Downtown Trenton

BICYCLE & PEDESTRIAN PLAN

June 2016

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

TRENTON DIVISION *of* PLANNING

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

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

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

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

The Delaware Valley Regional Planning Commission (DVRPC) fully complies with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 12898 on Environmental Justice, and related nondiscrimination statutes and regulations in all programs and activities. DVRPC's website, www.dvrpc.org, may be translated into multiple languages. Publications and other public documents can be made available in alternative languages and formats, if requested. DVRPC public meetings are always held in ADA-accessible facilities and in transit-accessible locations when possible. Auxiliary services can be provided to individuals who submit a request at least seven days prior to a meeting. Requests made within seven days will be accommodated to the greatest extent possible. Any person who believes they have been aggrieved by an unlawful discriminatory practice by DVRPC under Title VI has a right to file a formal complaint. Any such complaint may be in writing and filed with DVRPC's Title VI Compliance Manager and/or the appropriate state or federal agency within 180 days of the alleged discriminatory occurrence. For more information on DVRPC's Title VI program, or to obtain a Title VI Complaint Form, please call (215) 592-1800 or email public_affairs@dvrpc.org.

Table of Contents

List of Figures

List of Figures

List of Tables

Appendix

PHOTO CREDIT: DELAWARE VALLEY REGIONAL PLANNING COMMISSION

dvrpc

CHAPTER 1
introduction

This chapter highlights the plan's purpose and goals. It also discusses the outreach and stakeholder consultation process.

The chapter concludes with a summary of previous related studies.

Chapter 1: Introduction

Purpose

The Delaware Valley Regional Planning Commission (DVRPC), with input from local, county and regional stakeholders, and the public, developed this, the *Downtown Trenton Bicycle and Pedestrian Plan*.

The purpose of this document is to detail a set of bicycle and pedestrian recommendations for Trenton's downtown district that enhances local safety and mobility.

The plan proposes improvements to the streets downtown, as well as connections to regional infrastructure for bicyclists and pedestrians. These improvements form a comprehensive network to ensure all users safety, access, and convenience when traveling. The facilities recommended in this plan will build on Trenton's existing bicycle and pedestrian network with facilities that will create safer and more complete roads, trails, and intersections.

These recommendations seek to enhance pedestrian and bicycle safety, facilitate access to transit, and delineate preferred routes for bicyclists.

This plan will be integrated into the Trenton 250 *Master Plan as one of its transportation sections.*
Source: Trenton 250

This plan...

- ***Recommends actions*** that will enhance safety when traveling to, and within, downtown Trenton.
- Aims to ***increase cycling and protect pedestrians*** in downtown Trenton.
- ***Will build upon and include the work of related plans*** such as the 2004/2005 *Trenton Transportation Master Plan* and the 2006 *Trenton Station Linkage Plan.*
- Will be ***incorporated into the upcoming* Trenton 250 *Master Plan as a part of the Transportation Circulation Element.***

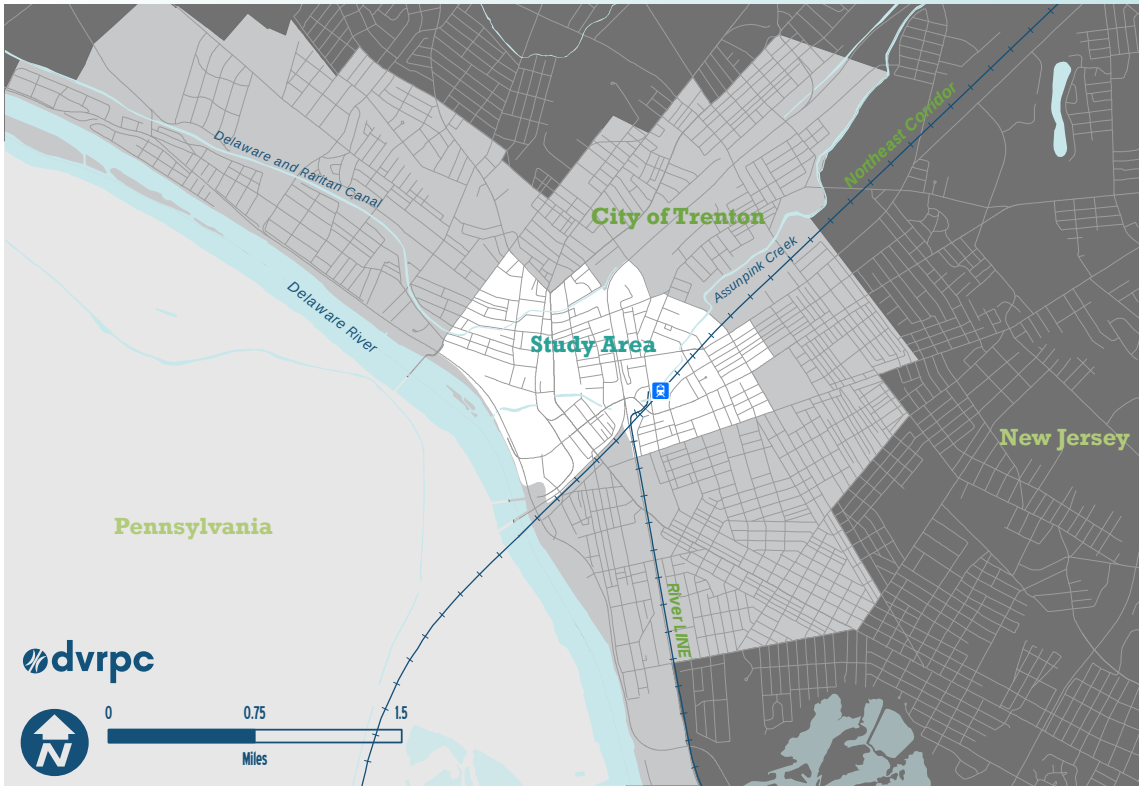
Study Area

The *Downtown Trenton Bicycle and Pedestrian Plan* develops bicycle and pedestrian recommendations for downtown Trenton. The downtown is defined using the "Downtown Capital District" boundaries from the 2008 *Living Trenton Downtown Capital District Master Plan,* described in the next section.

DOWNTOWN BOUNDARIES

The study area is bordered by the Delaware River on its west side from Calhoun Street in the north to the Northeast Corridor rail line in the south. East of NJ 129, the southern boundary of downtown is Hamilton Avenue. Lincoln Avenue and Chambers Street are the primary borders to the east, while Pennington Avenue, Brunswick Avenue, and the Delaware and Raritan (D&R) Canal comprise the northeast boundary. Features within the study area include state, county, and city government buildings and the Trenton Transportation Center. The Assunpink Creek and D&R Canal both cut horizontally across downtown.

FIGURE 1: Study Area



Sources: NJDOT, DVRPC, Mercer County, City of Trenton

Project Goals

Developed during stakeholder meetings, a list of guiding principles was created to focus on satisfying specific overarching goals.

Four main themes emerged from stakeholder input (See “Guiding Principles”).

Guiding Principles

FOCUS ON SAFETY

Safety is an essential part of what makes people feel comfortable walking and biking. If the streets can be made safer for people, more are likely to choose these modes.

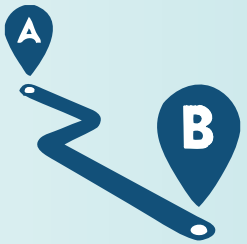
DEVELOP A NETWORK

This plan needs to connect people to the places they are coming from and going to with direct and complete routes.

MAKE IT “NOT JUST ABOUT BIKES”

Pedestrians have to be a major part of the plan, as there are currently many more people walking in Trenton than biking. Furthermore, all trips start and end with walking.

MAKE IT INTUITIVE



Trenton’s bicycle and pedestrian facilities should be easy to navigate and intuitive to use.

Previous Studies

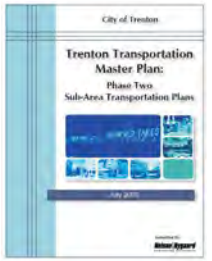
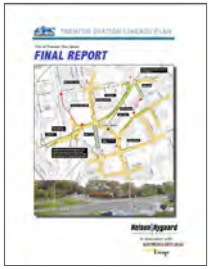
Many previous studies have examined bicycle and pedestrian transportation within downtown Trenton.

A few of these plans include the *Trenton Station Linkage Plan* (2006), *New Jersey's Long-Range Transportation Plan: Urban Supplement Report, City of Trenton* (2008), and the *Living Trenton Downtown Capital District Master Plan* (2008).

DVRPC has done additional planning work in the City, including *State Street Transit Signal Priority Study* in 2015.

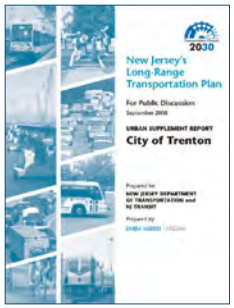
This plan draws ideas and inspiration from these prior documents and builds on the work contained within. See Table 1 for a summary of the most relevant previous plans.

TABLE 1: Previous Studies

TRENTON TRANSPORTATION MASTER PLAN (2004/2005)	The *Trenton Transportation Master Plan* was a two-phased report that documented the existing transportation network, as well as recommended a strategic plan for both short- and long-term improvements. This plan serves as Trenton's current master plan transportation element.	
TRENTON STATION LINKAGE PLAN (2006)	This plan sought to improve access to the Trenton Transportation Center for all modes of transportation. The plan addresses reconfiguring traffic flow, introducing new wayfinding, examining and improving pedestrian and bicycling conditions, and optimizing signal timing, particularly in the area around the station.	

Sources: City of Trenton; Nelson\Nygaard Consulting Associates

TABLE 1: Previous Studies (Continued)

LIVING TRENTON DOWNTOWN CAPITAL DISTRICT MASTER PLAN (2008)	This plan suggested a multitude of different transportation improvements for different sections of the city. The Route 29 Boulevard project and the creation of Transit Villages within walking distance of the Trenton Transportation Center and the River LINE are two of the plan's recommendations.	
CALHOUN STREET ROAD SAFETY AUDIT (2008)	This DVRPC safety audit examined Calhoun Street within downtown Trenton and suggested a variety of improvements for user safety, such as upgrading curb ramps, installing pedestrian crossing signs, and replacing street lighting.	
NEW JERSEY'S LONG-RANGE TRANSPORTATION PLAN: URBAN SUPPLEMENT REPORT, CITY OF TRENTON (2008)	Supplement reports are a requirement for the state's seven largest cities, as well as New Brunswick. This report reviews the existing conditions, examines current projects, previous reports, and interviews key agencies to provide a list of recommendations that inform the planning and capital programming processes. The goal of this report is to ensure that transportation investments align with economic development and land use objectives.	
ROUTE 29 BOULEVARD PROJECT (2009)	The New Jersey Department of Transportation (NJDOT) conducted a feasibility study of replacing the existing freeway with an urban boulevard on the southern section of Route 29 from the Richey Place/Calhoun Street interchange to the intersection at Cass Street with the goal of connecting the waterfront to Trenton's downtown neighborhoods.	

Sources: City of Trenton; DVRPC; NJDOT; DMJM Harris and AECOM

Plan Structure

The *Downtown Trenton Bicycle and Pedestrian Plan* introduces a wide range of multi-modal infrastructure and policy interventions.

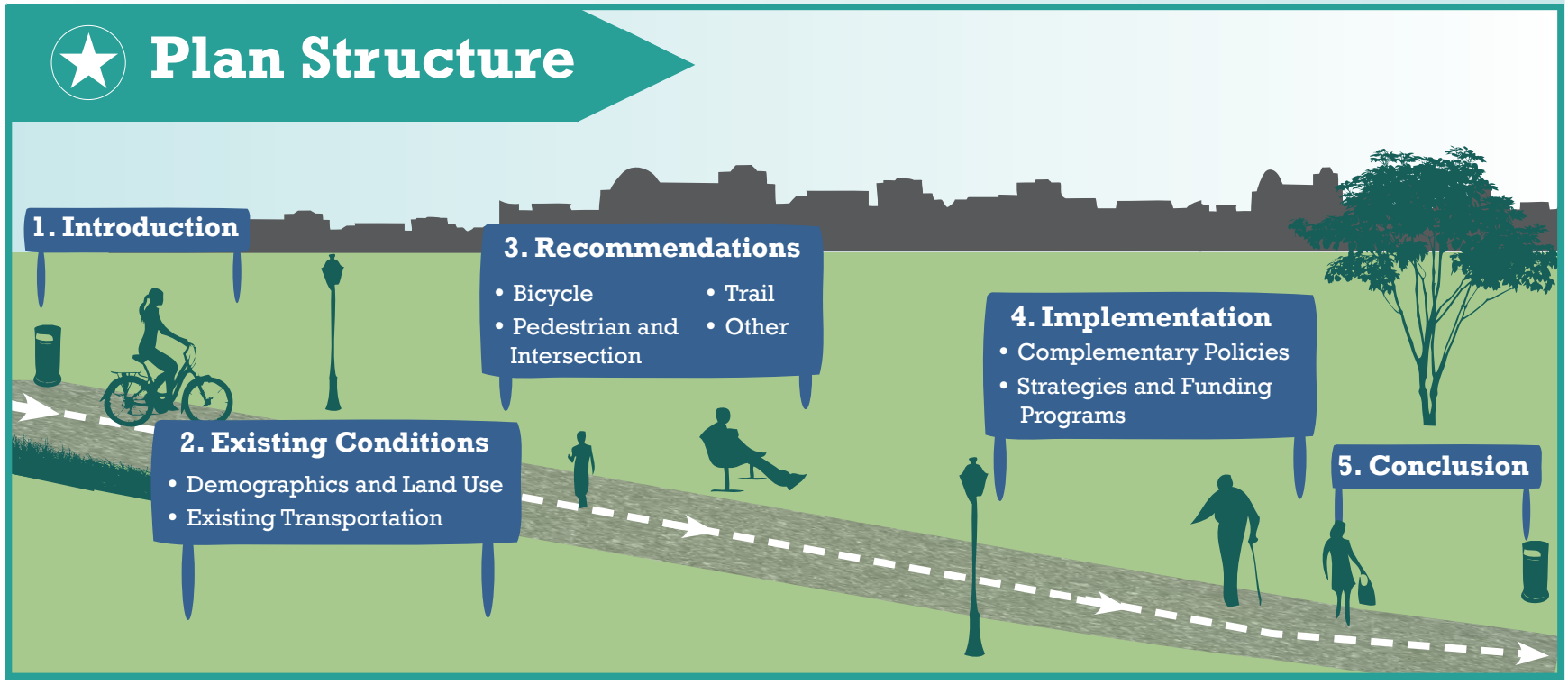
Following the **introduction,** this plan is divided into three main sections: existing conditions, recommendations, and implementation.

Existing conditions is divided into an overview of demographics and land use, followed by an overview of existing transportation conditions.

The **recommendations section** is divided into four sub-sections: bicycle improvements, trail improvements, pedestrian and intersection improvements, and other improvements.

The **implementation section** describes complementary policies that can be pursued to support walking and bicycling in the city. Finally, funding and financing strategies are presented as options for possible resources for implementing the interventions recommended in this document.

FIGURE 2: Plan Structure



Outreach and Stakeholders

A steering committee was formed in order to assist and guide the plan. The steering committee created a space for sharing local knowledge and developing a deeper understanding of particular issues within downtown Trenton.

This steering committee consisted of a variety of stakeholders, including government and transportation partners such as the **NJ DOT, Mercer County, Greater Mercer Transportation Management Association** (TMA)**, and NJ Transit.** Other local partners participated, such as the **Trenton Health Team, New Jersey Partnership for Healthy Kids–Trenton, Trenton Downtown Association, Capital City Redevelopment Corporation, and Trenton Cycling Revolution.**

Stakeholders were invited to attend two meetings in 2014. The first meeting in February introduced the project and reviewed the existing conditions, as well as previous plans with stakeholders. The second meeting in September featured a presentation of the results of the bicycle and pedestrian counts, as well as preliminary recommendations.

In October 2014, a public outreach meeting was held with interested members of the public. At this meeting the majority of the plan's recommendations were presented and attendees were provided an opportunity to comment on the plan and suggest changes.

Both groups helped shape the recommendations in this plan by providing feedback throughout the process. Collaboration with stakeholders also helped prioritize specific recommendations.

As part of this plan process, staff partnered with the New Jersey Partnership for Healthy Kids–Trenton to design the Wellness Loop, a dedicated bicycle facility discussed later in the document.

Steering Committee Members

City of Trenton

NJ DOT

Greater Mercer TMA

Mercer County

NJ Transit

Trenton Health Team

New Jersey Partnership for Healthy Kids – Trenton

Trenton Downtown Association

Capital City Redevelopment Corporation

Trenton Cycling Revolution

Meeting Timeline

FEBRUARY - KICKOFF
Present existing conditions and develop plan principles

SEPTEMBER - STAKEHOLDER FEEDBACK
Discuss initial recommendations and provide feedback

OCTOBER - PUBLIC OUTREACH
General public feedback on recommendations

PHOTO CREDIT: DELAWARE VALLEY REGIONAL PLANNING COMMISSION

dvrpc

CHAPTER 2
existing conditions

This chapter provides an overview of downtown Trenton's demographics, land use, and existing transportation conditions.

Chapter 2: Existing Conditions

Introduction

Trenton, New Jersey is the state capital and houses many government jobs. The downtown district is also home to residents with diverse ethnic and socioeconomic backgrounds, which add to Trenton's unique character.

The downtown district also has a rich and historic existing transportation network, including rail lines, bus service, trails, and bicycle lanes.

This chapter will discuss existing conditions in Trenton, with the first section focused on the city's demographics and land use, and the second portion focusing on existing transportation.

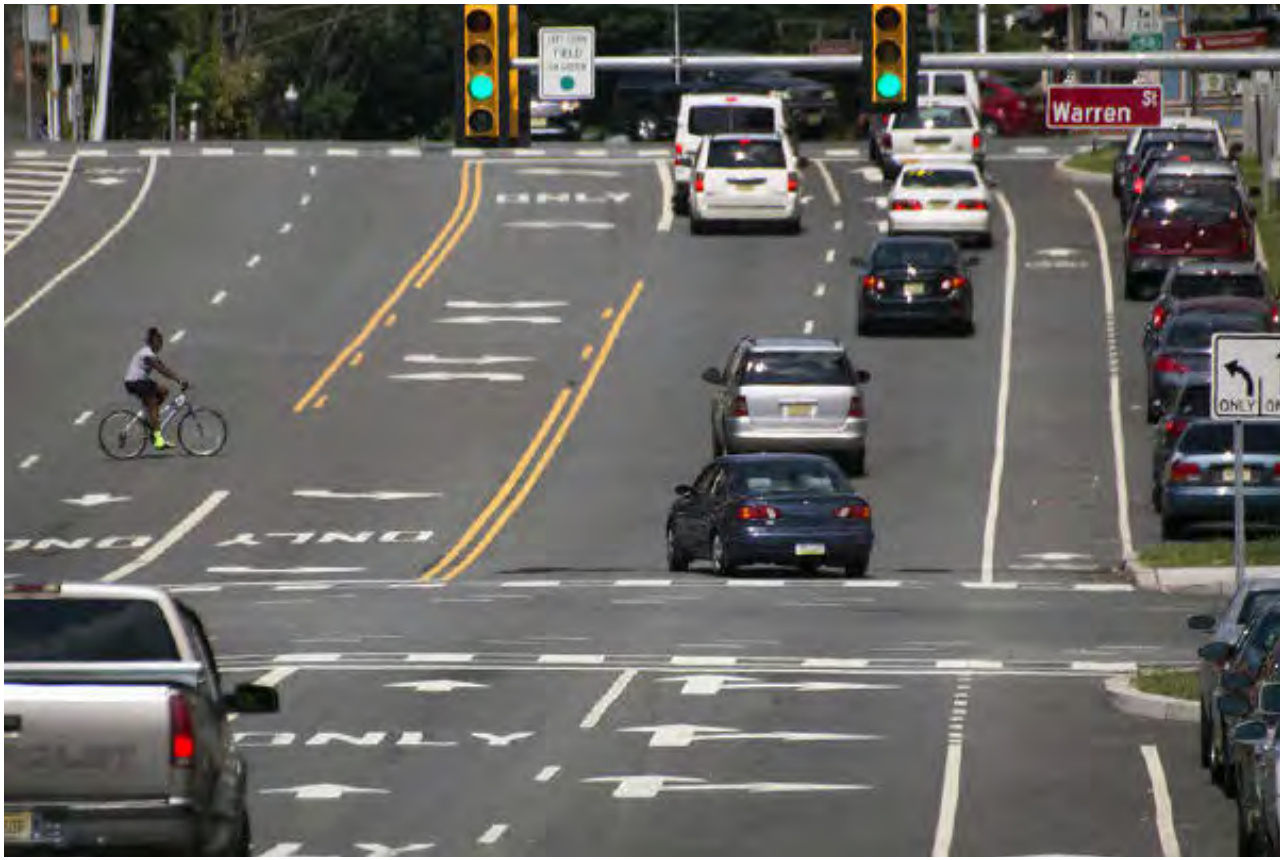


Photo Credit: Michael Mancuso

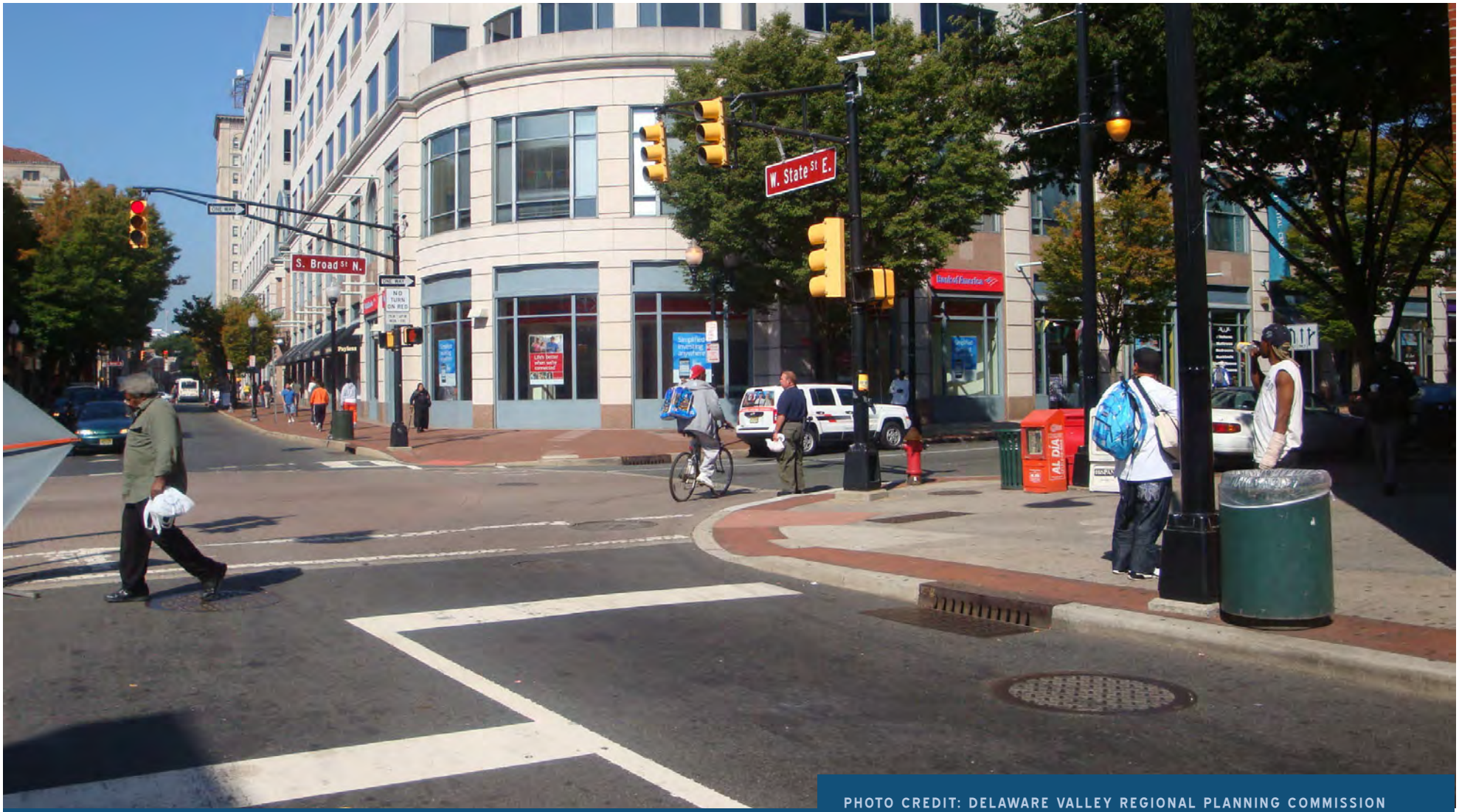


PHOTO CREDIT: DELAWARE VALLEY REGIONAL PLANNING COMMISSION

EXISTING
demographics and land use

Demographics and Land Use

Trenton, home to the state and county governments, has experienced change since its late 19th/early 20th-century industrial period. Like many cities, it experienced a large drop in population and, in the second half of the 20th century, a severe decline in its retail sector. Currently, it faces challenges with poverty, health conditions, and unemployment. Population decline has slowed and the city is home to an ethnically diverse and relatively young populace.

Demographics

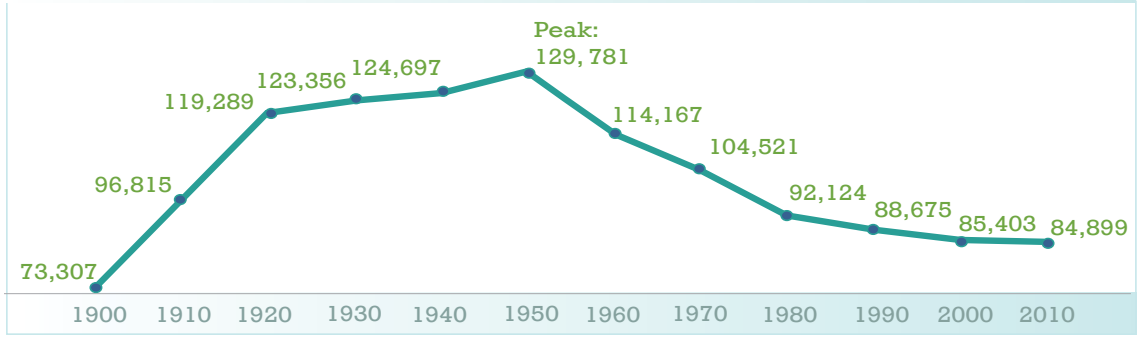
POPULATION

Trenton is located within Mercer County, New Jersey. The city has an estimated population of 84,899 in an area of 7.65 square miles as of 2010. The city's population grew rapidly during the first half of the 20th century due to the attractiveness of manufacturing jobs, with its peak of 129,781 residents around 1950. Since then, Trenton has experienced large declines in population and jobs: In 2010, Trenton was at its lowest population since 1900.

AGE

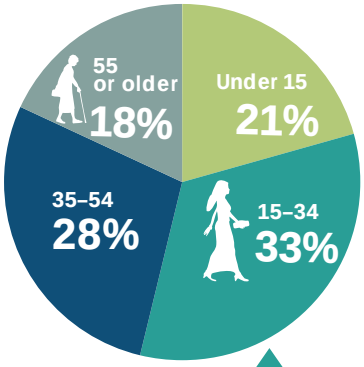
The median age is much younger in Trenton than both the state and the county: The median age is 33 compared to 37 in the United States and 39 in New Jersey. However, the difference is not due to a higher percentage of children, as the city has similar rates to the state and nation (28 percent Trenton, 26 percent New Jersey, 27 percent United States). Despite population decline, there is a growing number of 15–34-year-olds (consisting of a third of the population in 2010, up from 29 percent in 2000).

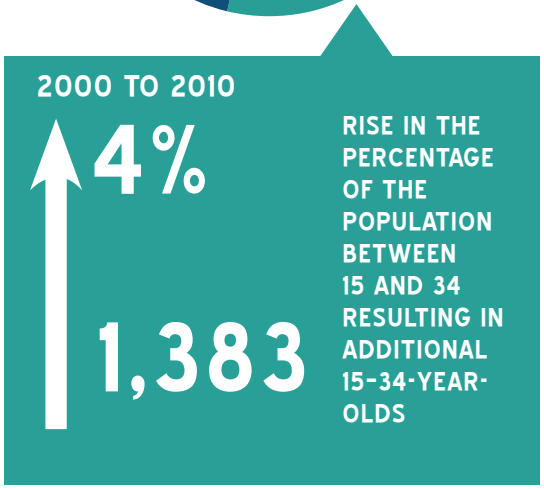
FIGURE 3: Trenton Population 1900–2010



Population decline since 1950. Source: Trenton 250

FIGURE 4: Trenton City Age Distribution, 2010





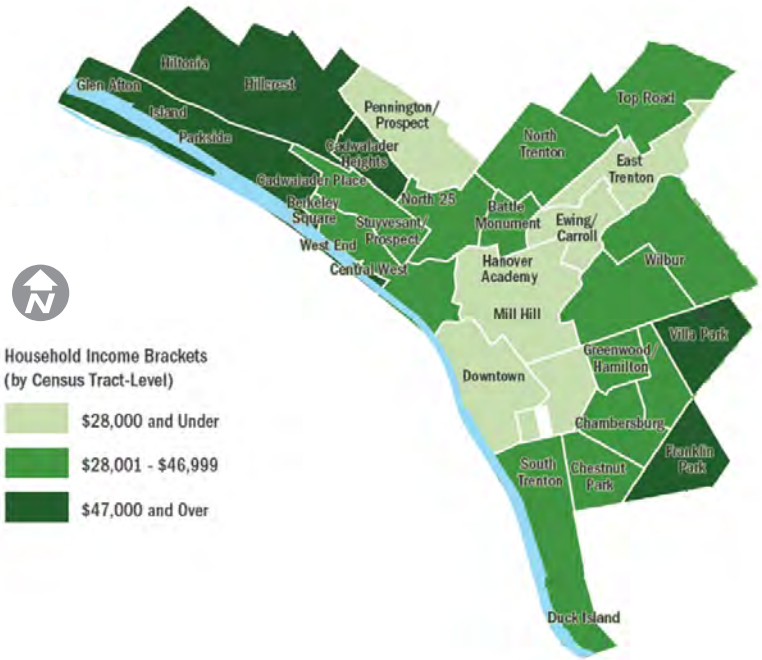
Source: U.S. Census Bureau

INCOME AND UNEMPLOYMENT

According to the 2010 Census, Trenton is a relatively low-income city facing issues with poverty and unemployment: Trenton has a high poverty rate at 26.5 percent of all residents (10.4 percent New Jersey, 15.4 percent United States). For families with children under 18, this rate rises to 33 percent. Additionally, there is an 18 percent unemployment rate in Trenton City, compared to 10.1 percent in New Jersey and 9.7 percent nationally.

Furthermore, median household income is relatively low at $36,662 in Trenton City, versus $71,629 in New Jersey and $53,046 nationally. Trenton's downtown neighborhoods have some of the lowest median incomes in the city (see Figure 5).

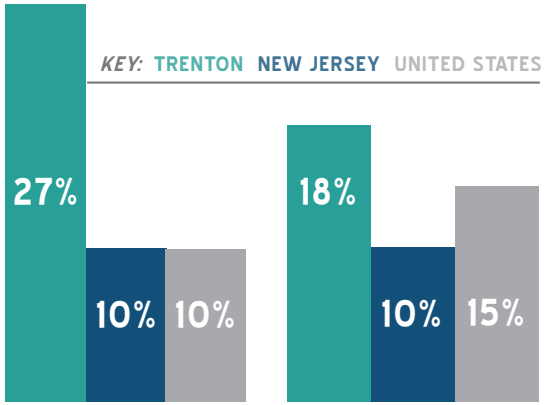
FIGURE 5: Median Household Income in Trenton



Source: Trenton 250

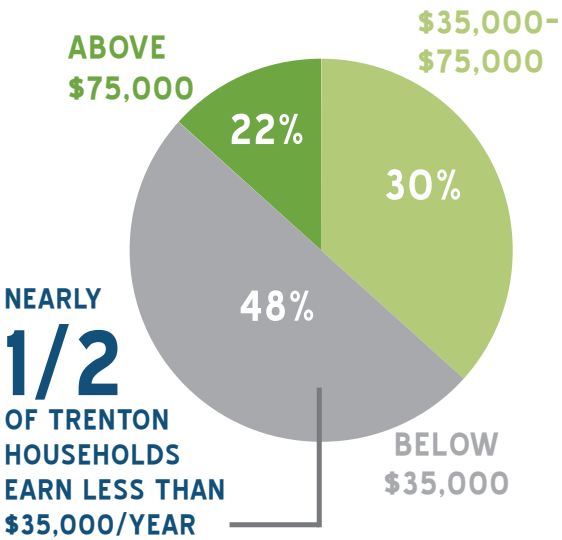
FIGURE 6: Poverty, Unemployment Rates, and Income Distribution

POVERTY AND UNEMPLOYMENT RATES



Source: U.S. Census Bureau

INCOME DISTRIBUTION



Source: U.S. Census Bureau

RACE

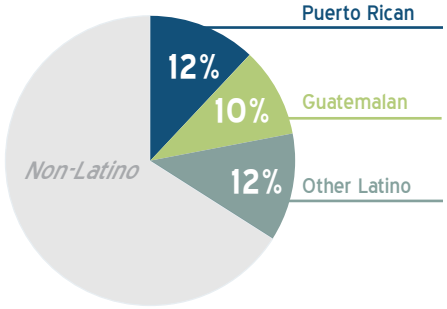
A little more than a quarter (27 percent) of Trenton residents identify as White on the 2010 Census, much lower than the New Jersey (69 percent) and national (72 percent) averages.

Conversely, around half (52 percent) of Trenton residents identify as Black or African American alone on the 2010 Census, much higher than state (14 percent) and national (13 percent) averages.

Latinos are also a large group in Trenton: About a third of the population (34 percent) identifies as Latino. The majority of the Latino population is Puerto Rican (12 percent of all residents) or Guatemalan (10 percent of all residents).

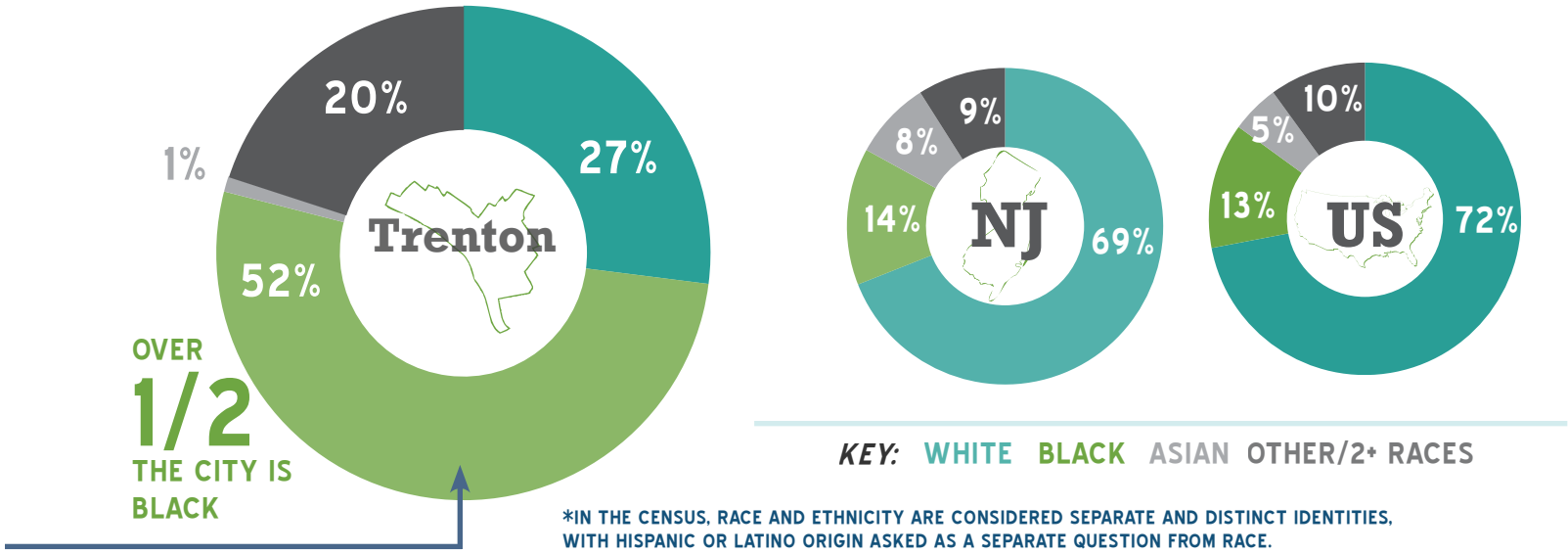
Trenton also has a much smaller Asian population (1 percent) compared to New Jersey (8 percent) or nationally (5 percent). Finally, 4 percent of residents identify with two or more races, and 16 percent did not identify with any of the categories.

FIGURE 8: Latino-Identified Trenton Residents in 2010



Source: U.S. Census Bureau

FIGURE 7: Racial Composition in 2010: Trenton, New Jersey, and the United States



*IN THE CENSUS, RACE AND ETHNICITY ARE CONSIDERED SEPARATE AND DISTINCT IDENTITIES, WITH HISPANIC OR LATINO ORIGIN ASKED AS A SEPARATE QUESTION FROM RACE.

Source: U.S. Census Bureau

HEALTH

Obesity and obesity-related diseases are a major health concern in Trenton. In 2011, around 39 percent of residents were classified as obese, compared to 20 percent in Mercer County and 24 percent in the State. Mercer County health rankings for 2013 show that this percentage has increased for the county and state since 2011, so it is likely that this percentage has also increased in Trenton as well.

The effects of less active lifestyles include an increase in diseases such as diabetes. In the United States, diabetes is the leading cause of kidney failure, non-traumatic lower limb amputations, and new cases of blindness. The onset of diabetes can be delayed, and the disease may even be prevented with weight loss and increased physical activity. In the City of Trenton this is a major health concern since 16 percent of adults have diabetes.

Weight concerns and lack of physical activity have become a major problem for the city's children. Nearly half (47 percent) of the city's children ages 3 to 19 classify as obese or overweight, much higher than the state average of 32 percent.

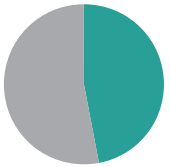
Obese and overweight children are more prevalent in some primary and secondary schools than others. The majority of Trenton schools fall into a range of 40–50 percent. However, Robbins Elementary School, within downtown Trenton, has the city's second highest rate of overweight/obese children at 55 percent. Sedentary lifestyles are a major concern for overweight and obese children. In Trenton, around 47 percent of children are not active for even 30 minutes daily. Making walking and bicycling an easier and safer choice can aid in increasing activity.

FIGURE 9: Trenton Health Statistics

39%
OF TRENTON'S RESIDENTS ARE OBESE

Source: Trenton 250, *City of Trenton*

47%
OF TRENTON'S CHILDREN GET LESS THAN 30 MINUTES OF EXERCISE A DAY



Source: P. Ohri-Vachaspati, et al.

Percentage of Adult Residents With....

	Diabetes	Obesity	Hypertension
TRENTON	16%	39%	31%
MERCER COUNTY AVERAGE	7%	20%	27%

Adapted From Trenton 250, *City of Trenton*

Land Use

Downtown Trenton has a mix of government, residential, and commercial land uses that house a large number of jobs that support the regional economy.

Additionally, Trenton's community assets, recreational places, and transportation options are essential elements of the city's landscape.

New Jersey State House
Photo Credit: Wikimedia User Smallbones

St. Francis Hospital
Photo Credit: Beverly Schaefer

EMPLOYMENT

Home to state and county government, two-thirds of jobs in Trenton are in the public sector. The downtown district includes many government buildings, such as the New Jersey State House and Mercer County Superior Court.

The largest private employers are Capital Health Systems and St. Francis Medical Center, employing 2,500 and 1,250 employees, respectively, in 2011.

Regionally, Trenton is a major employment center, although only a small portion of workers also live in the city (see Figure 10).

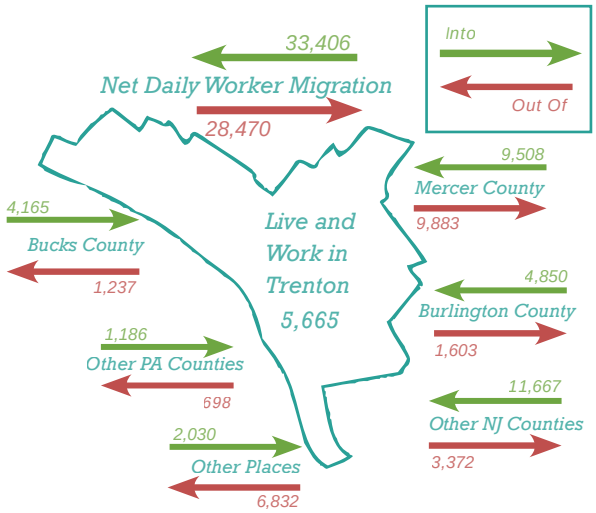
ABOUT 2/3 OF TRENTON'S JOBS ARE IN THE PUBLIC SECTOR

HEALTH CARE IS TRENTON'S LARGEST PRIVATE JOB SECTOR, EMPLOYING OVER 4,000 WORKERS

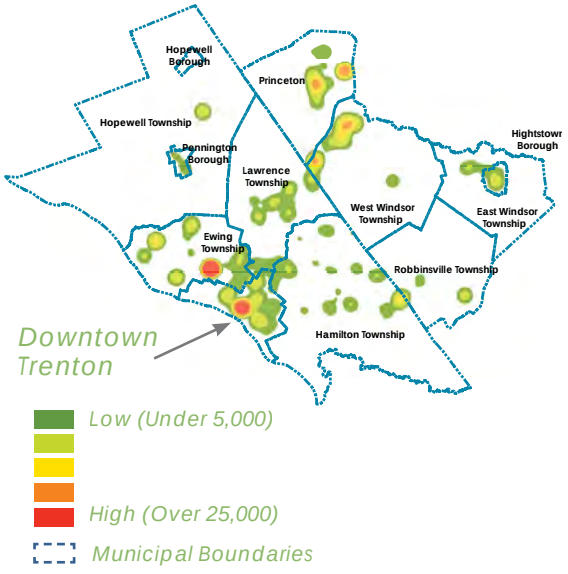
Source: Trenton 250

FIGURE 10: Regional Job Patterns

TRENTON COMMUTE PATTERNS

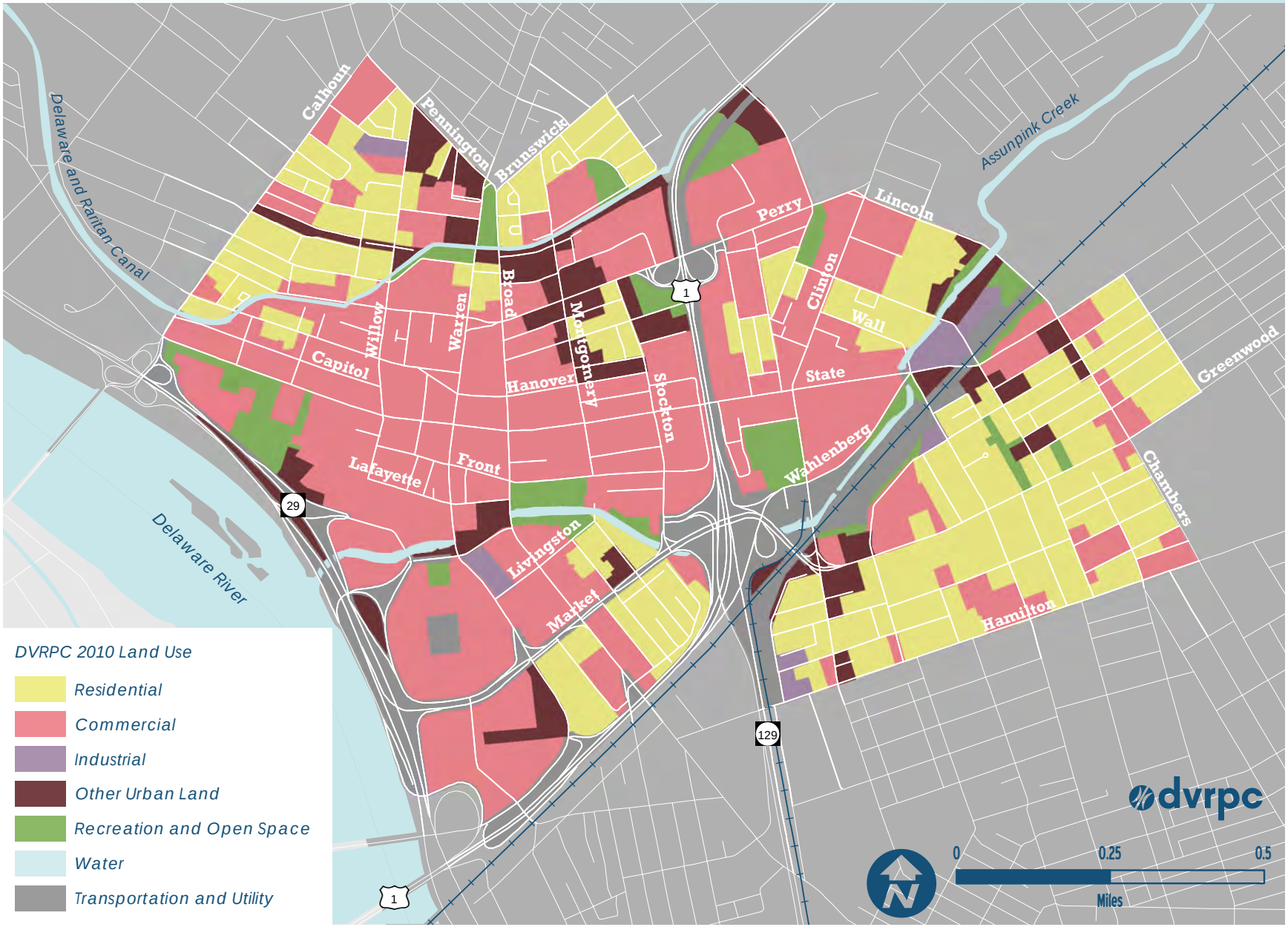


MERCER COUNTY JOB DENSITY, 2011
(JOBS PER SQUARE MILE)



Source: Trenton 250

FIGURE 11: Land Use



Sources: NJDOT, NJDEP, DVRPC, Mercer County, City of Trenton

Community Resources and Attractors

To determine where people want to bicycle and walk, a number of attractions in downtown Trenton were mapped. Locations included schools (elementary and secondary), colleges and universities, parks and open spaces, bodies of water (rivers and creeks), sports venues, the public library, and public transportation stops and stations. These places are shown in Figure 12.

SCHOOLS

Downtown Trenton has five elementary, two middle, and one high school, plus one alternative high school, all of which are public. Although there are no private schools within the downtown, there are a handful of private schools that lie just outside the downtown border. Additionally, there are two state colleges and a vocational school within downtown.

CHURCHES

There are many places of worship in the study area that are trip generators and destinations. Some of the largest and most active are Friendship Baptist Church, St. Mary's Catholic Church, and Turning Point United Methodist.

DOWNTOWN LANDMARKS AND RECREATION

Downtown Trenton has a variety of historic and recreational attractions. A few points of interest are shown below:

MILL HILL PARK

TRENTON BATTLE MONUMENT

SUN NATIONAL BANK CENTER

TRENT HOUSE

TRENTON FREE PUBLIC LIBRARY

RIVERWALK PARK AND ARM & HAMMER STADIUM

FIGURE 12: Community Attractors Map

Sources: NJDOT, NJDEP, DVRPC, Mercer County, City of Trenton

WEST STATE STREET. PHOTO CREDIT: DVRPC

EXISTING
transportation

Existing Transportation

This section is an overview of commuting patterns, bicycle and pedestrian counts, Trenton roads and bridges, and public transportation services. The existing multi-use trails and on-road bicycle network are also described.

Downtown Trenton is in a unique regional transportation location, with three bridge crossings into Pennsylvania, a major transportation center with connections to cities along Amtrak's Northeast Corridor and Camden via NJ Transit's River LINE, and access to several major state and national highways.

Pertinent to this plan, there are large numbers of residents who use non-motorized transportation and public transportation, particularly buses, to commute to work.

COMMUTE

Although commuting patterns are not a perfect means for analyzing transportation mode choice, they do indicate that generally Trenton uses automobile modes less than the state and national averages, and there are a substantially lower number of people driving alone to work. For those who commute to work by automobile, a larger percentage are carpooling (see Figure 13). However, these numbers reflect people's primary mode choice and do not include secondary modes; for example, a person who walks to the train to commute to work will typically only be counted for the public transportation mode.

In the City of Trenton, of workers over 16 years old, 12 percent take public transportation to work (most [11 percent] commute by bus), 5 percent walk, and 0.8 percent bike. However, these rates vary across Trenton's neighborhoods (see Figure 14).

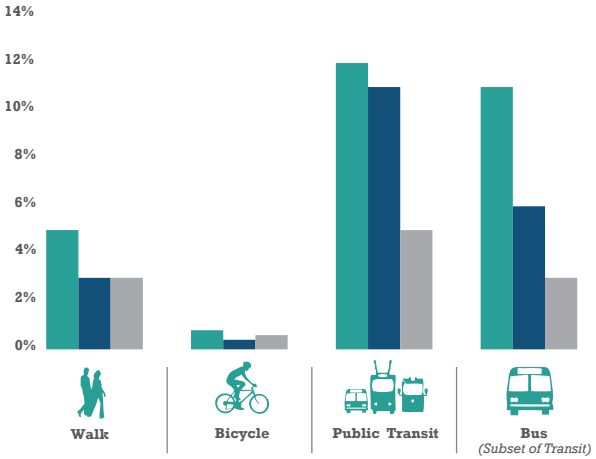
These patterns demonstrate that there is an existing need to improve walking and biking conditions and non-motorized access to transit.

FIGURE 13: Mode to Work: Trenton, New Jersey, and United States

DRIVING

Drive Alone	
Trenton	56%
New Jersey	72%
United States	76%
Carpool	
Trenton	21%
New Jersey	8%
United States	10%

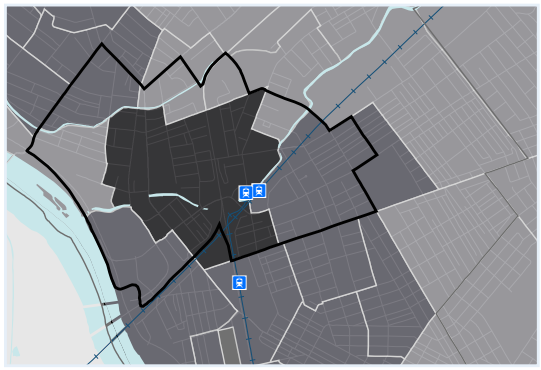
OTHER MODES



Source: 2009–2013 American Community Survey 5-Year Estimates

FIGURE 14: Journey to Work

WALK TO WORK



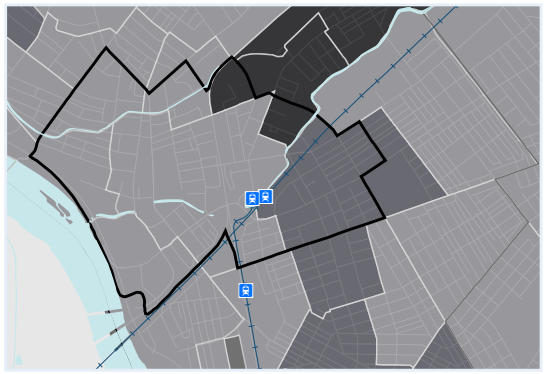
Selected Tract-Level American Community Survey 5-Year Profiles: 2007–2011

Percentage Commuting by Walking

- 0% – 5.5%
- 5.6% – 18.1%
- 18.2% – 39.2%
- 39.3% – 73.7%

These maps show by Census tract the rate that people are walking and bicycling to work in the City of Trenton. Walking to work is especially prevalent in the downtown districts. Biking to work is most common in the area directly northeast of the downtown district.

BICYCLE TO WORK



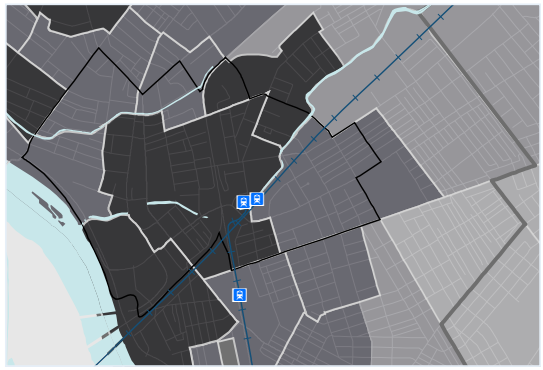
Selected Tract-Level American Community Survey 5-Year Profiles: 2007–2011

Percentage Commuting by Bicycle

- 0% – 1%
- 1.1% – 1.3%
- 3.9% – 8.9%
- 9% – 19.7%

Additionally, there are large portions of downtown residents with no or limited vehicle access: 18 percent of workers over age 16 have no vehicle available, and 32 percent have only one vehicle available in their household.

NO-VEHICLE HOUSEHOLDS



Selected Tract-Level American Community Survey 5-Year Profiles: 2007–2011

Percentage of No-Vehicle Households

- 0% – 9.7%
- 9.8% – 25.4%
- 25.5% – 45.2%
- 45.3% – 73.4%

18% OF TRENTON WORKERS LIVE IN A NO-VEHICLE HOUSEHOLD

ROAD OWNERSHIP

New Jersey has four tiers of road ownership: national, state, county, and local roads. Road jurisdiction determines who has authority and responsibility for maintenance and decision making about each roadway segment. Road jurisdiction is shown in Figure 15.

Local Trenton City Roads (shown in gray)*:* The majority of the roads in downtown Trenton are local roads such as Montgomery Street and Clinton Street. Trenton also has jurisdiction over major streets such as Broad and State streets.

Mercer County Roads (shown in red)*:* Chambers Street, Hamilton Avenue, State Street (east of Clinton Avenue) and Calhoun Street are owned by Mercer County. Mercer County also has jurisdiction over Warren Street and Pennington Avenue.

New Jersey State Roads (shown in royal blue)*:* Greenwood Avenue is a New Jersey-owned road that runs northeast through the downtown. State Route 129, a divided highway, runs parallel to the River LINE alignment, south of the Northeast Corridor. Limited-access State Route 29 runs along the shoreline of the Delaware River.

FIGURE 15: Road Jurisdiction

Sources: NJDOT, DVRPC, Mercer County, City of Trenton

U.S. Roads (shown in dark blue)*:* US Route 1 runs through downtown Trenton from the US Route 1 toll bridge and Pennsylvania in the west. From this point, US 1 runs northeast through downtown Trenton. NJDOT assumes responsibility for maintaining U.S. roads in New Jersey. Although Warren Street and Broad Street are portions of US Route 206 through downtown Trenton, the city and county have jurisdiction, as shown in Figure 15.

Calhoun Street Bridge

Lower Trenton (Trenton Makes) Bridge

Trenton Morrisville Route 1 Toll Bridge

Photo Credits: Delaware River Joint Toll Bridge Commission

BRIDGES

Three different Delaware River crossings connect Trenton and Morrisville, Pennsylvania, and are all controlled by the Delaware River Joint Toll Bridge Commission: The Lower Trenton Bridge (also known as the "Trenton Makes" bridge), the Trenton-Morrisville Route 1 Toll Bridge, and the Calhoun Street Bridge.

- The Calhoun Street Bridge was constructed in 1884 and renovated in 2010. Bicyclists and pedestrians can cross using a 5.5-foot sidepath on the northern side.

- The Lower Trenton Bridge was built in 1928 and features the iconic "Trenton Makes The World Takes" sign. Bicyclists and pedestrians can use the eight-foot separated sidepath on the northern side. Signage instructs bicyclists to walk their bikes.

- The US 1 bridge was built in 1952 and charges a toll to motorists entering Pennsylvania. No bicyclists or pedestrians are allowed on this bridge.

Additionally, bridges in Trenton cross US 1, the Northeast Corridor rail line, the Assunpink Creek, and the D&R Canal.

PUBLIC TRANSPORTATION

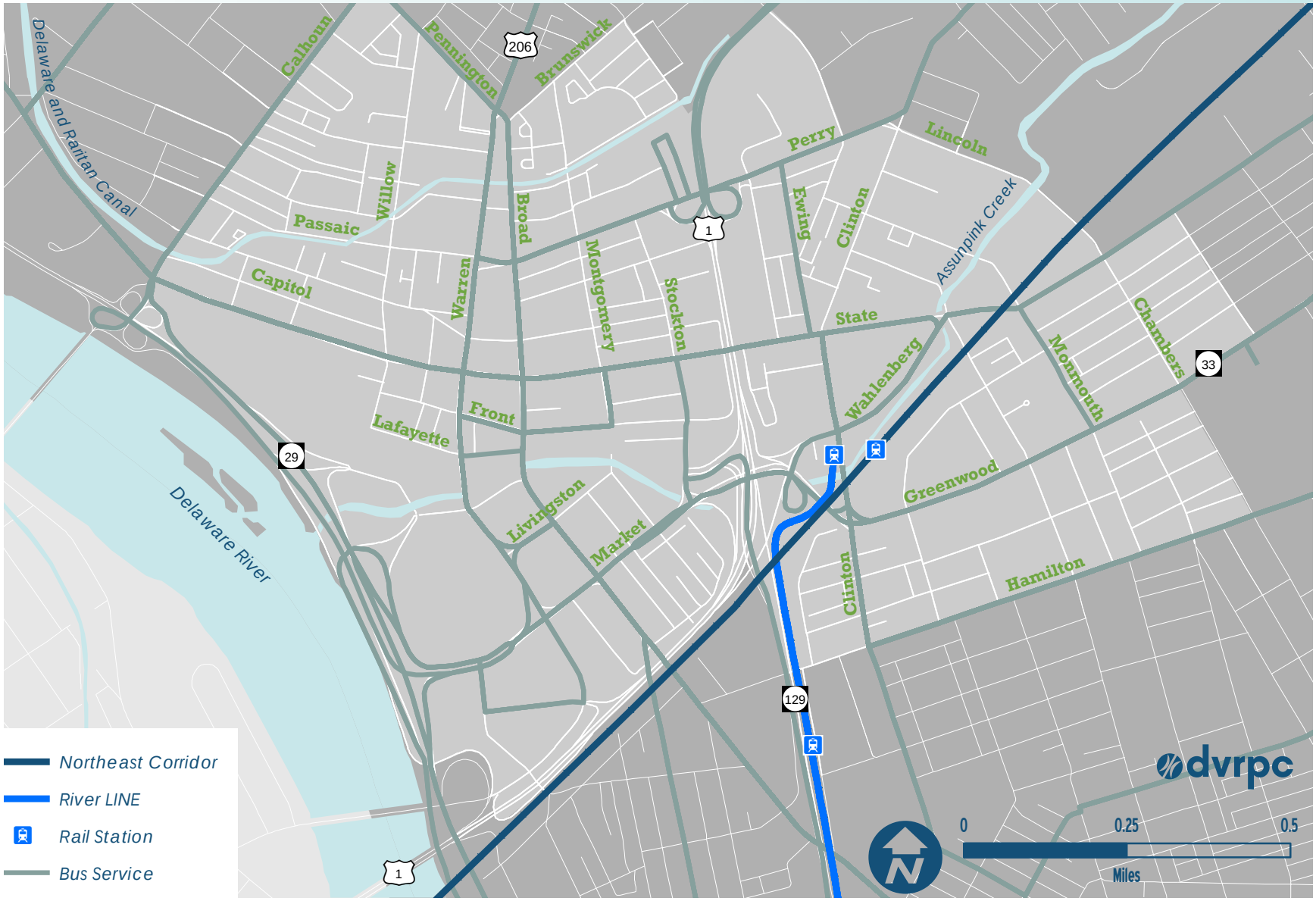
Trenton Transportation Center, located on Wallenberg Avenue between Clinton Avenue and East State Street, is a major hub for bus and train services. The transportation center was built in 1891 and renovated in both 1972 and 2009. The transportation center has train connections to New York, Philadelphia, Washington, DC, and other cities in New Jersey through NJ Transit, SEPTA, and Amtrak. Approximately 60 trains serve the station daily. The River LINE, a light rail line between Camden and Trenton that opened in 2004, also terminates adjacent to the Trenton Transportation Center.

Twelve NJ Transit bus routes serve Trenton, 10 of which serve the transportation center. Route 409 connects Trenton to Philadelphia and Camden, while the other routes are more local ones. Additionally, one SEPTA bus (Route 127) serves Trenton and travels to Oxford Valley Mall in Pennsylvania.

The above routes, lines, and stations are shown in Figure 16.

Trenton Transportation Center
Photo Credit: Ron Reiring

FIGURE 16: Existing Public Transit Service



Sources: NJDOT, DVRPC, Mercer County, City of Trenton

TRAFFIC VOLUMES

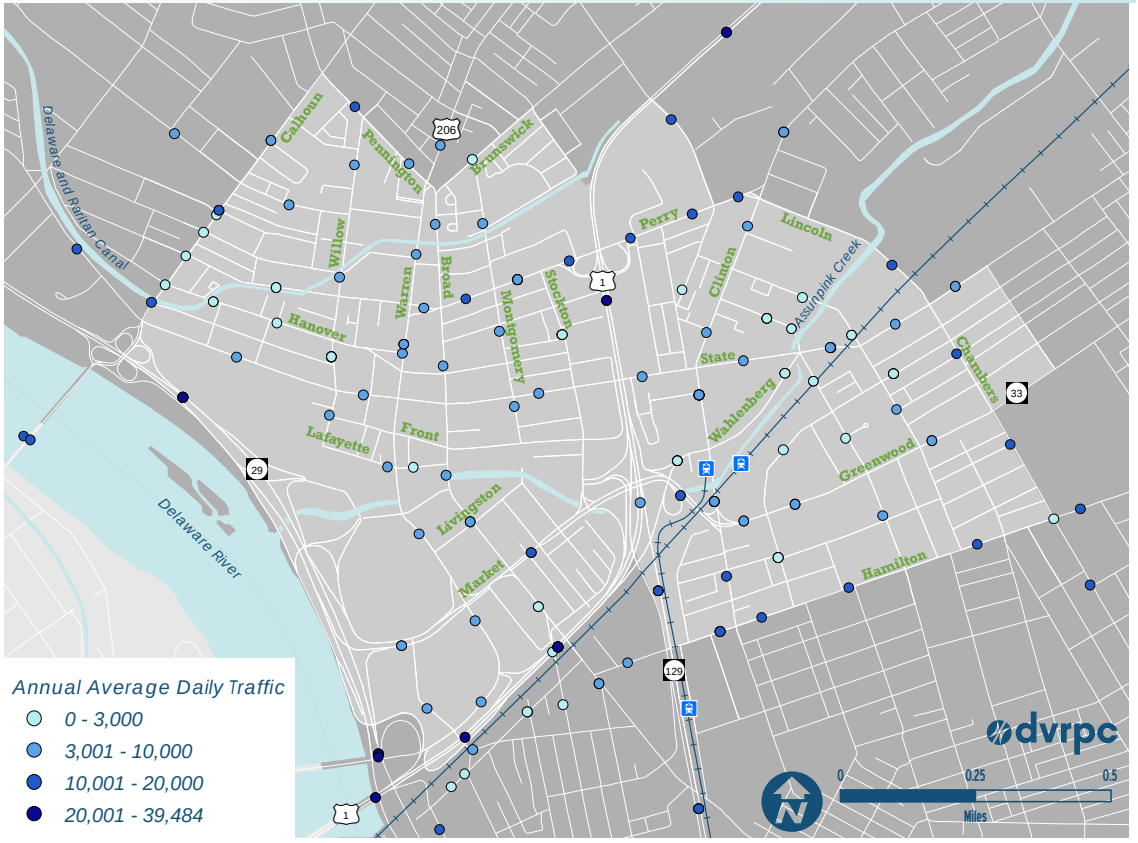
The highest vehicle volumes in downtown Trenton are on US 1 and NJ 29. Market Street between these two roadways also carries high volumes of vehicular traffic.

The second highest traffic volumes are on the major east-west river crossings: Calhoun Street and US 1. Other streets with high vehicle volumes include NJ 129, Perry Street, Greenwood Street, Chambers Street, and South Broad Street.

The recommendations in this plan are made in response to the existing traffic volumes and speeds. On roadways with high speeds or high volumes of motorized traffic, more separation and road markings are necessary to make them safer and more comfortable for bicyclists and pedestrians (buffered or protected bicycle lanes, and pedestrian islands, for example).

Roads with lower traffic volumes and speeds are generally safer and more comfortable for people riding bicycles and walking, and therefore less physical separation is typically necessary. Standard bicycle lanes, neighborhood bicycle boulevards, and standard sidewalks and crosswalks are generally more appropriate on these streets.

FIGURE 17: Downtown Trenton Traffic Volumes



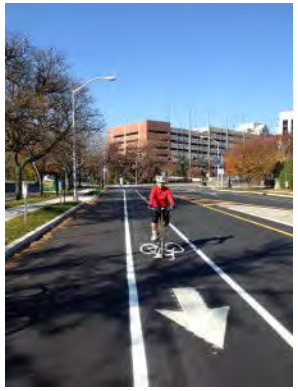
Note: Volumes are per direction for divided roadways

Sources: NJDOT, DVRPC, Mercer County, City of Trenton

Existing Bicycle Network

Trenton's current on-road bicycle network consists of bicycle lanes on a few high-traffic streets within southwest downtown near the US 1 Bridge and the downtown government district (see Figure 18). These streets include **New Warren Street, Market Street, Lafayette Street, and Broad Street.**

Despite the bicycle lanes, these streets can be uncomfortable for bicyclists due to high speeds and traffic volumes. The city currently does not have any other types of on-road bicycle infrastructure, such as protected bicycle lanes, which would make cyclists more comfortable on these roadways and attract new bicyclists. The existing facilities do not provide full access to the destinations downtown or a full network of facilities for bicyclists.



Warren Street Bicycle Lane in downtown Trenton

Photo Credit: Trenton Cycling Revolution

Definitions

Mixed Traffic Route

Mixed traffic routes have lower traffic volumes and speeds and are typically narrower streets, where bicycle traffic mixes in the same lane as automobile traffic. There is no space dedicated to bicycle traffic.

The two main types of treatments in the plan for these streets are advisory bicycle lanes and neighborhood greenways or bicycle boulevards. Advisory bike lanes are delineated with skip-stripe bike lane markings, and the center line on the road is omitted. Neighborhood greenways are designed using pavement markings, signs, and speed and volume management techniques to give bicyclists the travel priority.

A neighborhood greenway street in Portland, OR
Photo Credit: Neighborhood Notes

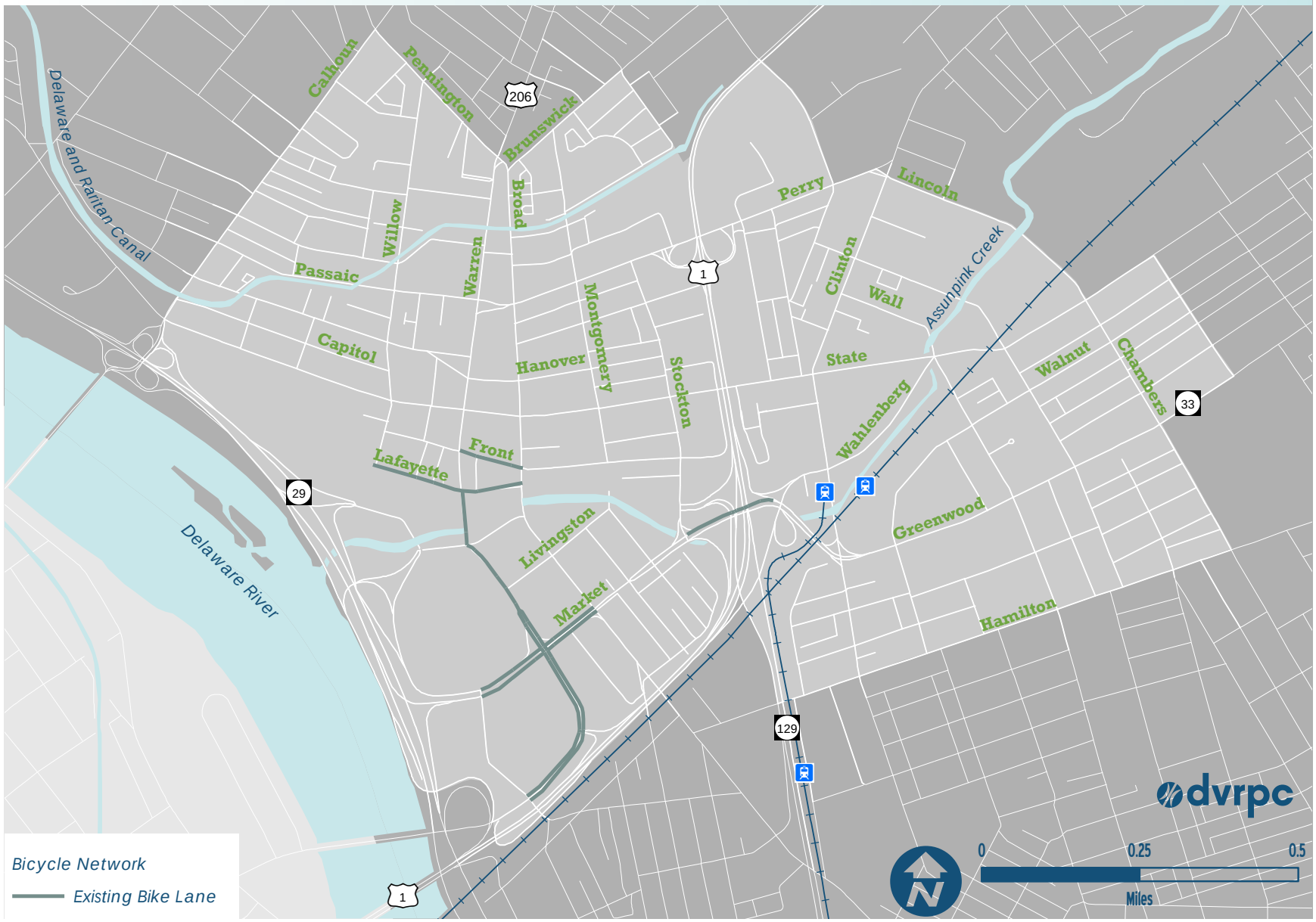
Dedicated Bicycle Facility

A dedicated bicycle facility is a portion of the roadway designated by striping, signing, and pavement markings for the exclusive use of bicyclists.

A standard bicycle lane has two lines of white paint to indicate the lane, while buffered or physically separated lanes have additional lane markings, such as a painted buffer, bollards, or other physical barriers, or a raised surface.

Physically separated lane in Chicago, IL
Photo Credit: People for Bikes

FIGURE 18: Existing On-Street Bicycle Network



Sources: NJDOT, DVRPC, Mercer County, City of Trenton

BICYCLE AND PEDESTRIAN COUNTS

To measure existing levels of bicycling and walking in downtown Trenton, DVRPC conducted bicycle and pedestrian counts at 10 locations in and adjacent to the study area. DVRPC chose these locations based on the presence of trip generators, as well as input from the stakeholder group. In each case, both sides of the street and both directions of travel were counted.

Pedestrians were counted at each location for a seven-day period by infrared sensors that detect the presence of a pedestrian based on their body heat signature. Bicycle counts were taken in two ways because of the particular behaviors that staff observed during field work. Across the study area, but especially in the core of downtown, most bicycling was being done on the sidewalk.

DVRPC's standard procedure for counting bicyclists is to use pneumatic tubes placed in the cartway. It is agency practice not to place these tubes on the sidewalk, due to issues of safety and liability. So to effectively measure levels of bicycling, a two-pronged count strategy was used. Pneumatic tubes were laid in the roadway at each location. These tubes gathered data for a seven-day period. Video cameras were also used to capture all bicycle activity at each count location. The video was then manually transcribed to arrive at a one-day bicycle count at each location. This is an important data point since **video revealed that at some locations, as much as 60–70 percent of bicycle traffic was using the sidewalk.**

This behavior is important to consider when selecting facilities for each road. A new in-street facility should provide a level of protection, comfort, and safety similar to that of a sidewalk. A new facility should be clearly dedicated to bicycle traffic in order to change existing behavior and convince bicyclists to use it.

The counts inform the treatments recommended in the plan. The clearest example of this is that the large number of pedestrians crossing at the intersection of Hamilton Avenue and Anderson Street, partially as a result of students traveling to and from Trenton Central High School, necessitates large-scale interventions to accommodate demand and improve pedestrian safety.

Count locations and totals are shown in Table 2. More detailed count information can also be found at: www.dvrpc.org/webmaps/pedbikecounts.

Video count location at Hamilton Ave. and Anderson St. Photo Credit: DVRPC

TABLE 2: Bicycle and Pedestrian Counts

Location	Bicycle								Pedestrian			
	N		S		E		W		N	S	E	W
	P	V	P	V	P	V	P	V				
1. Warren between Hanover and State		19	38	41					636	771		
2. Broad between Hanover and State	99	129							1001	4617		
3. State between Warren and Broad					19	73	19	75			3002	2427
4. Perry near Montgomery and Stockton					22	39	14	41			269	591
5. Hamilton near Anderson					27	66	36	69			1618	491
6. Greenwood and Chambers					12	37					932	817
7. Hamilton and Broad	28	69	31	76							1370	462
8. State between Stockton and Canal					26	98	41	111	1370	462		
9. Calhoun between State and Capitol	5	15	19	16					1165	1651		
10. Calhoun between Spring and Belvidere	10	23	19	31							155	334

Key

Low
Medium
High

Types of Bicycle Counts

P Pneumatic Count - 24-hour average over one week using pneumatic tubes

V Video Count - 24-hour video recording, manually transcribed

Traffic Direction

N North **E** East

S South **W** West

Count Dates

Pedestrian May 4, 2014 - May 20, 2014

Bicycle May 5, 2014 - June 3, 2014

Source: DVRPC

FIGURE 19: Bicycle and Pedestrian Count Locations

Bicycle and Pedestrian Count Location

Sources: NJDOT, DVRPC, Mercer County, City of Trenton

Existing Trail Network

An inventory of Trenton's existing trail network was the first step in developing trail recommendations. Downtown Trenton has many trails that converge within its limits including, the Assunpink Greenway, D&R Canal, and Delaware River Heritage Trail. Existing facilities are shown in Figure 20.

The historic D&R Canal is an important regional trail facility because of the towpath alongside it. The towpath and its extensions connect Milford to New Brunswick and run through the heart of Trenton. There are a number of proposals for other extensions of the D&R Canal Trail.

The Assunpink Greenway is a partially completed linear park maintained by the City of Trenton along the Assunpink Creek.

The Delaware River Heritage Trail is a partially completed 60-mile loop that circles the Delaware River. This trail is intended to connect 24 communities, including Trenton, Palmyra, Burlington, and Levittown.

D&R Canal Towpath
Photo Credit: DVRPC

Definition: Multi-Use Trails

Multi-use trails are off-road facilities that often accommodate all types of non-motorized users. They can be paved or unpaved and should be at least 10 feet in width. Multi-use paths are most frequently used for recreation but can also provide valuable links to transit, employment, retail, etc. Costs can vary substantially based on construction materials, right-of-way acquisition, and other considerations. Because of their complete separation from vehicular traffic, these facilities provide the most comfort and safety for users and are very low stress.

TABLE 3: Existing Trails

D&R CANAL TOWPATH AND EXTENSION	The D&R Canal is a historic towpath that runs along the canal from Trenton to New Brunswick. Maintained by the Delaware and Raritan Canal Commission.
ASSUNPINK GREENWAY	The greenway runs along the Assunpink Creek through downtown Trenton. There are plans for expansion further east in the future. Maintained by the City of Trenton.
DELAWARE RIVER HERITAGE TRAIL	Upon completion, this 60-mile loop will connect 24 communities along the Delaware River in New Jersey and Pennsylvania, such as Trenton, Palmyra, Burlington, and Levittown. Maintained by the Delaware and Raritan Canal Commission Delaware River Greenway Partnership.

Source: DVRPC

FIGURE 20: Existing Trail Network

Sources: NJDOT, DVRPC, Mercer County, City of Trenton

NON-MOTORIZED CRASH LOCATIONS

From 2008 to 2012, there were 79 reportable crashes in downtown Trenton involving pedestrians and 28 involving bicyclists, constituting 3.6 percent and 1.3 percent of total reportable downtown crashes, respectively.

Three pedestrian fatalities occurred during this time period, all in dark conditions. There were no fatal bicycle crashes. In the entire City of Trenton, there were 218 pedestrian crashes and 68 bike crashes, 36 percent of which occurred in the downtown boundaries.

In the state of New Jersey, 4.4 percent of all collisions involved pedestrians and 2.8 percent involved bicyclists during the 2008–2012 time period. **Approximately 10 percent of all New Jersey pedestrian crashes occurred in the City of Trenton.**

FIGURE 21: Bicycle and Pedestrian Crashes in Downtown Trenton, 2008–2012

Downtown Trenton Crash Summary: 2008–2012

79	PEDESTRIAN CRASHES
3	PEDESTRIAN FATALITIES, ALL OCCURRING IN DARK CONDITIONS
28	BICYCLE CRASHES

Sources: NJDOT, DVRPC, Mercer County, City of Trenton

Existing Pedestrian and Crosswalk Conditions

As a historic urban center, downtown Trenton has a mostly complete sidewalk network. However, there are many intersections that do not have crosswalks and Americans with Disabilities Act (ADA)-compliant curb ramps. This is particularly important in high-volume pedestrian corridors, intersections near schools, and intersections near recreation areas.

Additionally, Trenton must make all curb ramps ADA-compliant by 2016. This requires identifying intersections that are not currently in compliance. Figure 22 shows the results from the crosswalk and curb ramp survey conducted for this plan. Conditions were evaluated in the following ways:

CROSSWALKS

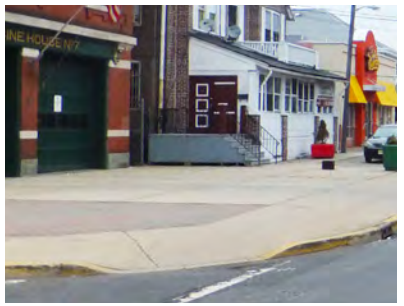
If a crosswalk was degraded or not present, it is indicated with either a red or yellow 'X' in Figure 22. Crosswalks were evaluated by intersection; therefore, if a crosswalk was missing or faded on any leg of the intersection, the entire intersection is labeled accordingly. Crosswalks composed of brick are also shown on the map. During discussions with stakeholders, issues related to brick crosswalk maintenance and conditions were brought up several times. Moving forward the city should clarify its policy and design standards for crosswalk materials.

CURB RAMPS

As with crosswalks, curb ramps were evaluated by intersection. If one corner of the intersection was missing a ramp or the ramp was determined not to be ADA compliant, the whole intersection is marked as such. Figure 22 displays intersections with either a red or yellow 'O' if any curb ramp was missing or determined to not be ADA compliant. It is important to note that with assistance from NJDOT, the City of Trenton has been aggressively constructing and replacing curb ramps. The survey for this plan was completed in October 2013 and does not reflect this more recent work. Updated data was not made available for use in this plan.

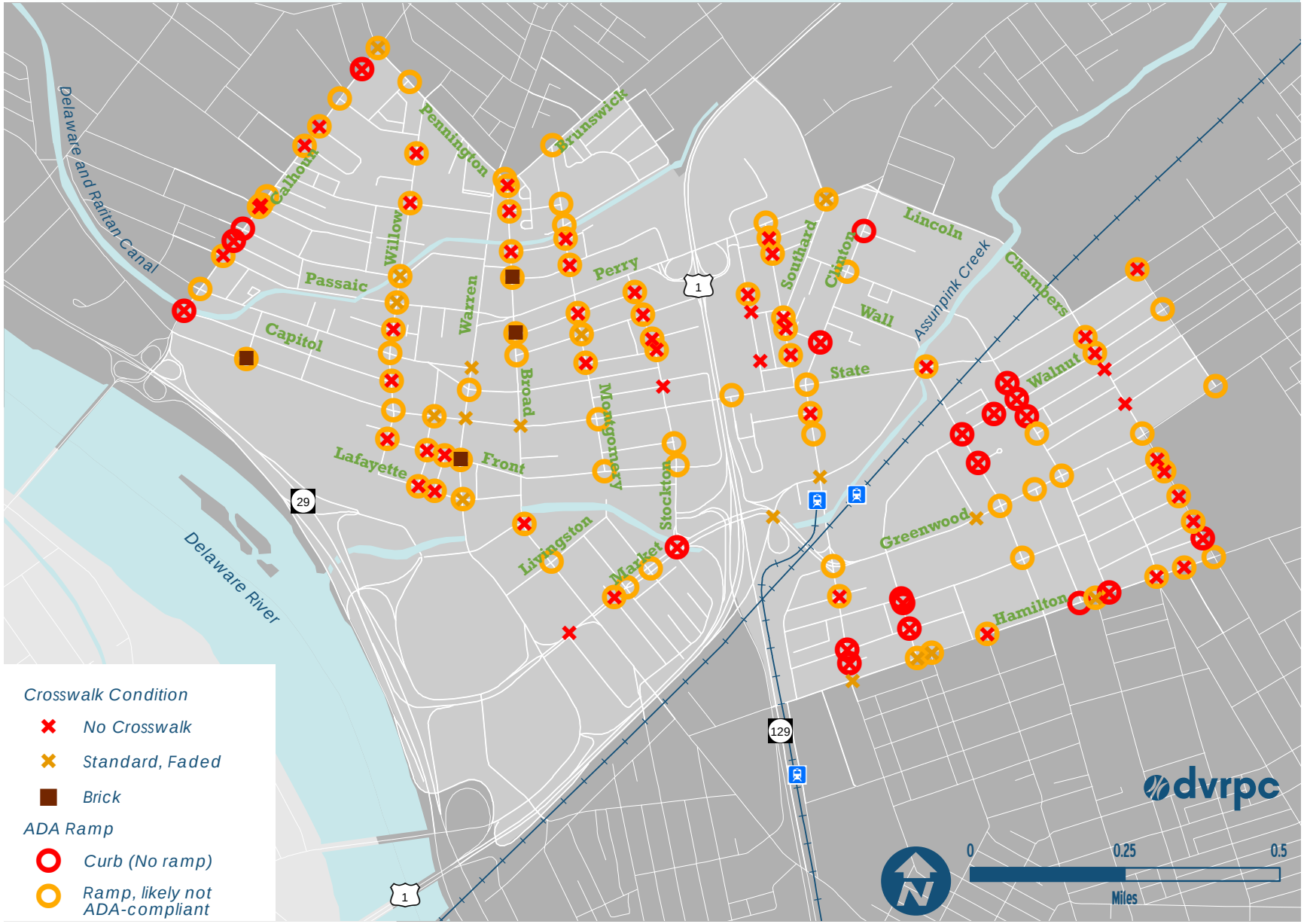
Additionally, according to the Trenton Department of Public Works, it is policy not to paint a crosswalk unless it is connecting two ADA-compliant curb ramps. Therefore, for many intersections, ramps would need to be constructed prior to crosswalks being painted.

(Top) Worn crosswalk on Walnut Avenue; (Bottom) Degraded road conditions at Front and Barrack
Photo Credit: DVRPC



Problems with brick sidewalks and crosswalks include uneven surfaces and frequent maintenance needs.
Photo Credit: DVRPC

FIGURE 22: Crosswalk and Ramp Conditions



Sources: NJDOT, DVRPC, Mercer County, City of Trenton

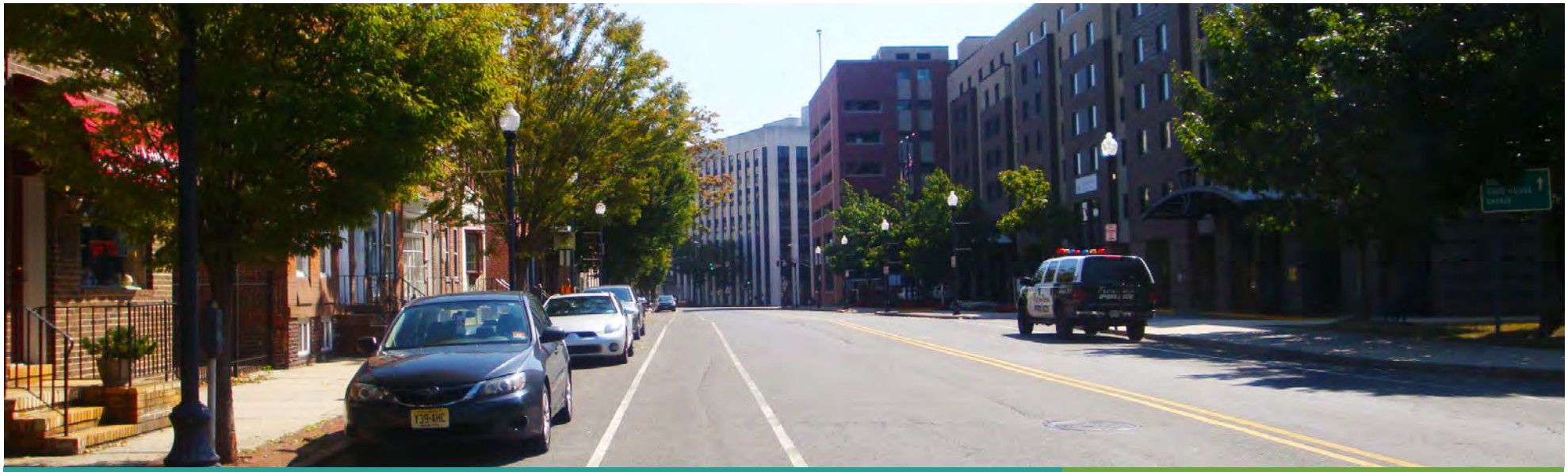


PHOTO CREDIT: DELAWARE VALLEY REGIONAL PLANNING COMMISSION

dvrpc

CHAPTER 3
recommendations

This section proposes a set of recommendations that will enhance bicycle and pedestrian mobility in downtown Trenton.

Chapter 3: Recommendations

Recommendations

Based on the existing land use, demographics, and transportation networks, a set of bicycle and pedestrian recommendations was developed and is discussed in this section.

This plan separates recommendations into four categories:

BICYCLE RECOMMENDATIONS

On-road bicycle facilities in this plan vary based on the different types of streets within downtown Trenton. Recommendations include both dedicated bicycle facilities and mixed traffic routes.

TRAIL RECOMMENDATIONS

The trail recommendations summarize proposed expansions of the existing multi-use, off-road trail network, as well as discussing places where gateways can be added to link the trail network to the on-road bicycle network.

PEDESTRIAN AND INTERSECTION RECOMMENDATIONS

In this section, five different types of intersections are examined to give sample recommendations on what kinds of bicycle and pedestrian improvements can be implemented at intersections.

OTHER RECOMMENDATIONS

These recommendations include bicycle parking, wayfinding signage, supportive policies, and areas for further study.

These recommendations work together to create a complete bicycle and pedestrian network and a supportive environment for active transportation in Trenton.

PLAN PRIORITY RECOMMENDATIONS

In this plan, priority recommendations are noted with the symbol shown below. These priority recommendations are first-action steps that may be the most transformative or are local priorities. These priorities are based on steering committee and public feedback.

Design Guidelines

DESIGN MANUALS

Most standards and guidelines for bicycle and pedestrian facilities have been updated in the past decade. These standards guide the various sections of bicycle and pedestrian recommendations in this plan.

Manuals outline standard treatments that can be used as guidance for specific locations. These manuals are generally updated every few years and offer different standards with each update. For example, new treatments become more popular and are added, while others are found less desirable.

The manuals work together to offer bicycle and pedestrian improvements in different environments and scales.

The **American Association of State Highway and Transportation Officials (AASHTO)** created the ***Guide for Development of Bicycle Facilities,*** with the most recent edition updated in 2012.

The ***Manual on Uniform Traffic Control Devices (MUTCD),*** issued by the Federal Highway Administration (FHWA), is another reference for designing bicycle and pedestrian facilities. This manual details standards for signage, pavement markings, and other traffic control devices.

The **National Association of City Transportation Officials (NACTO)** published two manuals that pertain to urban environments: ***The Urban Bikeway Design Guide*** and the ***Urban Street Design Guide.*** These guides generally represent the most current state of practice in U.S. bicycle facility design.

The plan's recommendations encourage the urban treatments found within NACTO, and to a lesser extent AASHTO, and *MUTCD* manuals. These guides are specifically sanctified as design references in the city's complete streets resolution (see Appendix A).

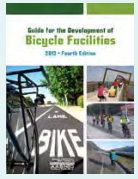
Another guide, the Dutch **CROW *Design Manual for Bicycle Traffic,*** provides advance guidance for urban settings, *some of which are* compatible with U.S. standards and some of which would need FHWA experimental approval.

The **NJDOT** also published the ***Bicycle Compatible Roadways and Bikeways Planning and Design Guidance*** in 1996 with guidance from previous versions of the AASHTO and *MUTCD* manuals.

Still, engineering judgment remains an important element for innovation and in determining appropriate treatments in each location.

Design Manuals by Agency

FHWA



AASHTO

NACTO

NACTO

CROW

NJDOT

FHWA Experimental Standards

Although many of the design treatments in the NACTO guide are not currently included in the *MUTCD*, FHWA has encouraged municipalities and road owners to be flexible when designing bicycle and pedestrian facilities and go beyond the minimum requirements in order to provide "convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate."

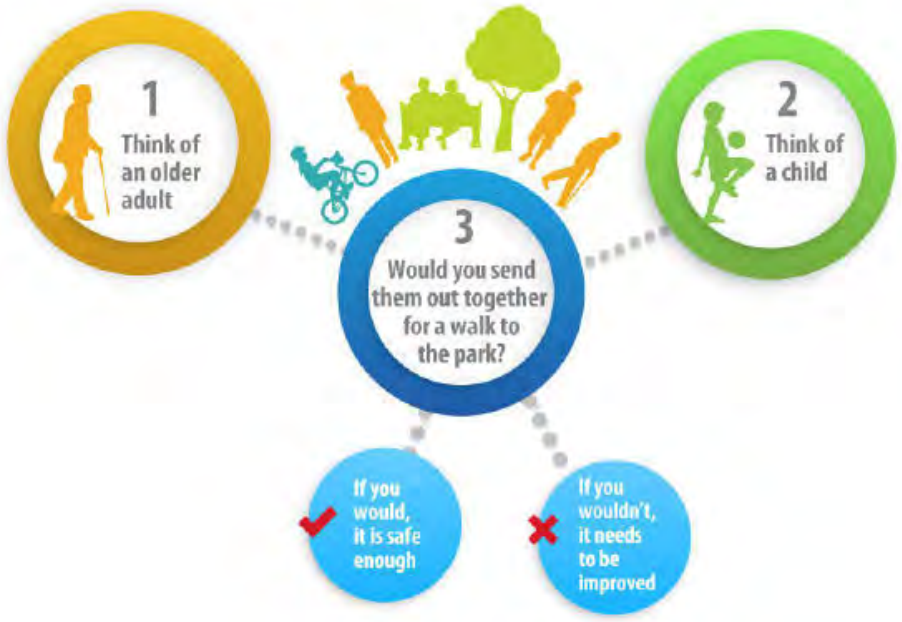
In a memo with the subject "Bicycle and Pedestrian Facility Design Flexibility," FHWA states its support for the use of these other manuals and a general flexibility in designing for active transportation, especially in dense urban environments. In fact, the vast majority of treatments presented in the NACTO guides are either allowed or not precluded by the *MUTCD*.

Many other treatments are being considered in the current rule-making cycle for a new edition of the *MUTCD*. For traffic control devices that are presently non-compliant, FHWA encourages the piloting of treatments through the *MUTCD* experimentation process. This process is outlined in Section 1A.10 of the *MUTCD*.

Design for 8-80

One initiative to design safer streets is the 8-80 Cities project. The 8-80 Cities is a non-profit based on the principle that cities should be designed for people, whether 8 years old or 80 years old. When considering design proposals, options should be comfortable and safe for users between 8 and 80 years old.

Priorities of 8-80 include creating safe places to walk and sustain healthy lifestyles. A large part of their vision includes social equality in that streets should be for all users. The 8-80 projects not only focus on streets but also include creating safe park lands, trails, and open spaces.



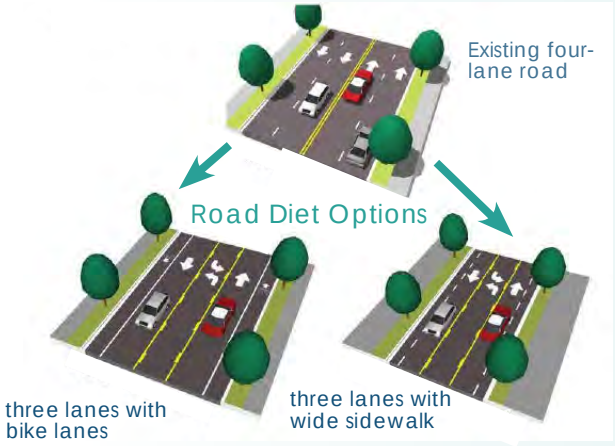
Graphic Credit: 8-80 Cities

Design Tool: Road Diets

Generally, road diets involve reallocating roadway space by removing vehicle travel lanes from a roadway and using that space for other modes or uses. One of the most common conversions is moving from a four-lane road to one with two through lanes and a center two-way left-turn lane, an example of which is shown below. By reducing lanes, other features such as bicycle lanes, widened sidewalks, or landscaped boulevards can be added to the right-of-way, resulting in fewer vehicle conflicts and improved safety outcomes.

Road diets can be used for streets of all widths. Two different examples are shown to the right.

SAMPLE FOUR-LANE ROAD DIET



Sample ways to road diet a four-lane road
Adapted from: https://www.pinterest.com/pin/295689531755839821/

PHILADELPHIA'S SPRUCE AND PINE STS

In 2009, Philadelphia implemented its first buffered bicycle lanes on a two-mile segment of Spruce and Pine streets. Within the 26-foot cartway, formerly with two automobile lanes and one parking lane, one vehicle lane was converted to a six-foot bicycle lane with a three-foot buffer. The parking remained the same at seven feet. These two one-way streets provide an integral east-west connection in Center City for bicyclists. The speed limit and signal progression speed was also reduced from 25 to 20 miles an hour. Despite a reduction of a vehicle lane, throughput remained constant at 6,000 vehicles, and the number of crashes has decreased by nearly 30 percent.

Before

After

Photo Credit: (Top) Google; (Bottom) Kyle Gradinger

EAST BOULEVARD IN CHARLOTTE, NC

East Boulevard stretches 1.6 miles and ranges from 60 to 100 feet wide. Prior to reconstruction, speeding on the road was a major concern. In a multi-phased project, Charlotte reduced travel lanes to one in each direction, with the remaining width used for bicycle lanes, a widened center turn lane, and pedestrian refuge islands at crosswalks. After implementation, speeds along the corridor declined without significant travel time increases, and businesses with outdoor dining have significantly increased due to the reduced traffic noise and greater separation from roadway activity.

Before

After

Photo Credit: City of Charlotte

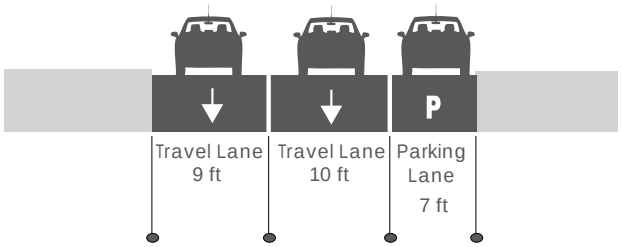
FIGURE 23: Road Diet Cross Sections

Spruce and Pine Streets

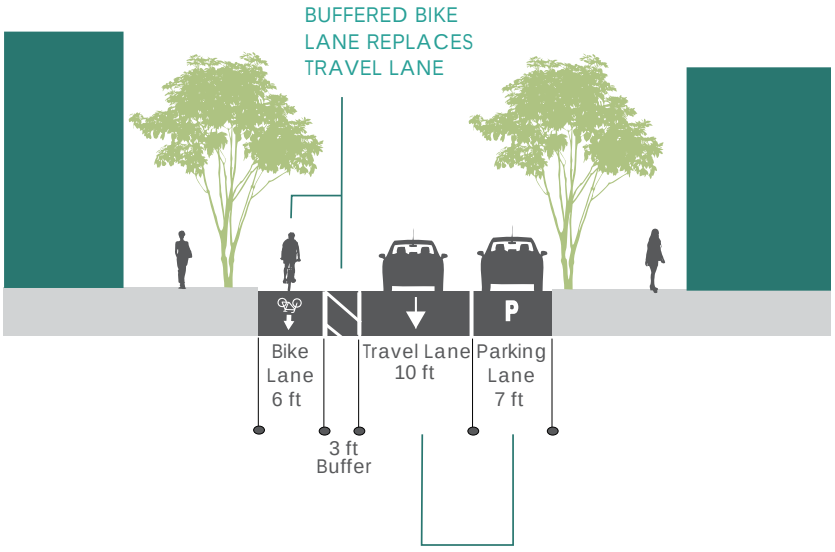
Philadelphia, PA

26-FOOT CARTWAY

BEFORE



AFTER

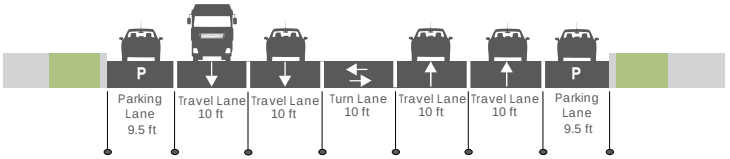


East Boulevard

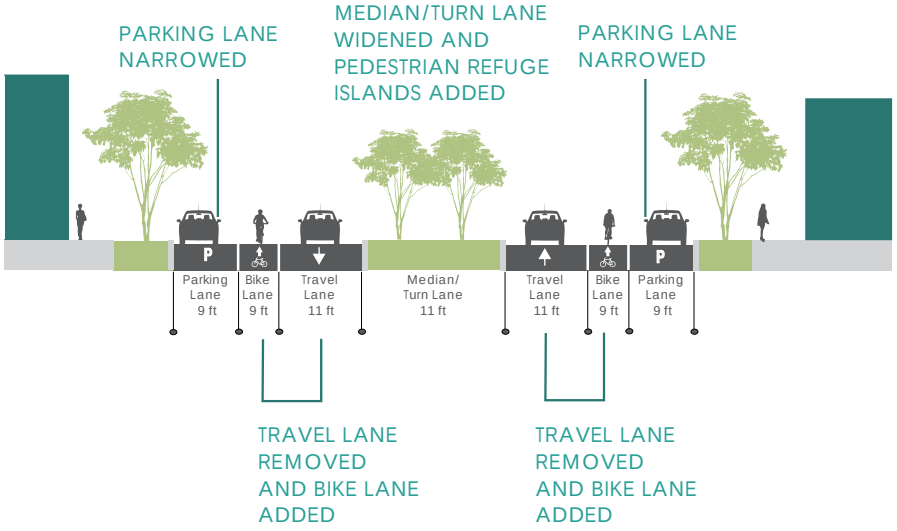
Charlotte, NC

60-100-FOOT CARTWAY

BEFORE



AFTER



Adapted from: Marc Schlossberg, John Rowell, Dave Amos, and Kelly Sanford

PHOTO CREDIT: DAN FATTON

BICYCLE
recommendations

Bicycle Recommendations

Bicycles are an increasingly used mode of transportation and recreation in cities across the United States. Today, as cities seek to offer more multi-modal transportation options, creating safe environments and networks for all users often includes retrofitting streets.

BICYCLE TRAFFIC LAWS

In New Jersey, every person riding a bicycle on a roadway is granted all the rights and are subject to all of the laws of a motor vehicle driver. Bicyclists must ride on the right side of the road, obey traffic controls, maintain a safe passing distance, and remain within the roadway. Bicyclists should also follow the rules of the road, such as riding with the directional flow of traffic.

Motorists also are required to treat bicyclists the same as other motorists when yielding and passing, and all road users must yield to pedestrians.

However, bicycles have different needs than those of automobiles. This is why creating facilities to accommodate bicycles is essential to increasing safety for all users. Bicycle facilities should lead bicyclists to follow rules for the greatest protection against legal liability or physical injury. Additionally, creating dedicated bicycle facilities has decreased illegal sidewalk riding in many cities, including Philadelphia.

EXISTING PLANS

Recent city plans have recommended bicycle and pedestrian improvements, such as the *Trenton Transportation Master Plan* (2004/2005). This plan suggests many improvements, such as bicycle parking, wayfinding, traffic calming, and landscaping. The *Trenton Station Linkage Plan* also examined bicycle and pedestrian connections to and around the Trenton Transportation Center (for more information, see page 62). The recommendations of this plan build on this previous work.

GOALS OF THE PROPOSED BICYCLE NETWORK

The location and type of bicycle facilities in downtown Trenton is based on the following goals:

Provide north/south and east/west connections

Trenton's downtown network needs routes that allow riders to bicycle in all directions.

Balance the needs of all road users

While making streets safe for bicycles is essential, other users must also be considered. Many recommendations can improve safety and reduce conflicts for all road users.

High-quality facilities with more separation attract new people to riding

People feel more comfortable with separated facilities. This plan aims to provide as many as possible given current road widths and traffic volumes.

Provide access to attractions and services

Ensuring that the network connects people to recreation, work, and education destinations is crucial. The network should allow people to safely bicycle to the places they want and need to go.

IMPROVEMENTS FOR NEW AND EXISTING USERS

The recommendations in the plan are meant to accommodate the widest group of bicyclists based on age, abilities, and level of comfort riding. Bicyclists are often treated as one user type; however, those who ride bicycles have many different purposes and confidence levels.

A common way to classify current and potential bicyclists is based on their attitudes toward bicycling. This methodology, established by Roger Geller, has four typologies:

- **Strong and Fearless:** These people will ride in any condition but are only a small percentage of the population.

- **Enthused and Confident:** These are more casual bicyclists who will ride in conditions that are perceived as safe. These riders usually feel comfortable riding in the street but will not travel more dangerous roads.

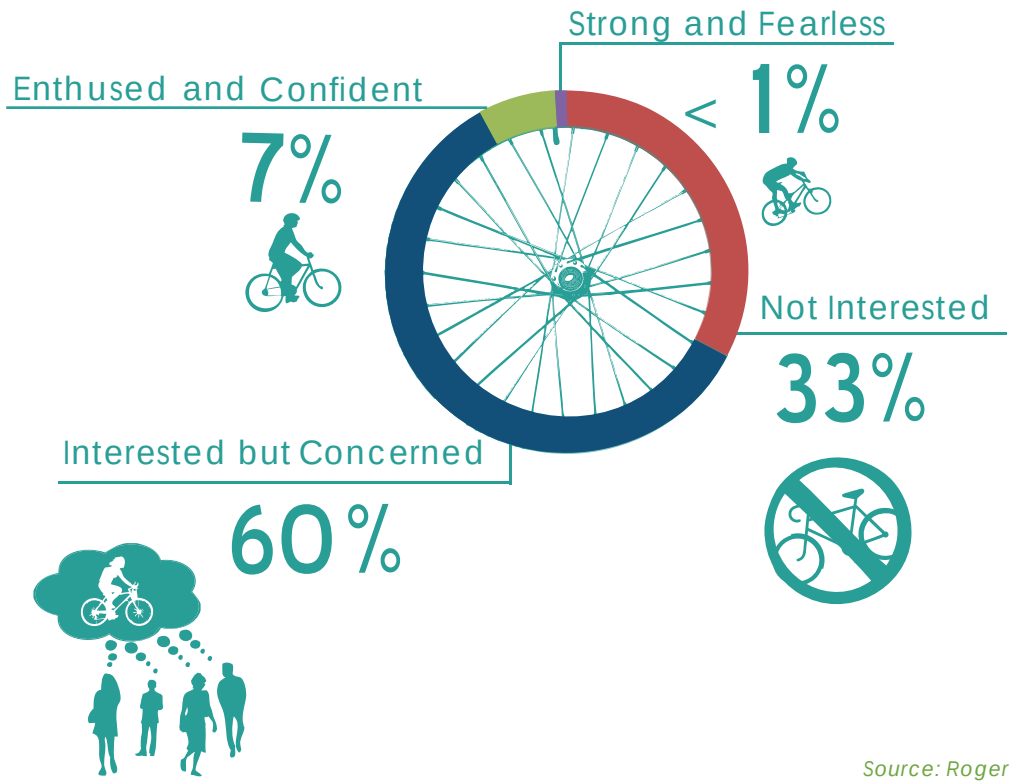
- **Interested but Concerned:** This portion of the population is considering riding a bicycle, and perhaps do ride occasionally, but are concerned about everyday safety and may not feel comfortable riding on facilities that are not separated from traffic. This is the largest group, and converting some of these people to confident bicyclists is key to increasing bicycle usage and providing real transportation options.

- **Not Interested (Also called "No Way, No How"):** For a variety of reasons, around one-third of the population is not interested in bicycling or not able to.

The comfort level of "interested but concerned" bicyclists increases significantly with a bicycle lane. Furthermore, it raises even higher with a protected bicycle lane (see Figure 25). Due to these different comfort levels, creating as many protected or buffered facilities as possible is important.

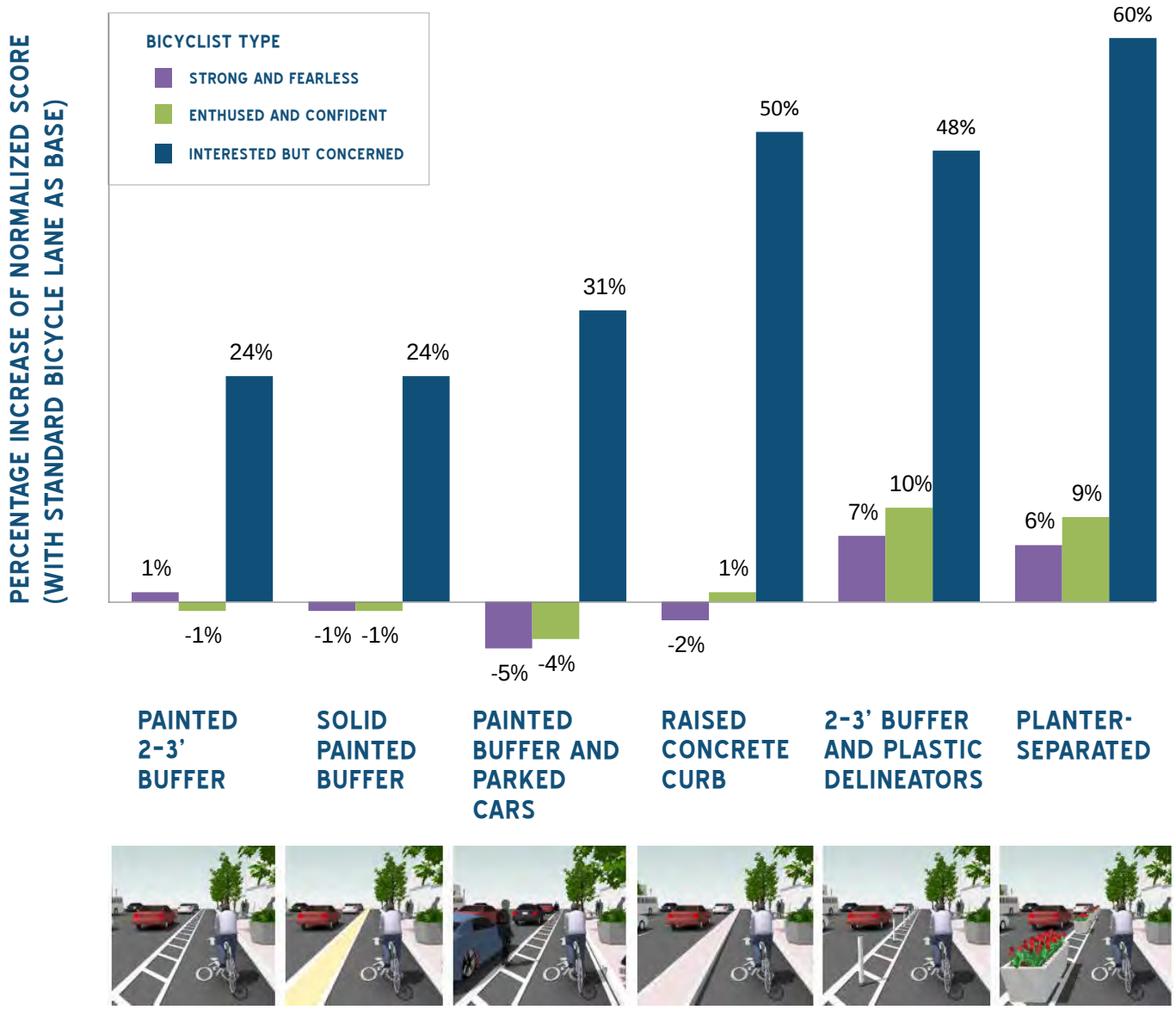
While some people may feel comfortable riding in mixed traffic or in standard bicycle lanes, the majority of people who are willing to bicycle feel more comfortable in separated facilities, like physically protected lanes.

FIGURE 24: Four Types of Bicyclists



Source: Roger Geller

FIGURE 25: Change in Stated Comfort from a Standard Bike Lane, by Bicyclist Type



Adapted from Christopher Monsere, "Early Adopters of the Protected Bicycle Lane in the United States: What Have We Learned?" (Presentation, March 19, 2015)

Proposed Facilities

Two groups of bicycle facilities are recommended in this plan: dedicated bicycle facilities and mixed traffic routes.

This plan offers general guidelines for the entire downtown area. However, there are some smaller pinch points (such as bridge crossings) that have specific concerns that need to be addressed separately.

Recommendations for streets of different widths in this plan vary. However, two general rules apply:

- ***Travel lanes of greater than 12 feet should be narrowed* to make space for other features, such as bicycle lanes, landscaping, or new turn lanes. Streets in Trenton have travel lanes as wide as 14 feet.** Narrower travel lanes have the added benefit of slowing travel speeds, and therefore reducing crash severity, without negatively affecting roadway capacity.

- **If the cartway is sufficiently wide, *buffered or protected bicycle lanes are preferred over standard bicycle lane treatments.*** Bicycle lanes should be five to seven feet wide. Buffers should be at least two feet wide but can be wider.

DEDICATED FACILITIES

Dedicated bicycle facilities are intended for higher-speed and higher -traffic streets. These facilities may be standard lanes, or preferably protected or buffered lanes. The proposed on-road network recommends different treatments based on road width, traffic volume and speed, and connections to other roads.

Dedicated facilities are proposed on many streets, including Broad Street, Warren Street, Calhoun Street, State Street, and Greenwood Avenue. Within this section, the plan separates recommendations by standard, and buffered or protected bicycle lanes on streets with either one- or two-way directional traffic.

Buffered bicycle lane in Chicago, IL
Photo Credit: John Greenfield

MIXED TRAFFIC ROUTES

Mixed traffic routes are a type of treatment that is intended for lower -traffic, narrower streets. Different treatments, such as creating "bicycle boulevards" (mixed traffic routes with aligned sharrows and other traffic calming features) or advisory lanes (lanes with a dotted line to indicate a bicycle lane that is also used by automobiles), may be used.

This plan recommends mixed traffic routes for a few streets, such as Clinton Avenue and Chestnut Street.

Advisory bicycle lanes in Minneapolis, MN
Photo Credit: Tom Bertulis

FIGURE 26: Recommended On-Road Bicycle Network

Sources: NJDOT, DVRPC, Mercer County, City of Trenton

Standard Bicycle Lanes

PLAN PRIORITY

HANOVER STREET AND STATE STREET

Description

Standard bicycle lanes are delineated by solidly striped lines and can be marked with a combination of bicycle symbols, directional arrows, and words. Lanes can range from five to seven feet wide and are located between a vehicular travel lane and parking or the curb, directing bicyclists to move with traffic. Green paint can be used to visually alert drivers and increase comfort for cyclists. It can also be used to draw attention to conflict zones.

Standard lanes are most appropriate on streets with more than 3,000 motor vehicles daily and speed limits that are between 25 and 35 miles per hour.

EXISTING FACTORS

Cartway width: 32–40 feet

FIGURE 27: Proposed Standard Bicycle Lane Locations and Visualization

Locations

PENNINGTON AVENUE
- Calhoun Street to Warren Street

HANOVER STREET
- Calhoun Street to Willow Street
- Warren Street to Stockton Street

MERCHANT STREET
- Stockton Street to Canal Street

LINCOLN STREET
- Clinton Street to State Street

CHAMBERS STREET
- State Street to Greenwood Avenue

STATE STREET
- Clinton Avenue to Hampton Avenue

MARKET STREET
- Broad Street to Clinton Avenue

GREENWOOD STREET
- Clinton Avenue to Quinton Avenue

HAMILTON STREET
- Broad Street to Clinton Avenue

BROAD STREET
- Livingston Street to Cass Street

Visualization

CHAMBERS STREET BETWEEN STATE STREET AND WALNUT STREET

Existing Conditions

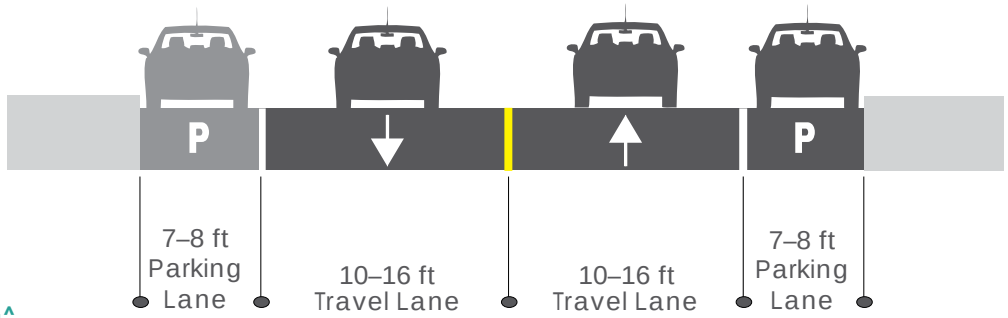
Recommendation: Standard bike lane with option of green paint

Photo Credit: DVRPC

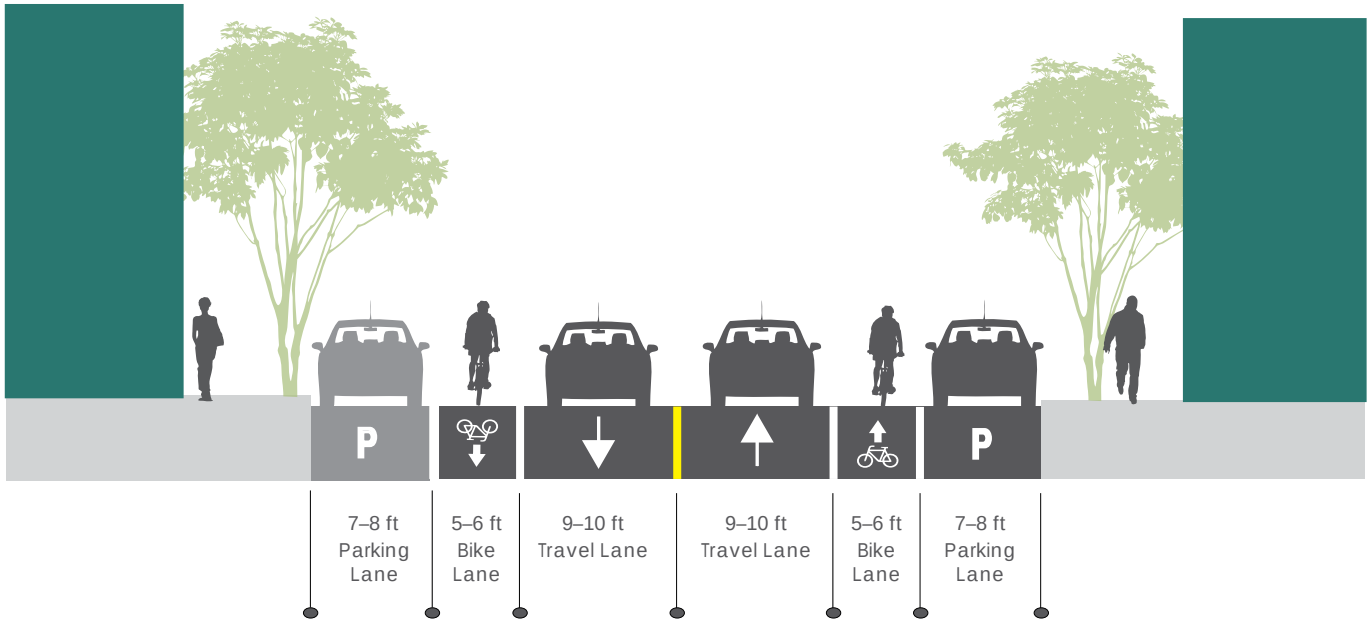
FIGURE 28: Standard Bicycle Lane Cross Sections

Existing Conditions*

Two Way Standard Bike Lane With Parking



Recommendations^



**Gray lanes indicate a varied condition between existing cross sections. Portions of Market Street also have additional travel lanes (not shown).*
^ While nine feet is the narrowest allowable width for a travel lane, it is highly recommended to remove a parking lane instead.

Separated or Buffered Bicycle Lane

Description

This type of treatment is suitable for the entirety of Calhoun Street in the downtown study area, along with portions of Greenwood Avenue and Front Street between Broad Street and Stockton Street.

These streets have no or one parking lane and currently have either three or four lanes of traffic.

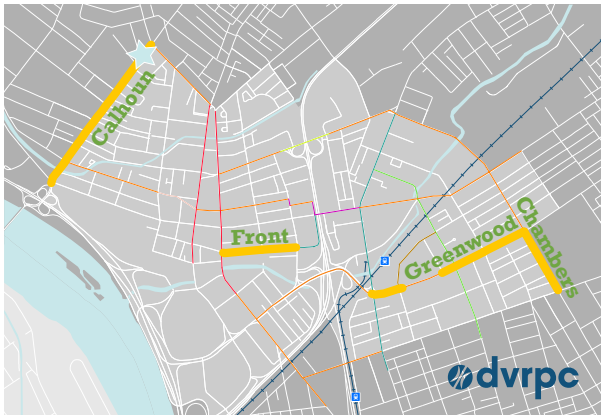
Five- or six-foot separated or buffered bicycle lanes are recommended on these streets. On streets with travel lanes greater than 10 feet, travel lane widths are reduced.

EXISTING FACTORS

Cartway width: 36–40 feet

FIGURE 29: Proposed Separated or Buffered Bicycle Lane Locations and Visualization

Locations



FRONT STREET

- Broad Street to Montgomery Street

GREENWOOD STREET

- Hollywood Avenue to Monmouth Street

CALHOUN STREET

West side:

Parking-Separated Lanes: Pennington Street to Louise Lane

Delineator-Separated Lanes: Louise Lane to Hanover Street

East side:

Buffered Bicycle Lane: Hanover Street to Pennington Street

CHAMBERS STREET

- Greenwood Avenue to Hamilton Avenue

Visualization

CALHOUN STREET AND PENNINGTON AVENUE - MONUMENT ELEMENTARY SCHOOL

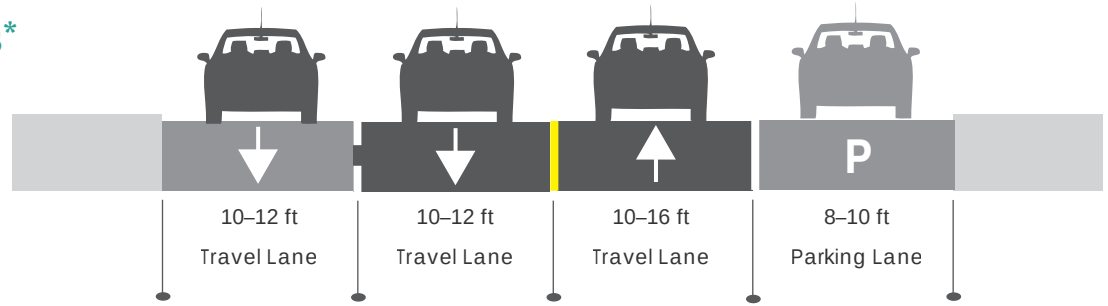
Existing Conditions

Recommendation: Separated or buffered bicycle lane

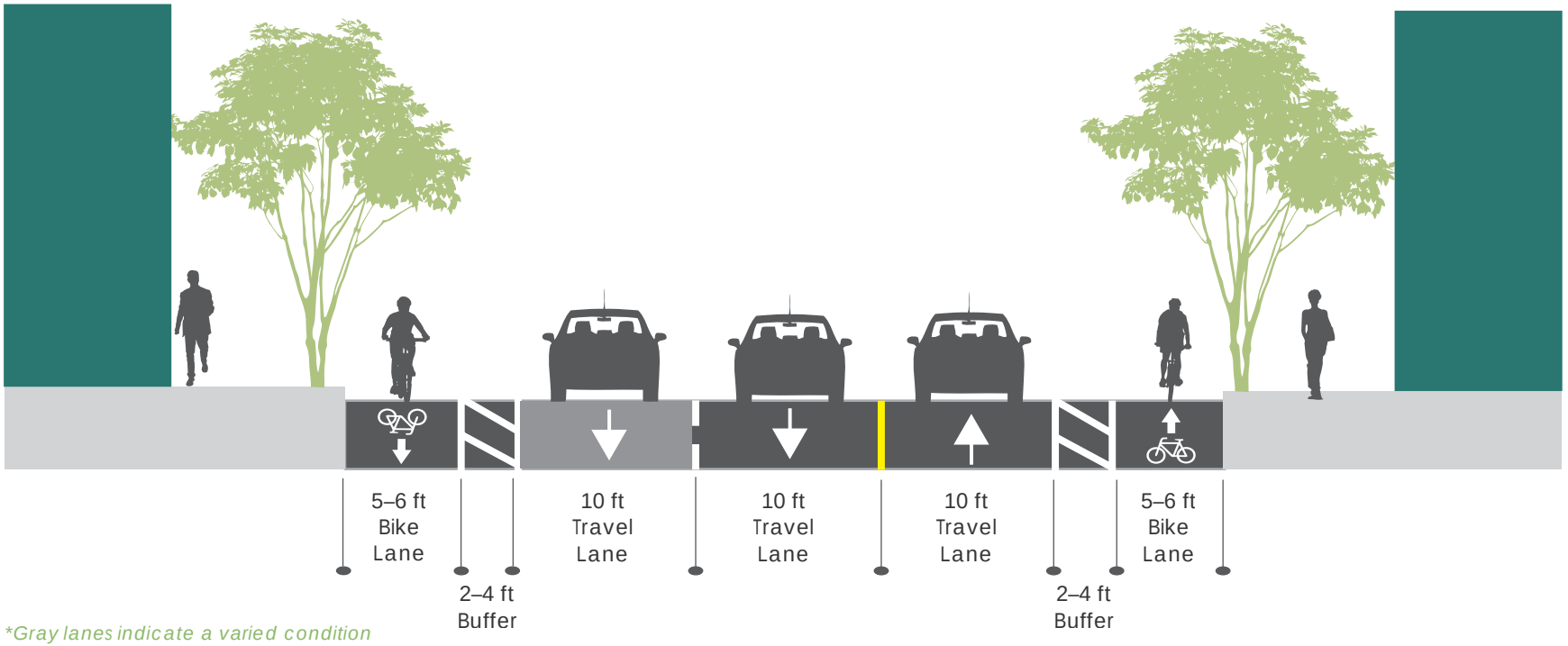
Photo Credit: DVRPC

FIGURE 30: Separated or Buffered Bicycle Lane Cross Sections

Existing Conditions*



Recommendations



Gray lanes indicate a varied condition between cross sections

Separated or Buffered Bicycle Lane on One-Way Street

PLAN PRIORITY

BROAD STREET AND WARREN STREET

Description

This type of treatment is recommended for the entire stretch of Broad Street, as well as Warren Street.

The buffered or protected bicycle lane is recommended because of high vehicular volumes. Because of bus traffic and being one-way, bicycle lanes on these streets should be on the left side to reduce conflicts.

At key intersections and conflict points, green paint should be used to make bicyclists and bicycle lanes more visible.

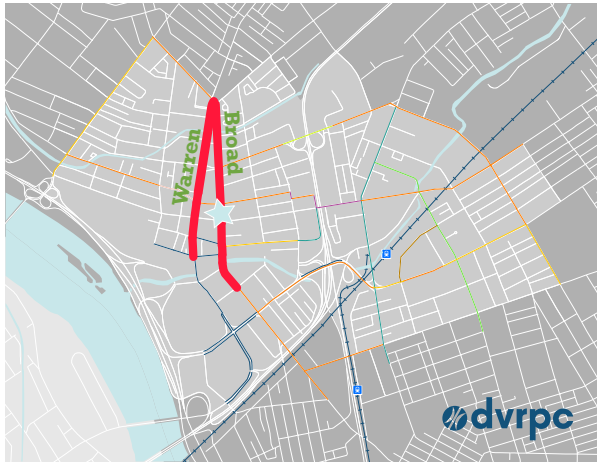
EXISTING FACTORS

1-Way Traffic	2 Travel Lanes	0–2 Parking Lanes

Cartway width: 28–44 feet

FIGURE 31: Proposed Separated or Buffered Bicycle Lanes on One-Way Streets Locations and Visualization

Locations



At Assunpink Bridge No Parking ®

BROAD STREET:

- Front Street to Assunpink Drive

One Existing Parking Lane

BROAD STREET

- Pennington Avenue to Front Street

WARREN STREET

- Front Street to Lafayette Street

Two Existing Parking Lanes

BROAD STREET

- Assunpink Drive to Livingston Street

WARREN STREET

- Pennington Avenue to Front Street

Visualization

NEAR BROAD STREET AND STATE STREET

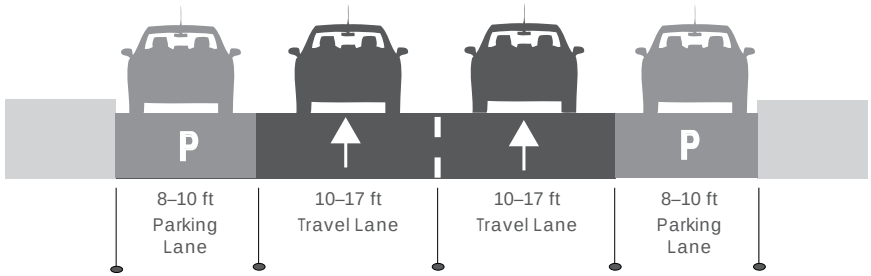
Existing Conditions

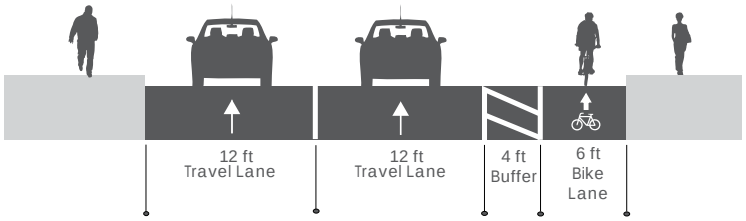
Recommendation:
Left-side buffered bicycle lane

Photo Credit: Google

FIGURE 32: Separated or Buffered Bicycle Lane on One-Way Street Cross Sections

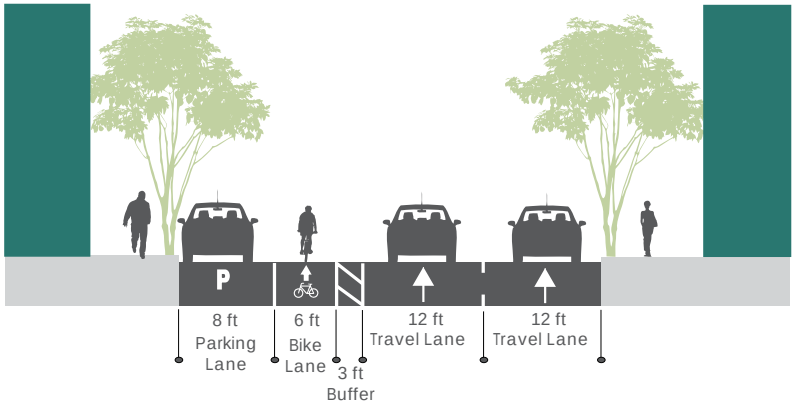
Existing Conditions



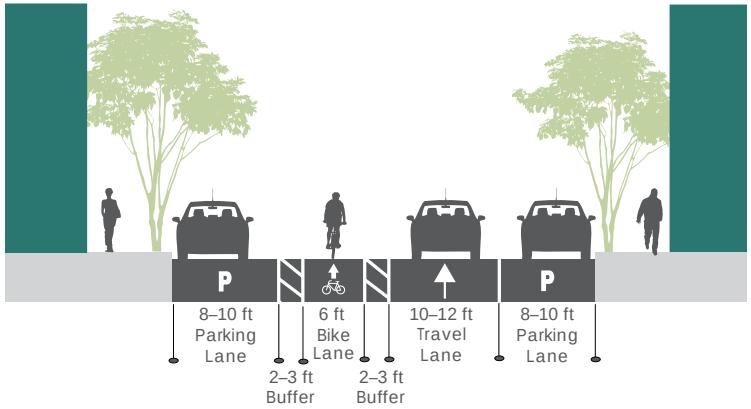


At Assunpink Bridge
(No Existing Parking)

Recommendations



One Existing Parking Lane



Two Existing Parking Lanes

Gray lanes indicate a varied condition between cross sections

Advisory Lanes

Description

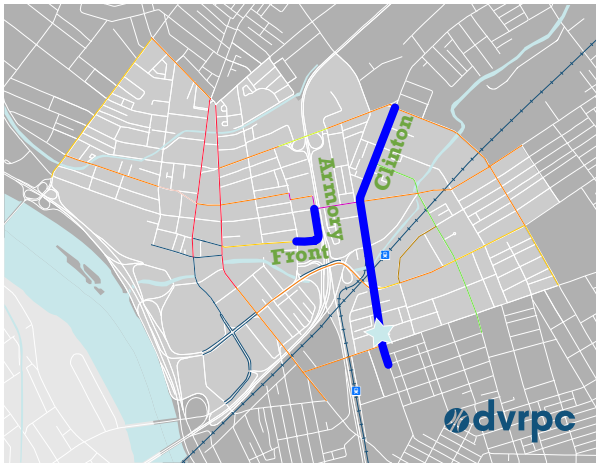
Advisory bike lanes look similar to standard bike lanes in width and placement but tend to be used on low-volume streets that are too narrow to fit a standard vehicle lane alongside a bicycle lane. Advisory lanes are unique in that they feature a dashed marking on the traffic side of the lane and a solid one on the parking side. This configuration pushes vehicles into one wide, shared lane in the middle of the street and requires them to yield to cyclists and oncoming cars before parking, passing, or turning. Advisory lanes can create a safer environment for bicyclists by forcing vehicles to share the road and yield to more vulnerable users.

EXISTING FACTORS

Cartway width: 20–38 feet

FIGURE 33: Proposed Advisory Lanes Locations and Visualization

Locations



CLINTON AVENUE

- Lincoln Avenue to Hamilton Avenue

FRONT STREET / ARMORY DRIVE

- Stockton Street to State Street

Visualization

CLINTON AVENUE AND PEARL STREET

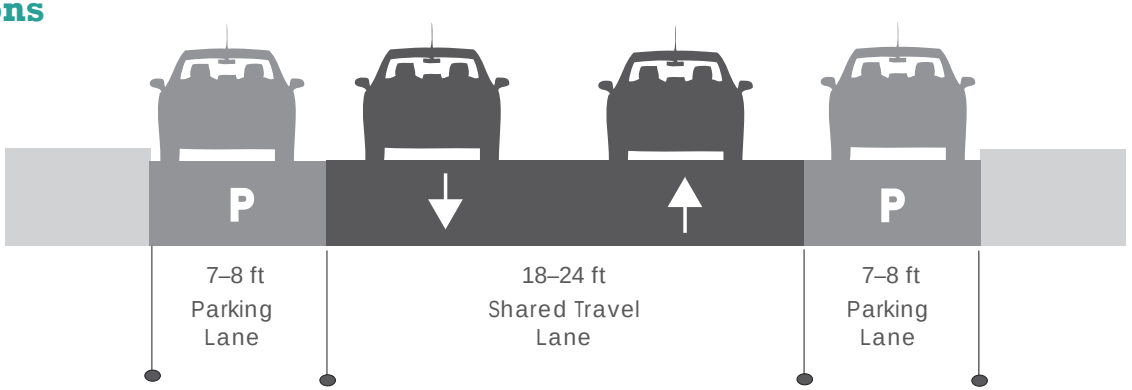
Existing Conditions

Recommendation:
Advisory bicycle lane

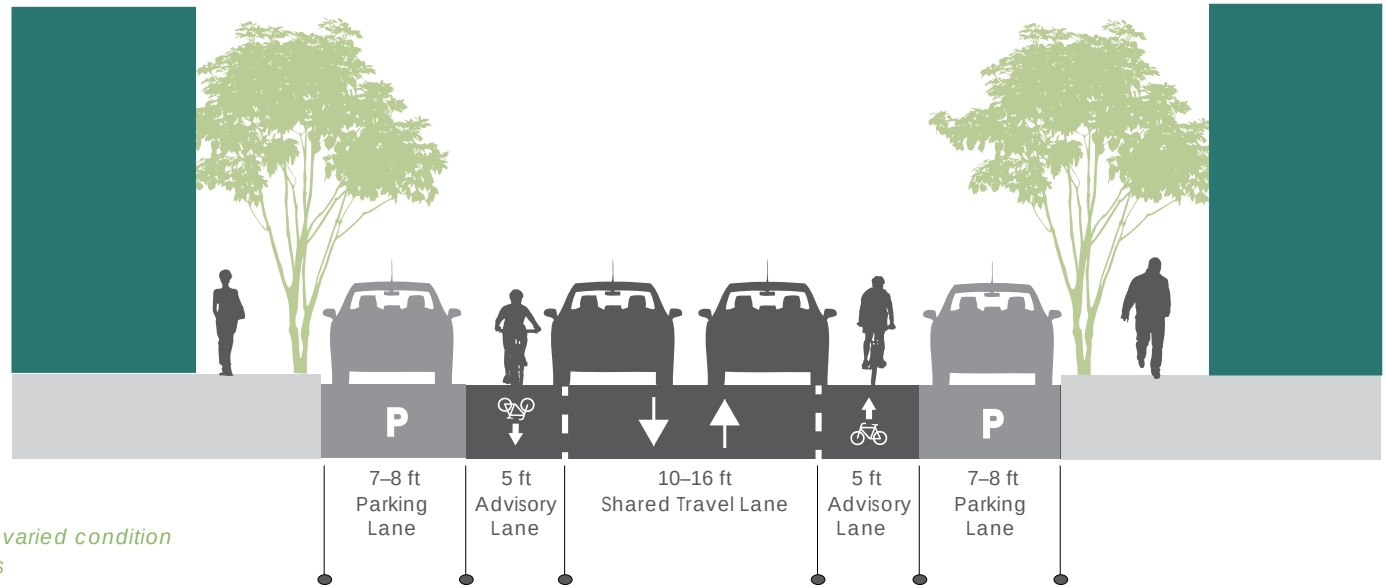
Photo Credit: Google 2013

FIGURE 34: Advisory Lanes Cross Sections

Existing Conditions



Recommendation



**Gray lanes indicate a varied condition between cross sections*

Bicycle Boulevards

Description

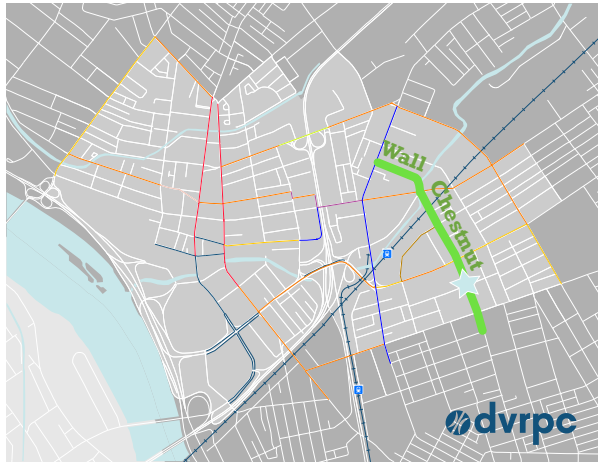
NACTO defines bicycle boulevards as "streets with low motorized traffic volumes and speeds [that are] designated and designed to give bicycle travel priority." Bicycle boulevards use directional signage, pavement markings such as sharrows, and speed and volume management measures to discourage through trips by motor vehicles. Together, these strategies limit the number of times a bicyclist will be passed by a vehicle and create a safer, more comfortable route when compared to the busier downtown streets with higher traffic volumes.

EXISTING FACTORS

Cartway width: 20–40 feet

FIGURE 35: Proposed Bicycle Boulevards Locations and Visualization

Locations



WALL STREET

- Clinton Avenue to State Street

CHESTNUT STREET

- State Street to Bayard Street

Visualization

CHESTNUT STREET AND TYLER STREET

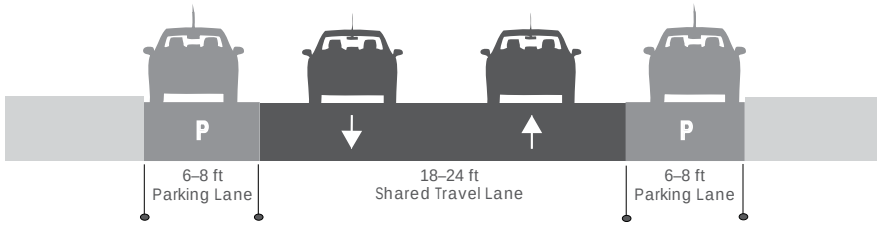
Existing Conditions

Recommendation:
Bicycle Boulevard

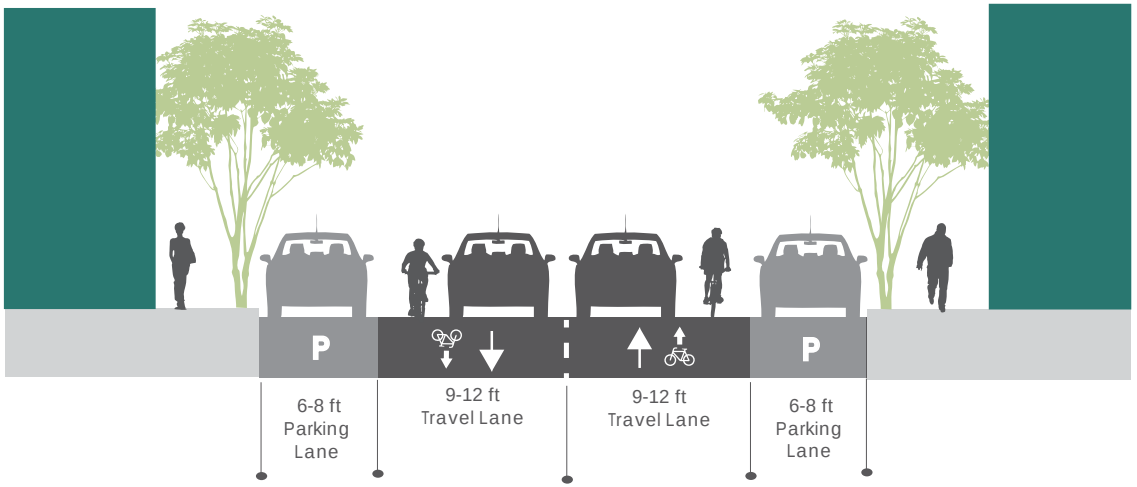
Photo Credit: DVRPC

FIGURE 36: Bicycle Boulevards Cross Sections

Existing Conditions



Recommendation



**Gray lanes indicate a varied condition between cross sections*

CHESTNUT AVENUE AT THOMPSON STREET

Chestnut Avenue is a one-way, southbound street beginning at the south end of the bridge that traverses the Northeast Corridor rail right-of-way. This change forces northbound bicyclists to travel out of the way to reach State Street. Since Chestnut is more than wide enough for one-way vehicular traffic, it is recommended that two-way bicycling be allowed on this segment via a delineator-protected contraflow lane from Thompson Street to East State Street. The *Trenton Station Linkage Plan* recommends this section be converted back to two-way traffic instead, which would also allow northbound bicycle traffic.

Photo Credit: DVRPC

Walnut Street at Trenton Transportation Center

Description

Walnut Street is a two-way street that runs along the south side of the Trenton Transportation Center and has parking on the south side of the street. An advisory lane should be striped on Walnut Street from Chestnut to the Transportation Center. A buffered bicycle lane should continue on the remainder of Walnut Street from the Trenton Transportation Center to Greenwood Avenue. Green paint is used in these lanes because of high parking turnover.

For further station recommendations, refer to the existing *Trenton Station Linkage Plan* (see page 62 and Appendix B).

EXISTING FACTORS

Cartway width: 30–48 feet

FIGURE 37: Trenton Transportation Center Location and Visualization

Locations

WALNUT STREET

- Advisory Lanes: Chestnut Street to Trenton Transportation Center

- Buffered Bicycle Lanes: Trenton Transportation Center to Greenwood Avenue

Visualization

WALNUT STREET NEAR GREENWOOD AVENUE

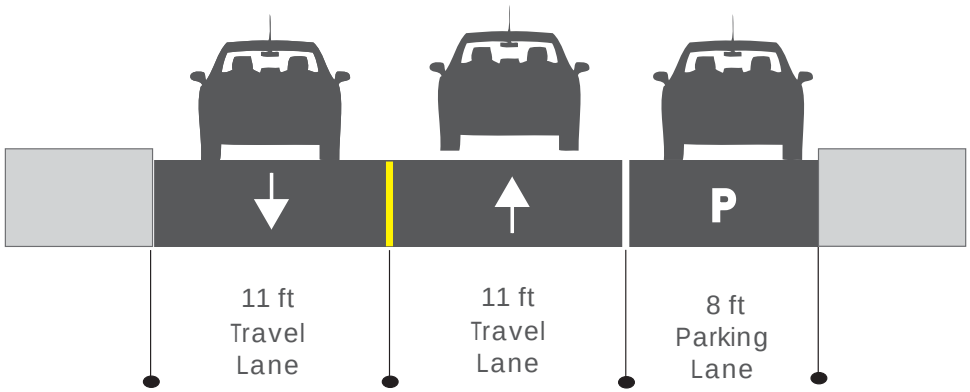
Existing Conditions

Recommendation:
Buffered bicycle lane

Photo Credit: DVRPC

FIGURE 38: Walnut Street Cross Section from Chestnut Street to Transportation Center

Existing Conditions



Recommendation

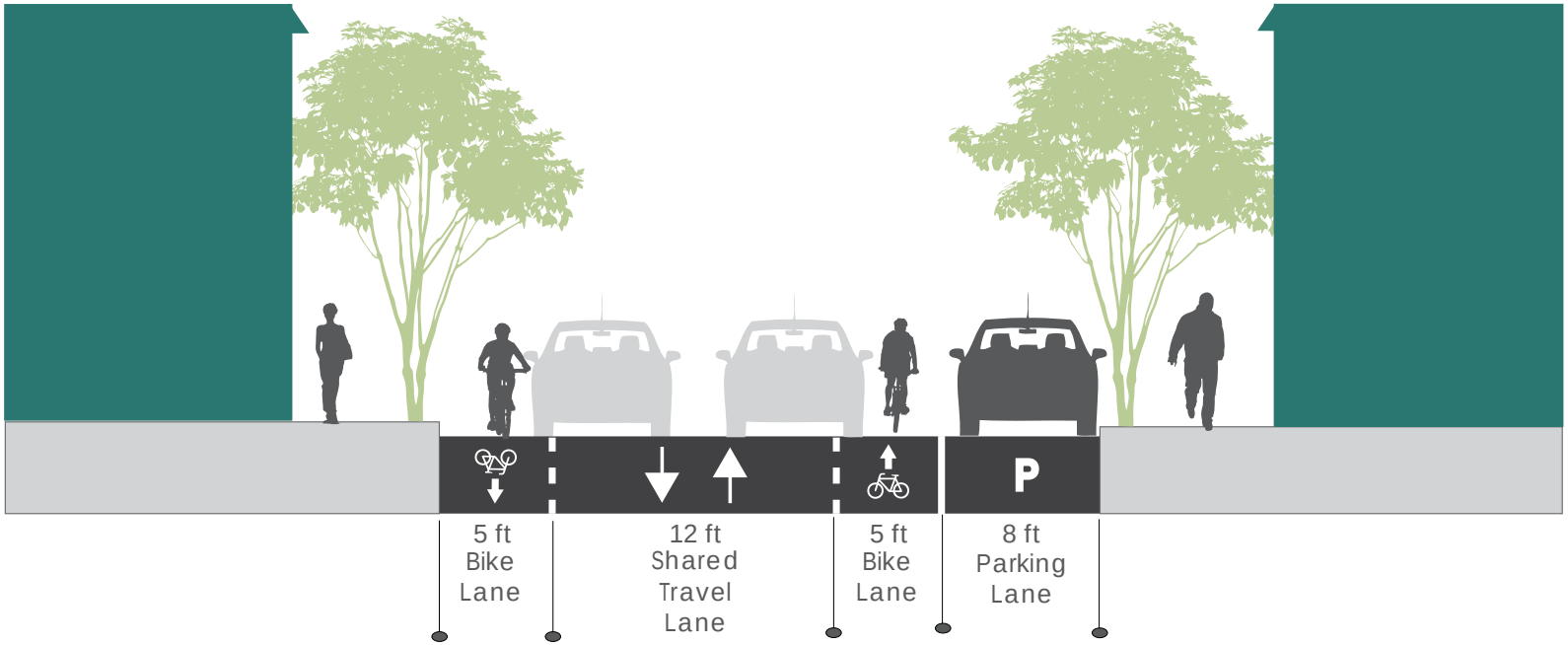
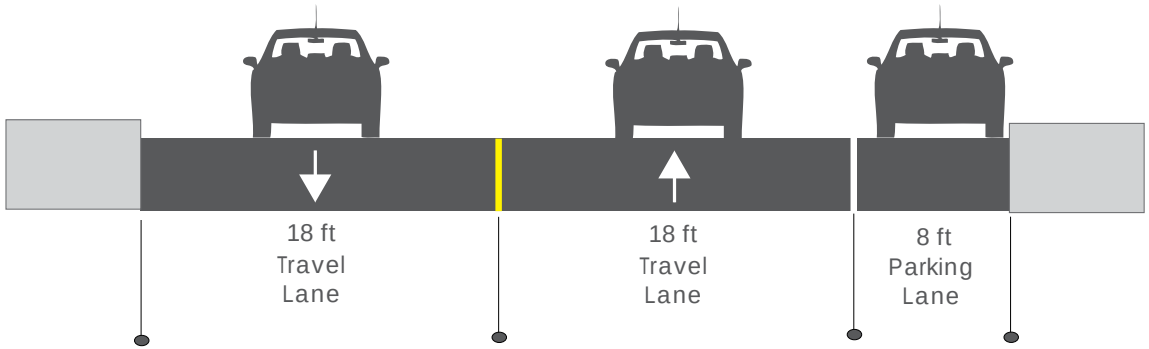
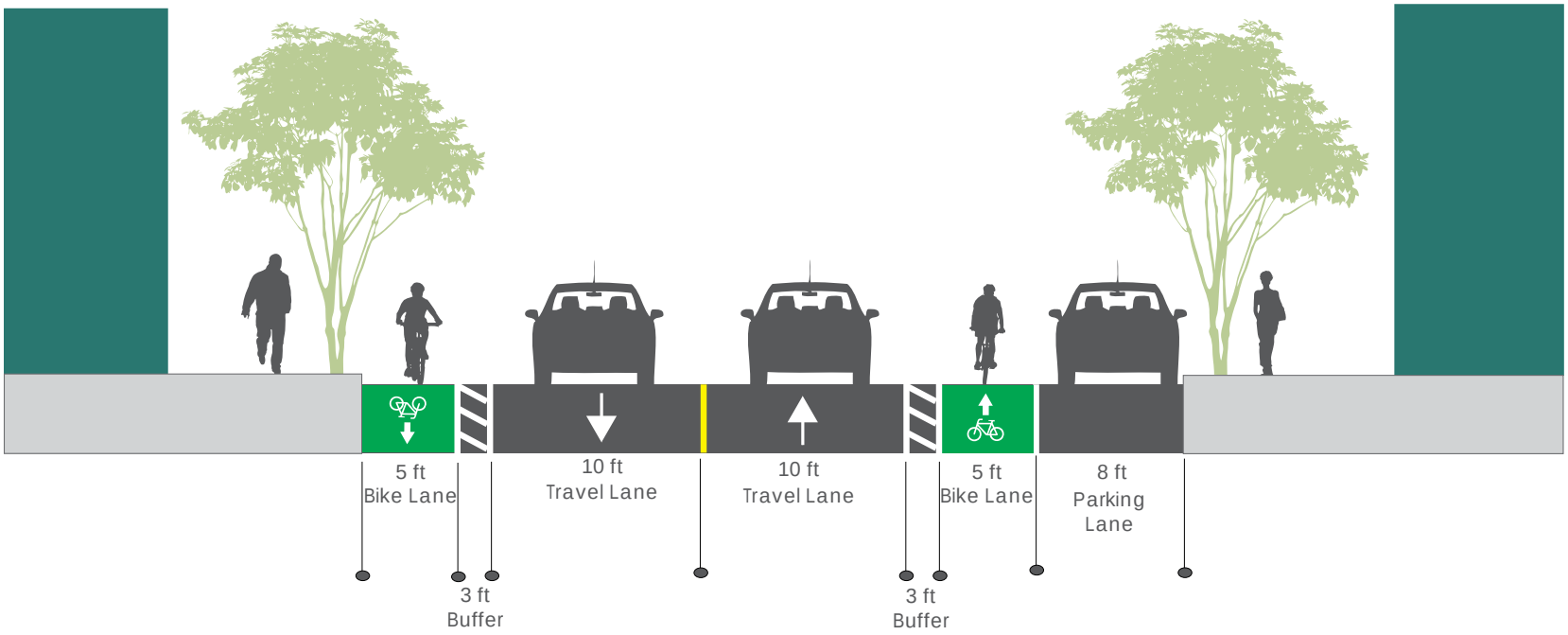


FIGURE 39: Walnut Street Cross Section from Transportation Center to Greenwood Avenue

Existing Conditions



Recommendation



TRENTON STATION LINKAGE PLAN

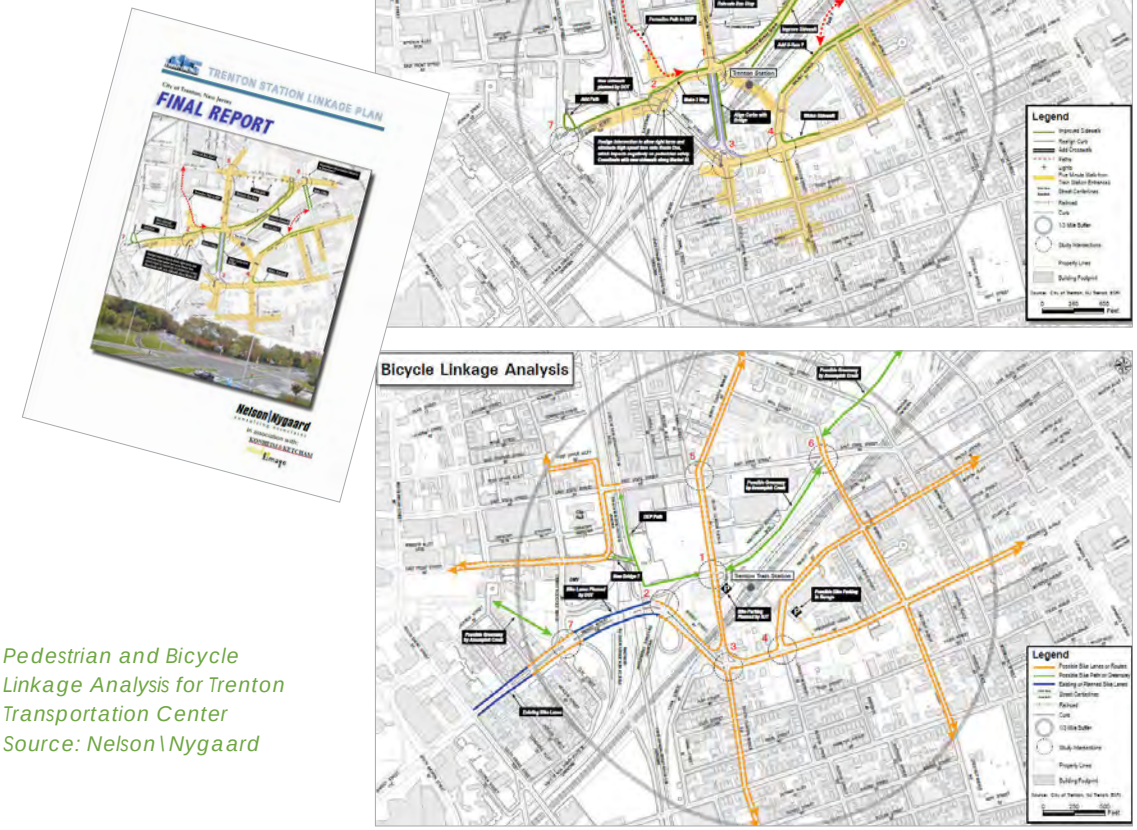
Nelson Nygaard's 2006 *Trenton Station Linkage Plan*, which examined pedestrian and bicycle connections around the station, was consulted in developing this plan. This plan extends beyond the study area of the Linkage Plan to include the entire downtown area. Although the recommendations coming from each plan are mostly consistent, this plan does not include some of the greenway recommendations from the *Linkage Plan* because on-road options may provide similar benefits while being less expensive and potentially easier to implement.

The *Linkage Plan* recommends reverting Chestnut Street to a two-way street between Walnut and State streets. While we find this to be a reasonable solution, **we have also offered that this segment be made a two-way street for bikes (and remain one-way for vehicular traffic)** as a reasonable way to keep traffic volumes low while providing safe and improved northbound connections for bicycles.

This plan is in support of the *Linkage Plan's* pedestrian and signage analysis, which shows areas in need of sidewalks, sidewalk improvements, path formalization, bridge replacement, bus stops/locations, wayfinding, lighting, and intersection alignments.

These changes contribute to an improved built environment that encourages safety, greater walkability, and support for multi-modal transportation.

Larger versions of these diagrams are shown in Appendix A.



Pedestrian and Bicycle Linkage Analysis for Trenton Transportation Center
Source: Nelson\Nygaard

Hanover Street Contraflow and Protected Bicycle Lanes

Because of the limited number of continuous east-west routes through downtown and the existing vehicular demand on many of these roads, Hanover is an important east-west connection through and to downtown. However, Hanover Street adjacent to Warren Plaza has a complex traffic pattern due to the section running one-way westbound after Warren Street for two blocks before returning to two-way vehicular movement at Willow Street. The complexity of Hanover Street necessitates two different types of bicycle facilities: cycle tracks and contraflow lanes.

TWO-WAY CYCLE TRACKS

Two-way cycle tracks are a physically separated set of bike lanes that allow bicycle movement in both directions on the same side of a street. Two-way cycle tracks tend to be good for bicyclists of all experience levels due to their physical separation from traffic, their ability to avoid the risk of being "doored" by a parked vehicle, and because they reduce indirect travel by allowing movement against the direction of one-way streets. Two-way cycle tracks require a bike symbol and an arrow in each lane, a "one way" sign with an "except bikes" plaque, "do not enter" with "except bikes" signs and intersection traffic controls (i.e., traffic lights) oriented for bicyclists.

CONTRAFLOW BIKE LANES

Contraflow lanes allow bicyclists to ride in the opposite direction of traffic and are used on streets with one-way vehicular traffic to allow bicycles to travel both ways. Contraflow lanes are usually best suited to low-volume, low-speed corridors and can be effective in reducing wrong-way or sidewalk riding.

In the case of Hanover Street, it is recommended that flexible delineators be used on the contraflow lane running east from Willow Street to Barnes Street to physically separate bicyclists from traffic. After Barnes Street, the lane becomes a protected two-way cycle track to North Warren Street.

According to NACTO, contraflow lanes require a bike symbol with an arrow in the lane, a "one way" sign with an "except bikes" plaque and intersection traffic controls (i.e., traffic lights) oriented for bicyclists using the contraflow lane. Colored pavement and "two way" bicycle signs can also be used to draw attention to the lane's special function.

Bicycle Traffic Light
Photo Credit: Rethink Urban Center

"Do Not Enter Except Bikes" Sign in Minneapolis, MN
Photo Credit: Flickr User Between Stations

"Begin One Way Except Bicycles" signage in Vancouver
Photo Credit: ActiveCommutePDX

Peer City Examples

Photo Credit: Stan Parkford

CONTRAFLOW BICYCLE LANE

San Francisco, CA

The Polk Contraflow Bikeway in San Francisco opened in 2014. The contraflow lane bridges a crucial two-block gap between two major business districts, Polk Street and Market Street.

Photo Credit: Tyler Reed

TWO-WAY CYCLE TRACK

Brooklyn, NY

The Kent Avenue two-way cycle track in Brooklyn, New York is approximately two miles long and is physically separated from vehicular traffic using parking, painted buffers, and flexible bollards to create a comfortable thoroughfare for both commuters and recreational cyclists.

Recommendations

Below are detailed recommendations for Hanover Street, which are also shown in Figure 40:

1. **A two-way cycle track should be implemented along the left-hand (south) curb from Warren to Barnes Street.** This cycle track should be separated from vehicular traffic by a painted buffer and flexible delineators.

2. At Hanover's intersection with Chancery Lane, use dashed lines, green paint, signage, and bike symbols with arrows to symbolize that bikes are moving in both directions through this intersection.

3. Separate eastbound and westbound bicycle facilities from Barnes Street to Willow Street: **westbound bicyclists will follow a path with sharrow markings and green paint blocks.**

4. **Westbound sharrows will end at a green bike box at the intersection of Hanover Street and Willow Street.** From the bike box, bicyclists will be able to continue straight to meet the westbound bike lane on the other side of Hanover Street.

5. **The eastbound bike lane at Barnes Street will continue as a protected lane along the south side of Hanover Street. This lane will meet the proposed standard bicycle lane after crossing Willow Street.** Hanover Street's three vehicular lanes should be narrowed from 12 feet to 10 feet to allow space for the protected lane along the south curb.

6. **Green stormwater infrastructure (GSI),** such as tree trenches, bioswales, or rain gardens, **should be considered along the southern curb lane between Barnes and Willow streets, as well as at the tip of Warren Street Plaza**. GSI allows plants to capture and slowly release excess runoff from precipitation. Increasingly, GSI projects are combined with streetscape redesign to enhance the transportation environment as well decrease stormwater runoff.

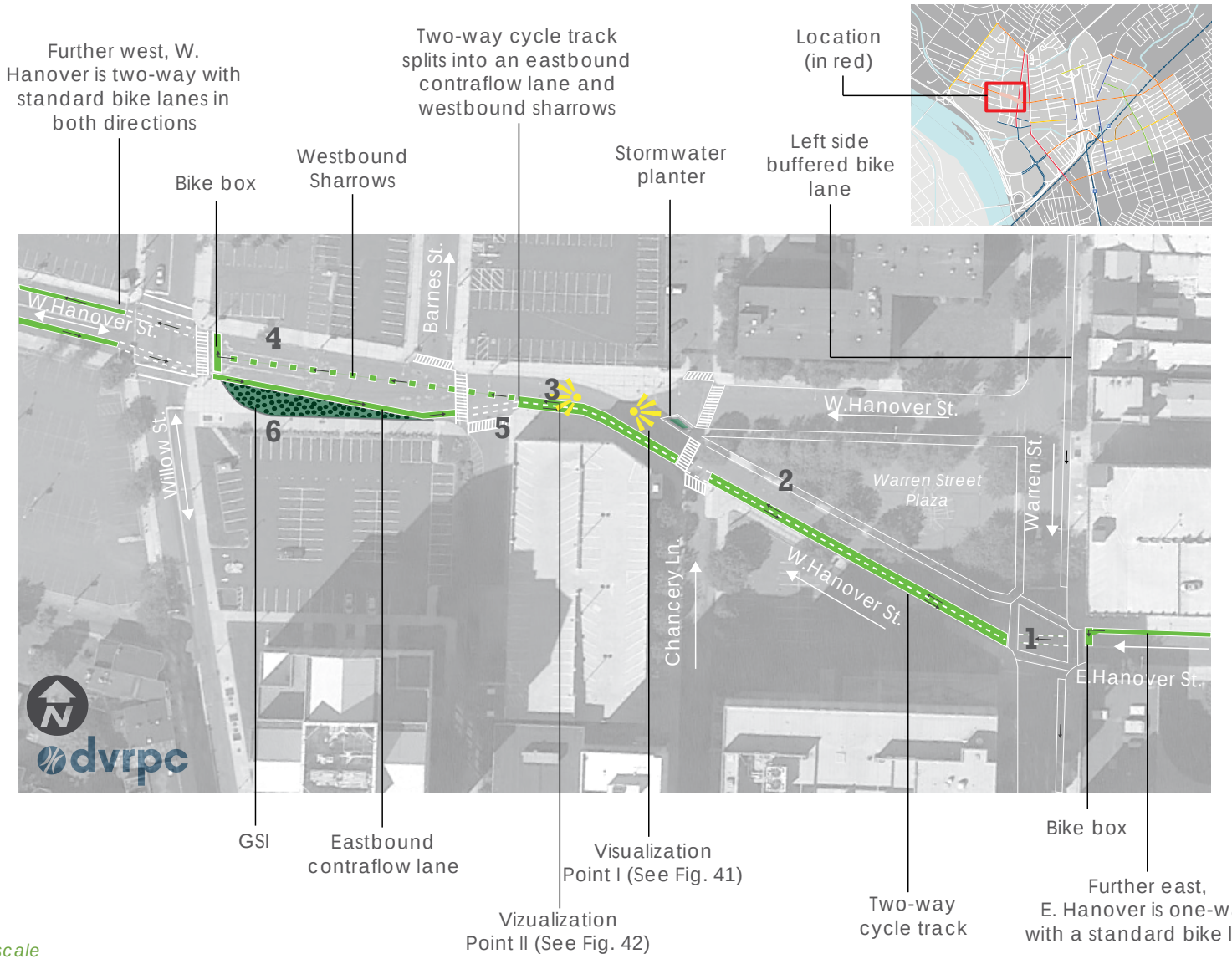
OVERALL:

- **Repaint crosswalks at all intersections** around this treatment. In this portion, Hanover Street crosses Willow Street, Barnes Street, Chancery Lane, Warren Street, and Broad Street.

- **"Two way bicycle" and "no entry except bicycle" signage should be added around the contraflow and the cycle track sections to make road users aware of the facility**.

Hanover Street has relatively low traffic volumes in both directions between Calhoun and Willow streets, so a bicycle light may not be necessary but should be added if traffic volumes increase substantially in the future.

FIGURE 40: Diagram of Recommended Bicycle Facilities on Hanover Street*

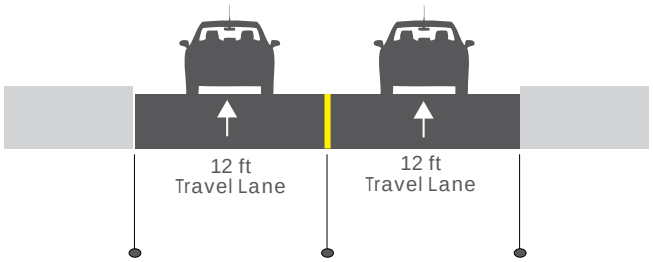


*Schematic not to scale

Hanover Street Contraflow and Separated Bicycle Lanes

FIGURE 41: Visualization Point I: Hanover Street Contraflow and Separated Bicycle Lanes

Existing Conditions



Recommendations

Photo Credit: Google

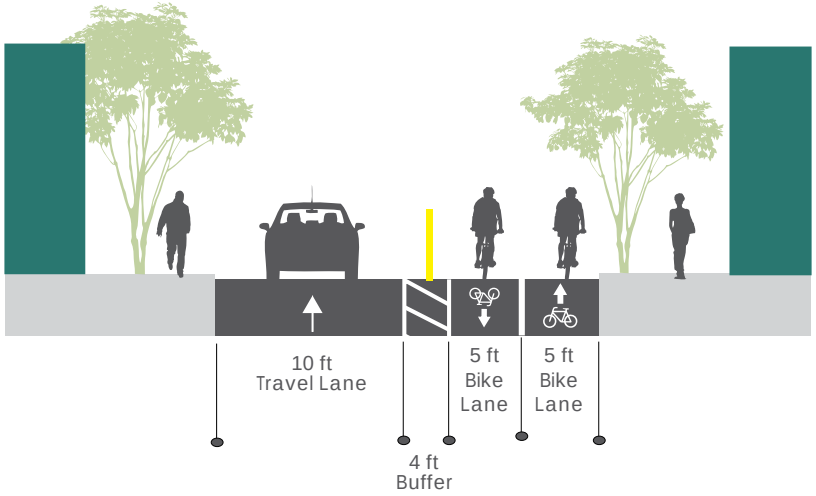
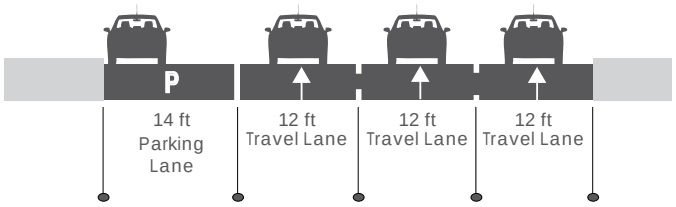


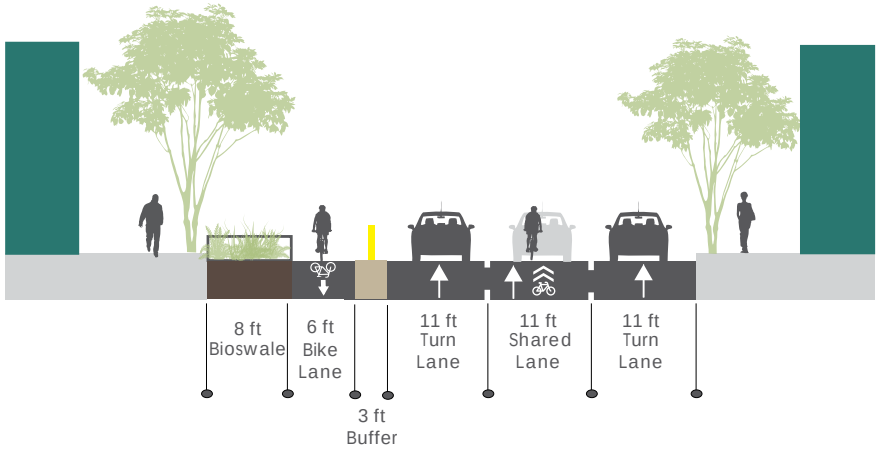
FIGURE 42: Visualization Point II: Bicycle Lane, Chancery Lane to Willow Street

Existing Conditions



Recommendations

Photo Credit: Google



Perry Street

Description

Perry Street is one of two east-west connections over US Route 1 in central Trenton, connecting bicyclists and pedestrians to downtown, as well as providing access to Roberto Clemente Park. At present, Perry is a dangerous street to navigate for bicycles and pedestrians (particularly those traveling eastbound) due to the six entry and exit ramps to US Route 1 located on the south side of the street.

In order to improve visibility and reduce interactions with vehicles, it is recommended that the two exterior slip ramps to the west of Route 1 be closed so that only a t-intersection remains, and those ramp entrances to the east of Route 1 be narrowed to create shorter crossing distances and to reduce the number of conflict points for pedestrians and bicyclists.

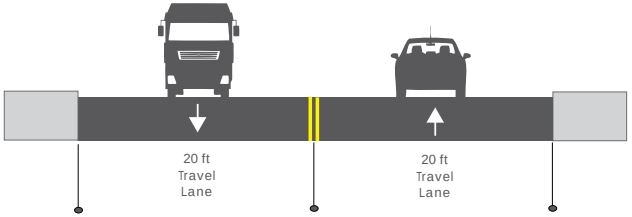
EXISTING FACTORS

Cartway width: 40 feet

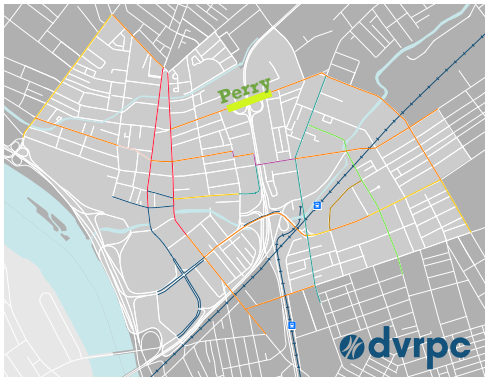
The treatment along this segment would be bicycle lanes protected by flexible delineators along both sides of the street. West of North Stockton Street, the protected lanes would transition to standard bicycle lanes as the cartway narrows and street parking is present. East of Carroll Street the protected bike lanes would transition to standard bike lanes.

FIGURE 43: Perry Street Location and Cross Sections

Existing Conditions



Location



Recommendations

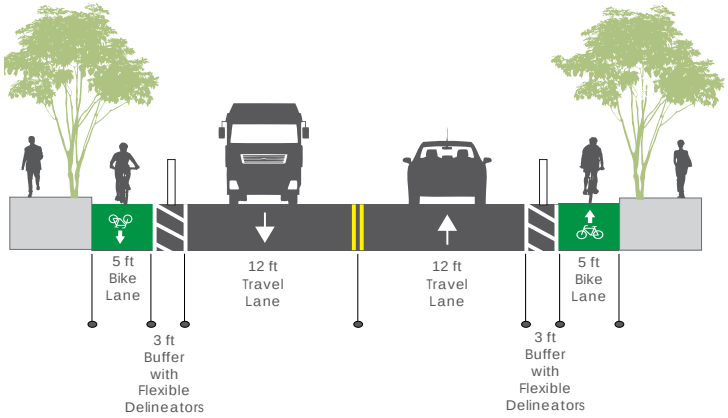
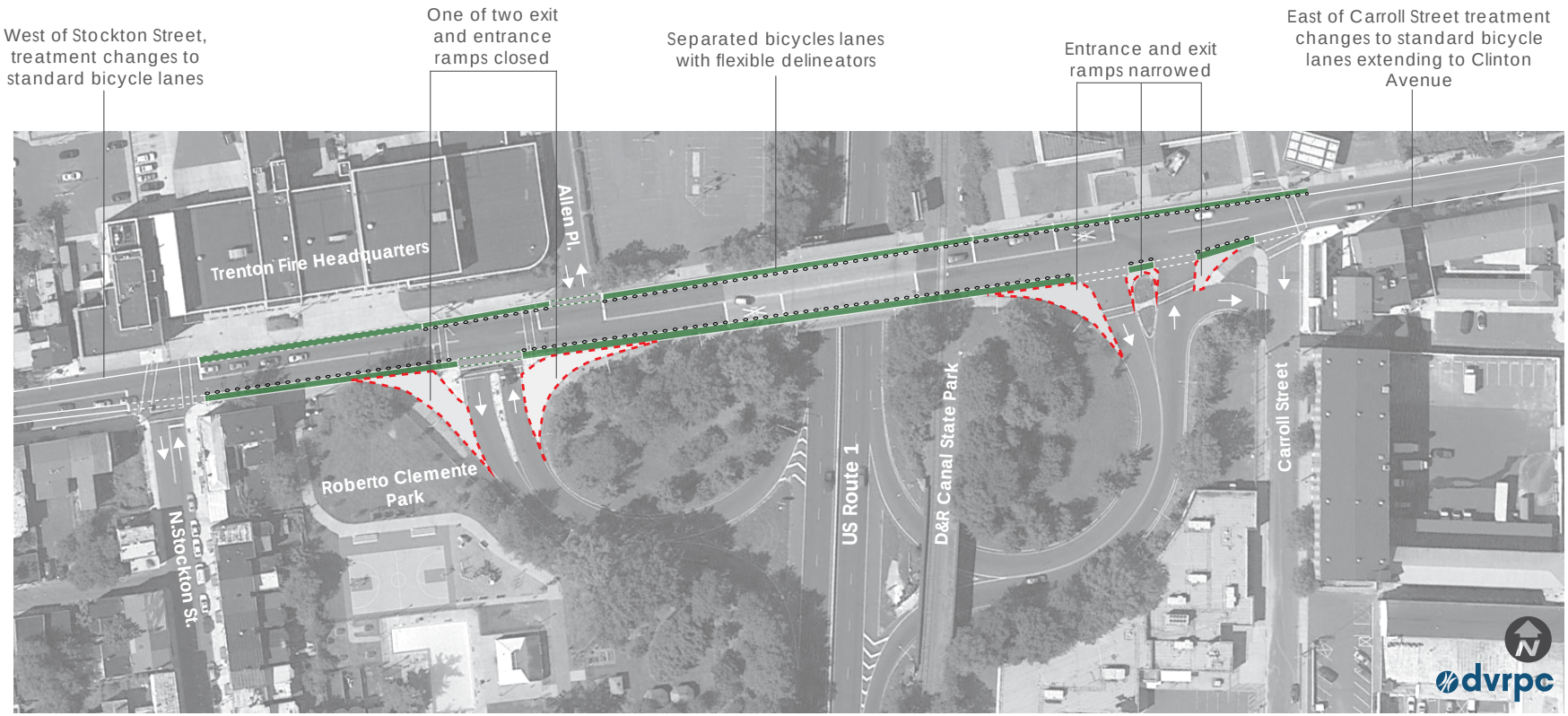


FIGURE 44: Perry Street: Diagram of Proposed Route 1 Interchange Improvements*



Schematic not to scale

Other Design Strategies

Many facility typologies explained in the previous pages can incorporate additional features to improve the safety and comfort of people riding bicycles, depending on existing and ongoing conditions. Below are a list of these strategies:

PHYSICAL SEPARATION

Physical separation is an important element in creating safer bicycle facilities on higher-volume or wider streets, allowing greater comfort for a range of bicyclists. Physical separation can be achieved using flexible delineators, medians, or planters adjacent to curbside lanes in areas without driveways or parking. Flexible delineators, in particular, can be placed with minimal buffered space (18 inches) between bicycle and vehicular lanes. Also, parking can be moved from curbside areas to the vehicular side of bicycle lanes to create physically separated bicycle lanes, and is helpful in reducing incidents of "dooring", while retaining parking and creating safer bicycling conditions.

BIKE BOXES

The NACTO Urban Bikeway Design Guide defines bike boxes as designated areas located at the head of a traffic lane at a signalized intersection that provide bicyclists with a safe and visible way to get ahead of queuing traffic during a signal phase. Boxes are usually painted green and sometimes feature a short curbside lane that helps create space for cyclists to move to the front of the vehicle queue. Bike boxes are beneficial in that they provide increased visibility for bicyclists, reduce vehicle delay, help to facilitate turning and mitigate turn-related conflicts, and reduce encroachment on pedestrian crosswalks by vehicles and bicyclists. Right on red must be prohibited when using a bike box.

INTERSECTION CROSSING MARKINGS

Intersection crossing markings help to guide bicyclists through intersections by providing clear and direct paths using arrows and dashes. These markings are also helpful in that they make bicyclists' paths more predictable for drivers, reinforcing that they have priority over turning vehicles and bringing attention to their presence.

RAIN GARDENS OR BIOSWALES

Although not always associated with bicycle infrastructure, bioswales, a depressed vegetated area running alongside a road that collects stormwater runoff, can be used as part of a road diet for oversized streets. Eliminating excess street width can help to reduce speeding, while the capture of stormwater can reduce stress on sewers and help to prevent streets from flooding.

GREEN PAINT

Painted pavement within a bike facility can increase the visibility of cycle tracks, bike lanes, bike boxes, and intersection crossings. It generally helps to identify conflict areas and reinforce a bicyclist's right to the road. Consistency in use of color across a corridor is vital to promoting a clear understanding of its meaning.

SIGNALS

Signals and other crossing treatments make crossing intersections safer for bicyclists by restricting vehicle movements and moderating conflicts. Traditional signal heads stenciled with bicycle symbols can be used at signalized intersections. Flashing warning beacons or rapid flash beacons, pedestrian- or bicyclist-activated signals, can be used at unsignalized crossing locations where signals are not warranted.

Examples of Other Design Strategies

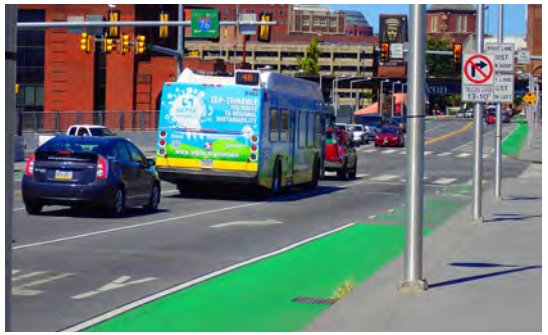
FLEXIBLE DELINEATORS

Protected bicycle lane in downtown Pittsburgh, PA
Photo Credit: Bike Pittsburgh

INTERSECTION MARKINGS

Intersection crossing markings in Brooklyn, NY
Photo Credit: NACTO

GREEN PAINT



Green bicycle lane on the South Street Bridge, Philadelphia, PA
Photo Credit: DVRPC

BIKE BOXES

Bicycle box with a leading green bicycle lane in Portland, OR
Photo Credit: Jonathan Maus

PHYSICAL SEPARATION WITH PARKING

Kent Avenue, Brooklyn, NY
Photo Credit: NYC DOT

SIGNALS

Rapid flashing beacon that is activated by a bicyclist or pedestrian before crossing
Photo Credit: City of Lincoln, NE

On-Road Bicycle Recommendations Summary

This plan recommends a variety of on-road bicycle treatments based on the different conditions in downtown Trenton.

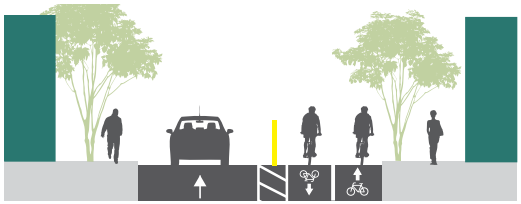
The diversity of street widths and traffic patterns in downtown requires different design interventions. There also are a number of sections that need more elaborate interventions based on their special characteristics.

Generally, design characteristics should remain as consistent as possible throughout an entire corridor to limit bicycle and automobile confusion. For example, one portion of Broad Street should not switch between buffered and standard bicycle lanes, to ensure that there is a level of predictability.

FIGURE 45: Summary of Typical Recommended On-Road Bicycle Cross Sections

FIGURE 46: Summary of Special Recommended On-Road Bicycle Cross Sections

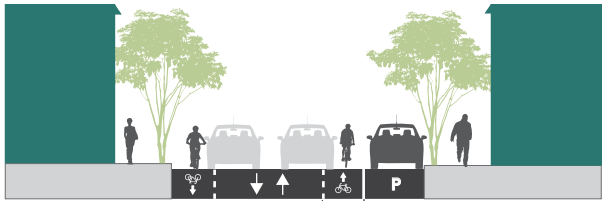
HANOVER STREET



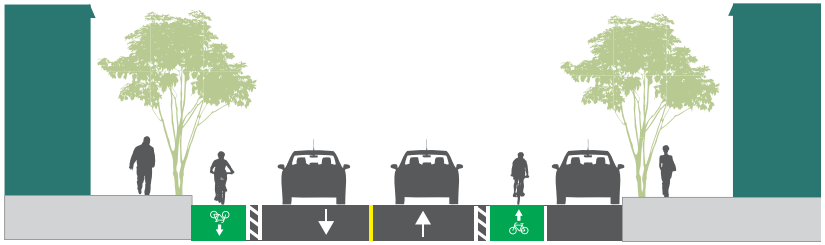
Warren to Chancery

Chancery to Willow

WALNUT STREET



Chestnut to Transportation Center



Transportation Center to Greenwood

PERRY STREET

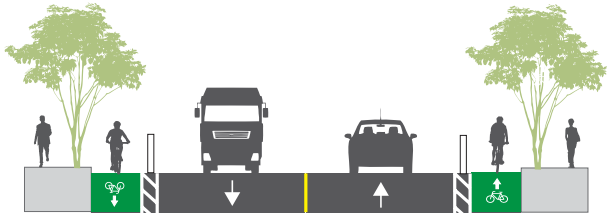


PHOTO CREDIT: DELAWARE VALLEY REGIONAL PLANNING COMMISSION

TRAIL
recommendations

Trail Recommendations

Off-road trails complement the on-road bicycle network and pedestrian street grid. Trails can serve as recreational and transportation routes, connecting users to work, school, parks and open space, and other transportation services.

Downtown Trenton has several regional and local trails. However, these resources are underused and are a significant source of untapped potential. As existing trails are improved and upgraded and proposed trails are designed and constructed, there are a number of best practices in trail development that should be followed.

First, access points and routes of trails and shared-use paths must be well marked. They should be a minimum of 10 feet wide and, given the densities downtown, 12 to 14 feet is a recommended width. Trails can be designed to increase real and perceived safety, which has had an impact on trail usage in the past. Trails should be designed with adequate lines of sight and building edges; corners and access points should have security lighting. Because these trails will be in neighborhoods and the downtown district, including space for gathering and sitting may be desirable on some segments.

As has been done in other recent projects, trail construction can be a chance to restore streams, introduce native species, and address stormwater management with green infrastructure.

Existing D&R Canal trail conditions near the War Memorial
Photo Credit: DVRPC

Finally, successful trails and sidepaths have well-designed street crossings that may include signals, medians, stop signs, crosswalks, etc.

Trailhead for the Delaware River Heritage Trail in Bordentown, NJ
Photo Credit: John Boyle

Example of clear trail signage in Hillsboro, OR
Photo Credit: DVRPC

Proposed Trail Network and Connectors

The planned trail network includes all existing and proposed trails, gathered from stakeholder and public feedback.

These trails, and the connections between them, extend and create a more integrated trail network. The major trail recommendation is to expand the trail network, with the following being identified priority projects:

- continuing the D&R Canal Extension to Market Street;
- Delaware River Heritage Trail on-road connectors to provide access between the existing trail on the Delaware River and downtown Trenton attractions; and
- Assunpink Greenway completion to create a better east-west connection to and through downtown Trenton.

Proposals for the Delaware and Bound Brook Rail Trail and the Trenton to Princeton Rail Trail are shown on the following maps at a conceptual level only in an effort to document all proposals. Currently, each only exists as a concept and needs further development.

Trail Coordination Initiatives

The regional Circuit trail network
Source: DVRPC

THE CIRCUIT

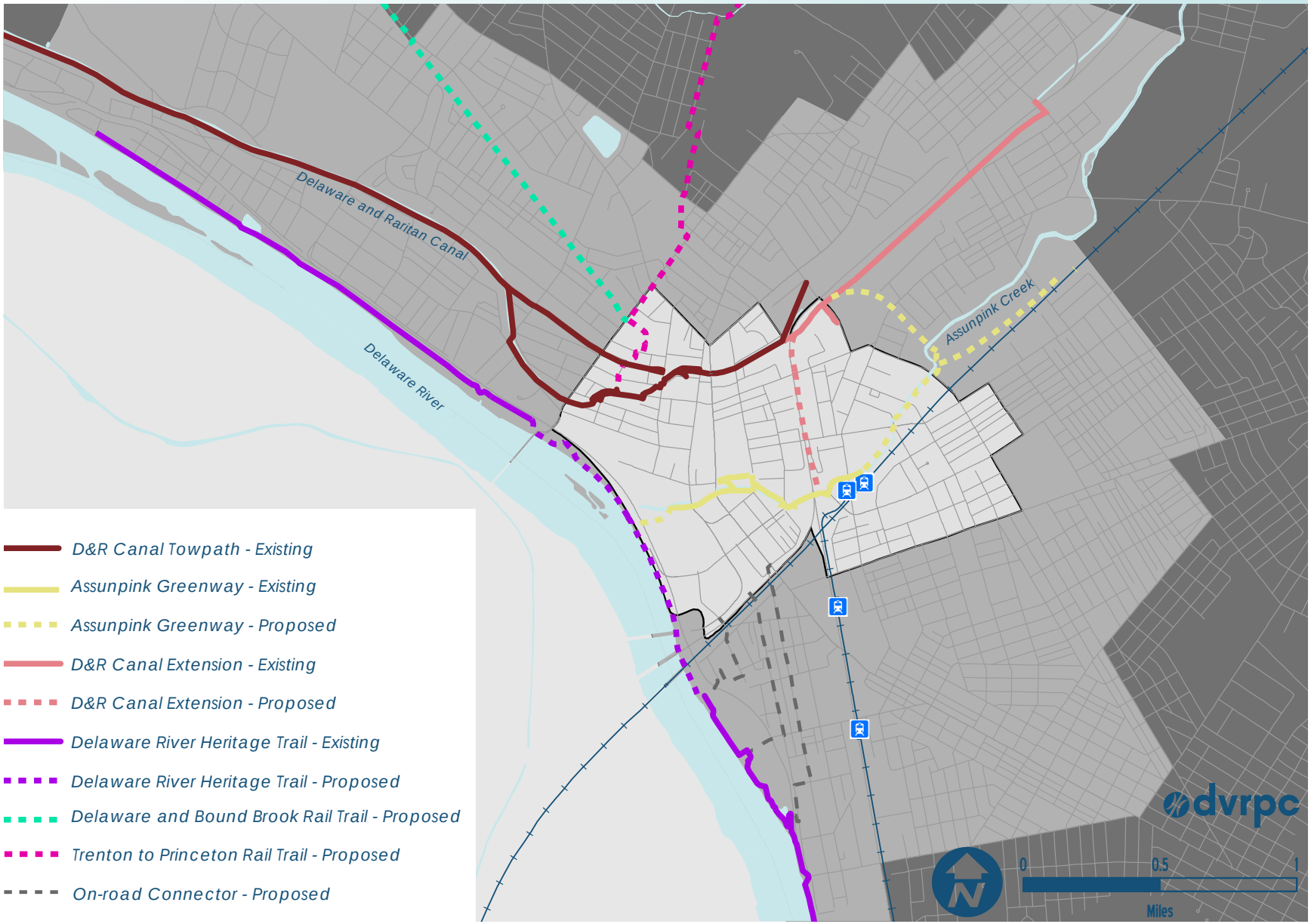
Many of Trenton's existing and proposed trails are part of a larger regional trail network called The Circuit. The Circuit was developed by a coalition of partners, including DVRPC and many non-profit trail and conservancy groups, foundations, and agencies, as a prioritized network of bicycle and pedestrian trails. The coalition works toward completion of the network by making it a regional priority and highlighting its benefits. The system has a proposed 750 miles with over 300 miles already constructed.

New Jersey Trail Association volunteers building trails in central New Jersey
Photo Credit: D&R Greenway Land Trust

NEW JERSEY TRAIL ASSOCIATION

The New Jersey Trail Association is a group led by the D&R Greenway Land Trust to coordinate trail projects in the area around Trenton. This group includes other land trusts and open space organizations and has the goal of coordinating the planning and construction of trails and encouraging their use.

FIGURE 47: Existing and Proposed Trenton Trail Network



Sources: NJDOT, DVRPC, Mercer County, City of Trenton

Trail Connections

D&R CANAL EXTENSION EXPANSION TO MARKET STREET

The main D&R Canal Towpath runs along the D&R Canal. The extension begins west of Route 1 and connects the northern and eastern portions of the towpath and bridges the gap where the canal is no longer present. The trail could be continued south on an abandoned rail line that exists parallel to Route 1 until Market Street. At State Street the rail line is approximately at grade with the street, and the trail would be accessible without major infrastructure investments. At Market Street, there is a substantial elevation difference between the proposed trail and the street. A ramp would be necessary to provide a connection between the trail and the street. If completed, this approximately half-mile segment would create a primarily off-road route to the Trenton Transportation Center for many Trenton neighborhoods via the D&R Towpath and Extension. This proposed trail segment is a priority project for both city and county stakeholders.

DELAWARE RIVER HERITAGE TRAIL GAP CLOSURE AND ON-ROAD CONNECTIONS

There currently is a large gap between the northern portion of the trail that runs through Stacy Park and the southern portion that extends north from Bordentown. Plans to connect these pieces are challenging because of the lack of space between the waterfront and Route 29. However, if plans to convert Route 29 to a boulevard were to move forward, the trail may be able to be advanced more easily.

In the near term, a number of on-road connections between the southern portion of the trail and Battle Monument Park have been proposed. It is recommended that the Cass Street option be advanced and a facility that maximizes comfort and safety and provides an experience most similar to an off-road trail, most likely something with physical separation, be pursued.

ASSUNPINK GREENWAY EXTENSION AND COMPLETION

The completed trail segments are primarily a network of sidewalks and a walkway through Mill Hill Park. As it is envisioned, the completed project would connect and pass through several existing and proposed parks and open spaces, including several remediated brownfields.

Based on the New Jersey Capital Park Master Plan (2008), Assunpink Greenway and Creek would connect to the Delaware River Heritage Trail via new greenspace and park development, some of which, like the Assunpink Park, have been completed.

To connect to the D&R Canal Extension, just north of downtown, the trail would cross the Assunpink Creek just before Freight Yards Park and connect near Southard Street.

Trail Gateways

Although downtown Trenton has a rich trail network, many of the access points are either minimally marked or have some kind of barrier to access. This makes the trail network an underutilized resource for residents and visitors. Below and in Figure 48 are a number of places where improvements to entrances could highlight these rich assets, as well as increase usage and visibility.

THE CALHOUN STREET BRIDGE AND NEW JERSEY 29 INTERCHANGE

The entrance and exit ramps to NJ 29 at Calhoun Street create a barrier between the Calhoun Street Bridge, the proposed on-road network, and the East Coast Greenway, which uses Calhoun Street and Bridge to cross into Pennsylvania. Clear signage and separated on-road facilities would improve access between these routes. Improvements to the intersection of State Street and Calhoun Street, just north of NJ 29, could also improve access to the bridge for pedestrians and bicyclists.

LOWER D&R CANAL GATEWAYS

The D&R Canal Towpath crosses Calhoun Street at two points between State Street and Bellevue Avenue. The signage that does mark these entrances is minimal and in disrepair. The midblock crosswalk connecting one side of the trail to the other is not highly visible. No pedestrian-scale lighting is present. At the entrance between Summer and Bellevue, guardrails pose additional barriers and an uninviting entrance. Installing additional signage, trail maps and lighting could be initial improvements.

TRENTON BATTLE MONUMENT

The Trenton Battle Monument sits between Broad Street and Warren Street in a triangle configuration. The D&R Canal Trail runs horizontally across the park with trail entrances currently on Broad Street and Warren Street. The current trail entrances have older signage. Closed-gate entrances also add to the poor visibility of the trail and do not encourage usage. This gateway will connect to the new on-road bicycle lane facilities on Broad and Warren streets, as well as the historic Trenton Battle Monument.

Simple improvements such as opening the gates to the trail, as well as creating a midblock crossing with curb ramps between one side of the trail to the other, would help to mark the canal trail at this location and make bicycling along the trail easier. Other signage like a trail map and environmental or historical signs could highlight the trail and help residents and visitors learn about this resource and asset.

OLD ROSE STREET AND HOLLAND AVENUE

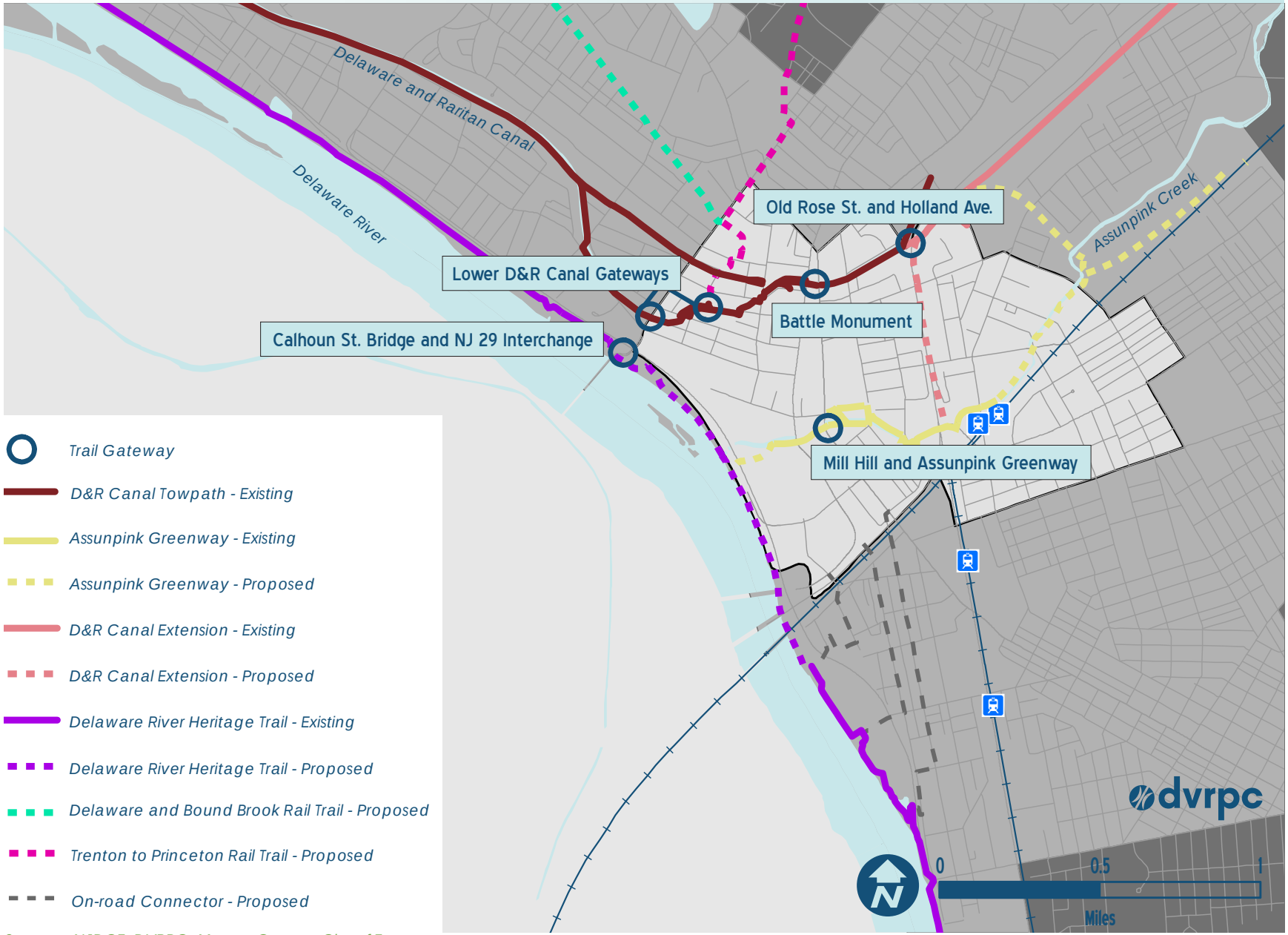
This entrance on the northeastern end of downtown is at the intersection of the D&R Canal Towpath and the Canal Extension. The gateway is at the end of a road in a primarily residential area and less than a block away from Rivera Middle School. There is little lighting, and trail signage at the entrance is vandalized.

Additional lighting, landscaping, signage, new curb ramps, and amenities like benches and picnic tables could make the trail more inviting in this area, as well as increase use and safety.

MILL HILL PARK AND ASSUNPINK GREENWAY

The entrance to the park from Broad Street is not signed, and there is no indication that the greenway continues through the park. Given that much of the existing greenway is on sidewalk, route markings are particularly important because it is otherwise easily indistinguishable.

FIGURE 48: Trail Gateways



Sources: NJDOT, DVRPC, Mercer County, City of Trenton

Existing Trail Gateways

NEAR THE CALHOUN STREET BRIDGE AND NEW JERSEY 29 INTERCHANGE

OLD ROSE STREET AND HOLLAND AVENUE

NEAR THE TRENTON BATTLE MONUMENT

Photo Credit: DVRPC

PHOTO CREDIT: DELAWARE VALLEY REGIONAL PLANNING COMMISSION

PEDESTRIAN AND INTERSECTION recommendations

Pedestrian and Intersection Treatments

The Pedestrian and Intersection Recommendations section suggests interventions that can improve safety and access across all transportation modes.

This section of the plan targets several priority locations for improvements, selected on the basis of land use, crash history, and existing transportation conditions. Using design best practices and the plan's goals and guiding principles, conceptual designs were developed for each focus intersection.

Source: DVRPC

DESIGN CONSIDERATIONS

Intersections are some of the hardest and the most critical areas to design for safe pedestrian and bicycle movements, since the safest and most appropriate path may not be entirely clear. At the same time, the cross section and roadway width may also change at intersections.

Proper intersection design should make it clear to bicyclists, pedestrians, and motorists how to traverse the intersection. A bicyclist's route through the intersection should be direct and logical and generally follow the path of vehicle traffic. Bicycle and pedestrian facilities should reduce conflict between users and vehicles. Lighting and signal timing that does not require bicyclists to wait an excessive amount of time are also important.

Acknowledging both the importance and difficulty of designing intersections to be safe nodes of the non-motorized transportation network, five key intersections were analyzed and a set of design recommendations were developed for each. These intersections were chosen based on the presence of a cluster of crashes or based on high volumes of pedestrians and bicyclists. While each has unique attributes and geometry, many of the recommended design treatments can be applied to other intersections within downtown Trenton.

INTERSECTION TREATMENTS

Five key intersections are examined in this analysis: State Street at Barrack/ Willow Street, Perry Street/Lincoln Avenue at Clinton Avenue, Chambers Street at Greenwood Avenue, Hamilton Avenue at Anderson Street, and State Route 129 and Hamilton Avenue.

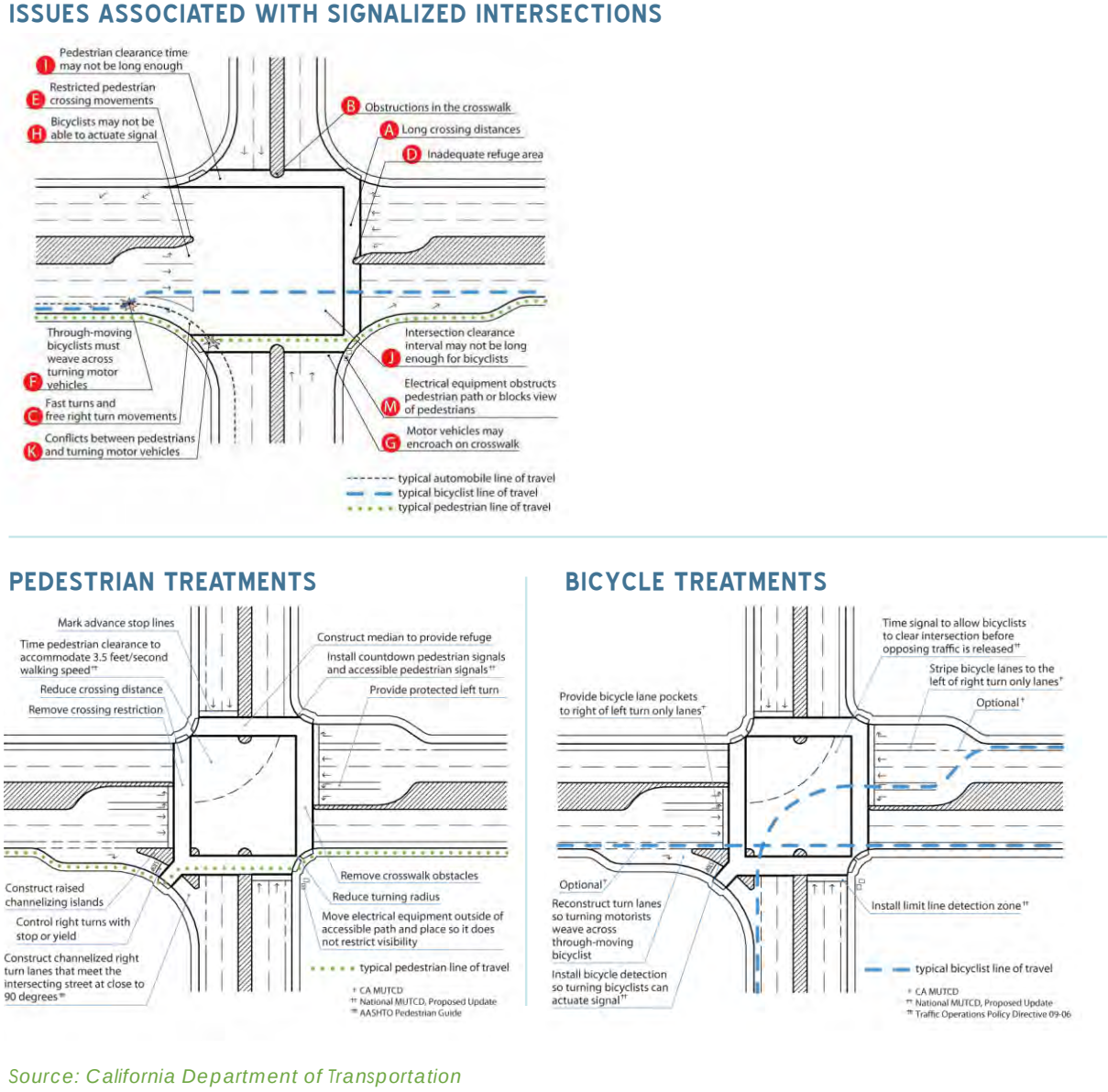
Intersection Design

Generally, good intersection design heightens the visibility of bicycles and pedestrians and reduces conflicts between modes. Listed below are several design and infrastructure treatments to improve intersection safety, especially for pedestrians:

- Leading Pedestrian Interval phase;
- pedestrian countdown timers;
- curb extensions;
- right turn on red restrictions;
- daylighting intersections; and
- marking crosswalks.

Figure 49 illustrates many of the issues and additional strategies for improving bicyclist and pedestrian safety at intersections. Many of these strategies are employed in the intersection recommendations that follow.

FIGURE 49: Signalized Intersection Design Guidelines from the California Department of Transportation



Source: California Department of Transportation

FIGURE 50: Map of Focus Intersections

Sources: NJDOT, DVRPC, Mercer County, City of Trenton

PLAN PRIORITY

Hamilton Avenue and Anderson Street

ACTIVE COMMERCIAL CORRIDOR

This busy intersection is on a commercial corridor (Hamilton Avenue) near Trenton Central High School. It has high pedestrian volumes especially in the afternoon when school lets out and it is peak commute time. In the crash data, this is reflected in a higher-than-average number of bicycle and pedestrian crashes.

In spite of these factors, the intersection is unsignalized. During periods of peak activity, this forces pedestrians to either wait for long periods of time before crossing, to cross the street mid-block, or to otherwise cross unsafely.

The main recommendation for this intersection is installing a traffic signal. DVRPC traffic counts for this block of Hamilton Avenue indicate an annual average daily traffic (AADT) count of 13,933 vehicles, while DVRPC's pedestrian counts show an annual daily pedestrian count of 2,560 pedestrians. This strongly suggests that pedestrian volume is high enough to meet the traffic signal warrant for school crossings as described in the *Manual on Uniform Traffic Control Devices for Streets and Highways* (2009 ed), Section 4C.06, Warrant 5, School Crossing.

Existing Conditions

Facing south where Washington and Anderson streets merge

Eastern side of intersection on Hamilton Avenue

Photo Credit: DVRPC

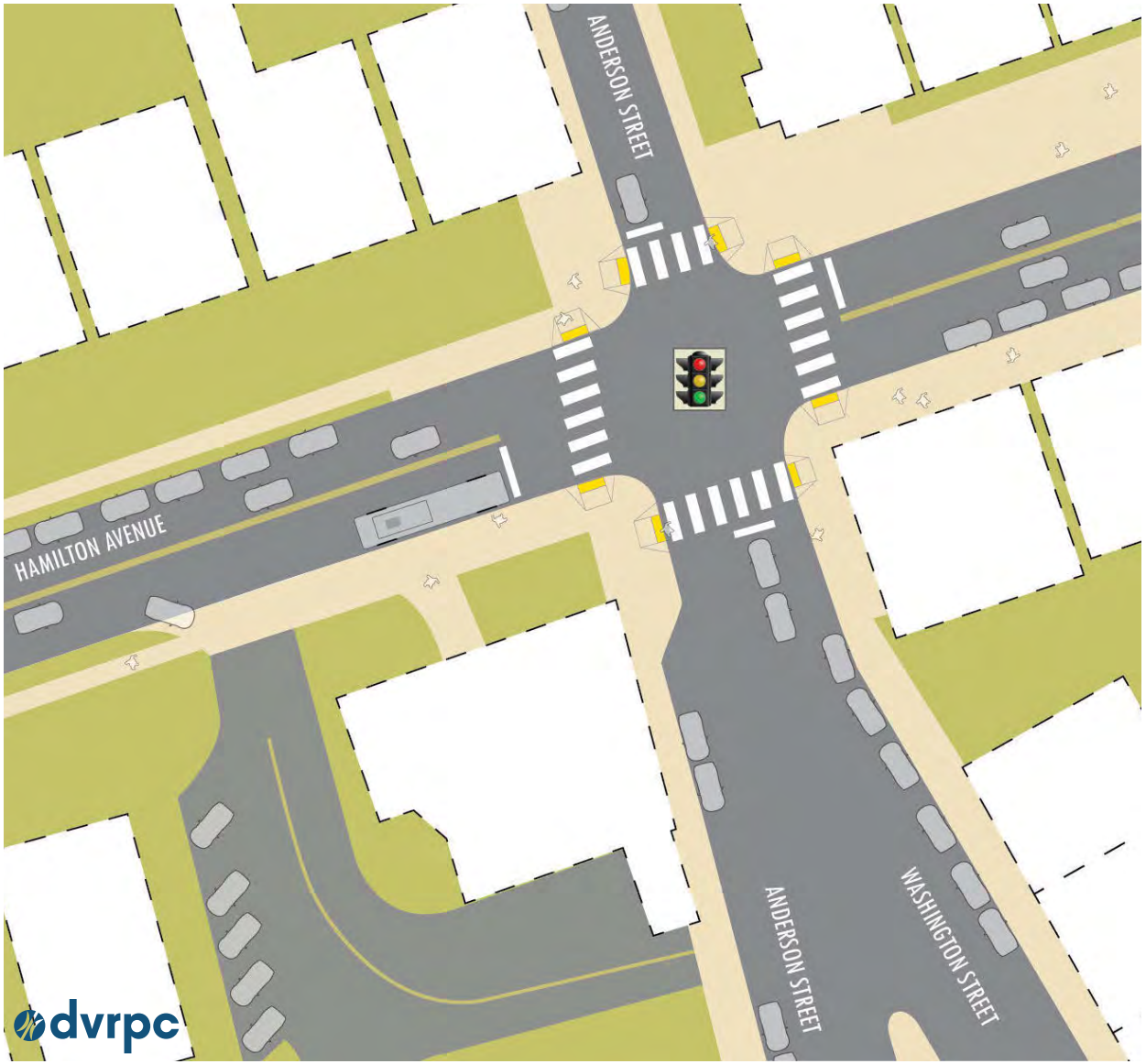
FIGURE 51: Hamilton Avenue and Anderson Street Existing Conditions

- High pedestrian volumes
- No marked pedestrian crossing over Hamilton Avenue
- Difficult sight lines for vehicles

FIGURE 52: Hamilton Avenue and Anderson Street Recommended Improvements

Recommendations

- A traffic signal due to high AADTs and pedestrian counts
- Fully striped crosswalks with walk signals
- A curb extension on the southwest corner of the intersection to shorten the crossing distance across Anderson Street and clarify the vehicular movements



State Street and Willow Street/Barrack Street

BUSY DOWNTOWN INTERSECTION

This intersection is in the heart of downtown Trenton's business district. Several public- and private-sector office buildings, along with Thomas Edison State College, are nearby, generating high volumes of pedestrians. Likewise, this portion of State Street is one of the busiest transit corridors in downtown Trenton, with five NJ Transit bus routes (Routes 601, 606, 608, 609, and 619) stopping at far-side stops in each direction at this intersection.

Crash data showed a high number of pedestrian-involved vehicle crashes (see Figure 21 on page 34). This number of pedestrian-involved crashes was high even when compared to other nearby intersections with high pedestrian volumes. As a result, these recommendations focus on promoting pedestrian safety.

Existing Conditions

State Street facing east

State Street facing west

Photo Credit: DVRPC

FIGURE 53: State Street and Willow Street/Barrack Street Existing Conditions

- High bus volumes
- High pedestrian volumes
- Relatively high-quality existing infrastructure

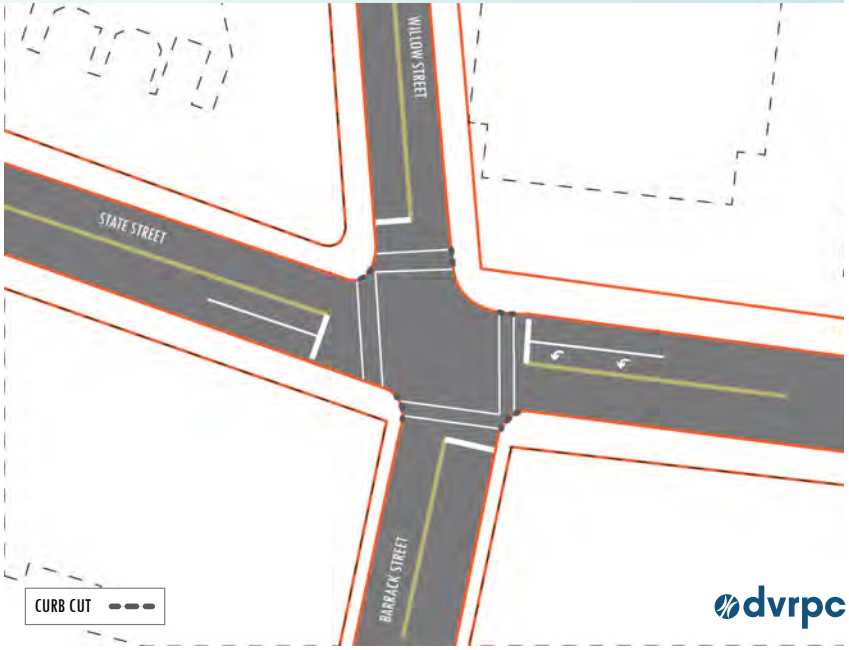


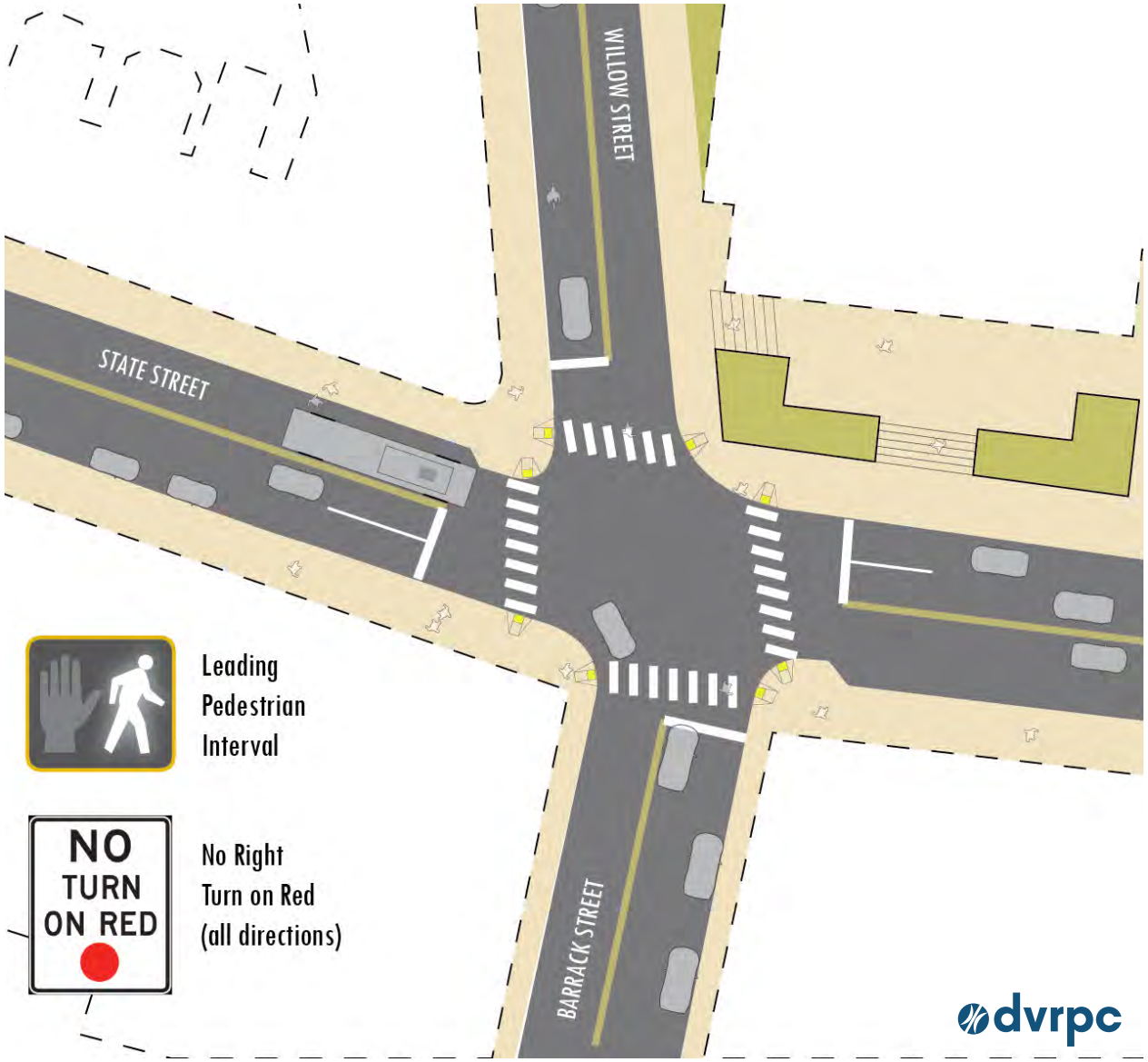
FIGURE 54: State Street and Willow Street/Barrack Street Recommended Improvements

Recommendations

- Two curb extensions (at the northwest and southeast corners) to shorten crossing distances across State Street

- A leading pedestrian interval for all crosswalks, allowing pedestrians extra time and added visibility in the intersection

- Right turns on red (currently allowed in all directions except southbound on Willow Street) are not recommended in any direction at this intersection



Perry Street/Lincoln Avenue and Clinton Avenue

AUTO-CENTRIC INTERSECTION

This busy intersection suffers from an auto-centric design despite its location near potential bicycle and pedestrian destinations, including an elementary school, a church, municipal buildings, and a corner store. Perry Street and Lincoln Avenue fan out into four lanes at the intersection, while Clinton Avenue expands to three lanes, forcing pedestrians to cross long distances. This intersection is also a key link between a north-south bicycle facility on Clinton Avenue and an east-west bicycle facility on Lincoln Avenue.

Existing Conditions

Perry Street facing east toward Clinton Avenue

Clinton Avenue facing south

Photo Credit: DVRPC, Google

FIGURE 55: Perry Street/Lincoln Avenue and Clinton Avenue Existing Conditions

- Auto-centric lane design
- Difficult pedestrian access

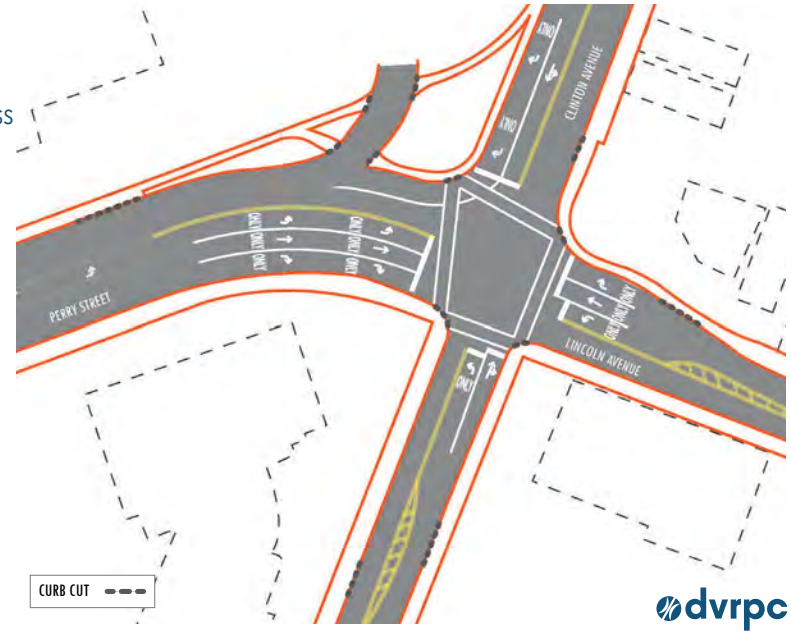


FIGURE 56: Perry Street/Lincoln Avenue and Clinton Avenue Recommended Improvements

Recommendations

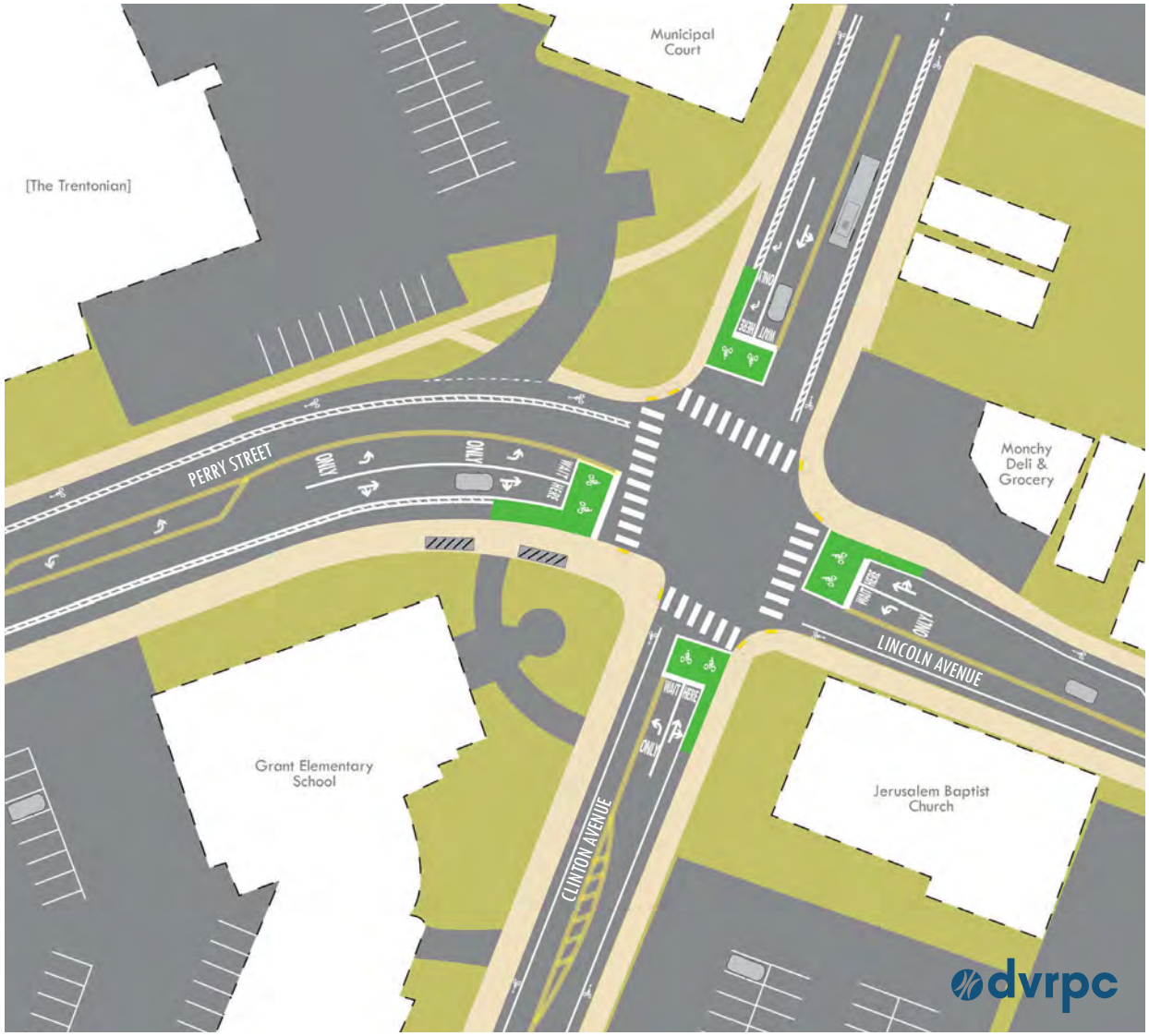
- Painted bike boxes in each direction to provide cyclists with appropriate visibility before entering the intersection

- Buffered bike lanes in each direction on Perry Street and on Clinton Avenue north of the intersection

- Standard bike lanes on Lincoln Avenue and on Clinton Avenue south of the intersection

- The turning/through lanes on Perry Street and Lincoln Avenue should be reduced to one left-turn-only lane and one through/right-turn lane

- Bicycle parking on the southwest corner of the intersection to serve Grant Elementary School



NJ 129 and Hamilton Avenue

WIDE ARTERIAL CROSSING

This intersection was selected for several reasons. This portion of Hamilton Avenue is an important connector in this plan's proposed on-street bicycle network. NJ 129 is an auto-oriented arterial boulevard with long crossing distances and high vehicle speeds. Additionally, the nearby Hamilton Avenue River LINE station makes this intersection critical for bike-to-transit and walk-to-transit considerations. This is especially important in this location because of the Sun National Bank Center nearby.

Existing Conditions

NJ 129 facing north

Photo Credit: Google

Hamilton facing east toward NJ 129

Photo Credit: DVRPC

FIGURE 57: NJ 129 and Hamilton Avenue Existing Conditions

- High-speed vehicular traffic
- Long crossing distances for bicyclists and pedestrians
- Adjacent to the River LINE station

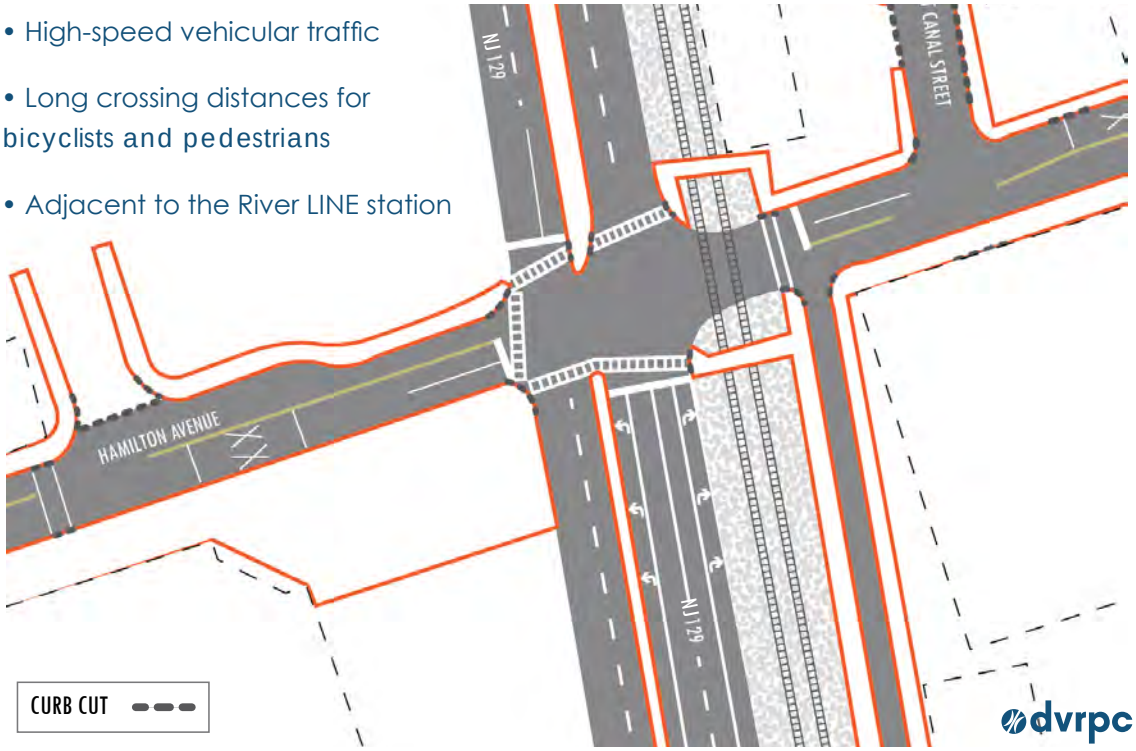


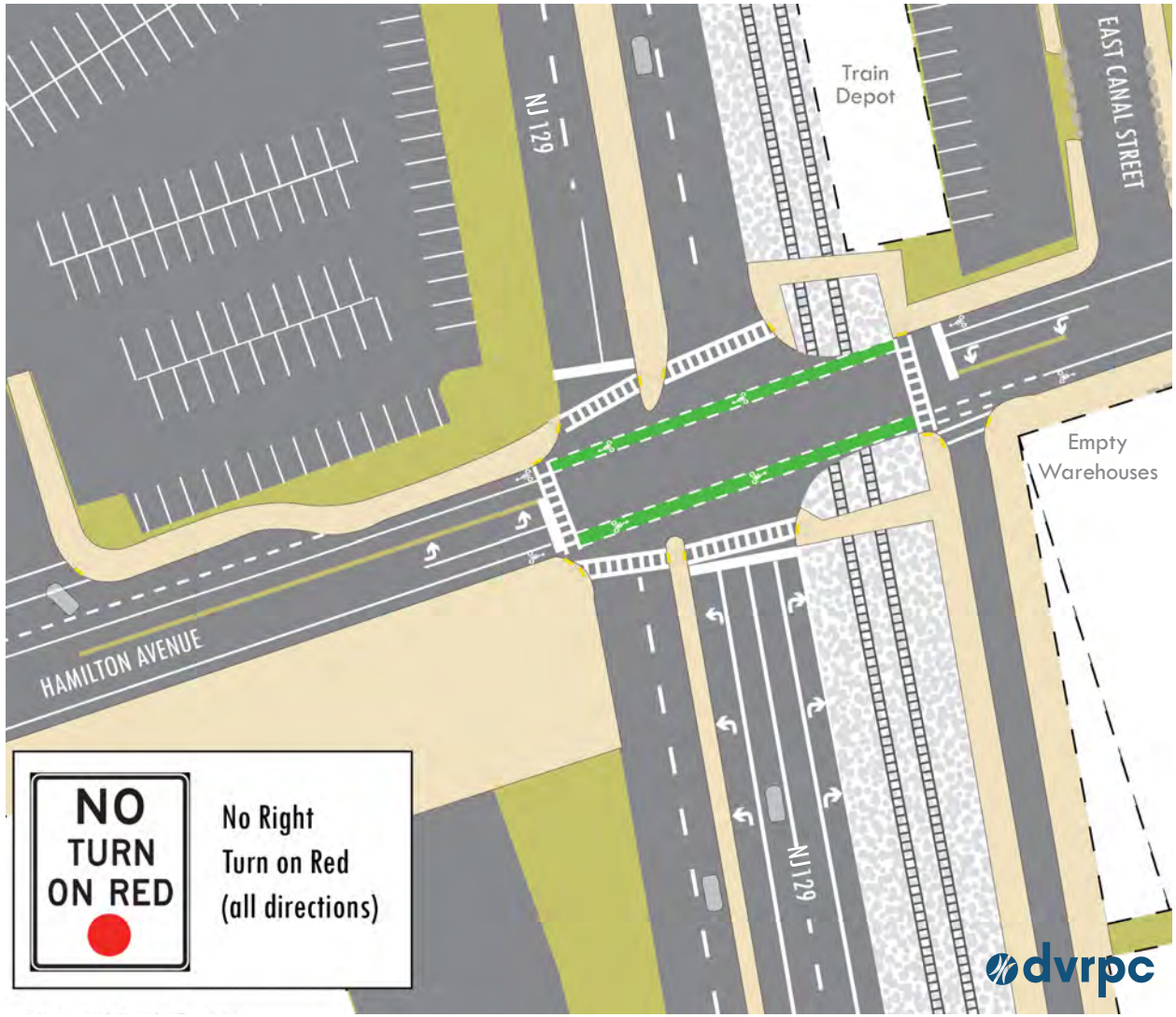
FIGURE 58: NJ 129 and Hamilton Avenue Recommended Improvements

Recommendations

- Intersection crossing markings for bicycle lanes on Hamilton Avenue. These markings are intended both to guide bicyclists and to alert motorists to the potential presence of bicyclists

- "No Turn On Red" signs are recommended in every direction (right turns on red are already disallowed when crossing the River LINE tracks)

- A pedestrian refuge island consisting of a widened median is recommended for the south side of the intersection



Greenwood Avenue and Chambers Street

MAJOR ROAD NETWORK CROSSING

This intersection is the site of a crossing of a major east-west route and a major north-south route in this plan's proposed on-street bicycle network. It is also immediately adjacent to Trenton Central High School's Chambers Street campus (currently under renovation), making safety a critical issue. Additionally, the two gas stations on the north side of the intersection have multiple wide curb cuts, causing a chaotic situation on the sidewalk.

Each street separates into either two or three lanes at this intersection, and DVRPC's video count observations show that the right-most lane is often used for queue jumping by through traffic—a dangerous behavior that could potentially affect all users. These recommendations aim to mitigate unsafe motorist behavior while providing safer, more predictable spaces for pedestrians and cyclists.

Existing Conditions

Greenwood Avenue facing west

Chambers Street facing north

Photo Credit: DVRPC

FIGURE 59: Greenwood Avenue and Chambers Street Existing Conditions

- Numerous driveways with long curb cuts
- Adjacent to Trenton Central High School, Chambers Campus
- Key intersection in proposed on-road bike network

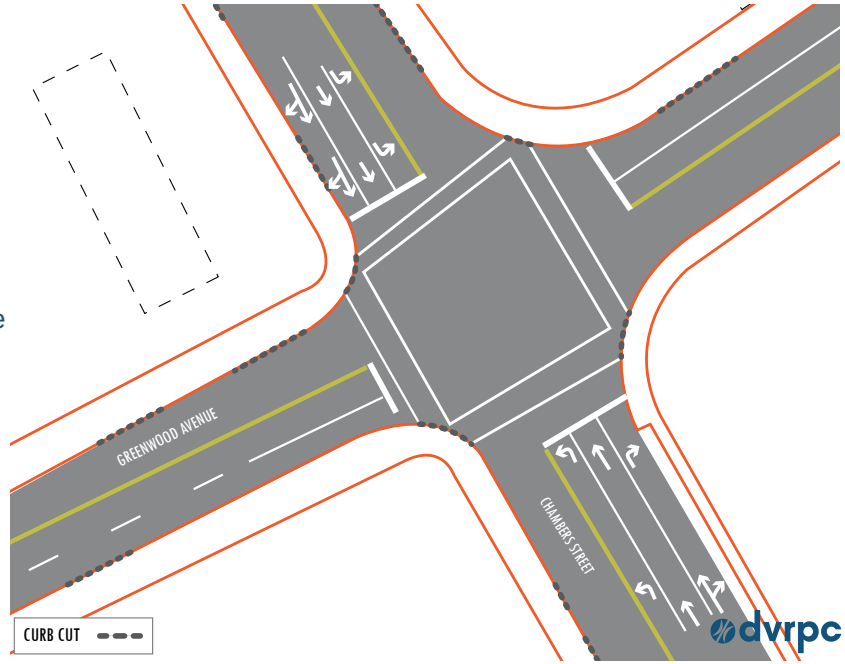


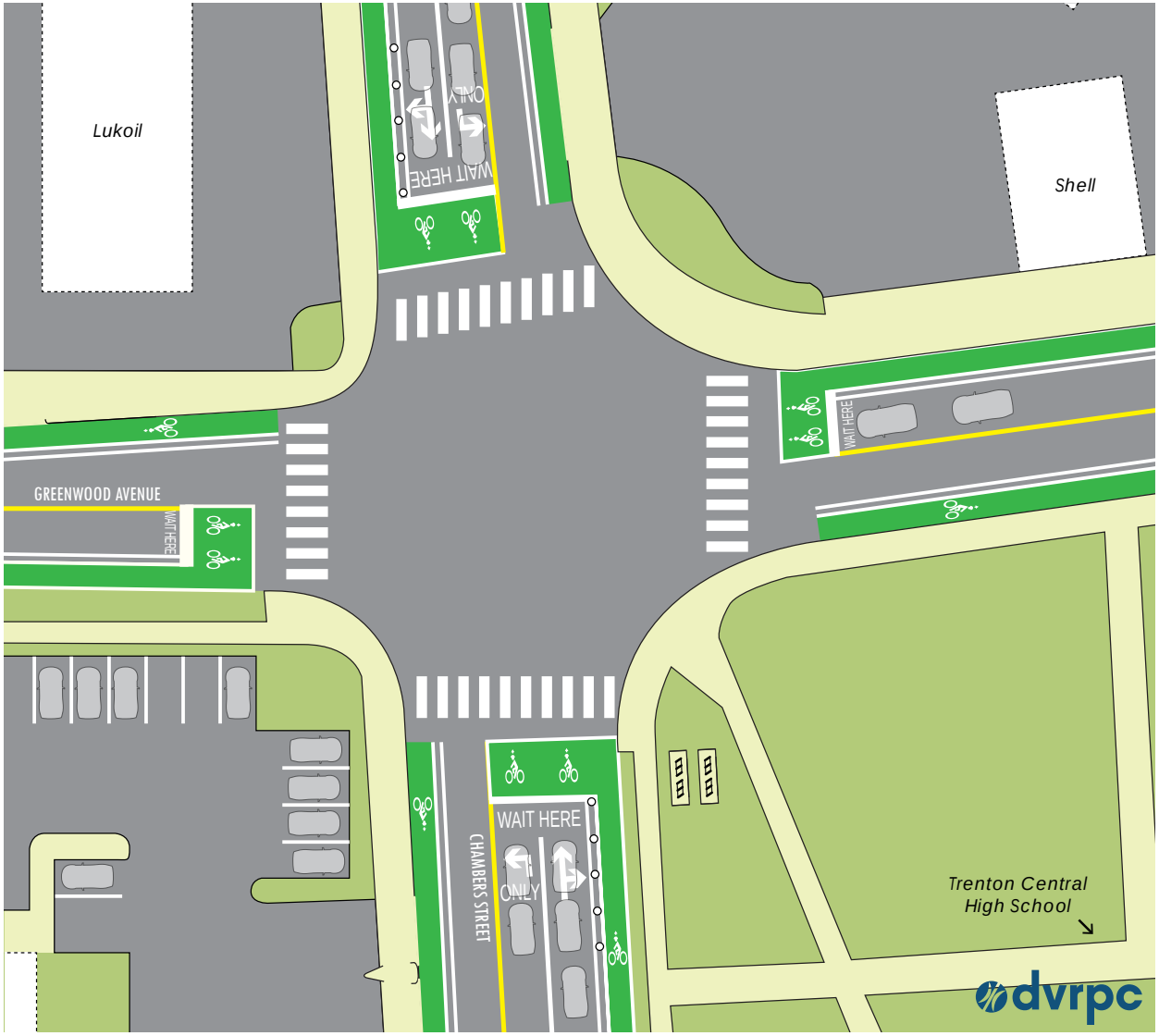
FIGURE 60: Greenwood Avenue and Chambers Street Recommended Improvements

Recommendations

- Buffered bicycle lane on each street, with green painted sections within 200 feet of the intersection to alert motorists to the presence of bicyclists

- Bicycle racks on the Trenton Central High School property at the southeast corner of the intersection

- Painted bike boxes in each direction



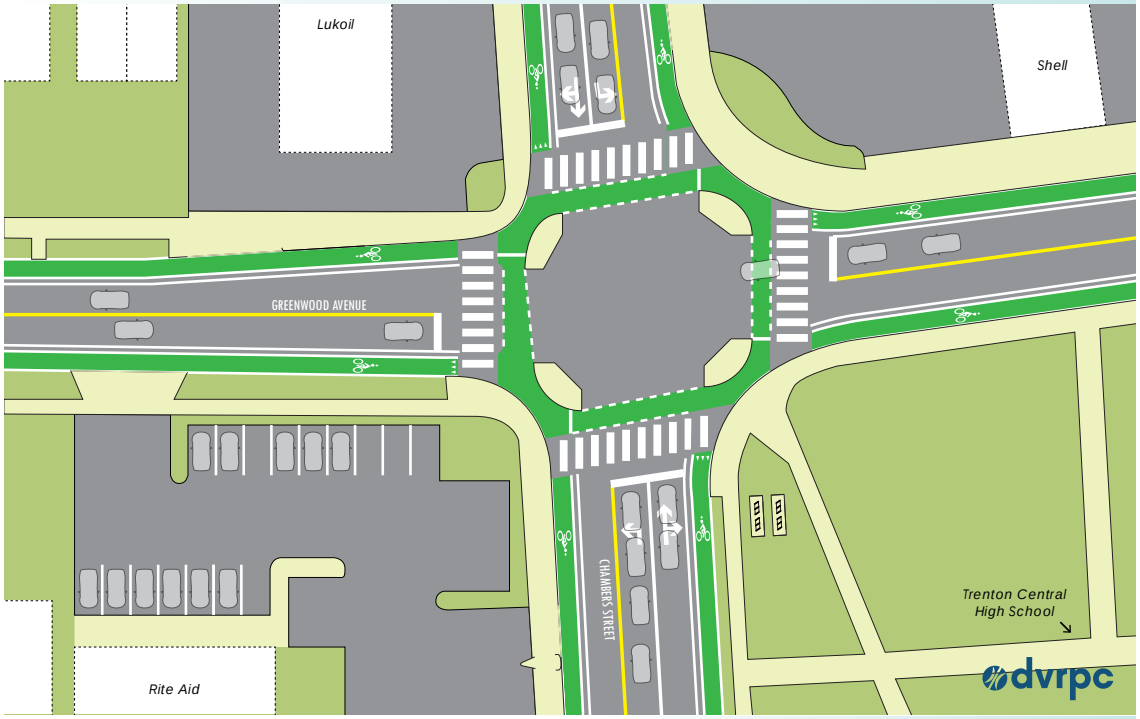
Alternative Experimental Treatment: Protected Intersection at Greenwood Avenue and Chambers Street

In addition to the recommended treatment on the previous page, this plan recommends considering a more experimental treatment and constructing a protected intersection at this location. This intersection design is used often in The Netherlands and as of May 2015, four U.S. cities—Austin, TX; Boston, MA; Salt Lake City, UT; and Davis, CA—were in either the design or construction phases of implementing the first protected bicycle intersections in the nation.

A major feature of this design is creating raised curbs inside of the intersection surrounded by a bicycle lane. This decreases the curb radius for vehicles, requiring slower speeds. In turn, pedestrians and bicyclists can more easily travel across intersections.

In addition to physical design, a protected intersection also relies on bicycle-friendly signal phasing to prevent conflicting car and bicycle movements.

FIGURE 61: Greenwood Avenue and Chambers Street Experimental Treatment



This may be accomplished with a variety of signal timings, including a leading green signal interval for bicycles of 2 to 5 seconds, an extended red signal for cars, or a bicycle-only green signal interval.

This treatment would reduce traffic speeds at Greenwood Avenue and Chambers Street, creating a safer design for all users.

PROTECTED INTERSECTIONS IN THE UNITED STATES

Davis, CA | Photo Credit: City of Davis

Salt Lake City, UT | Photo Credit: Alta Planning

Intersections Summary

The Pedestrian and Intersection Recommendations section suggests interventions that can improve safety and access across all transportation modes. Intersection conditions vary and require different types of treatment based on automobile, bicycle, and pedestrian traffic. New designs are also being tested and are becoming more standard practice as transportation safety focuses on multi-modal needs.

While these recommendations feature single intersections, elements of these designs can be used throughout the city.

PHOTO CREDIT: DELAWARE VALLEY REGIONAL PLANNING COMMISSION

OTHER recommendations

Bicycle Parking

Providing bicycle parking is an important piece of supporting and expanding Trenton's bicycling community. People are more likely to choose to ride a bike if they know there will be a safe place to lock their bike at their destination. The following section provides a series of recommendations for selecting, siting, and installing bike racks.

SITING

The placement of bicycle racks is an important aspect of developing bike parking that is secure and well used. The following are general rules for siting of bicycle racks:

- Ensure that bicycle parking is sited within 50 feet of the building entrances.
- Only locate bicycle racks on sidewalks where there is also adequate space for pedestrian traffic. To minimize conflicts, align the rack with other types of street furnishings, such as light poles, near the curb of the street.
- Make sure racks are in well-lit areas if possible.
- Locate parking where cyclists are aware it exists. If it is not placed in sight of a building or trafficked area, it is unlikely to be used.

ARRANGEMENT AND DESIGN

When installing bike racks, it is important to remember that bikes require space for maneuverability.

Remember to:

- Consider the space that a full rack of bicycles will take up. Allow two feet by six feet for each rack, and an aisle at least five feet behind the rack for maneuverability when exiting.
- If installing more than one rack, stagger them by a minimum of 17 inches to allow for more parking.
- Do not install racks too close to walls or car parking. Insufficient room can greatly cut capacity and reduce usage.
- Create a sufficient pathway to and from the parking area.
- When a location lacks adequate sidewalk space, but has a high demand for bike parking, bike corrals can be used by removing an in-street parking space and filling it with bicycle racks. Standard corrals can fit at least 10 bicycles.

The design of a bike rack should provide durability, ease of access, and vandal-resistant anchoring to attract users and provide long-term utility. When considering racks, it is important to note that they should hold bikes upright by providing two points of contact along the horizontal plane, allowing for both frame and wheels to be locked. Racks that only allow for cyclists to lock their wheels tend to be more vulnerable to vandalism and theft.

BIKE PARKING ORDINANCE

It is recommended that the city and Mercer County consider an ordinance that requires bicycle parking for both existing and new developments. This code can be customized to fit different types of destinations. The ordinance should also make clear that bicycle parking should be located near building entrances, for increased security and convenience for cyclists.

Bike parking near the Philadelphia Zoo
Photo Credit: DVRPC

Bike Corral in Philadelphia
Photo Credit: Bicycle Coalition of Greater Philadelphia

Wayfinding Signage Improvements

Signage for bicyclists, pedestrians, and motorists serves the important function of helping to orient people to their surroundings. Feeling oriented in a place increases comfort and satisfaction and increases frequency of use.

Generally, signage should be placed regularly along designated routes and at decision points. Design should be consistent and understandable by the widest group of people possible, and messaging should be concise.

TRAIL SIGNAGE

In addition to gateway signage, frequent trail signage, markers, and maps should be clearly visible along the trail and easy to read. Signage that leads users to a trail is also important. An example of this is the Delaware River Heritage Trail signs within the city of Bordentown, which lead people to the trail gateway.

Delaware River Heritage Trail on-road trail signage
Photo Credit: John Boyle

PEDESTRIAN WAYFINDING

Many places are overhauling signage for pedestrians to be more user friendly. These are extremely useful in tourist areas where many are unfamiliar with the area.

Walk!Philadelphia pedestrian signage
Photo Credit: LH Signs

SIGNAGE FOR BICYCLISTS

Clear signage along bicycle or mixed traffic routes can lead bicyclists to key destinations. These signs can also include distance and/or approximate travel times and alert drivers to increased bicycle traffic along these routes.

Directional bicycle route signs in Portland, OR
Photo Credit: Richard Drdul

Four hundred directional wayfinding signs have been installed in Sydney, Australia, along the city's bicycle ways to lead bicyclists to key destinations.
Photo Credit: Sydney Cycleways

Areas Needing Further Study

Three locations in downtown Trenton need further study. These locations are important links in the network and need study and design beyond what is possible in this plan.

CALHOUN STREET BRIDGE AND APPROACHES

This bridge is part of the East Coast Greenway, a connection to Pennsylvania, and provides access from the on-road network to the D&R Canal Towpath. Currently the walkway is narrow and the approaching intersection and ramps are hard to navigate and dangerous.

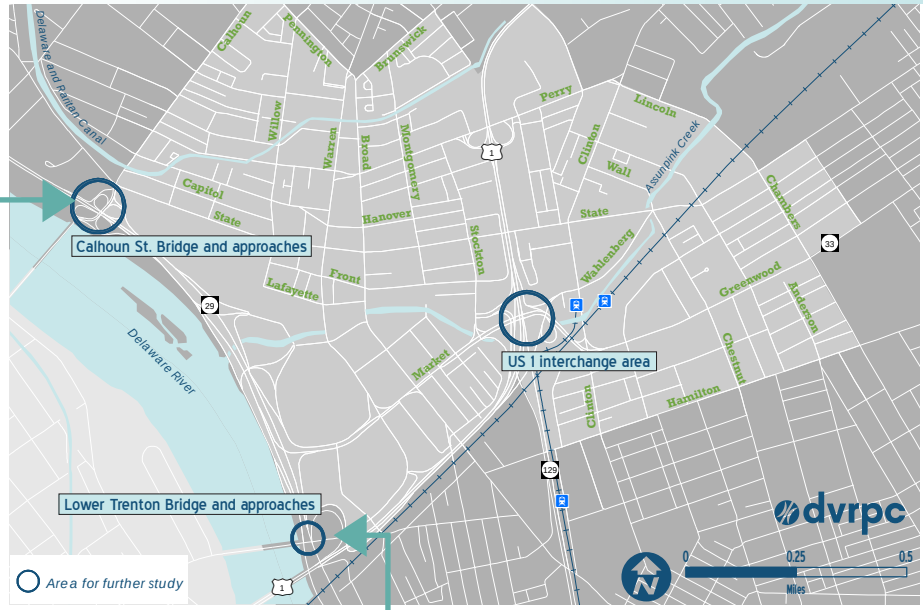
LOWER TRENTON BRIDGE AND APPROACHES

This bridge near the heart of downtown Trenton is well-used. The approaching sidewalk and underpass are unfriendly to pedestrians, and bicyclists must dismount.

US 1 AND MARKET STREET INTERCHANGE AREA

This interchange is unfriendly for bicyclists and pedestrians, despite being near the train station and downtown Trenton and at the intersection of many proposed bicycle and pedestrian facilities.

FIGURE 62: Areas Needing Further Study



Sources: NJDOT, DVRPC, Mercer County, City of Trenton.

CALHOUN STREET BRIDGE AND APPROACHES

Photo Credit: Wikimedia Commons User Famartin

LOWER TRENTON BRIDGE AND APPROACHES

Photo Credit: DVRPC

Photo Credit: DVRPC

PHOTO CREDIT: WEST WINDSOR BICYCLE AND PEDESTRIAN ALLIANCE

dvrpc

CHAPTER 4
implementation

This section discusses project implementation practices and also introduces other policies and practices, beyond infrastructure, that the city can pursue to increase rates and acceptance of walking and bicycling.

Chapter 4:
Implementation

Introduction

Effective project implementation involves finding the appropriate partnerships, matching complementary policies and processes, and obtaining financial resources.

This section first introduces complementary policies and processes that would further the goals of this plan, followed by project development strategies and funding programs to implement projects on the ground.

Ribbon cutting for a portion of the Lawrence Hopewell Trail
Photo Credit: Cie Stroud

Pedestrian improvements under construction on Bala Avenue in Lower Merion Township, PA
Photo Credit: DVRPC

PHOTO CREDIT: TRENTON CYCLING REVOLUTION

COMPLEMENTARY policies

Supportive Policies and Programming

Complementary policies and programs can maximize the impacts of investments in physical infrastructure, enhance the overall safety of the environment, and encourage additional people to choose non-motorized transportation.

General road safety initiatives, as well as more specialized non-motorized public education efforts, introduce people to choosing bicycling or walking and doing it safely. Furthermore, routine maintenance of existing infrastructure is also essential to ensure adequate and safe facilities.

South Warren Street
Photo Credit: Dan Fatton

VISION ZERO

Vision Zero challenges conventional thinking on traffic crashes and injuries, moving from reacting to collisions to improving the physical environment proactively so that fewer crashes occur and severity is lower when they do. Examples of Vision Zero improvements may include physical improvements, as well as taking actions such as reducing speed limits.

Vision Zero is an initiative that started in Sweden in 1997 and has since spread to countries around the world. Vision Zero is increasing in popularity in the United States, with recent Vision Zero plans passed in San Francisco, New York City, Portland, and Boston. Similar to complete streets adoption, municipalities typically begin this important work by adopting a Vision Zero goal or policy.

Vision Zero initiatives are gaining momentum around the country.
Photo Credit: Bike NYC

Traditional Thinking	Vision Zero
• Focus on **crashes**	• Focus on the **facilities and serious injuries**
• Assume **perfect human behavior**	• **Integrate the failing human** in design
• **Individual responsibility**	• **Shared responsibility** between system and design
• Industry must be forced	• Industry can be stimulated
• Saving lives is **expensive**	• Saving lives is **cheap**

Adapted from Vision Zero Initiative

COMPLETE STREETS

Complete streets policies are intended to create a safe environment for all users. These policies often include a community vision, performance measures, and implementable next steps. They use industry design best practices, often pulling from examples in other communities. Complete streets policies are applied to both new and retrofitted projects in order to fully meet community goals.

The City of Trenton passed Resolution No. 12-121, "Establishing a 'Complete Streets' Policy for the City of Trenton" in March 2012 (the full resolution can be found in Appendix A). This policy was highly ranked by Smart Growth America for features such as mentioning all users and modes, identifying a prioritized network, and having design flexibility. However, the resolution does not list specific performance measures.

Learning from other places with successful complete streets implementation processes and metrics, such as Essex County, New Jersey (see right), will help the City of Trenton operationalize its complete streets policy and ensure that the city is moving toward meeting its goals.

ESSEX COUNTY'S COMPLETE STREETS IMPLEMENTATION ACTION PLAN

In 2014, Essex County and North Jersey Transportation Planning Authority developed the *Complete Streets Action Plan for Essex County.* It examined how to incorporate the county's complete streets policy, adopted in 2012, into other policies and processes and consists of a series of implementation tools, such as an implementation matrix and a series of project checklists (see below).

Essex County has created a complete streets implementation plan. Photo Credit: Together North Jersey

Separate Complete Streets Checklists:

- Concept Development
- Design Engineering
- Construction
- Resurfacing
- Maintenance and Operations

Action Item	Action Required	Responsibility	Timeframe
Municipal Coordination	• Review municipal plans and codes to develop and adopt changes that incorporate language that supports and promotes bicycling and walking, especially local master plans, zoning ordinances,, and bicycle riding ordinances.	Municipalities	Short Term
Municipal Coordination	• Encourage all municipalities within the County to amend existing policies and ordinances as per the recommendations noted in the Essex County Complete Streets Implementation Action Plan.	Essex County	Short Term
Transparency	• Create a webpage, on the Essex County website, dedicated to the Complete Streets Program	Essex County	Long Term
Exemptions Process	• Provide a link or description of the decision-making process for each exemption made under the CS policy	Essex County	Long Term
Complete Streets Marketing/Outreach	• Host a logo contest for residents to create a Complete Streets logo unique to Essex County	Essex County	Long Term
Action Plan Implementation	• Adopt a policy to install bicycle racks or other bicycle storage at all existing and future community facilities and appropriate funding to assist with retrofitting existing facilities with bicycle racks or other bicycle storage.	Essex County/ Municipalities	Short Term
Action Plan Implementation	• Establish targets for increasing the number, mileage or percentage of roads in the County that are bicycle friendly and the number and mileage of designated bicycle facilities in the County by a pre-determined forecast year.	Essex County/ Municipalities	Short Term
Action Plan Implementation	• Establish a target goal to decrease the number of bicycling and pedestrian injuries and fatalities within the County by a pre-determined forecast year.	Essex County	Short Term

Item to be Addressed	Design Engineering Checklist Consideration	YES	NO	N/A	Comments/Explanation of How the Item will be Addressed
Proposed Bicyclist, Pedestrian, and Transit Accommodations	What is the proposed typical cross section?				
	Does the proposed project design include accommodations for bicyclists?	☐	☐	☐	
	Does the proposed project design include accommodations for pedestrians to safely travel along and across the facility at appropriate intervals, including ADA compliance?	☐	☐	☐	
	Has there been coordination with the relevant transit agency and have transit users been accommodated in the project design?	☐	☐	☐	
	Does the proposed design include landscaping, street trees, planters, buffer strips, or other environmental enhancements such as drainage swales?	☐	☐	☐	
	Does the proposed project design remove, reduce or relocate an existing bicycle or pedestrian accommodation? If yes, list reasons why the design is as proposed.	☐	☐	☐	

(Left) A portion of the implementation matrix; (Right) A portion of the Design Engineering Checklist
Photo Credit: Together North Jersey

INSTITUTIONALIZING BICYCLE AND PEDESTRIAN PLANNING

To further engage cyclists in the planning process, it is recommended that Trenton form a bicycle and pedestrian technical advisory committee. Led by the city's Planning Division, and including other relevant departments such as Public Works, this group can provide important input on plan and facility implementation priorities or provide technical expertise about active transportation's incorporation into projects. It can also ensure that the city's complete streets policy is being followed. Members should have knowledge and experience related to pedestrian, bicycle, trails, health, recreation and open space, and ADA issues.

MAINTAINING FACILITIES

Bicycle and pedestrian facilities must be properly maintained (for example, cleaning debris along the side of the road or clearing sidewalks) so that these facilities are best experienced by users. Bicyclists are more affected by pavement condition, and poor facility condition can affect usage.

EDUCATION

Creating and supporting programs that teach bicycle education are critical in developing a strong support system for bicyclists of all ages and abilities in Trenton.

Bike education can take many forms, ranging from basic riding and safety lessons to bike maintenance, mechanic classes, and advocacy roles. Bicycle riding and safety lessons for individuals of all ages are vital to assuring that bike infrastructure is properly used, and that new and experienced bike riders alike know the rules of the road. With new bicycle infrastructure, it is also important that motorists understand laws and best practices when sharing the road with bicyclists.

ENFORCEMENT

Proper enforcement by local police will aid in assuring that bicyclists and motorists are obeying laws and sharing the road. Establishing bicycle patrols and training officers on the regulations pertaining to bicycle operation and vehicle and bicycle interactions builds a culture of bicycling in the city and ensures that bicyclists' rights are known and protected.

Neighborhood Bike Works' Earn-A-Bike program in Philadelphia works with children ages 8–18 teaching them about bicycle safety, repairing bicycles, and going on bike rides. At the end of the program each of the participants receives their own bicycle. Neighborhood Bike Works also has adult repair classes available.
Photo Credit: Neighborhood Bike Works

Free Ride bicycle co-op in Pittsburgh "is a non-profit, do-it-yourself recycled bike shop that enables people of all ages to obtain, recycle, and maintain bicycles." Through educating people on how to recondition used bicycles, they are putting forgotten bikes back on the streets in a reliable, safe condition. They aim to enhance the health of the community and environment by promoting active living and encouraging bicycle transportation.
Photo Credit: Bike PGH!

ENCOURAGEMENT

In addition to safety and enforcement, the support of local advocacy groups such as Trenton Cycling Revolution, as well as providing access to affordable bicycles and repair resources like the New Jersey Bicycle Exchange at the Boys and Girls Club, are excellent ways to further develop a strong culture of bicycle riding and education in Trenton.

Other encouragement activities include bicycling and walking events and group rides, programs that market and encourage commuting by bike or walking, competitions and incentives, and publishing and distributing walking and biking maps.

Preparing for a walking audit in Seattle
Photo Credit: West Seattle Herald

PARTNERING TO BUILD AND EXPAND SAFE ROUTES TO SCHOOL

Increasing walking and bicycling to school is an effective way to increase children's physical activity. The Trenton Board of Education and other organizations, such as the New Jersey Partnership for Healthy Kids–Trenton, have been leaders in institutionalizing the importance of health and physical activity in their policies and practices.

In January 2015, the school board adopted a comprehensive wellness policy that includes language on Safe Routes to School and the need for infrastructure improvements to accomplish policy goals. A District Wellness Council made up of members from all Trenton schools will lead implementation.

This policy builds on previous work by the district and its schools. In 2006, NJDOT and Greater Mercer TMA worked with the school district to develop travel plans for Hedgepeth-Williams Middle School and Paul Robeson Elementary School. School travel plans investigate the existing levels of bicycling and walking and also what infrastructure barriers are present. These plans can guide further project development and implementation and can help secure funding for construction.

Similarly, the New Jersey Partnership for Healthy Kids–Trenton engages in many activities that encourage Trentonians to make physical activity a part of their daily lives. Ongoing work includes the design and construction of a "wellness loop" along Broad and Warren Streets. The loop will include crosswalk improvements and striping left-side bicycle lanes.

The school district and other organizations can be partners for implementing this plan, as well as furthering its foundational goals.

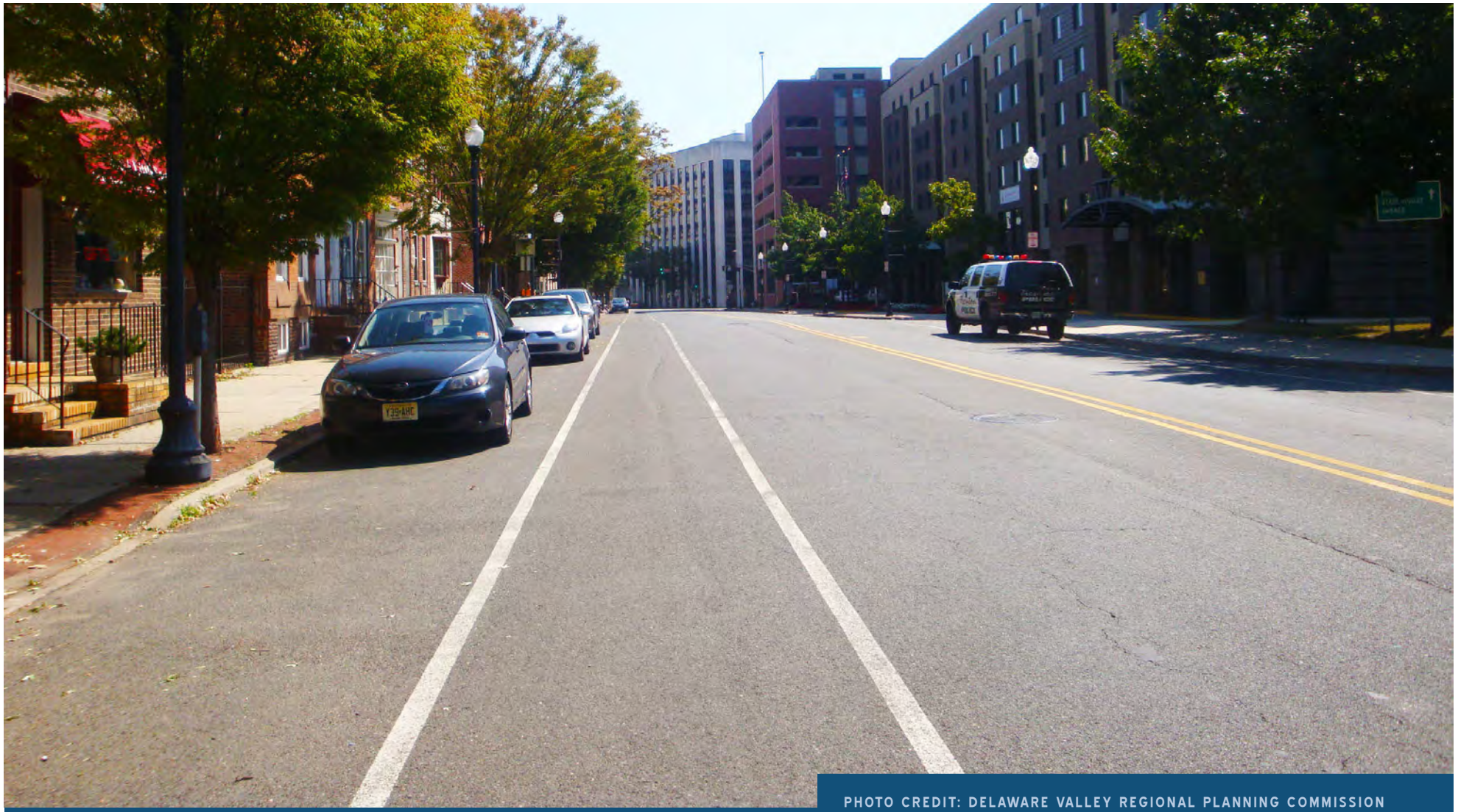


PHOTO CREDIT: DELAWARE VALLEY REGIONAL PLANNING COMMISSION

PROJECT DEVELOPMENT:
strategies and funding programs

Project Development

Although obtaining transportation funding has become more competitive in recent years, thorough project development and strategic partnerships increase the likelihood of funding and implementation. This section discusses different funding streams that are available for bicycle and pedestrian projects.

PROJECT DEVELOPMENT CHECKLIST

The Center for Planning Excellence in Louisiana has created a checklist to guide bicycle and pedestrian projects through the development and funding process (see Table 4). This checklist provides strategies that open the project to the greatest amount of stakeholders while maintaining feasibility, with the aim of developing a better and more comprehensive project.

TABLE 4: Project Development Checklist

To ensure that public transportation dollars have the greatest impact and stakeholders' energies are directed toward feasible projects that effectively address community need, the following checklist offers some guidance on successful project development.

ASSESSMENT

- ☐ Develop a problem statement that describes the issue that you are attempting to solve
- ☐ Determine who owns and operates the property or right-of-way in question
- ☐ Develop a physical inventory of the problem area
- ☐ Obtain historical crash and demand data (e.g., vehicular, bicycle, and pedestrian volumes)
- ☐ Determine who is most vulnerable to being impacted by problem and conduct user surveys
  - *For example, children may be unable to bike or walk safely to school: elderly people may be unable to cross roads because of short traffic light cycles; people reliant on transit, walking, or bicycling may be unable to access jobs, schools, retail, or civic amenities*
- ☐ Observe and document travel behaviors in the travel area

COLLABORATION

- ☐ Conduct a site walk with others who can support or provide input on the problem
- ☐ Determine if problem is already identified in local, regional, or state plans
- ☐ Reach out to civic associations, advocacy groups, and non-profit organizations who might be able to support a solution
- ☐ Involve the owner and operator of the property in developing a solution
- ☐ Determine if philanthropic organizations, the business community, or others have an interest in supporting a solution

Adapted from *Walk and Ride: A Resource Guide to Funding Pedestrian, Bicycle + Complete Streets in Louisiana* by Center for Planning Excellence

PROPOSAL

- ☐ Develop possible solutions to the problem that maximize positive impacts for vulnerable users
  - *For example, installation of a bike lane along a busy commercial corridor with a history of bicycle crashes can increase safety for bicyclists*
- ☐ Determine feasibility (including costs and time frame) of possible solutions
- ☐ Document anticipated environmental and social impacts
  - *For example, solutions may improve air quality and make access to transit stops safer for a neighborhood with high asthma rates and low rates of households automobile ownership*
- ☐ Obtain permission and assistance of owner and operator to seek funding and implement solution
- ☐ Contact funding program manager(s) to learn about program requirements, eligibility, etc.
- ☐ Designate local sponsor who is eligible to apply for funding (see individual program requirements)
- ☐ Secure local cash and/or in-kind match

IMPLEMENTATION

- ☐ Host a community meeting to provide information on the project
- ☐ Track the project's progress by periodically checking in with the local sponsor
- ☐ Continue to grow support for the project and/or subsequent phases of the project
- ☐ Celebrate the completion of the project with local sponsor and community stakeholders
  - *For example, a survey of pedestrians and motorists after a pedestrian safety media campaign might gauge level of awareness for safe travel behaviors, and crash data may show a reduction in pedestrian crashes along a roadway*
- ☐ Assess effectiveness of the solution by conducting user satisfaction surveys and reviewing crash and travel mode data
- ☐ Incorporate lessons learned into future projects

Leveraging Other Projects

Every year, miles of local, state, and federal roads are resurfaced in Trenton. During this repaving process, lines are re-striped, signs are replaced, and signals are recalibrated. Using this bike plan, it is recommended that the Mercer County and City of Trenton's transportation planners and engineers provide oversight of these construction processes and use the resurfacing of these road segments as an opportunity to implement proposed bicycle and pedestrian infrastructure where possible to support county and city complete streets policies. The costs associated with this implementation can often be absorbed by the agency doing the resurfacing and provide an optimal surface for new bicycle infrastructure. In return, ribbon cutting ceremonies and letters of acknowledgment can be written to the resurfacing agency to commend and ensure continued support.

Additionally, utilities and construction work (fiber optic cable installation, gas mains, etc.) often also must repair pavement. By arranging as a condition of approval that these companies stripe these repaved streets with new planned infrastructure, the city saves time and money in the implementation of the bicycle and pedestrian network.

NJDOT striped this bicycle lane in Trenton while repaving Market Street.
Photo Credit: Dan Fatton

PHILADELPHIA'S WALNUT STREET LEFT-SIDE BICYCLE LANE

In anticipation of the Pennsylvania Department of Transportation (PennDOT) resurfacing Walnut Street, the Bicycle Coalition of Greater Philadelphia worked with the Philadelphia Streets Department to request that PennDOT consider striping the bicycle lanes on the left side instead of re-striping them on the right side of the street. This change was subsequently approved and implemented in the fall of 2012 from 22nd to 63rd streets.

Bicycle volumes were increasing in the existing right-hand bicycle lanes, which were some of the first buffered lanes in the city. However, Walnut Street is used by several high-ridership bus routes. This condition created a high number of conflicts, especially between bicyclists and people boarding and alighting buses. Moving the bicycle lane to the left side can reduce these conflicts. Furthermore, since many cars only carry a single passenger, left-hand lanes can reduce the number of bicyclists getting hit by the opening of automobile doors.

By leveraging existing maintenance resources, the updated cross section is safer and was implemented at no additional cost.

Walnut Street, Philadelphia, PA
Photo Credit: Bicycle Coalition of Greater Philadelphia

Project Costs

ESTIMATED COSTS

Costs for bicycle and pedestrian infrastructure projects tend to vary by city and state. Exact project costs can only be determined during final design. However, as more projects are completed across the country, better resources have become available to estimate costs.

In 2013, the University of North Carolina Highway Safety Research Center published *Costs for Pedestrian and Bicyclist Infrastructure Improvements* as a resource for planners and municipalities as they develop plans and projects. This guide, which was the source for Table 5, summarizes a nationwide survey of over 1,700 cost observations to provide better information to use when estimating infrastructure costs.

Table 5 presents the minimum, maximum, and median costs from this survey. Other projects in the Trenton region have generally been in line with the median costs presented.

The document and table can be used by planners as they pursue implementing discrete projects from this plan.

TABLE 5: Examples of Estimated Implementation Costs

	Unit	Min.	Med.	Max.	Additional Notes
STANDARD BICYCLE LANES					
Bicycle Lane	mile	$5,360	$89,470	$536,680	
Excavation	foot		$55		
Grading	acre		$2,000		
Curb/Gutter removal	linear foot		$5		
Roadway Preparation Costs for Bicycle Lane					Varies by project
BICYCLE BOULEVARDS					
Shared Lane Marking/Sharrow	each	$22	$160	$600	Every 50-100 ft., lower traffic volumes every 250 ft.
Pavement Markings	per mile		$3,360		250 feet, or 21 markings/mile
Signage	per mile		$640		Every quarter-mile
MULTI-USE TRAILS					
Paved Multi-Use Trail	per mile	$64,710	$481,140	$4,288,520	Does not include routine maintenance

Source: Bushell, M. et al. (2013, November). Costs for Pedestrian and Bicyclist Infrastructure Improvements. A Resource for Researchers, Engineers, Planners, and the General Public.

COST EXAMPLE

To construct a bicycle boulevard on Chestnut and Wall streets, which, between the two-way and one-way sections, are **about one mile of linear feet, 21 sharrow markings and four signs would be necessary.** Based on the estimated implementation costs, the facility would cost about **$4,000.** Similar calculations can be done for the other facilities as implementation progresses.

Chestnut/Wall St. -
Bicycle Boulevard Treatment

Around one mile long →

Requires...
21 sharrow markings × $160 = *$3,360*
One mile of signage × $640 = *$ 640*
Total Cost: *$4,000**

**Additional traffic calming measures may be necessary, to be determined after a full analysis of existing conditions*

Funding Programs

Pursuing local, regional, state, and federal funding will be one of the most critical steps for the success of this plan. The following information highlights a number of existing programs that can be pursued.

The types of activities that are eligible under each funding program are identified in the adjacent table. Beyond those included here, there are a number of other programs and funding sources available that are not bicycle and pedestrian specific. These opportunities should also be tracked.

Often partnering with other agencies can be a successful strategy for securing funding and developing projects. For most programs, an adopted plan and implementation approach is the first step toward a successful application.

TCDI = Transportation and Community Development Initiative

CMAQ = Congestion, Mitigation, and Air Quality Program

TAP = Transportation Alternatives Program

SRTS = Safe Routes to School

RTP = Recreational Trails Program

Adapted from *Walk and Ride: A Resource Guide to Funding Pedestrian, Bicycle + Complete Streets in Louisiana* by Center for Planning Excellence

TABLE 6: Summary of Bicycle and Pedestrian Funding Programs

Eligible Bicycle and Pedestrian Projects	TCDI	CMAQ	TAP	SRTS	RTP
Safety					
Safety education		■	■	■	
Police patrols			■	■	
Helmet promotion				■	
Safety brochures or books		■		■	■
Training		■		■	■
Safety campaigns		■	■	■	
Trails and Greenways					
Multi-use trails		■	■	■	■
Trail and highway intersections		■	■	■	■
Complete Streets					
On-road bicycle facilities		■	■	■	
Paved shoulders		■	■	■	
Signs and striping		■	■	■	
Bike racks on buses		■	■		
Bicycle parking facilities		■	■	■	
Bicycle storage or services		■	■	■	
Sidewalks: new or retrofit		■	■	■	
Crosswalks: new or retrofit		■	■	■	
Pedestrian signal improvements		■	■	■	
Curb cuts and ramps		■	■	■	
Traffic calming		■	■		
Maps and Plans					
Pedestrian and bicycle plans	■	■	■	■	
Maps	■	■	■	■	
Eligible Project Categories					
Construction		■	■	■	■
Planning	■				
Other			■		■

TABLE 7: Funding Programs

Safe Routes to School (SRTS)

Program Administrator	Funding Type	Deadline
NJDOT	Federal	TBD

Summary

This program provides funds to improve the ability of elementary and middle school students to safely walk and bike to school.

Types of Projects

- Projects to educate and encourage school children on bicycle and pedestrian safety
- Infrastructure projects that improve the built environment within a two-mile radius of K-8 schools

Application Process

Who can apply?	· Any state, county, municipal government, school district, or school · Non-profits cannot receive direct grants but may partner with public agencies to apply
Process	1. Contact a regional SRTS coordinator and visit the website for requirements 2. Form an SRTS team that might include a school administrator, school staff person, parent, police officer, community representative, and municipal representative 3. Obtain resolutions of support from both the municipality and the school or school district 4. Obtain letters of support from community organizations, elected officials, and interested parties

Amounts

Annual Total	$5.69 M (FY 2012)	Typical Allotments	Approximately $100,000 and up
Website	www.dvrpc.org/saferoutes		

Organizing walking school buses is an example of a Safe Routes to School eligible activity.
Photo Credit: New Jersey Safe Routes to School

Transportation Alternatives Program (TAP)

Program Administrator	Funding Type	Deadline
NJDOT	Federal	TBD

Summary

Funds programs and projects that are defined as transportation alternatives, including design and construction of bicycle lanes and recreational trails.

Types of Projects

- Off- and on-road trails and bicycle infrastructure
- Conversion of abandoned railroad corridors to trails
- Community improvement and environmental mitigation activities
- Other non-motorized transportation infrastructure enhancements

Application Process

Who can apply?	· Local governments, regional transportation authorities, and transit agencies · Non-profits cannot receive direct grants, but may partner with public agencies to apply
Process	1. Visit website for more program information 2. Consult with DVRPC on how the proposed project relates to and supports the *DVRPC 2040 Plan* and the Transportation Improvement Program (TIP)

Amounts

Annual Total	$15.5 M (FY 2014)	Typical Allotments	$150,000 to $1,000,000
Website	www.dvrpc.org/TAP/NJ/		

The Delaware River Port Authority will be using TAP funding, along with other sources, for a new pedestrian and bicycle ramp from the Benjamin Franklin Bridge into Camden, NJ
Photo Credit: Thom Carroll

TABLE 7: Funding Programs

Congestion Mitigation and Air Quality Program (CMAQ)

Program Administrator			Funding Type	Deadline
DVRPC			Federal	TBD
Summary		**Types of Projects**		
Projects that demonstrably reduce air pollution emissions or reduce traffic congestion.		Bicycle and pedestrian projects, transit improvement programs, congestion reduction and traffic flow improvements, diesel retrofit and repower projects, freight projects, and funding of transportation demand management programs, among other eligible project types		
Application Process				
Who can apply?	Public agencies, non-profits, and public–private partnerships with a public agency sponsor			
Process	1. Attend a mandatory information session held at DVRPC 2. Fill out the project application form on the DVRPC website			
Amounts				
Annual Total	**$2.6 M**	**Typical Allotments**	**Up to $160,000–$1 M**	
Website	www.dvrpc.org/cmaq			

CMAQ funds were awarded to Lawrence Township to connect Providence Line Road to the Lawrence Hopewell Trail. Photo Credit: West Windsor Bicycle and Pedestrian Alliance

Transportation and Community Development Initiative (TCDI)

Program Administrator			Funding Type	Deadline
DVRPC			State	TBD
Summary		**Types of Projects**		
This effort is to ensure greater quality-of-life choices by providing and maintaining essential infrastructure, supporting local and regional economic development, and linking land use and transportation planning. **20% match is required**		Planning, analysis, or design initiatives for projects or programs that enhance development or redevelopment and improve the efficiency of the regional transportation system		
Application Process				
Who can apply?	Municipal and county governments			
Process	Submit to DVRPC: · Grant application and budget form · Study area map · Description of the project · Description how the project will affect the area and population · Proposed approach to achieve public- and private-sector cooperation · Summary of how the project fits the TCDI goals, and other supporting materials			
Amounts				
Annual Total	**$1 M**	**Typical Allotments**	**Up to $100,000**	
Website	www.dvrpc.org/TCDI			

The TCDI program funded an update to the City of Trenton's parking plan (as part of Trenton 250). Photo Credit: Emile Wamsteker

TABLE 7: Funding Programs (continued)

Recreational Trails Program (RTP)

Program Administrator	Funding Type	Deadline
New Jersey Department of Environmental Protection (NJDEP)	Federal	TBD

Summary

Funds to improve access to open space and provide additional biking and hiking opportunities.
20% match is required

Types of Projects

- Maintenance and restoration of existing recreational trails
- Development and rehabilitation of trailside and trailhead facilities and trail linkages for recreational trails
- Purchase and lease of recreational trail construction and maintenance equipment
- Construction of new recreational trails in existing parks or in new rights-of-way
- For motorized use only, acquisition of easement and fee simple title to property for recreational trails

Application Process

Who can apply?	Government agencies and non-profit organizations
Process	Obtain and submit the application from the NJDEP website

Amounts

Annual Total	$2.2 M	Typical Allotments	Up to $24,000
Website	www.state.nj.us/dep/parksandforests/natural/trail_grants.htm		

D&R Canal State Park received RTP funding to improve access for those with disabilities to a two-mile section within the vicinity of the Port Mercer Canal House. Photo Credit: Eric Feigenbaum

Bikeway Grant Program

Program Administrator	Funding Type	Deadline
NJDOT	State	TBD

Summary

Funds projects that promote bicycling as an alternative mode of transportation.
20% match is required

Types of Projects

Priority is given to construction of new bike paths; however, the proposed construction or delineation of any new bicycle facility will be considered.

Application Process

Who can apply?	Federal, state, county, and local governments; non-profit organizations
Process	Apply to the program via New Jersey's System for Administering Grants Electronically website

Amounts

Annual Total	$1 M	Typical Allotments	$180,000–$330,000
Website	www.state.nj.us/transportation/business/localaid/bikewaysf.shtm		

Phases 4 and 5 of the Middle Township Bike Path in New Jersey used Bikeway Grant Program funding. Photo Credit: Kevin Marriner

TABLE 7: Funding Programs (continued)

Other Bicycle and Pedestrian Funding Programs						Eligibility					
						Projects			Entities		
Program	Funding	Program Adminstrator	Deadline	Annual Total	Typical Allotments	Construction	Planning	Other	Municipalities	Counties	Other
Municipal Aid	State	NJDOT	Sep	$78.75 M	$150,000–$1 M	■			■		
County Aid	State	NJDOT	Feb	$78.75 M	$1.6 M–6.6 M	■				■	
Local Aid	State	NJDOT	Rolling	$5.3 M	$43,000–$450,000	■			■	■	
Local Bridges, Future Needs	State	NJDOT	Feb	$21 M	$250,000–$1 M	■				■	
Transit Village	State	NJDOT	Sep	$1 M	$45,000–$295,000	■			■		
Green Acres Program	State	NJDEP	Feb	$57 M	$300,000–$975,000	■			■	■	■
Muncipal Park Development	County	County	Jun	$5 M	$250,000	■			■		
Private Foundation Funding	Other	Varies	Varies	Varies	Varies	■	■	■	■	■	■

Additional Streams: NJDOT Bicycle & Pedestrian Local Technical Assistance Program, National Highway Performance Program, Hazard Elimination Program

OTHER PROGRAMS

In addition to the programs discussed on the previous pages, a variety of other sources can be used to fund pedestrian, bicycle, and trail projects. For more information, visit the websites of the respective programs, some summarized above.

PHOTO CREDIT: DELAWARE VALLEY REGIONAL PLANNING COMMISSION

dvrpc

CHAPTER 5
conclusion

The creation of an expanded bicycle and pedestrian network in downtown Trenton has the potential to provide an abundant and diverse range of new possibilities for the city and its residents.

Chapter 5: Conclusion

Conclusion

The creation of an expanded bicycle and pedestrian network in downtown Trenton has the potential to provide an abundant and diverse range of new possibilities for the city and its residents.

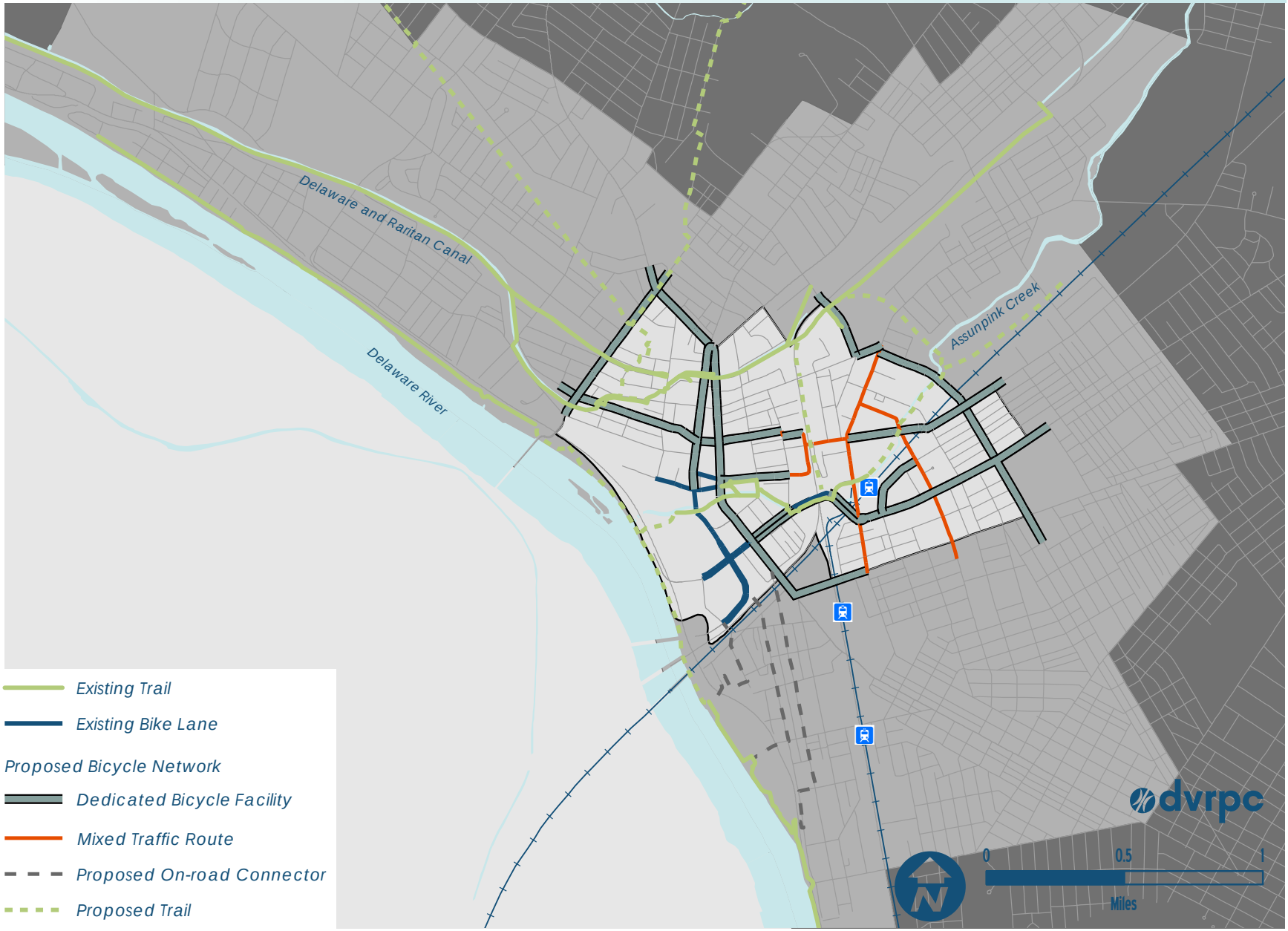
As mentioned in the plan, this network can provide, above all else, continuity. Creating a safe and dense network of bicycle and pedestrian linkages to transportation hubs and places of interest, this plan seeks to help provide Trenton with a truly multi-modal transportation system that can serve as a backbone for a reinvigoration of downtown.

The plan also serves as a resource that other city-wide bike, pedestrian, and transit plans can build from in order to further expand and enhance the network. In supporting a density of infrastructure, Trenton is making walking and bicycling both a practical and convenient means of transportation, showing a commitment to improving the overall quality of life for those living and working in the city.

When examining the existing conditions of this report, issues of mobility, health, and employment are of critical concern to the City of Trenton. High levels of obesity, for example, show a need for improved access to healthy food options and exercise, while low levels of personal car ownership and high unemployment suggest that affordable means of access to transportation, such as biking and walking, could be vital to improving the length and quality of life for a large segment of the city's population.

This plan also highly recommends the investment and expansion of several trails to enhance bicycle and pedestrian connectivity. The Delaware and Raritan Trail, for example, represents a right-of-way with great potential, yet its lack of a formalized path, locked gates, and unlit segments leave it often overlooked or deemed unsafe by passersby. Developing these trails (as well as other infrastructure throughout the city) with fully realized bike and pedestrian infrastructure can provide more foot and bike traffic, putting more eyes on the street and enhancing a feeling of safety in places that previously might have lacked it.

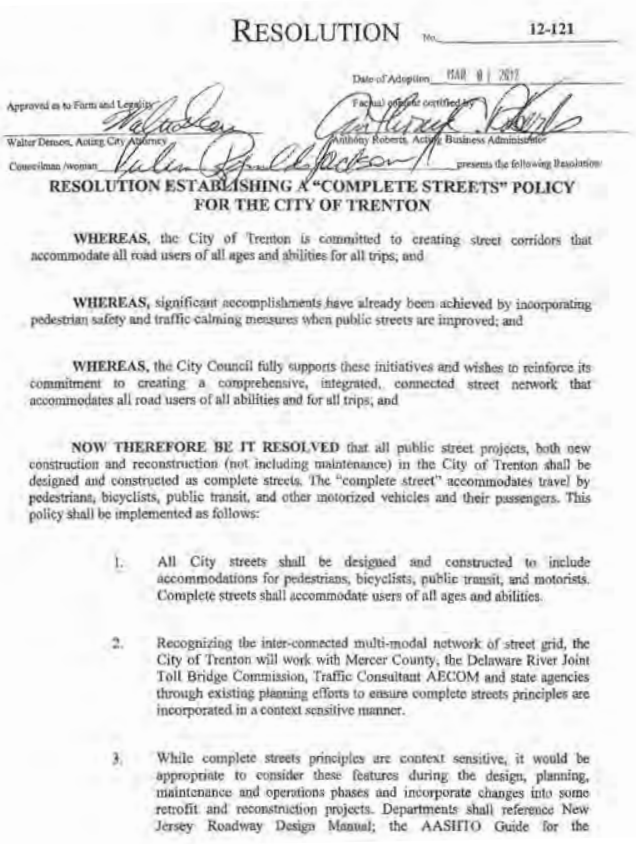
FIGURE 63: Complete Existing and Recommended Active Transportation Network



Sources: NJDOT, DVRPC, Mercer County, City of Trenton

This plan, overall, will support an enhancement of safety, greater connectivity, and a sense of place in downtown Trenton. Road diets will slim down oversized and unsafe intersections, while bike lanes and pedestrian infrastructure will emphasize to motorists that bicyclists and pedestrians have a right to the road. This infrastructure has the potential to create new transportation connections, shorten commutes, and expand job opportunities. More foot and bicycle traffic throughout the day and week can improve health and enhance a community's feeling of safety, while providing better outcomes for local businesses and real estate. Lastly, a more involved community planning process can help Trenton's bicycle community continue to blossom and hold greater stake in its development and expansion.

Appendix A:
City of Trenton Complete Streets Policy



RESOLUTION No. 12-121

Date of Adoption: MAR 0 1 2012

Approved as to Form and Legality: Walter Denson, Acting City Attorney

Factual content certified by: Anthony Roberts, Acting Business Administrator

Councilman /woman Tyler Jackson presents the following Resolution:

RESOLUTION ESTABLISHING A "COMPLETE STREETS" POLICY FOR THE CITY OF TRENTON

WHEREAS, the City of Trenton is committed to creating street corridors that accommodate all road users of all ages and abilities for all trips; and

WHEREAS, significant accomplishments have already been achieved by incorporating pedestrian safety and traffic calming measures when public streets are improved; and

WHEREAS, the City Council fully supports these initiatives and wishes to reinforce its commitment to creating a comprehensive, integrated, connected street network that accommodates all road users of all abilities and for all trips; and

NOW THEREFORE BE IT RESOLVED that all public street projects, both new construction and reconstruction (not including maintenance) in the City of Trenton shall be designed and constructed as complete streets. The "complete street" accommodates travel by pedestrians, bicyclists, public transit, and other motorized vehicles and their passengers. This policy shall be implemented as follows:

1. All City streets shall be designed and constructed to include accommodations for pedestrians, bicyclists, public transit, and motorists. Complete streets shall accommodate users of all ages and abilities.

2. Recognizing the inter-connected multi-modal network of street grid, the City of Trenton will work with Mercer County, the Delaware River Joint Toll Bridge Commission, Traffic Consultant AECOM and state agencies through existing planning efforts to ensure complete streets principles are incorporated in a context sensitive manner.

3. While complete streets principles are context sensitive, it would be appropriate to consider these features during the design, planning, maintenance and operations phases and incorporate changes into some retrofit and reconstruction projects. Departments shall reference New Jersey Roadway Design Manual; the AASHTO Guide for the Development of Bicycle Facilities; AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities; the Manual of Uniform Traffic Control Devices; the NACTO Urban Bikeway Design Guide and other design criteria as necessary, striving to balance all needs, when repaving or reconstructing streets.

4. To facilitate timely implementation of the new policy, the following steps shall be taken:
   a. A memorandum outlining this new policy will be distributed to all department heads within 90 days of this resolution.
   b. At least one training about complete streets will be conducted for appropriate staff within 180 days of this resolution.
   c. The Train Station Linkage Plan, prepared for the city by Nelson/Nygaard in 2006 shall be revisited, with a specific focus on designating appropriate routes for pedestrians, dedicated bike lanes and preferred bicycle routes (shoulders or shared travel lanes with appropriate signage and/or pavement markings). The City Engineer (or other designee as determined by Council) shall coordinate this effort in collaboration with the Traffic Analyst and update City Council within 180 days of this resolution.
   d. Oversight of the new complete streets policy will be handled by the Principle Planner, or other appropriate cabinet officials approved by City Council.

5. Exceptions may be made to this policy under any one of the following conditions:
   a. Bicycle and pedestrian facilities are not required where they are prohibited by law.
   b. Public transit facilities are not required on streets not serving as transit routes. The desirability of transit facilities will be determined on a project specific basis.
   c. When the cost of incorporating new bicycle, pedestrian, and/or public transit facilities is excessive, defined as greater than 20% of the overall project cost, the need for and/or probable use of the facility shall be considered in making the determination as to whether or not an exception should be approved at this time or held for future consideration. This determination may occur during the budget and capital improvements program approval process or when project plans and specifications are being prepared. Exceptions due to cost increases shall be sent to City Council for formal approval.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Trenton that the City hereby consents to all public street projects, both new construction and reconstruction (not including maintenance) in the City of Trenton shall be designed and constructed as complete streets; and

BE IT FURTHER RESOLVED, that this resolution shall remain on file in the City Clerk's office.

	Aye	Nay	Abstain	Absent		Aye	Nay	Abstain	Absent		Aye	Nay	Abstain	Absent
BETHEA	✓				HOLLY WARD	✓				MUSCHAL	✓			
CALDWELL WILSON	✓				MORRIS	✓								
CHESTER	✓				REYNOLDS JACKSON	✓								

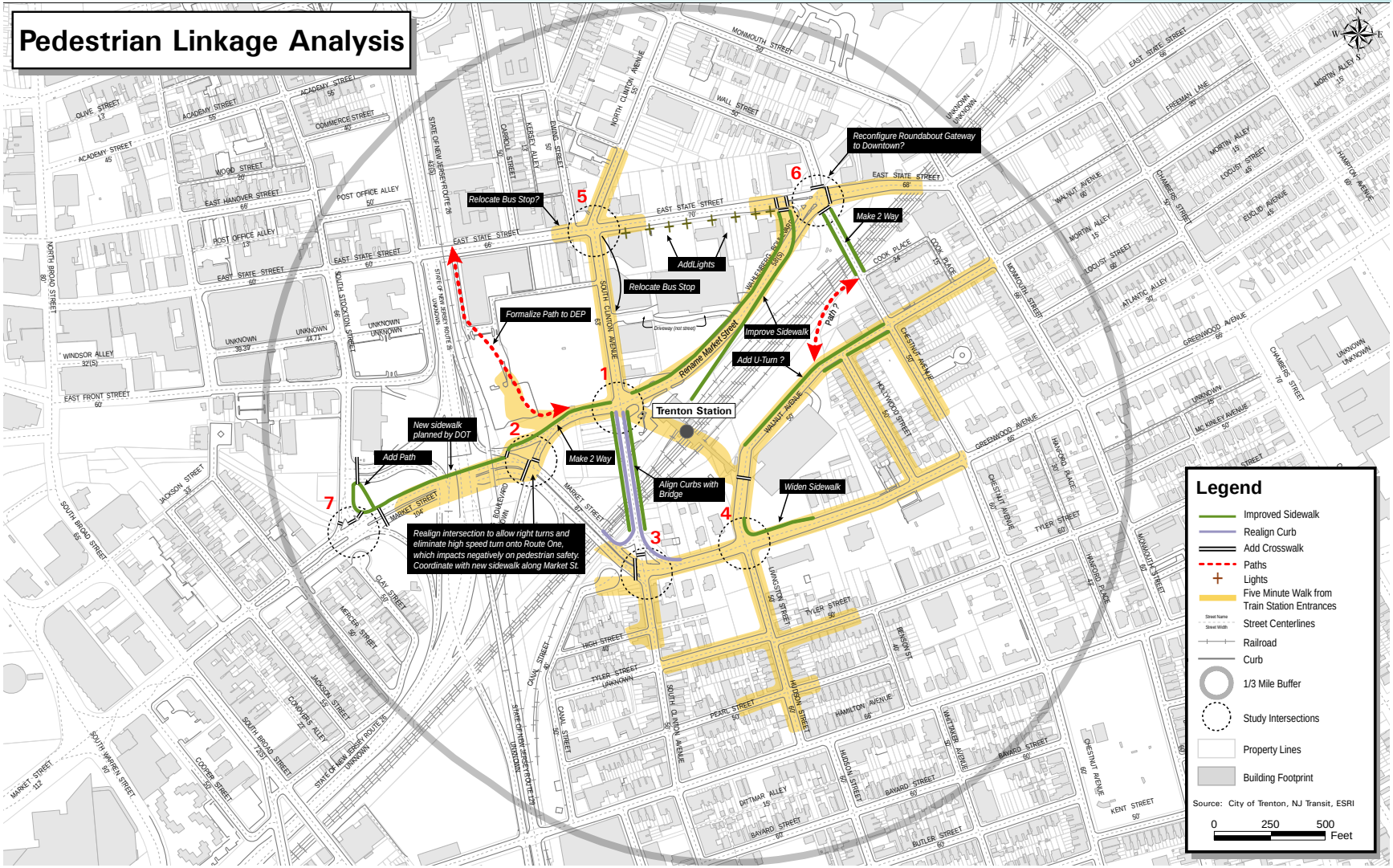
This Resolution was adopted at a Meeting of the City Council of the City of Trenton on MAR 0 1 2012

President of Council

City Clerk

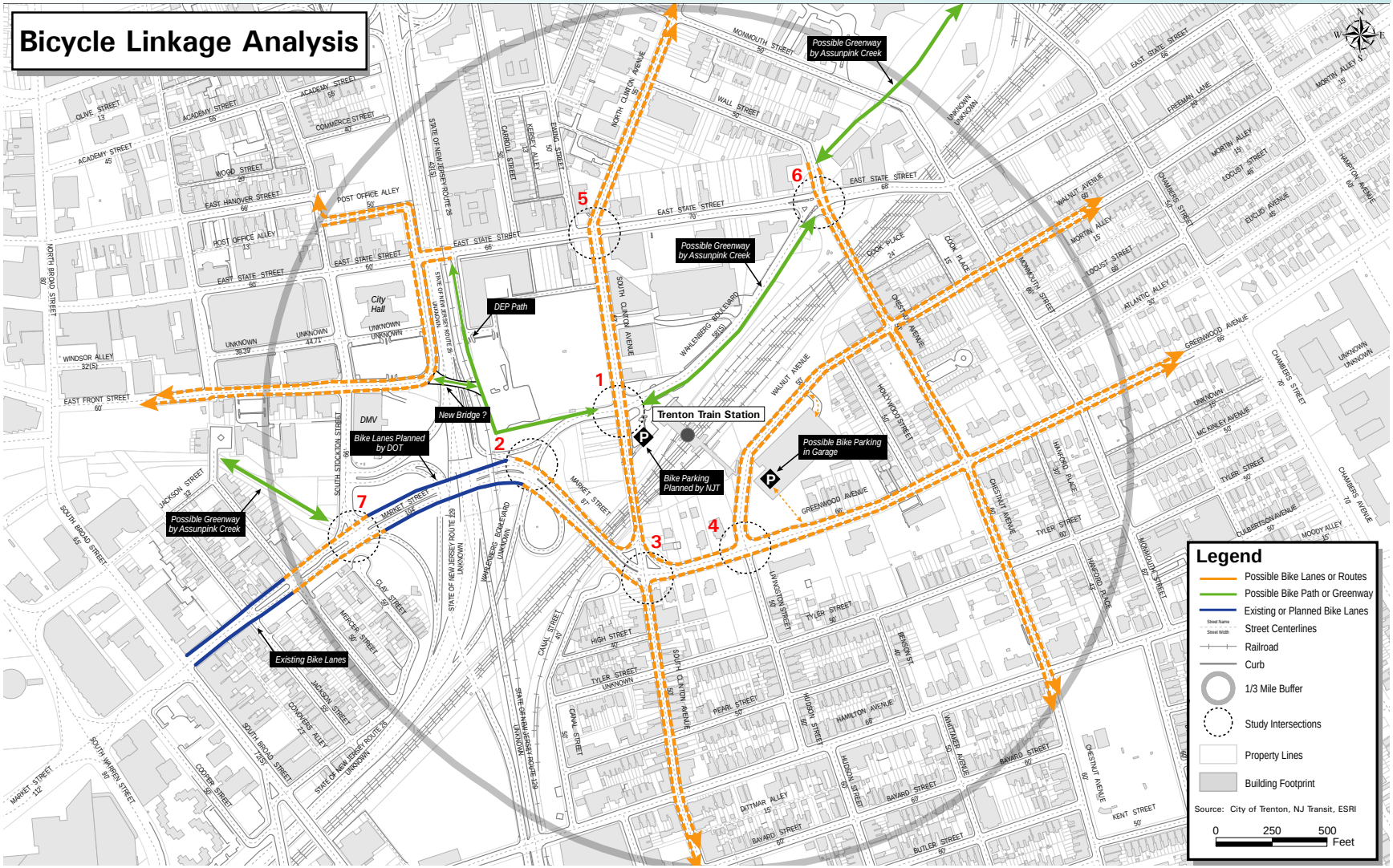
Appendix B:
Trenton Station Linkage Plan Recommendations

FIGURE B-1: Trenton Linkage Plan: Pedestrian Linkage Analysis



Prepared by Nelson/Nygaard Consulting Associates for the Trenton Station Linkage Plan, *2006*

FIGURE B-2: Trenton Linkage Plan: Bicycle Linkage Analysis



Prepared by Nelson/Nygaard Consulting Associates for the Trenton Station Linkage Plan, *2006*

Downtown Trenton Bicycle and Pedestrian Plan

PUBLICATION NUMBER
14022

DATE PUBLISHED
June 2016

GEOGRAPHIC AREA COVERED
Downtown Trenton, New Jersey

KEY WORDS
Bicycle, Pedestrian, Trails, City of Trenton

ABSTRACT

The *Downtown Trenton Bicycle and Pedestrian Plan* was created by the Delaware Valley Regional Planning Commission in collaboration with a variety of partners, most notably the City of Trenton. This study proposes different bicycle, pedestrian, intersection, and trail interventions within downtown Trenton, New Jersey. The plan also offers potential funding streams and examples of estimated construction costs. This plan will be incorporated into the City of Trenton's *Trenton 250* Master Plan.

STAFF CONTACT

Cassidy Boulan, AICP
Transportation Planner
(215) 238-2832
cboulan@dvrpc.org

Delaware Valley Regional Planning Commission
190 N. Independence Mall West, 8th Floor
Philadelphia, PA 19106
Phone: (215) 592-1800
Fax: (215) 592-9125
Internet: www.dvrpc.org

190 N. Independence Mall West
8th Floor
Philadelphia, PA 19106-1520
phone 215.592.1800
fax 215.592.9125

connect with us!
www.dvrpc.org