

JUNE 2020

BICYCLE AND PEDESTRIAN PLAN

City of Portsmouth, Virginia



ACKNOWLEDGMENTS

The City of Portsmouth and project staff would like to thank the region's citizens, elected officials, and professional staff who supported this effort.

In particular, we are indebted to the Project Committee for their commitment and expertise, as well as to the people who provided their time and vision for a walking and bicycling-friendly city.

PROJECT COMMITTEE

Carl Jackson, AICP, Manager of Transportation Planning, Planning Department, City of Portsmouth

Bob Baldwin, AICP, Deputy City Manager, Director - Planning Department, City of Portsmouth

James E. Wright, P.E., CSM, Director of Engineering, City of Portsmouth

Jeff Harper, Senior Civil Engineer, Engineering & Technical Services Department, City of Portsmouth

Lauren James, MD, District Health Director, Virginia Department of Health

George Wojcik, Acting Director, Public Works Department, City of Portsmouth

Mark Palmarchuck, Director, Department of Parks, Recreation, & Tourism, City of Portsmouth

PLANNING DEPARTMENT

Bob Baldwin, AICP

Regina Jackson

Brian Swets, AICP

Carl Jackson, AICP

Jeffrey Crimer, AICP

Samson Okafor

Stacy Porter

Julie Chop

Meg Pittenger

Kelton Millhouse, CZA, CTM

Kelly De Jesus, CZO

PLANNING COMMISSION

Albert Williams, Chairman

Amy Thompson, Vice Chairman

Peter Youngblood

Occasio Gee

Sherri Thaxton

Edwina Ricks

Donna Coleman

CITY COUNCIL

John L. Rowe, Jr., Mayor

Lisa Lucas-Burke, Vice Mayor

William E. Moody, Jr.

Elizabeth M. Psimas

Nathan J. Clark

Paul J. Battle

Shannon E. Glover

SPECIAL THANKS TO THE PORTSMOUTH BICYCLE AND PEDESTRIAN CITIZEN'S ADVISORY COMMITTEE

Fred Brusso, Former Portsmouth Neighborhood Director

Bruce LaLonde, Portsmouth City Treasurer's Office, Safety Town

Marjorie Mayfield-Jackson, Elizabeth River Project

Tom Miano, Former Owner SCAT Bike Shop

Jonathan Nye, Ecocycling

Amy Paulson, Eastern Virginia Medical School/Healthy Portsmouth

Susan Wilson, VDOT, Former Portsmouth Planning

Yolima Carr, Elizabeth River Project

Prepared for:



Prepared by:





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Executive Summary



THE PLAN'S VISION

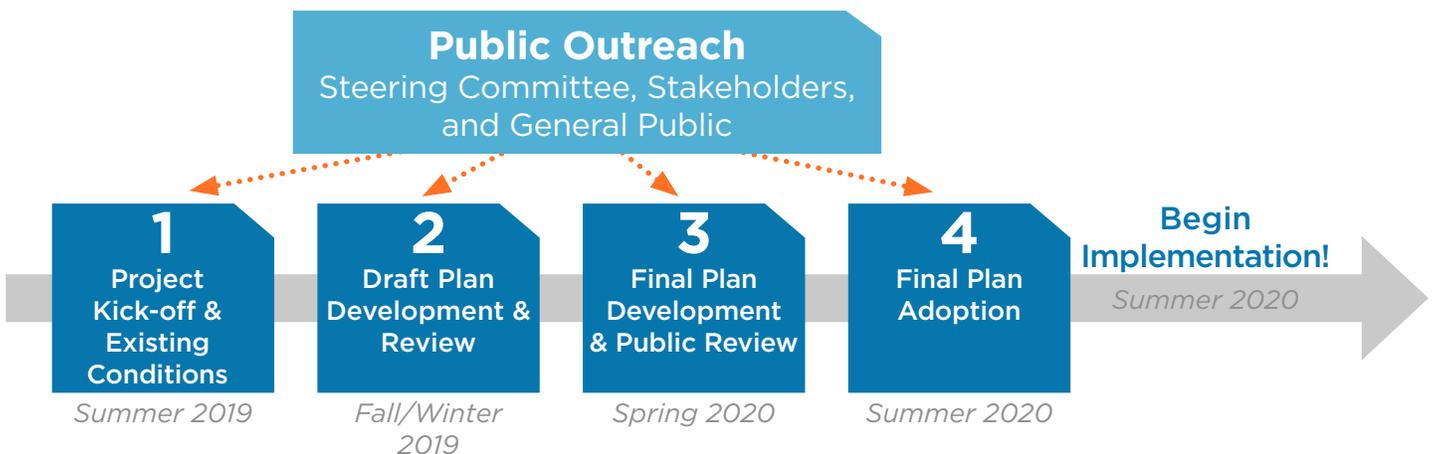
“The City of Portsmouth Bicycle and Pedestrian Plan builds upon efforts from the City to create an active community, where bicycling and walking are safe, healthy, and fun for all ages and abilities.”



WHAT DOES THIS PLAN RECOMMEND?

This bicycle and pedestrian transportation plan features policy, program, and infrastructure recommendations that, if adopted, funded, and implemented, will create the bike- and walk-friendly community that residents have long supported. This plan documents the past and current active transportation planning processes in Portsmouth, and highlights some of the current conditions impacting active transportation today (see Chapter 2).

PROJECT TIMELINE





PUBLIC INPUT RESPONSE HIGHLIGHTS

64% said
WALKING IN PORTSMOUTH today is

Fair

57% said
BIKING IN PORTSMOUTH today is

Fair

70% said
IMPROVING WALKING CONDITIONS is

Very Important

65% said
IMPROVING BIKING CONDITIONS is

Very Important

81% said they WOULD WALK MORE IF
there were

More Sidewalks

81% said they WOULD BIKE MORE IF
there were

More Bikeways

OVERVIEW OF EXISTING CONDITIONS

Demand Analysis

The downtown core, Frederick Boulevard, and portions of High Street and Portsmouth Boulevard have been identified as areas with a particularly high demand for expected bicycle and pedestrian activity.

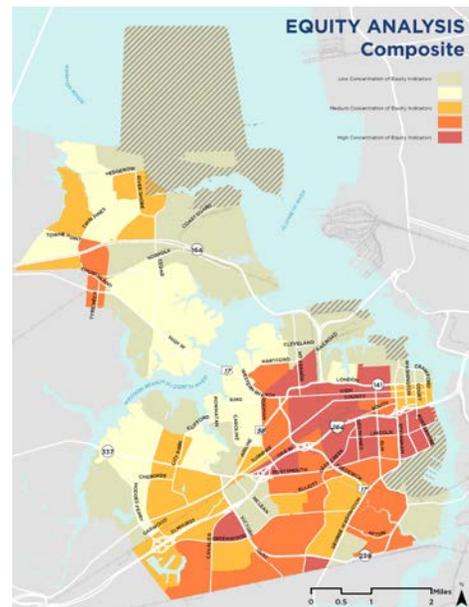
Equity Analysis

The analysis scored the study area to locate higher concentrations of traditionally vulnerable populations, such as minority groups, low-income individuals, children, older adults, and people with limited English proficiency. Results of the analysis (see map at right) were used to develop recommendations.

Safety Analysis

The majority of pedestrian and bicycle crashes occurred in the areas that fell in the highest equity tier (**49% of pedestrian crashes, including 2 fatalities**).

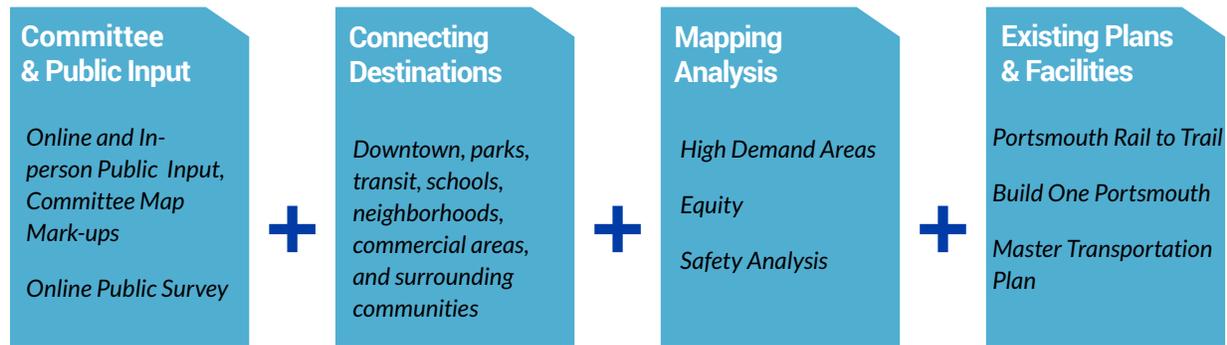
Barriers within the study area include Elizabeth River and large highways like I-264 and VA-164.



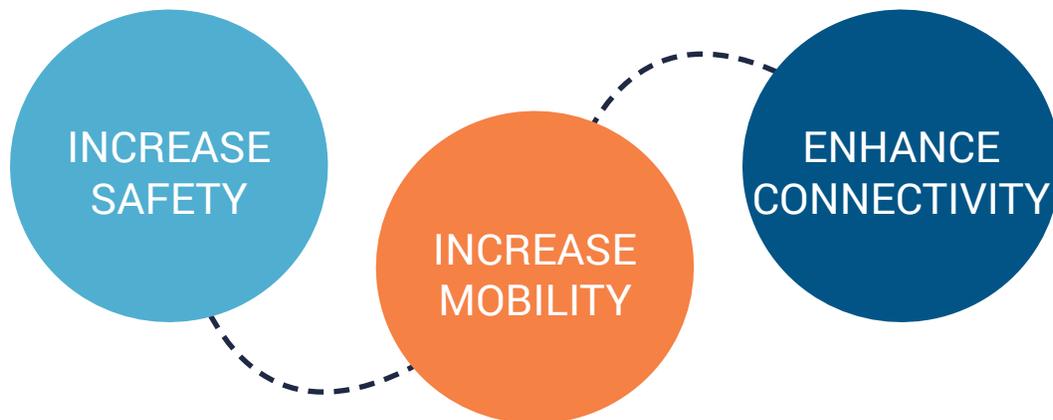
See Chapter 2 for detailed maps and findings



BASIS OF RECOMMENDATIONS



PERFORMANCE MEASURES



TOP 5 PRIORITY PROJECTS

Project	Extents	Description
High Street	Churchland Bridge to Academy Avenue	Long-term: Shared Use Path Short-term: Sidewalk + Pedestrian Improvements
Victory Boulevard/ Jordan Bridge	Paradise Creek Park to Jordan Bridge	Long-term: Shared Use Path Short-term: Sidewalk + Pedestrian Improvements
Victory Boulevard	Greenwood Drive to George Washington Highway	Long-term: Shared Use Path Short-term: Sidewalk + Pedestrian Improvements
Portsmouth Boulevard	Alexander's Corner to Portsmouth Sportsplex	Long-term: Shared Use Path Short-term: Sidewalk + Pedestrian Improvements
Lincoln Street	Port Centre Parkway to Des Moines Avenue	Neighborhood Greenway + Sidewalks

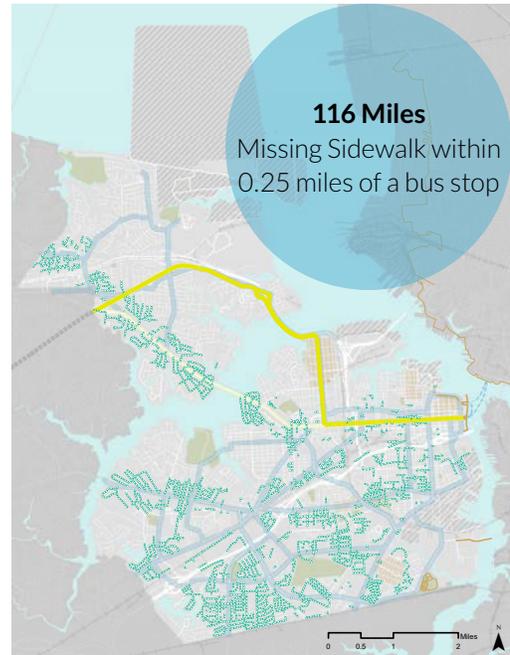


RECOMMENDED SIDEWALK NETWORK

Tier 1: Multimodal Corridors



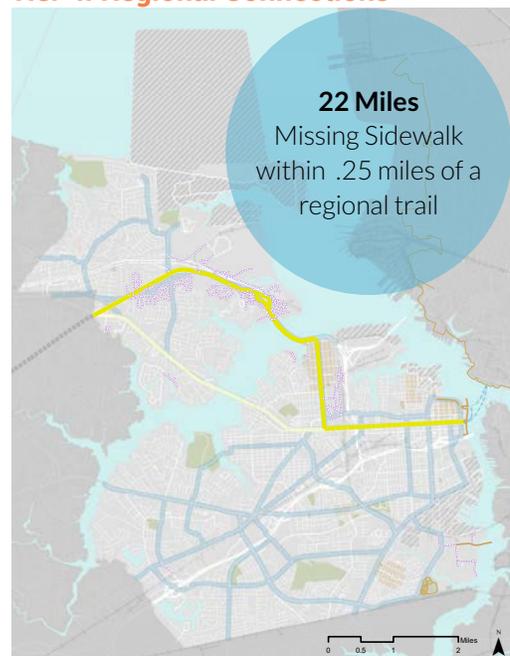
Tier 2: Transit



Tier 3: Recreation and Education



Tier 4: Regional Connections



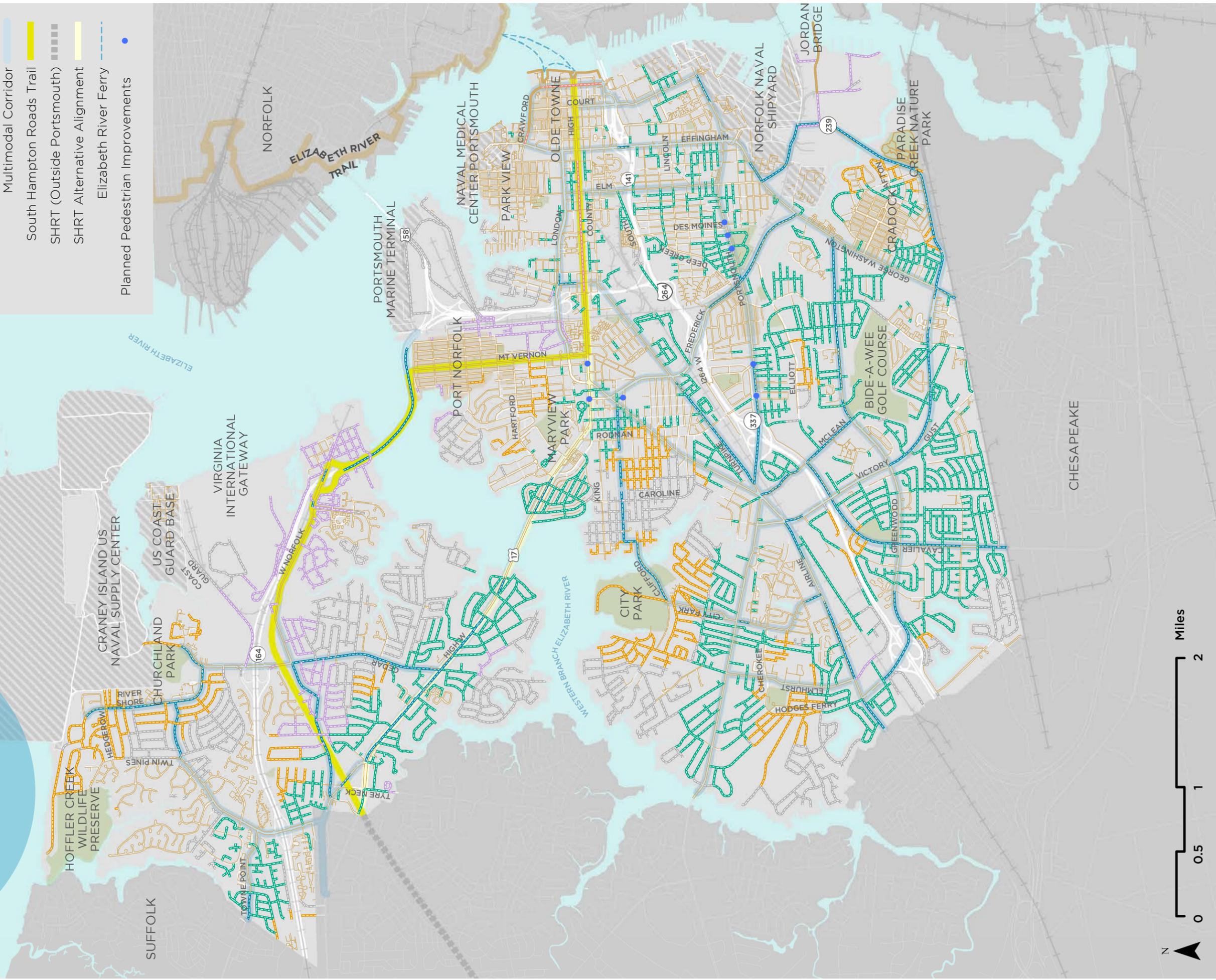
* See pages 68-69 for more detail on proposed pedestrian crossing improvements.

RECOMMENDED SIDEWALK NETWORK

- Tier 1: Multimodal Corridors
- Tier 2: Transit
- Tier 3: Parks and Schools
- Tier 4: Regional Connections
- Long-Term Sidewalk Network
- Planned Road Diets
- Existing Sidewalk
- Multimodal Corridor
- South Hampton Roads Trail
- SHRT (Outside Portsmouth)
- SHRT Alternative Alignment
- Elizabeth River Ferry
- Planned Pedestrian Improvements

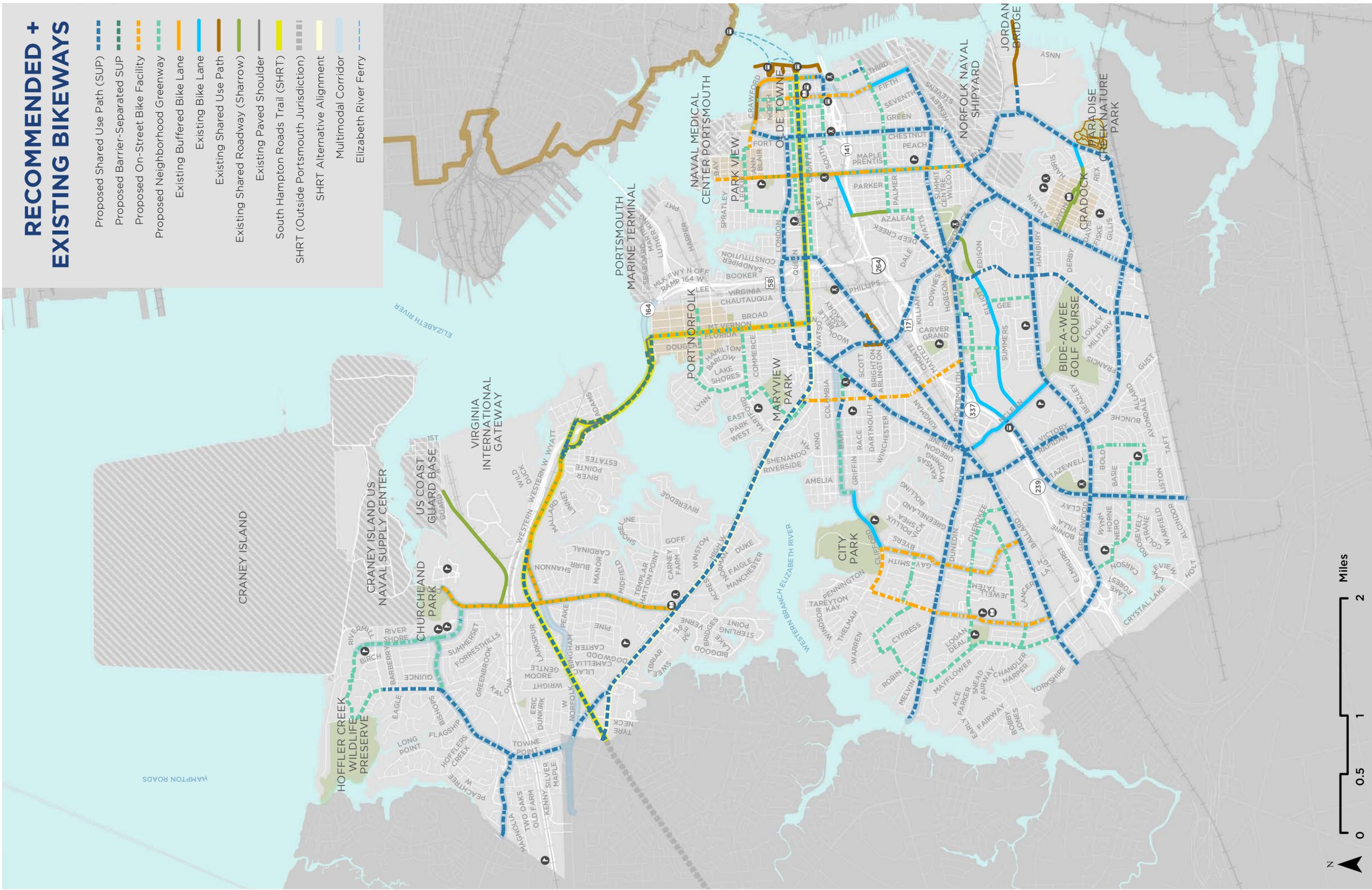
38 (Tier 1)
+
116 (Tier 2)
+
35 (Tier 3)
+
22 (Tier 4)
+
64 (Long-Term Network)

**275 Miles of Missing
Sidewalks**



RECOMMENDED + EXISTING BIKEWAYS

- Proposed Shared Use Path (SUP) 
- Proposed Barrier-Separated SUP 
- Proposed On-Street Bike Facility 
- Proposed Neighborhood Greenway 
- Existing Buffered Bike Lane 
- Existing Bike Lane 
- Existing Shared Use Path 
- Existing Shared Roadway (Sharrow) 
- Existing Paved Shoulder 
- South Hampton Roads Trail (SHRT) 
- SHRT (Outside Portsmouth Jurisdiction) 
- SHRT Alternative Alignment 
- Multimodal Corridor 
- Elizabeth River Ferry 





RECOMMENDED BIKEWAY NETWORK

The proposed bike network was developed with the goal of creating a network of well-connected facilities. Biking needs to be a safe, convenient, and pleasant form of transportation for the broadest array of people. This Plan recommends a network of shared use paths, on-street bike facilities, and neighborhood bikeways to connect people to destinations such as transit, parks, schools, and jobs. These facilities are described in detail on pages 86-88.

Shared use paths, on-street bike facilities, and neighborhood greenways all make biking more comfortable. However, perception of safety is largely driven by factors like vehicle speeds and traffic volumes. Not all routes are the same, and therefore design flexibility is essential to building a low-stress network. The network approach developed as part of this Plan sets the parameters for the bikeway network, but the project design process will determine the ultimate cross-section for each project using national best practices and engineering judgment. VDOT, AASHTO, and NACTO provide design guidance and standards for bikeway facilities.

82 miles Proposed Bikeways

47 miles

Shared Use Path

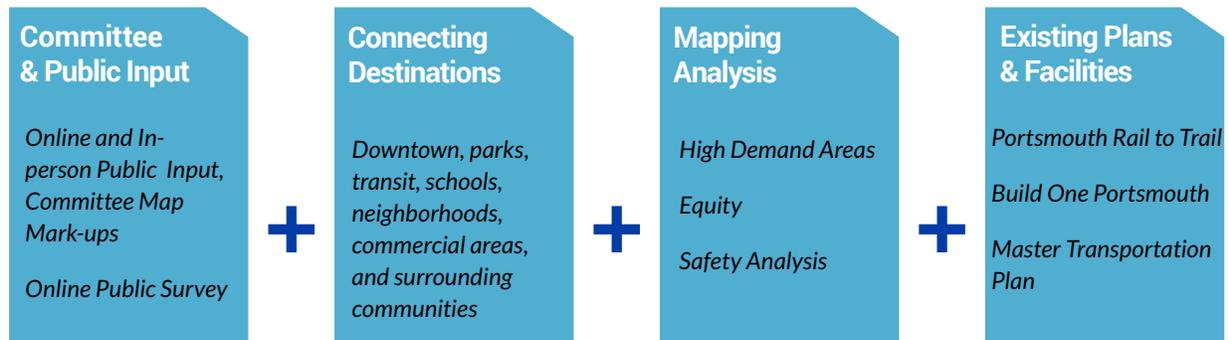
13 miles

On-Street Bike Facility

22 miles

Neighborhood Bikeways

BASIS OF RECOMMENDATIONS





POLICY RECOMMENDATIONS

Policies add political backing and institutionalize recommendations and design guidelines into city codes. Policies may be specific to infrastructure elements such as bike parking requirements, or may be broad and include multiple municipal departments, such as Complete Streets Policies that may include design guidelines and evaluation metrics. Note: In addition to the policies listed below, the City of Portsmouth is currently developing a shared mobility program, which is the focus of Chapter 6 of this Plan.

Complete Streets (see Policy Spotlight starting on pg. 52)	Complete Streets policies call for a safe, accessible transportation network that accommodates users of all ages and abilities, which encompasses bicyclists, pedestrians, transit riders, and motorists.
Maintenance (see Policy Spotlight on pg. 56)	Ensuring facilities are in good shape and clear of debris is important to increase the number of people walking and biking
Vision Zero	Vision Zero is the concept that no loss of life is acceptable on our roadways. Jurisdictions across the nation and across the world are adopting Vision Zero policies to eliminate preventable traffic deaths.
Shared Mobility Program	Shared mobility programs are designed to provide cost-effective, environmentally-friendly and convenient travel options for short trips within a city or region. The systems consist of a fleet of user-friendly and durable bicycles, electric power-assisted bicycles or lightweight electric scooters (e-scooters) intended to be driven while standing.

PROGRAM RECOMMENDATIONS

Programs can engage the broader community to encourage more people to walk and bike, educate community members on rights and responsibilities, and enforce traffic laws to improve safety for all modes.

Safe Routes to Schools/ Safe Routes to Parks	Continue work started with the Safe Routes to Parks grant in order to increase the number of students and community members who walk or bike to schools/parks.
Expand Education, Safety, and Encouragement Programs	A targeted education/encouragement campaign that fits within the culture and brand of Portsmouth would help educate users and encourage walking and biking. Targeted safety campaigns can help prevent future crashes will improve the safety of walking and biking in Portsmouth.
Develop Process for Citizens to Report Sidewalk Access Issues	Provide an easily accessible resource for residents to report maintenance, safety, or accessibility issues.

HIGH PRIORITY PROJECTS

- Priority Sidewalk Recommendation —
- High Priority Bike Recommendation —
- Existing Bike Facility —
- South Hampton Roads Trail (SHRT) —
- SHRT (Outside Portsmouth) —
- SHRT Alternative Alignment —
- Multimodal Corridor —
- Elizabeth River Ferry —



CHAPTER 1: Introduction





Bike Lanes on Elm Ave

PROJECT BACKGROUND

The Portsmouth Bicycle and Pedestrian Plan outlines a comprehensive bicycling and pedestrian network, policies, and programs aimed to create and bolster a safe biking and walking community in the City of Portsmouth. The City of Portsmouth is a mature waterfront community with a rich history, robust employment centers, and a strong infrastructure foundation. The downtown waterfront features a gridded street network of small blocks that encourages walkability and cohesive neighborhoods, and recent City projects have modernized aged infrastructure. Additionally, many people in the Portsmouth community rely on biking, walking, or transit for transportation. As such, opportunities to enhance connections throughout the area and foster an active community

in Portsmouth set the stage for the Portsmouth Bicycle and Pedestrian Plan.

The City of Portsmouth, along with other stakeholders, will utilize the Plan for future implementation of the bicycling and walking network. The recommendations within the Plan culminate from extensive research into previous plans and current policies, comprehension and analysis of existing conditions, and community visions of bicycling and walking in Portsmouth. The City of Portsmouth Bicycling and Pedestrian Plan also prioritizes these recommendations and presents a set of funding opportunities for future implementation of high-quality infrastructure, high-impact programs, and supportive policies for walking and biking.

Common method of travel for workers in Portsmouth, VA

 Walking
3.65%

 Public Transit
2.25%

 Bicycle
<1%

2017 Census - ACS 5-Year Estimates. https://datausa.io/profile/geo/portsmouth-va#mode_transport



PROJECT OVERVIEW

Existing Conditions & Field Review

- Existing Plans & Policies
- Current Road Network Conditions

Needs Assessment

- Equity Analysis
- Demand Analysis
- Safety Analysis
- Shared Mobility Analysis

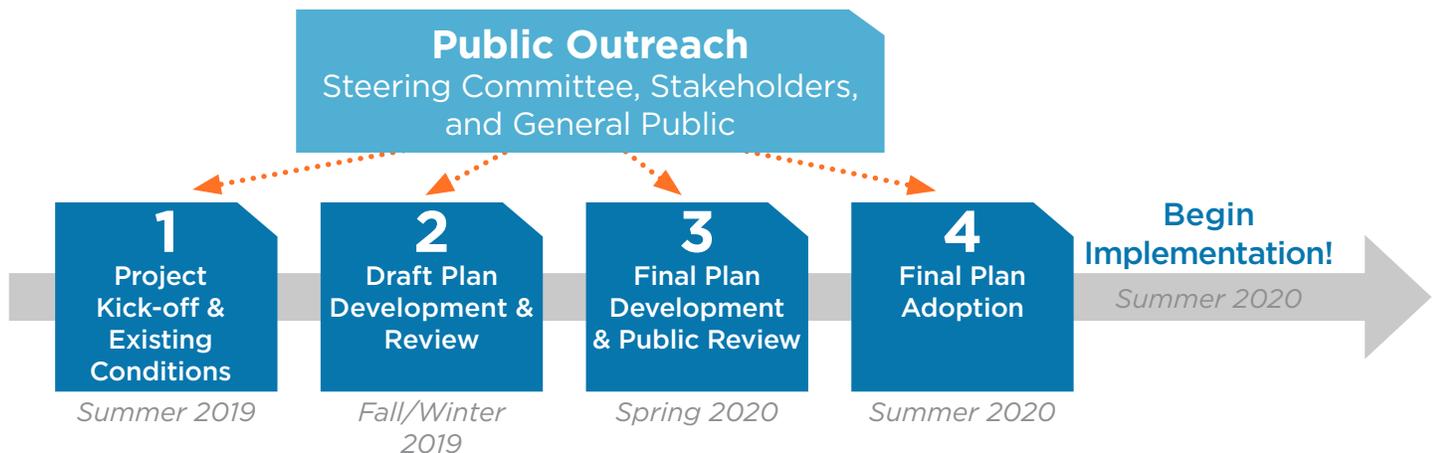
Public Outreach

- Surveys
- Stakeholder Interviews
- Community Events

Prioritization & Funding

- Recommended Networks
- Funding Resources

PROJECT TIMELINE





The Plan's Vision

“The City of Portsmouth Bicycle and Pedestrian Plan builds upon efforts from the City to create an active community, where bicycling and walking are safe, healthy, and fun for all ages and abilities.”

How to Get There

The goals outlined below build upon the vision statement, relate to key themes from local plans, and expand upon national best practices.



Enhance Connectivity

Create connected walkable and bikeable streets that allow people of all ages and abilities to safely and conveniently get where they want and need to go.



Improve Health

Enhance access to active transportation and outdoor recreation for health and wellness.



Encourage Economic Growth

Recognize the economic benefits of walkable and bicycle-friendly communities, and capitalize on potential for economic growth and tourism



Increase Safety

Address the safety of the transportation system for the most vulnerable users and aim for zero bicycle and pedestrian fatalities and serious injuries.



Promote Equity

Ensure that walking and bicycling infrastructure is provided in the areas with the greatest need.



Increase Mobility

Provide active transportation choices that support healthy, safe, and walkable/bikeable neighborhoods, whether urban or suburban.



ACTIVE TRANSPORTATION AND BUILD ONE PORTSMOUTH

Portsmouth’s 2018 Comprehensive Plan update, “Build One Portsmouth” (BOP), is a robust long-range plan that touches on nearly every aspect of life in the city. The Portsmouth Bicycle and Pedestrian Plan reinforces many of the elements of BOP, from detailed tools and actions to overarching concepts and community goals.

The information below illustrates some of the connections between BOP’s three core elements (Strategic, Geographic, and Implementation Plans) and this Plan. It should be noted that the list is not exhaustive. Transportation systems are deeply connected to community development issues including housing, land use, economic development, sustainability, public health, equity, and more. The two plans should be used in tandem for both planning and implementation guidance by residents, stakeholders, City staff, and decision-makers.

STRATEGIC PLAN

The Strategic Plan component expresses the vision for Portsmouth. This effort was guided by extensive community engagement efforts. The content cascades from abstract vision statements and goals to specific strategies and tactics that support overarching themes.



Thriving

- T.2 Be a healthy city
- T.3 Expand economic opportunity

Resilient

- R.4 Strengthen connectivity to improve mobility

Evolving

- E.1 Promote a renaissance of our neighborhoods

Equitable

- EQ.2 Enhance city services, especially to the underserved
- EQ.3 Seek social and environmental justice in policies and practices



BUILD ONE PORTSMOUTH VISION THEMES

Thriving

We draw from our rich history to promote healthy individuals, local economies, regional collaboration, and vibrant neighborhoods with strong identities.

Resilient

We prepare for long-term prosperity by thoughtfully creating adaptable structures, systems, and practices to prepare for opportunities and to meet challenges.

Evolving

We embrace the future and respond positively to emerging opportunities to care for the people and places we love by balancing historic preservation with thoughtful reinvestment and redevelopment.

Equitable

We cultivate a vibrant city where equality is evident as we meet the needs of all our citizens in ways that are fair, meaningful, and empowering.

GEOGRAPHIC PLAN

The Geographic Plan provides spatial representation of targeted recommendations. The maps and associated guidance here are referenced throughout the Strategic Plan. The material in this section should be frequently referenced during a transportation project to ensure consistency with BOP guidance and goals.

The elements below are of particular relevance to the development of bicycle and pedestrian facilities.

Character Areas

Focus Areas

Environmental and Open Space Resources

Citywide Connectivity and Mobility Networks

IMPLEMENTATION PLAN

The Implementation Plan describes the tools and actions that can be used to help achieve the goals formulated during this process. The items are prioritized based on community and Planning Commission feedback.

The Tools that most directly relate to the advancement of walking and bicycling are listed below. Each tool in BOP includes a host of helpful details that will help stakeholders employ the tool.

Tools

- Complete Street Design Manual
- Corridor redevelopment Study and Plan
- Design Guidelines
- EcoDistricts
- Neighborhood Planning Programs
- Origin/Destination Study
- Tactical Urbanism
- Transit Needs Assessment



WHY WALK AND BIKE IN PORTSMOUTH?

The City of Portsmouth, VA is located within Hampton Roads coastal area of Virginia. Its shared waterfront with the adjacent city of Norfolk, VA presents opportunities to strengthen regional connections by extending the network of walkable and bikeable spaces into Portsmouth. The City has already begun this process with the Portsmouth Rail Trail, which is a portion of the planned South Hampton Roads Trail, a multi-city initiative connecting downtown Suffolk to Virginia Beach.

The compact, gridded street system of the City of Portsmouth is conducive to the creation of a safe, navigable, and enjoyable walking and biking network. This unique characteristic of historic cities, in addition to mild, coastal temperatures and flat terrain, are assets that place Portsmouth at an advantage for implementing the Portsmouth Bicycle and Pedestrian Plan. Biking and walking offer positive community health benefits such as physical activity and improved public health, local economic growth, additional transportation modes, and tourism.

The rapid development of a highway system which focused on moving cars within the area presents a challenge to enhanced bikeability and walkability in Portsmouth, VA. Such development led to patterns of growth wherein core commercial and residential areas are connected solely by high-volume road infrastructure that lack bicycle and pedestrian facilities.

However, several initiatives, such as Healthy Portsmouth and Safety Town, show commitment by decision makers for furthering bicycling and walking in the City of Portsmouth. Build One Portsmouth, adopted in November 2018, supports accommodating pedestrians and bicyclists through the development of complete streets as well as on specific corridor improvements such as the George Washington Highway Corridor. Additionally, the Crawford Street Corridor Study will inform the development of bicycle and pedestrian facilities along this section of the waterfront.

Celebrate Portsmouth's diverse natural setting with a network of greenways and blueways

- This citizen comment is supported in Portsmouth's Comprehensive Plan Update, Build One Portsmouth; Resilient Theme #5 - Increase Green Spaces in Our City; Strategy C.



Family of Tourists on a Self-Guided History tour - <https://portsvacation.com/history/>



THE VALUE OF WALKABLE AND BIKEABLE COMMUNITIES

Economic Benefits



In 2020, an economic study was conducted to evaluate **visitor spending in Hampton Roads due to the Virginia Capital Trail**. Findings suggest that trail-based tourism contributes **\$4 to \$6 million per year** directly into the Hampton Roads community.

VCT Economic Study Breakdown

Annual Users
120,000

% of Users that are Visitors
35%

Spending per person
\$113



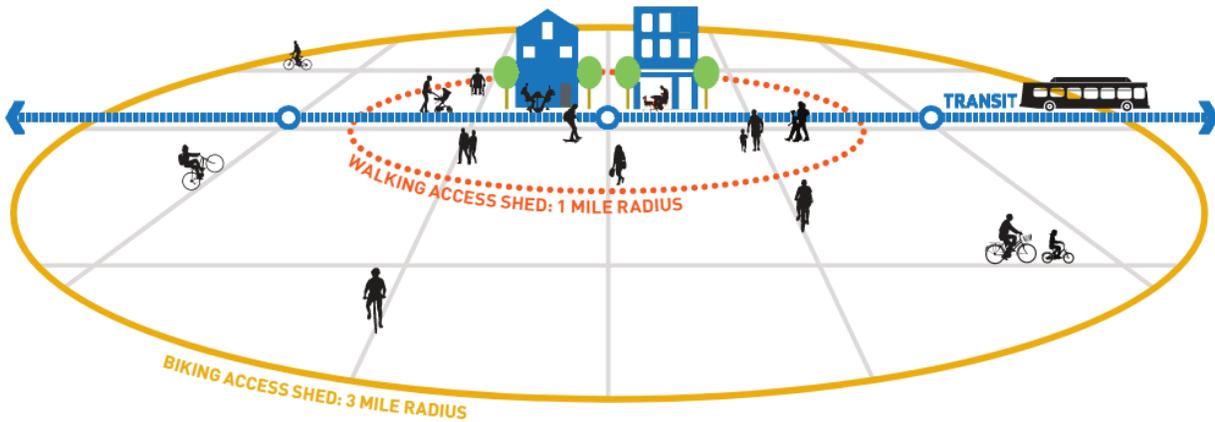
Houses in highly **walkable neighborhoods** have property values **\$4,000 to \$34,000 higher** than houses in areas with average walkability.

Building **sidewalk and bicycle facilities** creates **36% more jobs** than building highways and almost **100% more jobs** than pavement improvements.

Sources: Cortright, J. (2009). Walking the Walk: How Walkability Raises Housing Values in U.S Cities. CEO for Cities; American Association of State Highway and Transportation Officials (AASHTO) Average Direct Jobs by Project Type (2012); Job in terms of full-time equivalents (FTE).

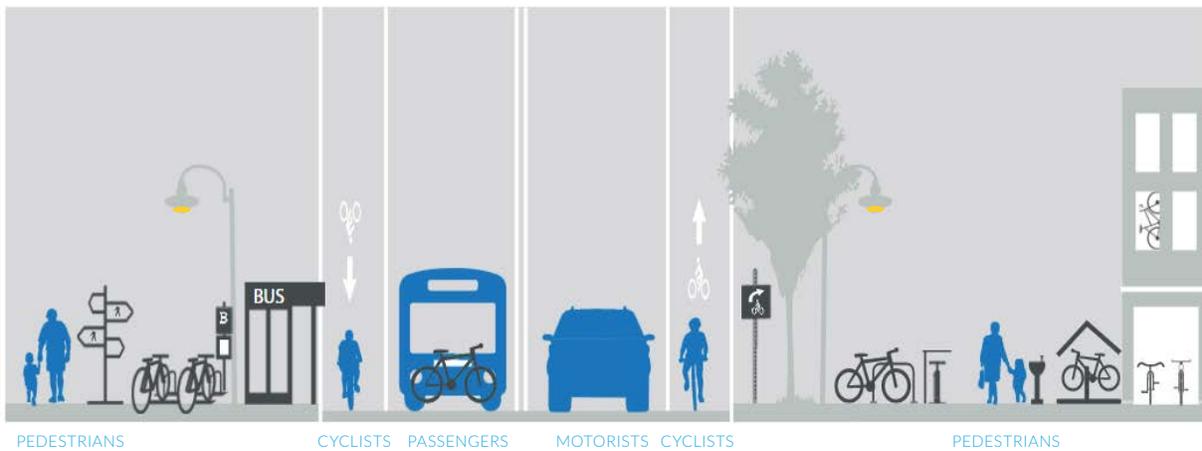
Accessibility and Mobility Benefits

On average, **30% of all trips** we make are for a distance of **two miles or less**—a distance that can easily be covered by a **10 minute bike ride** or a **30 minute walk**.



Source: Alta Planning + Design graphic based on national data.

Complete streets design results in increased mobility options



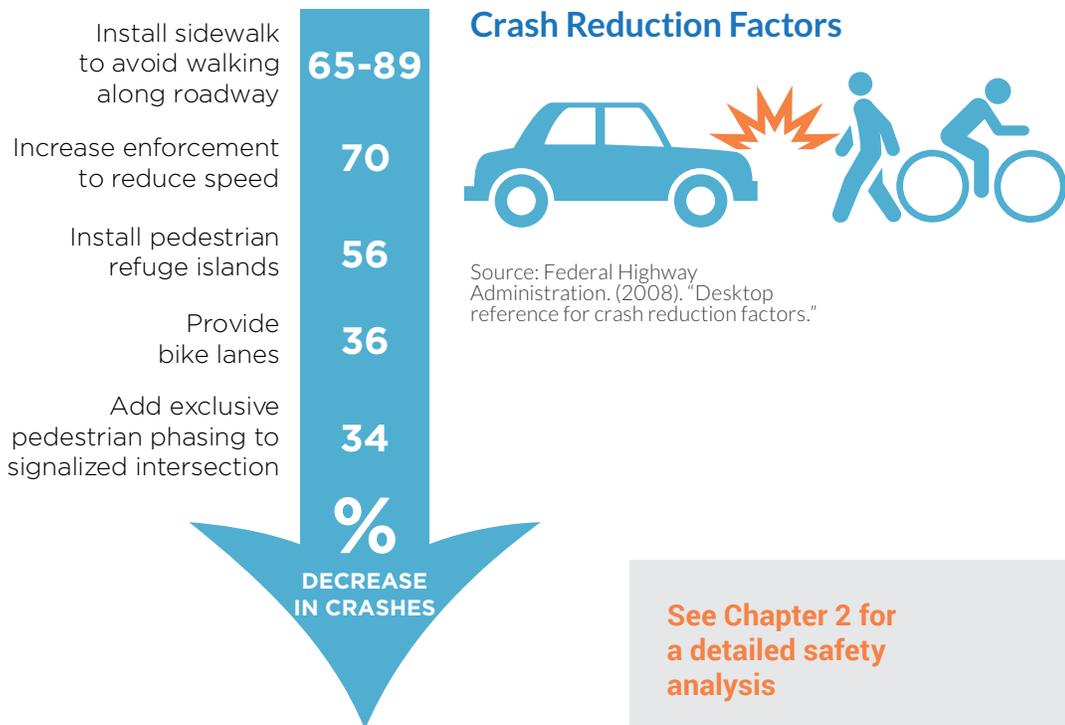


Safety Benefits

Speed + Survivability in Crashes



Source: Rosén, E., & Sander, U. (2009). Pedestrian fatality risk as a function of car impact speed. *Accident Analysis & Prevention*, 41(3), 536-542.



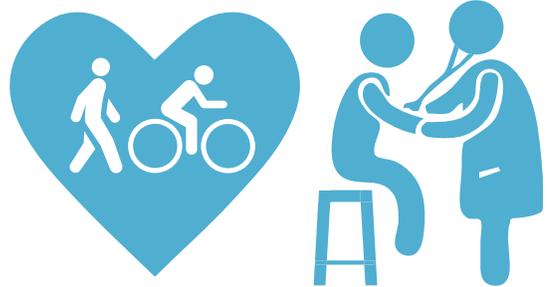


Health and Environmental Benefits



Residents who switch to **more walking and biking** for their commute weigh an average of **6.5 pounds less** than those who continue to drive to work.

Source: MacDonald, J.M., Stokes, R.J., Cohen, D.A., Kofner, A., & G.K. Ridgeway. (2010). The effect of light rail transit on body mass index and physical activity. *American Journal of Preventive Medicine* 39(2): 105-112.



Replacing automobile trips with biking/walking trips improves air quality and **decreases public health concerns** such as asthma.

Sources: Frank, L., et al. (2006). Many pathways from land use to health: Associations between neighborhood walkability and active transportation, body mass index, and air quality. *Journal of the American Planning Association*, 72, 75-8.; Friedman, M., et al. (2001) Impact of Changes in Transportation and Commuting Behaviors During the 1996 Summer Olympic Games in Atlanta on Air Quality and Childhood Asthma. *Journal of the American Medical Association*, 285(7): 897



The average bike commuter reduces their annual carbon emissions by **128 pounds**.

Sources: European Cyclists' Federations. (2016). *Cycle More Often 2 Cool Down the Planet! Quantifying CO2 savings of cycling.*

U.S. HEALTH STATISTICS

PORTSMOUTH HEALTH STATISTICS



80% of Americans DO NOT ACHIEVE the recommended 150 minutes per week of **MODERATE EXERCISE** (CDC)

42% of Portsmouth Residents REPORT PHYSICAL INACTIVITY



Residents of **WALKABLE COMMUNITIES** are **2x** as **LIKELY TO MEET PHYSICAL ACTIVITY GUIDELINES** compared to those who do not live in walkable neighborhoods (Frank, 2005)



66% of Americans ARE **OVERWEIGHT OR OBESE** (CDC)

57% of Portsmouth Residents ARE **OBESE**



For every **0.6 MILE WALKED** there is a **5%** **REDUCTION IN THE LIKELIHOOD OF OBESITY** (Frank, 2004)



ASTHMA IS THE LEADING CHRONIC DISEASE IN CHILDREN and the number one reason for missed school days (CDC)

17% of Portsmouth Residents HAVE **ASTHMA**



A minimum of **20 MINUTES OF PHYSICAL ACTIVITY, 3X WEEK, STRENGTHENS THE LUNGS**, including those of individuals living with asthma (US National Lib of Medicine)



CARDIOVASCULAR DISEASES are the **#1 CAUSE OF DEATH** in the United States (American Heart Association)



20 MINUTES WALKING OR BIKING each day is associated with **21% LOWER RISK OF HEART FAILURE FOR MEN** and **29% LOWER RISK FOR WOMEN** (Rahman, 2014 and 2015)



1,630 Americans **DIE EVERY DAY FROM CANCER**, mainly that of the lung, breast and colon (American Cancer Society)



MODERATE EXERCISE for 30-60 minutes a day **REDUCES THE RISK OF LUNG, BREAST AND COLON CANCER** by a minimum of **20%** (National Cancer Institute)



61% of American adults 65 years or older **HAVE AT LEAST ONE ACTIVITY-BASED LIMITATION** (CDC)



PHYSICAL ACTIVITY HELPS PREVENT OR DELAY ARTHRITIS, OSTEOPOROSIS AND DIABETES, while helping maintain balance, mental cognition, and independence (NIH-National Institute on Aging)

CHAPTER 2: Existing Conditions





INTRODUCTION

An existing conditions analysis was performed to better understand bicycle and pedestrian trends and issues. The following pages feature different types of analyses that were conducted to take a closer look at current walking and biking conditions in Portsmouth. Results of these analyses illustrate areas where improvements to safety and connectivity could be made.

The chart below provides an overview of the analyses conducted and how they relate to existing conditions in the City.



High Street near Commodore Theatre in Old Towne

TYPE OF ANALYSIS

- Past Accomplishments & Current Efforts
- Demand
- Equity
- Safety
- Opportunities & Constraints
- Public Input

TO UNDERSTAND

- Existing interest in bicycle and pedestrian projects and how the new Plan can support larger community goals and connect to existing infrastructure
- Expected bicycle and pedestrian activity
- Where there are concentrations of higher need populations
- Where bicycle and pedestrian crashes are occurring and any trends or patterns related to where the crashes occur
- Where the most promise and greatest barriers exist in achieving the Plan's goals
- What the community wants



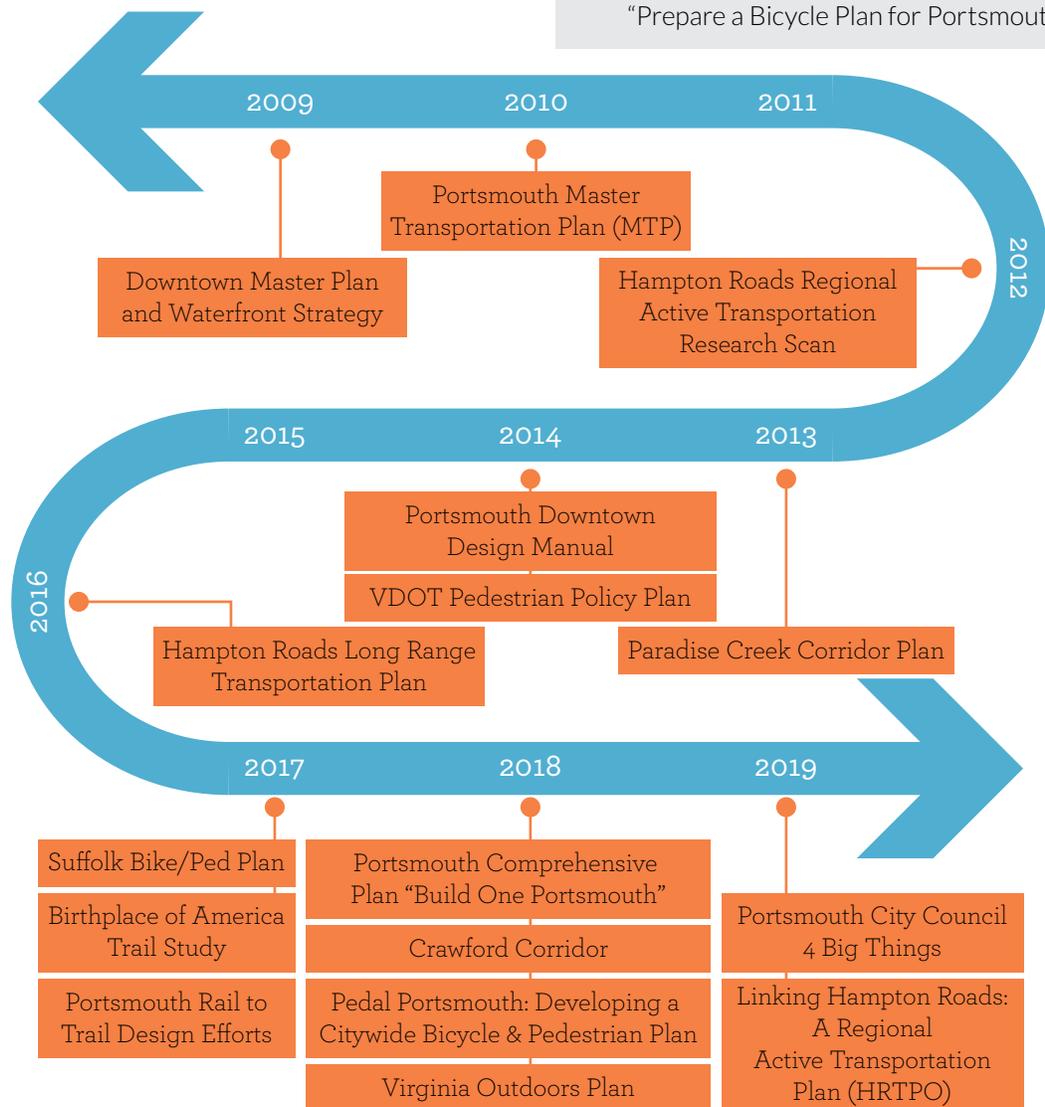
PAST ACCOMPLISHMENTS + CURRENT EFFORTS

PAST ACCOMPLISHMENTS

The following timeline illustrates the planning activity in and around Portsmouth over the last ten years. These plans were used as a foundation for developing the bicycle and pedestrian recommendations in this Plan.

Calls for a Portsmouth Bike Plan

- **Build One Portsmouth** (2018) - Strategy R.4.B - Tactic vi “Develop a bicycle and pedestrian plan, including an evaluation of the feasibility of a bike share program”
- **Portsmouth Master Transportation Plan** (2010) - Strategy 2 - Action B2.1 “Prepare a Bicycle Plan for Portsmouth”





CURRENT EFFORTS

Portsmouth has a foundation of existing bicycle and pedestrian infrastructure and programs, which will form a strong basis for this Plan’s recommendations. A more in-depth analysis of existing facilities can be found in Chapter 4 of this Plan.



0.2

miles of

BUFFERED BIKE LANES

6.5

miles of

BIKE LANES

8

miles of

SHARED ROADWAYS (SHARROWS)

2

miles of

EXISTING SHARED USE PATHS

1.5

miles of

WIDE SHOULDER

18.2

total miles of

EXISTING BIKEWAYS

Existing Programs

- Safety Town
- Hampton Roads Transit (HRT) Smart Cities and Innovation Committee
- Safe Routes to School
- Healthy Portsmouth
- Bike Month & Bike to Work Events
- 2019 Bicycle Friendly Community (Bronze)
- 2014 Walk Friendly Community (Bronze)



62.2

miles of street with

SIDEWALK ON ONE SIDE

266.5

miles of street with

NO SIDEWALKS

138.7

miles of street with

SIDEWALKS ON BOTH SIDES



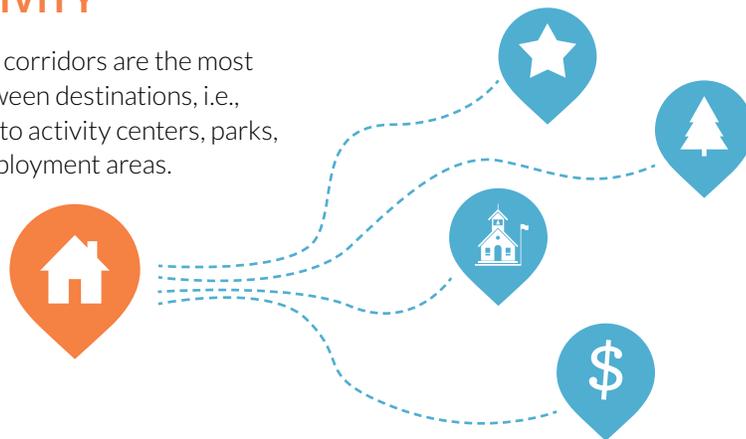
MULTIMODAL CORRIDORS

Multimodal corridors were identified in the 2010 City of Portsmouth Master Transportation Plan. They are the key links in Portsmouth's transportation network, intended to provide access to all road users between the major destinations in the City. This concept provides a framework for transportation investments that will facilitate the creation of complete streets in important corridors.

The multimodal corridor framework was used in this planning process as a foundation for the development of the bicycle and pedestrian network and priorities.

CONNECTIVITY

The multimodal corridors are the most direct links between destinations, i.e., neighborhoods to activity centers, parks, schools and employment areas.

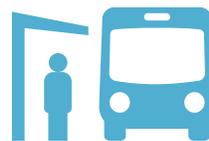


MODAL IMPROVEMENTS



Bike/Ped

Create a basic level of accommodation and improve safety



Transit

Increase the service frequency and accessibility of buses, and continuing to improve ferry service, transit facilities, and express bus service



Vehicular

Improve roadway safety and reduce traffic congestion

MULTIMODAL CORRIDORS

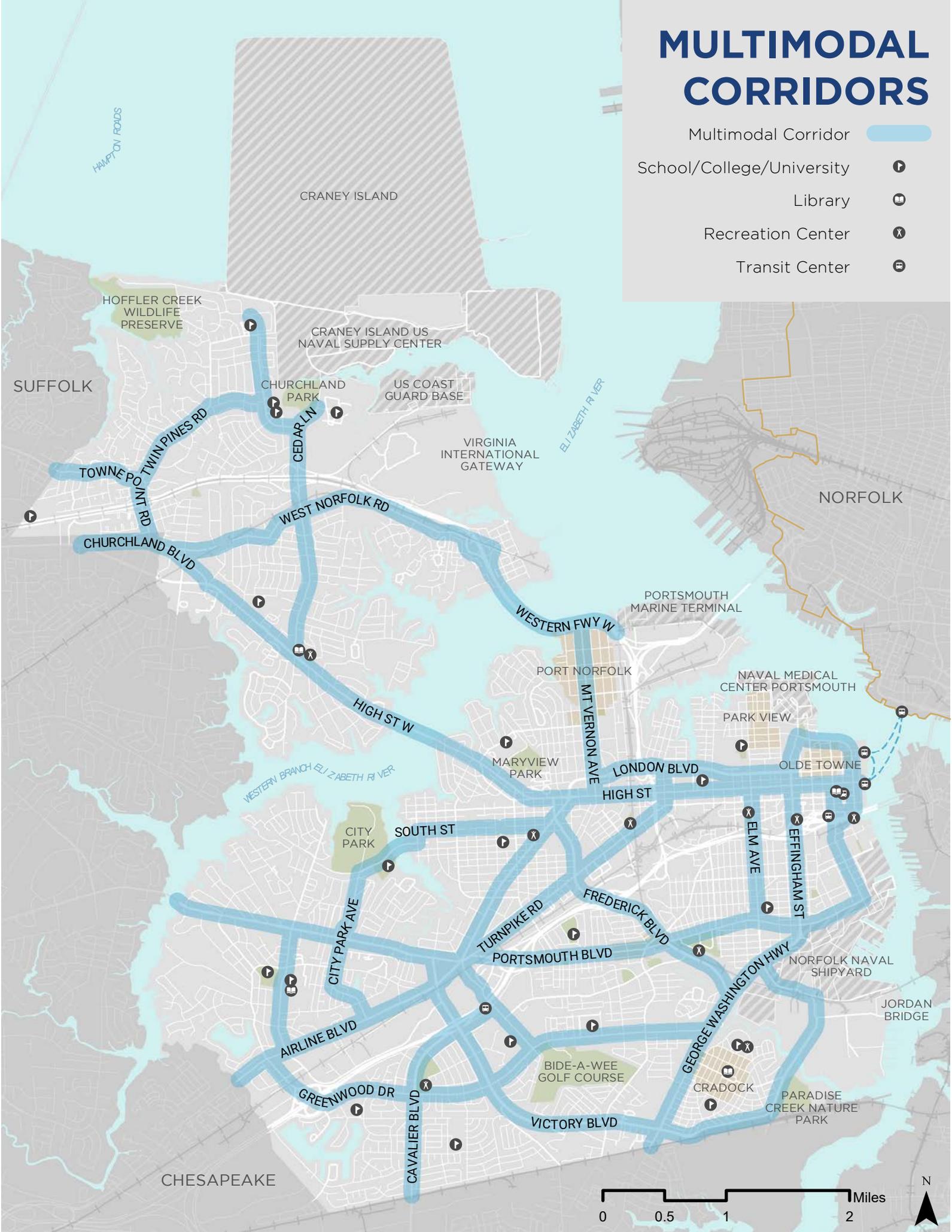
Multimodal Corridor

School/College/University

Library

Recreation Center

Transit Center





DEMAND ANALYSIS

A non-motorized demand analysis was completed for the City of Portsmouth to determine areas of expected pedestrian and bicyclist activity. The areas of high demand are focused within the more urban areas of the region, where residential and commercial density are highest. The downtown core and part of the US-17 corridor (High Street and

Frederick Boulevard) between Hartford St and Turnpike Rd have particularly high demand.

The map on the following page shows the composite demand in Portsmouth, which was calculated based on a combination of the factors listed below. For a detailed look at the Demand Analysis, please see Appendix A.



WHERE PEOPLE LIVE

People are likely to walk near their homes for recreation or to visit nearby friends and family.



WHERE PEOPLE WORK

Higher densities of workers translates to higher propensity for people to walk or bike.



WHERE PEOPLE LEARN

Schools are a significant source of walking and biking by populations that either cannot drive because they are not old enough or are more likely to walk or bike for economic reasons.



WHERE PEOPLE ACCESS TRANSIT

All transit trips start or end with a walking trip.



WHERE PEOPLE PLAY

Trails and parks are attractors and generators of walking and biking activity.



WHERE PEOPLE SHOP

Retail shopping areas are attractors for walking and biking. Places where people can complete errands, such as banks, are also generators of walking and bicycling trips.

Common method of travel for workers in Portsmouth, VA



Walking
3.65%



Public Transit
2.25%



Bicycle
<1%

2017 Census - ACS 5-Year Estimates. https://datausa.io/profile/geo/portsmouth-va#mode_transport



EQUITY ANALYSIS

Portsmouth Poverty Study (2019)

The Study was developed with assistance from Portsmouth’s Planning Department, City Manager’s Office , and a variety of community stakeholders.

The Study includes information on Poverty and its impacts, an overview of current efforts, a review of best practices examples, public engagement outcomes, and a set of recommendations.

Rate of Poverty

- 18%

Survey Results

- 67% responded that “Clean and well-lit streets and sidewalks” are a “High Priority”
- 48.9% responded that “Transportation to and from work” is a “High Priority”

Workforce

Recommendation:

- “Work with regional transportation partners to help employees get to and from work.”

<http://www.portsmouthva.gov/DocumentCenter/View/7385/City-of-Portsmouth-Poverty-Study>

Transportation facilities are essential components in creating communities of opportunity and reducing the disproportionate economic and health burdens on communities of concern. Often, traditionally vulnerable populations, such as minority groups, low-income individuals, children, older adults, and people with limited English proficiency rely heavily on affordable transportation options, specifically walking, biking, and transit.

The project team conducted an equity analysis using existing demographic information from the US Census Bureau. All data was obtained from the 2017 American Community Survey 5-year estimates and analysis was conducted at the census block group level for the City of Portsmouth.

The analysis scored the study area using the following economic and demographic indicators:

Minority Groups:

This indicator shows the percentage of the population that identifies as non-white or multiple races/ethnicities.

Youths & Older Adults:

These indicators show the percent of the population that is under the age of 18 and over the age of 64.

Poverty:

This indicator shows the percent of the population that is living at or below 200% of the Federal Poverty Level.

Limited Education:

This indicator shows the percent of the adult population over the age of 24 that does not have a high school diploma or equivalent degree.

Limited English Proficiency:

This indicator shows the percent of the population that identified as not speaking English well or at all.

Carless Households:

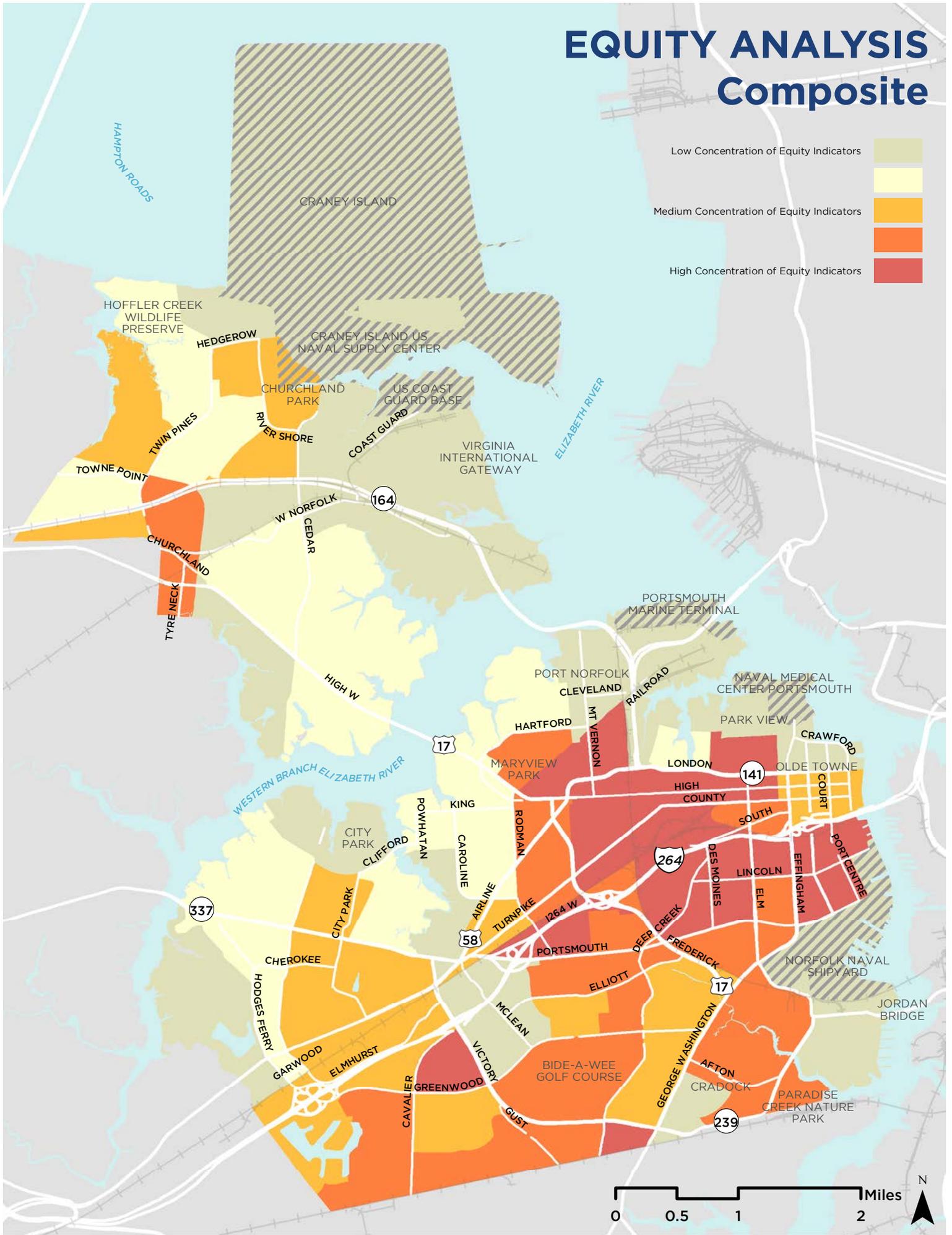
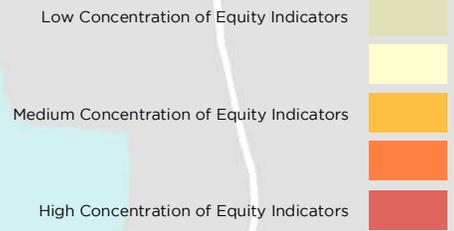
This indicator shows the percent of households that said they did not have regular access to a motor vehicle.

For more information on the Equity Analysis, please see Appendix B.



Pedestrian crossing multiple driving lanes

EQUITY ANALYSIS Composite





SAFETY ANALYSIS (2016-2019)



144

Reported Pedestrian Crashes

8

Pedestrian Fatalities

49%

occurred in a Census block group identified as the highest equity tier (most need) (including 2 of the fatal pedestrian crashes)



58

Reported Bicyclist Crashes

2

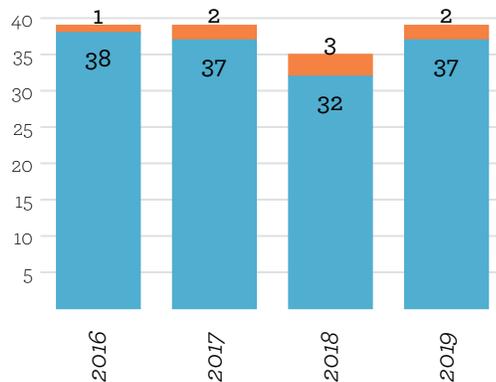
Bicyclist Fatalities

47%

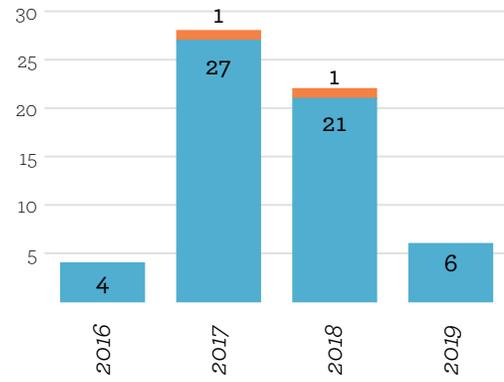
occurred in a Census block group identified as the highest equity tier (most need)

Contributing Factors

- Mature Driver (65+) Involved **(26%)**
- Young Driver (15-20) Involved **(14%)**
- Distraction Involved **(10%)**
- Alcohol Related **(9%)**
- Speed Related **(5%)**

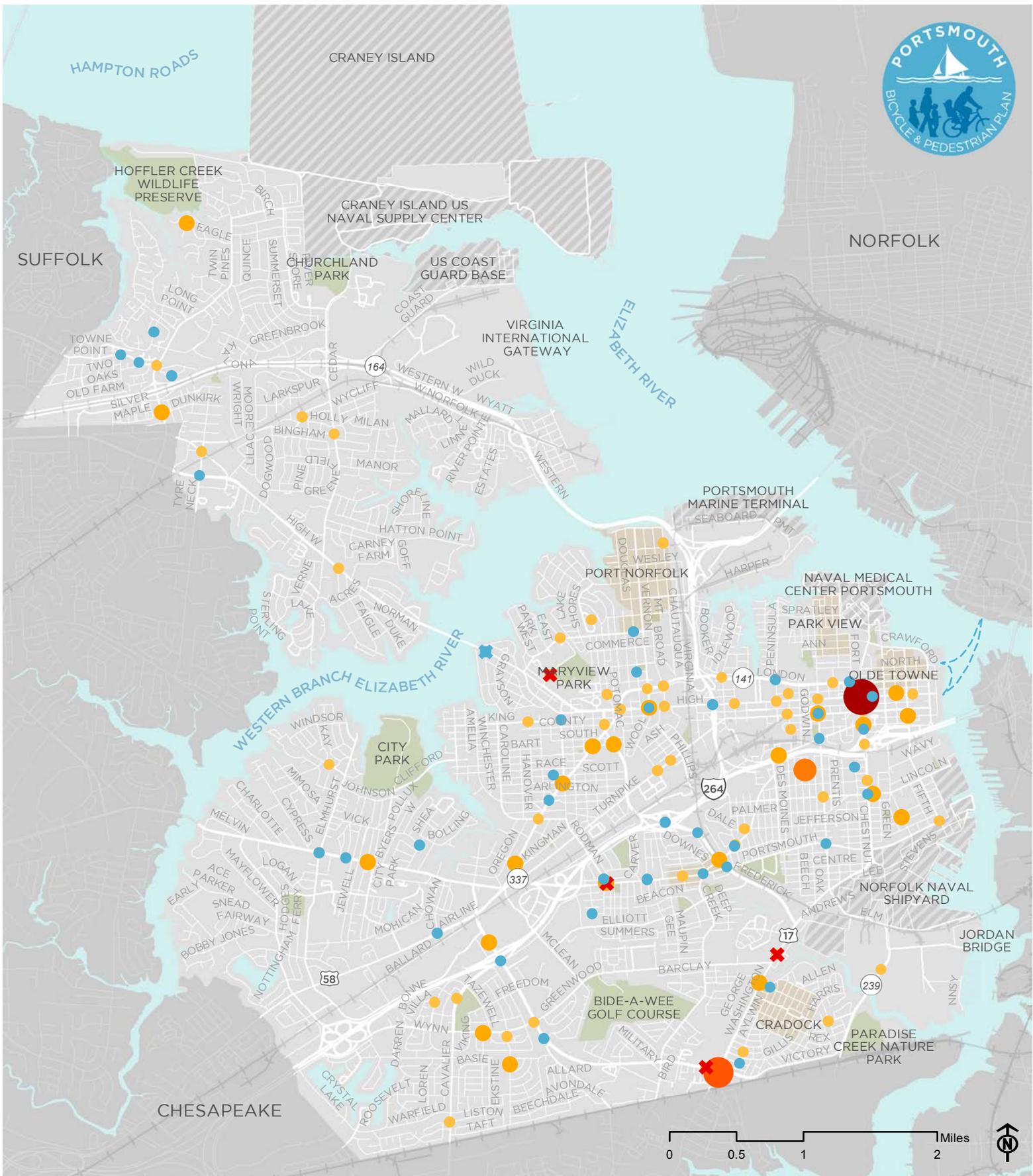


Crash
Fatality



Crash
Fatality

For a detailed look at the Safety Analysis, please see Appendix C.



SAFETY ANALYSIS | 2016 - 2019

- ✖ Fatal Crash Pedestrian
- ✖ Bicyclist
- Number of Crashes**
Pedestrian
1 2 3 4 5
Bicyclist
1
- High Need Census Block Group (Equity Analysis)
- Elizabeth River Ferry
- + Railways
- Parks
- Water Body
- Historic District
- Port/Government
- Portsmouth City Limits
- Surrounding City

Crash Data Source: Virginia Department of Transportation, City of Portsmouth Police Department.
 Note: 44 crashes did not have precise location information in the data and are not mapped here.



OPPORTUNITIES + CONSTRAINTS

OPPORTUNITIES

There are already many people riding bikes and walking around Portsmouth. Improving infrastructure will provide a more safe and comfortable experience for those current users, while also inviting others to walk and bike around town.

One of the greatest opportunities lies in Portsmouth's relatively consistent street grid. Strong street connectivity allows for creating a more simple network based on

a combination of treatment types that is responsive to community contexts. Other opportunities include having a strong downtown that is in close proximity to other employment hubs like the Portsmouth Naval Medical Center and Norfolk Naval Shipyard. Connecting neighborhoods to these activity hubs will increase multimodal travel and economic development.





CONSTRAINTS

Portsmouth faces many challenges as it works to improve its bicycle and pedestrian networks. Some of the most difficult constraints to overcome are the abundance

of physical barriers like the Elizabeth River and large highways like I-264, VA-164, and others. Additionally, many main corridors lack safe pedestrian crossings or bike facilities.





STAKEHOLDER MEETINGS

Stakeholder feedback and participation was an essential component of the development of this plan. The following summaries highlight the feedback received from key stakeholders.

CITIZEN ADVISORY COMMITTEE

The City of Portsmouth organized a Bicycle and Pedestrian Citizen Advisory Committee comprised of key stakeholders with varying backgrounds. The committee was charged with overseeing the development of this plan. The committee is intended to continue meeting after the plan is adopted to monitor implementation.

Citizen Advisory Committee Members

- Fred Brusso, Former Portsmouth Neighborhood Director
- Bruce LaLonde, Portsmouth City Treasurer, Safety Town
- Marjorie Mayfield-Jackson, Elizabeth River Project
- Tom Miano, Former Owner SCAT Bike Shop
- Jonathan Nye, Ecocycling
- Amy Paulson, Eastern Virginia Medical School/Healthy Portsmouth
- Susan Wilson, VDOT, Former Portsmouth Planning
- Yolima Carr, Elizabeth River Project

The committee met early in the planning process to discuss existing condition findings and opportunities and challenges associated with walking and biking in Portsmouth. Key discussion included:

- Sidewalks should focus on how to connect to key destinations.
- Not every street needs a sidewalk.
- Priority connections should focus on transit dependent areas.
- More sidewalks are needed in West Cradock.
- Two district groups of cyclists in Portsmouth - recreation riders and those that ride for transportation.
- Team Portsmouth developed recreational routes that would provide a connection to tourism.
- Challenges with connectivity in the northern part of the City.
- Opportunity for greenway connections between cul-de-sac communities.

The committee also met to review the full draft plan and provided the following key input:

- Plan needs more emphasis on education and programs.
- Neighborhood greenways provide a good alternative to main roads and could be featured more prominently in the plan.
- Funding is important and some opportunities include Made to Move Grant Program, People for Bikes, Virginia Recreational Trails Program, and the Elizabeth River Project.



BUSINESS ASSOCIATION

The project team met with several representatives of the business community to gather input about walking and biking. Feedback included:

- Bike parking is important to provide a convenient place to secure bikes at key destinations.
- Consider lowering speed limits along busy streets such as Martin Luther King, JR Boulevard and London Street.
- Critical that this plan is coordinated with and connected to transit planning and implementation.

PUBLIC SCHOOLS

Safe Routes to Schools is a priority for the City of Portsmouth. To understand the distinct opportunities and challenges associated with walking and biking to school, the project team met with several students and school staff. Feedback included:

- Biggest challenge currently is that Portsmouth isn't a walkable community and parents are afraid to let their kids walk or bike to school for several reasons such as personal safety and lack of crossing guards.
- Bicycle education is important for all users as there's currently a lot of wrong way riding. PSA's and social media videos about how to share the road would be helpful.
- Opportunity for a school project to paint crosswalks as a way to promote safety and public art.
- There are no sidewalks on South Street but a lot of people walking, including kids.

PORTSMOUTH NAVAL SHIPYARD

As the largest employer in Portsmouth, the project team met with shipyard staff to discuss opportunities and challenges associated with walking and biking. Feedback included:

- 17% of the shipyard workforce lives in Portsmouth (about 2,000 people). Most employees either drive, carpool, or use rideshare. Very few walk or bike to work.
- The biggest barrier to walking and biking is the distance from the shipyard to key destinations.
- Sidewalk improvements along George Washington Street would be helpful as that's the main connection when the pedestrian bridge that connects Scott Center is closed.
- The shipyard is willing to work with the City to improve mobility options to and around the shipyard.



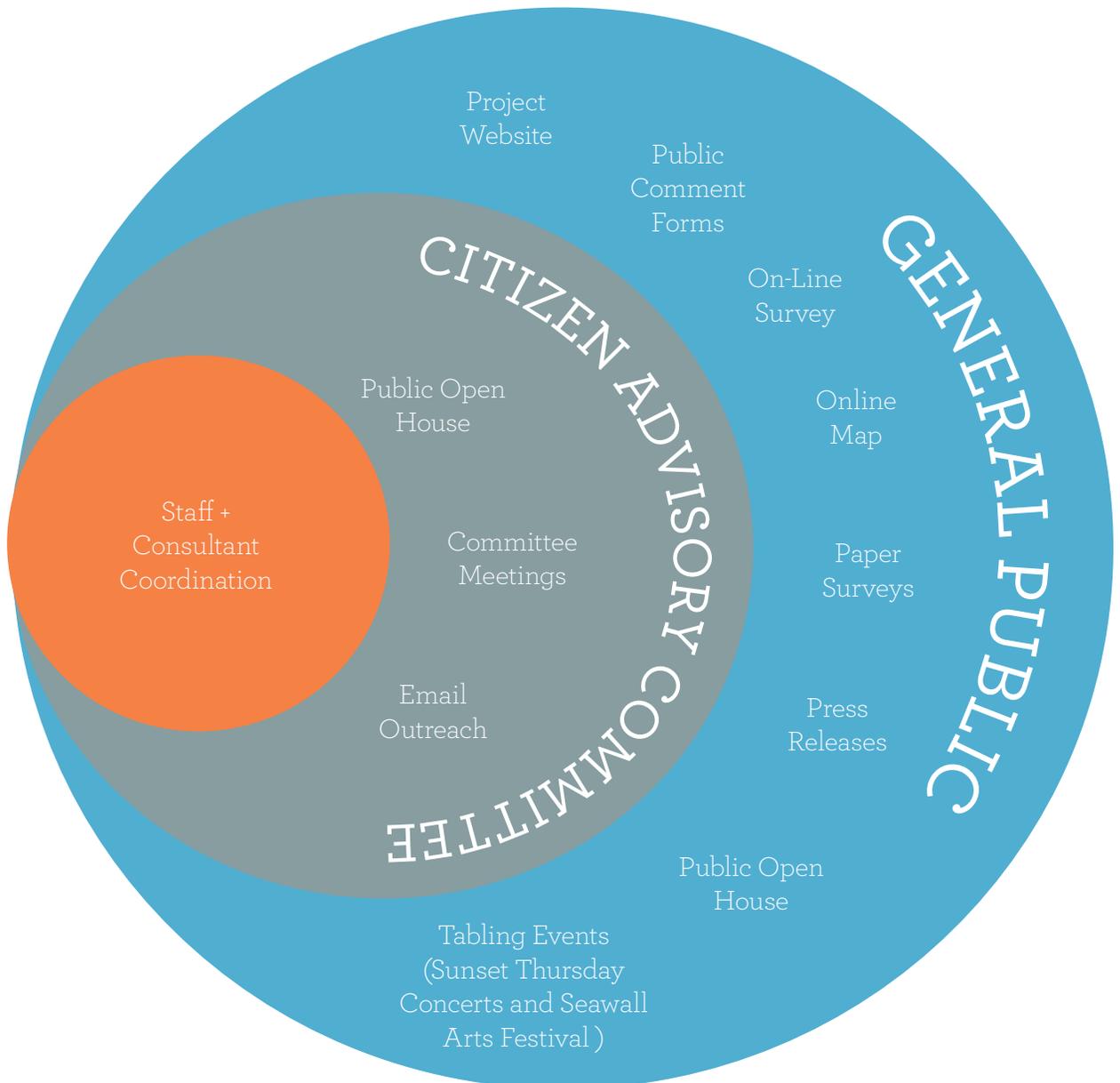
Prioritizing access to transit was a common theme among stakeholders.



PUBLIC INPUT

The graphic below demonstrates the various ways public input was collected. The page to the right illustrates some of the most powerful outcomes of the survey related to biking and walking in Portsmouth.

The program, policy, and infrastructure recommendations of this plan (see Chapters 3-5) stem directly from the findings of the public outreach efforts. For complete survey results, please see Appendix D.





<p style="text-align: center;">327 ONLINE AND PAPER SURVEYS COMPLETED</p>	
	
<p>64% said WALKING IN PORTSMOUTH today</p> <p><i>Fair</i></p>	<p>57% said BIKING IN PORTSMOUTH today</p> <p><i>Fair</i></p>
<p>70% said IMPROVING WALKING CONDITIONS is</p> <p><i>Very Important</i></p>	<p>65% said IMPROVING BIKING CONDITIONS is</p> <p><i>Very Important</i></p>
<p>81% said they WOULD WALK MORE IF there were</p> <p><i>More Sidewalks</i></p>	<p>81% said they WOULD BIKE MORE IF there were</p> <p><i>More Bikeways</i></p>
<p>PURPOSE OF WALKING trips</p> <ol style="list-style-type: none"> 1. <i>Exercise (85%)</i> 2. <i>To Enjoy Being Outside (72%)</i> 3. <i>Fun (51%)</i> 	<p>PURPOSE OF BIKING trips</p> <ol style="list-style-type: none"> 1. <i>Exercise (78%)</i> 2. <i>To Enjoy Being Outside (62%)</i> 3. <i>Fun (61%)</i>
<p>TOP DESTINATIONS</p> <ol style="list-style-type: none"> 1. <i>Downtown</i> 2. <i>Local Parks</i> 3. <i>Restaurants</i> 	<p>TOP DESTINATIONS</p> <ol style="list-style-type: none"> 1. <i>Downtown</i> 2. <i>Local Parks</i> 3. <i>Library</i>



WHAT WE HEARD

I'd love to ride from Churchland to downtown, but it's completely unsafe, especially the Churchland Bridge. Also, there's no safe way to get to City Park.

There is not a safe way to get to a grocery store from downtown.

Crossing in front of the Naval Hospital on the corner of Effingham and Crawford Parkway. The traffic pattern is very dangerous and the cars at that light are not friendly to bikers and walkers.

Bike and breakdown lanes are not regularly cleaned...for example, the West Norfolk Bridge. I'm glad there are shared lanes, but we need more dedicated bike lanes throughout the City.





Walkability is a major draw for potential homeowners, especially young people. If we had sidewalks along High Street, we would walk/bike more.

Bike lanes are great; however if we aren't policing the speeding and reckless driving, we will never have safe, bike-able streets.

In the future, I want walking in Portsmouth to be organized, safe, easy to understand for visitors, and attractive (art, sign markers, etc).

Existing sidewalk network is decent. An education and safety campaign will increase pedestrian use.



CHAPTER 3:

Programs + Policies





INTRODUCTION

While transportation infrastructure – roads, sidewalks, crossings, bikeways – are critical for improving walking and bicycling, other components must also be used to create communities that are truly walking- and bicycling-friendly. This Plan incorporates these strategies to make walking and bicycling safe, comfortable, and common forms of transportation. By building on the region’s existing resources and community spirit, the City of Portsmouth can lead the way to a more livable, multimodal future.

This chapter starts by discussing the potential partnerships and existing non-infrastructure efforts currently underway in Portsmouth. It then moves into recommendations that are organized according to four distinct categories:

- Policies
- Programs
- Design
- Evaluation



Officers from Portsmouth PD participating in a Safe Route to Schools event - <https://wtkr.com/2019/01/10/portsmouth-police-departments-walking-program-encourages-fitness-keeps-kids-safe/>



EXISTING EFFORTS

SAFETY TOWN

Safety Town is a partnership between Portsmouth's education, law enforcement, and legislative bodies designed to teach young children pedestrian and bicycle safety. Through the use of age-appropriate, hands-on interactive experiences, children enjoy learning lifesaving behaviors and practices that help reduce the chance of serious injury.

Safety Town provides a safe and interesting learning environment that is set up to simulate an actual neighborhood. Safety Town has working traffic signals, miniature buildings, cross walks, and a fire truck.¹



HEALTHY PORTSMOUTH

Healthy Portsmouth is a city-wide health and wellness initiative led by a group of community leaders committed to changing the policies, systems and environments that affect neighborhoods, schools and workplaces to improve the health of Portsmouth's citizens.²

¹safetytownportsmouth.org

²www.portsmouthva.gov

³saferoutespartnership.org

SAFE ROUTES TO PARKS GRANT

In 2019, The Elizabeth River Project won a Safe Routes to Parks Activating Communities Grant to improve safe, equitable access to Paradise Creek Nature Park. Paradise Creek Nature Park is an "urban oasis" of restored wetlands, forests, and trails adjacent to an inner-city community that struggles with gangs, poverty, and health challenges. The neighborhood is also isolated from the park by a high-traffic, four-lane arterial. The Elizabeth River Project will work to improve connections and signage to the park and a nearby bridge where people can run, jog, and bike, so that residents can enjoy the health and community benefits of their local park.³



OTHER EFFORTS

Bike Month: Portsmouth partners with the Hampton Roads Transportation Planning Organization (HRTPO) on many of its bike month events.

Safe Routes to School: Portsmouth and Portsmouth Public Schools is an active participant in the National Safe Routes to School initiative, enabling and encouraging children to walk and bicycle to school and making walking and bicycling to school safe and appealing.



PARTNERSHIPS

Implementation of the Portsmouth Bicycle and Pedestrian Plan will be a collaborative effort between regional and local partners.

While the City and its agency and jurisdictional partners are responsible for infrastructure projects, community programs and the non-infrastructure recommendations listed here can be

supported and championed by outside partners such as nonprofits, advocacy groups, foundations, private sector businesses, and interested citizens.

POTENTIAL PARTNER AGENCIES

Eastern Virginia Medical School

Ecocycling

Elizabeth River Project

Hampton Roads Transit

Hampton Roads Transportation Planning Organization

Hampton Roads Pedestrian and Bicycle Advisory Committee

Hampton Roads TRAFFIX

Portsmouth City Schools

Portsmouth Health Department

Safe Routes to School Virginia

Safety Town

Team Portsmouth

US Navy

Virginia Department of Transportation (VDOT)





RECOMMENDATIONS



POLICIES

Policies add political backing and institutionalize recommendations and design guidelines into city codes. Policies may be specific to infrastructure elements such as bike parking requirements, or may be broad and include multiple municipal departments, such as Complete Streets Policies that may include design guidelines and evaluation metrics. Note: In addition to the policies listed below, the City of Portsmouth is currently developing a shared mobility program, which is the focus of Chapter 6 of this Plan.

VA Vision Zero Goals

- The Hampton Roads Transportation Planning Organization (HRTPO) aims for zero traffic deaths by 2045¹
- The Virginia 2017-2021 Strategic Highway Safety Plan outlines how the Commonwealth will work to “Arrive Alive”, or reach zero traffic deaths²

Complete Streets (see Policy Spotlight starting on pg. 52)

Develop a Complete Streets policy that calls for a safe, accessible transportation network that accommodates users of all ages and abilities, which encompasses bicyclists, pedestrians, transit riders, and motorists.

Maintenance (see Policy Spotlight on pg. 56)

Formulate processes that ensure facilities are in good shape and clear of debris

Vision Zero

Enact a Vision Zero policy with a clear process to achieving zero traffic deaths in the City of Portsmouth.

Dedicated Funding Stream

Identify a program funding strategy that would allow for more reliable and consistent long-term pedestrian and bicycle planning and implementation.

¹<https://www.hrtpo.org/page/regional-performance-measures-and-targets/>

²https://www.virginiadot.org/info/resources/SHSP/VA_2017_SHSP_Final_complete.pdf



DESIGN

Design Guidelines are based on best practices in facility design and create clear and uniform regional standards for walkways and bikeways. The guidelines provide an explanation of facility types and direction for implementing the infrastructure recommendations.

Pop-Up Demonstration Projects

Provide the ability to test new infrastructure and allows for immediate public feedback and early detection of obstacles before making large investments.

Bike/Pedestrian Design Guidelines

Develop Bike/Pedestrian Design Guidelines based on the VDOT Complete Streets Design Guidelines that will support the Portsmouth Complete Streets Policy.

Bicycle/Shared Mobility Parking Study

Conduct a bicycle parking inventory and develop design guidelines for bicycle parking and shared mobility devices.



PROGRAMS

Programs can engage the broader community to encourage more people to walk and bike, educate community members on rights and responsibilities, and enforce traffic laws to improve safety for all modes.

Safe Routes to Schools/Safe Routes to Parks	Continue work started with the Safe Routes to Parks grant in order to increase the number of students and community members who walk or bike to schools/parks.
Education, Safety, and Encouragement Programs	Expand on the targeted education/encouragement campaign that fits within the culture and brand of Portsmouth would help educate users and encourage walking and biking. Targeted safety campaigns can help prevent future crashes will improve the safety of walking and biking in Portsmouth.
Safety Reporting System	Provide an easily accessible process for residents to report maintenance, safety, or accessibility issues.

Transportation Education Ideas

- Bike patrol
- Host educational videos on City online platforms
- Adult safety programs
- Promote protective gear use
- Walk audits and/or walking tours
- Motor vehicle driver education



EVALUATION

Evaluation assesses facility usage and user perceptions, as well as the progress of implementing infrastructure, program, and policy recommendations. Progress may measure benefits for safety, the economy, health, and the environment.

Citizen Advisory Committee	Maintain momentum with the Citizen Advisory Committee that convened during this planning process and provide opportunities for them to give oversight and guidance for the implementation of the Plan.
Re-Apply for Bike/Walk Designations	Applying for, and maintaining, Bicycle Friendly Community and Walk Friendly Community certifications from the League of American Bicyclists and Walk Friendly Communities organizations, respectively, will ensure consistent tracking of plan implementation.
Data Collection and Sharing	Develop a data collection and sharing process that assesses available data, identifies gaps, tracks progress, and routinely distributes updates. The CAC should be a primary stakeholder in the data sharing component and could potentially lead collection efforts like count programs.



COMPLETE STREETS

What Are Complete Streets

Complete Streets policies call for a safe, accessible transportation network that accommodates users of all ages and abilities, which encompasses bicyclists, pedestrians, transit riders, and motorists. The intent behind Complete Streets is that streets should be for everyone. To carry this vision out, a Complete Streets approach is integrated into the planning, design, construction, operation, and maintenance of the transportation system. In addition, Complete Streets redefines the goals a City is going to meet and how a community should prioritize funding. No single prescription exists in terms of what a Complete Street should look like; context-sensitive design drives Complete Streets principles, meaning that elements may change based on locally-appropriate solutions and environmental, physical, historic, cultural, or economic considerations. Examples of some elements of Complete Streets are crosswalks, sidewalks, bike lanes, bus shelters, and narrower travel lanes.

For More Information:

The full Portsmouth Bicycle and Pedestrian Plan Complete Streets Memo can be found in Appendix A. The memo includes specific design recommendations and language to be included in a Complete Streets policy for Portsmouth; in depth case studies; and links to local, state, and national resources for best practices referenced in this section.

Elements of a Complete Streets Policy

1. Includes a **vision** for how and why the community wants to complete its streets
2. Specifies that 'all users' includes **pedestrians, bicyclists, users of micro-mobility, and transit passengers of all ages and abilities**, as well as **trucks, buses, emergency vehicles, and automobiles**.
3. Encourages **street connectivity** and aims to create a comprehensive, integrated, connected network for all modes.
4. Is understood by **all agencies** to cover **all roads**.
5. Applies to both **new and retrofit projects**, including design, planning, maintenance, and operations, for the entire right of way.
6. Makes any exceptions specific and sets a clear procedure that requires high-level **approval of exceptions**.
7. Directs the use of the **latest and best design criteria** and guidelines while recognizing the need for **flexibility** in balancing user needs.
8. Directs that Complete Streets solutions will complement the **context of the community**.
9. Establishes performance standards with **measurable outcomes**.
10. Includes specific **next steps for implementation** of the policy



Complete Streets Decision Making Process: Best Practices

1

PROJECT INITIATION

Identify Project Location, Scope, & Goals

- Define clear and accountable project exemptions. Project decisions are on a case by case basis and complete streets often won't be the sole driver of a maintenance project.
- Prioritize projects that include multimodal accommodations. If there is a selection criteria rubric, change it to reflect these values.
- Adjust maintenance and operations procedures with the City of Portsmouth Public Works Department to prioritize Complete Streets. Find low-cost projects or routine repaving plans where bike lanes and sidewalks can be integrated.
- Review all City of Portsmouth documents that impact transportation decisions and modify to include language supportive of Complete Streets.
- If Level of Service (LOS) is a metric for transportation projects, then loosen standards in certain areas: decrease the rating for peak times, or utilize the Multimodal Level of Service Standards. Strict LOS standards even at peak times can impede projects having extra space used for transit, pedestrians, and bicyclists.

2

PLAN DEVELOPMENT

Conduct Initial Screening of Site Design Tools; Collect and Analyze Data

- The project development process can help facilitate incorporating Complete Streets. The [Virginia Department of Rail and Public Transportation's \(DRPT\) Multimodal System Design Guidelines](#) outlines a 6-Step Process for establishing an integrated land use and transportation multimodal system, including the important steps of data analysis and funding best practices.

3

FUNDING AND DESIGN

Secure Project Funding and Develop Design

- Establish a Bicycle and Pedestrian Advisory Committee, or Citizen's Advisory Committee, with representatives from local and regional agencies, school districts, and parks and health departments to oversee implementation.
- Utilize a Complete Streets Checklist when signing off on projects. There are many examples from around the country compiled in [Smart Growth America's \(SGA\) Taking Action Guide](#), pages 25-26.
- Choose facilities based on the [National Association of Transportation Officials \(NACTO\) Contextual Guidance tool](#).
- Save time and resources by adopting national or state design guidelines.

4

INSTALLATION

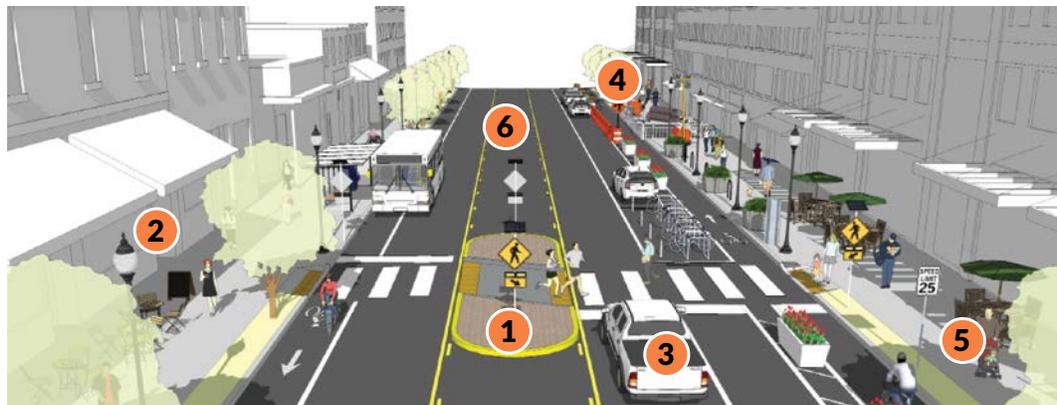
Construct Project, and Perform Post-Construction Evaluation

- The [National Complete Streets Coalition](#) promotes the use of performance measures that reflect multimodal needs to evaluate Complete Streets Projects. To undertake project evaluation, the following general steps should be taken:
 - » Agree to goals and objectives of the project
 - » Determine best ways to measure goals
 - » Implement measure
 - » Communicate the results of the evaluation
- For more detailed information, see SGA's [Evaluating Complete Street Projects: A Guide for Practitioners](#).

Policies to Support Complete Streets

There are many elements that make a street complete and it is not always a one-size-fits-all approach. Rather, Complete Streets principles are context-sensitive and require engineering judgment. However,

the elements described below highlight key complementary policy and program elements that should be considered along with any recommended Complete Street projects.



1 Adopt a Vision Zero Strategy

Vision Zero is the concept that no loss of life is acceptable on our roadways. Jurisdictions across the nation and across the world are adopting Vision Zero policies to eliminate preventable traffic deaths.

2 Update Land use and Development Codes

Local codes that encourage or require short block lengths, mixed use developments with street-fronting retail, and a connected network of streets with high-quality sidewalks form the bedrock of livable communities.

3 Rethink Parking Requirements

Parking policy reform includes better management of existing parking, pricing that reflects demand, lowering parking requirements for commercial and residential development, and bike parking minimums.

4 Create Safe Walkways and Bikeways in Construction Zones

Walkways in construction zones should be routed on the same side of the street, run on or parallel to the closed sidewalk, and must comply with the Americans with Disabilities Act and the Manual on Uniform Traffic Control Devices.

5 Establish Speed Reduction Policies

Traffic speed disproportionately threatens people walking and biking so speed should be managed through speed limit enforcement and traffic calming where appropriate.

6 Adopt a Local Complete Street Policy

A Complete Street policy asserts that all new street projects should accommodate all people who use the street, whether traveling on foot, bike, transit, or car.



Case Study: Arlington, VA Neighborhood Complete Streets

Arlington, Virginia developed a Neighborhood Complete Streets Program to improve the multimodal potential of eligible corridors. Through County Board-approved evaluation criteria, streets were scored and ranked to come up with a series of 3 pilot projects in 2018, 3 pilot projects in 2019, and identified 3 Capital Projects which are moving forward at present.



Neighborhood Complete Streets Pilot Project in Arlington, VA: North Buchanan Street at 13th and 14th Streets. Due to the existing street and sidewalk alignment, pedestrians were filtered into the middle of this intersection in order to cross North Buchanan Street and access Woodlawn Park. The project will be monitored for a year and evaluated for its effectiveness. (Image source: <https://projects.arlingtonva.us/projects/n-buchanan-street-at-13th-street-n-and-14th-street-n-improvements/>)

Case Study: City of Norfolk, VA Complete Streets Policy Implementation

The City of Norfolk adopted a Complete Streets policy in 2017. The Pilot Bike Loop, Lafayette Boulevard “Road Diet,” Robin Hood Road bike lanes, and crosswalk safety improvements are examples of recent projects to integrate Complete Streets policy. The City of Norfolk utilized the NACTO Urban Street Design Guide and Urban Bikeway Design Guide as a basis for their plan. When a Norfolk transportation project is reviewed, Complete Streets elements need to be considered in the design, planning, construction, maintenance, and operations, encompassing all phases.

More recent efforts include an urban design manual specifically for outdoor dining; options would include parklets or enclosure designs suitable for narrow sidewalks.



Complete Streets Project in Norfolk, VA: East Ocean View Avenue Repaving/Road Diet with Bike Lanes (2018). Image source: <https://www.norfolk.gov/AgendaCenter/ViewFile/Item/4186?fileID=8488>.



MAINTENANCE

Why It's Important

Just as road and highway facilities are monitored and maintained to ensure safe and dependable use, the same commitment to maintenance should be made for active transportation facilities. Proper maintenance of the existing and expanded bicycle and pedestrian network is as integral to the initial planning and development of the overall network.

Appropriate and on-going maintenance of bike lanes, sidewalks, and trails leads to safe, comfortable, reliable, and accessible facilities for all active transport users. Preventative maintenance of sidewalks and bike lanes can often be incorporated into routine roadway maintenance and can serve to reduce hazards for users and facility life cycle costs.

Furthermore, continual upkeep of active transportation facilities improves community aesthetic and demonstrates an investment and dedication by local government to bicycle and pedestrian transportation.

Key Principles

Similar to streets, the active transportation network, consisting of sidewalks, bikeways and shared use paths in Portsmouth should be viewed and maintained as a public resource, serving generations to come. The following guiding principles will help assure the preservation of a high-quality system:

- 1. Develop a management plan** that is reviewed and updated annually with tasks, operational policies, standards, and routine and remedial maintenance goals.
- 2. Maintain quality control** and conduct regular inspections.

- 3. Include field crews, police and fire/rescue personnel** in both the design review and ongoing management process.

- 4. Maintain an effective, responsive public feedback system** and promote public participation.

Action Steps

The action steps below provide guidance for improving and maintaining both existing and future bicycle and pedestrian facilities.

Implementation of these recommendations will require coordination across multiple departments, including local public works, state road crews, and parks and recreation agencies.

- Fund bicycle and pedestrian facility maintenance and consider funding additional maintenance equipment needed to adequately maintain an expanded network.

What Does Maintenance Include?

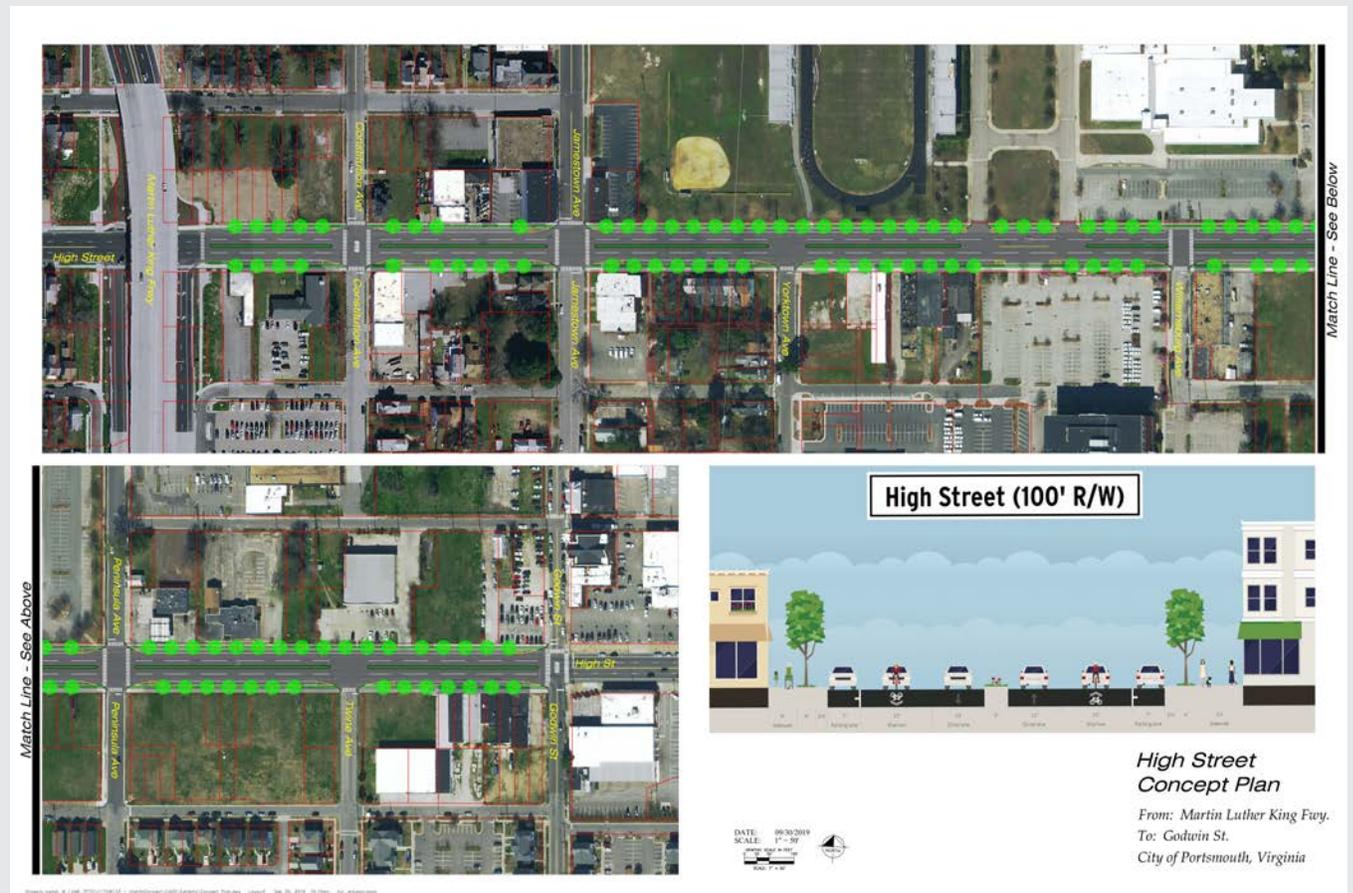
Routine maintenance tasks include those that should be addressed on a regular basis to keep all network facilities in good, usable condition. Maintenance tasks should be conducted more frequently on shared use path, bike, and pedestrian facilities where use is the most concentrated.

PREVIOUS PLAN HIGHLIGHT: HIGH STREET CONCEPT PLAN

**From: Martin Luther King Fwy.
To: Godwin St**

The “Complete” High Street Pilot Project: High Street is identified as a multi-modal corridor in the 2010 Master Transportation Plan and as an on-street route for the regional South Hampton Roads Trail. The Uptown portion of High Street between Chestnut Street and the MLK Freeway is an excellent candidate for a Complete Streets conversion pilot project. Sufficient pavement width and right-of-way is available along

most of the corridor to accommodate wider sidewalks, on-street parking, bus pull-offs, and shared travel lanes that are convertible to bike lanes. The pilot project should also include scenic streetscaping, utility relocations, landscaped medians, and high visibility crosswalks to reduce speeds within the corridor. The conversion should be done in phases to accompany the city’s longterm revitalization efforts within the vicinity. Ultimately, this Complete Streets conversion could be replicated along other multimodal corridors across the city.



CHAPTER 4: Sidewalk Network





SIDEWALK NETWORK APPROACH

The proposed sidewalk network seeks to:

- » Reflect the Plan’s vision + goals
- » Address the needs of all ages and abilities
- » Balance the transportation system for all roadway users
- » Provide access to important destinations for all members of the community





EXISTING SIDEWALK NETWORK

The existing sidewalk network is a dense grid in the downtown area. However, the network starts to break down further from the downtown core. Currently, there are 139 miles of street that have sidewalk on both sides, 62 miles of street that have sidewalks on only one side, and 267 miles of street with no sidewalk on either side.

RECOMMENDED NETWORK APPROACH

The recommended sidewalk network is organized into tiers which focus on connections along key corridors and access to destinations.

Sidewalks on Both Sides

- » Tier 1: Multimodal Corridors

Sidewalks on at Least One Side

- » Tier 2: Transit (Within .25 miles of a Bus Stop)
- » Tier 3: Recreation and Education (Within .25 miles of a Park or School)
- » Tier 4: Regional Connections (Within .25 miles of a Regional Trail Connection)

139 Miles
of Street
has
Sidewalk
on Both
Sides

Long-Term Sidewalk Network

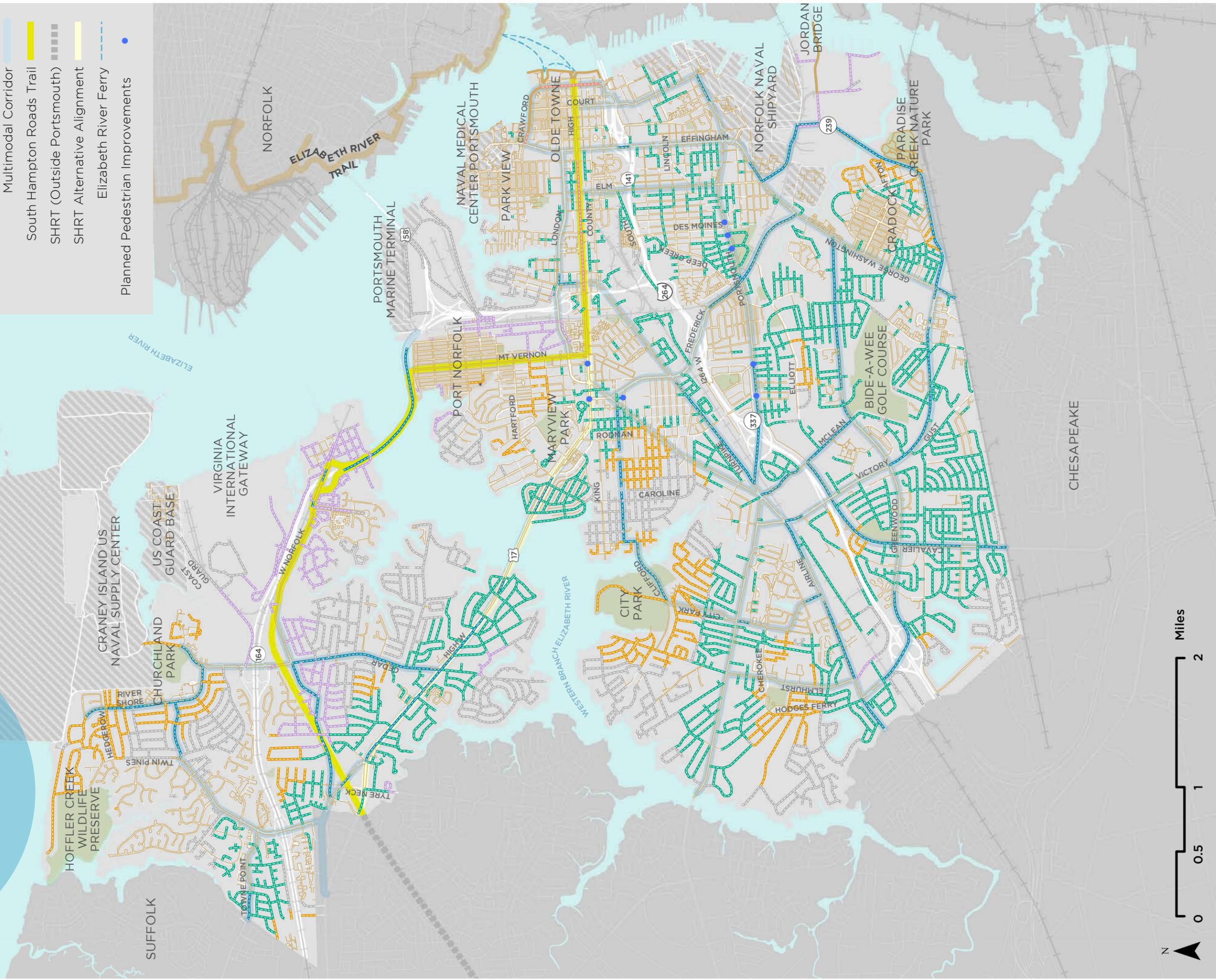
The tiers above identify missing portions of the sidewalk network located on main roads, or which provide access to key destinations throughout the City. In the future, as opportunities arise, Portsmouth should aim to install sidewalks on both sides of streets in any areas where they are missing. These portions of the network have been identified as long-term missing sidewalks.

RECOMMENDED SIDEWALK NETWORK

- Tier 1: Multimodal Corridors
- Tier 2: Transit
- Tier 3: Parks and Schools
- Tier 4: Regional Connections
- Long-Term Sidewalk Network
- Planned Road Diets
- Existing Sidewalk
- Multimodal Corridor
- South Hampton Roads Trail
- SHRT (Outside Portsmouth)
- SHRT Alternative Alignment
- Elizabeth River Ferry
- Planned Pedestrian Improvements

38 (Tier 1)
+
116 (Tier 2)
+
35 (Tier 3)
+
22 (Tier 4)
+
64 (Long-Term Network)

**275 Miles of Missing
Sidewalks**



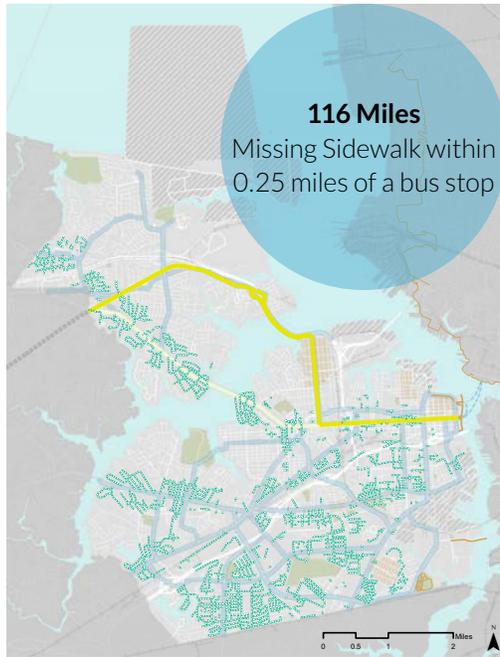


RECOMMENDED SIDEWALK NETWORK

Tier 1: Multimodal Corridors



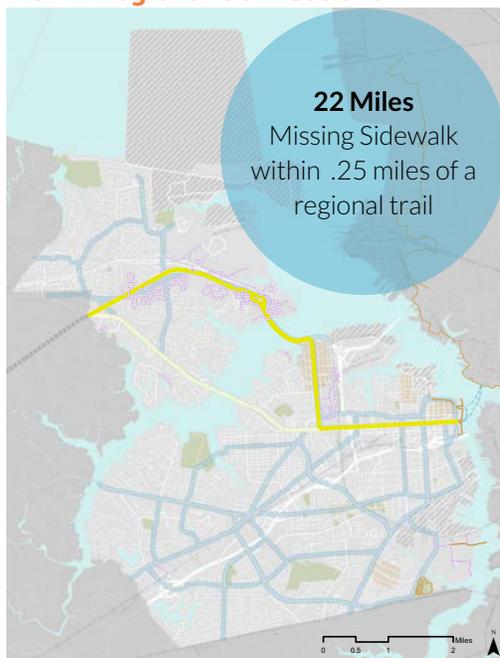
Tier 2: Transit



Tier 3: Recreation and Education



Tier 4: Regional Connections



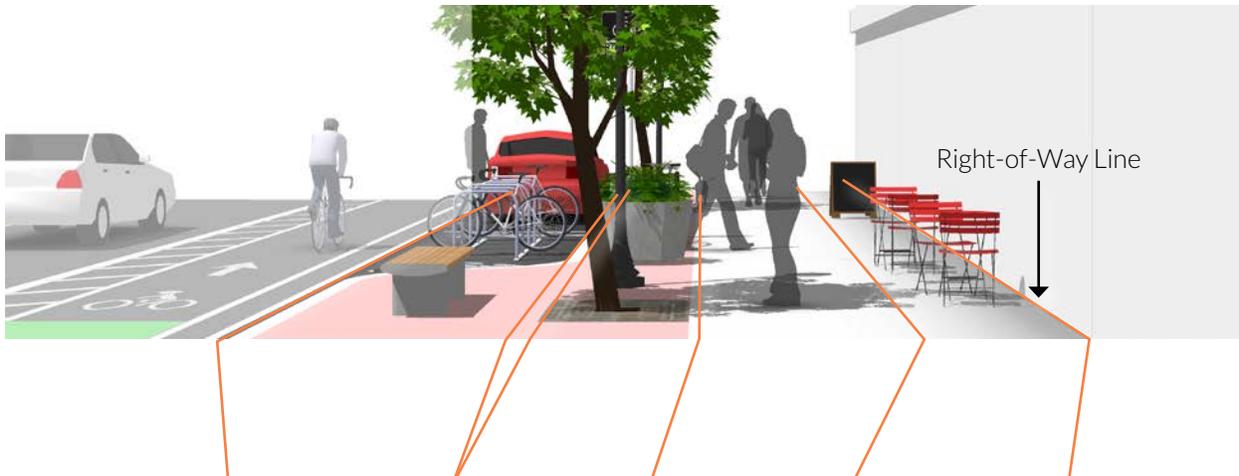
* See pages 70-71 for more detail on proposed pedestrian crossing improvements.

DESIGN GUIDANCE

All sidewalks should include adequate crossing treatments along with the appropriate facilities and dimensions, as referenced in the policy and design guidance.

Sidewalks should contain adequate width to accommodate high volumes and different walking speeds of pedestrians. The Americans with Disabilities Act requires a 4 foot clear width in the pedestrian zone

plus 5 foot passing areas every 200 feet. Recommended dimensions shown below are based on the VDOT Complete Streets Planning and Design Guidelines, DRPT Multimodal Corridor Guidelines, and City of Portsmouth Uptown D2 District Standards. Exact dimensions should be selected in response to local context and expected/ desired pedestrian volumes.



Street Classification	Parking Lane/ Enhancement Zone	Furnishing/ Green Zone*	Sidewalk Width	Frontage Zone**	Total Sidewalk Area
Local Streets	7 feet	3 - 8 feet	5 - 6 feet	N/A	9 - 14 feet
Commercial Areas	8 feet	6 - 8 feet	10 - 12 feet	4 feet	18- 34 feet
Arterials and Collectors	8 feet	6 - 8 feet	6 - 12 feet	4 feet	14 -24 feet

* If trees are planted in zone, minimum width is 6'. 3' buffer zone can be used where posted speed limit is 25 mph or less. If on-street parking is utilized - 8' minimum.

** Recommend as a minimum value

Six feet enables two pedestrians (including wheelchair users) to walk side-by-side, or to pass each other comfortably

Total sidewalk area excludes parking dimensions



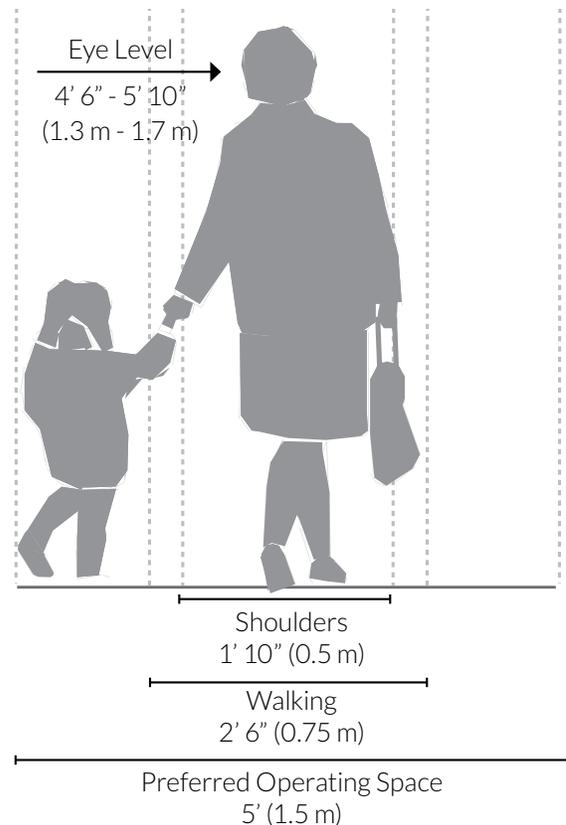
DESIGNING STREETS FOR ALL AGES

Types of Pedestrians

The transportation network should accommodate pedestrians with a variety of needs, abilities, and possible impairments. Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. Children have low eye height and walk at slower speeds than adults. Older adults walk more slowly and may require assistant devices to help with their walking stability, sight, and hearing. The table below summarizes common pedestrian characteristics for various age groups.

The Manual on Uniform Traffic Control Devices (MUTCD) recommends a normal walking speed of 3.5 feet per second when calculating the pedestrian clearance interval at traffic signals. The walking speed can drop to 3 feet per second for areas with older populations and persons with mobility impairments. The transportation system should accommodate these users to the greatest extent possible.

AGE	CHARACTERISTICS
0-4	Learning to walk Requires constant adult supervision Developing peripheral vision and depth perception
5-8	Increasing independence, but still requires supervision Poor depth perception
9-13	Susceptible to "darting out" in roadways Insufficient judgment Sense of invulnerability
14-18	Improved awareness of traffic environment Insufficient judgment
19-40	Active, aware of traffic environment
41-65	Slowing of reflexes
65+	Difficulty crossing street Vision loss Difficulty hearing vehicles approaching from behind





BARRIER ASSESSMENT

Two limited access highways cut through many Portsmouth communities leading to downtown. VA-164 and I-264 provide motor vehicle users speedy access to destinations throughout Portsmouth, but create physical barriers with pinch points that limit pedestrian movement due to unsafe or uncomfortable crossings or crossing distances.

Each of the crossings along VA-164 and I-264 were evaluated based on its

infrastructure needs and ranked according to a qualitative assessment of pedestrian comfort*.

Future bridges and reconstruction should provide accommodations for pedestrians.

**Comfort rankings are based on a qualitative assessment of factors including accessibility, land use, quality of infrastructure, buffers, lighting, street characteristics, etc.*

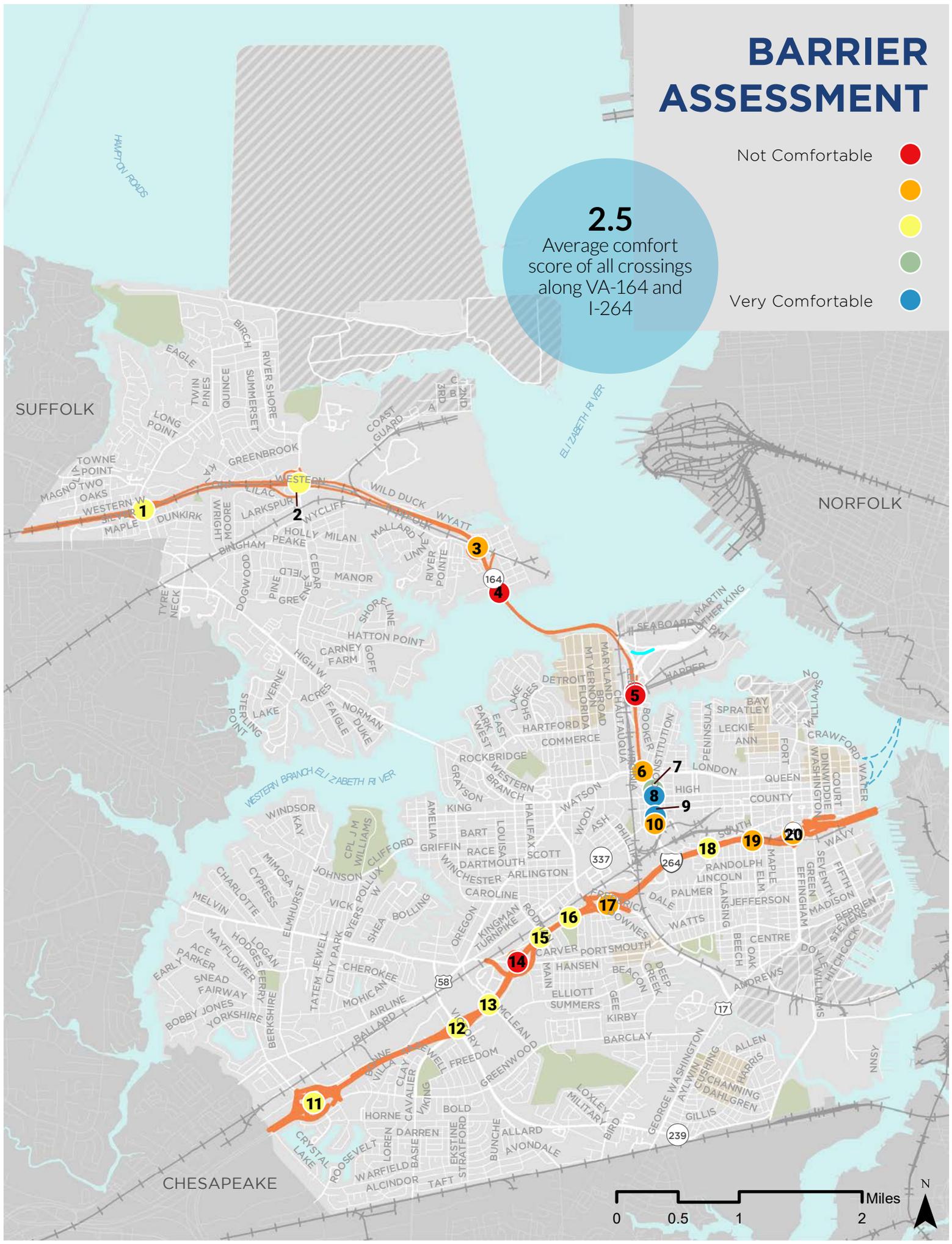
TABLE 4.1 BARRIER ASSESSMENT

Map ID	Cross Street	Existing Sidewalk	Buffer	ADA Ramps	Improvements Needed	Comfort Rating
1	Towne Point Rd	Both	No	Yes	Yes	3
2	Cedar Ln	Both	No	Yes	Yes	3
3	W Norfolk Rd	Both	No	Yes	Yes	2
4	Shipwright St	None	N/A	N/A	No	1
5	Railroad Ave	One Side	No	No	No	1
6	Harper Ave	None	N/A	N/A	No	1
7	London Blvd	Both	No	Partial	Yes	2
8	Queen St	Both	No	N/A	No	4
9	High Street	Both	Yes	Yes	No	5
10	Turnpike Rd	Both	No	Yes	No	5
11	Columbus Ave	None	N/A	N/A	Not able to determine	2
12	Greenwood Dr	Both	No	No	Yes	3
13	Victory Blvd	Both	No	Yes	Yes	3
14	McLean St	Both	No	Yes	Yes	3
15	Portsmouth Blvd	None	N/A	N/A	Yes	1
16	Rodman Ave	Both	No	Yes	Yes	3
17	Frederick Blvd	Both	Yes	Partial	Yes	2
18	Des Moines Ave	Both	Yes	Yes	Not able to determine	3
19	Elm Ave	Both	Yes	No	Yes	2
20	Effingham St	Both	No	Partial	Yes	2

BARRIER ASSESSMENT



2.5
Average comfort score of all crossings along VA-164 and I-264





CROSSING INVENTORY

Effingham Street (Fort Nelson Park to Portsmouth Blvd)

In addition to limited access highways, Portsmouth has many roadways with perceived high speeds, 4 or more travel lanes, limited pedestrian infrastructure, minimal streetscape, etc. These roadways can still act as barriers because pedestrians may feel unsafe or uncomfortable crossing them. Additionally, the presence of long crossing distances, limited pedestrian infrastructure, and concentration of destinations may present a more dangerous situation than a limited access highway because users may take great risks crossing the street if it is perceived as a more convenient option. A crossing inventory is a useful tool for identifying potential crossing and intersection improvements to improve pedestrian safety.

The crossings along Effingham Street (VA-141) between Fort Nelson Park and Portsmouth Blvd were analyzed as a pilot pedestrian crossing inventory that could be undertaken as multimodal corridors undergo

planning development.

The crossing inventory found numerous locations where vehicular crossing was restricted due to median but was likely used as pedestrian crossing points.

The southern section between Lincoln St and Portsmouth Blvd (almost 4/10ths of a mile) has no traffic lights and effectively zero formal pedestrian crossing points. Here, the alternative medians become a de-facto pedestrian refuge are a safer pedestrian crossing option than the traditional four-way vehicular intersections.

This inventory can be used as a template for identifying crossing improvements on arterials throughout the City. Table 4.2 identifies several corridors recommended for further crossing inventory analysis.

TABLE 4.2 CROSSING INVENTORY CORRIDOR RECOMMENDATIONS

Street	To	From
High St	US 17 (Frederick Blvd)	Crawford St
US 17 (Frederick Blvd)	Portsmouth Blvd	VA-239 (Victory Blvd)
US-58 (Airline Blvd)	Portsmouth Blvd	High St
Turnpike Rd	US-58 (Airline Blvd)	VA-164 (MLK Fwy)
VA-239 (Victory Blvd)	Airline Blvd	US-17 (George Washington Hwy)

CROSSING QUALITY

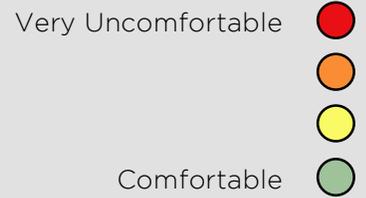
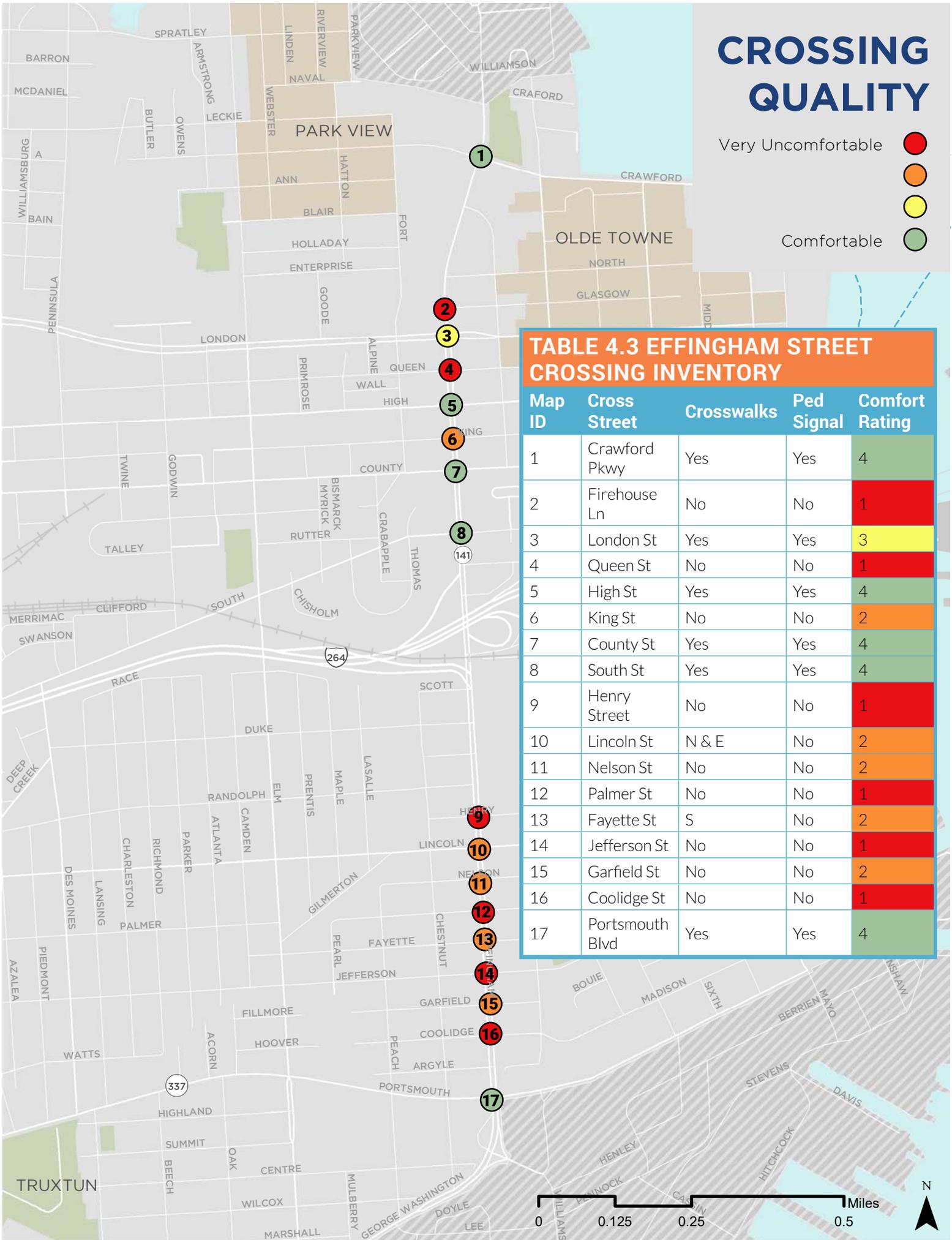


TABLE 4.3 EFFINGHAM STREET CROSSING INVENTORY

Map ID	Cross Street	Crosswalks	Ped Signal	Comfort Rating
1	Crawford Pkwy	Yes	Yes	4
2	Firehouse Ln	No	No	1
3	London St	Yes	Yes	3
4	Queen St	No	No	1
5	High St	Yes	Yes	4
6	King St	No	No	2
7	County St	Yes	Yes	4
8	South St	Yes	Yes	4
9	Henry Street	No	No	1
10	Lincoln St	N & E	No	2
11	Nelson St	No	No	2
12	Palmer St	No	No	1
13	Fayette St	S	No	2
14	Jefferson St	No	No	1
15	Garfield St	No	No	2
16	Coolidge St	No	No	1
17	Portsmouth Blvd	Yes	Yes	4



CROSSING IMPROVEMENTS

Intersections are an important part of the pedestrian network. Intersections pose a high rate of potential conflict between pedestrians, bicyclists, and vehicles. However, intersections can be designed to help reduce these conflicts, making them safer for all users.

The following guidelines should be considered when designing intersection improvements for pedestrians:

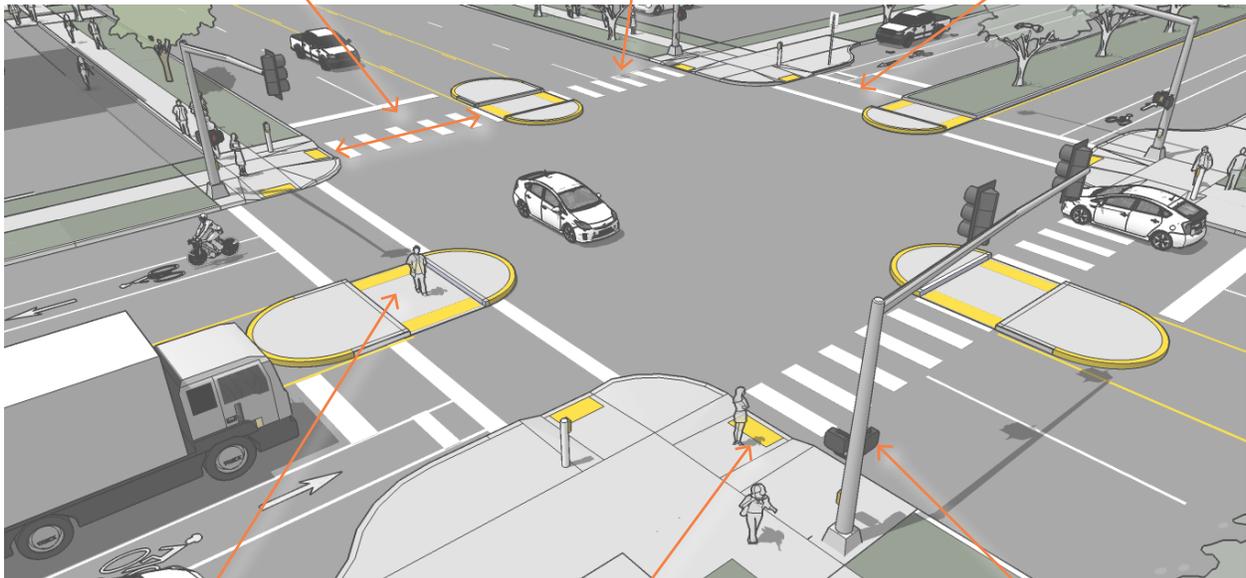
PEDESTRIAN INTERSECTION DESIGN GUIDELINES

The diagram below highlights best practices for pedestrian facility design at intersections.

The crosswalk should be located to align as closely as possible with the through pedestrian zone of the sidewalk corridor.

Continental markings provide additional visibility.

Parallel markings are the most basic crosswalk marking type.



Median refuge islands increase visibility and allow pedestrians to cross one direction of traffic at a time.

ADA compliant curb ramps allow all users to transition from the street to a sidewalk. Perpendicular curb ramps are preferred to diagonal curb ramps.

The use of a Leading Pedestrian Interval (LPI) to provide additional traffic-protected crossing time to pedestrians should be considered.



CROSSING TREATMENT SELECTION

The specific type of treatment at a crossing may range from a simple marked crosswalk to a full traffic signal or grade separated crossing. Before a marked crosswalk is installed, appropriate selection of crossing treatments should be evaluated in an engineering study, which should

consider number of lanes, presence of a median, distance from adjacent signalized intersections, pedestrian volumes and delays, average daily traffic (ADT), speed limit, geometry of the location, possible consolidation of crossing points, availability of street lighting, and other appropriate factors.

PEDESTRIAN CROSSING CONTEXTUAL GUIDANCE At unsignalized locations		Local Streets 15-25 mph			Collector Streets 25-30 mph			Arterial Streets 30-45 mph					
		2 lane	3 lane		2 lane with median refuge	3 lane	2 lane with median refuge	3 lane	4 lane	4 lane with median refuge	5 lane	6 lane	6 lane with median refuge
1	Crosswalk Only (high visibility)	✓	✓	EJ	EJ	X	EJ	EJ	X	X	X	X	X
2	Crosswalk with warning signage and yield lines	EJ	✓	✓	✓	✓	EJ	EJ	EJ	X	X	X	X
3	Active Warning Beacon (RRFB)	X	EJ	✓	✓	✓	✓	✓	✓	X	✓	X	X
4	Hybrid Beacon	X	X	EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓	✓
5	Full Traffic Signal	X	X	EJ	EJ	EJ	EJ	EJ	EJ	✓	✓	✓	✓
6	Grade separation	X	X	EJ	EJ	EJ	X	EJ	EJ	✓	✓	✓	✓

LEGEND	
Most Desirable	✓
Engineering Judgement	EJ
Not Recommended	X



MIDBLOCK CROSSINGS

Midblock crossings can provide legal crossings at locations where pedestrians want to travel, and can be safer than crossings at intersections because traffic is only moving in two directions. Locations where midblock crossings should be considered include:

- » Long blocks (longer than 600 ft) with destinations on both sides of the street;
- » Locations with heavy pedestrian traffic, such as schools or shopping centers; and
- » Midblock transit stops, where transit riders must cross the street on one leg of their journey.



PROPOSED PEDESTRIAN CROSSING IMPROVEMENTS

The City of Portsmouth has recently completed several pedestrian crossing improvement projects, including median and pedestrian crossing islands and RRFBs. The

map to the right shows additional proposed crossing improvements, including hybrid beacons, pedestrian signal crossings, and crosswalks.

TABLE 4.4 PROPOSED CROSSING IMPROVEMENTS

Type	Location	Status
Median and Pedestrian Crossing Islands	Alexander’s Corner	Complete
	High & Florida	Planned
	High & London	Complete
	High & Tyre Neck	Complete
	Frederick & Turnpike	Complete
	Frederick & George Washington	Complete
	Portsmouth & Effingham	Complete
	Frederick & High	Proposed
Pedestrian Hybrid Beacons	Portsmouth & Grand	Proposed
	Portsmouth & Roanoke	Proposed
	Airline & Ponderosa	Proposed
RRFB	Turnpike Road	Complete
	Willett Drive	Complete
	Victory Boulevard	Complete
Pedestrian Signal Crossing	Bart at Walmart Supercenter	Proposed
	Portsmouth & Rodman	Proposed
	Portsmouth & Piedmont	Proposed
Crosswalk	Portsmouth & Lansing	Proposed

PEDESTRIAN CROSSING IMPROVEMENTS

Proposed

- Median and Pedestrian Crossing Islands ●
- Pedestrian Hybrid Beacon ●
- Signal Crossing ●
- Crosswalk ●

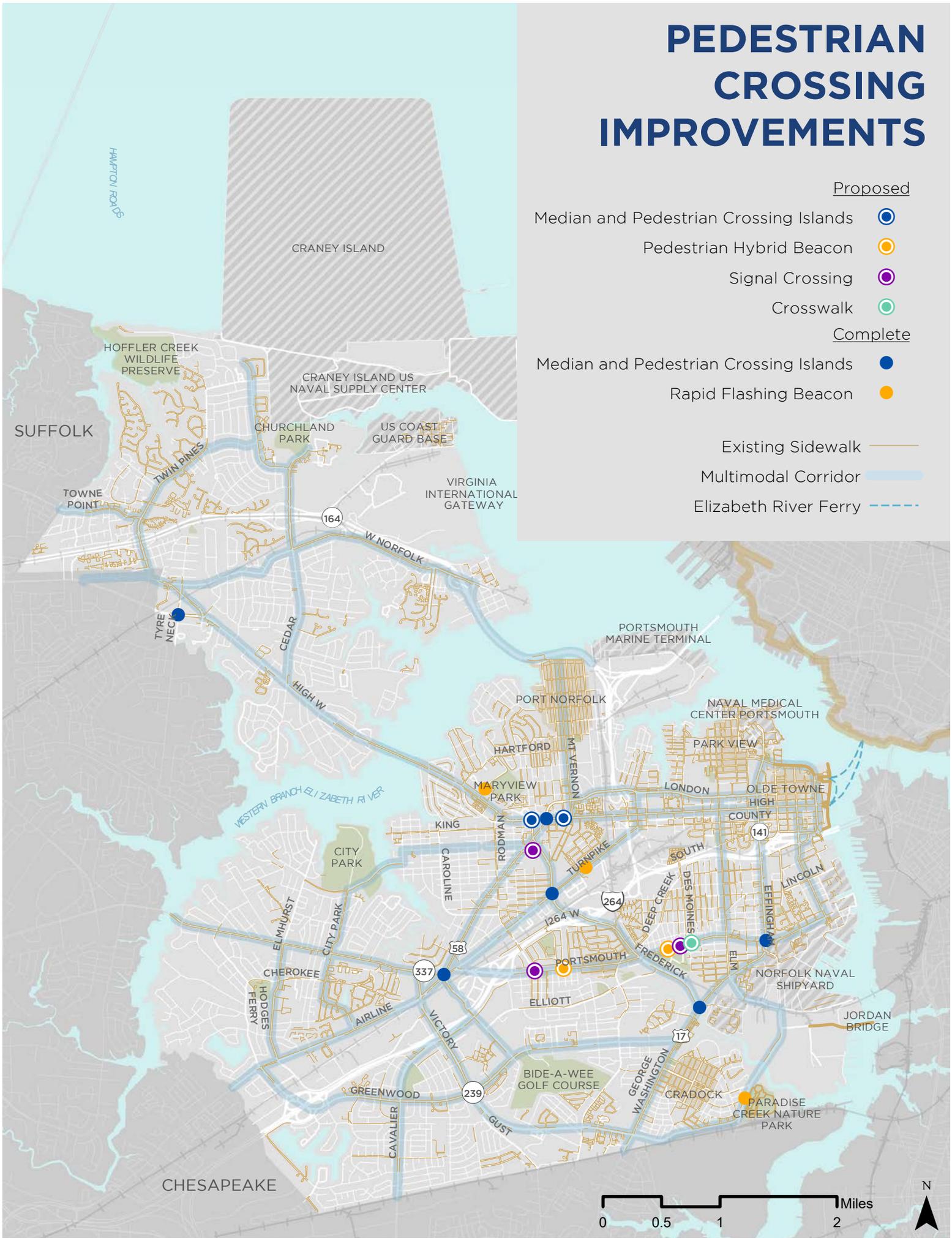
Complete

- Median and Pedestrian Crossing Islands ●
- Rapid Flashing Beacon ●

Existing Sidewalk —

Multimodal Corridor —

Elizabeth River Ferry - - -



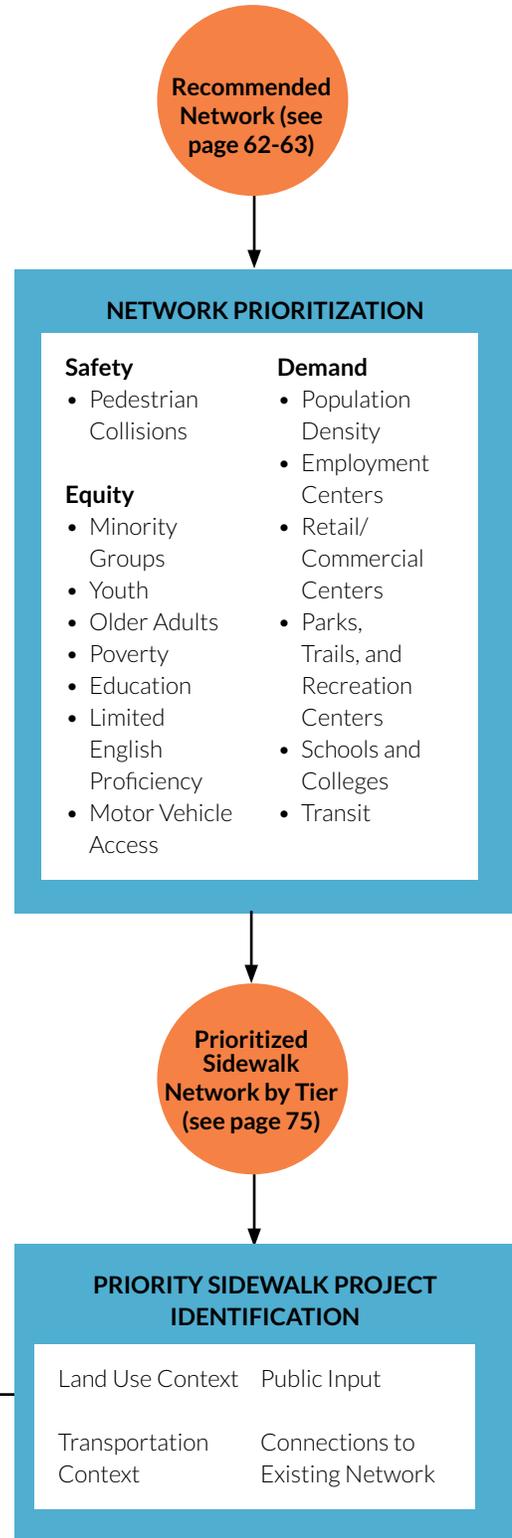


PRIORITIZATION

Full implementation of the recommended sidewalk network will take many years and require a significant amount of investment. However, this Plan aims to identify projects located in areas with the highest demand and the greatest need for short-term, priority implementation.

In order to identify high priority projects, it was essential to develop a process for selecting an equitable and realistic prioritization methodology in order to develop short-term priority projects. The evaluation criteria, based on the existing conditions analyses conducted during this planning process, are highlighted in the graphic to the right. The high-level results of this analysis are shown on the heat maps on the next page. Detailed heat maps can be found in Appendix G.

From these results, 15 top priority sidewalk projects were identified. These projects were developed based on the results of the initial prioritization process, taking into account factors such as transportation context, land use context, public input, and connections to the existing network. For a map and list of the top priority sidewalk projects, see pages 76 and 77.



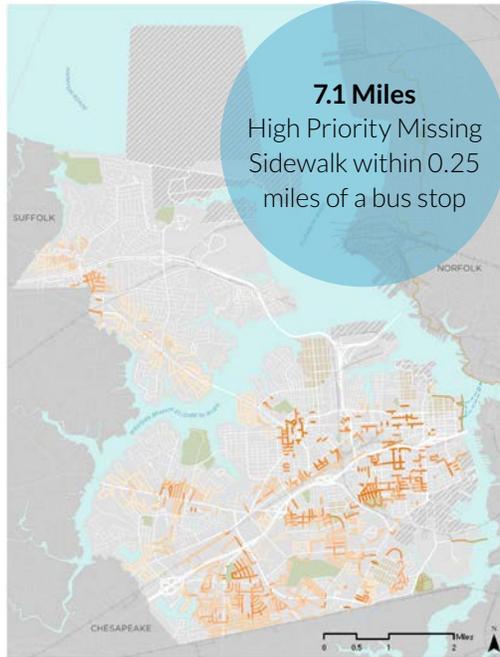


PRIORITIZED SIDEWALK NETWORK

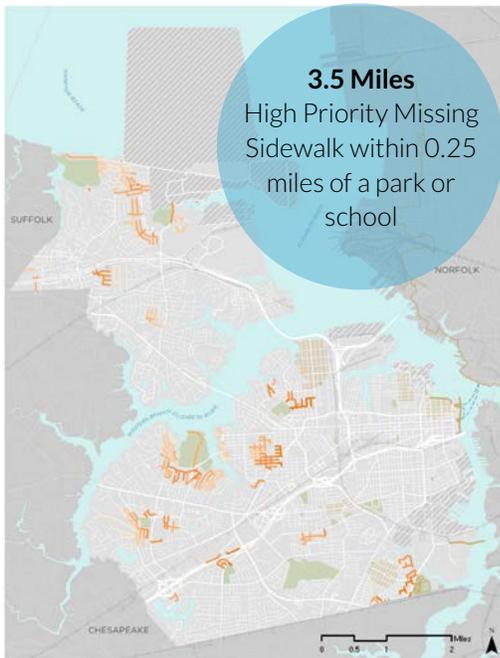
Tier 1: Multimodal Corridors



Tier 2: Transit



Tier 3: Recreation and Education



Tier 4: Regional Connections



Low  High Priority



PRIORITY SIDEWALK NETWORK

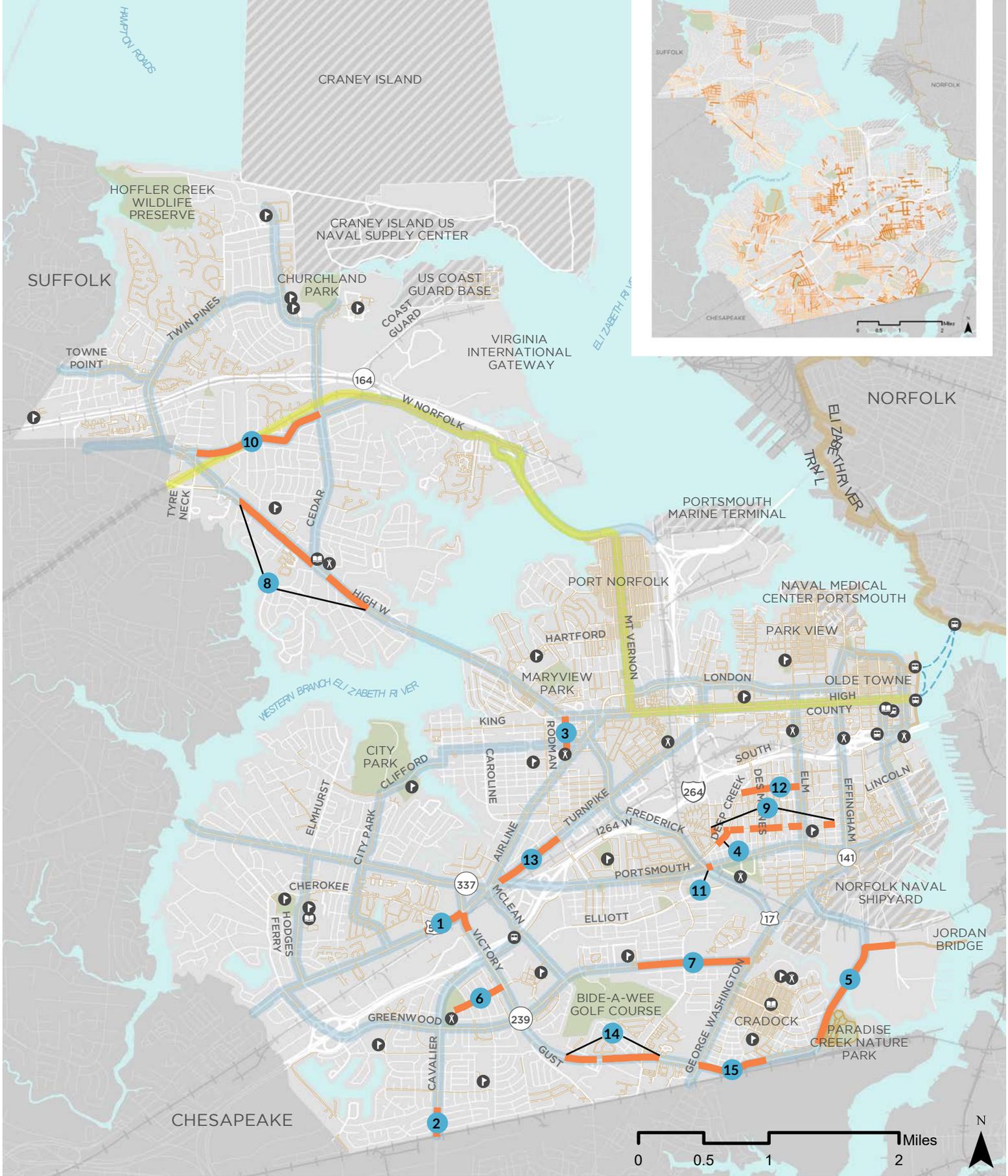
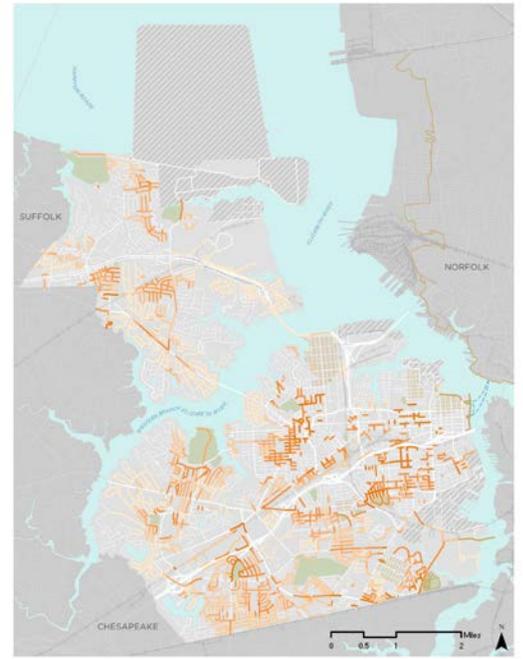
The top fifteen priority sidewalk projects are listed in the table below and highlighted on the map to the right. Together, these projects total approximately 8.5 miles of priority sidewalk projects.

TABLE 4.5 PRIORITY SIDEWALK NETWORK								
Map ID	Street Name	From Street	To Street	Length (Miles)	Sidewalk Network Tiers			
					Multimodal Corridor	Transit Access	Park or School Access	Regional Connection
1	Airline/ Victory*	Chowan & Airline	Elmhurst & Victory	0.5	X	X		
2	Cavalier	Warfield	City Boundary (South of Taft)	0.2	X	X		
3	Cumberland	High	Clifford	0.3		X	X	X
4	Deep Creek	Columbus	Jefferson	0.1		X	X	
5	Elm/ Victory*	Paradise Creek	Jordan Bridge	1.1	X		X	X
6	Freedom	Victory	Viking	0.4		X	X	
7	Greenwood*	Independence	George Washington	0.9	X	X	X	
8	High*	Shirley	Garland	1.1	X	X	X	X
9	Jefferson*	Columbus	Chestnut	0.6		X	X	
10	W Norfolk	Tyre Neck	Cedar	1.1	X	X		X
11	Portsmouth	Frederick	Existing Sidewalks	0.05	X	X	X	
12	Randolph	Deep Creek	Elm	0.5		X		
13	Turnpike*	Rodman	Portsmouth	0.6	X	X	X	
14	Victory*	Victory Court	Deep Creek	0.7	X	X		
15	Victory	George Washington	Vail	0.5	X	X	X	

* Project bounds include minor segments of existing sidewalk or sidewalk on one side of the street.

PRIORITY SIDEWALK NETWORK

Prioritized Sidewalk Network: All Tiers





IMPLEMENTATION

Implementation of the recommended sidewalk network will require securing a variety of dedicated funding sources. This can be done through strategic collaboration with City, regional, and state agencies; the federal government; the private sector; and non-profit organizations. These funding mechanisms are discussed further in Chapter 7 of this report.

For implementation of the sidewalk network, typical cost estimates were developed for the recommended sidewalk network, as shown in Table 4.5. Per unit cost estimates for potential

crossing improvements are shown in Table 4.6. Detailed costing will be needed as part of the implementation of each individual project during the project development and design phase. Notably, the complexity of right-of-way (ROW) acquisition and design tends to increase with increasing roadway hierarchy, so the costs increase with hierarchy.

Detailed planning-level cost estimates for the Plan's top five priority projects are provided in Chapter 7

TABLE 4.6 SIDEWALK NETWORK COST ESTIMATES

	Length (LF)	Total Cost Estimate Range (million dollars)
Typical Cost Estimate for 5-foot concrete sidewalk: \$32.50/LF		
Tier 1 Missing Sidewalks	198,900	\$4.8M - \$8.1M
Tier 2 Missing Sidewalks	610,800	\$14.9M - \$24.8M
Tier 3 Missing Sidewalks	184,400	\$4.5M - \$7.5M
Tier 4 Missing Sidewalks	116,200	\$2.8M - \$4.7M
Total Recommended Sidewalk Network	1,110,300	\$27.1M - \$45.1M
Priority Sidewalk Projects	45,500	\$1.1M - \$1.8M

TABLE 4.7 PEDESTRIAN CROSSING IMPROVEMENT COST ESTIMATES

Feature	Unit	Typical Cost Estimate
Curb Bulb-Out	linear foot	\$87
ADA Ramp	each	\$1,300
HAWK Signal	lump sum	\$150,000
RRFB	lump sum	\$15,000
Pedestrian Signal	lump sum	\$20,000
Median Refuge Island	each	\$3,000
High Visibility Crosswalk	linear foot	\$47

Note: All cost estimates are order of magnitude estimates for generic situations and program planning level estimates. Prior to any detailed grant application, more project scoping and refined cost estimates would be required. Estimates include a 30% contingency factor. Estimates are specific to construction of identified item only and do not include cost for demolition of existing site, stormwater, right-of-way, utility relocations, or other site-specific conditions



Runner on a walking path along the Elizabeth River - <https://www.flickr.com/photos/usepagov/9454348674/in/photostream/>

CHAPTER 5: Bike Network





DESIGNING BIKEWAYS FOR ALL USERS

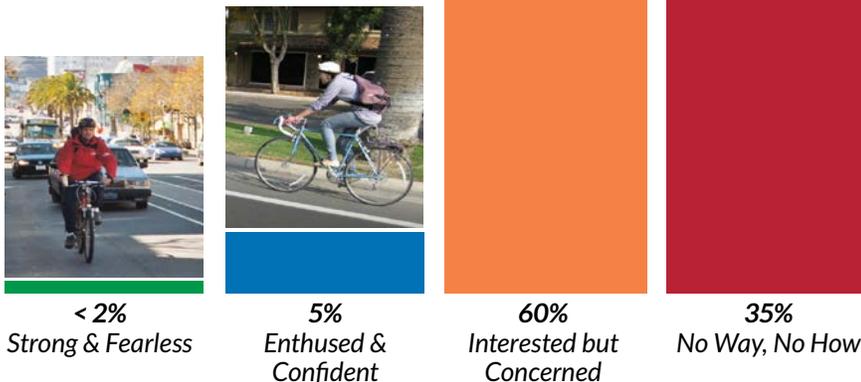
The last decade has seen tremendous investment in bicycle infrastructure locally and across the United States. However, one key realization is now shaping how bicycle investments are made.

DIFFERENT CYCLISTS HAVE DIFFERENT NEEDS

Although some bicyclists will ride on any road, regardless of an available bikeway (“strong and fearless”), a much larger portion of the population will ride only where there is a high-quality bikeway (“interested but concerned” population). Understanding this concept has led us to design more low-stress bikeways that provide the high-quality experience the majority of cyclists desire.

The chart on this page shows a “typical” distribution of bicyclists while also capturing the general type of experience they prefer.

Designing for ages 8 to 80 will be the most effective way to reach the “Interested but Concerned” group



SOURCE: www.portlandoregon.gov/transportation/article/264746



EXISTING BIKEWAY NETWORK

The City of Portsmouth currently has 18.2 miles of existing bikeways. While these facilities provide a foundation for the Portsmouth bikeway network, there are opportunities to build a more connected network that provides access to key destinations.

This chapter presents recommendations for building out Portsmouth's bikeway network, in order to provide safe transportation and recreation options for riders of all ages and abilities. The recommendations are categorized into three facility types: shared use paths, on-street bike facilities, and neighborhood greenways.

18.2 miles Existing Bikeways

.2 miles

Buffered Bike Lanes

6.5 miles

Bike Lanes

9 miles

Shared Roadways (Sharrows)

2 miles

Existing Multi-Use Paths

1.5 miles

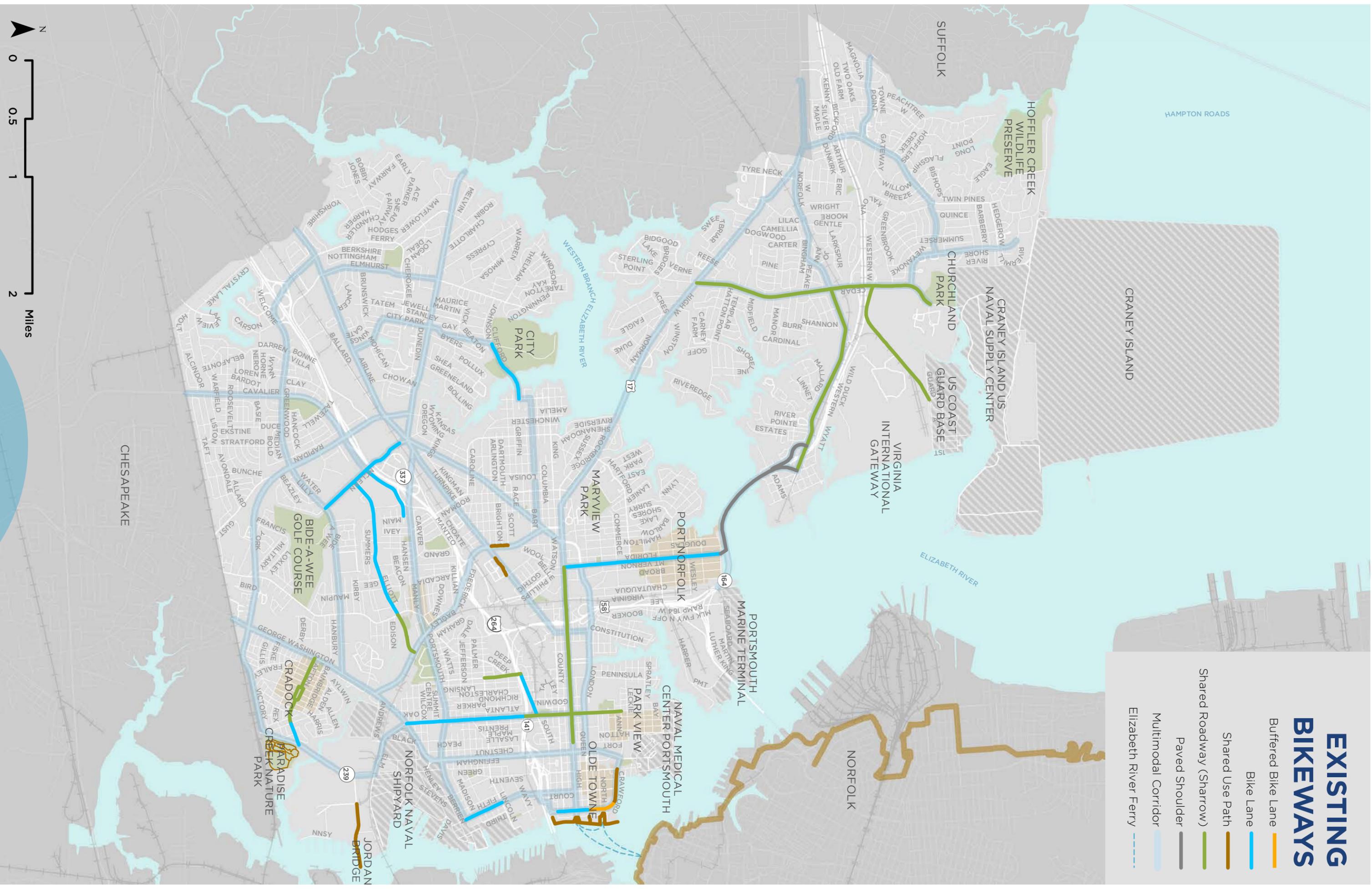
Paved Wide Shoulder



Bicyclist along Mt Vernon Ave - <https://www.flickr.com/photos/usepagov/9454348164/in/photostream/>

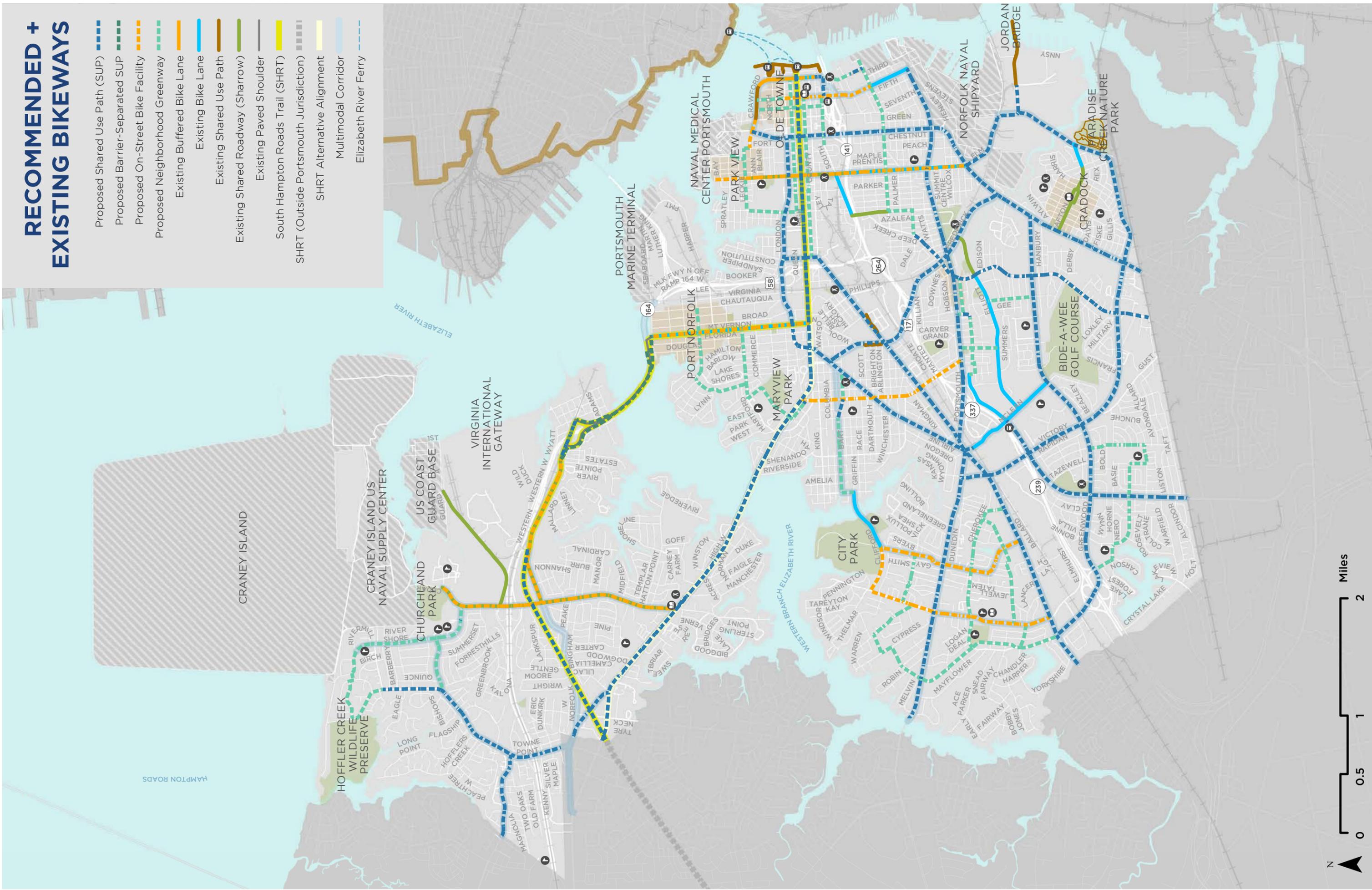
EXISTING BIKEWAYS

- Buffered Bike Lane
- Bike Lane
- Shared Use Path
- Shared Roadway (Sharrow)
- Paved Shoulder
- Multimodal Corridor
- Elizabeth River Ferry



RECOMMENDED + EXISTING BIKEWAYS

- Proposed Shared Use Path (SUP) — — — —
- Proposed Barrier-Separated SUP — — — —
- Proposed On-Street Bike Facility — — — —
- Proposed Neighborhood Greenway — — — —
- Existing Buffered Bike Lane — — — —
- Existing Bike Lane — — — —
- Existing Shared Use Path — — — —
- Existing Shared Roadway (Sharrow) — — — —
- Existing Paved Shoulder — — — —
- South Hampton Roads Trail (SHRT) — — — —
- SHRT (Outside Portsmouth Jurisdiction) — — — —
- SHRT Alternative Alignment — — — —
- Multimodal Corridor — — — —
- Elizabeth River Ferry - - - -





RECOMMENDED BIKEWAY NETWORK

The proposed bike network was developed with the goal of creating a network of well-connected facilities. Biking needs to be a safe, convenient, and pleasant form of transportation for the broadest array of people. This Plan recommends a network of shared use paths, on-street bike facilities, and neighborhood bikeways to connect people to destinations such as transit, parks, schools, and jobs. These facilities are described in detail on pages 86-88.

Shared use paths, on-street bike facilities, and neighborhood greenways all make biking more comfortable. However, perception of safety is largely driven by factors like vehicle speeds and traffic volumes. Not all routes are the same, and therefore design flexibility is essential to building a low-stress network. The network approach developed as part of this Plan sets the parameters for the bikeway network, but the project design process will determine the ultimate cross-section for each project using national best practices and engineering judgment. VDOT, AASHTO, and NACTO provide design guidance and standards for bikeway facilities.

82 miles Proposed Bikeways

47 miles

Shared Use Path

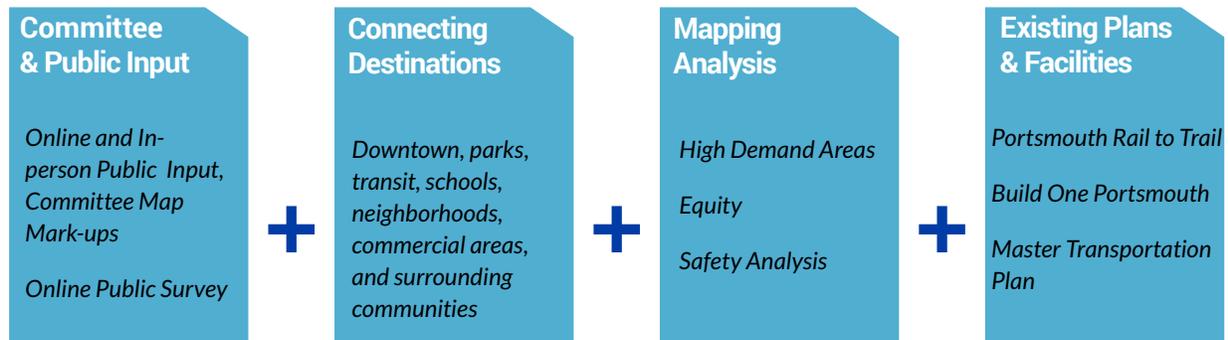
13 miles

On-Street Bike Facility

22 miles

Neighborhood Bikeways

BASIS OF RECOMMENDATIONS





NEIGHBORHOOD GREENWAY

Definition:

In residential neighborhoods (when streets are low-volume and low-speed), neighborhood greenways provide key links and corridors for a bike network.

Benefits:

Neighborhood greenways are shared by automobiles and bicycles, but at speeds that make travel more comfortable for a wide range of bicyclists. These facilities have a low implementation and maintenance cost while also greening neighborhoods and improving travel.

Implementation strategies include:

- » Sharrow pavement markings
- » Signage
- » Traffic calming
- » Speed reduction tools
- » MUTCD approved wayfinding signage



22 Miles
Proposed
Neighborhood
Greenways





ON-STREET BIKE FACILITY

Definition:

On-street bike facilities can include sharrows with signage, striped bike lanes, visually-buffered bike lanes, or physically separated bike lanes.

Benefits:

On-street bike facilities are the core component of a bicycle network. There are many types of facilities within this category allowing for implementation that meets the context and feasibility of the situation.

Implementation strategies include:

These treatments can be accomplished via new pavement markings, re-striping or road-diets on existing roadways.



13 Miles
Proposed
On-Street
Bike Facilities





SHARED USE PATHS

Definition:

Shared use paths are bi-directional multi-use paths completely separated from motorized vehicular traffic and are constructed in their own corridor, often within an open-space area.

Benefits:

A shared use path parallel to a roadway can encourage bicycling in areas where high-volume and high-speed motor traffic would otherwise discourage it.

Implementation strategies include:

Shared use paths can be paved and should be a minimum of 10' wide. Pavement widths of 12-, 14-, and even 16-feet are appropriate in high-use urban situations.



47 Miles
Proposed
Shared Use Paths





BIKEWAY NETWORK COST ESTIMATE

To understand the potential costs of implementing the recommended bikeway network, typical cost estimates were developed for each facility type, as shown in Tables 5.1. For shared use paths and on-street bike facilities, costs are shown as a range, representing different facility implementation options.

Detailed costing will be needed as part of the implementation of each individual project during the project development and design phase. Notably, the cost estimates below

do not include right-of-way acquisition, utility relocations, and other site specific considerations. Especially for shared use paths, these costs can vary greatly and have a large impact on project cost, depending on the context of the facility.

Securing dedicated funding for bikeway projects will be a critical step in implementing the bikeway network. Funding sources, as well as detailed cost estimates for the Plan’s top five priority projects, are provided in Chapter 7.

TABLE 5.1 RECOMMENDED BIKEWAY NETWORK: COST ESTIMATES				
Implementation Strategy	Facility Description	Typical Unit Cost Estimate (per LF)	Length (LF)	Total Cost Estimate
SHARED USE PATHS				
Low Cost	8-foot asphalt shared use path	\$35.00	249,000	\$6.5 - \$10.9
Medium Cost	10-foot asphalt shared use path	\$44.00	249,000	\$8.2 - \$13.7
High Cost	12-foot asphalt shared use path	\$52.00	249,000	\$9.7 - \$16.2
ON-STREET BIKE FACILITIES ¹				
Low Cost	Sharrows	\$2.50	42,100	\$106,000
Medium Cost	Striped bike lanes	\$9.00	66,200	\$596,000
High Cost	Buffered bike lanes	\$32.50	80,400	\$2,613,000
NEIGHBORHOOD GREENWAYS				
Typical Cost	Sharrows	\$2.50	117,000	\$293,000

Total Cost Estimate Range (million dollars)

Note: All cost estimates are order of magnitude estimates for generic situations and program planning level estimates. Estimates include a 30% contingency factor. Prior to any detailed grant application, more project scoping and refined cost estimates would be required. Estimates are specific to construction of identified item only and do not include cost for demolition of existing site, stormwater, right-of-way, utility relocations, or other site-specific conditions

¹ On-street cost estimates are for striping only. Costs for projects that involve additional pavement or changing curbs would be significantly higher. Some on-street bike facilities are recommended as upgrades to roadways with existing facilities. Roads with existing sharrows or bike lanes are not included in the estimates for sharrow costs; roads with existing bike lanes are not included in the estimates for bike lane costs.

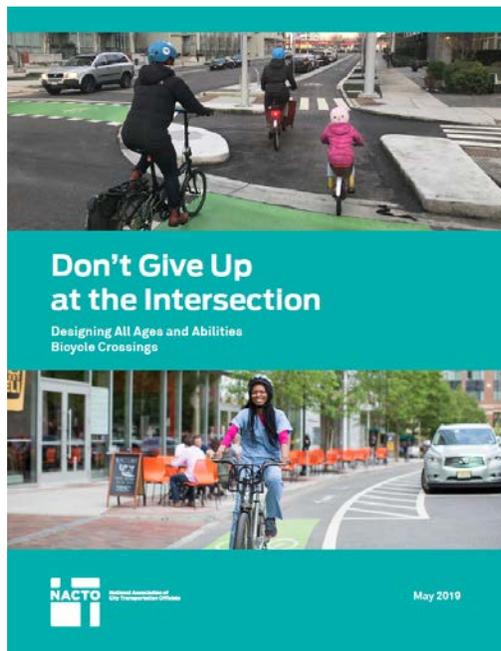


INTERSECTION DESIGN GUIDANCE

Intersections are junctions at which different modes of transportation meet and facilities overlap. An intersection facilitates the interchange between bicyclists, motorists, pedestrians, and other modes in order to advance traffic flow in a safe and efficient

manner. Designs for intersections with bicycle facilities should reduce conflict between bicyclists and motor vehicles by heightening the level of visibility, denoting clear right-of-way, and facilitating eye contact and awareness with other modes.

INTERSECTION TYPE AND TOOLS



For more information and design guidance see NACTO's *Don't Give Up at the Intersection: Designing All Ages and Abilities Bicycle Crossings*

REDUCING TURN CONFLICTS

Reduce Turn Speed

Drivers yield more frequently to people walking and biking when speeds are low, making it safer for bikes to pass in front of turning cars.

Make Bikes Visible

Setting back the bikeway crossing, installing recessed (early) stop lines for motor vehicles, and building raised bikeway crossings all make it easier for drivers to see people using the bikeway.

Give Bike the Right-Of-Way

People on bikes crossing a busy intersection need clear priority over turning motor vehicles.



CROSSING TREATMENT OPTIONS

The graphics below highlight different bicycle crossing treatments that can be implemented to improve bicycle safety at intersections throughout the network.

Bike Boxes



Bike boxes are designated areas at the front of a traffic lane that provide bicyclists with a safe and visible place to queue during a traffic signal.

Intersection Crossing Markings



Intersection crossing markings show drivers where a bicyclist will be traveling through an intersection, and provide bicyclists with a safe, direct path.

Median Refuge Island



Median refuge islands help facilitate comfortable bike and pedestrian crossings.

Two-Stage Turn Queue Boxes



Two-stage turn boxes provide a way for bicyclists to make left turns via a two-step process so they do not have to merge into traffic lanes.

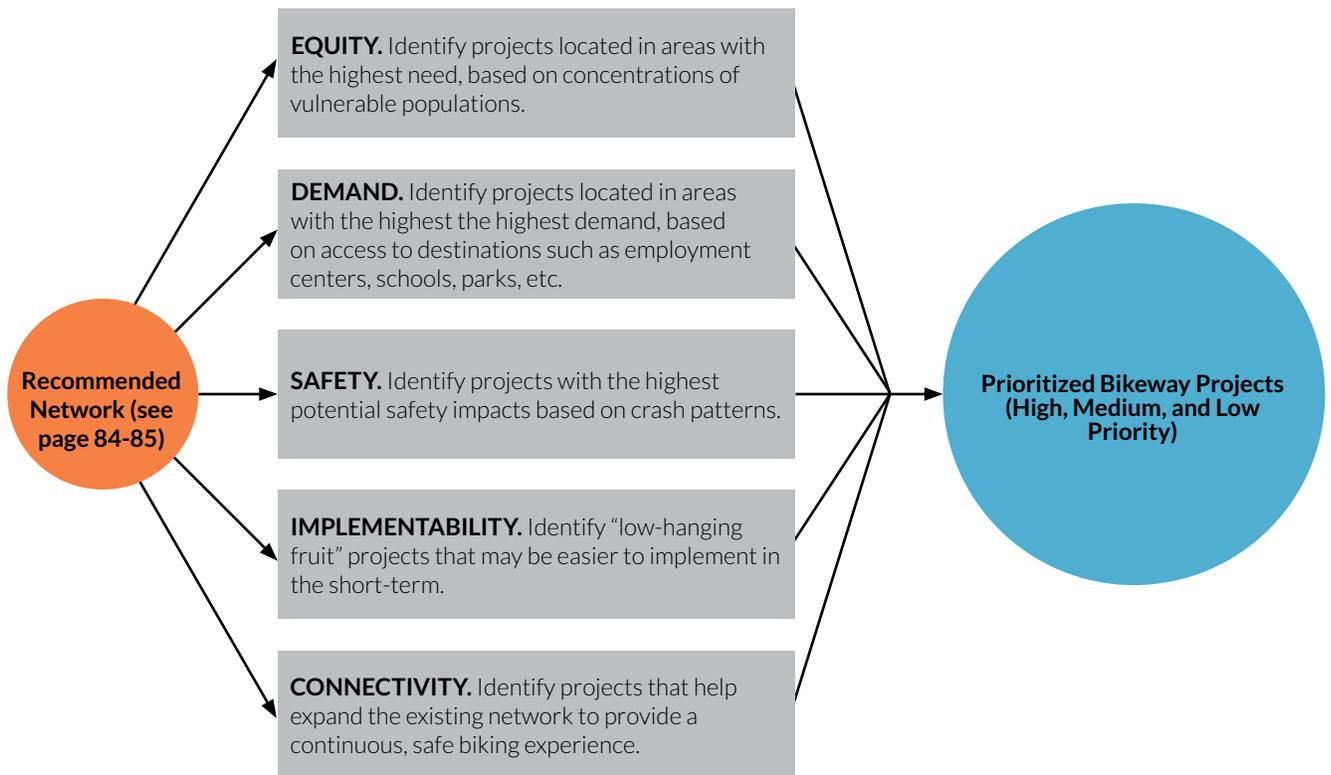


PRIORITIZATION

Implementation of the recommended bikeway network will require substantial funding and will happen over the course of many years. In order to identify high priority initiatives, the project team developed a methodology to determine high, medium, and low priority projects. The methodology can be used to revisit the priority project list on a regular basis to reevaluate a specific project’s importance as the City builds out the bikeway network. In this way the City

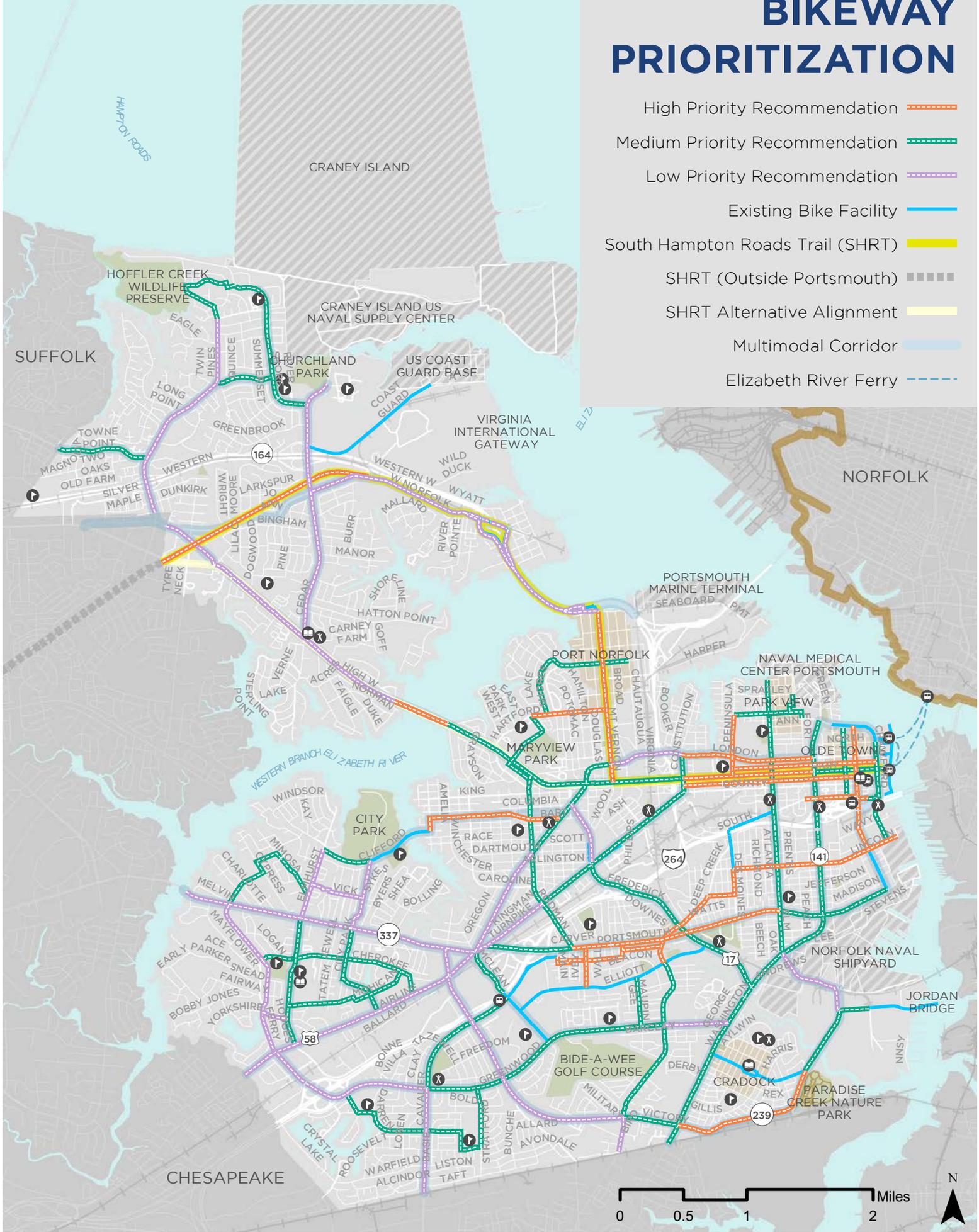
can ensure that the priority list achieves the desired goals while responding to changes in the needs and desires of the community, as well as funding availability over time.

Using the criteria shown below, a prioritized list of bikeway projects was developed. These recommendations are shown in the map to the right. The full prioritized bikeway project list can be found in Appendix H.



BIKEWAY PRIORITIZATION

- High Priority Recommendation — — — — —
- Medium Priority Recommendation — — — — —
- Low Priority Recommendation — — — — —
- Existing Bike Facility — — — — —
- South Hampton Roads Trail (SHRT) — — — — —
- SHRT (Outside Portsmouth) ■ ■ ■ ■ ■
- SHRT Alternative Alignment — — — — —
- Multimodal Corridor — — — — —
- Elizabeth River Ferry - - - - -



CHAPTER 6: Shared Mobility





INTRODUCTION

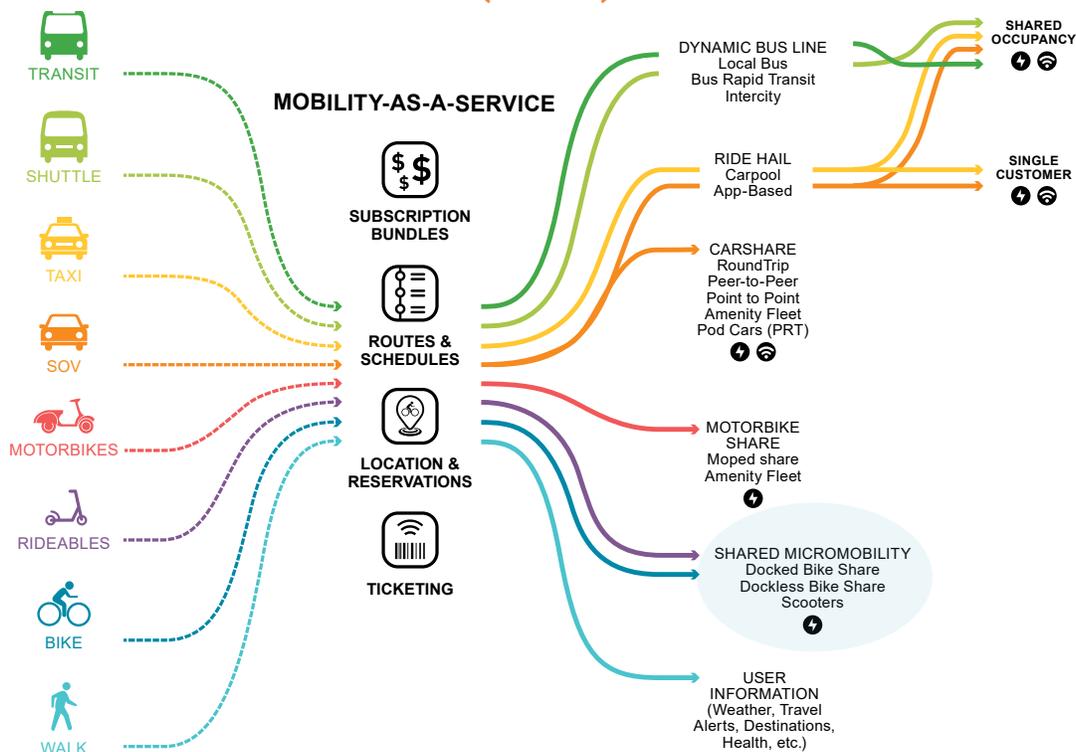
EXPANDED OPTIONS: SHARED MOBILITY

Transportation is evolving, and there are more mobility options than ever before including ride-hailing services, bikeshare, scooter share, e-bikes, and more. It is critical to think about these options not only as new applications of technology but also new ways to connect people. Shared mobility continues to change how we think about transportation as a service. This chapter will particularly focus on shared bikes and scooters, and presents an evaluation of demand for shared mobility in Portsmouth, and recommendations for implementing a bike and scooter share system.

These new shared mobility modes of transportation represent innovative responses to the demand for new options and offer an opportunity to:

- » Provide more mobility choices
- » Offer last mile and first mile connections
- » Reduce traffic congestion
- » Mitigate various forms of pollution
- » Reduce transportation costs
- » Improve efficiency
- » Provide options for those who cannot afford to buy and maintain a vehicle
- » Offer accessible mobility options for children, the elderly, disabled, and those with limited physical ability

MOBILITY-AS-A-SERVICE (MAAS)





WHAT ARE BIKE & SCOOTER SHARE SYSTEMS

Shared mobility programs are designed to provide cost-effective, environmentally-friendly and convenient travel options for short trips within a city or region. The systems consist of a fleet of user-friendly and durable bicycles, electric power-assisted bicycles or lightweight electric

scooters (e-scooters) intended to be driven while standing. Both bike or scooter share programs are relatively inexpensive and quick to launch—compared to highway and transit projects—and can provide an extension to Portsmouth’s public transportation system.

1. Dock-Based Bike Share

- » Expensive (roughly \$50,000 for a 10-bike, 20-dock station)
- » Docking points use strong magnets to secure the bicycles, powered by a solar panel typically affixed to the transaction kiosk
- » Bicycles within a dock-based system may only be secured properly at the station, so density of stations and high visibility is critical to success

2. Dockless Smart Bike

- » Cheaper than dock-based systems
- » Allows the user to retrieve or park the bicycle anywhere within the designated service area
- » Potential for high rates of vandalism and theft

3. Lock-To Smart Bike

- » Users are typically allowed to retrieve or park the bicycle anywhere within the designated service area but must lock to a fixed object
- » Considered a hybrid of the dock-based and dockless systems in both cost and function

4. Electric-Assist Bike Share

- » Companies that provide dock-based, dockless and lock-to hybrid systems all have e-assist models that can be integrated into a current or future bike share program
- » Top speed for an e-bike share system is typically 15 mph
- » Benefits include increased distance riders are able to cover and an enhanced ability to ride up and over hills

5. Scooter

- » App-based technology allows short-term rentals of electric-powered scooters where users park at their destination within a defined geographic service area
- » Typically picked up every night to be charged, and are deployed again the next day
- » Benefits: broad appeal to a wide user base, first mile/last mile connectivity, and potential to reduce automobile trips
- » Concerns: Use on sidewalks and paths, the sometimes-disorderly ways users park the scooters, and the safety of using such small-wheeled vehicles on busy streets.



POTENTIAL BENEFITS OF SHARED MOBILITY

The people who use and benefit from bike and scooter share systems are constantly changing. Initially, these programs in the U.S. were considered limited to only large cities with a high population and employment density and large mass transit systems. As more success has been realized, larger cities are expanding bike and scooter sharing into lower density and lower income areas, and

mid-size and smaller cities have launched successful bike share and scooter share systems. Bike share and scooter share have been transformative transportation system offerings for many cities in North America. Some of the financial, health, transportation and safety benefits that can result from a successful bike share or scooter share system are discussed below.



Economic

- » Infilling the city's transit system/last mile connectivity
- » Enhancing Portsmouth's image as a city with sustainable transportation options
- » Job creation
- » Businesses can benefit from improved access to their stores
- » Reduced transportation costs for household budgets



Health

- » Because average bike share trips are just over one mile at relatively slow speeds, the typical 20-minute trip can help people get this needed physical activity as part of their daily commute or travel pattern



Transportation/Mobility

- » Reduce reliance on private automobiles
- » Extend the reach of transit
- » Encourages active transportation
- » Reduce barriers to active transportation



Safety

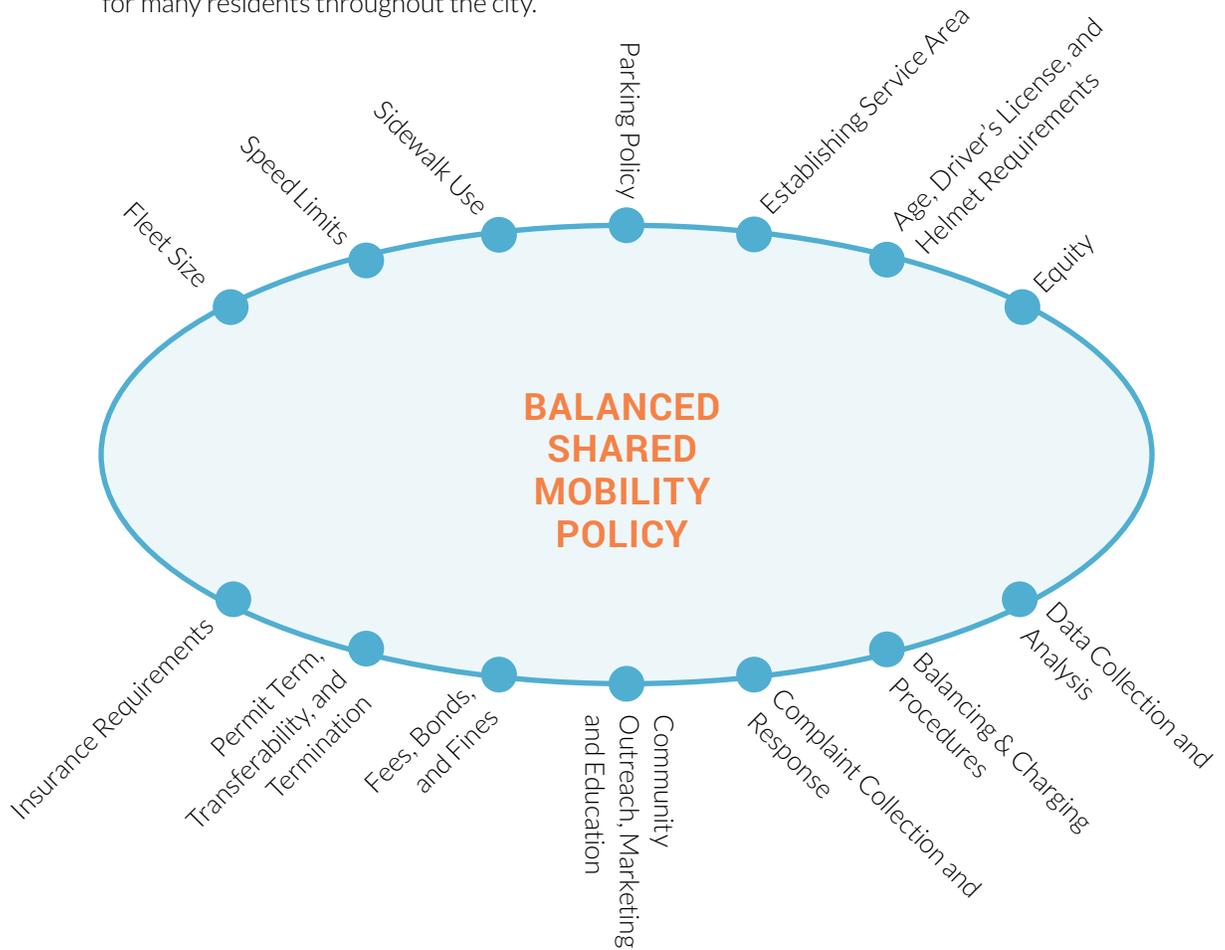
- » Safety in numbers
- » Heavy-duty design results in slower travel speeds
- » Device safety features



POLICY RECOMMENDATIONS

This is an opportune time for consideration of shared mobility in Portsmouth. The Virginia General Assembly has issued legislation that requires local jurisdictions to regulate the operation of motorized skateboards or e-scooters, bicycles, or electric power-assisted bicycles for hire by January 1, 2020. Furthermore, national trends are showing a growing demand for sustainable and efficient means of transportation. A potential bike and/or scooter share program could complement this evolution, and at the same time provide enhanced mobility and public health benefits for many residents throughout the city.

Finding the right balance of the core policy elements below has been a challenge for many communities. There are large variances between shared mobility pilot programs just within the Commonwealth. These pilot program experiences are a good opportunity for sharing insight and lessons learned from fellow Commonwealth communities. Ideally, a positive relationship will form between the Shared Mobility Device (SMD) providers, City staff, and the community so Portsmouth can harness many of the positive benefits that stem from this technology.





POLICY CASE STUDY: SHARED MOBILITY IN VIRGINIA

The City of Portsmouth has conducted a thorough review of other shared mobility systems in Virginia. These case studies were used to develop specific policy language recommendations for Portsmouth’s Shared Mobility Device policy, and incorporated into detailed policy and program recommendations in the Shared

Mobility Assessment memo in Appendix J of this report. The table below highlights findings for Portsmouth’s neighboring cities of Norfolk and Virginia Beach, as well as Charlottesville, which was one of the early adopters of shared mobility devices in Virginia.

	Norfolk, VA	Virginia Beach, VA	Charlottesville, VA	Portsmouth, VA
Pilot Program Shared Mobility Devices	Bicycles, e-scooters	E-scooters	Bicycles, e-bicycles, e-scooters	Bicycles, e-bicycles, scooters, e-scooters
Program Operations Agency	Department of Transit	City Manager	Department of Neighborhood Services	City Manager
Permit Required for Operation	Yes	Yes	Yes	Yes
Application Fee and Operation Cost	\$15,000 + 5 cents per ride	\$5,000 + \$50/scooter/year + 50 cents/day/scooter	\$500 + \$1/day per device	\$5,000 + \$1/device/year
Fleet Size	100-500	1000+	100-200 per company	250 (initial)
Equipment Rebalancing	Required	Required	Not required	Required
Maximum Speed Limit	20 mph	15 mph; 10 mph on shared paths	15 mph	15 mph
Permitted Use Areas	Bike lanes, no sidewalks	Bike lanes, On-street (less than 25 mph), no sidewalks	On-street, bike lanes, no sidewalks	On-street, bike lanes, no sidewalks
Parking Requirements	Dockless and corrals, allowed on sidewalk without impediment	Dockless and corrals, staging allowed on public property	Racks or corrals, allowed on sidewalk or private property	Dockless and corrals in City approved geo-fenced parking areas
Equitable Access	Must have reduced/low-income plan and meet ADA requirements	Must meet ADA requirements	Must provide access to the unbanked, must have reduced/low-income cost plan, must meet ADA requirements	Must have reduced/low-income operations, safety, and outreach plan and meet ADA requirements



SHARED MOBILITY ASSESSMENT

To determine the demand for a potential bike and/or scooter share system in Portsmouth, three important factors have been considered. Together, these factors have been used to identify areas where there is the most potential for a successful shared mobility system, as well as strategies for overcoming barriers and obstacles to implementation.

1. Level of Demand

2. Equity Goals

3. Qualitative Barriers Analysis

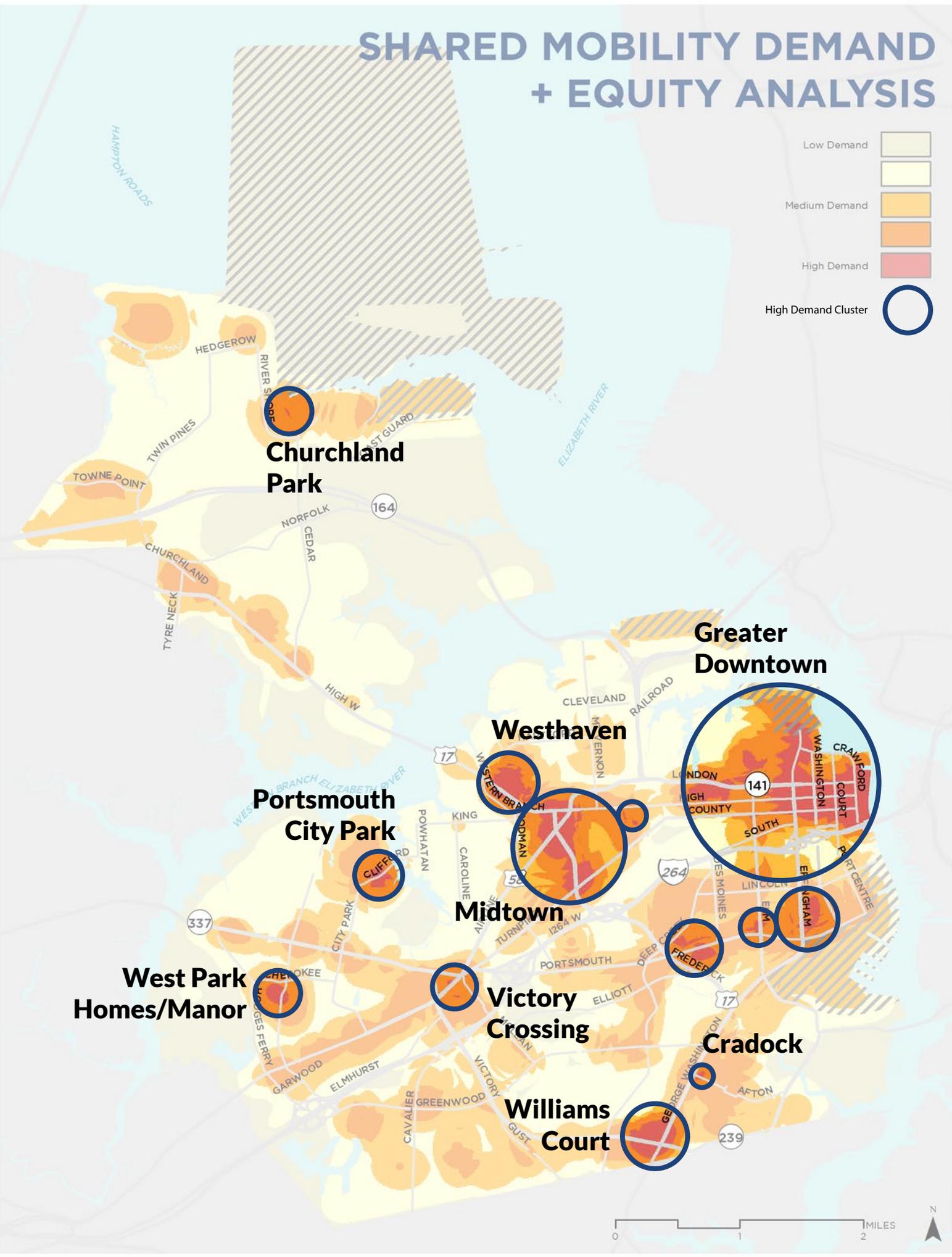
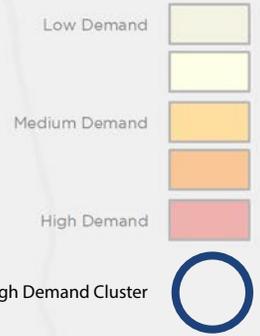
1. LEVEL OF DEMAND

The composite shared mobility demand analysis provides an aggregate look at the relative demand for shared mobility in Portsmouth. These results should act as a launching point where local knowledge and community input would contribute to station placement and distribution.

High Demand Clusters (by Approximate Neighborhood, from north to south)

- » Churchland Park
- » Midtown
- » Westhaven
- » Greater Downtown (includes Downtown, Olde Towne and Port-Centre)
- » Portsmouth City Park
- » West Park Homes/Manor
- » Victory Crossing
- » Cradock
- » Williams Court

SHARED MOBILITY DEMAND + EQUITY ANALYSIS



Churchland Park

Greater Downtown

Westhaven

Portsmouth City Park

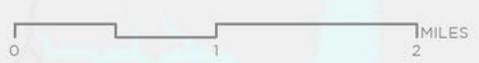
Midtown

West Park Homes/Manor

Victory Crossing

Williams Court

Cradock





2. WORKING TOWARD EQUITY GOALS WITH SHARED MOBILITY

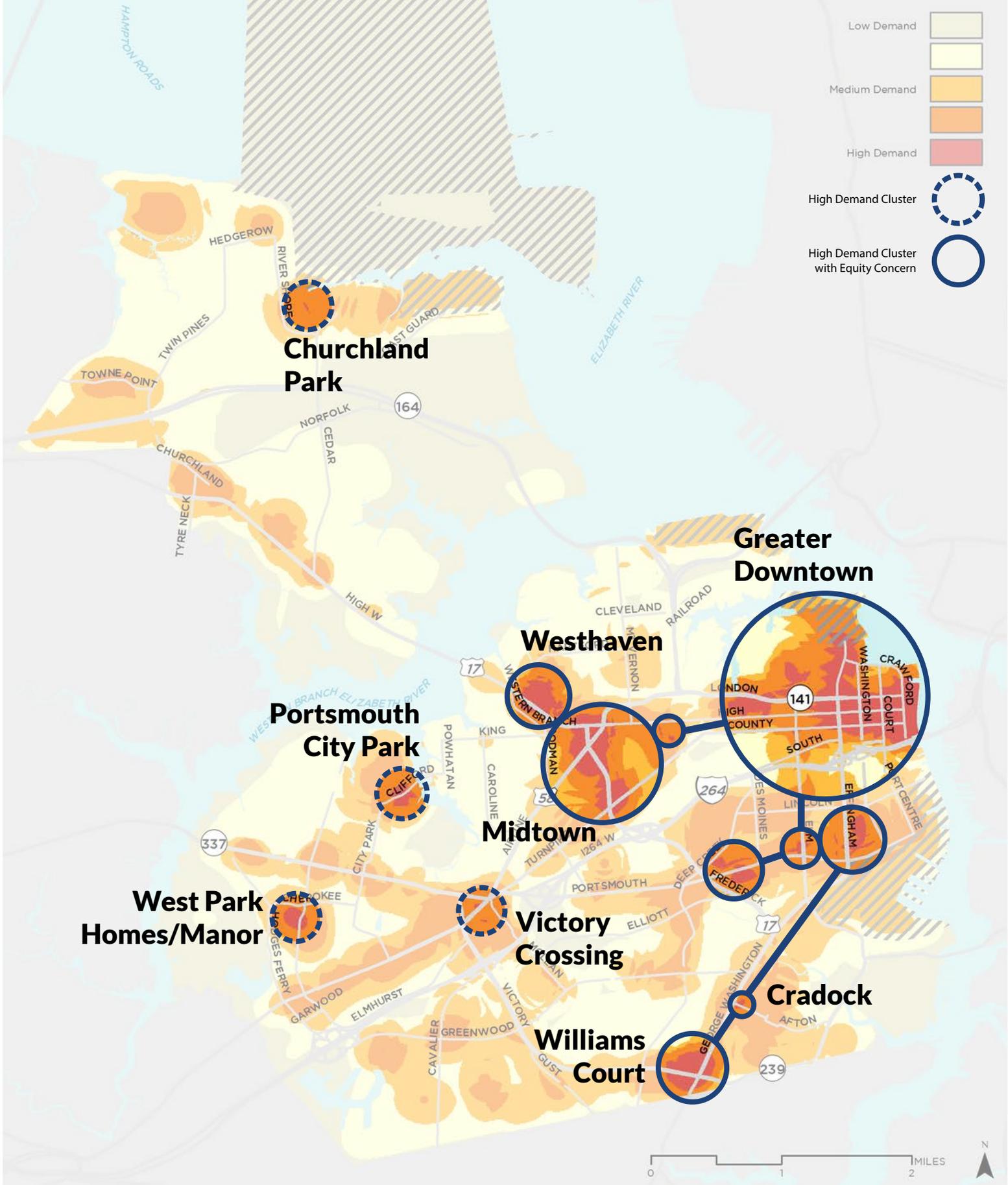
While shared mobility programs typically launch in the highest demand areas (e.g. downtowns or areas near universities), geographic and social equity are also important considerations. After launching bike share service in relatively-confined, high demand areas, cities such as Boston, Minneapolis, and Washington D.C. expanded into underserved communities that typically exhibit lower demand. Other cities such as Detroit and St Louis were keen to include bike share in lower-income and/or minority communities from the initial launch.

Access to transportation can help or hinder a person's ability to get to work, attend school, buy healthy food, or socialize. Traditionally, the people most susceptible to experiencing the negative impacts of limited mobility options have been children, seniors, people of color, and people with limited access to a car, limited formal education, living in a lower-income household, or with limited English-speaking proficiency. Identifying locations that can serve these "communities of concern" can help close the gap in individuals' access to Portsmouth's transportation network and can help foster new opportunities for economic and social inclusion.

The map on the following page highlights the areas of overlap between the shared mobility Demand Analysis results and where communities of concern are present. Locating shared mobility in or near these neighborhoods will provide greater transportation options for the identified communities of concern within Portsmouth. Since one of the goals of a shared mobility system in Portsmouth should be to "improve mobility options for communities of concern", understanding concentrations of the communities will help to inform recommendations related to the shared mobility service area.

The map shows all of the high demand areas with an equity concern being linked via corridors of medium to high demand. Churchland Park, Portsmouth City Park, West Park Homes/Manor, and Victory Crossing have areas of high demand but are largely disconnected from other high demand areas. Placing shared mobility stations in these areas may result in reduced use compared to areas of higher connectivity between high demand areas.

SHARED MOBILITY DEMAND + EQUITY ANALYSIS





Shared Mobility and Covid-19¹

- Shared mobility systems prior to the Coronavirus (Covid-19) pandemic were faced with difficult financial realities. The pandemic exacerbated those challenges with a plummeting user base due to stay at home orders, economic uncertainty, and concerns over sanitation.
- As the once booming, shared mobility sector consolidates and contracts, some cities are considering replacing their strict regulations with subsidization programs in an attempt to save the systems that they believe help fill crucial mobility gaps both before and during the pandemic.
- With the shared mobility pilot program in Portsmouth on hold, it will be important to continue looking to other communities for lessons learned in this unique time.

3. BARRIERS AND OPPORTUNITIES

Within the City of Portsmouth, a number of physical barriers to shared mobility exist today: interstate highways, high-volume arterial roads, bodies of water with long bridges, and wide/busy intersections. These present real and perceived barriers to active transportation, discouraging connectivity not only for current bicyclists, but for potential shared mobility users as well. Because many users are likely to be visitors and/or novices, the visual and spatial barriers between Portsmouth's various districts and destinations could play a role in whether someone decides to participate in a shared mobility system.

The barriers listed below present some of the critical challenges to launching a bike or scooter share program in Portsmouth:

- » I-264
- » MLK Expressway (US-58)
- » High St (US-17)
- » Western Fwy (VA-164)
- » Victory Blvd
- » Portsmouth Blvd
- » Effingham St
- » High Street Bridge (US-17)
- » W Norfolk Bridge (Western Fwy, VA-164)
- » Lack of shared use trails and bicycle network
- » Elizabeth River tributaries

Although nearly all cities with shared mobility programs suffer from some discontinuity due to busy roads and highways, of particular concern in

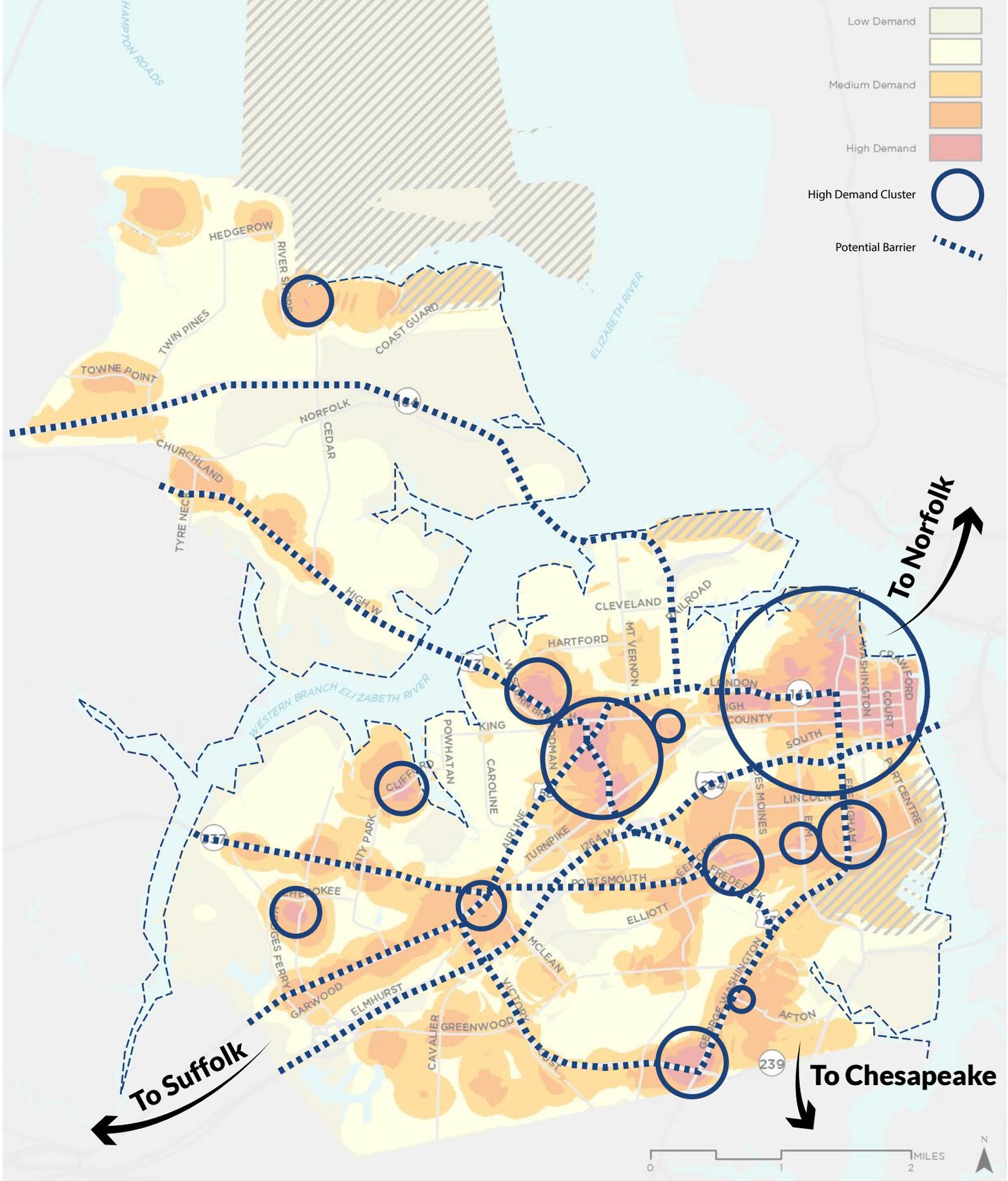
Portsmouth are the water bodies that separate parts of the city and can create a challenging experience for users and system implementation. The map to the right illustrates how many areas of high demand, where people would most likely want to travel to/from/about, often have barriers that impedes comfortable connectivity. This emphasizes the need to try to mitigate these challenges through improved infrastructure facilities that benefit both individual and shared micro-mobility transportation alternatives.

Regional Connectivity

The introduction of a shared mobility system in Portsmouth could increase multimodal opportunities for regional travel to and from neighboring communities, like Norfolk, Suffolk, or Chesapeake. Although geofencing and complicated agreements between vendors and municipalities make an open and unified regional system challenging, it's important to think regionally about shared micro-mobility. Using the same vendor as that of a neighboring community could increase implementation efficiency while taking advantage of brand recognition in the region, local knowledge acquired by the vendor, and user familiarity with the system.

Because there have already been instances of shared mobility devices making their way from Norfolk to Portsmouth via passenger ferry, an emphasis within the vendor's education program should focus on system boundaries and fees.

SHARED MOBILITY DEMAND + EQUITY ANALYSIS



CHAPTER 7: Implementation





INTRODUCTION

The infrastructure, policy, and program recommendations in previous chapters provide strategies for making Portsmouth more bicycle and pedestrian friendly. The purpose of this chapter is to provide guidance and action steps for implementing the recommendations.

Implementing the recommendations within this Plan will require leadership and dedication to bicycle and pedestrian facility development on the part of a variety of groups and agencies. Equally critical, and perhaps more challenging, will be meeting the need for a recurring source of revenue. Even small amounts of local funding could

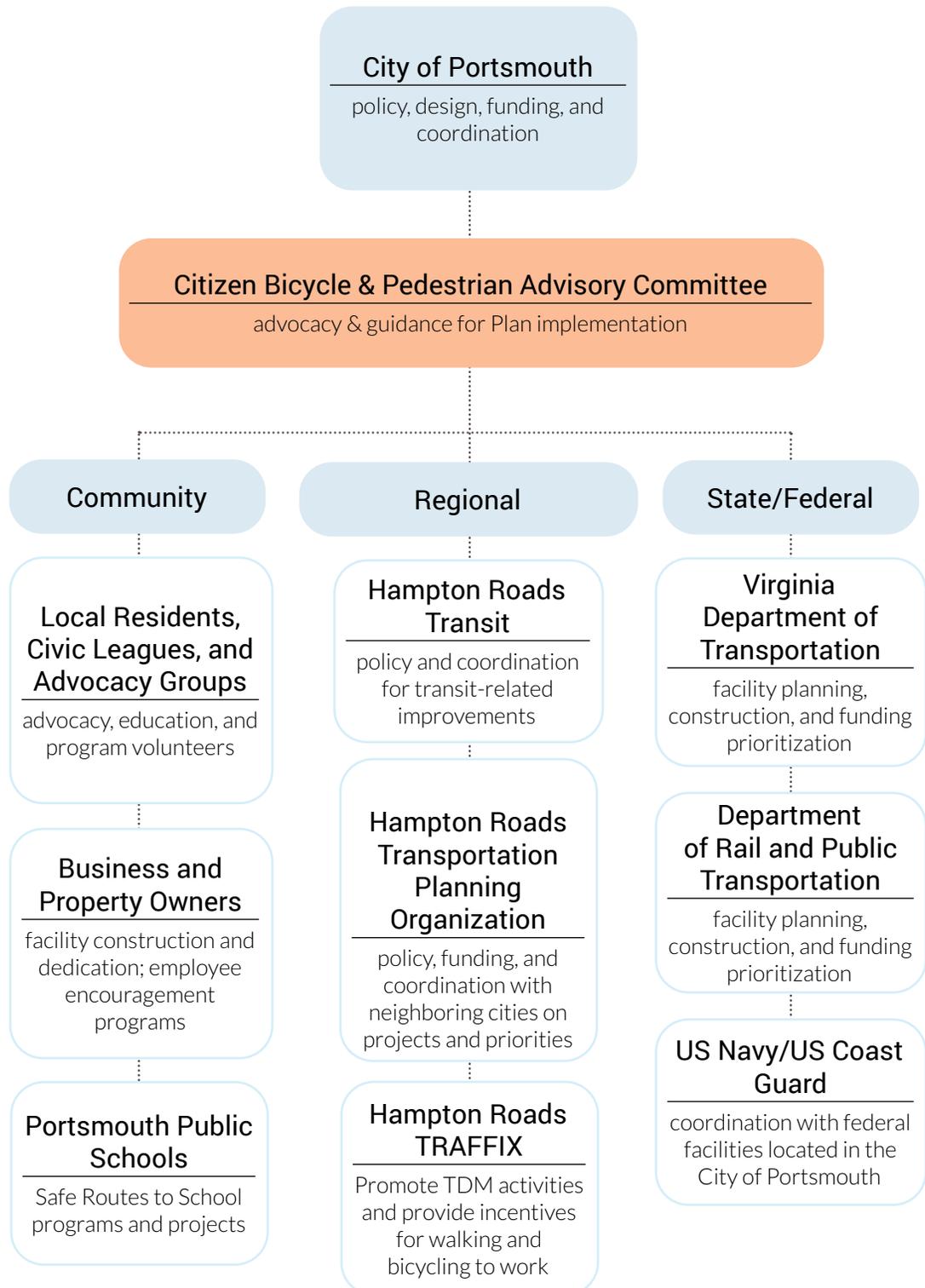
be very useful and beneficial when matched with outside sources.

Most importantly, the City and its local partners need not accomplish the recommendations of this Plan by acting alone; success will be realized through collaboration with regional and state agencies, the private sector, and non-profit organizations. The chart on the following page provides a general description of potential partners and their roles in implementation.





ROLES FOR IMPLEMENTATION





PERFORMANCE MEASURES

Performance measures are critical for assessing and understanding whether the goals of the Plan are being achieved over time. While these measures focus on evaluating progress over the long-term, data should be collected on a regular basis to track interim progress (5 years). Frequent tracking will provide the City of Portsmouth and its partners with feedback on whether policy adjustments are needed to progress beyond the current baseline.

The performance measures outlined below are generally outcome based and focus on achieving policy objectives. The intent of

outcome-based performance measures is to prioritize investments that best progress the safety, connectivity, and mobility goals of this Plan.

The key to meeting these measures will be data collection. Relevant data will need to be collected both now and in the future in order to effectively determine the outcomes of the performance measures.

The Citizen Bicycle and Pedestrian Advisory Committee will be routinely updated on the progress of the performance measures.

TABLE 7.1 PERFORMANCE MEASURES

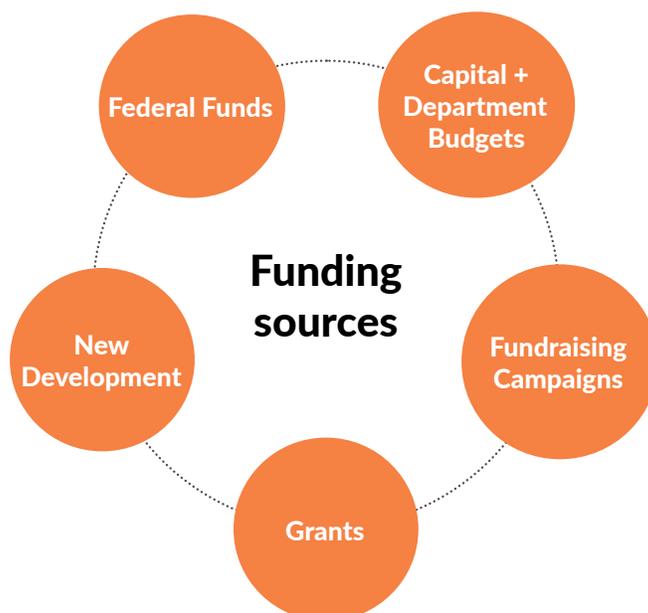
Goal	Performance Measure	Baseline Measurement	Performance Target
Increase Safety	Bicycle and pedestrian crash rates	Average of 2016, 2017, and 2018 rates (average of 38 pedestrian crashes per year; average of 18 bicycle crashes per year)	Reduce bicycle and pedestrian crash rates by half (50%) between 2020 and 2045
Increase Mobility	Percentage of bikeway, trail and pedestrian improvement network completed	Total miles of existing bikeways (18.2 miles) and total miles of existing sidewalk (340 miles)	Priority projects constructed or funded by 2023
Enhance Connectivity	Percentage of intersections that are bicycle-friendly and pedestrian-friendly	2020 percentage (based on crossing inventories of intersections to be conducted along corridors identified in Table 4.2)	15% of intersections improved by 2045



POTENTIAL FUNDING SOURCES

In order to achieve the goals of this Plan, the City of Portsmouth and its local partners will need to fund improvements from a variety of funding sources and partners. Funding sources will need to be opportunistic and consistent in order to implement this Plan. Five primary funding sources make up the core funding strategy for this Plan:

- **Federal Funds.** Federal funding is typically directed through state agencies to local governments either in the form of grants or direct appropriations, independent from state budgets. In Virginia, federal monies are administered through the Virginia Department of Transportation (VDOT) by the Commonwealth Transportation Board (CTB) and metropolitan planning organizations, such as the Hampton Roads TPO (HRTPO). Most, but not all, of these programs are oriented toward transportation, with an emphasis on reducing auto trips and providing intermodal connections.



- **Capital & Department Budgets.**

Portsmouth can use the concepts and policies presented in this Plan to implement it through regularly scheduled capital projects, such as streetscape projects, street resurfacing, or new public or private property construction. Departments like Public Works or Parks and Recreation can use their maintenance resources and staff to support programs and infrastructure maintenance. Bicycle and pedestrian projects should be included in the local Capital Improvement Program (CIP), increasing consistent year-to-year funding levels.

- **Coordination with New Development.**

Fostering partnerships with private developers provides an opportunity to generate revenue to fund infrastructure projects, such as sidewalk and shared use path construction, as well as programs, such as bicycle education classes.

- **Grants.** Competitive grants through public agencies or through private or non-profit foundations can generate additional resources for projects and programs. Grant funding may also be used to acquire right-of-way. To increase readiness for grant funding, preliminary plans (30% construction drawings) can be developed for priority bikeway and pedestrian projects.

- **Fundraising Campaigns.** Fundraising through neighborhood groups, advocacy groups, or even crowd-funding can help generate additional resources for projects and programs.



FUNDING SOURCES BY BUDGET SIZE

Given the constant change in funding availability at local, state, and federal levels, it is difficult to know what financial resources will be available at different time frames during the implementation of this Plan. The following table highlights funding options to consider for projects of various sizes.

TABLE 7.2 FUNDING SOURCES BY PROJECT SIZE

Small Budget	Large Budget
<ul style="list-style-type: none"> • Federal Transportation Funds - The Congestion Mitigation/Air Quality Improvement Program (CMAQ) and Transportation Alternatives Program (TAP) • U.S. Department of Urban Development (HUD) and U.S. Environmental Protection Agency (EPA) funds • Capital Improvement budget funds • Virginia Department of Transportation funds • Community Development Block Grant (CDBG) • Virginia’s Smart Scale • FAST Act: Surface Transportation Block Grant funding for Transportation Alternatives • Safe Routes to School • Made to Move Grant Program • People for Bikes • Virginia Recreational Trails Program • Elizabeth River Project 	<ul style="list-style-type: none"> • Highway Safety Improvement Program (HSIP) • Federal Transportation Funds • Foundation grants • Individual donors • Community Improvement Districts • Public-Private Partnerships • Infrastructure bonds • Dedicated local tax sources • Virginia’s Smart Scale

PROJECT IMPLEMENTATION

An integrated and strategic project delivery process is an important element of public engagement and project evaluation. Consistency is critical to provide the public a general understanding of how a project will

be developed, designed, and implemented. The flow chart below demonstrates a process for project implementation, from project selection through evaluation.





PRIORITY PROJECT CUTSHEETS

The following pages offer detailed information on five priority projects, including individual project maps. These projects were selected based on input from the public, City Staff, the Citizen Advisory Committee, and other stakeholders. The priority project cut sheets were designed based on the types of information required by potential funding partners, and feature the following information:

- **Project length**
- **Facility Types**
- **Jurisdiction**
- **Trip Generators**
- **ROW needs**
- **Traffic Volumes (AADTs)**
- **Projected Future Traffic Volumes**
- **Estimated Construction Costs**
- **Estimated Land Acquisition Costs**
- **Annotated Map of Project Corridor**



PRIORITY PROJECT CUTSHEETS

- High Street
- Paradise Creek Park/Jordan Bridge
- Victory Boulevard
- Portsmouth Boulevard
- Lincoln Street



1 - HIGH STREET

FROM:
Churchland Bridge

TO:
Academy Avenue

LENGTH:
2.24 miles (11,800 LF)

PROJECT DESCRIPTION:

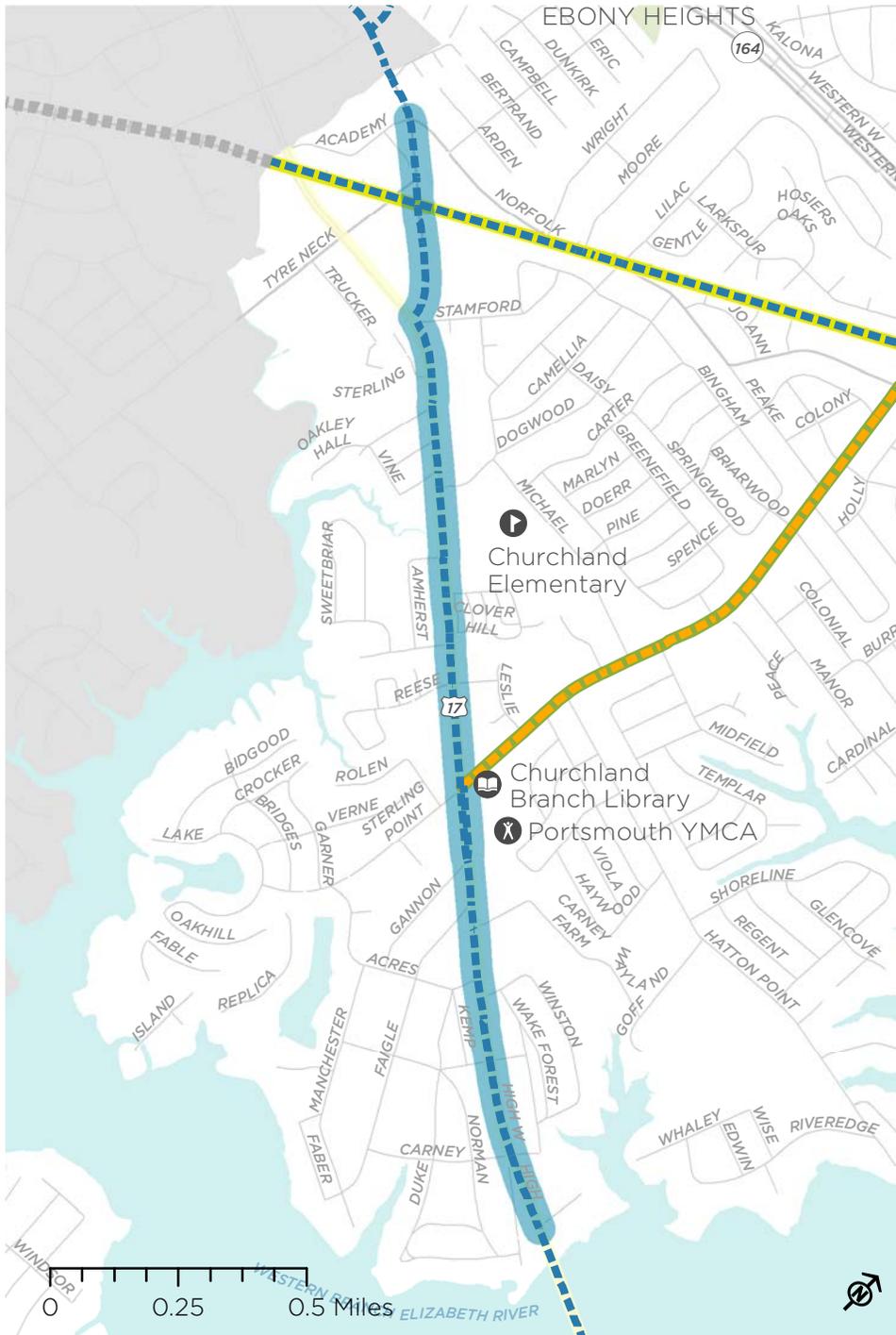
High Street from Churchland Bridge to Churchland Blvd is an Urban Principal Arterial with intermittent curb and gutter and sidewalks along both sides of High Street. Sections of sidewalk and curb are in poor repair and need to be replaced. A 5-foot sidewalk (new and replacement) is recommended on the south side of High Street and a 10-foot Shared Use Path is recommended on the north side of High Street. (Certain segments of High Street near the Churchland Bridge have guardrail adjacent to roadway and construction of any type of pedestrian facility would be costly from a Right-of-Way perspective). Right-of-Way in this segment appears to be limited. Verge area contains mature trees as well as overhead utilities and public utilities where sidewalks currently exist and widening may impact both. Midway between Cedar Lane and Churchland Blvd is a river crossing. High Street would need to be widened with a new separate structure in order to accommodate pedestrian access. Wetlands are a concern in this area. Pavement is not wide enough to include on-street pavement markings.

ADT:

21,000 ADT (2018)

DESIGN CONSIDERATIONS

Biggest concern is condition and location of existing facilities/pavement, as well as RW, Utility, wetland and drainage issues



- Priority Project
- Proposed Shared Use Path (SUP)
- Proposed On-Street Bike Facility
- Existing Shared Roadway (Sharrow)
- South Hampton Roads Trail (SHRT)
- SHRT (Outside Portsmouth Jurisdiction)
- SHRT Alternative Alignment

TRIP GENERATORS:

- » Residential
- » Schools
- » Churches
- » Commercial

POTENTIAL ROW NEEDS:

Major impacts as any widening to existing Sidewalks could impact not only RW, but Private utilities, requiring RW for relocations. *

* Existing RW was not available for this review and is based an engineering judgment.

TABLE 7.3 HIGH STREET RECOMMENDATIONS

Timescale	Notes	Cost	ROW	Design Complexity	Provides Connectivity
Short Range	Perform maintenance on existing sidewalks. Research available City R/W and construct 5' sidewalk, with a buffer strip if possible, in existing R/W for connectivity along corridor, with minimal impacts to mature vegetation and utilities.	●●○○○○	●○○○○○	●○○○○○	●●○○○○
Mid Range	Construct structure to span tributary crossing High Street to allow for completion of connectivity of sidewalk along north side of High Street from Churchland Bridge to Academy Avenue. Develop a plan to engage with stakeholders regarding potential encroachments in the R/W.	●●●○○○	●●○○○○	●●●○○○	●●●○○○
Long Range	Research and purchase necessary R/W, resolve encroachment issues, and relocate utilities as necessary to construct new 10-foot Shared Use Path (SUP), along north side of High Street. Modify signalized intersections to provide accessible pedestrian signals and ADA compliant ramps to facilitate the SUP.	●●●●●●	●●●●○	●●●●●●	●●●●●●

2 - VICTORY BLVD/JORDAN BRIDGE

FROM:
George Washington Highway

TO:
Jordan Bridge

LENGTH:
2 Miles (10,500 LF)

PROJECT DESCRIPTION:

Victory Boulevard is a Minor Arterial with shoulders and sparing and very limited pedestrian access. This project would construct a shared use path (SUP) on the west side of Victory to tie into existing facility along Elm Avenue leading to Jordan Bridge. Victory Boulevard Bridge (midway of the proposed project) cannot be expanded to accommodate a SUP. A separate facility would have to be constructed to accommodate a SUP. Portsmouth has a design and construction project to replace existing bridge over Paradise Creek in their Capital Improvement Program (project is currently under design with a SUP on the west side of the bridge). Construction of a SUP will require drainage improvements along the corridor. Depending on Right-of-Way, utility structures may be avoided, if not, cost of utility relocations will be a major risk to the project. Wetland concerns also exist at bridge crossing. This segment of Victory Boulevard is not wide enough for on-street bike lanes. Interim improvements would include construction of a 5' sidewalk along the west side of Victory Boulevard to provide access to local neighborhoods, as well as Sharrows on Afton Boulevard.

ADT:

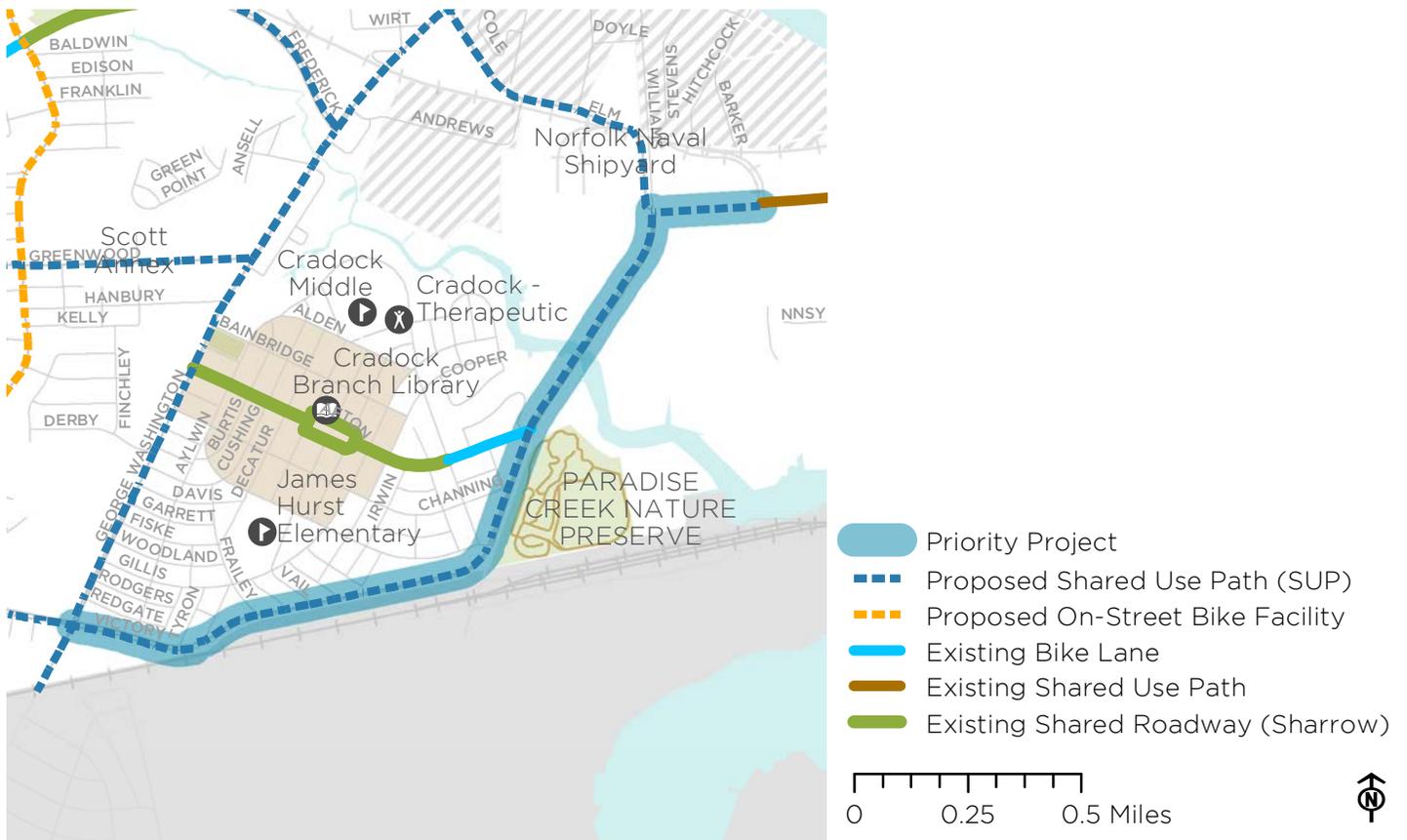
6,700 ADT (2018)

DESIGN CONSIDERATIONS

- » Utility impacts
- » Right-of-Way
- » Drainage

TRIP GENERATORS:

- » Residential
- » Park



POTENTIAL ROW NEEDS:

RW may be required, however predominantly open space acquisition, no private or commercial properties. Utility relocations will be a major concern and avoidance factor. Drainage and wetlands are also major concerns. *

* Existing RW was not available for this review and is based on engineering judgment.

TABLE 7.4 VICTORY BLVD/JORDAN BRIDGE RECOMMENDATIONS

Timescale	Notes	Cost	ROW	Design Complexity	Provides Connectivity
Short Range	Perform maintenance on existing sidewalks. Research available City R/W and construct 5' sidewalk, with a buffer strip if possible, in existing R/W for connectivity along corridor, with minimal impacts to mature vegetation and utilities. Provide Sharrows on Afton Boulevard	●●○○○○	●○○○○○	●○○○○○	●●●○○○
Long Range	Research and purchase necessary R/W, update drainage, and relocate utilities as necessary to construct new 10-foot Shared Use Path, along west side of Victory Boulevard.	●●●○○○	●●●○○○	●●●○○○	●●●●●●

3 - VICTORY BOULEVARD

FROM:
Greenwood Drive

TO:
George Washington Highway

LENGTH:
1.52 miles (8,000 LF)

PROJECT DESCRIPTION:

Victory Boulevard from Greenwood Drive to George Washington Highway is classified as a Minor Arterial. From Greenwood Drive to Deep Creek Boulevard, a new sidewalk or Shared Use Path (SUP) may be feasible along the south side of Victory Boulevard, however, Right-of-Way and utilities are a concern, with R/W being primarily commercial properties. There is an existing shoulder that can be utilized and repurposed as bike lanes for the majority of this segment (both directions).

From Deep Creek Boulevard to George Washington Highway, the south side of Victory Boulevard offers apparent Right-of-Way for a SUP while minimizing impacts to utilities. However, drainage will be impacted as the new alignment would likely traverse along existing drainage facilities. Again, there are shoulders that can be reutilized and marked for on-street bike lanes.

ADT:

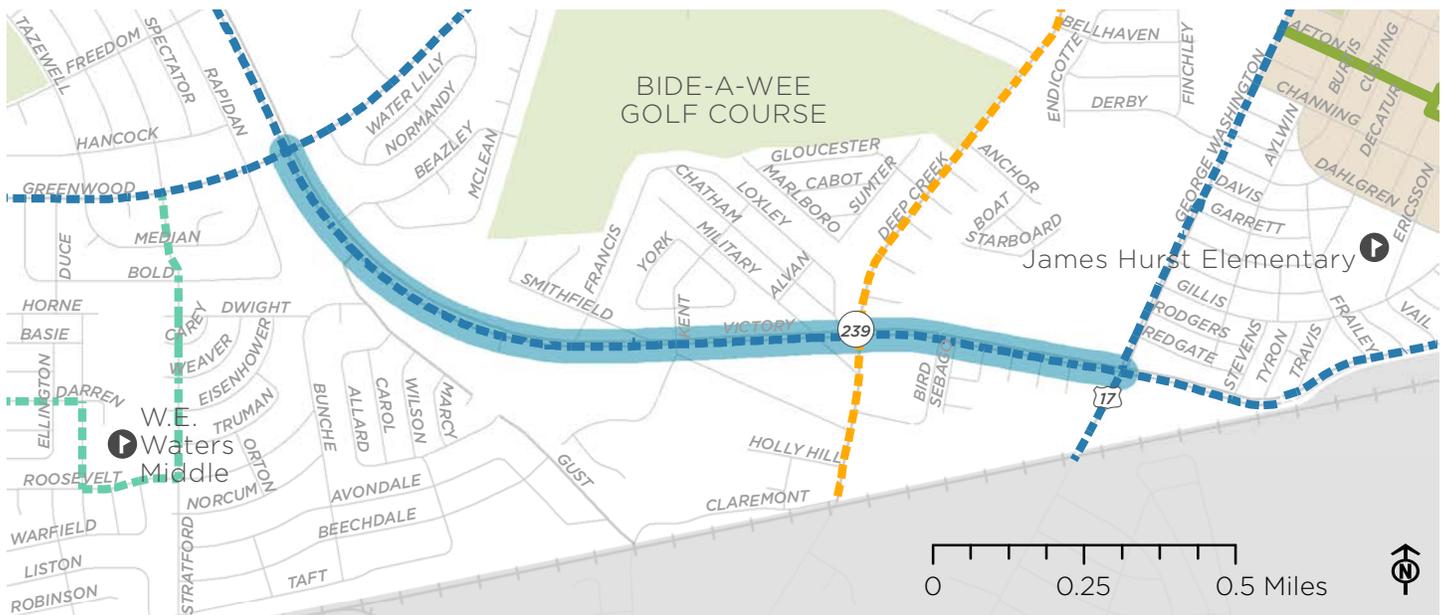
18,000 ADT (2018)

DESIGN CONSIDERATIONS

Biggest concern is condition and location of existing facilities, as well as Right-of-Way, Utility, and Drainage concerns.

TRIP GENERATORS:

- » Residential
- » Commercial



- Priority Project
- Proposed Shared Use Path (SUP)
- Proposed On-Street Bike Facility
- Proposed Neighborhood Greenway
- Existing Shared Roadway (Sharrow)

POTENTIAL ROW NEEDS:

Impacts to potential RW from commercial properties; Private utilities, requiring RW for relocations; drainage relocations and enhancements*

* Existing RW was not available for this review and is based on engineering judgment.

TABLE 7.5 VICTORY BOULEVARD RECOMMENDATIONS

Timescale	Notes	Cost	ROW	Design Complexity	Provides Connectivity
Short Range	Perform maintenance on shoulders sufficient to provide on-street bike lane markings. Install all signage as required by MUTCD to adequately and safely mark the bike lanes.	● ○ ○ ○ ○ ○	● ○ ○ ○ ○ ○	● ○ ○ ○ ○ ○	● ● ○ ○ ○ ○
Mid Range	Design and construct 10-foot SUP from Deep Creek Boulevard to George Washington Highway. This would provide a connection to previous Victory Boulevard project.	● ● ● ○ ○ ○	● ● ○ ○ ○ ○	● ○ ○ ○ ○ ○	● ● ● ○ ○ ○
Long Range	Design and construct 10-foot Shared Use Path from Greenwood Drive to Deep Creek Boulevard. This would provide a continuous SUP along Victory Boulevard from Greenwood Street to Jordan Bridge.* Modify signalized intersection to provide accessible pedestrian signals and ADA compliant ramps to facilitate the SUP. * Continuous SUP along Victory depends on funding and priority of construction projects among the Victory Boulevard projects.	● ● ● ○ ○ ○	● ● ○ ○ ○ ○	● ● ● ○ ○ ○	● ● ● ● ○ ○

4 - PORTSMOUTH BOULEVARD

FROM:
Alexander's Corner

TO:
Portsmouth Sportsplex

LENGTH:
1.95 miles (10,300 LF)

POTENTIAL ROW NEEDS:

Major impacts as any widening to existing Sidewalks could impact not only RW, but Private utilities, requiring Right-of-Way for relocations. *

* Existing Right-of-Way was not available for this review and is based an engineering judgment.

ADT:

7,500 ADT (2018)

DESIGN CONSIDERATIONS

Biggest concern is condition and location of existing pedestrian facilities, as well as Right-of-Way, Utility, and Drainage issues.

TRIP GENERATORS:

- » Residential
- » Commercial
- » Portsmouth Sportsplex



PROJECT DESCRIPTION:

Portsmouth Boulevard is classified as a Minor Arterial. Overall Project is to add 10' Shared Use Path (SUP) from Sportsplex to Airline Boulevard (along north side of Portsmouth Boulevard). Existing roadway does not have sufficient width for on-street bike lane markings. Recommend dividing into segments.

Segment 1 from Sportsplex to Rodman Avenue. Major concerns with potential Right-of-Way impacts, as well as utility relocations. Design standards require 8' from curb and gutter to SUP. Any widening of existing sidewalk may impact Right-of-Way. Widening existing facility toward the street would have major impacts to utilities and would not meet design standards. Do not recommend installation of on-street markings as existing pavement width does not accommodate on-street facilities. This segment has potential for road diet to accommodate facilities and providing safe access to Sportsplex considering low ADT on a 4-lane roadway.

Segment 2 from Rodman to Railroad tracks. Currently, there is no pedestrian facility in this segment. A majority of the existing Right-of-Way is currently owned by VDOT. Heavy vegetation in this area would require clearing, as well as utility concerns. There are 2 overpasses in this segment, but based on a cursory review, it appears there is room for a new facility, with design exceptions being acquired from the state.

Segment 3 from the railroad tracks to existing sidewalk on Turnpike Road. Although a short segment, potential impacts to parking for local businesses are likely as result of constructing a new facility.

TABLE 7.6 PORTSMOUTH BOULEVARD RECOMMENDATIONS

Timescale	Notes	Cost	ROW	Design Complexity	Provides Connectivity
Short Range	Perform maintenance on existing sidewalks. Research available City R/W and construct 5' sidewalk in existing R/W for connectivity along corridor, with minimal impacts to mature vegetation and utilities. Perform Traffic Analysis to evaluate feasibility of Road Diet along Portsmouth Boulevard from Sportsplex to Rodman Avenue.	●●○○○○	●○○○○○	●●○○○○	●●○○○○
Mid Range	Research and purchase necessary Right-of-Way, update drainage, and relocate utilities as necessary to construct new 5-foot Sidewalk, along north side of Portsmouth Boulevard.	●●●○○○	●●●○○○	●○○○○○	●●●●○○
Long Range	Research and purchase necessary Right-of-Way, update drainage, and relocate utilities as necessary to construct new 10-foot Shared Use Path, along north side of Portsmouth Boulevard.	●●●○○○	●●●○○○	●●●●○○	●●●●●●

5 - LINCOLN STREET

FROM:
Port Centre Parkway

TO:
Des Moines

LENGTH:
1.35 miles (7,100 LF)

PROJECT DESCRIPTION:

Lincoln Street from Des Moines Avenue to Effingham Street is primarily a Major Collector with curb and gutter and sidewalks along majority of both sides of Lincoln Street. Sidewalks and Curb are in poor repair and need to be replaced. A 5-foot sidewalk (new and replacement) on both sides of Lincoln Street is recommended, although it may not be feasible in some sections with structures and/or utilities within approximately 5-10 feet of roadway. Right-of-Way in this segment appears to be limited. Verge area contains mature trees as well as overhead utilities and public utilities and widening may not be an option. This segment of Lincoln is a candidate for traffic calming measures such as Median Islands. Pavement appears wide enough to include "Sharrows" road marking (although it is recommended that the pavement be milled and overlaid at a minimum due to existing conditions). Lincoln Street from Effingham Street to Norfolk Naval Shipyard is primarily a commercial area. Sidewalks are constructed on both sides of Lincoln Street within this segment with the exception of one block. Pavement is wide enough to include "Sharrows" pavement markings.

ADT:

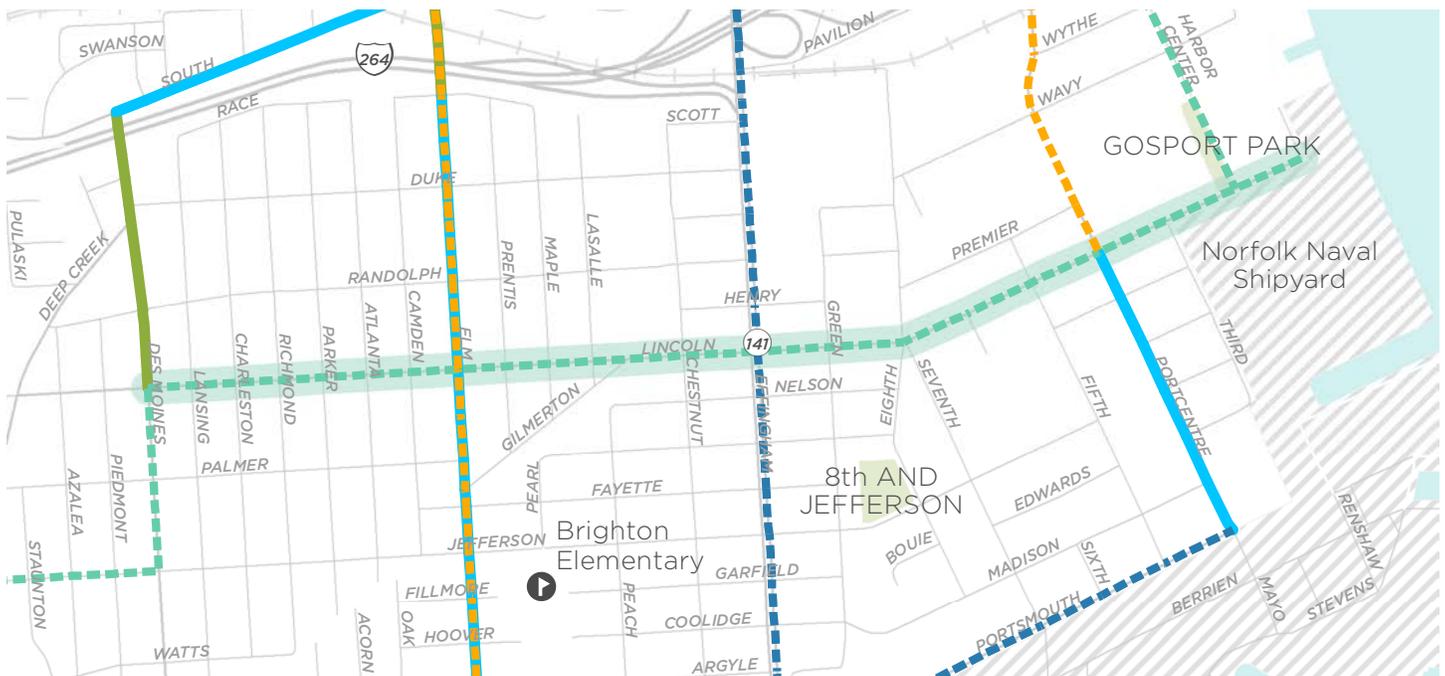
3,800 ADT (2018)

DESIGN CONSIDERATIONS

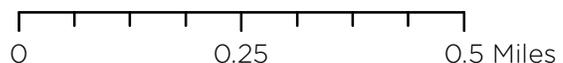
Biggest concern is condition and location of existing facilities/pavement from Des Moines to Effingham, as well as RW and Utility issues. Appears that any improvements in this segment would require complete reconstruction of Lincoln Street with all the issues/concerns related to reconstruction projects. Drainage improvements are also a consideration.

TRIP GENERATORS:

- » Residential
- » Commercial near Effingham (7-Eleven, Dollar General)



- Priority Project
- Existing Bike Lane
- Proposed Shared Use Path (SUP)
- Proposed On-Street Bike Facility
- Proposed Neighborhood Greenway
- Existing Shared Roadway (Sharrow)



POTENTIAL ROW NEEDS:

Des Moines to Effingham - Major impacts as any widening to existing Sidewalks could impact not only RW, but Private utilities, requiring RW for relocations.
 Effingham to Shipyard - Minor impacts as missing segment is on vacant block and RW impacts may be minimal.*

* Existing RW was not available for this review and is based an engineering judgment.

TABLE 7.7 LINCOLN STREET RECOMMENDATIONS

Timescale	Notes	Cost	ROW	Design Complexity	Provides Connectivity
Short Range	Perform maintenance on existing sidewalks. Research available City R/W and construct 5' sidewalk in existing right-of way for connectivity along corridor, with minimal impacts to mature vegetation and utilities.				
	Construct sidewalk on property located on the south side of Lincoln Street between 5th Street and 6th Street. This will provide continuous pedestrian access from Effingham Street to Port Centre Parkway. Also, provide "Sharrows" on the segment of Lincoln Street between Effingham Street and Port Centre Parkway.	●●○○○○	●○○○○○	●●●○○○	●●○○○○
	Additionally, study the Lincoln Street Corridor, as well as neighboring streets within the neighborhood, to create a complete pedestrian access system, to include upgraded sidewalks and Neighborhood Greenway alternatives.				
Mid Range	Perform pavement milling and overlay on Lincoln Street and install Sharrows. Pavement maintenance should be considered after maintenance to existing Curb and Gutter.	●●○○○○	●○○○○○	●○○○○○	●●●○○○
Long Range	Based on the analysis from the above recommended study, implement Neighborhood Greenway alternatives, such as median islands, 2-way chokers, improved pedestrian access with continuous sidewalk systems, etc.	●●●○○○	●●●○○○	●●●●○○	●●●●○○

