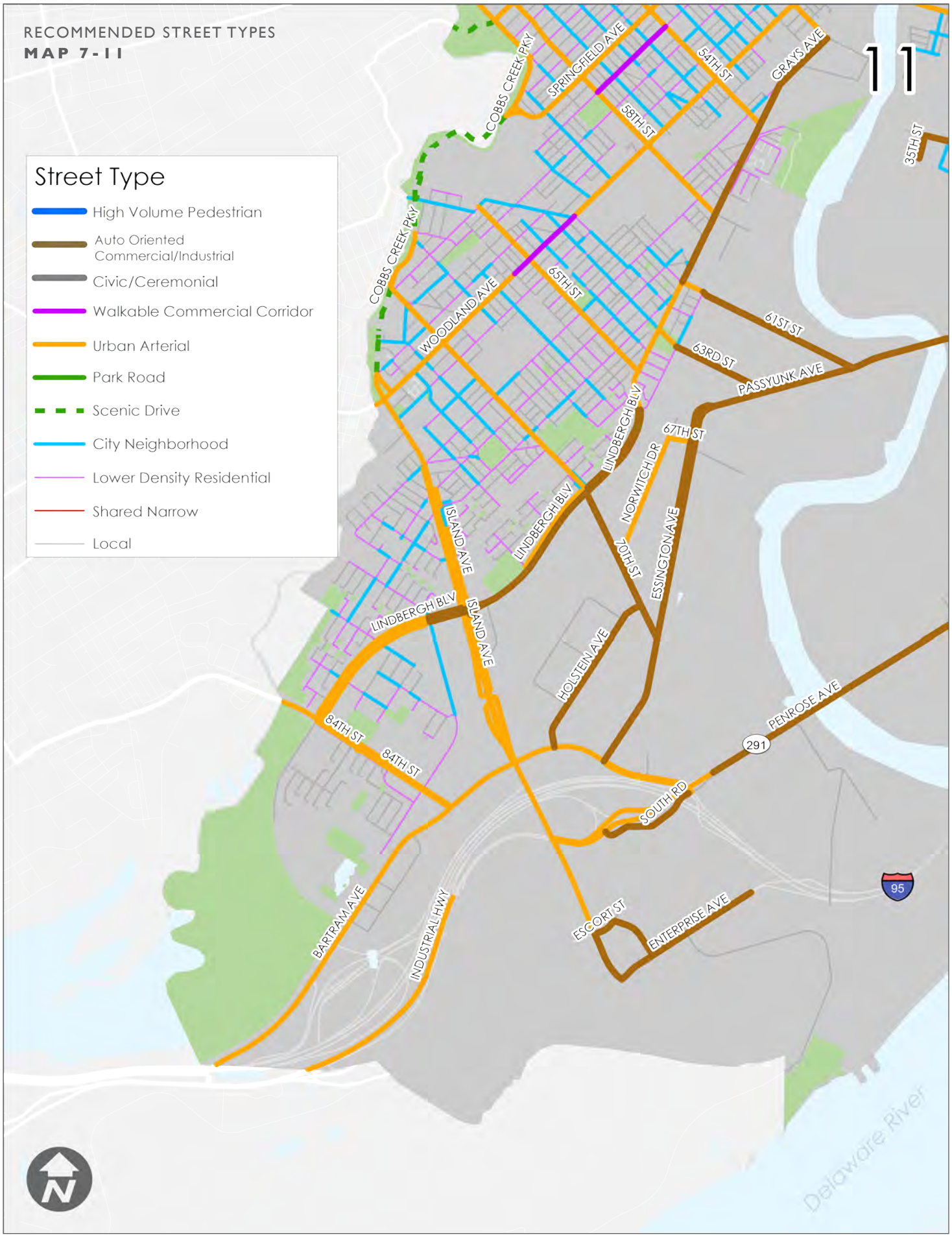


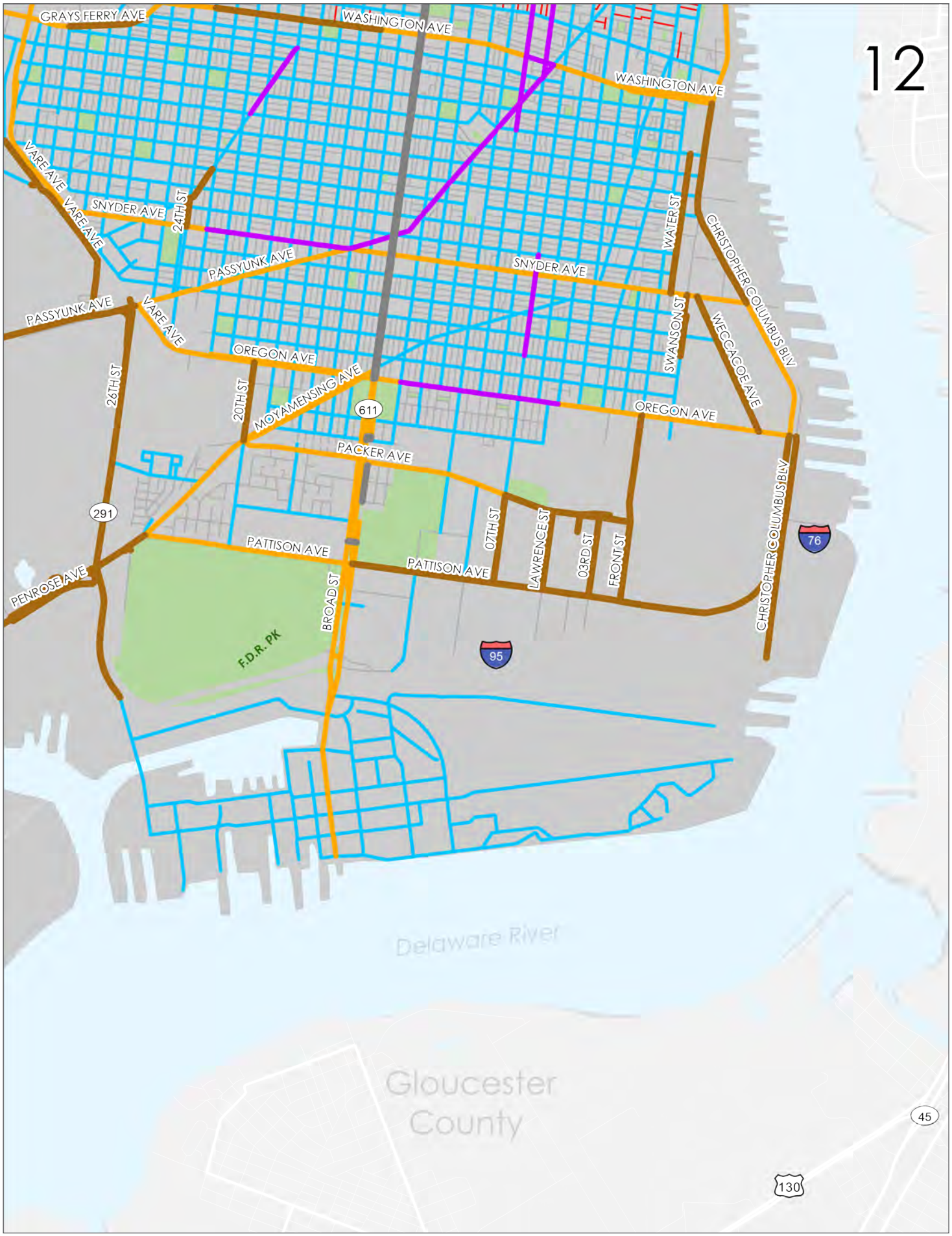

RIDGE AVE
KELLY DR
MIDVALE AVE
HENRY AVE
ROBERTS AVE
FOX ST
ERIE
CITY AVE
FALLS RD
22ND ST
ALLEGHENY AVE
HUNTING PARK AVE
FORD RD
MONUMENT RD
BRYN MAWR AVE
LEHIGH AVE
LEHIGH AVE
FAIRMOUNT PK
WYNNEFIELD AVE
RIDGE AVE
29TH ST
DIAMOND ST
DIAMOND ST
54TH ST
54TH ST
33RD ST
RIDGE AVE
CECIL B MOORE AVE
FAIRMOUNT PK
52ND ST
PARKSIDE AVE
LANCASTER AVE
BELMONT AVE
GIRARD AVE
30TH ST
COLLEGE AVE
GIRARD AVE
GIRARD AVE
RIDGE AVE
PENNSYLVANIA AVE
FAIRMOUNT AVE
48TH ST
HAVERFORD AVE
VINE ST
SPRING GARDEN ST
SPRING GARDEN ST
BENJAMIN FRANKLIN PKY
52ND ST
MARKET ST
POWELTON AVE
VINE ST
22ND ST
BROAD ST
VINE ST
MARKET ST
RACE ST
CHESTNUT ST
WALNUT ST
30TH ST
SCHUYLKILL AVE
MARKET ST
ARCH ST
34TH ST
33RD ST
16TH ST
15TH ST
38TH ST
SPRUCE ST
CHESTNUT ST
18TH ST
17TH ST
12TH ST
WALNUT ST
52ND ST
BALTIMORE AVE
22ND ST
BROAD ST
UNIVERSITY AVE
BALTIMORE AVE
WOODLAND AVE
27TH ST
LOMBARD ST
SOUTH ST
SOUTH ST
WHITBY AVE
54TH ST
49TH ST
SPRINGFIELD AVE
GRAYS FERRY AVE
34TH ST
BROAD ST


RECOMMENDED STREET TYPES
MAP 7-9
9
HUNTING PARK AVE
ERIE AVE
SEDGLEY AVE
KENSINGTON AVE
FRANKFORD AVE
TORRESDALE AVE
GERMANTOWN AVE
BROAD ST
ALLEGHENY AVE
CASTOR AVE
LEHIGH AVE
ARAMINGO AVE
VENANGO ST
DIAMOND ST
AMERICAN ST
DELAWARE AVE
CECIL B MOORE AVE
RICHMOND ST
GIRARD AVE
SPRING GARDEN ST
CALLOWHILL ST
VINE ST
RACE ST
ARCH ST
MARKET ST
CHESTNUT ST
WALNUT ST
LOMBARD ST
SOUTH ST
CHRISTOPHER COLUMBUS BLV
FRONT ST
B ST
C ST
02ND ST
05TH ST
09TH ST
Delaware River
Camden County
95
676
30


10
TACONY ST
BRIDGE ST
ARAMINGO AVE
73
73
90
90
Burlington County
Delaware River
130
Camden County
Street Type
High Volume Pedestrian
Auto Oriented Commercial/Industrial
Civic/Ceremonial
Walkable Commercial Corridor
Urban Arterial
Park Road
Scenic Drive
City Neighborhood
Lower Density Residential
Shared Narrow
Local
N

RECOMMENDED STREET TYPES
MAP 7-11




12
GRAYS FERRY AVE
WASHINGTON AVE
WASHINGTON AVE
VARE AVE
VARE AVE
SNYDER AVE
24TH ST
PASSYUNK AVE
SNYDER AVE
WATER ST
CHRISTOPHER COLUMBUS BLV
PASSYUNK AVE
VARE AVE
OREGON AVE
SWANSON ST
WECCACOE AVE
26TH ST
20TH ST
MOYAMENSING AVE
611
OREGON AVE
PACKER AVE
291
07TH ST
LAWRENCE ST
03RD ST
FRONT ST
76
PATTISON AVE
PATTISON AVE
PENROSE AVE
BROAD ST
CHRISTOPHER COLUMBUS BLV
F.D.R. PK
95
Delaware River
Gloucester County
45
130

SIDEWALK ZONES AND WIDTH STANDARDS

Each street type includes a set of associated design standards for sidewalk dimensions. The sidewalk is divided into three zones for the purpose of the design guidelines: the Walking Zone, the Furnishing Zone, and the Building Zone.

Because accommodating pedestrian flow is the primary function of sidewalks, an adequate *Walking Zone* is the most important design standard for the sidewalk. The average width of a pedestrian is 2 1/2 feet, without encumbrances such as bags and umbrellas. Two people need 5 feet of sidewalk width and, when encountering another person, will need about 8 feet to pass without dropping into single-file. When walking near walls, fixed obstructions or the curb, extra space called "shy distance" is needed.

The *Walking Zone* standard ideally depends on the number of pedestrians using or expected to use a particular sidewalk. In general, 5 feet of clear width for the Walking Zone should be the minimum for any new construction in low to moderate density areas. For sidewalks with relatively intensive pedestrian use, either in commercial corridors or in row house neighborhoods, six feet or half the total sidewalk width (whichever is greater) is the minimum recommended width for the Walking Zone. On streets having very heavy pedestrian volumes, 8 feet or half the total sidewalk width (whichever is greater) is the recommended minimum Walking Zone.

For the few streets with great symbolic importance and major ceremonial functions: Broad Street, Market Street, and the Benjamin Franklin Parkway, 10 feet should be provided in the Walking Zone. This will allow a truly generous pedestrian space, where one couple approaching another couple will be able to pass easily without anyone having to drop into single file. Some exceptions to the minimum Walking Zone are provided to accommodate street trees, storm water planters, and transit shelters; however, these exceptions are limited and minimum ADA dimensions must always be met.

The *Furnishing Zone* serves many functions: a safety buffer from traffic; a space to plant grass and street trees and absorb storm water runoff; storage space for snow and trash cans; and space for street furniture such as transit shelters, honor boxes, and bike racks, to name just the most important uses. The importance of the Furnishing Zone varies depending on the adjacent land use, the speed and volume of traffic, and the presence of parking at the curb. For major arterials, a minimum 5-foot Furnishing Zone is recommended to ensure adequate separation between pedestrians and motor vehicles. The Furnishing Zone usually requires at least 3 feet to accommodate utilitarian objects such as fire hydrants, utility poles, and road signs.

FIGURE 7: SIDEWALK ZONES

The *Building Zone* is the area of the sidewalk immediately adjacent to the building face, wall or fence marking the property line, or in less dense residential areas, a lawn. Minimum width standards cannot be recommended for the Building Zone because of this variability. However, the Building Zone is often significant, either because of architectural elements, such as steps, stoops, bay windows, or planters, or because the property owner wants to use the Building Zone for commercial purposes, for example, a sidewalk café or sidewalk sales. On streets where numerous permanent encroachments into the Building Zone already exist, the recommended standards would allow new encroachments to the extent that they respect the prevailing alignment of the existing encroachments.

Table 10 shows the recommended sidewalk width standards. For each street type, a minimum Walking Zone is recommended to allow for pedestrian comfort and safety based on the expected level of pedestrian activity.

Two people take up 5 feet of width.

Three people take up 8 feet of width

Minimum Furnishing Zone widths are recommended for most street types, with the intent of buffering pedestrians from higher volume roadways and for accommodation of appropriate sidewalk furnishings. Recommendations are also provided for total sidewalk width in most cases. The recommended total sidewalk width is typically greater than the sum of the minimum Walking Zone and the minimum Furnishing Zone. This could permit either of those zones to be wider, or it could allow for a Building Zone, for which minimums are not specified.

USING THE NEW STREET TYPES

The new street types were developed to inform planning and permitting decisions when existing streets and sidewalks are altered and when new streets and sidewalks are reviewed as part of the development process. The sidewalk design standards are especially useful in establishing the recommended total width of sidewalks and the minimum clear width for the Walking Zone. While the standards include minimum widths for the Furnishing Zone, in many cases there will be difficult decisions about allocating space between the Furnishing Zone and the Building Zone. Factors affecting these decisions include the nature of the adjacent land use and whether or not parking is permitted at the curb.

Since the City's sidewalk network is mostly in place and widening sidewalks would be difficult due to the constraints of the built environment, many sidewalk widths will probably not be changed, even though they do not meet the standards. Nevertheless, the street types and sidewalk standards will ensure that new development provides an acceptable pedestrian environment and does not lead to a deterioration of walking conditions.

The standards will be applied to the development of new sidewalks and the reconfiguration of old sidewalks wherever feasible. The sidewalk standards can also be used to secure an adequate Walking Zone by limiting sidewalk encroachments. Many sidewalk encroachments are currently legal and would likely be "grandfathered" if the law were changed to a stricter standard. However, a significant number of sidewalk encroachments are not legal and could be removed or made smaller with better enforcement of existing laws and regulations.

As noted above, the new street types have been incorporated into the *Complete Streets Handbook*. The street types and sidewalk standards are already being used to inform decisions that affect sidewalks. The training process for the *Handbook* will initially be targeted to City staff to ensure that the street types are fully integrated into the City's day-to-day planning, design, and development decisions.

STREET TYPE	DESCRIPTION	PEDESTRIAN SIGNIFICANCE	VEHICLE SIGNIFICANCE	FUNCTIONAL ROADWAY CLASSIFICATION
		The designations below are a rough guide to the relative significance of each street type for each mode.		
Civic/ Ceremonial Street	Small number of streets with great symbolic importance and major ceremonial functions that play a unique role in the life of the City. The sidewalks operate as generous pedestrian promenades.	High	High	Major Arterial
High-Volume Pedestrian	Important as pedestrian destinations or connectors serving large numbers of pedestrians. The threshold of 1200 pedestrians per hour using these streets is based on mid-day counts.	High	High to Medium	Major Arterial or Minor Arterial
Urban Arterial	Major and minor arterials that carry through traffic and usually have surface transit routes. May have more travel lanes and higher speeds than most other street types.	Medium	High	Major Arterial or Minor Arterial
City Neighborhood Street	Majority of grid streets in older sections of Philadelphia. Fronts of buildings typically meet the street line (edge of sidewalk).	Medium	Medium	Minor Arterial or Collector
Walkable Commercial Corridor	Active commercial corridors with pedestrian-friendly physical development pattern. Most buildings are set at the street line.	High	High to Medium	Major Arterial, Minor Arterial or Collector
Auto-Oriented Commercial/ Industrial	Auto- oriented development pattern; not pedestrian-friendly, not likely to attract high levels of pedestrian activity other than for roads with transit routes/stops, i.e., at activity nodes.	Low	High	Major Arterial, Minor Arterial or others as selected
Scenic Drive	Relatively high volume or high speed roadway with scenic views, especially in parks or along waterways. A shared-use side-path is often appropriate for pedestrian travel.	High to Medium	High to Medium	Major Arterial, some Minor Arterial
Park Road	Local park road with lower speed limits; functions for transportation within the park. May have a shared-use side-path.	High to Medium	Medium	Minor Arterial, Collector, Local
Lower Density Residential	Streets in residential areas where dwellings are set back from the sidewalk.	Medium	Low	Collector or Local
Local	Smaller streets in residential or non-residential neighborhoods. Parking provided on at least one side and sidewalks are usually present. This classification includes service streets and minor residential streets.	Low	Low	Local
Shared Narrow	Very narrow local streets, primarily in older areas of the City that are part of the walking network. Both streets and sidewalks tend to be narrow, and pedestrians can walk in the street comfortably. Parking precluded with cartway of 13' or less.	Medium	Low	Local

TABLE 10: STREET TYPES AND SIDEWALK WIDTH STANDARDS

TYPICAL LAND USE, OTHER CHARACTERISTICS	SIDEWALK WIDTH STANDARDS			
	TOTAL WIDTH	WALKING ZONE (minimum clear width)	FURNISHING ZONE	BUILDING ZONE
High density, governmental, cultural, institutional, and retail. Some of the first mapped streets, grand buildings, parade routes	20' recommended	10' min. or half sidewalk width, whichever is greater	5'	No minimum
Commercial, mixed use, higher density residential (R10+)	16' recommended	8' min. or half sidewalk width, whichever is greater	4'	No minimum
Land use varies, most often commercial, residential, or institutional	12' minimum	6' min. or half sidewalk width, whichever is greater	4'	No minimum
Commercial, mixed use, higher density residential (R10+)	12' minimum	6' min. or half sidewalk width, whichever is greater	4'	No minimum
Retail, commercial, mixed use, residential, some institutional	12' minimum	6' min. or half sidewalk width, whichever is greater	4'	No minimum
Automobile services, drive-ins, "big-box" retail and shopping centers set back significantly from the street, industrial	12' minimum	6' min. or half sidewalk width, whichever is greater	5'	No minimum
Parks or waterways. May include low density residential with heavy tree canopy		6' min. walkway if separate from bikeway. Need for separation and width of shared use path depends on expected volumes	5' recommended, 3' minimum "green gutter" may be appropriate	3' of clear ROW needed on side of path opposite the road
Parks		5' min. if sidewalk. If side-path, width depends on expected use, but not less than 8', terrain permitting	5' recommended, 3' minimum "green gutter" may be appropriate	3' of clear ROW needed on side of path opposite the road
Residential, some retail, recreational or institutional	10' minimum for new development	5' minimum	3.5' minimum for new development; should be permeable	No minimum. Building setback serves as building zone
Residential, commercial, industrial	10' minimum for new development	5' minimum	3.5' for new development in residential areas only	No minimum. No obstructions permitted beyond the line of steps or stoops
Mostly Residential, ADT less than 500 ROW no wider than 30'		5' minimum	No minimum	No minimum. No obstructions permitted beyond the line of steps or stoops

CHAPTER 5
PEDESTRIAN AND BICYCLE POLICIES

This Plan introduces a comprehensive review and revision of policies and programs that affect pedestrians and bicyclists in Philadelphia. The new policies complement and provide the framework for physical improvements to the pedestrian and bicycle networks. They address the limitations and gaps in existing policies, guidelines, regulations, and operating procedures. Policy changes to improve conditions for walking and bicycling fall into four areas:

- Pedestrian Network Design
- Bicycle Network Design
- Health and Safety
- Management and Monitoring

Members of the project Steering Committee, working in sub-committees, played an active role in developing the recommended policies. The final set of policies is the result of an iterative process was and is informed by best practices in other cities. Over the course of the project, Steering Committee members focused on the policies that would address the most pressing needs.

Each of the 22 policy papers begins with a summary of the current policy and practice. A goal and supporting objectives are established for each policy, followed by recommended strategies. The full policy papers are included in Appendix C of this Plan. The goals of each of the four policy subject areas are summarized below, and Tables 11 through 14 list the key recommendations.

Pedestrian Network Design

The major elements of the pedestrian network are sidewalks and street crossings. The sidewalk is where pedestrians do most of their traveling and is the space where they should be able to move freely and feel safe from collisions with vehicles (including bicycles). The goal for the sidewalk network is to provide an attractive pedestrian environment that includes adequate space to walk comfortably, separated from vehicles, while at the same time accommodating amenities and necessary utilities. Vehicular intrusion of driveways and lay-by lanes should be minimized. Goals for street crossings include improved safety and pedestrian comfort through better design of intersections and pedestrian signals. Providing frequent crossing opportunities and minimizing delay at traffic signals will reduce the temptation to jaywalk, improving safety for all users of the roadway.
The policies also address requirements for sidewalks in new developments and for filling gaps in the City's existing sidewalk network.

Bicycle Network Design

The recommended bike-related policies will better accommodate bicyclists in the public right-of-way, while also addressing bicycle parking and access to public transit. A primary goal is to establish up-to-date and comprehensive bikeway and shared lane design guidelines for City agencies and their consultants working on street and bridge projects in Philadelphia. Since the majority of bicycle crashes occur at intersections, the adoption of tested engineering measures that can reduce conflicts and confusion at intersections is a key objective. Convenient, secure bicycle parking is an important factor in encouraging bicycle ridership, and many recommendations are included to strengthen this essential component of the bicycle network. Easy bicycle access to transit stations and vehicles will help to promote both modes of travel, while at the same time reducing automobile use.

Health and Safety

These policies address the non-engineering aspects of an effective pedestrian and bicycle network: education, enforcement, and encouragement. Improved pedestrian and bicyclist safety requires increased enforcement of traffic laws regulating the interaction between motorists, bicyclists, and pedestrians. However, many people are not familiar with how the laws apply to bicyclists and pedestrians. Safety education is critical so that all users understand and recognize their role in the transportation system. Education policies also cover training of staff whose jobs affect pedestrian and bicyclist safety. Encouragement recommendations seek to promote physical activity and improve community health through increased levels of walking and bicycling. The "safety in numbers" phenomenon suggests that improved safety will also be a result of growing pedestrian and bicycling activity.

Management and Monitoring

Policies in this category cover management aspects of the transportation system that affect pedestrians and bicyclists, and data collection mechanisms to support evaluation needs.

> Pedestrians seek means to cross many streets without going more than 150 feet out of the way. For this reason, well-designed towns orchestrate convenient crossing points each 300 feet.
>
> — DAN BURDEN: *Distinguished Lecture presentation, Transportation Research Board, 2001*

Goals for better management include improved maintenance of bicycle and pedestrian networks; safe, convenient, and accessible pathways for pedestrians and bicycles around or through construction sites; and improved enforcement of laws and regulations to manage sidewalk encroachments including vendor carts, sidewalk cafes, and honor boxes. Bicycle detour routes and convenient, secure places to store bicycles in commercial buildings are also recommended to increase safety and ridership. Monitoring goals include the collection of accurate and consistent data on bicycling and walking activity, and better crash data collection and analysis so that safety countermeasures may be effectively designed and evaluated.

Sidewalk closed due to construction.

Beyond the Plan

Several of the recommended policies have been adopted by the City and are already in use. An ordinance to require bicycle parking with most new development was passed by City Council in the spring of 2009, based in part on the Steering Committee's recommendations. Another revision to the code, passed in the spring of 2010, allows the Streets Department to grant permits for bike racks instead of requiring a Council ordinance. A Bicycle and Pedestrian Safety Task Force was formed in the summer of 2010, which was one of the recommendations of the Health and Safety Subcommittee, and the Task Force helped develop "Give Respect, Get Respect", the City's first education and enforcement safety campaign focused on bicyclists or pedestrians in more than a dozen years. In addition, the City's new Zoning Code prohibits front parking in rowhouse zones, which will protect sidewalks by limiting the expansion of driveways in many neighborhoods. However, as discussed in Chapter 8, most recommendations in the policy papers still need to be implemented.

Bike Philly is an annual event to encourage cycling.

TABLE 11: PEDESTRIAN NETWORK POLICY RECOMMENDATION		
PEDESTRIAN NETWORK	**Sidewalk Design Guidelines**	• Establish a sidewalk zone system with minimum dimensions for the Walking Zone and for the Furnishing Zone, which also buffers pedestrians from traffic. • Tie new sidewalk standards to the proposed street classification system so that the standards will reflect the nature and levels of pedestrian activity.
	Sidewalk Furnishings	• Encourage street trees and sustainable street furnishings to control storm water and heat island effect. • Accommodate necessary utility infrastructure. • Allow for amenities that enhance the pedestrian environment. • Accommodate commercial enterprises that enliven the street life of the neighborhood.
	Street Crossings	• Maintain a robust crosswalk network. • Install ADA-compliant curb ramps at all marked and unmarked crosswalks. • Establish a policy for the use of crosswalks at uncontrolled locations, including a "toolbox" of engineering treatments for locations where crosswalk markings alone are not sufficient. • Revise subdivision regulations to allow curb radii smaller than 15 feet in new residential developments where truck, bus and other large vehicle traffic will be infrequent. • Increase installation of curb extensions (bumpouts), and include plantings where possible. • Establish guidelines for the use of raised medians for pedestrian refuge areas • Where expressway ramps enter the urban street network, design intersections with attention to pedestrian and bicyclist safety. • Avoid multiple turning lanes wherever possible. • Expand use of traffic calming to reduce speeding and protect pedestrians.
	Pedestrian Signals	• Expand the use of pedestrian signals. • Convert signals to countdowns at a rate of 30 per year until all have been converted. • Develop criteria for when to use audible pedestrian signals, based on 2009 MUTCD recommendations. • Test new technologies for traffic control such as Rapid Flash Beacons, HAWK Crossings (High-intensity Activated crossWalk), and Automated Pedestrian Detection. • Keep signal cycles as short as possible. • Ensure that clearance intervals are properly timed. • Develop criteria for Leading Pedestrian Intervals.
	Driveways and Lay-Bys	• Limit the width, number and location of driveways. • Strictly limit lay-by lanes to protect sidewalk space for pedestrians.
	Requirements for Sidewalks in New Development	• Require sidewalks in new developments to follow the recommended sidewalk design standards for total width and minimum width of the Walking Zone and the Furnishing Zone. • Promote sustainable development practices for new sidewalks through the use of permeable sidewalk surfaces and plantings in the Furnishing Zone.
	Sidewalk Retrofit	• Establish guidelines for requiring property owners to build or replace missing or substandard sidewalks.

TABLE 12: BICYCLE NETWORK POLICY RECOMMENDATIONS		
BICYCLE NETWORK	**Bicycle Network Design**	• Develop and adopt a *Philadelphia Complete Streets Handbook* to replace the *Bike-Friendly Design Guidelines Manual* currently used by the Streets Department. • Draw on latest best practices for full array of bikeway facilities, including currently used facilities and emerging designs.
	Bicycle Treatment at Intersections	• Implement advanced stop bars ("bike boxes") at intersections with high bicyclist and motor vehicle volumes, especially on multi-lane arterials and where bicyclists must switch lanes to turn. • Carry bike lanes across right-turn lanes by marking them as solid green. • Install signage at conflict points. • Implement mixing zones, a combination of a bike lane and a right turn lane within a constrained right-of-way. • Install chevrons or dashed lines across intersections.
	Bicycle Parking	• Add bike racks at a rate of 1,500 per year for five years to bring the total of City-installed bike racks to 10,000. • Establish a permanent "Request-a-Rack" program. • Convert existing meter posts to create space for locking two bicycles when the Parking Authority replaces metered parking with parking kiosks. • Create bike parking in street parking spaces. • Establish bike stations convenient to commuters. • Expand bicycle parking opportunities for employees at Philadelphia International Airport. • Encourage SEPTA to provide bike parking shelters at commuter stations and transfer stations. • Encourage SEPTA and AMTRAK to provide secure, long-term bicycle parking at key transportation hubs. • Make secure bicycle parking a requirement for obtaining a special events permit. • Require the provision of bike parking at a rate of 1 space for every 100 attendees to retrofit large public assembly buildings for cultural and sporting events through the City Property Maintenance Code.
	Bicycles on Public Transportation	• Encourage SEPTA to install bicycle securing devices inside all rail vehicles. • Integrate bike stair channels where possible on stairways in public transit facilities to provide access to platforms in new construction and during major renovations. • Adopt universal design principles wherever possible at regional rail and rapid transit stations. • Post signs inside transit vehicles to explain where bicycles may be stored. • Post signs at transportation facilities indicating bike parking locations and elevators. • Explore development of a Boston-style bicycle car on the Regional Rail system for tourism use.

TABLE 13: HEALTH AND SAFETY POLICY RECOMMENDATIONS		
HEALTH AND SAFETY	**Education**	• Enhance and expand current education programs focusing on pedestrian and bicycle safety. (Bicycle Ambassadors, Safe Routes Philly, formerly BEEP) • Target specific audiences including new college students, older Philadelphians, and non-English speakers. • Continue and expand the "Give Respect, Get Respect" safety awareness campaign emphasizing the rules of the road pertaining to bicycles and pedestrians as a part of the larger transportation community. • Improve training of staff whose jobs affect pedestrian or bicyclist safety, in order to implement the Plan. • Educate bicyclists on strategies and techniques for safe bicycle locking.
	Enforcement	• Continue the work of the Bicycle and Pedestrian Safety Task Force in developing safety education campaigns and improving enforcement of traffic laws. • Improve training of police officers and PPA personnel on traffic and parking laws as they relate to bicyclists and pedestrians. • Continue enforcement campaigns, such as "Give Respect, Get Respect", that target locations with high rates of pedestrian or bicycle crashes, and campaigns to target behaviors the endanger bicyclists and pedestrians. • Expand use of camera enforcement for red-light running to more locations. • Use police officers on bicycles to discourage bike lane incursions by motor vehicles, and in enforcing traffic violations by bicyclists. • Use pedestrian sting operations to increase compliance of Yield to Pedestrian laws. • Reduce incidence of bicycle theft. • Update Philadelphia laws to conform to state traffic laws and the Uniform Vehicle Code regarding bicycling and walking, except where different rules are appropriate to Philadelphia's urban conditions. • Repeal the "mandatory sidepath law" that prohibits bicycling in the street if an adjacent sidepath is available.
	Encouragement	• Develop a marketing campaign to promote the benefits of walking and bicycling, partnering with Philadelphia Department of Public Health. • Implement recommendations of Bike Sharing study. • Conduct and expand events to encourage bicycling and walking - Bike Philly, Bike Month, Walk and Bike to School Day, International Cycling Championship, a Cyclovia.[1] • Distribute materials encouraging residents and visitors to experience the City of Philadelphia by foot and pedal, including maps and self-guided walking and biking tours. • Update the City's bicycle map at least every other year. • Update the City's bicycling website and create a walking website. • Continue the development of directional signage for commonly traveled bicycle routes.

TABLE 14: MANAGEMENT AND MONITORING POLICY RECOMMENDATIONS		
MANAGEMENT AND MONITORING	**Construction Disruption**	• Construction sites should be inspected regularly to ensure compliance with City Code and regulations. The Streets Department should have control over inspections of street and sidewalk rights-of-way at construction sites, including the power to issue citations, fines, and stop-work orders. • Ensure that any sidewalk shed or sidewalk closure allows for safe pedestrian passage around and/or through the construction area. • Protect bikeways from disruption due to temporary street closures.
	Management of Sidewalk Encroachments	• Revise the Code to clarify and improve laws protecting pedestrians from sidewalk encroachments including sidewalk cafes, vendor carts, newsstands, honor boxes, planters, etc. • Create an interagency Public Space Committee to advise the Streets Department and the proposed Civic Design Review Committee on permit applications for sidewalk encroachments. • Revise the code to establish a new structure of fees and fines, a process to revoke licenses and permits after repeated violations, and a reinstatement fee. • Facilitate public reports about encroachments to 311 by creating a standard sign with specifics about the law and the permit. • Strengthen the renewal application process for major sidewalk encroachments. • Develop sidewalk markings to delineate the area permitted to be occupied by moveable sidewalk encroachments such as sidewalk cafes, vendor carts, and honor boxes. • Mark a corner clear zone 10 feet on either side of crosswalks prohibiting all encroachments except transit shelters and equipment essential to vehicular and pedestrian safety and flow. • Develop a program with the Bicycle Coalition, Center City District, and the City to reduce damages to street trees from illegal bicycle parking.
	Pedestrian Network Maintenance	• Set standards for acceptable sidewalk conditions. • Require sidewalk inspection when properties are sold. • Commit City funds to the maintenance of publicly owned sidewalks. • Develop a network of "priority clearance sidewalks" to ensure that major pedestrian pathways and access points are cleared early and regularly during snowstorms.
	Bicycle Network Maintenance	• Establish standards for maintenance of bikeways including replacement of worn pavement markings and damaged signs, sweeping away debris, repaving streets and repairing potholes. • Develop a snow removal policy for bike lanes and multi-use paths.
	Bicycle Detours	• Require responsible agency/department to prepare detour plans for bicycles on multi-use sidepaths, bridge walkway sidepaths or arterial roads with bike lanes. • Penalize contractors who illegally block bike lanes or multi-use sidepaths. • Require in-kind repair or replacement of bike lanes damaged by construction.
	Bicycles in Buildings	• Develop an ordinance that requires building managers with freight elevators to allow bicycle access upon request from a tenant. • Encourage building managers to increase off-street parking operations.
	Crash Reporting and Analysis	• Request changes to the Commonwealth crash report form to include information needed for analysis of pedestrian and bicycle crashes. • Bicycle-bicycle crashes and bicycle-pedestrian crashes should be included in the crash database, as should single bicycle crashes resulting in injury or death. • Improve the precision of crash analysis for better focus on countermeasures • Combine pedestrian and bicycle count data with crash data to evaluate the relative danger in different locations.
	Pedestrian and Bicycle Counts	• Continue to seek assistance through DVRPC for counts using new automated equipment. • Request that DVRPC's Household Travel Survey be repeated on a recurring 10-year cycle. • Require that all intersection traffic counts conducted as part of traffic studies submitted to the City, including studies prepared by developers, include pedestrian and bicycle counts. • Work with DRPA to install an automatic counter on the Ben Franklin Bridge.

CHAPTER 6
PEDESTRIAN NETWORK RECOMMENDATIONS

Introduction and General Overview

This chapter presents recommendations for improving the pedestrian network in Philadelphia. The recommendations are based on current best practices, and address a number of common issues along the roadway and crossing the roadway. Strategies detailed here are aimed at reducing barriers to pedestrian travel by increasing pedestrian safety, convenience and overall comfort.

The recommendations discussed in this chapter are primarily physical changes to the pedestrian network. They complement the street type recommendations discussed in Chapter 4, as well as the policy recommendations highlighted in Chapter 5. The chapter begins with a toolbox of options to improve walking conditions in Philadelphia. The toolbox can be used to inform the planning and design of roadway improvement projects and private development throughout the city. The chapter concludes with a discussion of the citywide sidewalk inventory developed as part of this Plan, and specific recommendations for a selected number of intersections and corridors throughout the city.

Seven specific improvement areas are highlighted in this chapter and more than forty additional locations are discussed in the appendix. The locations included here are representative of pedestrian issues that occur throughout the city.

Toolbox: What Can Be Done

The recommended treatments presented below fall into three main categories: signalization, geometric and signs/markings/operational.[5]

- *Signalization* treatments use traffic signals to increase the safety and comfort of pedestrians crossing the street. Example treatments include improving signal timing to current standards and modifying signal phasing to include a Leading Pedestrian Interval (LPI).
- *Geometric* treatments create or modify existing physical features in the right-of-way. Example treatments include installing a raised median and curb extensions/bumpouts.
- *Signs/Markings/Operational* treatments are those that do not fall into the other two categories. Example treatments include intersection lighting, right-turn-on-red prohibition, enforcement programs, and parking restrictions.

Recommended treatments in each of these categories address both "across the roadway" and "along the roadway" needs, as described in Chapter 3. One or more of the treatments may be appropriate for a given location, based on a careful review of the travel patterns for all modes. Pedestrian network issues in Philadelphia for which these treatments may be appropriate are listed in Table 15. Each row includes a description of the issue, infrastructure elements and recommended treatments. The City will use this toolbox to supplement its Complete Streets approach for roadway improvement projects. Some of the elements may also be provided as a part of the private development process.

Improve Conditions Along the Road: Sidewalks and Corridors

- ***Insufficient Sidewalk Capacity:*** Some roads lack sidewalks altogether, while others have major gaps, or are badly eroded. Sidewalks in areas with high levels of pedestrian use may not be wide enough to accommodate all users. In some locations, sidewalks are blocked partially or completely by sidewalk encroachments or by parked vehicles. Where sidewalks are missing, inadequate, or blocked, pedestrians are forced to walk in the street, at risk to themselves, and potentially disrupting vehicular traffic flow. The photograph below shows a sidewalk that was replaced using public funds from the City's capital program. Capital funding generally can only be used for sidewalks on publicly owned property.

[5] http://safety.fhwa.dot.gov/ped_bike/tools_solve/ped_tctpepc/index.cfm

While enforcing property owner responsibility for sidewalk maintenance is challenging, some communities have adopted a new strategy, called a "point of sale" program, which enforces the requirement when the property is sold.[6]

The sidewalk standards presented in Chapter 4 can help protect walking space on narrow sidewalks from encroachment by sidewalk furniture such as vendor carts or planters. Where demand for sidewalk space grows during warm weather, the use of parklets can help. Parklets convert parking spaces into sidewalk amenities, freeing up walking space on the sidewalk.

Illegal parking on the sidewalk can be difficult to enforce but, in some situations, it can be prevented through the use of bollards or other physical barriers. The photograph below is an example from Juniper Street in Philadelphia.

- ***Excess Auto-Orientation:*** Pedestrians walking along streets with excessive auto-orientation usually do not feel safe, especially if the sidewalks are not buffered from traffic by a landscaped strip or parked cars. The heavier the traffic volume and the higher the speed of adjacent traffic, the less comfortable pedestrians will feel. Another problem with excessively auto-oriented streets is the proliferation of driveways, which are essentially low volume intersections with curb cuts that intrude across the pedestrian walking area. Pedestrians have the legal right-of-way while walking across all driveways unless they are controlled by a traffic signal. However, motorists are unlikely to yield to pedestrians crossing wide driveways that allow vehicles to turn into them at speeds over 10-15 mph. The design of the driveway influences driver behavior and pedestrian comfort. Measures to mitigate pedestrian discomfort when walking along excessively auto-oriented streets include: changing the way motor vehicles travel along the roadway, i.e., traffic calming; creating space between the sidewalk and travel lanes to buffer the effect of motor vehicle traffic on pedestrians; and reducing the impact of driveways.

Four examples are included here. Each example includes at least one element aimed at mitigating the effect of motor vehicle traffic on pedestrians. The first example calms traffic with a rounded and textured center median along curves, narrowing the roadway.

The second example is a street with a heavily used bus route. Buffered sidewalks along this street serve neighborhood residents; the travel lanes carry motorists traveling within and through the neighborhood. Because motorists routinely exceed the posted speed limit, a permanent speed feedback sign was installed.

[6] Donald Shoup, "Fixing Broken Sidewalks", Access, Spring, 2010

	ISSUES	DESCRIPTION	INFRASTRUCTURE
ACROSS THE ROADWAY	**Inadequate or missing crossing facilities, including mid-block crossings**	Pedestrians are encouraged to cross the street at intersections, especially where some type of traffic control is present (i.e., stop signs or signals). Where traffic controls and crosswalks are missing or obsolete, the effectiveness of the pedestrian network is diminished. Signals and geometric treatments work in conjunction with crosswalks at intersections to improve safety and comfort. Mid-block crossings also need adequate crossing facilities.	Signalization • Traffic signals • Pedestrian Signals • Signal timing and sequencing
	Insufficient time to cross intersection	Pedestrians often feel that they do not have enough time to cross at signalized intersections. The 2009 Manual on Uniform Traffic Control Devices calls for signal timing to be based on assumptions of slower walking speed than was used in the past, i.e., reducing the rate of travel from 4 feet per second to 3.5 feet per second.	Signalization • Signal timing • Pedestrian Signals
	Wide or diagonal intersections	Regardless of the intersection size or shape, the shortest pedestrian crossing distance generally offers the greatest safety for pedestrians; i.e., reduces the likelihood of a crash with a motor vehicle. Streets that intersect at angles other than 90° create either wide or narrow corners. Wide corners allow motorists to turn without slowing down. When making a right hand turn, motorists must look back and over the left shoulder -- a maneuver that is difficult to execute and diverts a motorist's attention from potential pedestrians in the crossing just ahead. When making left hand turns, motorists may also fail to observe pedestrians as they move easily through a wide turn.	Signalization • Pedestrian signals • Signal timing and sequencing Geometric • Intersection geometry • Pedestrian crossing islands and median crossing islands
	Complex intersections	Intersections where three or more streets come together create challenges for all modes of travel. Many of the challenges of wide or diagonal intersections may be present at complex intersections. Another type of complex intersection is an offset intersection which looks like two T-intersections almost, but not quite, across from one another. Being the most vulnerable, pedestrians may find it difficult to travel through complex intersections comfortably and safely. Pedestrians may need to cross more streets and be aware of more motor vehicles, especially at crossings without traffic controls that are synchronized with the whole intersection.	Signalization • Signal timing and sequencing Geometric • Intersection geometry • Number of streets to cross • Pedestrian crossing islands and median crossing islands
	Excessive auto-orientation	Excessively auto-oriented streets are any streets where the speed or volume of traffic is inappropriate for the adjacent land use. These streets often have 4 or more travel lanes, traffic volumes over 10,000 per day, and posted speeds of 35 mph or more. Motorists may travel at speeds greater than the posted speed limit. In general, pedestrians crossing streets with excessive auto-orientation do not feel comfortable or safe because of the width of the crossings and the speed and volume of traffic. Motorists often fail to yield to pedestrians in crosswalks, especially when turning. Signalized intersections providing traffic control for pedestrian crossings often are too far apart, forcing pedestrians to walk excessively long distances to a protected crossing.	Signalization • Traffic signals • Pedestrian signals
ALONG THE ROADWAY	**Excessive auto-orientation**	Streets with heavy traffic volumes, high speeds, or excessive widths are uncomfortable for pedestrians to walk along, particularly if the sidewalks are directly adjacent to the roadway instead of buffered by a Furnishing zone, curb parking, or a bike lane. The intrusion of frequent driveways is another problem typical of such streets, forcing pedestrians to be alert for vehicles turning across their path. Where speeds are high and driveways are wide, turning motorists are unlikely to yield to pedestrians.	Geometric • Sidewalks • Buffers • Access management
	Insufficient sidewalk capactiy	Missing, undersized, or blocked sidewalks may force pedestrians to walk in the roadway, at great risk to themselves, and disrupting traffic flow.	Geometric • Sidewalk presence and width • Transit stops

TABLE 15: OVERVIEW OF PEDESTRIAN RECOMMENDATIONS

ELEMENTS	TYPES OF RECOMMENDATIONS		
Geometric • Pedestrian crossing islands • Curb extensions Signs/Markings/Operational • Crosswalks • Lighting • Signage	Signalization • Add pedestrian signals where missing • Signalize currently uncontrolled intersections at select locations • Install second pedestrian signal in medians at wide crossings	Geometric • Install pedestrian refuge in median • Install curb extensions to decrease crossing distance and slow turning vehicles	Signs/Markings/Operational • Add crosswalks or upgrade to high visibility crosswalks to increase motorists' awareness of crossing pedestrians and highlight desired crossing locations • Add Stop signs at select locations • Install Rapid Flash Beacon at select locations.
Geometric • Curb to curb distance, based on intersection geometry • Curb extensions • Pedestrian crossing islands and medians	Signalization • Increase the length of time a walk signal is provided • Program a leading pedestrian interval into the signal cycle	Geometric • Reduce the crossing distance with curb extensions and pedestrian crossing islands or medians • Narrow travel lanes and tighten turning radii at intersections to accommodate curb extensions and raised medians where possible, incorporating green streets elements	
Signs/Markings/Operational • Signage • Crosswalks	Signalization • Program a leading pedestrian interval into the signal cycle	Geometric • Create intersections with 90° angles • Install raised center medians and triangular medians that incorporate pedestrian crossing facilities • Consider feasibility of a modern roundabout	Signs/Markings/Operational • Stripe high visibility crosswalks • Narrow travel lanes to calm traffic
Signs/Markings/Operational • Crosswalks • Right turn on red • Signage	Signalization • If more than two phase signal, allow pedestrians to cross on all phases where crossing is safe • Consider separate pedestrian phase for offset intersections	Geometric • Consider closing approaches • Install medians to channel traffic and provide pedestrian refuges	Signs/Markings/Operational • Stripe high visibility crosswalks and install signage alerting motorists to the presence of pedestrians • Change two-way streets to one-way streets to reduce confusion at intersections. • Prohibit right turn on red
Geometric • Curb extensions • Median islands Signs/Markings/Operational • Crosswalks • Lighting • Right turn on red • Cameras	Signalization • Create mid-block crossings with appropriate warnings for motorists and protections for pedestrians – may require pedestrian-activated signal	Geometric • Narrow travel lanes at intersections and reduce turning radii, where possible. Radii must be adequate for bus turns where present • Install pedestrian refuge in median	Signs/Markings/Operational • Stripe high visibility crosswalks with signage alerting motorist of the presence of pedestrians • Install enforcement cameras calibrated for pedestrian safety needs • "Don't Block the Box" program • Prohibit right turn on red • Upgrade lighting at crosswalks
Signs/Markings/Operational • Signage • Cameras	Geometric • Widen sidewalks • Install buffers between sidewalk and travel lane • Use traffic calming treatments • Identify appropriate opportunities for access management (reducing the number and width of driveways)		Signs/Markings/Operational • Re-stripe curb lane to allow parking, if demand exists • Install speed cameras and permanent speed feedback signs
Signs/Markings/Operational • Minimum clear width Walking zone (control of encroachments) • Furnishing and Building zones	Geometric • Resolve sidewalk gaps, especially near schools, transit stops and park entrances • Extend the sidewalk at transit stops to provide additional space for transit rider alighting and boarding • Install bollards or bike racks at curb line to prevent parking on the sidewalk • Use "parklets" to expand sidewalk into parking lane in areas of heavy seasonal demand.		Signs/Markings/Operational • Maintain minimum clear width standards through encroachment enforcement program • Require sufficient capacity through redevelopment process

The next two examples involve mitigation of the effects of poorly designed driveways. Reducing the number of driveways along a roadway can take a long time. Shorter term treatments that mitigate the effect of driveways can be implemented, however.

The next photo shows a retrofit that was made to a gas station driveway. The overly wide entrance driveway was organized into two one-way entrances, with flexible bollards used to separate them.

Multi-lane roadways without medians present particular challenges to both pedestrians and motorists, as motorists turning left into a driveway are focused on finding gaps in oncoming traffic. While focusing on gaps in traffic, the motorist's sight lines of potentially conflicting pedestrians are blocked by approaching vehicles. Motorists often accelerate rapidly to clear a gap on multi-lane roadways which puts the pedestrian at risk when walking along the roadway.

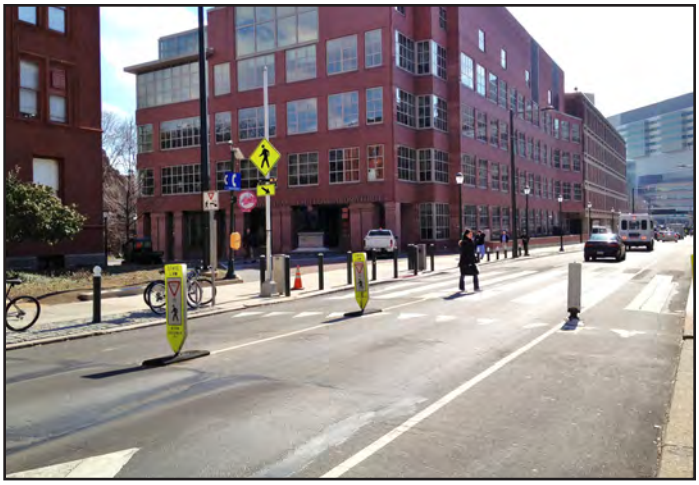
In the long run, the review and approval process for new development should include access management to limit driveway entrances and exits. Even when the number of access points is limited, two-lane driveways provide the same effect on pedestrians as a two-lane road. This photo shows how the pedestrian network was maintained across the driveway of a large apartment complex situated on a multi-lane roadway. The center median prohibits motorists from turning left into the driveway.

Improve Conditions Crossing the Road: Intersections

- ***Inadequate or Missing Crossing Facilities:*** Pedestrian crossings can be improved by adding pedestrian space at the edges of a street or in the middle of the street. Medians and triangular channelization islands create space in the middle of the street. Curb extensions do the same on the edge of the street. Signage alerts both motorists and pedestrians of crossing locations. Newer treatments, such as the Rapid Flash Beacon (RFB), can be installed independently of an intersection signalization system and provide additional protection for pedestrians. This intersection in a residential neighborhood is used by pedestrians traveling to shopping, schools, bus stops, and recreation facilities. The curb extension reduces the crossing distance for pedestrians and offers a safe crossing location. Signage and a high visibility crosswalk supplement the curb extension and alert motorists to the presence of pedestrians.

The high-volume pedestrian and bicycle crossing at Martin Luther King Jr. Drive and the Schuylkill River Trail near the Philadelphia Museum of Art was recently improved to included rumble strips, push button signalization, advanced stop bars, and highly visible signage. The new crossing of MLK Drive. is shown on the following page.

Rapid Flash Beacons use LED technology in combination with crosswalk warning signs. The RFB design differs from the traditional flashing beacon by utilizing a rapid flashing frequency (60 times per second versus 1 per second), brighter light intensity, and the ability to aim the LED lighting. Activated by pedestrians prior to crossing, the rate at which the light flashes has been shown to increase the rate of compliance of motorists stopping or yielding to pedestrians in a crosswalk. The crossing of 34th Street between Walnut and Spruce includes a Rapid Flash Beacon and a "speed lump."

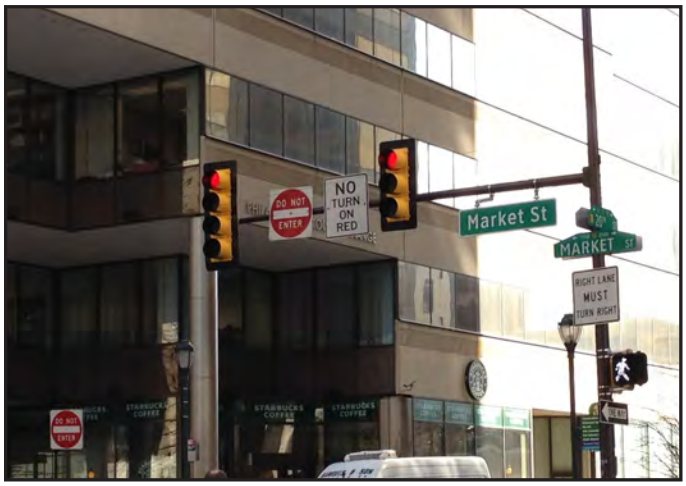


- ***Insufficient Time to Cross:*** Pedestrians, especially older people, often say that they don't have enough time to cross at traffic signals. This may be the result of variation in walking speeds; a lack of understanding of the meaning of traditional pedestrian signals; and vehicles that run red lights or don't yield when turning. "Pedestrian clearance" refers to that phase of the pedestrian signal when the flashing Don't Walk or flashing Hand symbol is displayed. During this phase, pedestrians are not supposed to start crossing but, if they have already stepped off the curb, are free to complete their crossing without interference from cross traffic. Guidance adopted in the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD) calls for pedestrian clearance times to be based on a walking speed of 3.5 feet per second. This is a change from the previous standard of 4 feet per second.

Where pedestrians travel more slowly than 3.5 feet per second, the MUTCD recommends that a slower walking speed be considered in determining the pedestrian clearance time.

The issue of insufficient time to cross may be mitigated by reducing the crossing distance with curb extensions, or by using medians that provide a pedestrian refuge so that pedestrians may take two signal cycles to cross. Countdown signals use the pedestrian clearance phase to display numbers showing pedestrians exactly how many seconds they have left to cross until the solid Don't Walk appears and cross traffic will start to move. Countdown signals have been found to be more informative and to help pedestrians make better judgments about when it is safe to cross, so they have now been adopted as standard practice by the City in accordance with the requirements of MUTCD.

One solution included in Table 15 is to program a Leading Pedestrian Interval (LPI) into the signal cycle. An LPI adds four seconds to the walk time before the green light for motor vehicles. Besides providing additional time for pedestrians to cross the street, the four-second head start makes pedestrians more visible to motorists, allowing them to enter the intersection before vehicles begin turning. LPIs are used on a selective basis. Not all crossings at an intersection or all intersections along a corridor need additional crossing time. Countdown signals should be installed first, and a study of pedestrian and motorist behavior should be made before deciding whether to use this technique.



The intersection of Market Street (Civic-Ceremonial Street type) and 20th Street (High-Volume Pedestrian Street) in Philadelphia accommodates high levels of both motor vehicle and pedestrian traffic. An LPI was installed to ensure pedestrians were visible to turning vehicles. No Turn on Red signs deter motorists from turning as pedestrians proceed across the intersection in advance of the green light.

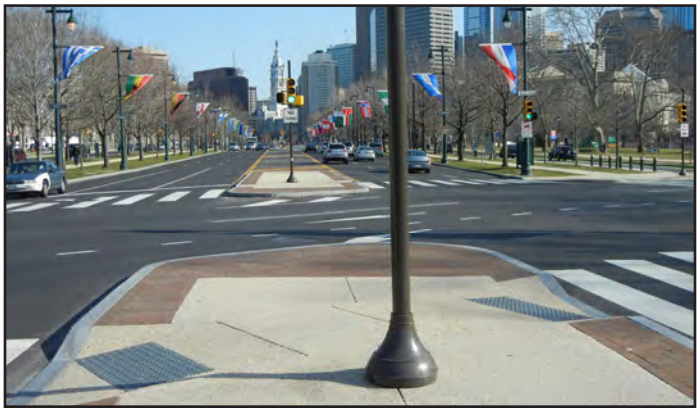
- ***Wide or Diagonal Intersections:*** Pedestrians experience the challenge of crossing these intersections in several ways. Long crossing distances increase exposure time to collisions, especially for slower pedestrians. The wider corners allow motorists to turn without slowing down, and drivers may be less likely to yield right-of-way to crossing pedestrians. At narrow corners, sight angles of less than 90° force pedestrians to look over their shoulder to see if a vehicle is turning into the crosswalk. All these effects are magnified when the streets are wide. Among the recommended treatments are reconfiguration of intersections with islands and medians to shorten crossing distances, tightening turning radii, and making approaches closer to 90°. Signage can also be used to alert users of potential conflicts that may not be easily visible.

Examples of reconfigurations of wide or diagonal intersections are shown here. The first example narrows the distance across a wide T-intersection of two well-traveled roads in a residential neighborhood.

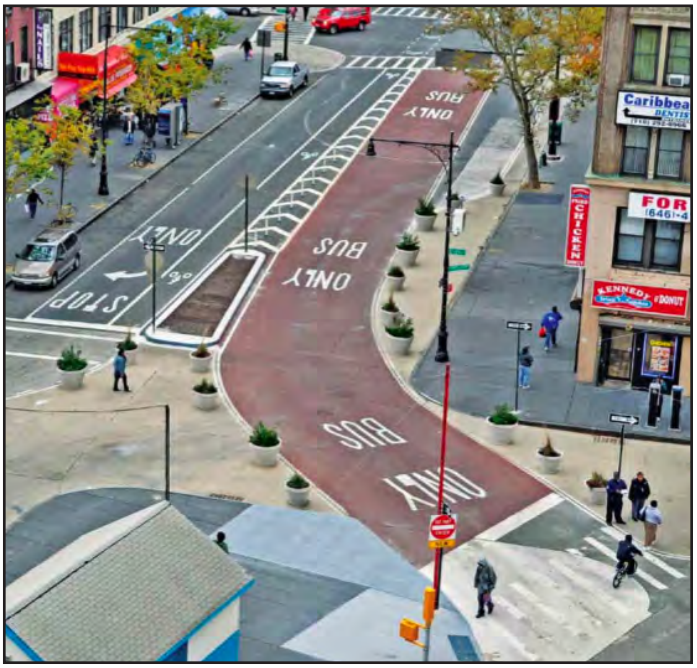
Both a straight center median and a raised triangular median narrow the pedestrian crossing distance. The center median slows traffic at the crosswalk by narrowing travel lanes in both directions. The triangular median extends the sidewalk along the roadway. This median is heavily planted, enhancing aesthetic appeal as well as safety. Existing drainage remains intact, as the triangular median was designed to create a channel between the existing curb and the curb of the median.

The next example is a large, asymmetrical intersection with long crossing distances. Channelizing islands create shorter crossing distances for pedestrians, increase their visibility to motorists, and adjust the angle at which motorists approach the intersection. Vegetation was incorporated wherever possible, including at storm water drainage inlets.

Philadelphia has recently widened the center medians on the Benjamin Franklin Parkway from 6' to 18', providing a generous refuge area for pedestrians who must make a two-stage crossing.



- ***Complex Intersections:*** Intersections of more than three streets can create challenges for pedestrian safety and comfort, especially when traffic controls and other pedestrian crossing facilities do not meet pedestrian needs. Issues for pedestrians usually include all the problems of Wide or Diagonal Intersections, plus an increase in the number of streets to cross and a larger intersection diameter, which increases vehicle orientation and reduces overall pedestrian visibility and comfort. A second type of complex intersection is the offset intersection, which occurs when two separate cross streets intersect a roadway within a very close proximity to each other, but do not directly line up. The result is two separate "T" intersections, and two separate crossings for pedestrians, with complex vehicular movements. Drivers may consider the cross streets as a continuous path of travel and be less aware of pedestrians. Appropriate traffic control and crosswalk placement may be challenging. The example below was the busiest intersection in the South Bronx. A 5-legged intersection was reconfigured to add bike lanes and a bus-only lane, along with 15,000 square feet of pedestrian space. The project led to the lowest crash rate in a decade.



- ***Excess Auto-Orientation:*** The angled intersection of Snyder Avenue, Broad Street, and McKean Street is an example of where the City has made improvements to reduce auto orientation and increase pedestrian safety and comfort. The modifications include curb extensions, clear pedestrian crossings, planted buffers, ADA ramps, and pedestrian countdown signals.

The next example is on a street with high traffic volume, well-used bus routes, and pedestrians traveling both across and along the roadway. Compliance with the posted speed limit is encouraged by the traffic signal automatically turning red when motorists exceed the speed limit. Over time, the average speed is gradually reduced. This treatment offers an interesting element of peer pressure among motorists, and may create additional opportunities for pedestrians to cross the street when the signal changes to red. The overall sequencing of this traffic signal needs to be coordinated with other traffic signals along the corridor.

Applying the Toolbox in Philadelphia

Sidewalk Inventory

Sidewalks are the foundation of the pedestrian network in Philadelphia. Sidewalks exist to varying degrees throughout the city; however, gaps in the network exist and in many cases existing sidewalks are narrow or obstructed, or are in such disrepair that they are practically impassable. This plan recommends that Philadelphia establish and build over time an ongoing program to improve deficient sidewalks and to build sidewalks where they do not presently exist. This will be done in a strategic way that prioritizes sidewalk improvements where they are needed most, as discussed in Chapter 8, while also taking full advantage of public and private development projects to continuously improve the city's sidewalk network. The first step in this process is to develop a comprehensive GIS-based sidewalk inventory, which has been completed as part of this plan, as discussed below.

In summer and fall 2010, a detailed sidewalk inventory was conducted in Philadelphia. Data collection teams evaluated more than 2,700 miles of sidewalk throughout the city: which included all arterials and collectors outside of Center City. Around 250 miles of missing sidewalk segments were identified in the inventory.

For each street segment the team noted whether sidewalks were present or missing on each side. A broad level condition assessment was completed to determine whether the sidewalk was "adequate" or in "poor" or "very poor" condition. Additionally, a limited number of additional characteristics was recorded, including whether there was a gap or an obstruction along each sidewalk section, and/or if it appeared to be narrow. The presence or absence of a buffer between the sidewalk and the road was also highlighted. It should be noted that an Americans with Disabilities Act (ADA) inventory was not completed. The information that was gathered is intended to inform planning level decisions; however, additional detail will be needed to truly assess accessibility, and to recommend specific improvements as projects move toward implementation.

Map 8 shows missing and very poor condition sidewalks identified as part of the sidewalk inventory.

In Chapter 8, a sidewalk prioritization methodology is outlined. This criteria-driven process is intended to enable the City to focus its efforts on locations where new or improved sidewalks are needed the most.

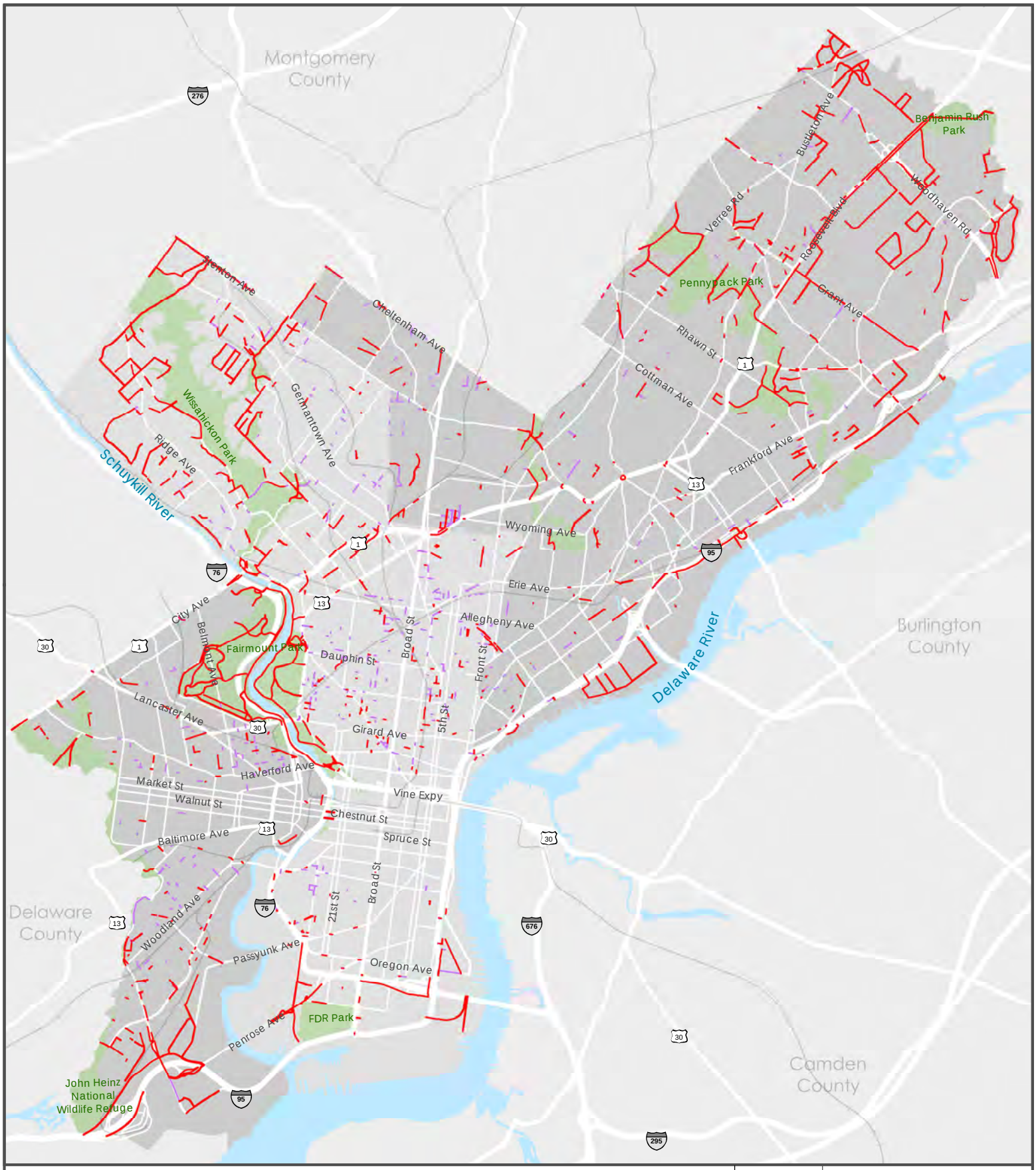
Location-Specific Analysis

As part of the Plan, the Steering Committee identified numerous locations to be evaluated for pedestrian-related improvements. The locations were selected based on a wide variety of factors including pedestrian crash history, the presence of pedestrian generators such as transit stations, schools, and parks, public input from the questionnaire and community open houses, and information gathered from the review of previous plans and studies (see Appendix A). After the locations were identified, the project team conducted field work to generate a series of initial ideas to improve physical conditions for those on foot. The initial concepts were presented to the Steering Committee and the public, and their feedback has been incorporated.

City staff has further developed some of the pedestrian network recommendations to more detailed concepts. Map 9 and Table 17 on the following pages list all the locations evaluated for pedestrian network recommendations; descriptions can be found in Appendix D. Before pedestrian network recommendations can be implemented, detailed plans must be developed; traffic analysis may be needed; and affected stakeholders, including SEPTA, must be consulted.

TABLE 16: SIDEWALK INVENTORY RESULTS

SIDEWALK STATUS	TOTAL MILES
Missing	250
Present	2482
SIDEWALK CONDITIONS	**TOTAL MILES**
Adequate Condition	2250
Poor Condition	198
Very Poor Condition	33
Gap <=25%	83
Gap <=50%	29
Miles of SW Obstruction	121
Miles Narrow	27



Sidewalk Inventory | Map 8

Legend

Missing Sidewalk

Sidewalk in Very Poor Condition

N

Miles
0 1 2

PCPC

GET HEALTHY PHILLY

Base Data Source: City of Philadelphia

No warranties of any sort, including accuracy, fitness or merchantability, accompany this product.

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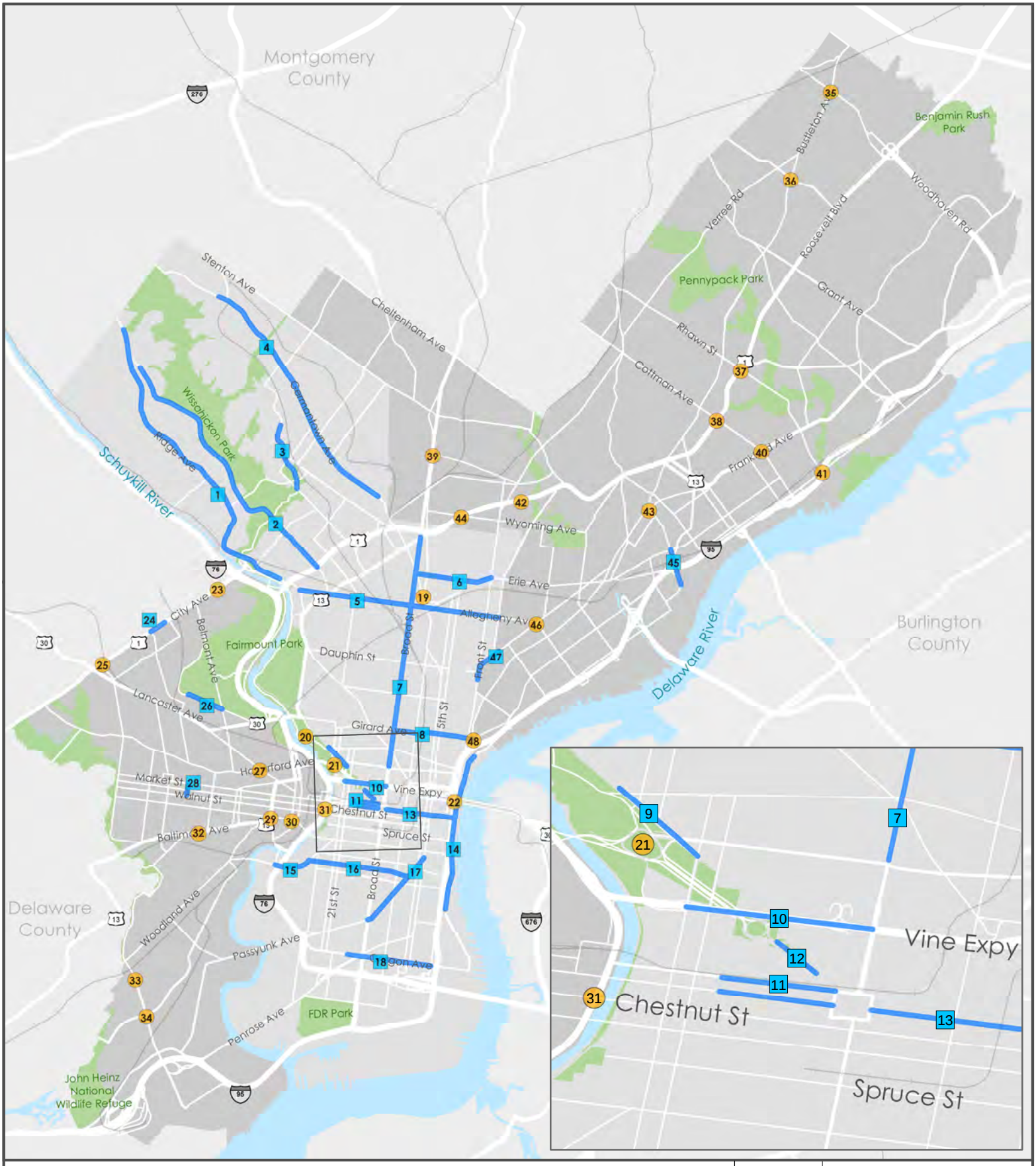
Philadelphia Pedestrian and Bicycle Plan | March 2012



Pedestrian Network Focus Areas | Map 9

Legend

Spot Location

Corridor

N

Miles 0 1 2

PCPC

GET HEALTHY PHILLY

Base Data Source: City of Philadelphia

No warranties of any sort, including accuracy, fitness or merchantability, accompany this product.

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TABLE 17: PEDESTRIAN NETWORK FOCUS AREAS				
LOCATION NUMBER	SPOT OR CORRIDOR	LOCATION	PLAN PHASE	HIGHLIGHTED IN CHAPTER 6
1	Corridor	Ridge Avenue (Bells Mill Road to Midvale)	1	
2	Corridor	Henry Avenue (Port Royal to Abbottsford)	1	
3	Corridor	Germantown Avenue (Chestnut Hill Ave to Logan)	1	•
4	Corridor	Lincoln Drive (Wissahickon to McCallum)	1	•
5	Corridor	Allegheny Avenue (B to Ridge)	1	
6	Corridor	Erie Avenue (Front to Broad)	1	
7	Corridor	North Broad Street (Spring Garden to Hunting Park)	1	
8	Corridor	Girard Avenue (Frankford to Broad)	1	
9	Corridor	Pennsylvania Avenue (22nd to 26th)	1	•
10	Corridor	Vine Street (Broad to 22nd)	1	
11	Corridor	JFK Boulevard (15th to 20th)	1	
12	Corridor	Benjamin Franklin Parkway (16th to 18th)	1	
13	Corridor	Market Street (Front to 20th)	1	
14	Corridor	Columbus Boulevard (Tasker to Frankford)	1	
15	Corridor	Gray's Ferry Avenue (Washington to 34th)	1	
16	Corridor	Washington Avenue (Grays Ferry to Passyunk)	1	
17	Corridor	Passyunk Avenue (Broad to 5th)	1	•
18	Corridor	Oregon Avenue (Front to 17th)	1	
19	Spot	Germantown/Ontario/Rising Sun/Old York Road	1	
20	Spot	Kelly Drive (Boathouse Row to Lemon Hill)	1	
21	Spot	Eakins Oval/PMA Area (Eakins Oval to 25th)	1	
22	Spot	Ben Franklin Bridge approach area (Callowhill/6th/Race/4th)	1	
23	Spot	City Avenue & Monument Road	2	
24	Corridor	City Avenue from Bryn Mawr Avenue to 54th Street	2	
25	Spot	City Avenue & 63rd Street	2	
26	Corridor	Parkside Avenue Between Girard Avenue & 52nd Street	2	
27	Spot	Lancaster Avenue/Haverford Avenue/ 40th Street	2	
28	Corridor	52nd Street Between Market & Walnut Streets	2	
29	Spot	38th Street & Spruce Street	2	
30	Spot	34th Street Between Spruce Street and 33rd Street	2	
31	Spot	Walnut & Chestnut Streets at Schuylkill Avenue	2	
32	Spot	Baltimore Avenue between 49th & 50th Streets	2	
33	Spot	Island Avenue – Elmwood to Buist	2	
34	Spot	Lindbergh Boulevard & Island Avenue	2	•
35	Spot	Byberry Avenue & Bustleton Avenue	2	
36	Spot	Haldeman Avenue & Bustleton Avenue	2	
37	Spot	Rhawn Street & Roosevelt Boulevard	2	
38	Spot	Cottman Avenue & Roosevelt Boulevard	2	
39	Spot	Olney Transportation Center	2	
40	Spot	Frankford Avenue & Cottman Avenue	2	
41	Spot	Rhawn Street & State Road	2	•
42	Spot	Roosevelt Boulevard & C Street	2	
43	Spot	Frankford Avenue - Between Bustleton Avenue & Pratt Street	2	•
44	Spot	Wyoming Avenue & Roosevelt Boulevard	2	
45	Corridor	Bridge Street Between Torresdale Avenue & Ramsay Road	2	
46	Spot	Kensington Avenue & Allegheny Avenue	2	
47	Corridor	Front Street – Between Lehigh Avenue & Susquehanna Avenue	2	
48	Spot	Girard Avenue between Front Street & Frankford Avenue	2	

EXAMPLE LOCATIONS

The following section highlights seven locations in Philadelphia where pedestrian improvements are needed. These locations are representative of pedestrian issues that occur throughout the city. The full set of recommendations for specific locations evaluated in the pedestrian network can be found in Appendix D. A few locations are also addressed in Appendix E. The recommended improvements incorporate treatments from the toolbox discussed earlier in this chapter, while also serving as specific opportunities to implement "Complete Streets" improvements in Philadelphia. The improvements focus on retrofitting the existing roadway to enhance the safety and comfort of those on foot. Some examples illustrate how projects move through the planning, design, and construction process, in that some of the recommendations have already been implemented.

FIGURE 8: FOCUS AREA
Intersection of Lindbergh Boulevard and Island Avenue

Number: 34

Current Conditions: The intersection of Lindbergh Boulevard and Island Avenue is currently very difficult for pedestrians. Wide turning radii enable motor vehicle drivers to turn at a high rate of speed, leading to potential conflicts between pedestrians, cars, bicycles, trolleys, and buses. Pedestrians must cross long distances with only narrow existing medians, and not all desired pedestrian crossings are accommodated. There are missing curb ramps and poorly maintained crosswalks at the intersection. There appears to be an excessive amount of paved space throughout the intersection, which diminishes its overall pedestrian friendliness. There is also limited queuing space for pedestrians waiting for trolleys.

Recommendations: To improve pedestrian conditions, curb ramps should be provided and existing crosswalks should be restriped, with advanced stop lines, throughout the intersection. More time should be provided on the pedestrian countdown signals for pedestrians to cross the large roads. Turning radii should be tightened where possible, in order to slow turning vehicles. This may be accomplished by expanding existing channelizing islands or medians. Providing a crosswalk between the southeast and southwest sides of the intersection should be evaluated given existing pedestrian desire lines. Pedestrian crossing distances, especially on Island Avenue, should be reduced through expanded medians or curb extensions. It may be possible to narrow existing travel lanes in order to free up space to widen the queuing area for pedestrians waiting for trolleys. Benches or shelters should be provided at all bus stops. As projects are implemented, ensure that the intersection appropriately accommodates planned bike improvements along Lindbergh Boulevard and Island Avenue.

FIGURE 9: FOCUS AREA
Frankford Avenue
(Between Bustleton Avenue and Pratt Street)

Number: 43

Current Conditions: Pedestrian improvements are needed on Frankford Avenue between Bustleton Avenue and Pratt Street. There appears to be a significant level of pedestrian crossings at uncontrolled intersections and mid-block locations in this location. There are poorly maintained crosswalks, and existing curb ramps need improvement. Some of the existing turning radii are wide, enabling cars to turn at high rates of speed. The existing painted median on Frankford Avenue does not function as a pedestrian refuge.

Recommendations: A selected number of physical improvements has the potential to significantly enhance pedestrian conditions in the area. Raising the existing painted median island on Frankford Avenue would enable it to better serve as a pedestrian refuge. A mid-block crossing treatment of Frankford Avenue should be considered. Associated changes should be considered as part of the evaluation of the mid-block crossing, for example: removing parking spaces to improve visibility; adding a pedestrian crossing signal and high visibility crosswalk; and realigning the crosswalk across the interior drive at the Frankford Transportation Center to meet the new crossing of Frankford Avenue. Pedestrian crossing distances could be reduced and visibility improved through the addition of curb extensions. A new mid-block crossing design should minimize impact on SEPTA's kiss-and-ride and delivery operations. Improving existing curb ramps throughout the corridor to make them ADA accessible and restriping existing crosswalks using high visibility pavement markings would also improve conditions for those on foot.

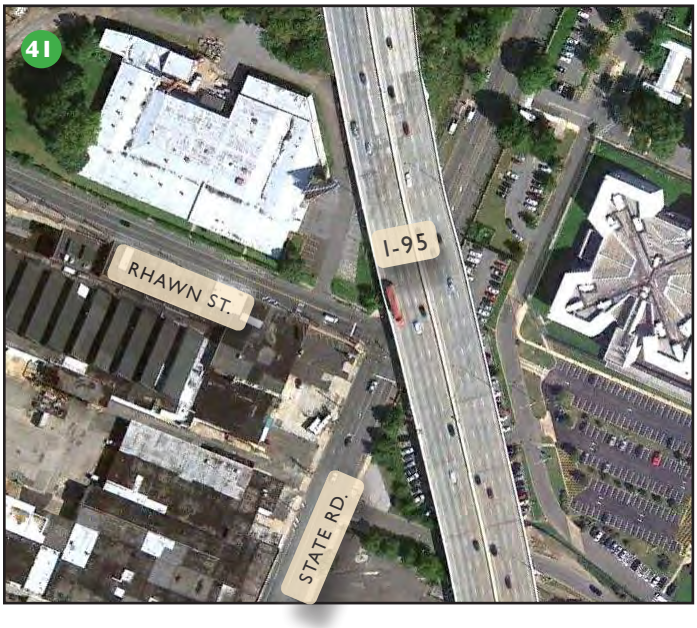


FIGURE 10: FOCUS AREA
Rhawn Street and State Road

Number: 41
Current Conditions: Pedestrian improvements are needed at the intersection of Rhawn Street and State Road. The pedestrian crossing distance across State Road is long, and there are no pedestrian signals. Visibility is limited due to I-95, which passes over the east side of the intersection. Connections to the Pennypack trail need improvement both north and south of the intersection. Additionally, there is limited queuing space and a lack of amenities for pedestrians waiting for buses.

Recommendations: To improve pedestrian conditions, countdown signals and high visibility crosswalks should be installed. Benches or shelters should be provided at the bus stops. Curb extensions should be considered to shorten crossing distances, improve pedestrian visibility, and increase the queuing area for bus riders. The east shoulder of State Road between Rhawn Street and the sidepath leading to Pennypack Park on the Delaware River could be converted to expand the sidewalk for shared use by bicyclists and pedestrians and to add a buffer. Wayfinding signs should be added at the intersection to direct path users to the proper route.

FIGURE 11: FOCUS AREA
Lincoln Drive (Wissahickon to McCallum)

Number: 4
Current Conditions: Lincoln Drive is a north-south street running from West Allens Lane to the Schuylkill River, primarily through Fairmount Park. Its curved and diagonal orientation creates skewed and complex intersections. Lincoln Drive has two lanes in each direction, plus shoulders north of Cliveden Street that are wide enough for parking, but rarely used for that purpose, due to concerns about the volume and speed of traffic. Issues for pedestrians include traffic speeds that significantly exceed the 25 mph posted speed limit, large intersections with high traffic volumes, and cars running off the roadway. Recent improvements included exclusive left turns at Greene Street that were striped after a recent resurfacing. Resurfacing, median repairs, and a signal upgrade of the section south of Wayne Avenue are scheduled for FY2014.

Recommendations: To improve conditions along Lincoln

Drive, the intersection corner radii should be tightened where possible, to slow traffic speeds and incorporate green streets elements. Reflective warning signage and speed feedback signs should be installed. Red light cameras should be considered at intersections with a high number of crashes caused by red light running. At Wayne Avenue, crossing distances across Wayne Avenue should be reduced through the use of medians, curb extensions, and/or recapturing the slip lane. The feasibility of a modern roundabout should be assessed. The Lincoln Drive sidewalk should be widened south of the intersection to function as a shared use sidepath. From Wissahickon Avenue to Wayne Avenue, the existing sidewalk should be incorporated into the recommended sidepath as appropriate, and pedestrian signals should be installed.

FIGURE 12: FOCUS AREA

Passyunk Avenue, South Broad Street to 5th Street

Number: 17

Current Conditions: Passyunk Avenue runs diagonally from northeast to southwest, operating as a one-way northbound street. There is generally one travel lane with parking on both sides and transit stops at every block. All intersections have angled crossings and several include more than two streets. Issues for pedestrians include long crossing distances; complex and confusing intersections; worn or missing crosswalks; and insufficient sidewalk capacity in high pedestrian travel areas. The intersection of Broad, Passyunk, and McKean was improved in 2010 by converting unneeded pavement to a large landscaped island, thus reducing crossing distances. Additionally, a signal project is currently in construction on the section of Passyunk Avenue from Broad to 63rd, including countdowns, curb extensions, and bike lanes.

Recommendations: To improve pedestrian conditions, the crossing distances for pedestrians should be reduced by identifying unused pavement. Curb extensions and raised medians with ADA-compliant pedestrian crossing areas could be added that incorporate green streets elements. Where excessive on-street parking or pavement exists, parklets or pedestrian plazas should be considered.

Existing crosswalks should be refreshed with high visibility striping; and crosswalks should be installed where they are missing. At Passyunk/Morris/12th, a curb extension should be added between Passyunk Avenue and 12th Street at the southern end of the intersection to shorten crossing distances across both streets. Seating should be provided on the enlarged curb extension. A raised pedestrian refuge and channelizing island should be provided on the painted median in the middle of the intersection. Additional curb extensions would shorten crossings and prevent vehicles from parking in crosswalks. Faded crosswalks should be restriped, and consideration given to striping the missing crosswalk across Morris Street.. At Passyunk/Reed/10th, the Reed Street angled parking should be converted to back-in parking and a curb extension should be added on the north side of Reed Street (west of 10th and adjacent to the angle parking).

FIGURE 13: FOCUS AREA
Germantown Avenue and Durham Street Intersection

Number: 3

Current Conditions: Durham Street intersects Germantown Avenue in two places, creating two separate T intersections, 50 feet apart. Durham is one-way eastbound with a stop sign at its approach to Germantown. None of the street crossings includes a marked crosswalk. The southern

intersection, with East Durham, is approximately 250 feet from the signalized intersection of Germantown with Mt. Pleasant Avenue. The northern intersection with West Durham is about 390 feet from the signal at Mt. Airy Avenue. Germantown is constructed of Belgian block and concrete surfaces that present challenges for marking crosswalks.

Recommendations: Pedestrian conditions can be improved at this location by installing pedestrian-activated Rapid Flash Beacons at a new Germantown Avenue crosswalk. Curb extensions should be added on both sides of Germantown Avenue between the two intersections extending the width of the crosswalk. This would require some removal of parking (approximately 3 spaces). A single 35' wide high visibility crosswalk should be considered across Germantown Avenue just south of the West Durham Street approach. On concrete, a black epoxy base may be used with white markings on top for contrast. High visibility crosswalks should be marked across both Durham Street crossings.

FIGURE 14: FOCUS AREA
Pennsylvania Avenue, Spring Garden Street, and 23rd Street Intersection

Number: 9

Current Conditions: This is a complex intersection with seven legs, just off Eakins Oval. East-west Spring Garden Street enters the Oval here, and one leg is the entrance to the Spring Garden tunnel. Pennsylvania Avenue runs from southeast to northwest along a series of apartment buildings and serves as an important parking resource. 23rd Street is a north-south street with two travel lanes. The signal cycle has three phases and there are no pedestrian signals. The crossings of both Spring Garden and Pennsylvania Avenue are quite long and some median refuges are inadequate. The most challenging crossing is on the north side of the intersection, where pedestrians must cross when Spring Garden traffic moves. Vehicles in the right lane may go straight, bear right into the tunnel, or turn right onto Pennsylvania Avenue. Pedestrians making this crossing with traffic cannot see turning vehicles and once they reach the median, they can't see the traffic signal.

Recommendations: To improve conditions, pedestrian signal indicators with countdowns should be added on all long crossing and in the medians. A Leading Pedestrian Interval should be considered for the north side crossing of Pennsylvania Avenue. The tunnel entrance and Pennsylvania Avenue median north of the intersection should be reconfigured to force Spring Garden Street traffic headed to the tunnel to turn right, then left, instead of accessing it straight through the intersection. Curbs at the corner of Parkway House should be extended to shorten long crosswalks of Pennsylvania Avenue and Spring Garden Street. The pedestrian refuge in the center of Spring Garden Street crossings should be widened to at least 6 feet. Additionally, "Yield to Pedestrians when Turning" signs should be posted for the eastbound Spring Garden Street approach to the intersection.

CHAPTER 7

Introduction and General Overview

Philadelphia developed its first Bicycle Network Plan in 2000. Since the adoption of that plan, more than two hundred thirty miles of streets have been striped with bike lanes and the City has begun to implement other on-road bicycle facilities, such as contra-flow lanes and marked shared lanes. In most cases, the bike lanes that have been added were included within the existing roadway by narrowing travel lanes, or using excess pavement. During this time, the city has also experienced a significant growth in the number of people bicycling. The focus of this update to the Bicycle Network Plan has been to improve the connectivity of the network by filling in the gaps, particularly in the parts of the city where growth in ridership has been strongest.

This chapter identifies an interconnected citywide network of bikeways that will serve all neighborhoods. The bicycle network establishes new connections and fills gaps between existing on and off-road bicycle facilities using a range of facility types. The goals identified in Chapter 2, including connectivity, safety, and encouragement, are addressed by the proposed bicycle network. Implementing these improvements can go a long way towards enhancing overall conditions for bicycling by increasing comfort and safety of streets and indirectly by changing motorist behavior. Establishing this network of bikeways will contribute to the realization of target outcomes, including an increase in the bicycle commuting mode share from 1.6% to 6.5% by 2020, and a tripling of bikes counted at key locations as part of ongoing bicycle counts. Combining these physical improvements with education, enforcement, and encouragement programs can reduce the number of crashes and increase the number of trips made by bicycle.

The chapter describes different types of facilities that can be constructed or marked to accommodate bicyclists. Each facility type plays a specific role in the network, so a discussion of where each type is appropriate is provided in this section.

The following facility types are discussed:

- Bike Lanes
- Climbing Lanes
- Contra-Flow Bike Lanes

- Cycle Tracks
- Bicycle Friendly Streets
- Marked Shared Lanes
- Shared Roadways
- Sidepaths
- Trails

Following the facility types, a series of maps showing the recommended bicycle network in Philadelphia is provided. For each segment, the facility type is designated on the map. For a small number of streets, a specific bicycle facility recommendation will require additional analysis. These locations are labeled "Further Study Required." While these streets serve as important connectors in the street network, making them more bicycle-friendly will require a finer grained analysis, possibly as part of a neighborhood or corridor level study. Improvements for bicyclists should be provided as part of any reconstruction and repaving efforts along these corridors, and also as part of the private development process.

The second part of the chapter focuses on safety, comfort, and encouragement by identifying key issues that should be considered as bicycle facilities are implemented and roads are reconstructed. Appendix E provides a more detailed discussion of recommended improvements, design issues, and implementation considerations for specific locations throughout the city, such as Eakins Oval and access to the Ben Franklin Bridge.

The issues and considerations outlined in this section include:

- Intersection Improvements
- Conflicts with On-street Parking
- Sidewalk Bicycling
- Bike Lanes on One-Way Streets
- Bicycles and Transit
- Bicycle-Specific Signage

A comprehensive set of policy papers was developed as part of this planning process, which in many cases provides more detailed information on the elements discussed in this chapter. Relevant policy papers are highlighted at the end of this chapter, and included in Appendix C.

Recommended Bicycle Facility Types

The Plan recommends a network of different types of "bikeways," a term that refers to on-road or off-road facilities designed and designated for travel by bicycle. Bikeway design may include pavement markings, signage, signals and geometric features. Figure 15 depicts each type of bikeway recommended in this Plan. The recommendations reflect the desire to provide a high level of bicyclist comfort and mobility, while also balancing the demands for limited street space from multiple users. The recommendations are intended to be cost-effective, and on-street recommendations generally involve retrofitting the existing roadway through signs and pavement markings.

Bike Lane: A bike lane is established by marking a portion of a roadway for the preferential or exclusive use of bicycles. There are currently more than 220 miles of streets with existing bike lanes in Philadelphia. Existing bike lanes are shown in the Existing Bicycle Facilities map in Chapter 3. Bike lanes are recommended on two-way arterial, collector, and local streets where there is enough width to accommodate a bike lane in both directions, and on one-way streets where there is enough width for a single bike lane. Implementation considerations include the following:

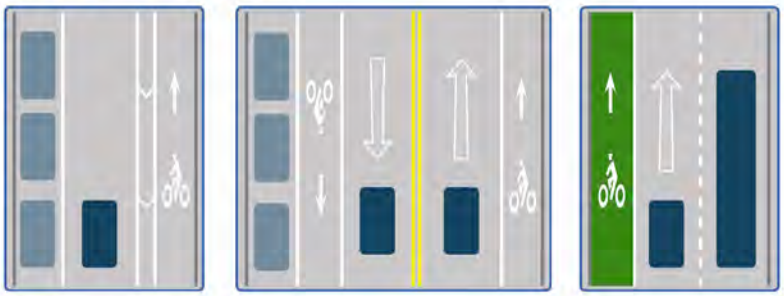
- Bike lanes should be a minimum of 5' wide when next to on-street parking, or when prevailing operating speeds are 30 mph or higher. Under tightly constrained conditions, where all other lane widths have been minimized, a 4' wide bike lane may be considered when speeds are low, there is no on-street parking, and when not abutting a vertical curb.
- Additional bike lane width increases separation from parked and moving vehicles, improves user comfort, and allows for bicycles to pass without leaving the bike lane. The City of Philadelphia's policy is to install bike lanes that are 6' wide where feasible.
- A striped hatched area may be provided between the bike lane and the travel lane to provide additional separation and buffering between bicyclists and motorists. There are currently around eleven miles of existing buffered bike lanes in Philadelphia.
- Consideration should be given to the likelihood that, in areas of significant vehicle congestion, the provision of additional width may result in the bike lane being used illegally by motor vehicles. In these cases, cycle tracks should be considered.
- On narrow streets with abutting land uses creating a high demand for both parking and short-term loading activity, such as taxis, passenger drop-off, or unloading of groceries, it may be necessary to allow motor vehicles to use the bike lane for loading and unloading activities on a limited basis.
- As noted in Chapter 3, Philadelphia has implemented green colored bike lanes on a pilot basis in order to highlight locations where a turn lane crosses a bike lane, creating a potentially dangerous merge condition. The colored pavement marking is meant to increase awareness, facilitate safer motor vehicle and bicycle movements, and reduce potential conflicts.

Climbing Lane: On streets with steep grades and insufficient widths to provide bike lanes in both directions, a bike lane (the climbing lane) is provided in the uphill direction to accommodate slow moving bicyclists and a marked shared lane, as discussed below, is provided in the downhill direction, requiring bicyclists to travel with motor vehicles. It should be noted that on the bike network map, the term climbing lane encompasses roads with a bike lane in one direction and a marked shared lane in the other, even if there is not a significant elevation change. An example of this is on 11th Street from Bainbridge Street to Washington Street. In this case, the road was not wide enough to accommodate bike lanes in both directions with back-in angle parking, but one bike lane and a marked shared lane was determined to be a significantly improved accommodation.

Contra-Flow Bike Lane: A contra-flow bike lane is a bike lane marked on an otherwise one-way street to allow bicyclists to travel in the opposite direction from motor vehicles. Bicyclists traveling in the same direction as motor vehicles may have a marked shared lane or a bike lane. If a bike lane is provided, it may be located on the right side of the street, or it may be located on the left side of the street, abutting the contra-flow bike lane.

FIGURE 15: BICYCLE FACILITY TYPES

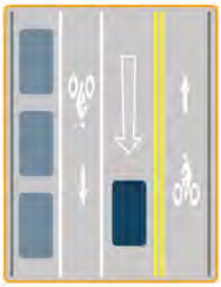
BICYCLE LANES



OPTIONS
Experimental colored treatment to deter parking where parking/stopping in bike lane may be an issue

EXAMPLE
South Street Bridge
Spruce Street
12th Street

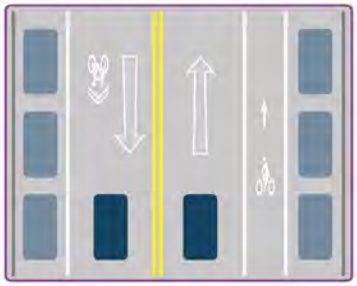
CONTRA-FLOW BICYCLE LANES



DESCRIPTION
Two way for bikes, 1 way for other vehicles

EXAMPLES
College Ave
Vare Ave
30th Street

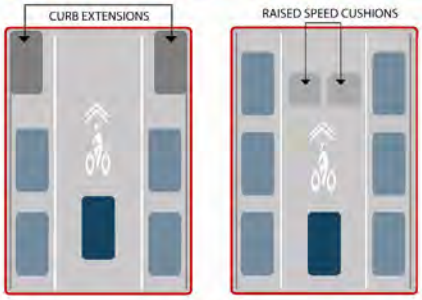
CLIMBING LANES



DESCRIPTION
Bike lane in uphill direction
Marked shared in lane in downhill

EXAMPLES
Midvale Ave
54th Street
65th Street

BICYCLE FRIENDLY STREET



DESCRIPTION
Shared-use;
Street not wide enough for vehicles to pass bicycles
Design speed lowered to bicycle speed (15 mph)
Bicycle-friendly traffic calming (e.g. speed cushions)
Often one-way pairs for routing

EXAMPLES
13th Street
15th Street
Tulip Street
Memphis Street

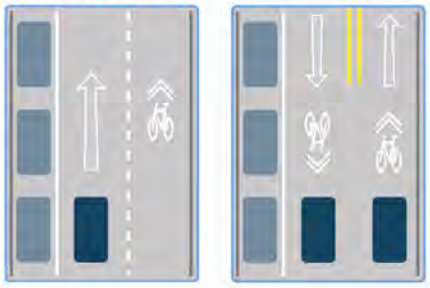
Proposed On-Street Facilities
- Cycletrack
- Bike Lane
- Marked Shared Lane
- Climbing Lane
- Bicycle Friendly Street
- Contraflow
- Shared Roadway
- Further Study Required

Proposed Off-Street Facilities
- Sidepath
- Trail

Existing On-Street Facilities
- Bike Lane
- Marked Shared Lane
- Climbing Lane
- Contraflow Bike Lane

Existing Off-Street Facilities
- Trail

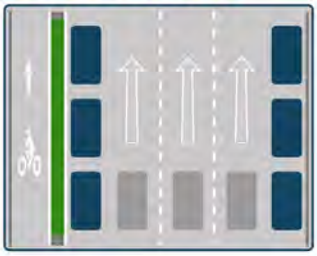
MARKED SHARED LANES



DESCRIPTION
Shared-use;
Marking used to indicate positions
Marking may be on left side or both sides
Often one-way pairs for routing

EXAMPLES
Main Street
Ridge Avenue
15th Street

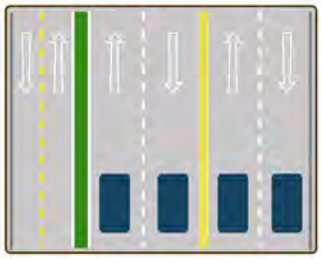
CYCLE TRACK



DESCRIPTION
1-way, bicycle-only
Physically separated

EXAMPLES
JFK Boulevard
Market Street

SIDE PATH



DESCRIPTION
Two way shared-use
Parallel to roadway

EXAMPLES
Columbus Boulevard
Hunting Park (West of Ridge)
Lincoln Drive

Special provisions should be made at intersections to alert other roadway users of the contra-flow condition. Transitions at the beginning and end of a contra-flow bike lane should be well marked and require signage that exempts bicycles from one-way street regulations. A contra-flow bike lane is marked on 30th Street from Market to Chestnut.

Cycle Track: A cycle track is a bicycle facility that is physically separated from both the roadway and the sidewalk. A cycle track may be constructed at the same grade as the street by using a combination of physical barriers such as on-street parking and/or flex posts to define the bicycle space, or it may be constructed at the elevation of the sidewalk typically adjacent to the curb. Cycle tracks can provide users with a higher level of comfort and may be appropriate on wider streets where double parking and/or higher vehicle speeds are a concern. On two-way streets, cycle tracks should generally be designed for one-way operation in the same direction as adjacent traffic. On one-way streets, a cycle track on the left side of the street can allow for two-way bicycle operation, with the reverse direction operating as a contra-flow lane. Implementation considerations include the following:

- Successful use of this design typically requires removal of parking spaces near intersections to provide adequate sight distance and, depending on operations, may require separate bicycle signals. A detailed assessment of sight lines and conflict management strategies for the proposed route will be needed. If the modifications necessary to ensure safe design cannot be fully implemented, a standard bike lane should be implemented at intersections instead of a cycle track.
- Care must also be taken to ensure the design of a cycle track does not complicate drainage, maintenance, deliveries or emergency services.
- When located on a street that has transit service, raised in-street passenger loading islands should be installed between the transit stop and the cycle track. Special care is required to ensure that bicyclists don't conflict with transit users and that the loading island is accessible from the sidewalk for passengers with mobility or visual disabilities. On one-way streets with bus routes, the cycle track should be located on the left side of the street to avoid the conflict with transit vehicles and users.
- At intersections with heavy turn volumes, the addition of bicycle signals should be considered to separate bicycles and turning vehicles.

This Plan recommends cycle tracks, for example along JFK Boulevard, in part because it is a wide one-way street. An analysis of the potential for cycle tracks on Walnut Street and Chestnut Street in West Philadelphia, also one way streets, is provided in Appendix E. While not required, one way traffic operations simplify intersection conflicts, and allow the cycle track to be placed on the left side where it will not interfere with bus operations. The Pennsylvania Environmental Council is currently conducting a feasibility study for a cycle track on Spring Garden Street in Center City. If a cycle track is considered to be feasible in this location, and is implemented successfully, consideration should be given to establishing cycle tracks on other streets with existing bike lanes such as Oregon Avenue or Washington Avenue.

Bicycle-Friendly Streets: A bicycle-friendly street, or series of contiguous streets, is a facility that is inherently bicycle friendly by design or has been modified to discourage high speed motor vehicle traffic while accommodating through bicycle traffic. This treatment is intended primarily for residential streets. This type of bikeway is generally recommended for narrow streets, often having only one traffic lane and parking on both sides. On designated Bicycle-Friendly Streets a tool box approach will be applied by considering a range of mid-block and intersection improvements aimed at making the corridors more attractive for bicycling and less attractive to fast or high volume motor vehicle traffic.

This type of facility will be implemented within the framework of a larger community process that considers neighborhood traffic management and parking impacts. In some cases, special pavement markings and signs may be sufficient to designate the bikeway. Bicycle-Friendly streets are ideal locations to incorporate sustainable design features such as street trees and rain gardens compatible with the City's stormwater management program (Green City, Clean Waters).

Bicycle-Friendly streets may also include bicycle-friendly traffic calming. Where speed tables are an appropriate countermeasure, they should be installed with a bicycle-friendly profile. Curb extensions (bumpouts) at intersections can contribute to improved visibility of bicycles and pedestrians, but care should be taken to ensure that bumpouts do not extend beyond parked cars and pose a hazard for bicyclists. Other potential intersection treatments include traffic circles, raised crosswalks and intersections, and bike boxes and medians at key intersections.

Marked Shared Lanes: This pavement marking is used to designate a bicycle facility on a street without sufficient width for bike lanes. A marked shared lane (sharrow) is a pavement marking symbol that is used to indicate the most appropriate position for a bicyclist to ride. Marked shared lanes direct bicyclists away from the door zone of parked cars and alert motorists of appropriate bicyclist positioning. The markings also provide a wayfinding benefit to bicyclists on routes that have numerous turns or changes in direction. Marked shared lanes are not appropriate on streets with speed limits greater than 35 mph. There are existing marked shared lanes on 15th Street in Center City and on Main Street in Manayunk.

A variation of this treatment is the "Priority Shared Lane Marking," which is currently being studied by the Federal Highway Administration in Long Beach, CA, Salt Lake City, UT, and Boston, MA to increase the effectiveness of sharrows. Elements of priority shared lane markings include dashed longitudinal lines along the length of the corridor or at specific locations, typically where sharrows are installed. Colorized pavement may also be considered to supplement the sharrows. Based on the outcomes of these pilots and other relevant studies, Philadelphia should consider the use of priority shared lane markings in appropriate contexts. Shared lane markings can also be used to assist with positioning and routing through large and complicated intersections, for example to help bicyclists turn into an existing bike lane on the perpendicular street.

Shared Roadway: A shared roadway consists of a lower volume, lower speed street that is compatible with bicycling without any geometric changes, pavement markings or signage, with the exception of bicycle network signs where appropriate. Shared roadways will often be residential streets but can also be located in commercial or institutional areas. Park roads can also often operate as shared roadways.

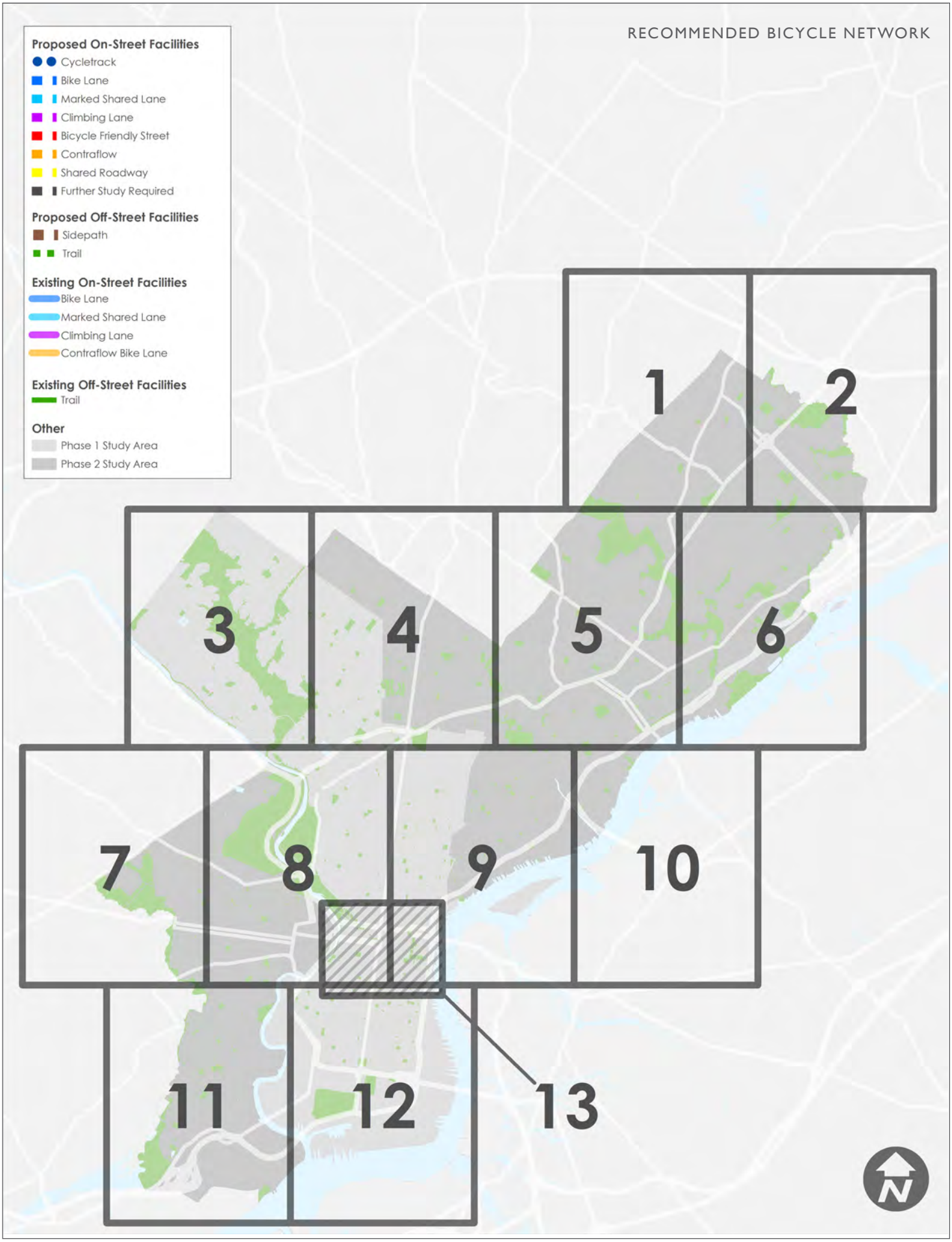
Sidepaths: A widened sidewalk on the side of the street can be designated as a sidepath. Unless designated as being appropriate for bicycle use, bicycling on sidewalks is prohibited in Philadelphia for all over the age of 12. Designation of a sidepath requires review by the Philadelphia City Planning Commission and approval by the Streets Department, which must ensure that the facility is safe for bicyclists and will not negatively impact sidewalk users. Sidepaths are not appropriate in areas of high pedestrian activity unless there is space to successfully manage conflicts. Sidepaths are generally operated as shared-use facilities, but in some locations with high volumes of activity, it may be appropriate to separate bicycle and pedestrian traffic. Separation may also require some enforcement. There is an existing sidepath on 31st Street in Philadelphia in the Mantua neighborhood. Implementation considerations include the following:

- 10' is the minimum recommended width for sidepaths. In areas with low anticipated use, sidepaths may be as narrow as 8' where there are significant constraints.
- Sidepaths are suitable for locations with few cross streets or driveways, where it is desirable to provide the highest level of comfort and separation from traffic, and to provide a connection to similar facilities i.e. trails.
- On-street facilities should also be provided where appropriate and feasible, even with a sidepath present, as some bicyclists will still prefer to ride in the roadway.

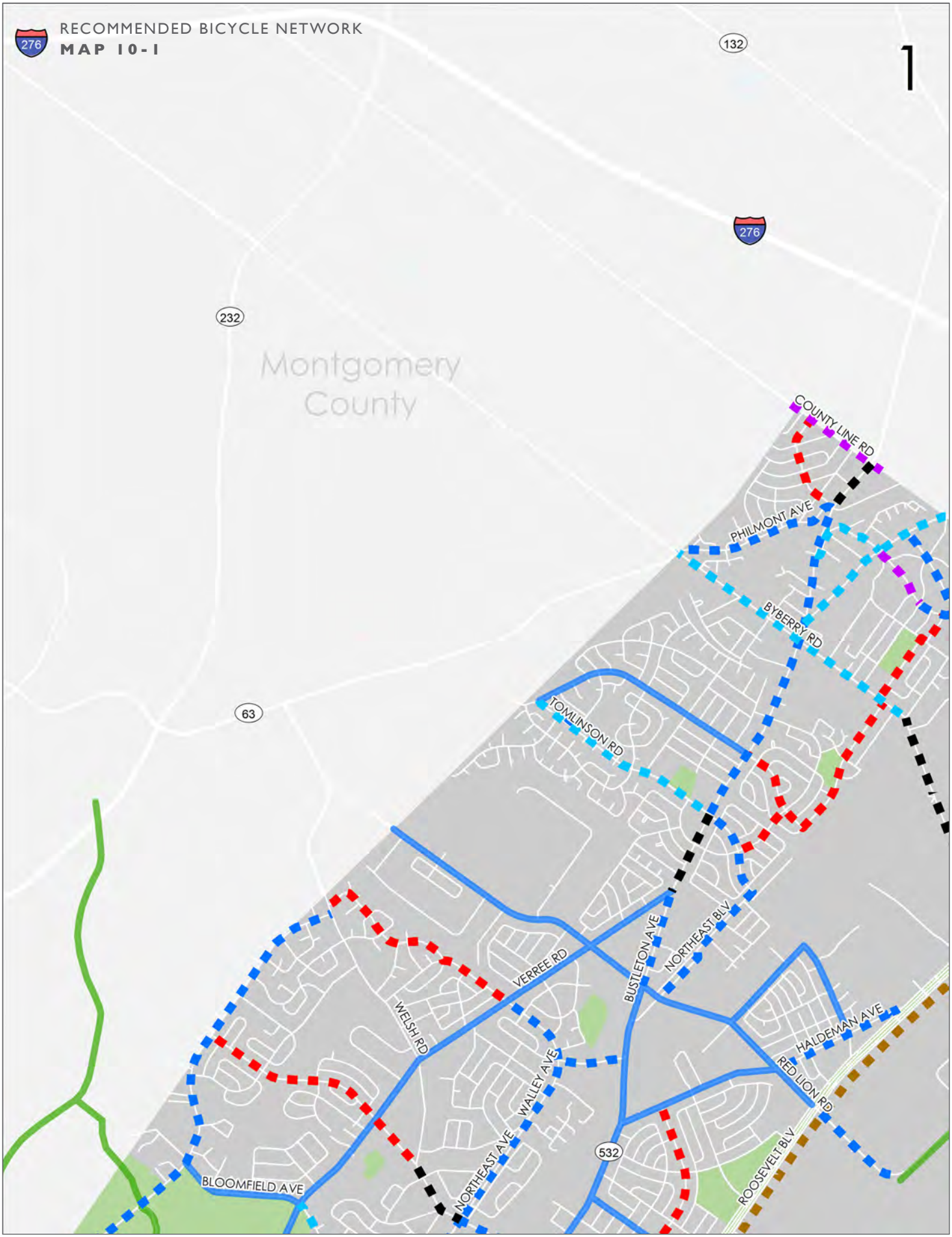
Trails: A trail is a type of facility that is physically separated from motor vehicle traffic by an open space or barrier or is located in an independent right-of-way. Trails are usually shared with other non-motorized users including pedestrians, skaters, wheelchair users, or joggers. Trails are primarily located in parks and include several user types. Major trails in Philadelphia include Pennypack Park Trail, Wissahickon Trail, the Schuylkill River Trail, and many unpaved trails in Fairmount Park. It should be noted that only selected proposed trails are shown on the bike network maps as there is a Citywide Trail Master Plan being developed concurrently with this Plan. The proposed trails that are shown as part of the proposed bike network are located on property that has already been acquired, and in some cases, they are already in the construction phase.

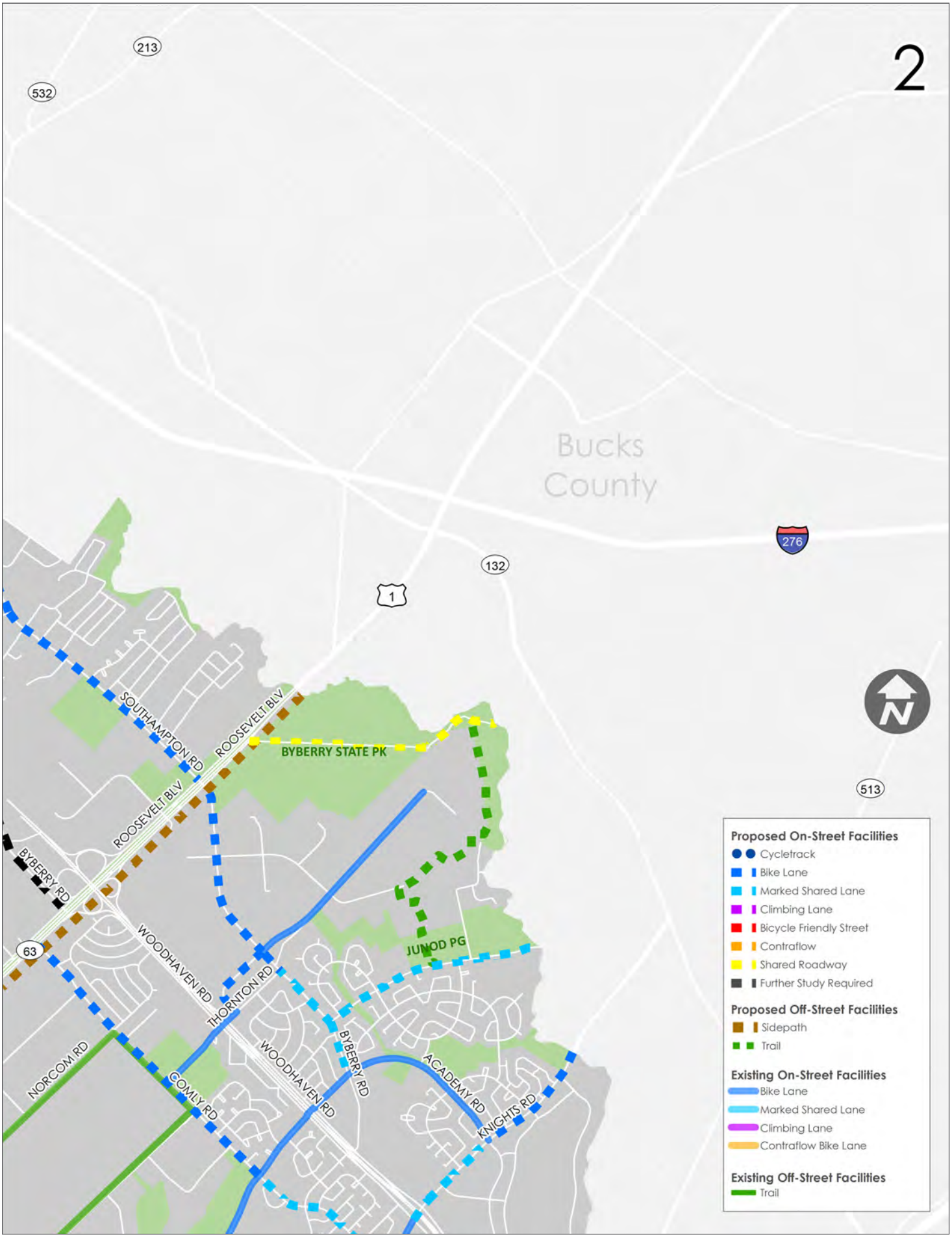
Bicycle Policy Paper

Additional guidance regarding bike facility design is provided in the Bikeway Design Standards policy paper. The policy paper in Appendix C sets a goal of establishing up-to-date and comprehensive bikeway design guidelines for city agencies and their consultants working on street and bridge projects in Philadelphia.

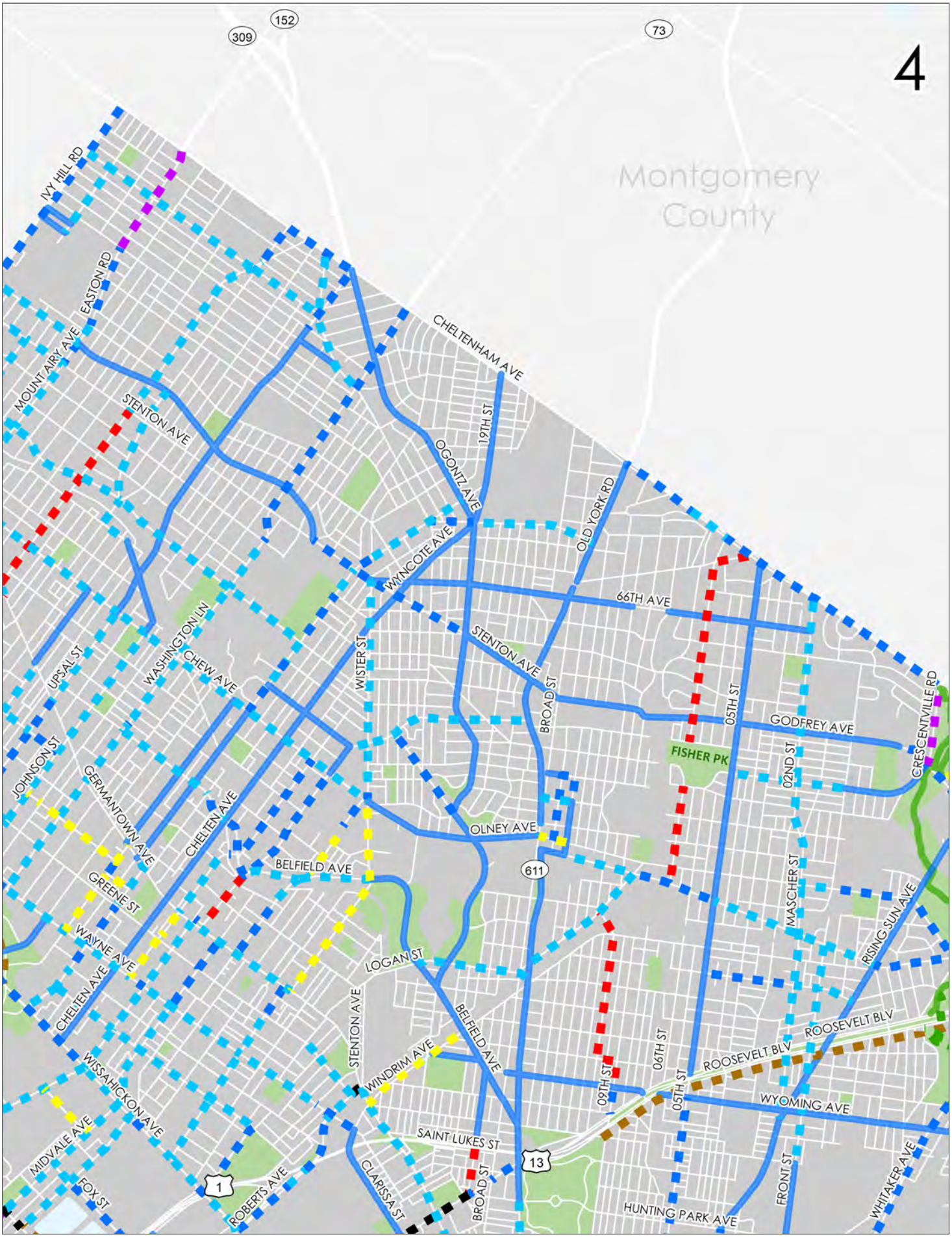

Proposed On-Street Facilities
Cycletrack
Bike Lane
Marked Shared Lane
Climbing Lane
Bicycle Friendly Street
Contraflow
Shared Roadway
Further Study Required
Proposed Off-Street Facilities
Sidepath
Trail
Existing On-Street Facilities
Bike Lane
Marked Shared Lane
Climbing Lane
Contraflow Bike Lane
Existing Off-Street Facilities
Trail
Other
Phase 1 Study Area
Phase 2 Study Area
1
2
3
4
5
6
7
8
9
10
11
12
13
N

RECOMMENDED BICYCLE NETWORK
MAP 10-1

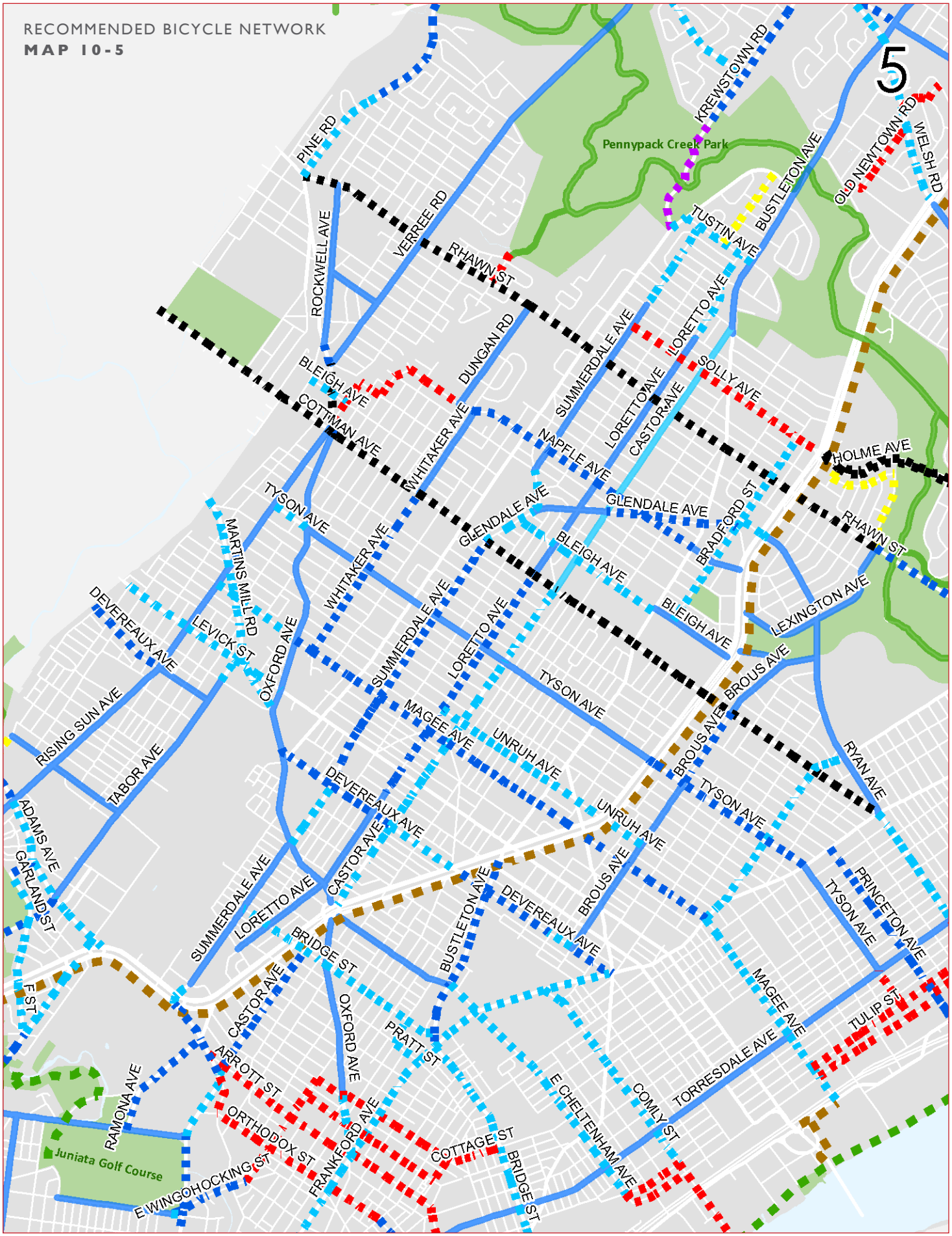


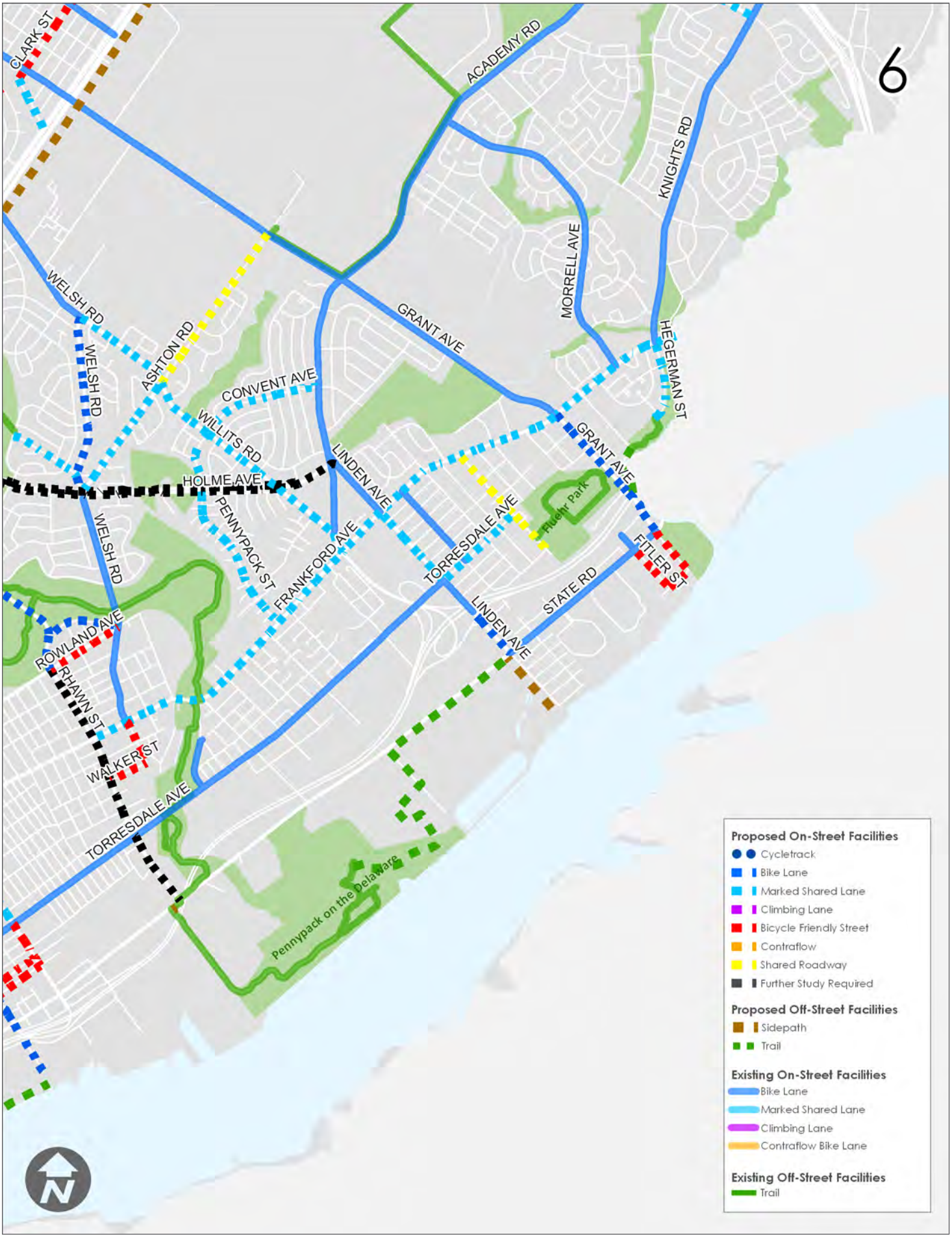

2
213
532
Bucks County
276
132
1
513
63
SOUTHAMPTON RD
ROOSEVELT BLV
BYBERRY STATE PK
ROOSEVELT BLV
BYBERRY RD
WOODHAVEN RD
THORNTON RD
JUNOD PG
NORCOM RD
COMLY RD
WOODHAVEN RD
BYBERRY RD
ACADEMY RD
KNIGHTS RD
Proposed On-Street Facilities
Cycletrack
Bike Lane
Marked Shared Lane
Climbing Lane
Bicycle Friendly Street
Contraflow
Shared Roadway
Further Study Required
Proposed Off-Street Facilities
Sidepath
Trail
Existing On-Street Facilities
Bike Lane
Marked Shared Lane
Climbing Lane
Contraflow Bike Lane
Existing Off-Street Facilities
Trail

RECOMMENDED BICYCLE NETWORK
MAP 10-3


4
Montgomery County
309
152
73
611
13
1
IVY HILL RD
EASTON RD
MOUNT AIRY AVE
STENTON AVE
CHELTENHAM AVE
19TH ST
OGONTZ AVE
OLD YORK RD
WYNCOTE AVE
66TH AVE
STENTON AVE
WISTER ST
BROAD ST
05TH ST
GODFREY AVE
CRESCENTVILLE RD
FISHER PK
02ND ST
UPSAL ST
WASHINGTON LN
CHEW AVE
JOHNSON ST
GERMANTOWN AVE
CHELTEN AVE
OLNEY AVE
BELFIELD AVE
GREENE ST
WAYNE AVE
MASCHER ST
RISING SUN AVE
LOGAN ST
STENTON AVE
BELFIELD AVE
ROOSEVELT BLV
WISSAHICKON AVE
WINDRIM AVE
06TH ST
09TH ST
05TH ST
WYOMING AVE
MIDVALE AVE
SAINT LUKES ST
FOX ST
ROBERTS AVE
CLARISSA ST
BROAD ST
HUNTING PARK AVE
FRONT ST
WHITAKER AVE

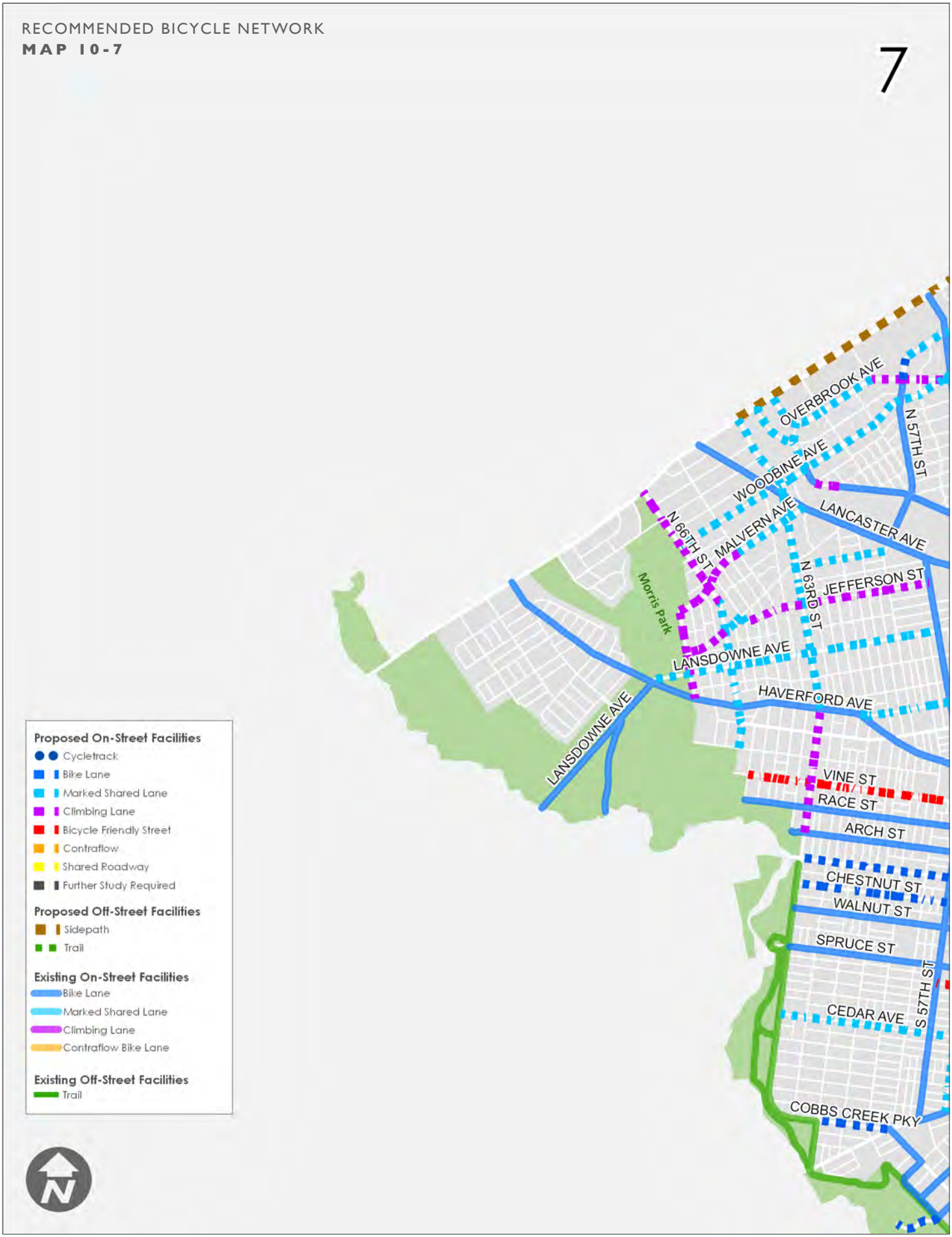
RECOMMENDED BICYCLE NETWORK
MAP 10-5

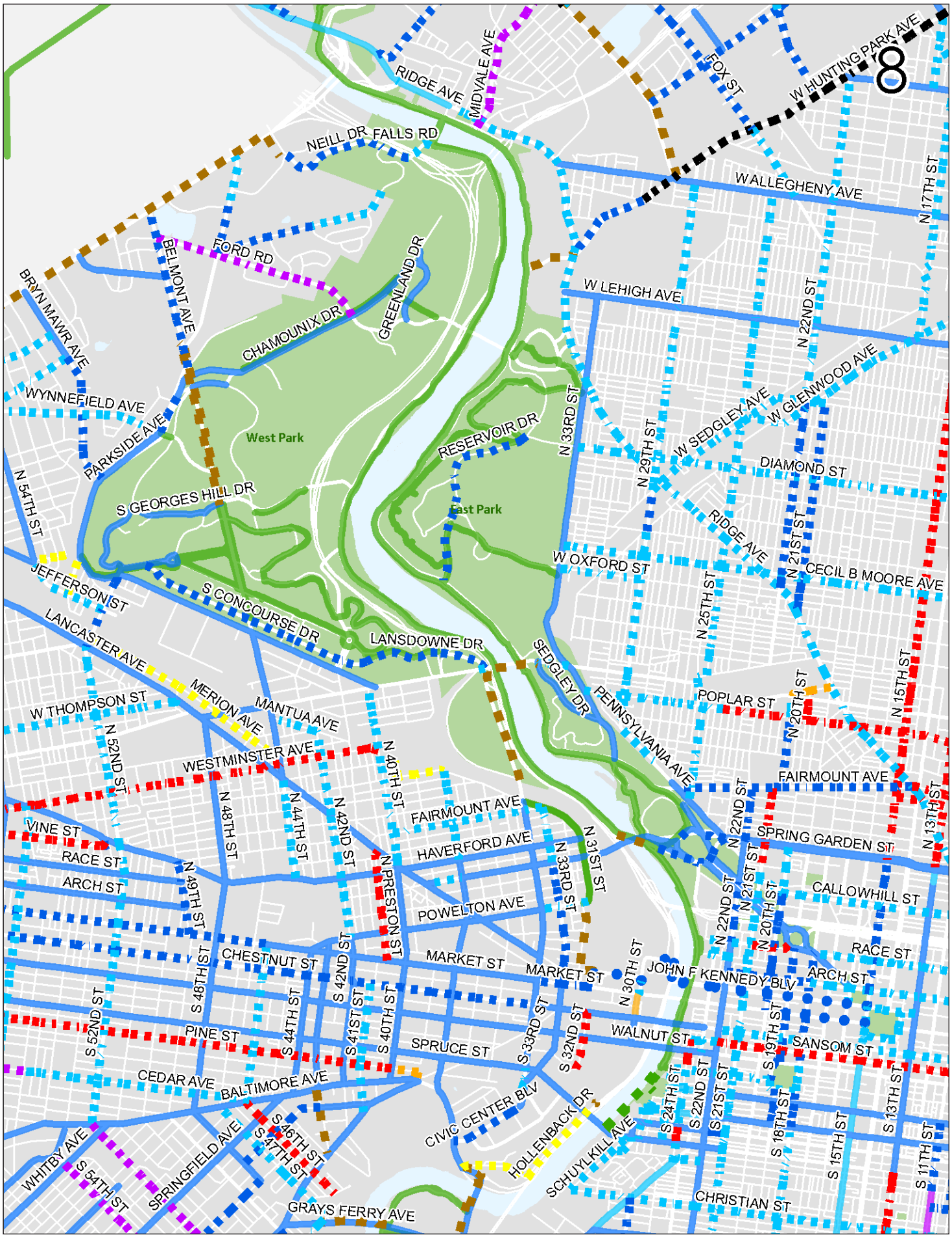



6
CLARK ST
ACADEMY RD
KNIGHTS RD
MORRELL AVE
WELSH RD
GRANT AVE
HEGERMAN ST
ASHTON RD
CONVENT AVE
WILLITS RD
LINDEN AVE
HOLME AVE
PENNYPACK ST
FRANKFORD AVE
TORRESDALE AVE
Fluehr Park
FITLER ST
STATE RD
ROWLAND AVE
RHAWN ST
WALKER ST
Pennypack on the Delaware
Proposed On-Street Facilities
Cycletrack
Bike Lane
Marked Shared Lane
Climbing Lane
Bicycle Friendly Street
Contraflow
Shared Roadway
Further Study Required
Proposed Off-Street Facilities
Sidepath
Trail
Existing On-Street Facilities
Bike Lane
Marked Shared Lane
Climbing Lane
Contraflow Bike Lane
Existing Off-Street Facilities
Trail
N

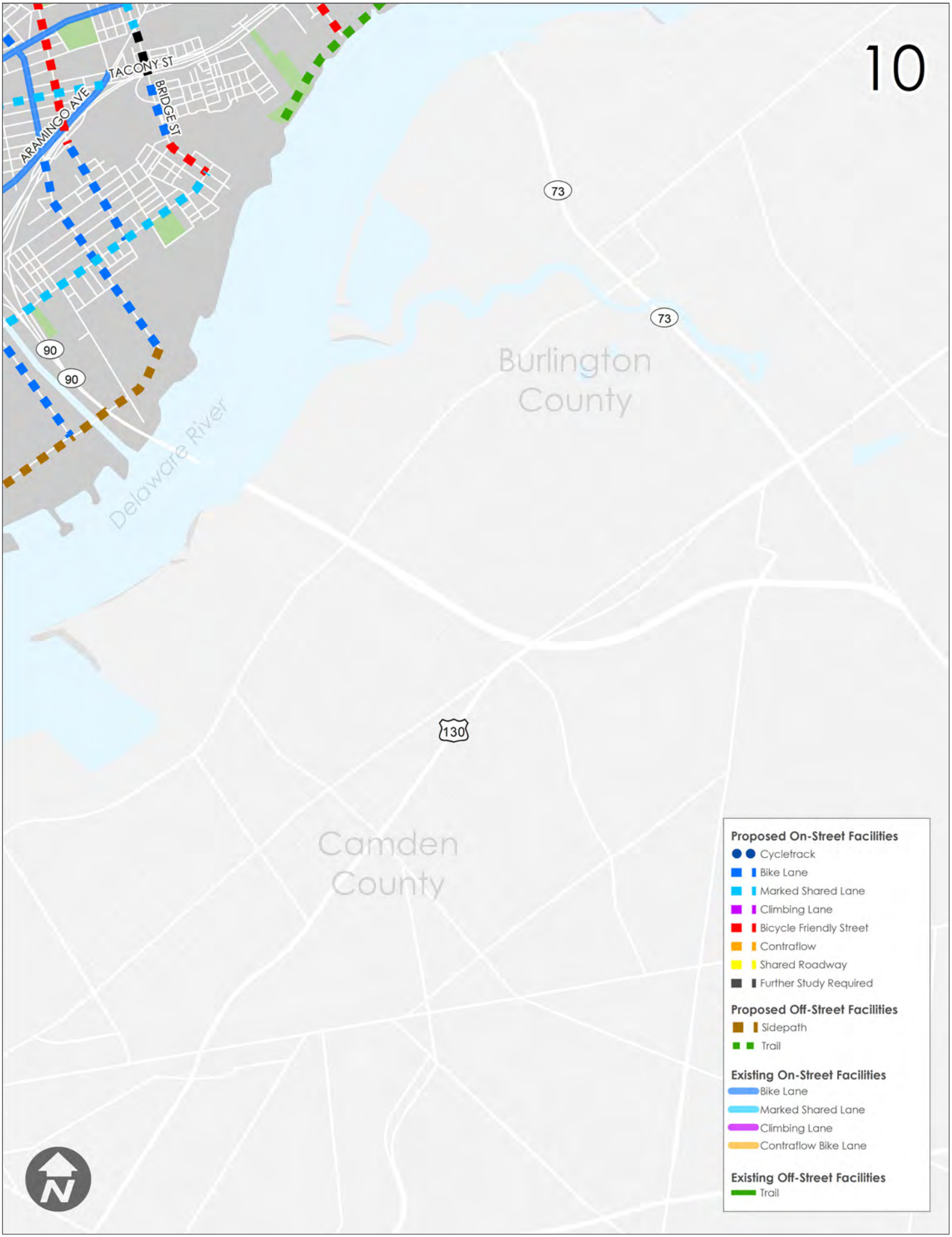
RECOMMENDED BICYCLE NETWORK

MAP 10-7

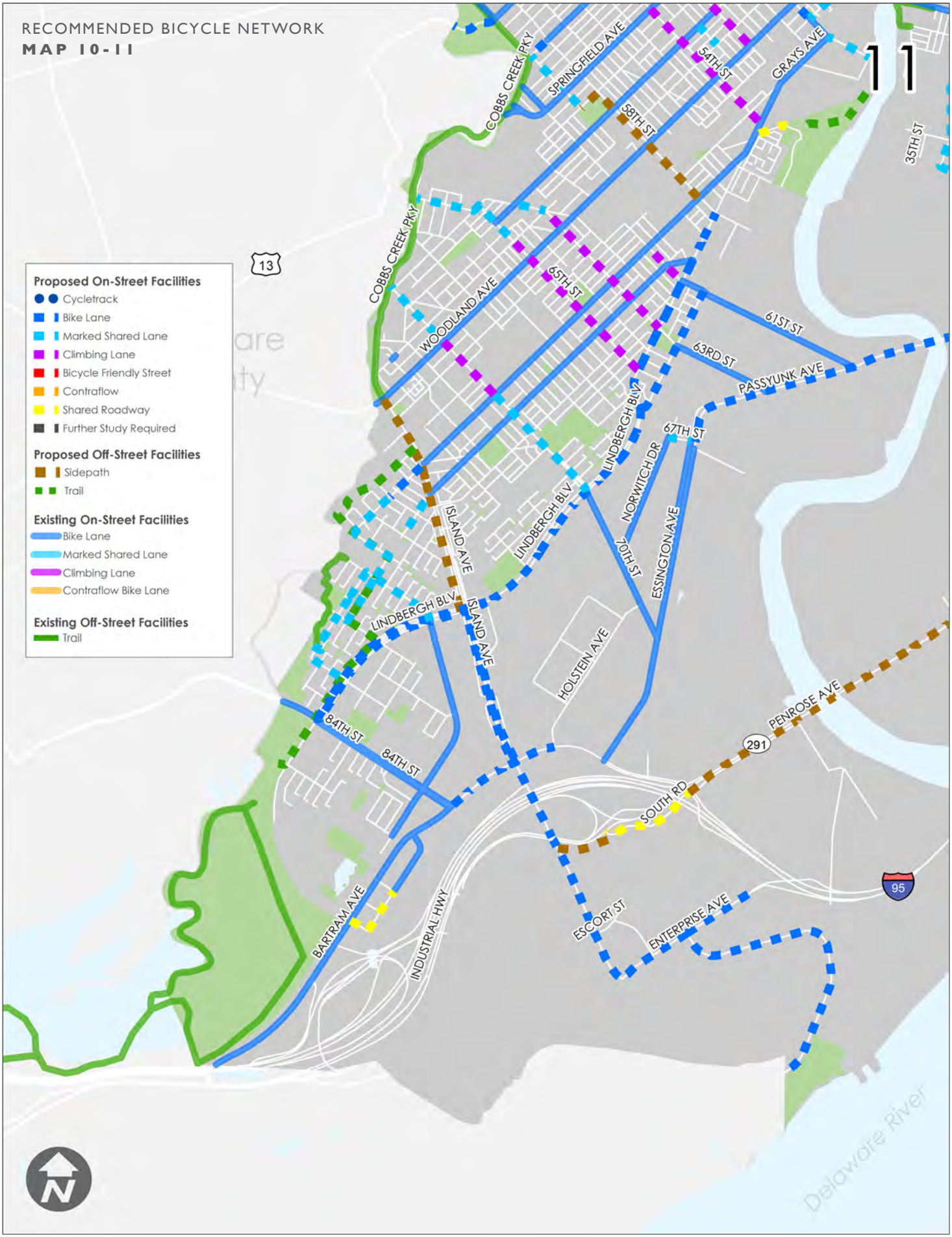


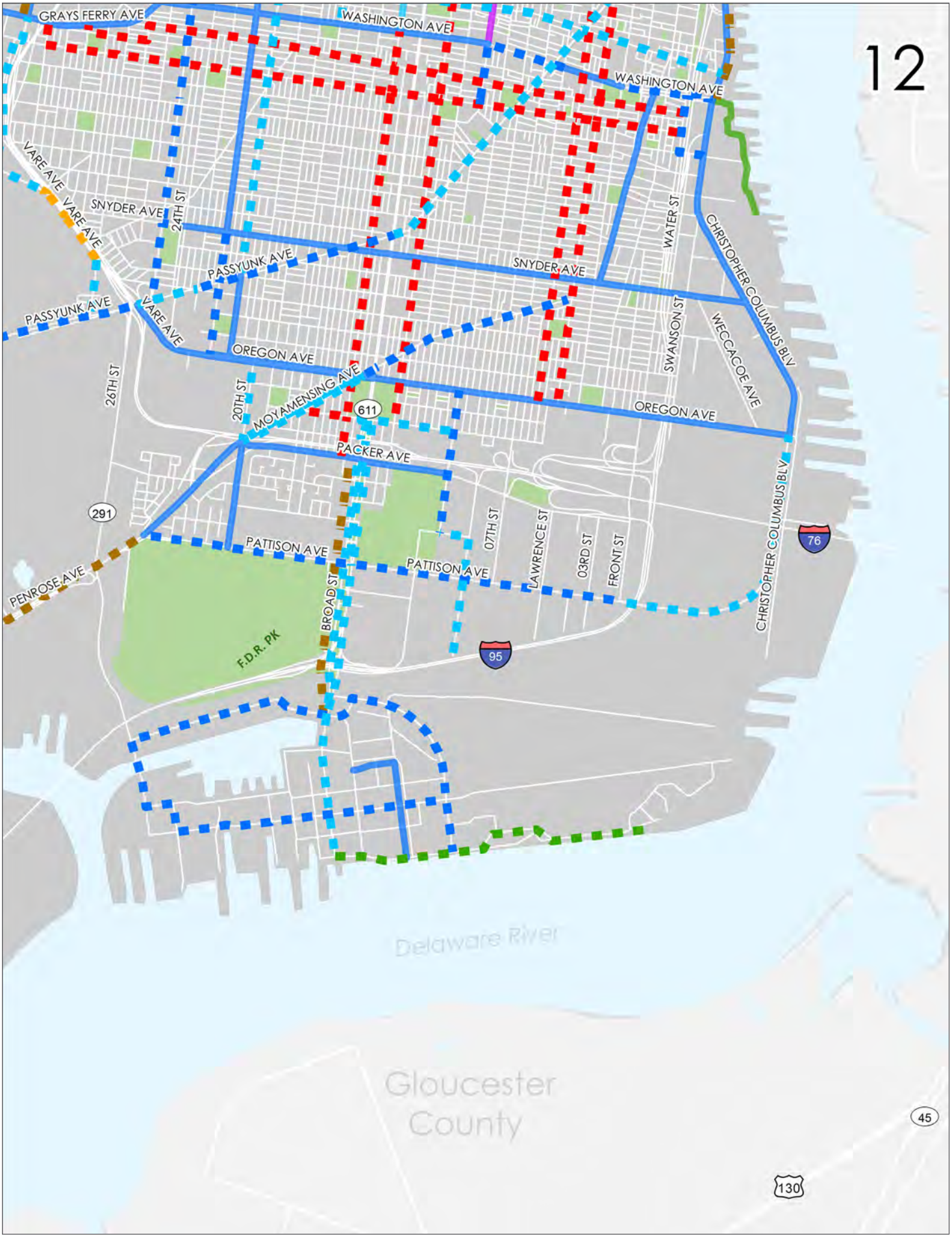

8
RIDGE AVE
MIDVALE AVE
FOX ST
W HUNTING PARK AVE
NEILL DR
FALLS RD
W ALLEGHENY AVE
N 17TH ST
FORD RD
BELMONT AVE
GREENLAND DR
BRYN MAWR AVE
W LEHIGH AVE
N 22ND ST
CHAMOUNIX DR
WYNNEFIELD AVE
W GLENWOOD AVE
N 33RD ST
W SEDGLEY AVE
PARKSIDE AVE
West Park
RESERVOIR DR
N 29TH ST
DIAMOND ST
N 54TH ST
S GEORGES HILL DR
East Park
RIDGE AVE
N 21ST ST
W OXFORD ST
CECIL B MOORE AVE
JEFFERSON ST
S CONCOURSE DR
N 25TH ST
LANCASTER AVE
LANSDOWNE DR
SEDGLEY DR
N 15TH ST
MERION AVE
MANTUA AVE
POPLAR ST
W THOMPSON ST
PENNSYLVANIA AVE
N 20TH ST
N 52ND ST
WESTMINSTER AVE
N 40TH ST
FAIRMOUNT AVE
N 22ND ST
N 13TH ST
N 48TH ST
N 44TH ST
N 42ND ST
FAIRMOUNT AVE
VINE ST
HAVERFORD AVE
N 31ST ST
SPRING GARDEN ST
RACE ST
N 33RD ST
N 21ST ST
ARCH ST
N 49TH ST
N PRESTON ST
CALLOWHILL ST
POWELTON AVE
N 22ND ST
N 20TH ST
RACE ST
CHESTNUT ST
MARKET ST
MARKET ST
N 30TH ST
JOHN F KENNEDY BLV
ARCH ST
S 48TH ST
S 42ND ST
S 52ND ST
S 44TH ST
S 41ST ST
S 40TH ST
S 33RD ST
N 19TH ST
PINE ST
WALNUT ST
SANSOM ST
SPRUCE ST
S 32ND ST
CEDAR AVE
BALTIMORE AVE
S 24TH ST
S 22ND ST
S 21ST ST
S 13TH ST
CIVIC CENTER BLV
HOLLENBACK DR
S 18TH ST
S 15TH ST
S 11TH ST
WHITBY AVE
S 46TH ST
S 47TH ST
SCHUYLKILL AVE
SPRINGFIELD AVE
S 64TH ST
CHRISTIAN ST
GRAYS FERRY AVE

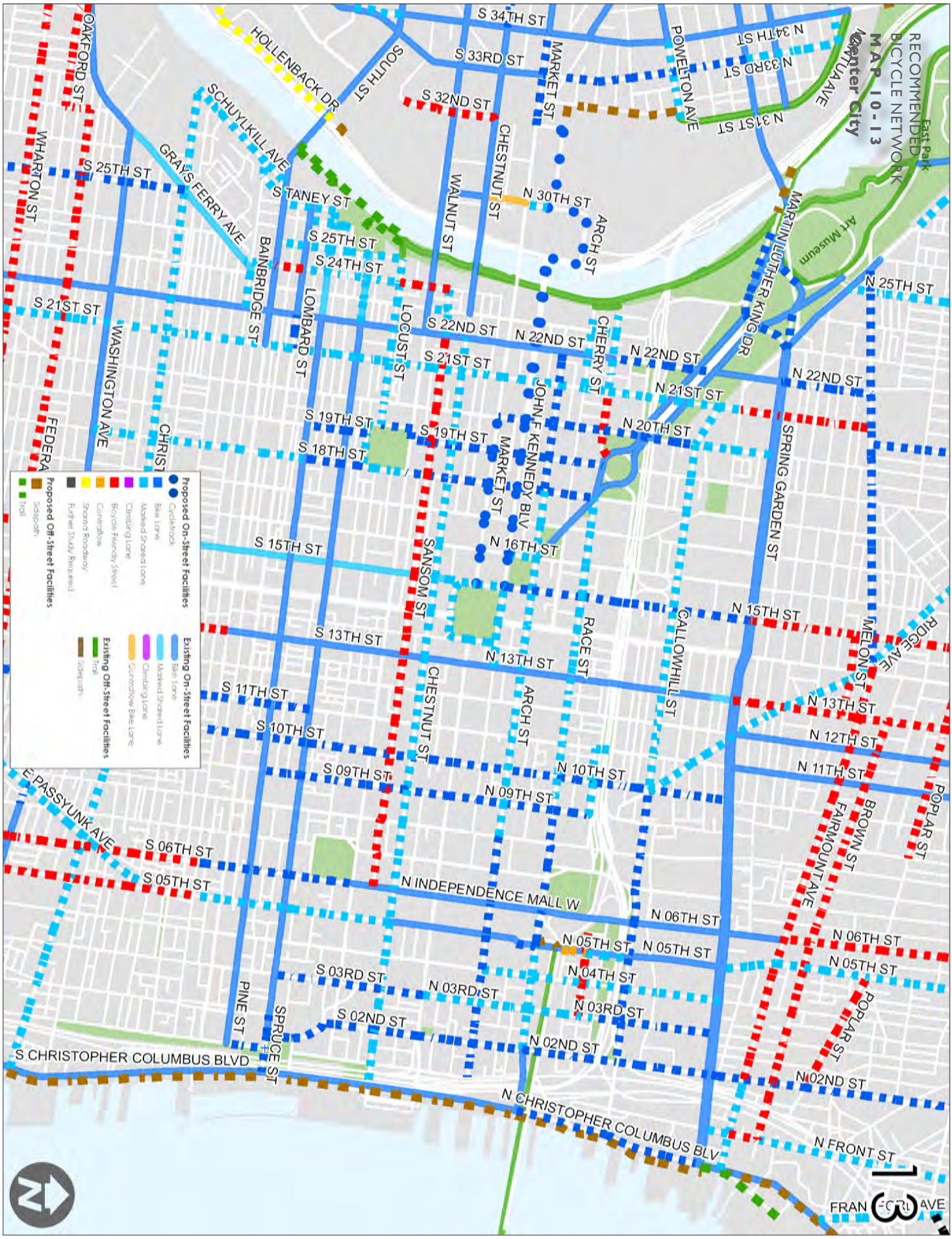
RECOMMENDED BICYCLE NETWORK
MAP 10-9


10
TACONY ST
ARAMINGO AVE
BRIDGE ST
73
73
90
90
Burlington County
Delaware River
130
Camden County
Proposed On-Street Facilities
Cycletrack
Bike Lane
Marked Shared Lane
Climbing Lane
Bicycle Friendly Street
Contraflow
Shared Roadway
Further Study Required
Proposed Off-Street Facilities
Sidepath
Trail
Existing On-Street Facilities
Bike Lane
Marked Shared Lane
Climbing Lane
Contraflow Bike Lane
Existing Off-Street Facilities
Trail
N

RECOMMENDED BICYCLE NETWORK
MAP 10-11




12
GRAYS FERRY AVE
WASHINGTON AVE
WASHINGTON AVE
VARE AVE
VARE AVE
SNYDER AVE
24TH ST
PASSYUNK AVE
SNYDER AVE
WATER ST
CHRISTOPHER COLUMBUS BLV
PASSYUNK AVE
VARE AVE
OREGON AVE
SWANSON ST
WECCACOE AVE
26TH ST
20TH ST
MOYAMENSING AVE
611
OREGON AVE
PACKER AVE
291
07TH ST
LAWRENCE ST
03RD ST
FRONT ST
76
PATTISON AVE
PATTISON AVE
PENROSE AVE
BROAD ST
CHRISTOPHER COLUMBUS BLV
F.D.R. PK
95
Delaware River
Gloucester
County
45
130


RECOMMENDED BICYCLE NETWORK
MAP 10-13
Center City
Proposed On-Street Facilities
Cycletrack
Bike Lane
Marked Shared Lane
Climbing Lane
Bicycle Friendly Street
Contraflow
Shared Roadway
Further Study Required
Existing On-Street Facilities
Bike Lane
Marked Shared Lane
Climbing Lane
Contraflow Bike Lane
Proposed Off-Street Facilities
Sidepath
Trail
Existing Off-Street Facilities
Trail
Sidepath
S 34TH ST
S 33RD ST
S 32ND ST
N 34TH ST
N 33RD ST
N 31ST ST
POWELTON AVE
MARKET ST
CHESTNUT ST
WALNUT ST
N 30TH ST
ARCH ST
HOLLENBACK DR
SOUTH ST
SCHUYLKILL AVE
GRAYS FERRY AVE
S TANEY ST
S 25TH ST
S 24TH ST
S 21ST ST
S 22ND ST
N 22ND ST
N 21ST ST
N 20TH ST
S 19TH ST
S 18TH ST
S 15TH ST
N 16TH ST
N 15TH ST
S 13TH ST
N 13TH ST
S 11TH ST
S 10TH ST
N 12TH ST
N 11TH ST
S 09TH ST
N 10TH ST
N 09TH ST
S 06TH ST
S 05TH ST
N INDEPENDENCE MALL W
N 06TH ST
N 05TH ST
N 04TH ST
S 03RD ST
N 03RD ST
S 02ND ST
N 02ND ST
S CHRISTOPHER COLUMBUS BLVD
N CHRISTOPHER COLUMBUS BLV
N FRONT ST
OAKFORD ST
WHARTON ST
WASHINGTON AVE
BAINBRIDGE ST
LOMBARD ST
LOCUST ST
CHERRY ST
JOHN F KENNEDY BLV
SANSOM ST
RACE ST
CALLOWHILL ST
SPRING GARDEN ST
MARTIN LUTHER KING DR
N 25TH ST
MELON ST
RIDGE AVE
POPLAR ST
BROWN ST
FAIRMOUNT AVE
PINE ST
SPRUCE ST
E PASSYUNK AVE
Fairmount Ave
Art Museum
East Park

Recommendations for Implementation: Addressing Safety, Comfort, and Encouragement

As the bicycle network is implemented, the following key considerations will enhance safety and comfort and should be factored into all planning and design efforts:

Intersection Improvements: The majority of bicycle crashes involving motor vehicles occur at intersections. Intersection improvements for bicycles should be considered as a part of all bikeway improvement projects in addition to general street redesign, safety improvements, or upgrades. Good intersection design makes bicycling more attractive and reduces crashes and injuries. The following guidelines should be used to supplement other city, state, and national standards:

- Provide a clear and obvious path for bicyclists at intersections. Extend bike lane markings to the stop bar in advance of intersections. Where there are significant turning conflicts or longer crossings, extend the bicycle markings through the intersection with a combination of either dashed lines or sharrows. Selective removal of parking spaces may be needed to provide adequate visibility and establish the width for bike lanes at approaches to intersections.
- Reduce conflicts between through bicyclists and turning motor vehicles. Consider dedicated turn lanes in addition to bike lanes; however, designs must consider effects on pedestrian crossing distances and signal timing. Add advanced stop bars with bike boxes as is the current practice in street resurfacing on arterial roads in Philadelphia.
- Signal timing and design should accommodate bicycles. Ensure that signal intervals allow bicyclists adequate time to safely enter and cross intersections. Equip all actuated signals with a method to detect bicycles (such as loops, video or microwave detectors). Signal timing and signal changes should be designed to reduce delay for all users.
- Consider bicycle signals at locations with heavy conflicts between bicycle and motor vehicles, including cycle tracks, or at locations where conflicts with cyclists may not be apparent. Bicycle signals are separate signals positioned to control bicycle movements through an intersection and provide a dedicated phase for bicyclists. Bicycle signals should be coordinated with pedestrian movement wherever possible in order to increase safety and minimize overall delay; however designs should minimize bicycle movements that conflict with pedestrian travel.

Conflicts with On-Street Parking: While on-street parking provides many benefits, it can create conflicts for bicycling. Bicyclists experience problems with motorists' double parking in bike lanes or shared lanes, parking or stopping in curb-side bike lanes, and opening motor vehicle doors into the bicycle's path, creating a "dooring" risk. The following strategies should be considered:

Reduce Risk of "Dooring"

- Increase education for motorists on the fines for not checking to make sure it is safe before opening motor vehicle doors.
- Educate bicyclists on the importance of riding away from the area where motor vehicle doors can be expected to open.
- Install markings to guide bicyclists to ride outside the door zone in constrained corridors with on-street parking.
- Install left-side bike lanes (fewer openings of passenger side door of motor vehicles).
- Conduct safety campaigns to remind motorists to check for any approaching vehicles including bicycles before opening doors. In Pennsylvania, and most states, the Vehicle Code requires persons in vehicles to determine that they will not interfere with the movement of traffic before opening a door.

Reduce Parking in Bike Lanes

- Install signs to alert motorists of fine for parking in a bike lane.
- Increase ticketing of illegally parked motor vehicles.
- Install colored bike lane markings.
- Install cycle tracks with flex posts to define the bike lane.
- Employ curbside management strategies, such as performance parking, that increase turnover and improve availability of curb space.

In Philadelphia operators of motor vehicles are permitted to use bike lanes to load or unload passengers or goods unless prohibited from doing so by regulatory signage. Any such use of the bike lane for loading must be kept to the minimum time necessary and drivers are required to yield to bicyclists when entering or exiting the curb lane for loading purposes.

Sidewalk Bicycling: Sidewalks in Philadelphia, most of which are narrow, are intended for pedestrians. The Philadelphia City Code prohibits bicyclists, except for children under 12, from riding on sidewalks unless a sidewalk has been designated as appropriate for bicycle use as a sidepath. Under limited circumstances, (see Sidepaths described above) the Streets Department, after City Planning Commission review, may allow bicyclists to ride on specially designated sidewalks, or sidepaths.

In much of Philadelphia, sidewalk bicycle riding poses a nuisance and potential safety hazard to pedestrians and to bicyclists. Older pedestrians, in particular, are discomfited by bicyclists on sidewalks, because these pedestrians are more vulnerable and may have experienced "near-misses". Although bicyclists often feel safer riding on the sidewalk, studies have found this behavior actually is almost twice as dangerous as cycling in the street, and riding against traffic on the sidewalk over four times as dangerous, in large part because of increased potential for conflicts at driveways.

Sidewalk riding is a complex issue with many contributing factors. Bicyclists often ride on the sidewalk in a desire to travel to a specific destination quickly and directly. Sidewalks can be inviting in many contexts when compared to high speed or heavily trafficked roads; a sidewalk with no pedestrians on it will be especially inviting in this situation.

The stress that comes from the competition for road space between motorists and bicyclists, and harassment of bicyclists by motorists, are also contributing factors, as are ignorance of the law and lack of enforcement.

Establishing well marked bikeways has been shown to reduce sidewalk bicycling by providing attractive, comfortable, and legal accommodations. Where bikeways cannot be provided on major destination routes, bicyclists should be alerted to the presence of parallel routes with signs and markings at key intersections to direct bicyclists who might otherwise ride on the sidewalks. Selected, targeted enforcement should also be considered where sidewalk bicycling is a persistent problem.

Bike Lanes on One-Way Streets: On one-way streets, bike lanes usually are placed on the right side of the roadway, just as is done on two-way streets. In some cases, however, it may be appropriate to consider placing bike lanes on the left side of a one-way street for one or more of the following reasons:

- Bus operations on the right side of the street create conflicts with bicyclists and can place bus passengers at risk of being hit by bicyclists.
- Locations that need to accommodate a priority bicycle movement, for example a left turn to another bicycle facility through the use of a bike box or a Copenhagen style refuge.
- At locations where high parking turnover is combined with narrow lanes, bicyclists will generally experience fewer conflicts with opening doors while riding on the left side due to the location of the driver door.

At locations where a street changes from one-way to two-way operations, the designer should exercise caution as bicyclists operating on the left side may be positioned incorrectly at intersections. In this situation, it is recommended that the bike lane be placed on the right side of the roadway or designed to transition to the

right side in advance of where the change occurs. This may be done with a combination of bike boxes and merging signage in appropriate locations.

Wrong-way riding on one-way streets is a major issue in Philadelphia. Though the law states that wrong-way or "salmoning" is illegal, education and enforcement are inadequate and the practice continues. This behavior happens on non-striped streets and in bike lanes alike. In areas of high ridership, MUTCD signs should be installed to call attention to the unlawfulness of wrong-way riding.

Bicycles and Transit: Reducing conflicts between bicycles and transit was an important consideration in developing the recommended bicycle network. The DVRPC *Bicycle-Bus Conflict Area Study* (2009) provides a detailed analysis of the interactions between bicycles and transit vehicles in shared rights-of-way.

In addition, trolley tracks present a hazard to bicyclists, as it is relatively easy to trap a bicycle wheel in the trolley track, a type of crash that can result in serious injury.

In a city as dense as Philadelphia, with as much transit and bicycle use in such a compact area, bicycle and transit use will overlap. Many of the streets that are the most direct and serve the greatest number of destinations also feature well-used transit routes. In these locations, design and operational strategies can help to minimize conflicts. The following recommendations to reduce conflicts between bicycles and transit vehicles should be considered when installing bikeways on streets shared with transit.

- Ensure transit stops are of sufficient length to allow transit vehicles to pull fully to the curb. Transit stops that are not long enough to permit the transit vehicle to pull fully to the curb can contribute to conflicts with bicycles, particularly when the bike lane is on the right hand side of the road.
- Enforce parking restrictions at transit stops. Illegal parking in transit stops can prevent buses from being able to pull fully to the curb and can contribute to conflicts with bicycles.
- Install bike facilities on the left side of one-way streets included in the bike network with an overlapping transit route. Buses operate on the right side of the roadway except when turning left, and they must load and unload passengers from doors on the right. Left side bike facilities can reduce "leapfrogging" between bike and buses and prevent conflicts at stops and prevent crashes between bicyclists and passengers entering or exiting a bus.

- Where bicycle routes are located on streets with trolleys, bicycle facilities should be designed to separate bicyclists from tracks as much as possible. Parallel trolley tracks can trap bicycle wheels and can quickly flip a bicycle or throw a bicyclist off his or her bicycle.
- Where a bicycle route crosses trolley tracks, the crossing should be designed to encourage a crossing angle as close to perpendicular as possible. This can be accomplished through geometric changes, signage, and other measures. This design will help reduce the chances that a bicyclist's wheel will get caught in the tracks when crossing. This is done in Center City on 11th Street.
- Educate transit vehicle operators and bicyclists, for example through targeted billboards on transit vehicles and transit stops. Education can help reduce conflicts between these users.

Bicycle-Specific Signage: Bicycle signage accomplishes several functions such as wayfinding, alerting users to a change in conditions, or addressing specific safety problems. Lines and symbols are the primary identifiers of bike lanes, and beginning with the 2009 edition of the MUTCD, the use of the bike lane sign is no longer required.

When installed, all bicycle-specific signage should be installed in accordance with current MUTCD standards.

In addition to signs required by the MUTCD, the following optional uses are recommended:

- Guide signage that provides bicyclists directions and distances to destinations, as installed in Philadelphia in 2011 and 2012.

- When bike lanes transition to Marked Shared Lanes, signs should be used to alert bicyclists and motorists of the change.
- The use of "May use full lane" signs are recommended in conjunction with Marked Shared Lanes in areas where the combination of narrow width, higher speeds and volumes contribute to conflicts between bicyclists and motorists.
- No Parking in Bike Lane signs (including information on fines) (See Conflicts with On-street Parking)
- Contra-flow lanes, such as on 30th Street, should be accompanied with signs and pavement markings at intersections alerting pedestrians and motorists to look for bicycles travelling in both directions.
- Temporary education signs should be considered for new facilities (i.e. contra-flow lanes, bike boxes, cycle tracks, etc.)

The following policy papers provide more detailed information on ways to enhance safety, comfort, and encouragement for bicyclists in Philadelphia.

- *The Bicycle Network Maintenance* paper establishes a goal of providing clear and comprehensive bicycle detour and construction guidelines for city and state transportation agencies and their consultants working on road projects in Philadelphia.
- *The Bicycle Treatments at Intersections* paper highlights strategies for improving bicyclist safety and comfort through intersections with tested engineering solutions.
- *The Crash Reporting and Analysis* paper identifies ways to improve crash data collection and analysis in order that countermeasures may be effectively designed to improve pedestrian and bicycle safety.
- *The Bicycle Detours* paper identifies the need to provide clear and comprehensive bicycle detour and construction guidelines for city and state transportation agencies and their consultants working on road projects in Philadelphia
- *The Bicycles in Buildings* paper encourage bicycle ridership by providing convenient, secure places to store bicycles within commercial (office and retail) buildings.
- *The Construction Disruption of Pedestrian and Bicycle Travel* paper highlights the need to provide safe, convenient, and accessible pathways for pedestrians and bicycles around and/or through construction sites.
- *The Bicycle Parking* paper encourages bicycle ridership through provision of convenient, secure places to park.
- *The Bicycles on Public Transportation* paper establishes the need to promote both bicycling and transit use by making bicycle access to transit as simple and unrestricted as possible.

CHAPTER 8
PLAN IMPLEMENTATION

This chapter outlines the strategy and approach for implementing the pedestrian and bicycle recommendations of the Plan. Pedestrian network recommendations will promote a safe, comfortable, efficient, and attractive pedestrian transportation system. The proposed expanded bikeway network will make bicycling safer and more convenient, and will help to promote a wider recognition and acceptance of bicycling as a transportation mode. The recommended policies, new street types, and sidewalk design standards will further enhance the effectiveness of the City's transportation system for walking and bicycling.

In Philadelphia, as in many places, pedestrian and bicycle improvements are often not accomplished as stand-alone projects, but rather as a part of larger roadway and streetscape improvement projects. For this reason, it is difficult to develop a precise phasing strategy for the Plan recommendations. Nevertheless, identifying priorities and phasing strategies will help focus efforts moving forward. It will be necessary to remain flexible and open to opportunities for implementing recommendations and related pedestrian and bicycle improvements. For example, the American Recovery and Reinvestment Act of 2009 (i.e., Federal stimulus program) has provided substantial amounts of funding for both the City and PennDOT to undertake resurfacing programs. Such programs can create opportunities to add bike lanes or shared lane markings as streets are paved. However, even in these cases, commitments will be required, for example to complete necessary traffic analysis, design, and pavement marking plans to facilitate implementation.

General Approaches to Implementing Plan Recommendations

- Institutionalize and set a quarterly schedule for the Bicycle and Pedestrian Advisory Task Force to monitor progress on the implementation of physical improvements and policy changes recommended in the Plan, and to advise the City on new pedestrian and bicycle issues as they arise. An ongoing advisory group can help ensure that opportunities are not overlooked. The Task Force should include representatives from City agencies, advocacy groups, Business Improvement Districts, community development corporations, educational institutions, and other organizations with an interest in walking and bicycling.
- Coordinate pedestrian and bicycle recommendations to avoid potential conflicts and take advantage of opportunities for dual improvements. Examples of treatments that require special consideration and careful design include raised crosswalks, bicycle-friendly streets with curb extensions, and bicycle signals at intersections with cycle tracks.
- Act on opportunities to make pedestrian and bicycle network improvements, whether as part of corridor projects (such as resurfacing, restriping, or streetscape projects), as part of development/redevelopment projects, or through specific spot improvements.
- Establish a collaborative relationship with parallel and complementary programs, such as storm water management (Green City, Clean Waters) and curb ramp replacement.
- Pursue additional funding to program the design and construction of pedestrian and bicycle improvements on a regular ongoing basis.

Implementing Non-Network Recommendations

The policy recommendations, including the street types and sidewalk design guidelines, are an integral part of achieving the vision and goals outlined in Chapter 2. Several of these recommendations have already been implemented, for example, a new bicycle parking requirement was passed in 2009. This requirement, along with the ordinance that allows bike racks to be installed by permit of the Streets Department, are making bike parking more widely available in the City. In addition, more than 1,000 meter post conversions were completed as of 2012. The Bicycle and Pedestrian Safety Task Force was formed to focus on crash analysis and safety strategies including a new education and enforcement campaign called "Give Respect, Get Respect".

One of the avenues for implementation of the non-network recommendations is the *Complete Streets Handbook*. This project of the Mayor's Office of Transportation and Utilities is incorporating recommendations of the Plan so that they will become standard policy for the City in the future design of streets, sidewalks, and traffic controls. It will also be essential to provide training for City engineers and planners responsible for improvements to the public right-of-way to ensure that they are fully aware of the new standards and policies in the Handbook.

Other priorities for implementation of non-network recommendations include:

- Implement regulations to ensure that any sidewalk shed or sidewalk closure allows for safe pedestrian passage around or through construction areas.
- Continue the public safety education campaign "Give Respect, Get Respect" to promote legal and courteous behavior among all transportation users.
- Form a Public Space Committee to advise the Streets Department and proposed Civic Design Review Committee on permit applications for sidewalk encroachments.
- Implement code revisions to allow benches and other routine encroachments by Streets Department permit, and to incorporate minimum pedestrian clear width standards in Streets Department regulations, where they may be modified to reflect the recommendations in the Plan and tied to the new Street Types.
- Create bike parking corrals in street parking spaces.
- Continue pedestrian and bicycle counts to monitor trends in non-motorized travel.

Implementing Pedestrian Network Recommendations

Priority Intersections and Corridors

As part of the development of this Plan, a selected number of spot locations and corridors were evaluated for potential pedestrian-related improvements. These locations are listed in Table 17 in Chapter 6 and discussed in Appendix D.

The initial concepts for pedestrian network improvements are based on a review of current conditions and issues identified through public input, recent studies, and Steering Committee recommendations. Development of conceptual recommendations into buildable schemes will require engineering and land use analysis, as well as coordination with the local community.

Once this additional analysis has occurred, implementation does not necessarily need to be a stand-alone project. As has been noted, pedestrian network improvements are often accomplished by diverse means, including "piggy-backing" onto other projects, such as corridor signalization or lighting upgrades, resurfacing, or streetscape projects, and negotiating improvements with developers.

Some of the most important pedestrian improvements implemented in recent years have been the upgrades to pedestrian signals. These improvements have included converting existing pedestrian signals to countdowns and revising signal timing to allow more crossing time for pedestrians. Rapid Flash Beacons have been installed in several locations with high levels of pedestrian activity, such as the 34th Street crossing illustrated on page 20. New signals, street lighting, and median refuges have been installed along North Broad Street, and PennDOT

is working on plans for safety improvements for Lehigh Avenue, Erie Avenue, and Allegheny Avenue. These measures will all increase pedestrian safety and comfort. The City is also working to upgrade curb ramps to improve ADA compliance. This holds the possibility of collaboration with the Water Department's program to expand "green infrastructure." For example, if corners and drainage must be reconstructed opportunities may exist to create curb extensions that will serve multiple purposes, including enhanced pedestrian safety.

Sidewalk Prioritization Methodology and Results

As described in Chapters 3 and 6, a sidewalk inventory was completed to document whether sidewalks were present or missing on all arterials and collectors outside Center City. As a result of this analysis, more than 250 miles of missing sidewalk segments were identified citywide. Additionally, more than 200 miles were noted as being in poor or very poor condition. Given the scope of the existing need, and the limited resources available, there is a need to prioritize pedestrian projects. As discussed, priority intersections and corridors were identified in Chapter 6. A recommended prioritization methodology focused on sidewalks has also been developed as a part of this planning process. The Steering Committee and members of the public contributed to the identification of criteria and the refinement of the methodology.

The sidewalk prioritization methodology is based on key destinations in Philadelphia, including transit, schools, parks, and senior centers, that are likely to generate pedestrian traffic. These types of destinations were chosen to reflect policy directives already established by the City. The location and frequency of these destinations was analyzed in GIS to identify "hot spots" where pedestrian generators are located close to each other. While the destinations are dispersed throughout the city, the GIS-based analysis identifies areas that have numerous pedestrian destinations within close proximity to each other, with the assumption being that pedestrian improvements should be focused in these areas.

The methodology accounts for different types of pedestrian generators and anticipated levels of pedestrian activity. For example, a transit station is likely to generate more pedestrian traffic than a park entrance. The analysis also accounts for the distance people are willing to walk to and from different types of destinations.

The tables to the right outline the pedestrian generators that are included in the methodology, as well as the categories identified to group areas together based on the number and frequency of pedestrian generators.

TABLE 18: PRIORITIZATION WEIGHTING

ELEMENT	WEIGHT		
	1/8 MILE	1/4 MILE	1/2 MILE
Transit Station	10	7	4
School	8	6	2
Major Park Entrance	8	6	2
Major Bus Stop	8	6	2
All Parks	8	6	2

TABLE 19: PRIORITY SCORE OUTPUT

PRIORITY	COLOR	POINT RANGE	MILES OF SIDEWALK
High	Red	18-32	61
Medium	Orange	12-17	86
Low	Yellow	0-11	133

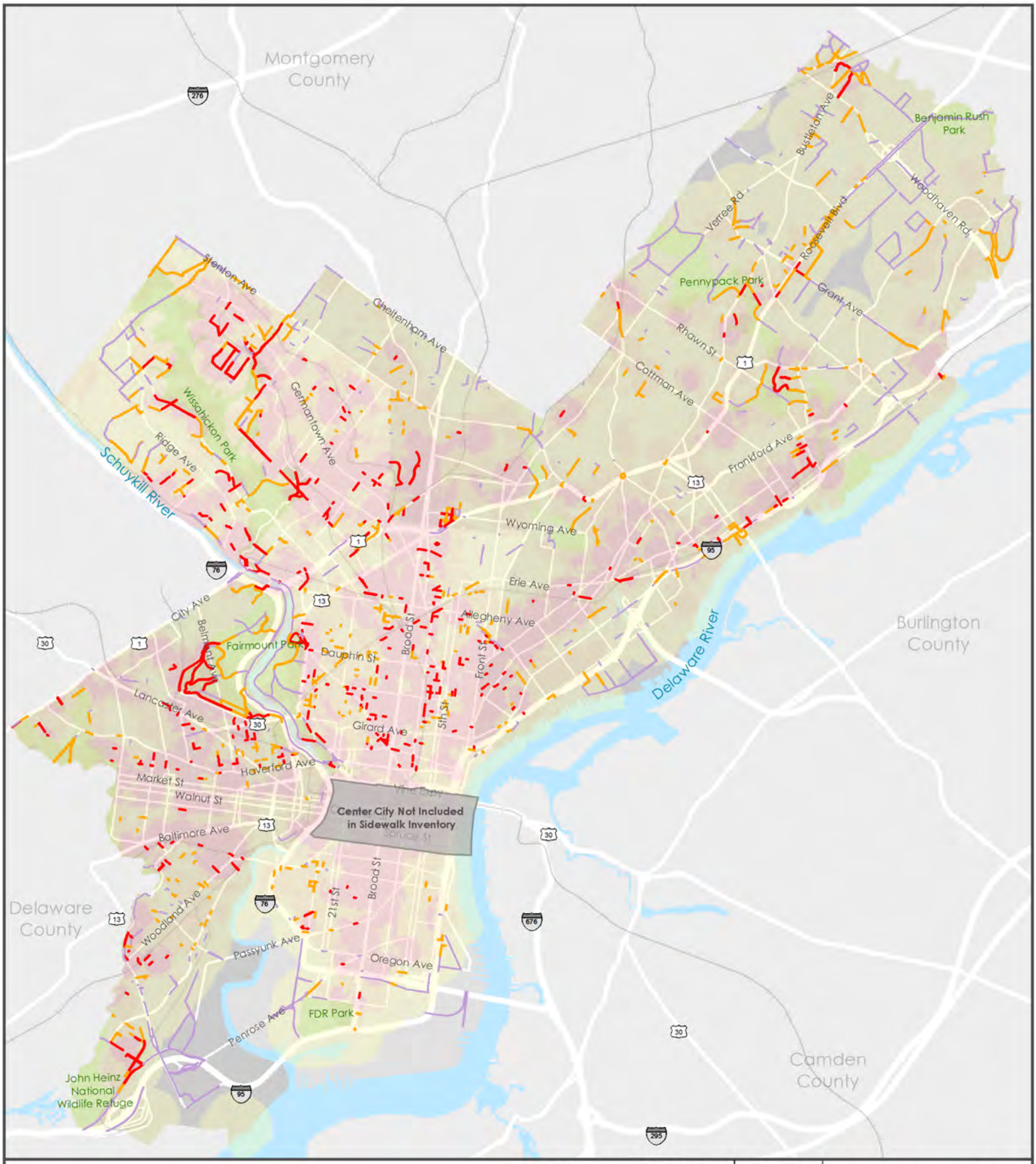
The application of the recommended prioritization methodology to the sidewalks identified as missing or in "very poor" condition is shown in Map 11. A total of 61 miles of sidewalk were classified as high priority as a result of the prioritization. Map 12 shows sidewalks classified as high priority that are also located within 50 feet of City-owned property. While not all of the sidewalk problems highlighted on Map 12 will turn out to be in public control, the map can serve to flag the possibility. All of the missing sidewalks and sidewalks with problems identified in the inventory should be subject to further review as planning continues on a more detailed community level.

Implementing Bicycle Network Recommendations

Bikeway recommendations in this Plan are based on an assessment and analysis of current conditions. While providing the highest level of bicyclist comfort (e.g. buffered bike lanes or cycle tracks) may be desirable, it is often not feasible given the current street widths and the need to balance demands for traffic lanes and parking or loading. Increases in the number of bicyclists and changes in traffic or parking patterns may make additional design options feasible in the future.

On-street bicycle accommodations can be provided on existing streets through one of the following methods:

- Narrow the width of travel and parking lanes (Lane Diet).
- Reduce the number of travel lanes (Road Diet).



Legend

Sidewalk Project Prioritization

- High
- Medium
- Low

Priority Area

- High
- Medium
- Low

Note: Includes missing sidewalks and sidewalks in "very poor" condition.

Sidewalk Project Prioritization | **Map 11**

Miles 0 1 2

N

PCPC

GET HEALTHY PHILLY Healthy, Active & Smoke-Free

Base Data Source: City of Philadelphia

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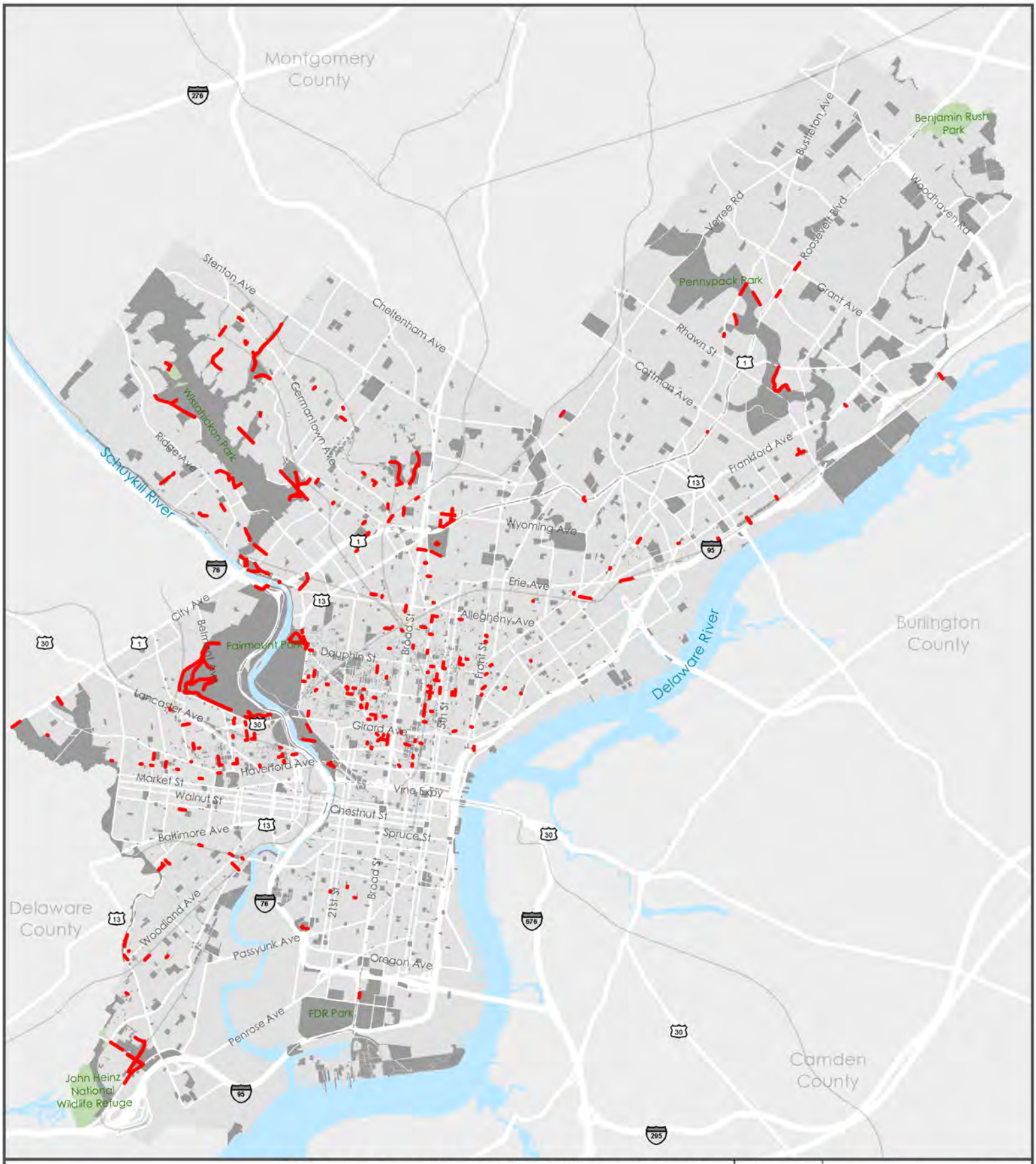

High Priority Sidewalks in Proximity to City-Owned Property

Map 12

Legend

High Priority Sidewalk
Within 50 feet of City-owned property

City-Owned Property

N

Miles
0 1 2

PCPC

GET HEALTHY PHILLY
Healthy, Active & Smoke-Free

Base Data Source: City of Philadelphia

No warranties of any sort, including accuracy, fitness or merchantability, accompany this product.

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March 2012

- Remove or consolidate on-street parking.
- Revise traffic regulations – in particular converting a street from two-way to one-way.
- Designate existing shoulders or excess roadway space for bicycle use.

Before installing a new bicycle facility that requires the loss of parking or a road diet, the Streets Department consults community groups and City Council representatives. The extent of community outreach depends in part upon the nature of the proposed project and its context.

Timeline and Schedule for the Repaving Process
Opportunities to upgrade or add to the bicycle network most often occur in conjunction with one of the following three types of projects:

- Streets Department resurfacing projects.
- PennDOT resurfacing projects.
- Streetscape, bridge or utility projects resulting in roadway reconstruction.

The Philadelphia Streets Department is the implementing agency for repaving and redesign of streets. When the list of resurfacing projects is released each year, Streets Department engineers consult with the Mayor's Office of Transportation and Utilities and the Planning Commission to determine which street segments on the list are appropriate and have adequate width and traffic capacity for the addition of bicycle facilities. The Recommended Bicycle Network in this Plan will inform this evaluation and the discussions that follow. The bikeways are then designed

and striped in concert with the repaving. In addition to roadway resurfacing and reconstruction, contracts for refreshing existing bikeway striping and adding pavement markings are sometimes procured through the Streets Department on an as-needed basis in order to close gaps in and expand the bicycle network.

PennDOT has jurisdiction over many of the major streets in Philadelphia – typically streets that are longer and carry higher volumes of traffic. PennDOT streets include streets such as Columbus Boulevard and Verree Road as well as numbered state routes such as Walnut and Chestnut Streets (Route 3) and Broad Street (Route 611). Because of the continuity they provide, PennDOT streets form critical elements of the city's bicycle network.

Although it is responsible for resurfacing its streets in the city, PennDOT looks to the Streets Department to develop lane marking plans that get implemented following resurfacing. The PennDOT resurfacing process is similar to the Streets Department process. Each winter a list of

TABLE 20: PRIORITY BICYCLE PROJECTS

STREETS	PRIORITY RECOMMENDATION
Walnut Street	Upgrade bike lanes
Chestnut Street	Extend and upgrade bike lanes
33rd Street	Extend and upgrade bike lanes
Belmont Avenue	Implement sidepath conversion
West Bank Greenway	Complete sidepath from Girard to Market
Roosevelt Boulevard	Implement sidepath construction and conversion
Bridge Access	Implement Ben Franklin and Tacony Palmyra access improvements
Columbus Boulevard (Race to Spring Garden)	Provide bike lanes
22nd Street (Race to the Parkway)	Provide bike lanes
Fairmount Avenue (Ridge to Pennsylvania)	Provide bike lanes
Washington Avenue	Provide continuous bike facilities
13th Street	Provide bike lanes to Temple University, and marked shared lanes from Oregon to Center City

resurfacing projects are identified for the following summer. The streets are then evaluated by staff from the City to determine what revisions should be made to the roadway marking plans. The revised marking plans are prepared by the Streets Department and given to PennDOT, which provides them to its contractors. The Recommended Bicycle Network will also inform decisions about on-road bicycle facilities to be provided on PennDOT's roads.

Streetscape and utility projects are also opportunities to incorporate bicycle network recommendations. The Philadelphia Water Department (PWD) and the Philadelphia Gas Works (PGW) have on-going capital projects requiring the reconstruction of streets. PWD has also embarked on a comprehensive "Green Streets" program aimed at capturing stormwater, storing it and, where possible, filtering and cleaning the water using sophisticated landscaping and filter beds. Projects involving major reconstruction of a street can provide opportunities to enhance a street for either bicycle or pedestrian circulation.

Federally-funded projects can also include streetscape and roadway improvements, such as the TIGER-funded Walnut Street Gateway, that includes enhanced facilities for pedestrians, bicyclists, and vehicular traffic. Implementation discussions should continue with City and State departments to ensure that recommendations from this Plan are reflected as projects continue.

Priority Bicycle Projects

As part of the development of this Plan, a selected number of priority bicycle projects were identified. These priority locations are highlighted in Table 20.

Funding

Funding for pedestrian and bicycle improvements can come from a broad variety of sources. Funding the physical improvements will mostly come from traditional transportation sources, through the Federal surface transportation program and state and City capital programs. Certain designated programs that are part of the Federal transportation program may be particularly important for implementing pedestrian and bicycle plan recommendations. These include the Transportation Enhancements (TE), Safe Routes to School (SRTS), and the Congestion Mitigation and Air Quality Improvement (CMAQ) programs.
The current transportation authorization, SAFETEA-LU, has expired, and Federal funding programs may change when a new authorization is passed by Congress. This may open up new or restrict existing opportunities for funding pedestrian and bicycle improvements. The Federal Transit Administration provides funding for transit projects, which may include pedestrian and bicycle access improvements. The National Highway Transportation Safety Administration is another source of Federal funds, typically used for safety education and enforcement programs.

A newer source of funds has opened up in recent years due to the health community's concern for active living. The U.S. Department of Health and Human Services has funded a major share of Phase 2 of the Pedestrian and Bicycle Plan, as well as pedestrian and bicycle counts for two years, extended funding for Safe Routes to School educational activities, and other education and enforcement programs.

Aside from PennDOT, which is the conduit for all Federal and state transportation funds, potential state sources of funding for pedestrian and bicycle improvements include the Department of Community and Economic Development and the Department of Conservation and Natural Resources.

Although City capital funds are extremely limited, the capital program does include funding for pedestrian and bicycle network improvements. The largest single line item in the capital program is for street resurfacing, a project that is quite important to bicyclists. Not only is the surface quality important for riding comfort and safety, but bike lane markings cannot be applied to roadways where the surface is in poor condition. The City's capital program also includes the only project specifically dedicated to sidewalks, in Fairmount Park. The capital program often includes funding for commercial corridor streetscape projects through the Commerce Department.

Property owners and business improvement districts may also share in the cost of improvements, especially if the improvements provide access to their properties. The Center City District used this approach in 1995 to "float" a major bond issue to repair sidewalks. The City installed new, pedestrian-scale street lights throughout the district as its contribution to the improvement project.

Funding is also needed for data collection and evaluation programs, and maintenance of the pedestrian and bicycle network GIS systems developed for this Plan. This funding should be provided in the City's operating budget.

APPENDICES

CITY OF PHILADELPHIA PEDESTRIAN AND BICYCLE PLAN

April 2012

APPENDIX A: Review of Existing Pedestrian & Bicycle Planning Studies

APPENDIX B: Summary of Web-based Questionnaire

APPENDIX C: Complete Set of Policy Papers

APPENDIX D: Conceptual Recommendations for Pedestrian Priority Corridors and Individual Locations

APPENDIX E: Locations for Bicycle Network Improvements Requiring Additional Study

APPENDIX A:
REVIEW OF EXISTING PEDESTRIAN AND BICYCLE PLANNING STUDIES

This appendix provides an overview of previous planning efforts undertaken in and around Philadelphia that are relevant to the Philadelphia Pedestrian and Bicycle Plan. These include city initiatives, plans, studies, internal memos, and other relevant documents. This appendix briefly summarizes each previous plan or study, discusses its relevance to pedestrian and bicycle planning in Philadelphia, and lists specific recommendations when applicable.

Available at www.philaplanning.org.

APPENDIX B:
SUMMARY OF WEB-BASED QUESTIONNAIRE

This appendix summarizes the results of an online questionnaire conducted as part of the Philadelphia Pedestrian and Bicycle Plan. The questionnaire was administered electronically via the Survey Monkey website and was publicly available from April 2009 through December 2010. This appendix isolates the responses collected as part of the Phase 2 planning process, which includes responses received between October and December 2010. Over 500 responses were received during this time.

Available at www.philaplanning.org.

APPENDIX C:
COMPLETE SET OF POLICY PAPERS

This appendix provides the complete set of policy papers developed in Phase 1 of the Philadelphia Pedestrian and Bicycle Plan.

Pedestrian Network Policy Papers

Sidewalk Design Guidelines

Sidewalk Furnishings

Street Crossings

Pedestrian Signals

Driveways and Lay-Bys

Sidewalks in New Development

Sidewalk Retrofit

Bicycle Network Policy Papers

Bikeway Network Design

Bicycle Treatment at Intersections

Bicycle Parking

Bicycles on Public Transportation

Health and Safety Policy Papers

Education

Enforcement

Encouragement

Management and Monitoring Policy Papers

Construction Disruption

Management of Sidewalk Encroachments

Pedestrian Network Maintenance

Bicycle Network Maintenance

Bicycle Detours

Bicycles in Buildings

Crash Reporting and Analysis

Pedestrian and Bicycle Counts

Available at www.philaplanning.org.

APPENDIX D: CONCEPTUAL RECOMMENDATIONS FOR PEDESTRIAN PRIORITY CORRIDORS AND INDIVIDUAL LOCATIONS

This appendix provides additional information on the 48 pedestrian priority corridors and intersections identified in Chapter 6 of the plan. A summary map and table of the locations is provided as an overview and specific locations are discussed on the pages that follow. Note that some pedestrian recommendations are discussed in the Bicycle Appendix, Appendix E.

Available at www.philaplanning.org.

APPENDIX E:
LOCATIONS FOR BICYCLE NETWORK IMPROVEMENTS REQUIRING ADDITIONAL STUDY

This appendix discusses specific locations that require more detailed attention beyond the recommendations in Chapter 7 of the plan. Twenty locations are included and, in some cases, pedestrian issues are addressed as well as bicycle issues.

Tacony Palmyra Bridge

Rhawn Street and State Road

Roosevelt Boulevard

Bustleton Avenue

Henry Avenue

Hunting Park Avenue

Belmont Avenue

City Avenue

Benjamin Franklin Bridge Approaches

Dock Street and Spruce Street

City Hall

Chestnut Street in Center City

Eakins Oval

JFK Boulevard, Market Street, and 30th Street Station

Washington Avenue

Walnut Street and Chestnut Street

Pine Street and Woodland Avenue

Grays Ferry Avenue Bridge

Bartram Avenue

Platt Bridge

Available at www.philaplanning.org.