JUNE 2024

City of Norfolk
Comprehensive Plan Update

Existing Conditions Assessment

Norfolk Today

Norfolk is a world-class maritime city with approximately 235,000 residents. As the urban heart of Virginia's historic Hampton Roads, the city is a cultural and economic hub for the entire region. More than that, though, it is home: a place of pride and high quality of life, full of varied neighborhoods with excellent access to nature, jobs, and history.

Even with these strong foundations, Norfolk faces challenges. The city's population has been stable for some time, but in the last 10 years has dipped by over 2%. The city's tight-knit neighborhoods are often disconnected from each other and from the region due to infrastructure and water barriers. And the threat of sea level rise is compounded by increasing storm events, creating challenges for the many communities and businesses located near the city's beautiful waterfronts.

This report outlines some of the major findings from a citywide existing conditions assessment conducted in Winter 2024 as part of the **NFK2050** Comprehensive Plan update. This assessment will set the stage for the visioning phase of work on NFK2050. Using this document as our foundation, the city and its residents will chart our collective course for the future. From there, we will draft detailed and implementable actions, tied to specific timeframes and partners, in order to build a framework for Norfolk to achieve even greater heights by 2050.

Prepared June 2024 for the City of Norfolk Department of City Planning

Prepared by the NFK2050 Consultant Team, including:

- WRT (Planning, Design, Housing, Engagement)
- WPA (Urban Design, History and Culture, Engagement)
- Arup (Transportation, Infrastructure Planning)
- ONE Architecture & Urbanism (Resilience)
- Urban3 (Geoaccounting)
- HR&A (Housing, Economics)

For more information on the NFK2050 Comprehensive Planning process, project timeline, community engagement and outreach to date, and other information, please visit the project website:

http://www.nfk2050.com/

THE CITY OF NORFOLK

NFK 2050

Contents

Introduction

(City of Norfolk)

WHAT IS NFK2050?

NFK2050 is the process to create a new Comprehensive Plan for Norfolk, establishing a framework for the city's growth and evolution over the next 25 years. Working towards an adoption timeframe of Summer 2025, NFK2050 has a planning horizon that will stretch through the year 2050.

Project Summary | Plan Framework | Past Planning Efforts
Norfolk History | Land Use & Zoning | Land Value

Project Summary

What is a Comprehensive Plan?

A Comprehensive Plan guides the vision of what a community wants to become in the future.

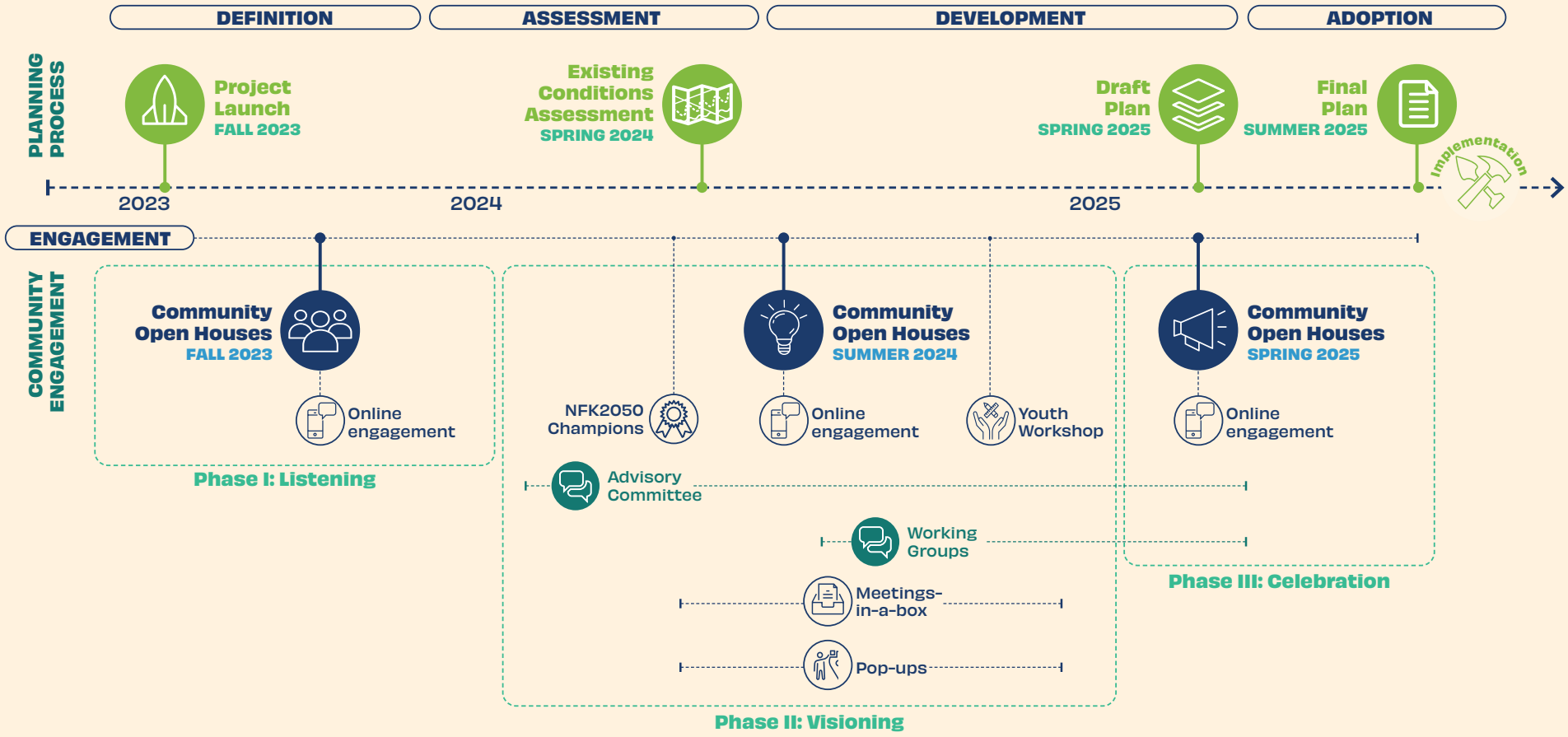
Sometimes also referred to as a master plan or a general plan, it is the foundational document of long-term planning, land use planning, zoning, and growth management in the United States and enables local government officials and citizens to anticipate and deal constructively with changes occurring within the community. It is a broad effort to address a wide range of community issues and concerns, and to understand the important relationships between each part of a community.

Plan Topics:

NFK2050 will examine the full range of topics related to land use, development, and policy.

These topics will generally align with the departments at the City of Norfolk and its partners who will be most responsible for implementing the recommendations that emerge from the Planning process. Actions that might emerge include recommendations around the City's policies and land use for Housing, Economic Development, Resilience, Sustainability, Transportation, and Zoning.

Project Timeline



Plan Framework

NFK2050's assessment and actions are organized under four primary pillars. These plan pillars are aspirational, and outline the heart of the collective vision for Norfolk's future development:

CELEBRATING OUR COMMUNITY:

Norfolk is blessed with many distinct and proud neighborhoods. Long-time residents and newcomers alike embrace the quality of life that comes with waterfront access, investment in the arts, and diverse walkable neighborhoods. How can we expand what's already great about our city for all residents and stakeholders?

GROWING EQUITABLY:

Norfolk has diverse housing types and jobs in many strong industries. Historically, though, the growth and prosperity of Norfolk hasn't benefitted every community equally. As we grow into 2050 and beyond, how can we make sure all our neighbors are lifted up into a brighter future?

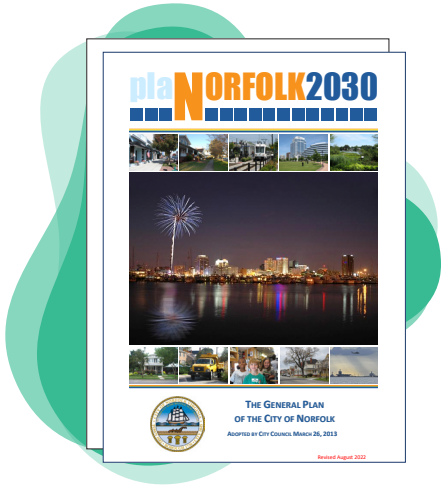
EMBRACING NATURE:

Nature is all around us – even in an urban environment! Norfolk is full of amazing parks, waterfronts, and even habitats for wildlife. The city's increasing flood events and sea level rise may challenge this balance, though. How can we embrace nature while developing our urban places and reducing the threat of future flooding?

CONNECTING THE CITY:

New assets developed in the city only truly benefit everyone if they are freely accessible and well-connected. Despite increasing transit and bike options, Norfolk residents tend to still rely on cars, furthering congestion. How can we better connect our strong neighborhoods to each other and to the entire Hampton Roads region?

Past Planning Efforts



NFK2050 is not starting from scratch; many recent planning efforts guide the city's current land use and development landscape. NFK2050 will build on all relevant recommendations.

PlaNorfolk2030 (2013)

Adopted in 2013, Norfolk's most recent comprehensive plan, PlaNorfolk2030, is designed to be adaptable to shifts in development patterns. It includes recommendations and policies that the city's diverse neighborhoods are utilizing to chart their future course.

The comprehensive plan develops a framework that centers on (1) strong and safe neighborhoods; (2) a comprehensive transportation system; (3) a healthy economy; (4) a sustainable environment; (5) a variety of well-maintained housing options; (6) opportunities for learning; (7) a well-managed government that provides public services to citizens; (8) a variety of cultural and recreational opportunities; (9) a rich history that is reflected in its architecture and cultural resources; and (10) a commitment to regional cooperation.

The Plan is organized into chapters, each addressing a specific topic area; the Land Use Strategies chapter lays out the ground for the Plan to fulfill its vision statement: "a real city that is a great place to live, work, and play."

> **"Creating and Maintaining Healthy and Vibrant Neighborhoods"** emphasizes the significant role that neighborhoods and their unique characteristics play in the lives of Norfolk residents. It highlights the importance of neighborhood pride and its residents, advocates for preserving the distinct character of these areas, supports the introduction of new and affordable housing options, and encourages the ongoing implementation of area-specific plans.

> **"Providing Transportation Options"** centers safe and efficient mobility and increased investment in transportation choices. It ensures efficient connections to business, shopping and employment centers through easy, sustainable multi-modal transportation systems, as well as expanded connections to the region.

> "**Enhancing Economic Vitality"** seeks investment opportunities for Norfolk to continue being a center for cultural, business, and educational resources of the region. It increases resources for business expansion and retention along Norfolk's commercial and employment corridors, continues to evaluate economic opportunities as the city evolves, capitalizes in existing cultural, art, and green assets, and provides support for increased learning opportunities.

> "Promoting Environmental Sustainability" leverages the environmental resources of the city to connect residents with nature while promoting resiliency strategies. It strives to protect and enhance existing natural resources as well as the ecosystem within them; increase natural areas and resiliency projects; set a baseline for clean, healthy air; and promote the application of energy-efficient designs.

> "**Ensuring Housing Choices For All"** promotes high quality, affordable housing through existing and new incentives and code enforcement strategies, protection from flooding, and alignment with the needs of the community.

> "Supporting Lifelong Learning" seeks opportunities for all Norfolk residents to develop their skills and interests through diverse learning opportunities: school preparedness, workforce training, and partnerships to provide continuing education for all ages.

> "Delivering Quality Community Services" advocates for effective services to Norfolk residents. It focuses on ensuring that City services meet the needs of residents and businesses.

> "Enjoying Daily Life" outlines a vibrant city where opportunities for recreation and leisure are accessible to all Norfolk residents. It highlights enhanced public parks and recreation areas, a wide range of cultural and entertainment programs, and the enhancement of the built environment through arts and culture.

> "**Preserving Our Heritage"** embraces and protects all the cultural, historic, and architectural resources that Norfolk has and promotes new and existing historic landmarks and districts through different actions and policies.

> "Fostering Responsible Regional Cooperation" calls for a collective effort to seek improvements and solutions to regional issues. It focuses on economic development, transportation, major regional assets, sea level rise, and regional services.

Within the **691 actions** identified in PlaNorfolk2030 to set a path forward for Norfolk and its residents, **56.8% are ongoing, 20.2% are underway, and 9% are completed.** Of the 12 chapters that represent a specific topic, all of them have seen progress in the implementation of their actions, with most of them being "ongoing" or "underway." Just 12.6% of all the actions in the Plan have not yet been started.

56%

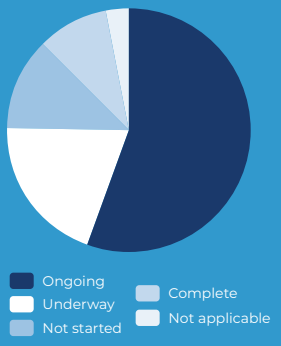
of PlaNorfolk2030 actions are categorized as ongoing efforts!

20%

of PlaNorfolk2030 actions are underway!

Neighborhoods

Creating and Maintaining Healthy and Vibrant Neighborhoods has 292 specific actions, of which **62% are ongoing or underway, and 34 are already completed!**



Of all 691 PlaNorfolk2030 actions, 76% are ongoing or underway and 9% have been completed!

Vision 2100 (2016)

ALIGNMENT WITH NFK2050: GROWING EQUITABLY, CONNECTING THE CITY, EMBRACING NATURE

Focused on filling in the gaps of plaNorfolk2030, Vision 2100 is a long-term citywide vision developed by an interagency team including Departments of City Planning, Communications and Marketing, and Neighborhood Services with the Office of Resilience and the City Manager's Office. It is organized around four key themes: Designing New Urban Centers, Enhancing Economic Engines, Adapting to Rising Waters, and Establishing Neighborhoods of the Future.

The Plan's primary objective is to develop Norfolk as a dynamic, water-based community protected from sea level rise and flooding through the end of the century. The Plan focuses investments in the most resilient areas and improves transportation connections, expands flood protection, supports walkability, promotes mixed-use development, housing affordability, and cultural development. Plan recommendations are intended to be folded into plaNorfolk2030 implementation.

NOTE: Not all plans listed on p.14-17 reflect official City of Norfolk policy, as not all of them have as of yet been adopted by City Council.

Multimodal Transportation Master Plan (DRAFT - 2022)

ALIGNMENT WITH WITH NFK2050: CONNECTING THE CITY

Norfolk's Multimodal Transportation Master Plan, though not yet officially adopted, provides a comprehensive foundation upon which to develop transportation strategies for NFK2050. Based on the values of safety, freedom, and equitable prosperity, the Plan was developed through robust stakeholder engagement. The following reoccuring themes come up throughout the engagement process and will be considered in NFK2050: Safer connections for bicyclists; transit connections to major destinations; prioritizing vulnerable street users; shorter waits for bus service, even if it meant a longer walk; reducing speed; and improving safety for people who walk, bike, or use a wheelchair.

Also contained within the Multimodal Transportation Master Plan are a series of policy recommendations, proposed maps for future connected multimodal networks, land use recommendations, a redesign of the Hampton Roads Transit bus network, and design strategies to help realize the City's Vision Zero commitments. Short, medium, and long-term improvements were developed to help realize the vision of the Master Plan within available resources.

Bicycle and Pedestrian Strategic Plan (2015)

ALIGNMENT WITH WITH NFK2050: CONNECTING THE CITY

This Plan, developed in 2015, recommends specific bicycle and pedestrian facilities on 12 key corridors, and provides a strong and detailed mobility foundation for the 2022 Multimodal Transportation Master Plan (page 14). The Bicycle and Pedestrian plan developed further in the 2022 Multimodal Master Plan builds on these 12 corridors by showing connections with multimodal centers to fill in a finer-grained network across the entire City.

The 2015 Bicycle and Pedestrian Strategic Plan remains an active and relevant plan due to the finer level of detail developed for the 12 corridors as appropriate to its strategic function. The 2015 Strategic Plan will be referenced in relation to the 2022 Multimodal Transportation Master Plan when developing recommendations for NFK2050.

Green Infrastructure Plan (2018)

ALIGNMENT WITH WITH NFK2050: CONNECTING THE CITY, EMBRACING NATURE

The 2018 Green Infrastructure Plan focuses on re-greening the city landscape, improving stormwater treatment, restoring shoreline habitats, and fostering recreation. The Plan is structured around four major strategies that link to specific actions. Natural and Constructed Green Infrastructure actions set goals for canopy coverage, tree planting incentives, connecting habitat patches with pathways, native plantings, tree-related data management, urban food production, permeable landscapes, and creek daylighting. The Plan identifies levels of imperviousness and stormwater pipe deficiency to inform where constructed or natural green infrastructure practices are suitable. Open Space Access actions include low-impact development, green infrastructure strategies, and education on stormwater retention and soil infiltration capacity. Shoreline Protection and Restoration actions include wetland restoration, vegetated buffers, property owner engagement, and invasive species management. Finally, Water Accessibility incorporates new boat ramps, pocket parks with water views, and inclusive fishing access.

Norfolk Comprehensive Housing Study and Strategic Plan (2023)

ALIGNMENT WITH NFK2050: GROWING EQUITABLY

Commissioned by the City's new Department of Housing and Community Development, the 2023 Housing Study was charged with identifying current market trends and housing needs in Norfolk, including:

- Norfolk is confronting stagnant population growth, increased climate and flooding risk, and ongoing disinvestment in a number of neighborhoods, which all contribute to relatively weak housing market conditions in most neighborhoods.
- Norfolk's housing stock is fairly diverse with naturally-occurring affordable housing (NOAH) being comprised of low- to moderate-density housing types that have the potential to support long-term housing affordability with preservation efforts.
- Norfolk has been home to concentrated poverty and racial segregation throughout its history, and has both a higher level of poverty compared to its regional peers and a disproportionate share of the region's subsidized affordable housing.
- Norfolk and the Hampton Roads Region at large face limited and fractured capacity across the housing ecosystem.

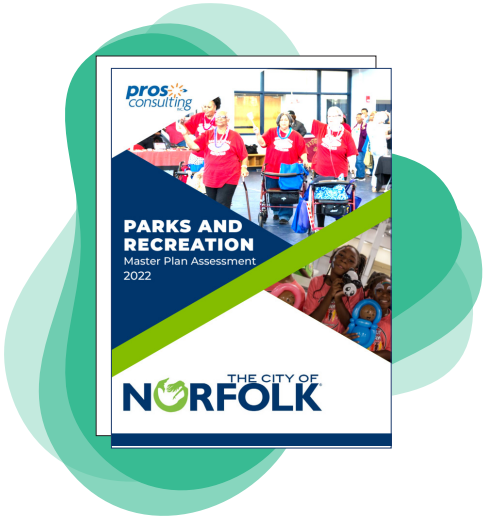
Norfolk Inclusive Economic Development Strategy (2018)

ALIGNMENT WITH NFK2050: GROWING EQUITABLY

The city's Department of Economic Development created an inclusive economic development strategy centered on facilitating economic mobility for all members of the Norfolk community. It aims to address slow job growth, stagnant incomes, rising inequality, family poverty, low educational attainment, and cross-cutting racial disparities.

The Plan advises that the City should consistently assess its programs, policies, and services. To facilitate this, it sets forth four objectives: developing a guide for conducting business in Norfolk, utilizing economic development incentives to promote inclusive growth, focusing workforce development and job creation on specific geographic areas, and tracking progress through quantifiable goals.

Furthermore, the Plan identifies five key areas for inclusive economic development: developing human capital, bolstering the local entrepreneurship ecosystem, retaining and expanding businesses, attracting businesses strategically, and integrating inclusivity and equity throughout all City operations.



Parks and Recreation Master Plan Assessment (2022)

ALIGNMENT WITH NFK2050: EMBRACING NATURE

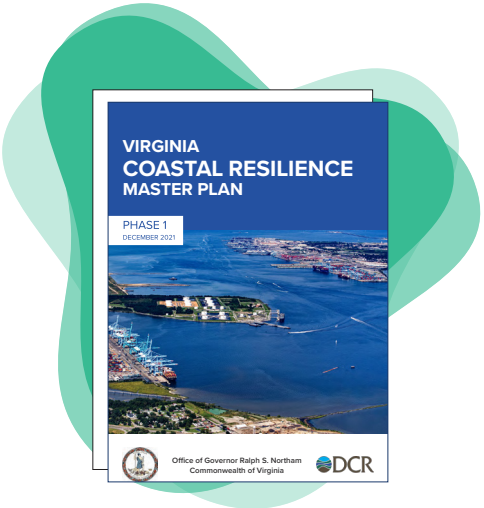
Led by the City of Norfolk Parks and Recreation Department, the 2022 Assessment is intended to strengthen existing programs, facilities, and amenities. The Plan identifies five “big moves”: build regional recreation centers for intergenerational and multipurpose use; create connected blue ways and trail networks; develop Norfolk Parks and Recreation’s unique story and branding; grow an enduring organizational culture that values staff and enhances morale; and maximize inclusive access to all offerings. In terms of recreation facilities and amenities needs, the engagement and survey process found that residents place a high value and need on walking and biking trails, beaches, fitness and exercise facilities, indoor pools/aquatics, and neighborhood parks.

The Plan also includes a physical and condition assessment of Norfolk’s parks and facilities owned and managed by the City. Recurring issues across the system include: lack of/limited ADA accessibility; lack of universal design and amenities; lack of connectivity to surrounding areas; and perceived crime and personal safety. Norfolk’s highest quality parks are those that include environmental best practices, newer recreation centers, unique/destination amenities, dog parks, and parks designed for special events.

Virginia Coastal Resilience Master Plan (2021)

ALIGNMENT WITH NFK2050: EMBRACING NATURE

The regional plan focuses on the four Master Planning Regions: Hampton Roads (including the City of Norfolk), Rural Coastal, Fall Line South, and Fall Line North. The Plan focused resources to implement resilience projects related to coastal flood hazards. Its goals also include promoting up-to-date climate change projections, achieving socioeconomic equity and justice in adaptation, promoting nature-based solutions and green infrastructure, and developing a financing strategy. The key plan components include the Coastal Resilience Web Explorer tool, which identifies resilience needs (collected through a survey), classifies existing projects by status, type, and level of priority. The Plan also proposes structural measures including drainage improvements, perimeter protection, elevation of buildings, and parcel-level adaptation. Non-structural measures for resilience include buyouts, parcel-level adaptation, and capacity-building. A Phase II Plan is anticipated to be complete by the end of 2024. Virginia has established a Community Flood Preparedness Fund (CFPF) managed by the Department of Conservation and Recreation to fund coastal resilience projects. Implementation will be based on the Coastal Zone Management Program Funding database priorities (2021).



Norfolk History

Map of Norfolk and Portsmouth, 1873 (Library of Congress)

Norfolk Harbor 1850-1860 (Library of Congress)

As one of the first US areas of settlement for European colonists in the US, the Hampton Roads region has a long, deep, and rich history. Looking back at four centuries of urban development and the diversity of people who have called this place home helps us to understand who we are today: why our rail and highway infrastructure developed where it did; why Norfolk is the home of the largest naval base in the world; and how the city's streets, blocks, and buildings spread over time. Only with an understanding of our shared past can we turn to look forward to a brighter future.

INDIGENOUS SETTLEMENT

The Chesepian Indians occupied the region before the arrival of the first Europeans. **Their main town, Skicoak, is believed to have been near the site of today's downtown.** The Chesepians were an independent tribe, reportedly destroyed by Chief Powhatan around 1607.

EARLY COLONIAL

The first permanent English settlers arrived to Virginia in April 1607 at a place they would name Jamestown in honor of their king, James I. From there the English settlers began spreading throughout the Hampton Roads region. The land that is now Norfolk, first called "Elizabeth Cittie," was settled by Thomas Willoughby by 1635. **Norfolk was officially designated a port in 1680** for the "building of storehouses to receive imported merchandise and tobacco for export;" this was also the year that surveyor John Ferebee laid out the city plan.

In 1776 the borough of Norfolk was burned to the ground due to fighting between British and Revolutionary forces. After the American Revolution Norfolk was rebuilt in earnest, expanding all the way to present-day Brambleton Ave.

THE 19TH CENTURY

The American Revolution officially gained US freedom from English rule, but subsequent embargos and skirmishes continued to harm

the region's burgeoning economy. During the War of 1812, Fort Norfolk was constructed on the Elizabeth River, on a site formerly occupied by a earthen fortification, in order to help protect the harbor. The fort was able to protect Norfolk and the USS Constellation from the British during the war.

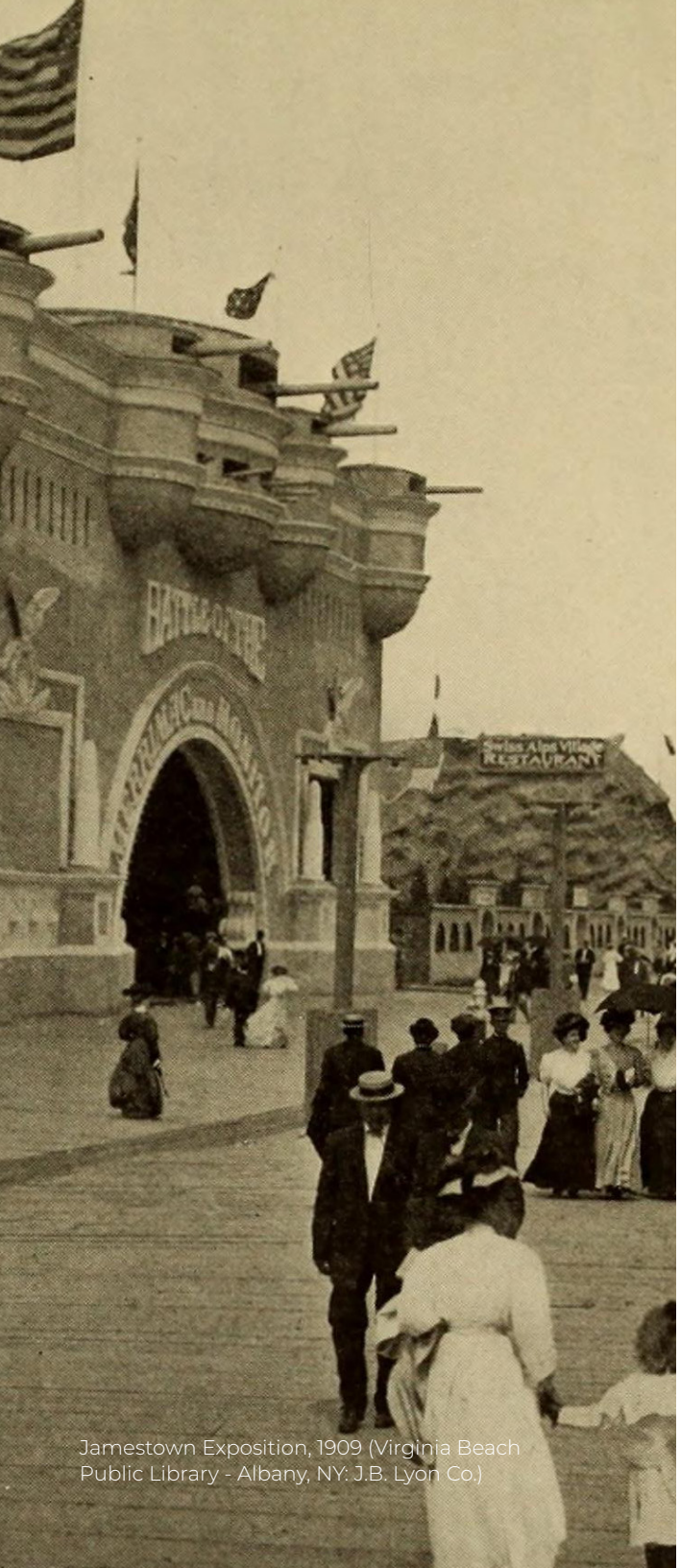
After the War of 1812, Norfolk's maritime played a critical role in its economy and the movement of people. Norfolk was one of the primary ports for enslaved people being sent to the Deep South for resale. Norfolk's port was also a means for formerly enslaved people to start new lives either in the Northern states or in Liberia. Formerly enslaved people who chose to remain in the region would come to Norfolk for opportunities.

In February 1861, radical differences between North and South led seven southern states to announce their secession from the United States and to form the Confederate States of America. Four more states, Virginia among them, would join the Confederacy later that year. **In March 1862, one of the most famous naval battles in history took place in Hampton Roads,** as the USS Monitor and CSS Virginia (formerly USS Merrimack) engaged in the first battle between ironclad war ships. It was the genesis of the modern steel navy.

After the Civil War, Norfolk and its surrounding localities continued their role in providing important farm crops, namely greens and potatoes.

Norfolk saw the foundations of its neighborhoods being laid during the 1890s and 1900s. Neighborhoods like Ghent, West Ghent, Larchmont, Colonial Place, Virginia Place, Riverview, Park Place, Logan's Park, Lafayette and Winona, Chesterfield Heights, and Lindenwood among others were formed during this period.

Lamberts Point, 1886
(https://www.trains.com/ctr/railroads/birds-eye-view/east-to-west-on-the-nw/ - Angela Cotey, August 26, 2010)



Jamestown Exposition, 1909 (Virginia Beach Public Library - Albany, NY: J.B. Lyon Co.)

EARLY 20TH CENTURY GROWTH

The world came to Norfolk in 1907, when the Jamestown Exposition was held on 340 acres at Sewells Point (now the site of Naval Station Norfolk), on the shore of the Chesapeake Bay some 20 miles north of downtown, to commemorate the 300th anniversary of the first permanent English settlement in America. A miniature city was created on the grounds, with boulevards, lights and telephone service and beautiful, permanent buildings representing governments, manufacturing and institutions from around the world.

The Jamestown Exposition was not a financial success but its impact on the City of Norfolk was huge. Several hotels and apartment hotels were constructed downtown, which anchored Granby Street as it was transitioning into Norfolk's primary shopping district. By 1910, Granby was Norfolk's busiest street. North of downtown, the Pelham Place and Holland Apartments were built in Ghent. A streetcar line was extended the length of what is now Hampton Boulevard to transport visitors from downtown to the Exposition grounds, subsequently sparking the development of neighborhoods along its length.

The Exposition closed in November 1907, but senior naval officers observed that the site would be ideal for a naval station. In June 1917, President Woodrow Wilson signed a bill establishing a naval installation on 474 acres at Sewells Point that included the old Exposition site. It would be called Naval Operating Base, Hampton Roads – or NOB. Known today as Naval Station Norfolk, it is the largest Navy installation in the world.

GREAT DEPRESSION

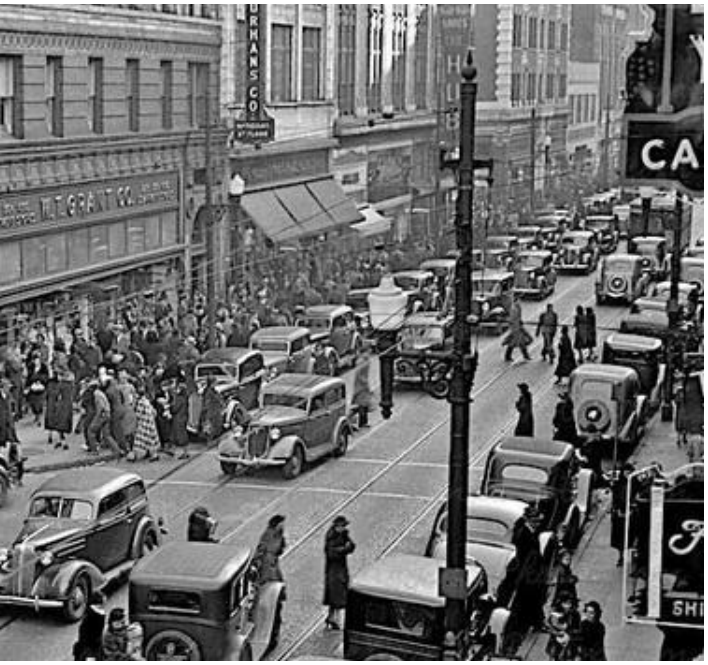
The U.S. stock market crash of October 1929 ushered in a decade that would become known as the Great Depression. In attempt to combat increasing foreclosures, the Home Owners' Loan Corporation (HOLC) was formed in 1933 to provide low interest mortages. Part

Granby Street at College Place, 1950s (Virginian-Pilot archives)

of this program involved assessing existing urban land for investment, a practice now known as “redlining” (see p.84). A series of subsequent federal redevelopment programs ensued, ushering in a period of massive demolition and redevelopment for housing and infrastructure.

URBAN RENEWAL

By the 1930s, large pockets of residential areas in and near downtown had deteriorated so badly that living conditions were unbearable. The Norfolk Housing Authority was formed in 1940 to direct federal funding for housing projects. These programs focused on slum clearance - primarily in communities of color - and the construction of large public housing projects throughout the city, and would span into the middle of the century, entirely reshaping many of Norfolk’s neighborhoods.

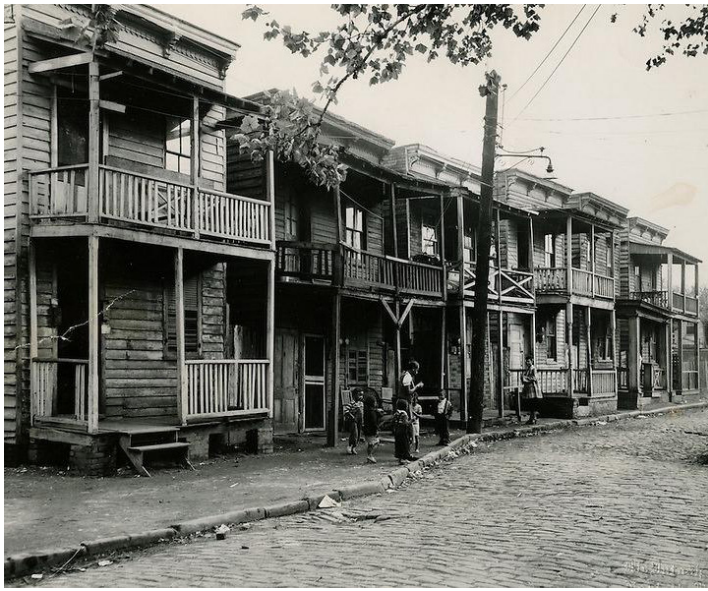


WORLD WAR II

The December 1941 Japanese attack on the American naval base at Pearl Harbor and America’s entry into World War II effectively ended the Great Depression. The Port of Hampton Roads was a major point of embarkation for troops heading overseas.

Norfolk’s population exploded. An influx of military and civilian personnel from across the country brought the city’s population from 144,332 in 1940 to more than 168,000 naval personnel and nearly 200,000 civilians by the end of 1943. Everything from a seat on the trolley to a place to lay one’s head was in short supply. Many who were brought to Norfolk by the war chose to remain in Norfolk. In 1950, the city’s population numbered 213,513. Annexations of the Tanners Creek District of Norfolk County in 1955 and a portion of the Kempsville District of Princess Anne County in 1959 brought an additional 24.66 square miles into the City.

Building on the city’s pivotal role in the navy, Norfolk has been the home of NATO’s Supreme Allied Commander Atlantic (SACLANT) since 1952.



4th Street, 1951
(Norfolk Public Library - Sargeant Memorial Collection)

MID-CENTURY ANNEXATION/TRANSITION

In 1954, in Brown v. Board of Education of Topeka, Kansas, the United States Supreme Court ruled that segregation of public schools based on race was unconstitutional. Thus began the strategy of Massive Resistance that would characterize the South’s response to mandatory school desegregation, and Norfolk was no exception to this movement.

A BRIEF HISTORY OF NORFOLK

1682: The deed establishing the Towne of Lower Norfolk County recorded

1680: Norfolk Designated a Port

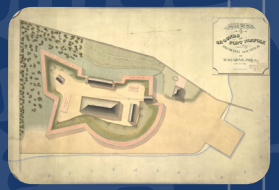
1736: English County of Norfolk formally incorporated

1637: New Norfolk County splits into Upper and Lower Norfolk Counties

1607: "Virginia's First Port" established at Jamestown

INDIGENOUS SETTLEMENTS: Chesepian Indians Destroyed by Chief Powhatan ~1607

1776: Burning of Norfolk by Lord Dunmore



1795: Fort Norfolk Construction

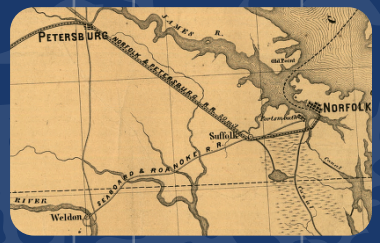
1812: War of 1812
Battle of Craney Island

1822: Fort Monroe construction

1845: Norfolk incorporated as a city

1862: "Battle of the Ironclads" USS Monitor and CSS Virginia (formerly USS Merrimack)

1883: Norfolk Southern Railroad founded - First coal from West Virginia Arrives



1851: Norfolk & Petersburg Rail line extended into Norfolk

1886: First coal pier opens at N&W Coal Yards at Lambert's Point

1894: First electrically driven streetcars in Norfolk

1907: Jamestown Exposition

1911: Booker T. Washington High School Opens (all-Black)

1917: Naval Station Norfolk Opens

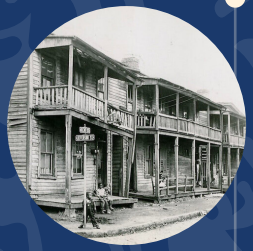
300K
250K
200K
150K
100K
50K

1600 1800 1850 1900

Population Growth

1930: ODU established as Norfolk division of College of William & Mary

1940: Norfolk City Council votes to create the Norfolk Housing Authority Grant funded to construct 500 military housing units (Merrimac Park)



1946: VA Development Law passes changing Norfolk Housing Authority to NRHA to focus on urban development

1939-1945: WWII
(NN Shipyard employed 43,000 people, built 101 vessels and repaired 6,850 others)

1920-1930: Norfolk began converting all-white schools to all-Black schools as white residents moved to Ocean View, Ghent, Larchmont, Edgewater

1949: Norfolk and Galveston TX are first cities to receive public funding under the Federal Housing Act

1950: Norfolk Begins "Project 1"- Clearing slums in Young Terrace, NRHA creating Tidewater Gardens public housing

300,000

1959: After the Virginia massive resistance to school desegregation "The Norfolk 17" were the first African-American students to enter six previously all-white middle and high schools in Norfolk.

1970: East Ghent and Huntersville redevelopment projects

1972: Berkley redevelopment project

1973: Park Place conservation plan

1976: Ghent Square - first residents

1977: Park Terrace Opens

1977: Church St. redevelopment

1986: Middletowne Arch opens on the site once occupied by Liberty Park

1986: Freemason Harbor condos

1989: East Beach Redevelopment

1983: Waterside Opens

2011: Opening of the Tide light rail - first light rail system in Virginia

2012: New South Norfolk Jordan Bridge Opens

2016: Toll Relief Program created for low-income Porstmouth & Norfolk residents

TODAY

1920 1950 1970 1980 2000 2020

In 1957, US District Court Judge Walter E. Hoffman ordered Norfolk's public schools to desegregate, and the ensuing legal and racial battle included Virginia Governor J. Lindsay Almond Jr. fully closing six all-white Norfolk Public Schools in protest. The fight to reopen the six schools continued until, on Monday, 2 February 1959, they were reopened, and **17 African American teenagers made history as the first students to desegregate Norfolk Public Schools.**

MIDCENTURY REDEVELOPMENT

World War II redirected the early mission of the Norfolk Housing Authority from clearing what they defined as slums, to building housing for defense workers. After the war, the vision of the Housing Authority broadened beyond merely replacing sub-standard housing for

Flooding in Norfolk, 1941 (John Vachon - Farm Security Administration)

Church Street, 1975 (Virginian-Pilot archives)

the poor, to creating a remodeled city for all. The name of the agency was changed to Norfolk Redevelopment & Housing Authority (NRHA). In December 1948 Norfolk City Council approved $25,000 in funds for the NRHA's slum clearance projects along with accessibility and parking improvements. In 1949, NRHA became the nation's first agency to receive funds under the new Federal Housing Act. Funding was received in September 1950, and Project One, the first phase of redevelopment, began in December 1951.

By 1965, Project One had cleared a total of 190 acres of downtown in order to construct what NRHA defined as new, affordable housing. At the same time the Authority turned over the former site of Broad Creek Village (built as demountable housing during World War II) to the city for development as Norfolk Industrial Park, to encourage

Norfolk, 1966 (City of Norfolk)

industry and manufacturing enterprises to establish locations in Norfolk. Project Two and Three followed, furthering large-scale redevelopment.

DOWNTOWN REVITALIZATION

Nine annexations between 1887 and 1959 brought Norfolk's land to its present size. From that point on, no more land was available for expansion, so the city of Norfolk had to look to the development of existing

assets for its economic future. City leaders began a long push to revive Norfolk's urban core, beginning at the downtown waterfront on the Elizabeth River. Once a bustling, working harbor, with commercial shipping and boats carrying passengers to Baltimore and to railroad connections with points farther north, Norfolk's waterfront had, by the 1960s, become a wasteland of decaying piers, dirt-paved parking lots and vacant warehouses. The shipping industry had moved northward to Norfolk International Terminals; travelers no longer made their way by steamer; and prime waterfront property along the river sat vacant, ready to be repurposed.

Norfolk's annual Harborfest was initiated in 1977 and the repurposing of downtown waterfront began. Within six years, city planners created a new boulevard, Waterside Drive, connecting downtown Norfolk to the Virginia Beach-Norfolk Expressway. Obsolete shipping and warehousing facilities along the downtown waterfront were demolished.

In June 1983, the City of Norfolk and the Maryland-based Rouse Company opened Waterside Festival Marketplace, a dining and entertainment venue that brought people back to the waterfront and served as a catalyst for the revitalization of downtown. This waterfront area along with Town Point Park is utilized form many events including Harborfest, which is the largest, longest-running, free maritime festival in the nation.

Norfolk's efforts to revitalize its downtown have attracted acclaim from economic development and urban planning circles throughout the country.

NORFOLK TODAY

Today, Norfolk is blessed with institutions for higher learning, theaters, and museums. The Port of Virginia, with a facility at Norfolk International Terminal, is one of the busiest ports by container volume in the nation, reporting record-breaking volume annually. Once separated by waterways, the entire Hampton Roads region is now connected by a loop of interstate highways and bridge-tunnels. But Norfolk is also a multi-modal city, the Tide light rail opened in 2011. The Elizabeth River Trail is a favorite for walkers, runners, and cyclists. Norfolk has emerged as an international leader in resilience efforts, finding ways to solve problems related to sea level rise and flooding.

From 50 acres and a population of one, Norfolk has grown to a city of 66 square miles and more than 230,000 people living, working, and enjoying life.

Text and Research: Peggy McPhillips, Norfolk Historical Society; Troy Valos, Norfolk Public Library; and Ross Cannon, WPA

Waterside, 1983 (Norfolk Redevelopment and Housing Authority)

THE LAST 25 YEARS IN NORFOLK

Once adopted, **NFK2050** will be official policy for the City of Norfolk for the next 25 years. Long-range and comprehensive planning can feel abstract, so it can be helpful to look back to see just how much can change in a city across a similar timespan. Norfolk has had a significant amount of development, infrastructure, and environmental changes since 1999, some of which are highlighted here for illustration:

1999

- MacArthur Mall Opens
- SR 44 Changed to I-264
- Hurricane Floyd
- Mermaid Adopted as City Symbol

2000

- Broad Creek Hope VI Award & Redevelopment Begins
- POP: 234,403 (-10.3% from 1990)
- NORVA Reopens as Concert Venue

2012

Hurricane Sandy

- Amtrak Intercity Train Service Returns

- Hurricane Sandy

2014

- Metro on Granby (Downtown 185 Units)
- The Wainwright Building (Downtown 126 Units)
- East Beach Marina Apts (Ocean View 137 Units)

2015

- Slover Library Opens
- Dutch Dialogues
- Law Building (Downtown 70 Units)
- Rockefeller Building (Downtown 126 Units)
- Broad Creek Hope VI Redevelopment Complete

2016

- Hurricane Matthew
- The Loraine (Downtown 56 Units)
- Virginia Building (Downtown 32 Units)

2017

- Hilton (The Main) Opens
- Norfolk Premium Outlets Open
- NDRC Ohio Creek Neighborhood Resilience Project Awarded
- Edge at 450 (Downtown 156 Units)
- Bank of America Tower Renovation ICON Norfolk (Downtown 275 Units)

2018

- NEON Arts Apts (Downtown 48 units)
- Olde Huntersville Plan Book
- Norfolk Southern Announces HQ Relocation to Atlanta

2019

- IKEA Norfolk Opens

- Bay Oaks Park Opens
- Pinewell Station Apts (Ocean View 145 units)

Year of events
Economic development
Housing/neighborhood
Environmental quality
Transportation

9/11

2001

USS Wisconsin Opens as Museum Attraction

Heritage at Freemason (Downtown 184 units)

2002

150 West Main Opens 20-Story Office Tower

2003

Hurricane Isabel

NATO Act HQ Built in Norfolk

2004

East Beach Redevelopment Begins Construction

Attucks Theatre opens

National Recession

2011

VA Renaissance Center Opens as former Ford Plant

TIDE Light Rail Transit Opens

Hurricane Irene

Wells Fargo Tower & Monticello station Apts (Downtown 178 units)

2009

Nor'Ida Nor'easter Storm

2010

Belmont at Freemason Opens (Downtown 239 Units)

POP: 242,803 (+3.6% from 2000)

2007

Half Moone Cruise Terminal Opens

Norfolk Ford Assembly Plant Closes

2006

Sentara Heart Hospital Opens SE VA's Only Heart Hospital

COVID-19 Pandemic

2020

POP: 238,005 (-2% from 2010)

Open Norfolk Outdoor Dining Initiative

2021

Acclaim at East Beach Apts (Ocean View 132 units)

2023

Duke Grace Building (Downtown 30 units)

NDRC Ohio Creek Neighborhood Resilience Project Completed

MacArthur Mall for sale acquired by City of Norfolk

Fairwinds Landing begins Construction

2024

FUSION at NEON 233 units

Gravity on 400 (Downtown 273 units)

Acclaim at East Beach II Apts (Ocean View 80 units)

Land Use & Zoning

CURRENT LAND USE

Norfolk, like all cities, accommodates a variety of uses on its land. Studying the differing ways that Norfolk residents, businesses, industry, and public institutions use the physical space of the city can give an understanding of our collective values and future opportunities.

Phase 1: Listening Open House in October 2023 (WRT)

As of 2022, Norfolk encompasses approximately 66 square miles of land. Of that, residential uses occupy 41% of the city's landmass, followed by 15% for military uses and 14% for industry. Residential districts in Norfolk are primarily comprised of single-family detached housing that is consistent with low to medium density development.

Much of the city's industrial and commercial uses occupy large swathes of land in neighborhoods such as Industrial Park and Military Circle, as well as along major thoroughfares such as Military Highway, East Little Creek Road and West 23rd Street, outlining the edges of residential neighborhoods. The city's industrial land also encompasses the Port of Virginia in the West that shelters the world's largest shipbuilding and repair base, a thriving coal and bulk trade, and the sixth largest containerized operation in the United States.

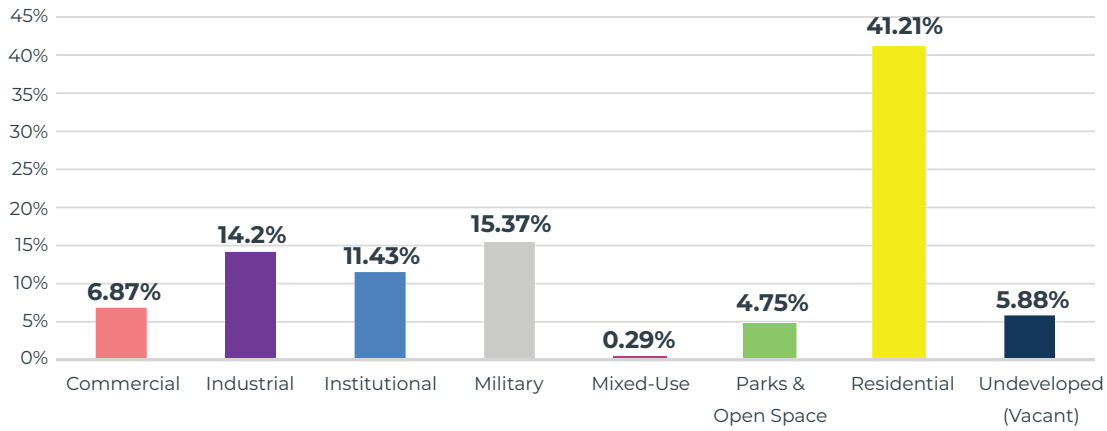


Figure 1: Existing Land Use by Percentage of Overall City Area

City of Norfolk

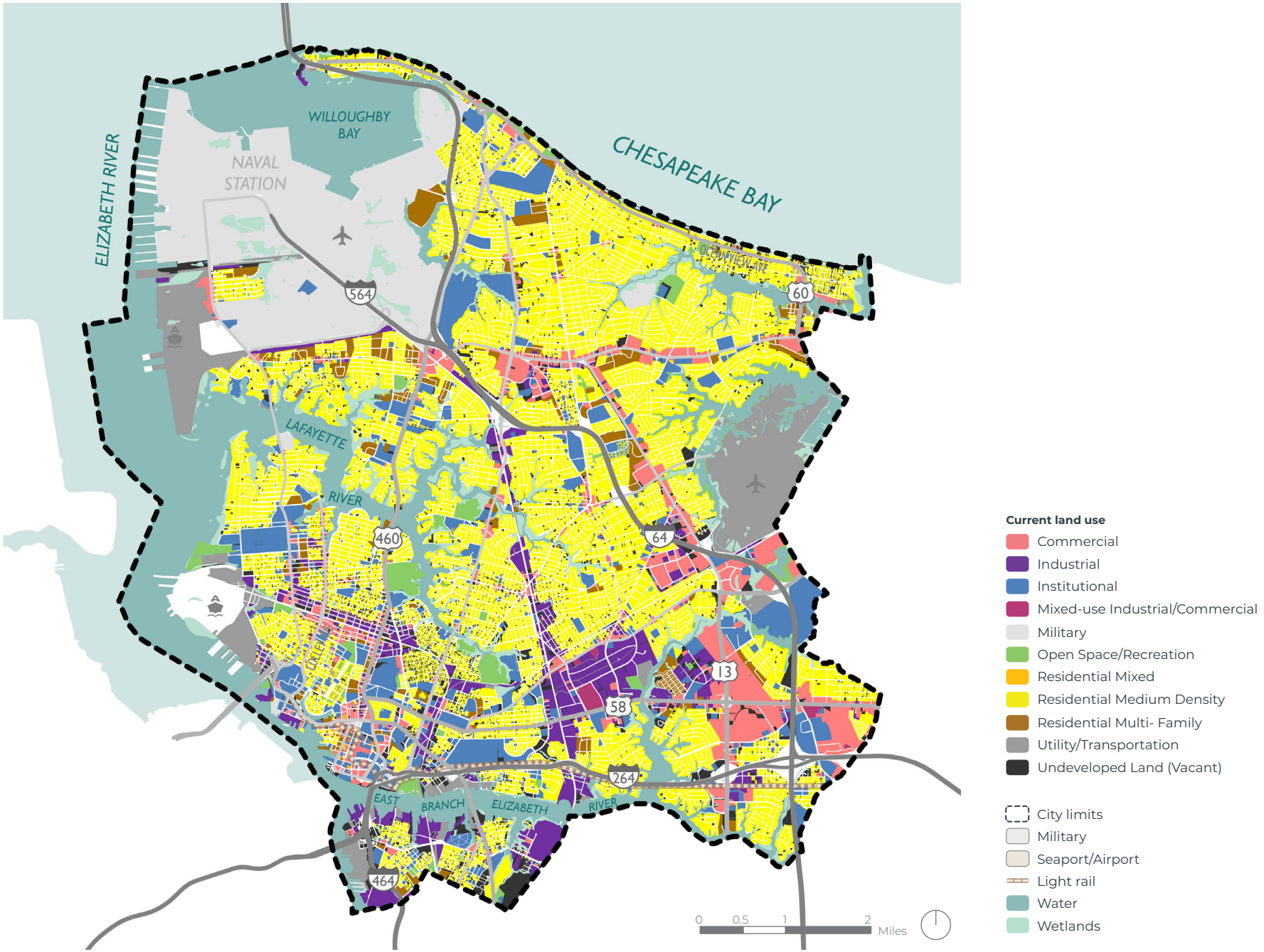


Figure 2: Existing land use, 2022

City of Norfolk

SUCCESS!

Zoning Code Update (2018)

The 2018 Zoning Ordinance Update was an ambitious and important implementation vehicle for plaNorfolk2030, including new zoning standards that implemented policies and recommendations of the Comprehensive Plan. New requirements included the following examples:

- Enhanced landscaping, buffering, and screening standards;
- Requirements for open space;
- Development standards focused on form for residential development;
- Resilience-based requirements for new development.

Source: City of Norfolk

CURRENT ZONING

Norfolk's 2018 zoning ordinance is a tool to guide future development, strengthening the City's commitment to vibrant neighborhoods, economic diversity, and coastal resilience.

The zoning ordinance regulates and encourages development that makes Norfolk more resilient, both physically and economically; recognizes the four established character districts; and supports streamlined development processes. The ordinance takes a proactive and innovative approach to address flooding and positions the Mermaid City as the coastal community of the 21st Century.

RESILIENCE

The ordinance contains a number of pioneering approaches in response to the long-term challenges posed by sea level rise, one of which requires all development within the city to meet a resilience quotient. The requirement is measured on a points system covering three separate resilience elements: risk reduction, stormwater management, and energy resilience. Additionally, new or expanding development must meet minimum requirements for first floor elevations 1.5 – 3 feet above flood level.

DIVERSITY

Current zoning allows for easier mixing of uses in commercial corridors to encourage more vibrant and pedestrian-friendly communities. Increasing the housing use and diversity also includes provisions for more live-work units, providing a broader range of home occupations; and the construction of accessory dwelling units on certain zoning districts to increase the city's housing supply.

NEIGHBORHOOD CHARACTER

In an attempt to preserve and enhance Norfolk's unique character, four "character districts" - Downtown, Traditional, Suburban, and Coastal – were established. Form standards for each district establish guidelines for how new buildings can be developed that focus on maintaining the integrity of each neighborhood character, including details such as porch or garage locations in residential development and window or parking location in commercial development.

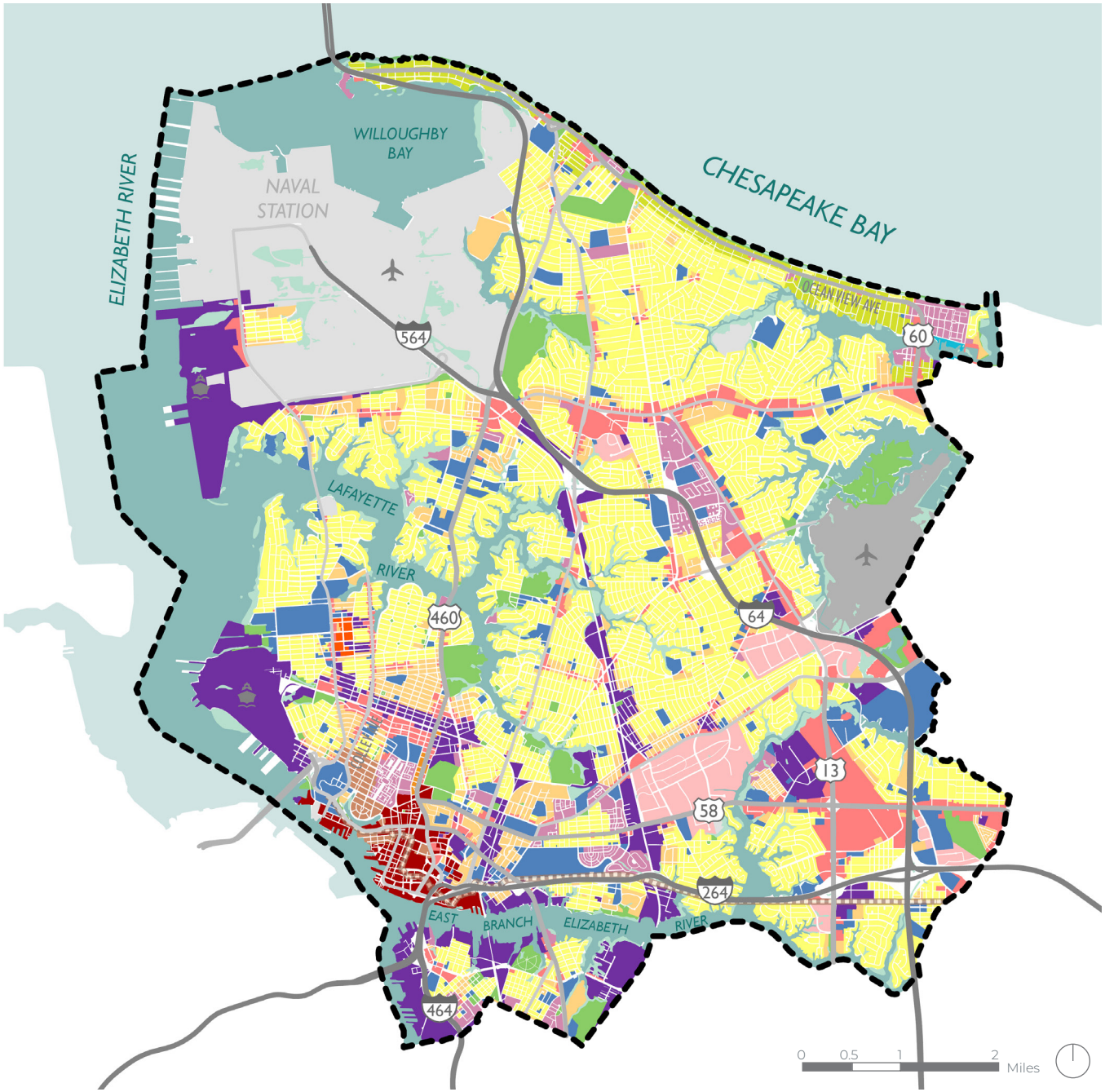


Figure 3: Current zoning

City of Norfolk

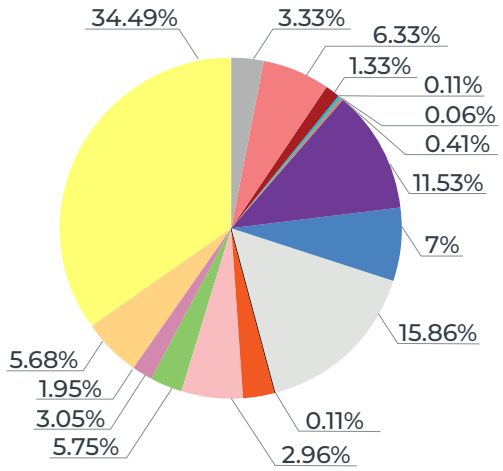


Figure 4: Current zoning (percentages)

City of Norfolk

Current Zoning

- Airport (3.33%)
- Commercial (6.33%)
- Downtown (1.33%)
- East Beach Harbor (0.11%)
- Granby/Monticello Corridor Mixed-use (0.06%)
- Historic District (0.41%)
- Industrial (11.53%)
- Institutional (7%)
- Military (15.86%)
- Monarch Way (0.11%)
- Office (2.96%)
- Open Space (5.75%)
- Planned Development (3.05%)
- Residential Coastal (1.95%)
- Residential Multi-Family (5.68%)
- Residential Single-Family (34.49%)

- City limits
- Military
- Seaport/Airport
- Light rail
- Water
- Wetlands

Land Value

At their core, cities are composed of unique and finite areas of land that can neither be moved nor destroyed. This is especially true for Norfolk, where there is little room for city expansion. As a result, it is imperative that Norfolk uses what finite land we have as efficiently as possible.

Land use decisions have enduring impacts on both public infrastructure and service costs, as well as on municipal revenue. The following Land Value per Acre models are built on real estate concepts that make a quantifiable case for better city planning and smarter growth, and are designed to assist the community in understanding Norfolk's fiscal health in terms of land use decisions.

UNDERSTANDING LOCAL FINANCE

FISCAL ANALYSIS

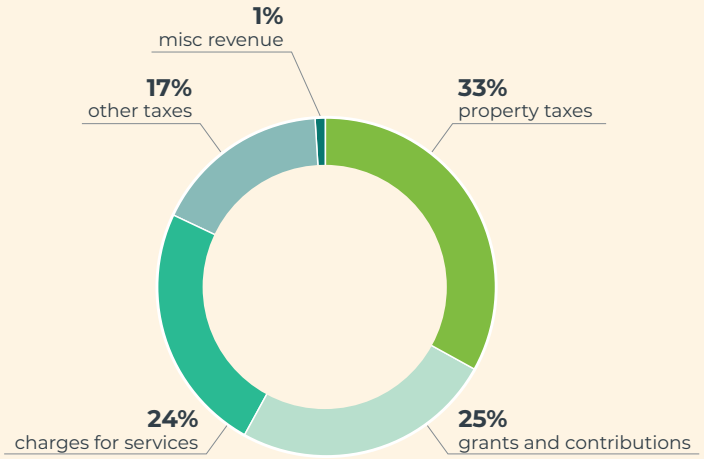
To understand the fiscal health of a community, we must first understand the underlying tax structure of the area to uncover the relationship between land use decisions and revenue production. When public revenues vary geographically, we can draw comparisons to other spatially relevant facts, such as patterns of development, demographics, and public investment. Put simply, **land use directly affects a parcel's tax productivity**. As such, analyzing both the source of government revenues and the patterns from which they originate is critical to planning a strong financial future.

BUDGET ANALYSIS

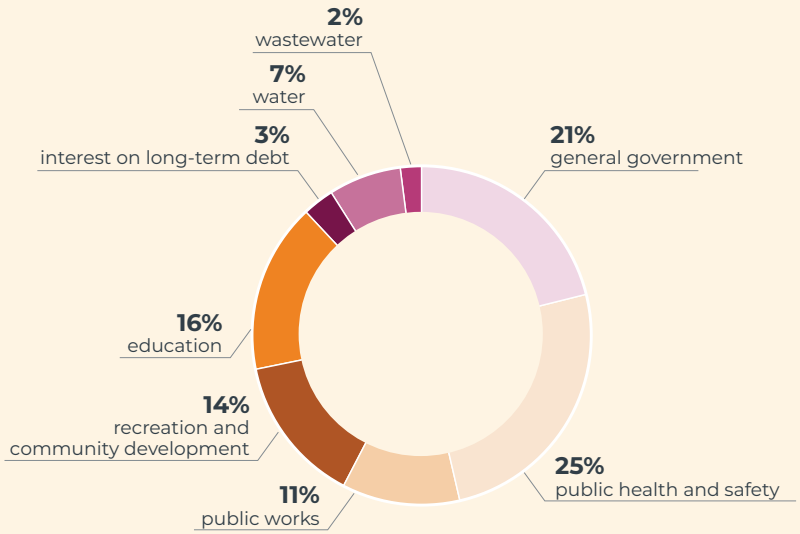
In the United States, tax systems vary by state and municipality. In Virginia, property tax is an important revenue stream for local governments. The charts on page 32 break down the 2022 General Fund revenues for the City of Norfolk. According to the Annual Comprehensive Financial Report and Proposed Budgets, **approximately a third of Norfolk's revenue comes from property taxes.** Other major revenue sources include Utility Charges for Services, and Grants & Contributions from State and Federal sources.

The major expenditures in Norfolk are common for most other American cities. Education and general government operating expenses make up a large portion of municipal spending. Infrastructure operations and maintenance also consume a notable part of Norfolk's coffers.

City of Norfolk budget overview, General Fund (2022)

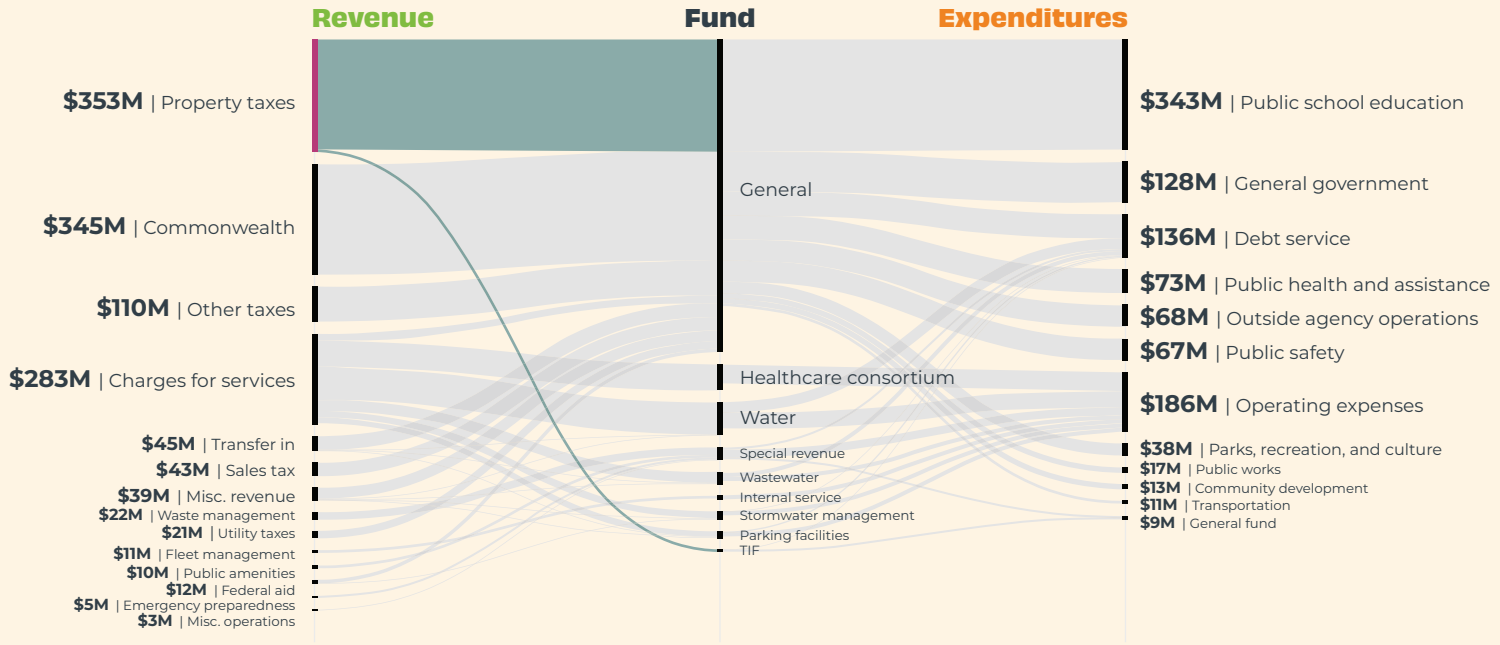


Revenue Distribution



Expenditure Distribution

City of Norfolk financial flow, operating budget (2022)



Downtown Norfolk (WRT)

Taxable Value

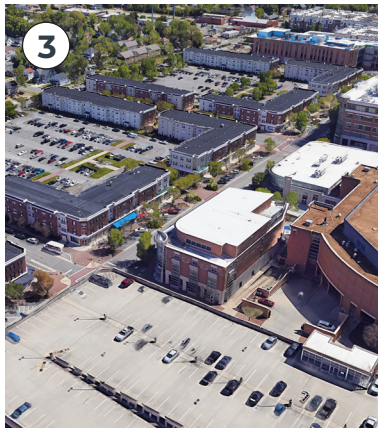
WHY VALUE PER ACRE?

This work focuses on visualizing tax data utilizing the “per acre” metric as a unit of productivity, as another way of looking at land use and value. **Cities have a finite area of land, and how that land is used has a direct effect on municipal coffers.** The per acre metric normalizes tax values into a direct “apples-to-apples” comparison utilizing land consumed as a unit of productivity. Put another way, different cars have differently sized gas tanks; when looking at the efficiency of a vehicle, the gallon is used as the standard measure, not the tank. Therefore, “miles per gallon” is common practice to gauge efficiency, not “miles per tank.” We can apply the same principle to measure the financial productivity of various development types across a community.

The images on these pages illustrate the difference between **Taxable Values** and **Value Per Acre** for select parcels throughout Norfolk. The image at opposite left, “Total Taxable Value,” reflects how we typically view and understand tax production. While parcels with the largest footprints often produce the highest revenue, they also carry the highest costs in regards to public utilities (i.e., streets, sewer, water). Thus, examining a development’s total tax production overlooks the amount of land and other public resources that are consumed in order to produce revenue. When we utilize the “Value Per Acre” metric (opposite right), values shift to highlight properties that yield **high property tax rates relative to their size.**

Broad Creek Shopping Center
(Point Homes)

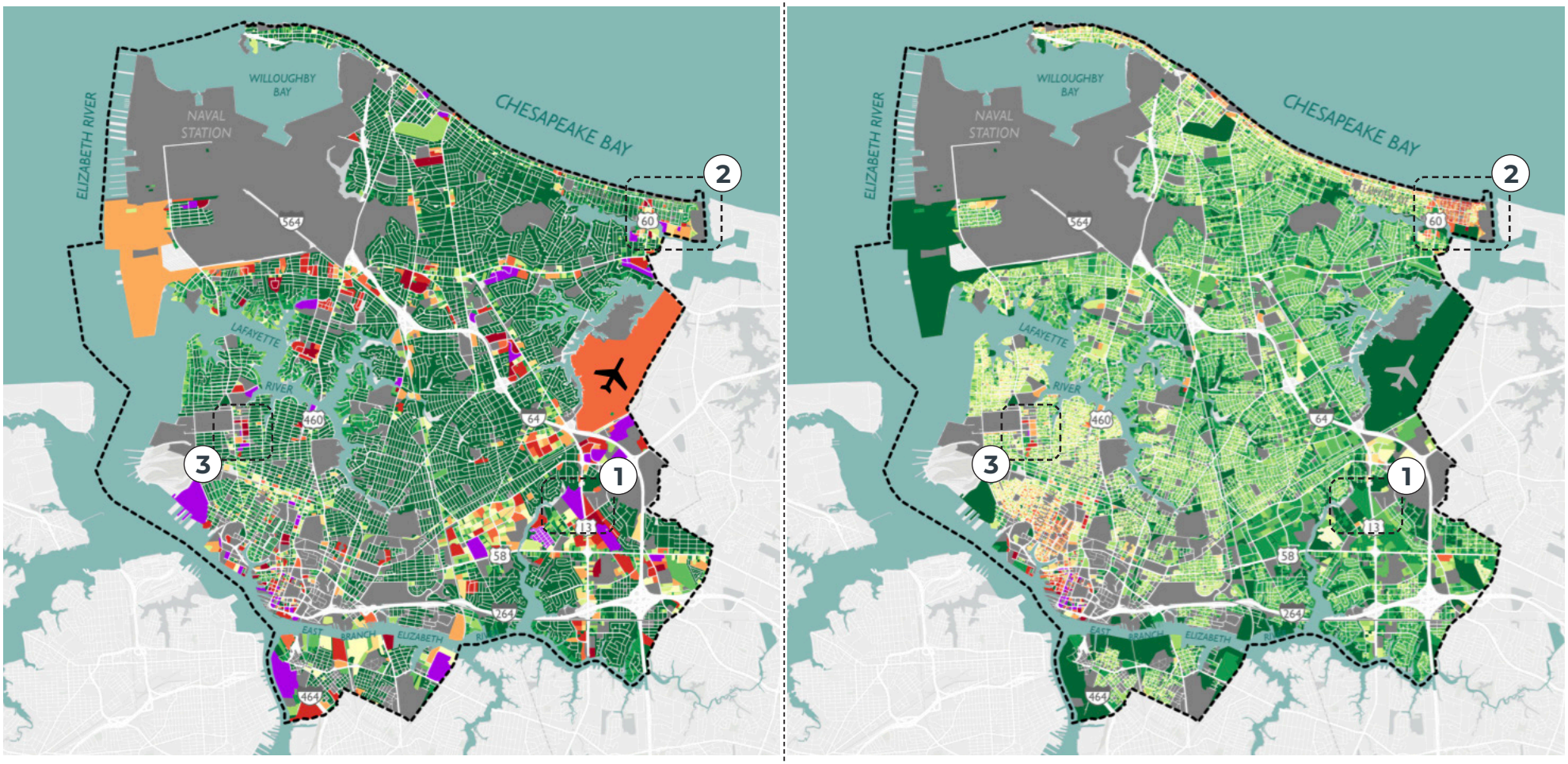
Homes at East Beach
(City of Norfolk)



Shops on Monarch Way
(Google Earth)

NORFOLK PARCELS - TOTAL TAXABLE VALUE

NORFOLK PARCELS - TAXABLE VALUE PER ACRE



City of Norfolk Assessor, 2023

	Total Taxable Value	Value Per Acre
1 Broad Creek Shopping Center, 56 acres	$44M	$791K
2 Homes at East Beach, Avg lot size: 0.1 ac	$938K	$9.4M
3 Shops on Monarch Way, Avg lot size: 2 ac	$18.4M	$9.2M

Total taxable value

- >$30M
- $20M-$30M
- $10M-$20M
- $7,5M-$10M
- $5M-$7,5M
- $4M-$5M
- $3M-$4M
- $2M-$3M
- $1,5M-$2M
- $1M-$1,5M
- $500K-$1M
- <$500K
- Tax Exempt

Low density, Industrial

Low density, Commercial

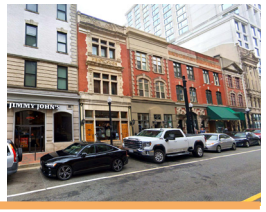
Low density, Residential

Low density, Mixed-use

Medium density, Industrial

Medium density, Commercial

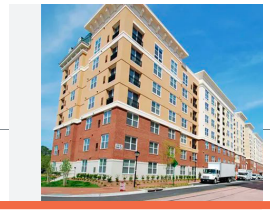
Medium density, Residential



Medium density, Mixed-use

High density, Industrial

High density, Commercial



High density, Residential

High density, Mixed-use

Google (all images)

When we look at taxable value per acre of parcels in three dimensions (page 37), we can see how productivity varies spatially across Norfolk. Most strikingly, tall purple spikes highlight the density of downtown. Beachfront properties are also visible along the spine of the coastline, as well as the dense developments of East Beach. The developed middle of the city consists primarily of greens and yellows, reflecting where the majority of Norfolk's single family housing and large commercial developments are located. **Generally speaking, sprawling developments yield a lower efficiency when we examine their values through the value-per-acre lens**.

It should be noted that industrial land uses are an outlier in this valuation, as an important and necessary part of any city's economy. In Norfolk, over 1,300 acres are designated for industrial land uses and contribute over $2B in total taxable value. Although industrial land uses typically consume a large amount of land, they provide thousands of jobs and are an important part of Norfolk's economy and culture.

Figure 5: Property tax revenue per acre by building type

City of Norfolk, 2023

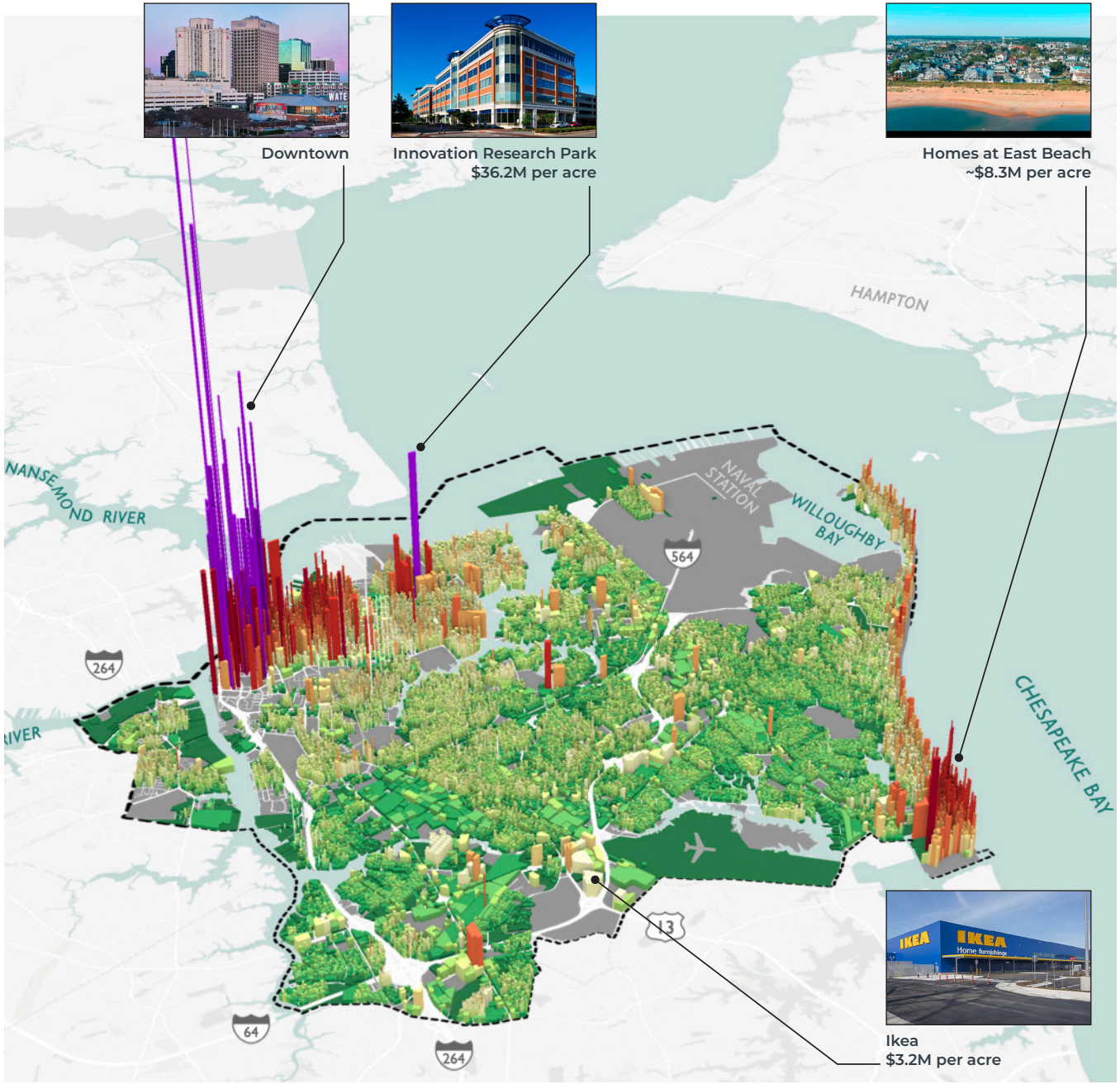


Figure 6: Taxable value per acre: value shown stacked vertically

City of Norfolk Assessor, 2023

LAND USE PATTERNS

Our main takeaway from this section is that land use decisions matter.

Whether we are considering the development of residential, commercial, or mixed-use properties, density has a great impact on value potency.

Property tax value is not the only way to quantify a site's value to the Norfolk community: many culturally and economically important parcels are not taxed (ex. parks, military sites, public institutions). However, when it comes to the city's revenue, whether sites are contributing efficiently to the overall budget has ramifications for infrastructure and other major expenses.

As NFK2050 moves into planning recommendations, the city's existing landscape of land use and value should be kept top of mind for future development decisions.

Who Is Norfolk?

Pride Fest, 2023 (City of Norfolk)

Before we can plan for the future, we need to understand who we are today. A current demographic snapshot of Norfolk shows a diverse cross-section: military families, empty-nesters, young professionals, long-time residents, and well-respected elders alike all call the city home.

WHO IS NORFOLK?

The following personas represent just some of the diverse voices who call Norfolk home:

NFK youth/ young adults

Enthusiastic about Norfolk and its culture;

Usually communicates through social media;

Known as the Norfolk leaders and changemakers of tomorrow.

NFK military family

Active military family who discovered Norfolk upon assignment here

Raising children in the neighborhood; advocate for walkability and nearby amenities;

Want a safe and green environment for their children and love getting on the water on their boat.

NFK worker

Public servant, moved to Norfolk some years ago and stayed for quality of life in community;

Enjoys walking in the neighborhood, visits local shops and community centers.

NFK college student

Moved to Norfolk for college;

Enjoys campus life and citywide events/ entertainment opportunities;

Ventures around their community and campus;

May take an Uber/Lyft, ride the Tide or public transportation to access daily needs, go to events, and enjoy the beach.

NFK artist

Engaged in several artist groups throughout the city like Makerspace and the Contemporary Arts Network;

Contributed to the design of mermaids and some of the most iconic murals in communities like Park Place, Teens With A Purpose, the NEON District, Norfolk State's Art gallery, Barry Arts Museum, etc.

NFK researcher

Moved to Norfolk for work studying climate change;

During down time, they like running along Norfolk's trails and neighborhoods and discovering nature;

On weekends, they volunteer at the Botanical Garden and often take care of their neighborhood community garden.

Youth Earn and Learn (WRT)

Zoo Tales at Slover Library (City of Norfolk)

I believe the future is boundless for us. We need to prepare our folks from the perspective of the opportunities that exist, the opportunities that are coming and including people that have traditionally not been included.

— Norfolk resident, Workshop #1, October 2023

NFK entrepreneur

Found an opportunity to open their dream business in Norfolk;

Loves chatting with clients, neighbors and has built relationships with them and their families;

Active in their civic league and business association;

Joins every opportunity to advocate for other small businesses.

NFK cycling enthusiast

Bought a bike to get around as a form of transportation, and is active in the cycling community;

Often seen riding on the Elizabeth River Trail as they make their way to a local brewery;

Knows shortcuts for moving through the city and identifies local spots (restaurants, scenic views of water, shops, etc.).

NFK boomerang

Born in Norfolk and left for college elsewhere, but returned after graduating to enjoy the city's quality of life and to be close to home;

They know the best neighborhood spots for ice cream and coffee;

They're always up to date on all events going on in the city and look forward to HarborFest every year.

NFK family

Love what the city has to offer for kids and parents alike;

Feel that Norfolk's diverse community is an important reason to raise their family here;

Appreciate that the city has all kinds of amenities for each family member to live, work, and play.

NFK empty-nester

Moved to Norfolk many years ago to raise their children due to the great character of the neighborhoods;

Now that their children are grown, they have relocated to a small condo near the beach to entertain friends at dinner parties;

Loves spending time downtown at restaurants and music venues.

NFK elder

Born and raised in Norfolk. They've seen all the changes that have happened in the city;

They still live in their home in an older neighborhood;

They are active voices for their community;

On weekends, they enjoy sitting in the park and greeting neighbors.

Demographic Snapshot

Growth

Norfolk's population, stable for decades, has seen a slight decline since 2010. The city observed a 2.4% decrease from 2010 to 2022, while the population of Virginia and the Greater Hampton Roads region grew by 7.79% and 4.8% respectively in the same period. It should be noted that the regular deployments of large numbers of Norfolk's military population can make truly accurate population counts difficult.

Statewide, the past year marked the slowest growth rate for Virginia. While this can be attributed to a declining birth rate (13,000 more births than deaths in 2022 as compared to 27,000 in 2019), an even larger factor is that since the COVID-19 pandemic, more people are leaving larger metro areas in favor of smaller southern states. This national trend of migration out from cities into suburbs and exurbs, for example, helped cause the number of residents in Suffolk to pass 100,000 in 2023 (Weldon Cooper Center, University of Virginia).

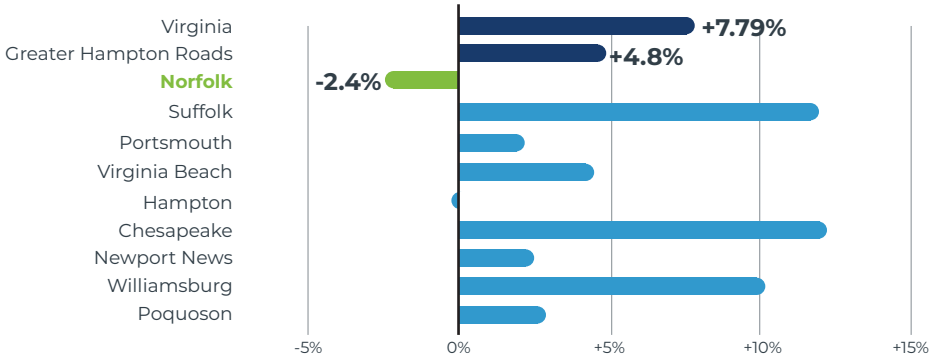


Figure 2: Regional growth rate, 2010-2022
US Census Bureau, ACS 5-year Estimates, 2010-2022

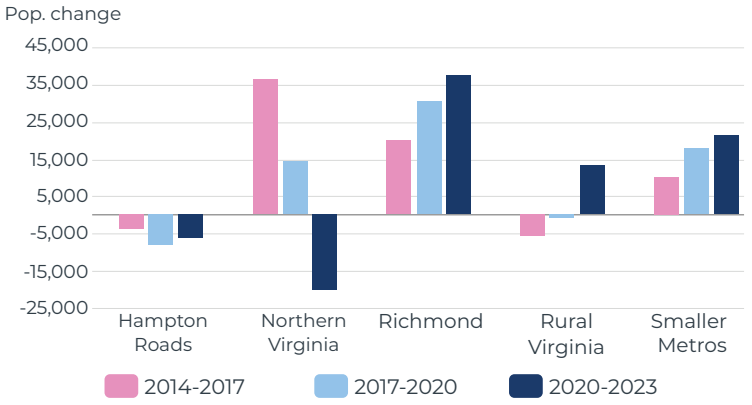


Figure 1: Net Migration by Region in Virginia
Weldon Cooper Center Population Estimates

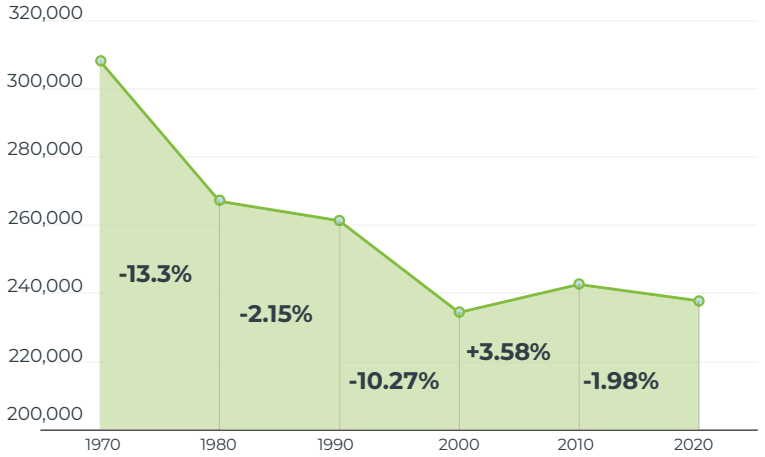


Figure 3: Population change in Norfolk, 1970-2020
CivicLab, City of Norfolk

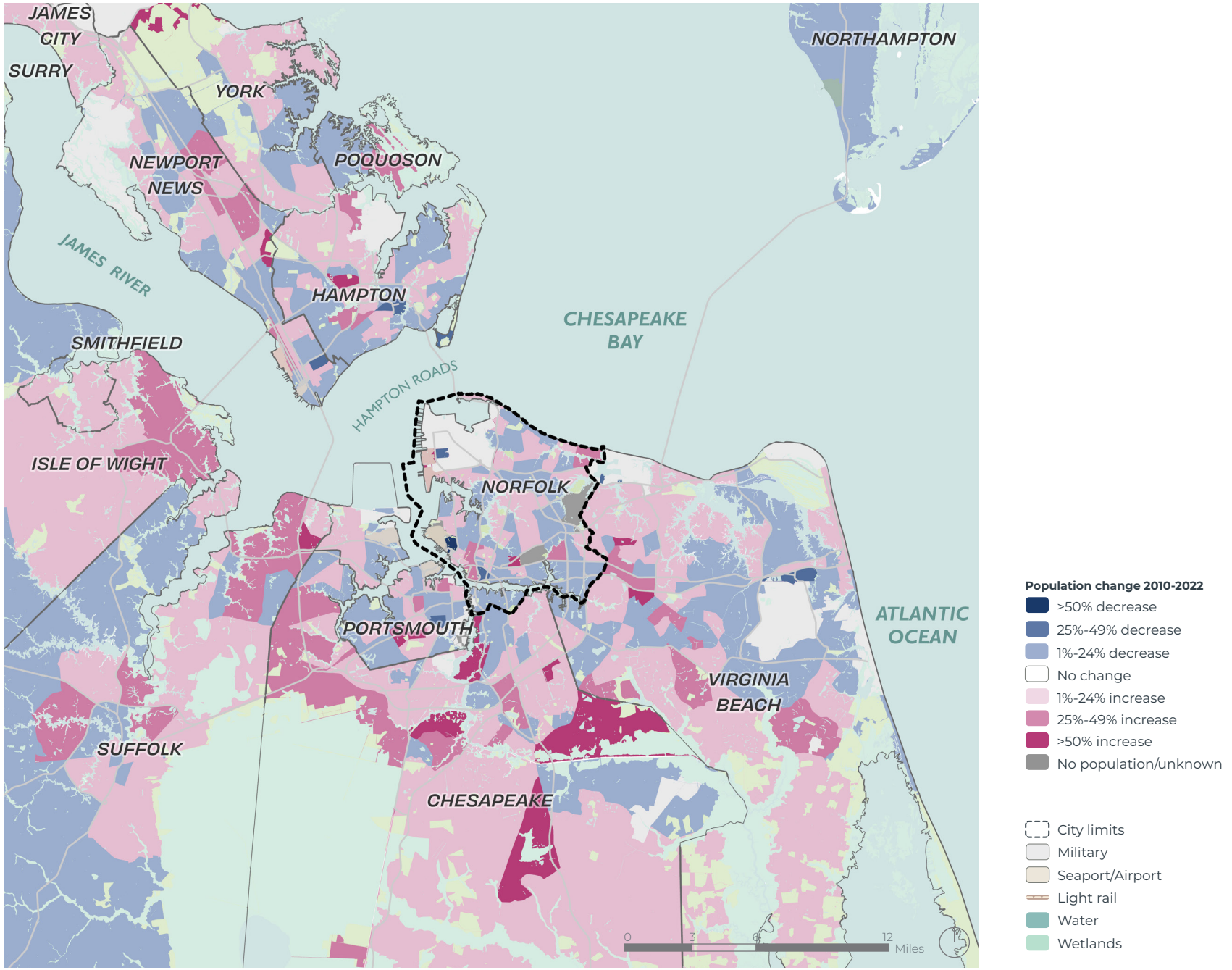


Figure 4: Population change 2010-2022

US Census Bureau, ACS 5-year Estimates, 2010-2022

Pride Fest, 2023 (City of Norfolk)

We have a pretty diverse neighborhood. There are kids who are white, Hispanic and then some of Asian origins. I feel like we have stumbled upon a magical little community. It's not perfect, but it is great!

— Norfolk resident, Workshop #1, October 2023

Age

Norfolk's population is aging. Between 2010 and 2022, the population above 65 years of age increased by 3.4% while those under 18 decreased by 1%. The median age has grown from 29.7 to 32.2 as of 2022. The city also saw a decline in public school enrollment rate by 18.6% as compared to the 7.5% decline in the Hampton Roads region (Virginia Department of Education, Fall Membership 2010-2011 & 2021-2022).

Diversity

Norfolk is becoming more Hispanic and more multi-racial. While 42% of Norfolkians are white, the city observed an increase in Asian, Hispanic and multi-racial populations in the last decade. Neighborhoods like Chesapeake Gardens and Glenwood Park are home to the largest concentrations of Hispanic and Asian communities in Norfolk.

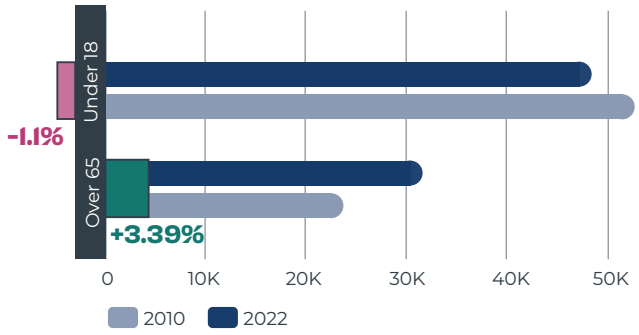


Figure 6: Change in youth and senior population between 2010 and 2022

US Census Bureau, ACS 5-year Estimates, 2010 and 2022

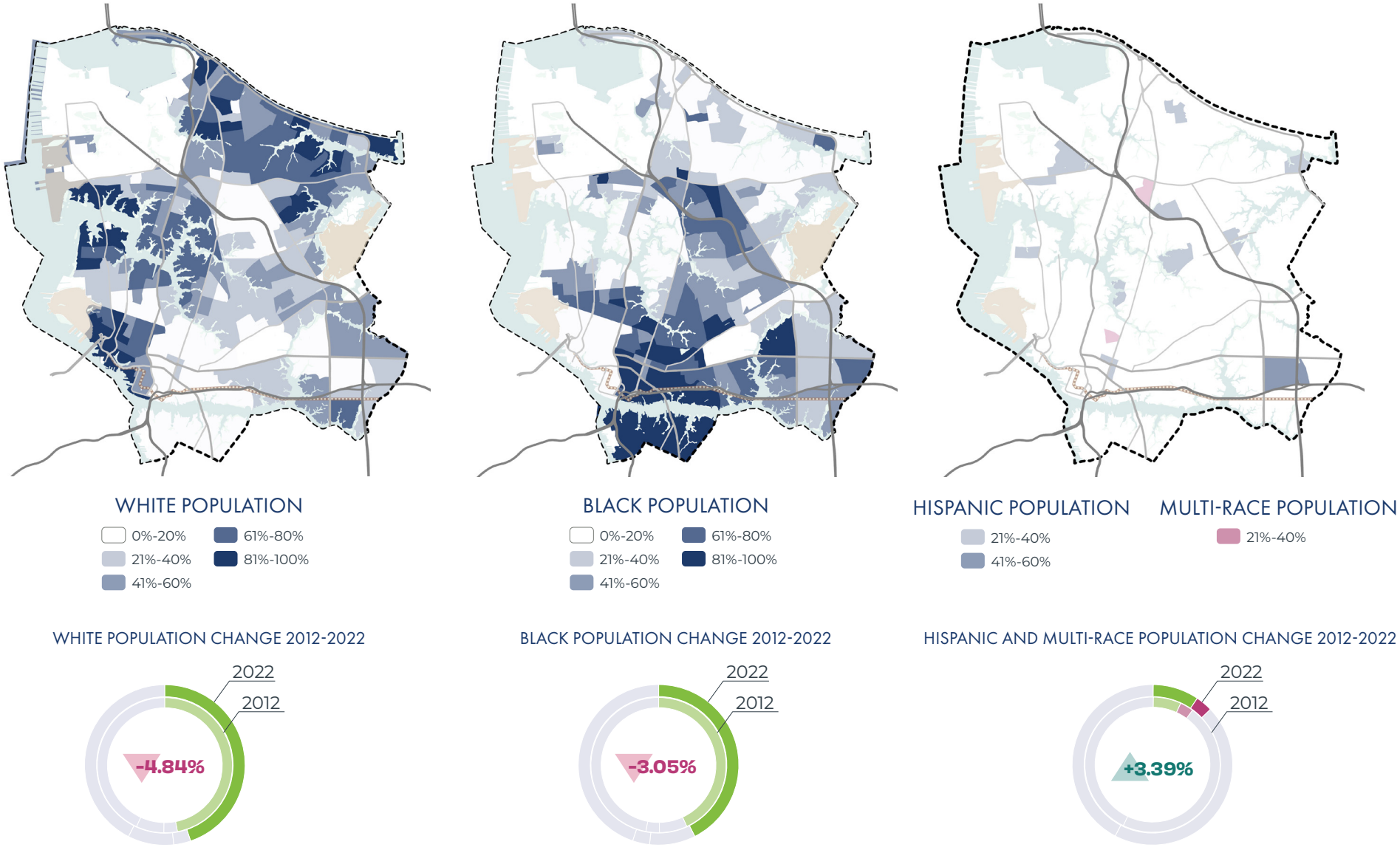
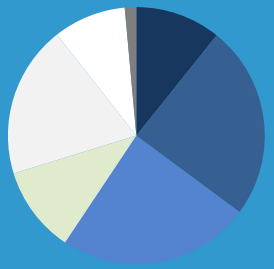


Figure 7: Racial/ethnic make-up of Norfolk, 2022

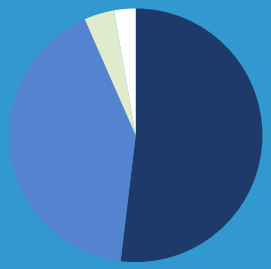
US Census Bureau, ACS 5-year Estimates, 2010 and 2022



30%

of Norfolk's residents hold at least a bachelor degree

- Less than high school
- High school or equiv.
- Some college
- Assoc./Prof. degree
- Bachelors
- Masters



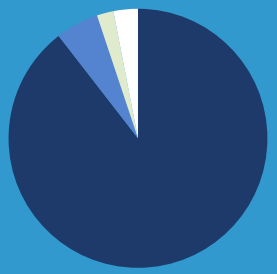
52%

of Norfolk's residents were born in Virginia

41.5%

moved from other states within the US

- Born in VA
- Born in another US State
- Foreign-born US Citizen
- Not US Citizen



89%

of Norfolk's residents speak only English

- Speak only English
- Speak Spanish
- Speak Indo-European
- Speak Asian

US Census Bureau, ACS 5-year Estimates, 2022

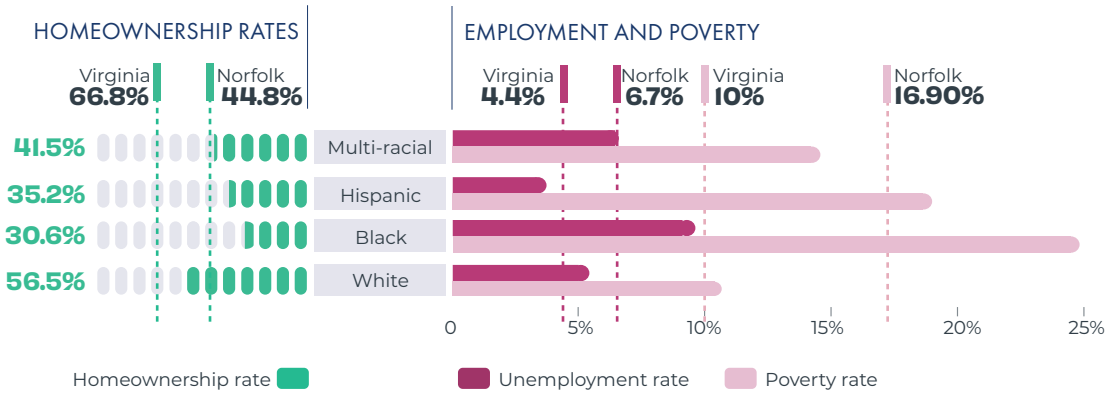


Figure 8: Social inequities in poverty, unemployment and homeownership rates by race/ethnicity
US Census Bureau, ACS 5-Yr Estimates 2022

Equity

Norfolk has a higher rate of poverty and unemployment than Virginia on average. With a 16.9% poverty rate, Norfolk has a significantly larger population living below poverty level compared to the 10% state average.

Economic opportunities vary significantly across racial lines. In Norfolk, where the population is 42% white and 40% Black, a disproportionate number of residents living below the poverty level are Black — 21,544 Black residents are living below poverty level, the highest in the city and over twice the number of white residents in similar circumstances. This inequality extends to housing security, with white residents having a median household income of $76,706 compared to $44,814 for Black residents, which is significantly below the city average of $60,998. Such disparities severely affect the ability of Black residents to accumulate wealth, evidenced by a homeownership rate of just 30.6% among Black Norfolk residents.

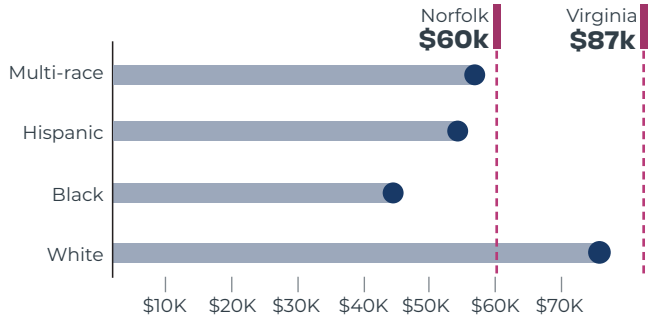


Figure 9: Median household income by race/ethnicity
US Census Bureau, ACS 5-Yr Estimates 2022

National Night Out 2023 (City of Norfolk)

Celebrating our Community

Asphalt Art at Five Points (City of Norfolk)

Norfolk's great strength is its people and their tightly knit communities. For residents of all backgrounds, this city is home and a great source of pride. At its heart, Norfolk's core identity revolves around knowing neighbors, taking care of home, and being a world-class maritime city.

Norfolk Neighborhoods | Historic Districts and Landmarks
Gathering Places & Social Infrastructure
Public Art & Culture Walkable Neighborhoods | Waterfront Access
Downtown Norfolk | Military Presence

CELEBRATING OUR COMMUNITY

INTRODUCTION

Norfolk's sense of community can be understood through multiple lenses: in the historic districts and landmarks preserving the physical heritage of the city; in the social infrastructure of the many Civic Leagues; in the proximity to necessary amenities like grocery stores; and in the many places where Norfolk residents access their waterfront as part of their daily lives.

> **Seeing all the great things that the city was doing between the light rail and the nightlife downtown, and a lot of really interesting and progressive things were happening in Norfolk - I just knew that I would end up back here.**
>
> — Norfolk resident, Workshop #1, October 2023

Beyond homes and workplaces, Norfolk boasts a network of "third places"—spaces where people can gather, socialize, and connect outside their homes. This social infrastructure is one of the keys to Norfolk's strong quality of life, and why many who discover the city decide to stay. In a post-COVID-19 era of flexible work, these third places are becoming more crucial than ever in attracting and retaining an increasingly mobile workforce.

Norfolk's neighborhoods are its day-to-day backbone, but Downtown is the hub of the entire Hampton Roads region. Located along the historic Elizabeth River, Downtown Norfolk is reestablishing itself as one of the city's vibrant neighborhoods; transforming from a nine-to-five financial and commercial district by growing in residents and welcoming new kinds of restaurants, retail, and cultural attractions that appeal to neighbors and visitors alike.

Finally, Norfolk cannot be understood without its relationship to the military. The nation's largest naval base has an immense presence in the city and the region—physically, socially, and economically. Though this plan does not have jurisdiction over national security or federal land, military families and employees are a crucial part of Norfolk's identity.

A volunteer at a 2023 Beach Cleanup Day (City of Norfolk)

(City of Norfolk)

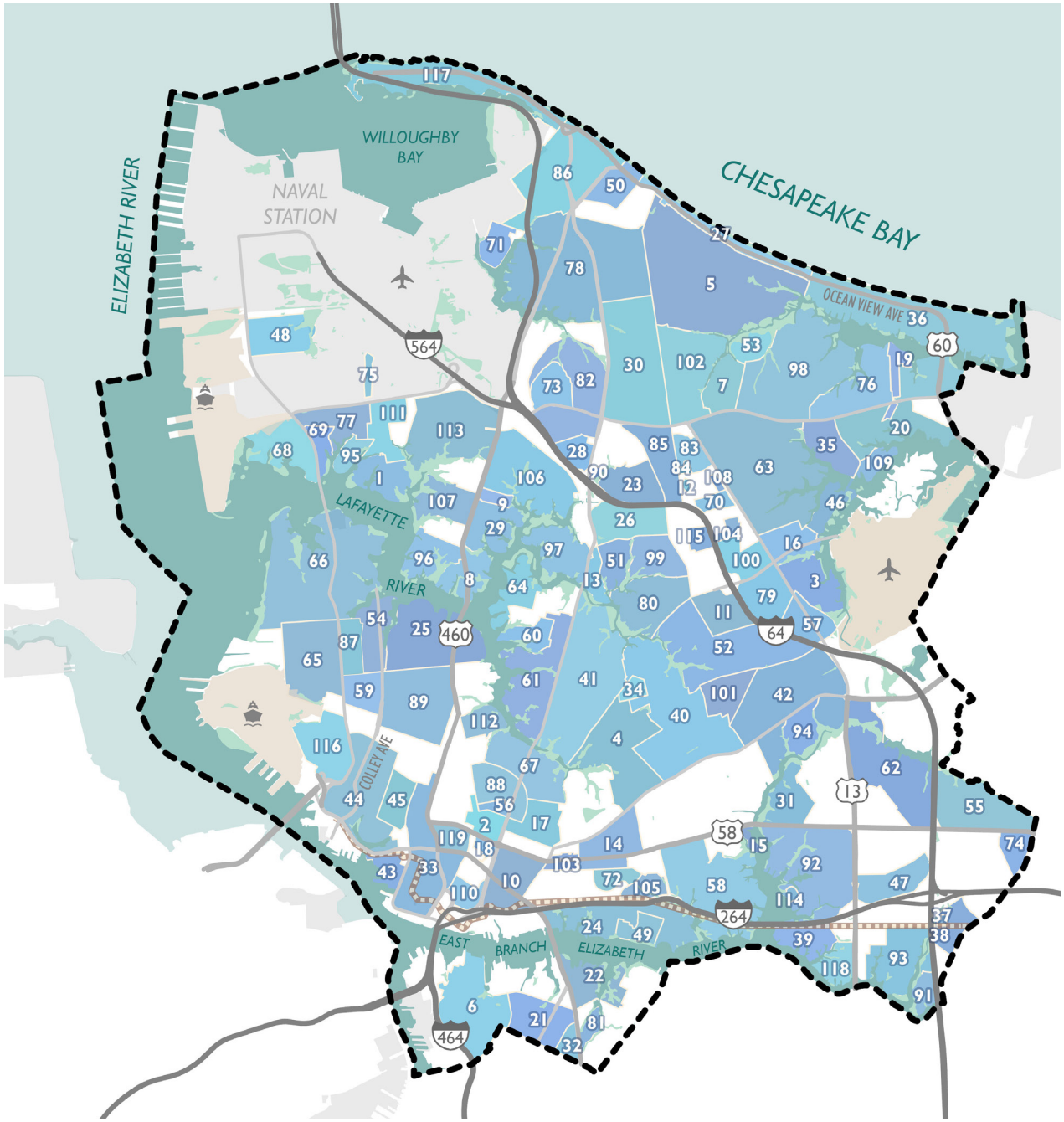
Many neighborhoods are marked with distinctive mermaid gateway signage (City of Norfolk)

NORFOLK'S NEIGHBORHOODS

Norfolk currently has more than 80 active Civic Leagues across the city

Norfolk has many small and close-knit neighborhoods, each serving to build a strong sense of identity and culture with their residents.

Most of Norfolk's neighborhoods, whether historic or newly developed, are represented by active Civic Leagues. Civic Leagues in Norfolk represent more than a name or a boundary. These organizations are empowered to play an active role in the development of their own community. Through formalized processes within the Zoning Ordinance and other City policies, Civic Leagues and other neighborhood organizations are given a voice any time property is rezoned, City-owned property changes hands or is developed, or significant changes are made to public infrastructure within or around their community.



1 Algonquin Park/ North Shore Point
2 Attucks/ Barberton/ Church
3 Azalea Acres/ Azalea Lakes
4 Ballentine Place
5 Bayview
6 Beacon Light Berkley
7 Bel-Aire
8 Belvedere
9 Bollingbrook
10 Brambleton
11 Brandon Place
12 Braywood Manor
13 Brightly - Norview Heights
14 Broad Creek
15 Broad Creek Shores
16 Bromley
17 Bruces Park
18 Calvert Square
19 Camellia Gardens
20 Camellia Shores/ Camellia Acres
21 Campostella
22 Campostella Heights
23 Chesapeake Gardens/ Mamie Homes
24 Chesterfield Heights
25 Colonial Place/ Riverview
26 Coronado/ Inglenook
27 Cottage Line
28 Cottage Road Park
29 Cromwell Farms/ Ellsworth
30 Crossroads
31 Crown Point
32 Diggs Town
33 Downtown Norfolk Civic League
34 East Fairmount
35 East Lynne/ Saratoga
36 East Ocean View
37 Easton Forest
38 Easton Place
39 Elizabeth Park
40 Estabrook/Coleman Place
41 Fairmount Park
42 Fox Hall
43 Freemason Street Area Association
44 Ghent Neighborhood League
45 Ghent Square Comminuty Association
46 Glengariff
47 Glenrock
48 Glenwood Park
49 Grandy Village Advisory Council
50 Greater Pinewell
51 Greenhill Farms
52 Greenwood/Elmhurst/Norview Heights
53 Hewitt Farms
54 Highland Park
55 Hollywood Homes/ Maple Hall
56 Hunters Square
57 Idlewood/ Sandy Heights
58 Ingleside
59 Kensington/ Old Dominion
60 Lafayette Shores Homeowners Association
61 Lafayette/ Winona
62 Lake Taylor
63 Lake Whitehurst West
64 Lakewood
65 Lamberts Point
66 Larchmont/ Edgewater
67 Lindenwood/ Barraud Park/ Cottage Heights
68 Lochhaven
69 Meadowbrook
70 Meadowbrook Woods
71 Merrimack Landing
72 Middle Towne Arch
73 Monticello Village
74 Newtown South
75 Norfolk Crossing
76 North Camelia Acres
77 North Meadowbrook
78 Northside
79 Norvella Heights
80 Norview
81 Oak Leaf Forest
82 Oakdale Farms/ Denby Park
83 Oakmont North
84 Oakmont North Home Owners
85 Oakwood
86 Ocean View
87 ODU Village
88 Olde Huntersville
89 Park Place
90 Partrea
91 Pleasant Point
92 Poplar Hall
93 River Forrest Shores/ Wayside Manor
94 River Oaks
95 Riverfront
96 Riverpoint
97 Roland Park
98 Roosevelt Area
99 Sewells Gardens
100 Shadywood East
101 Sherwood Forest
102 South Bayview
103 Spartan Village
104 St Andrews Place
105 Stonebridge Crossing
106 Suburban Acres
107 Talbot Park
108 Tanners Creek
109 The Gardens
110 Tidewater Gardens
111 Titustown
112 Villa Heights
113 Wards Corner
114 Waverly on Broad Creek
115 Wellington Oaks
116 West Ghent
117 Willoughby
118 Woodbine
119 Young Terrace

City limits
Military
Seaport/Airport
Light rail
Water
Wetlands

Figure 1: Norfolk's rich network of Civic Leagues, covering most of the city geography

City of Norfolk; WPA

HISTORIC DISTRICTS AND LANDMARKS

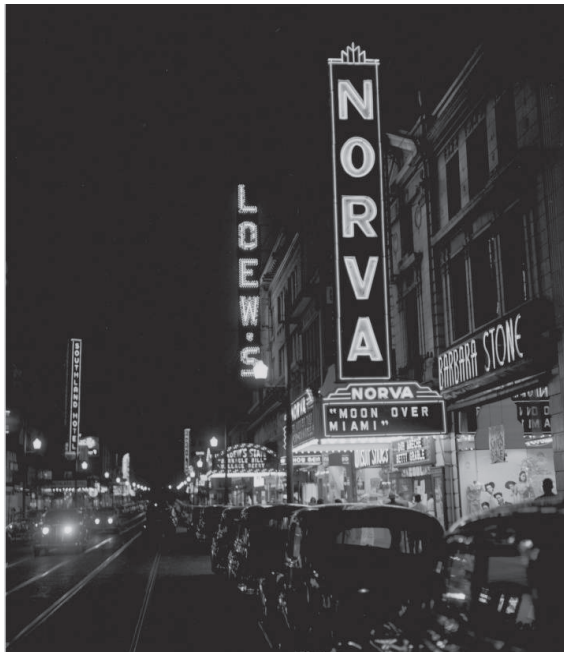
Norfolk's rich neighborhood infrastructure is quite literally built on the city's history: historic districts mark the early city development and align with historic streetcar lines.

Attucks Theatre (National Trust for Historic Preservation)

The city's historic districts and landmarks generally reinforce the development timeline of the city, with the largest number of sites in the portions of the city that were developed earliest. **Norfolk has a strong community of historic preservation advocates dedicated to preserving the city's history through its built environment.**

Currently Norfolk has four locally designated historic districts: East Freemason; Ghent; West Freemason; and the Downtown Historic Overlay District. Within these districts, all major architectural changes must be approved through the design review process. The City of Norfolk has two sets of guidelines: Local Historic District Guidelines, used for all local historic districts and landmarks, and Norfolk & Western Historic Overlay District Guidelines.

There are also 15 National Register Historic Districts, and 47 individually listed Historic Landmarks, including the USS Wisconsin, Talbot Hall, First Colony, Linde Air, Zion Methodist Church, Tidewater Supply Company, Boys & Girls Club, Fire Station 12, and Park Place Methodist Church.



Neon lights on Granby Street, circa 1940 (Virginian-Pilot)

By 2050, Norfolk will be a great example of architecture and historic place preservation.

— Norfolk resident, online engagement, Winter 2023

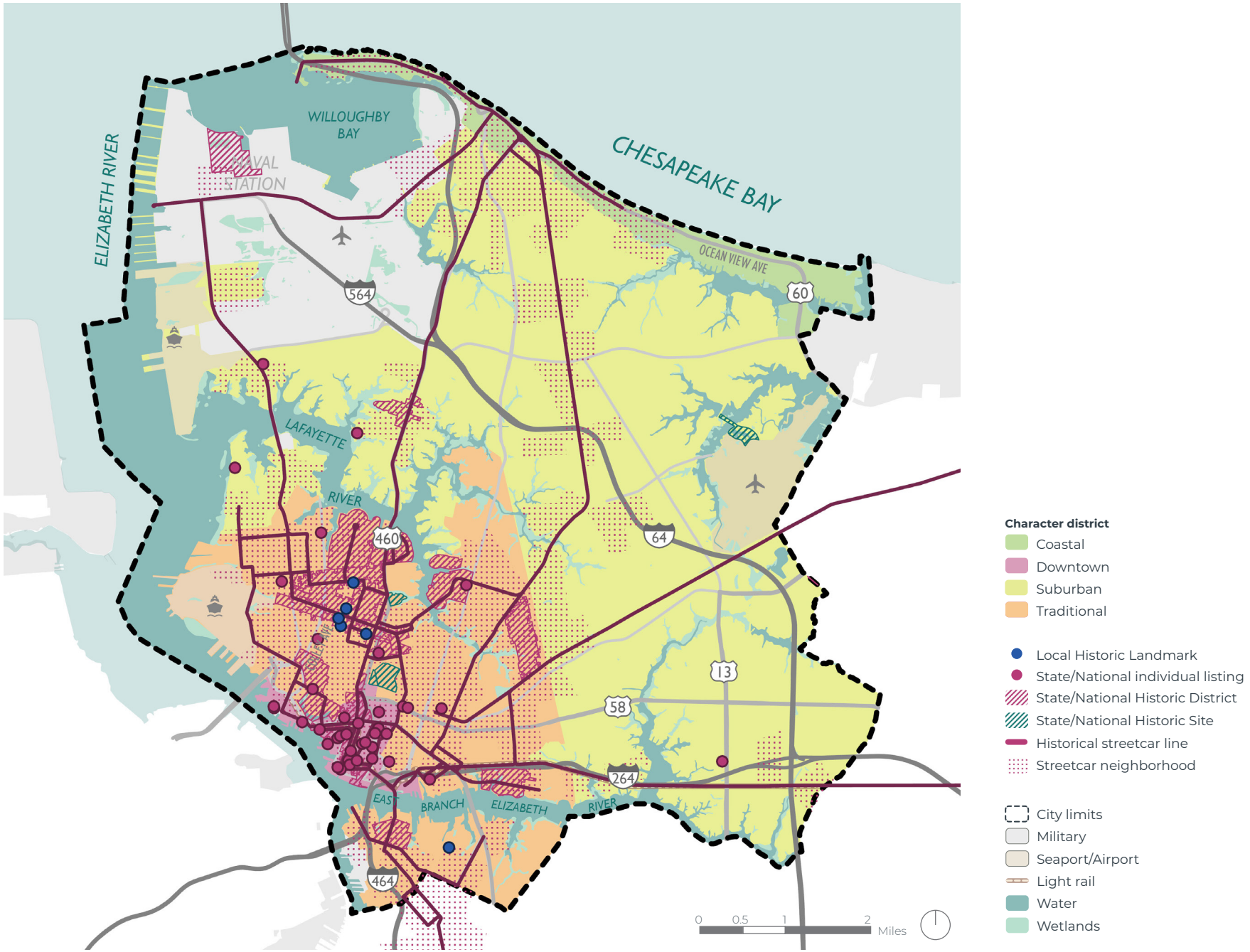


Figure 2: Historic Districts and landmarks, character districts, historic streetcar lines, and streetcar neighborhoods

City of Norfolk; Sargeant Memorial Collection; Virginia Department of Historic Resources; WPA

SUCCESS!

CHARACTER DISTRICTS

The establishment of Character Districts in Norfolk as a result of plaNorfolk2030 created a framework to establish differing development standards based on the character of development of an area.

Norfolk's Character Districts led to adoption into the Zoning Ordinance and has become the basis for development standards such as minimum vehicle and bicycle parking requirements, form standards for new development, and open space requirements.

An example of an implemented plaNorfolk2030 recommendation includes:

- LU1.2.3: Establish parking standards within the Character Districts based on the most current research on parking by the Institute of Traffic Engineers, and other professionally-recognized organizations.

"We don't really talk about our history here and it's a very long one. It's a very interesting one. I wish the city would invest more in its historical resources.

— Norfolk resident, Workshop #1, October 2023

Historic housing along the Hague, built around the turn of the 20th Century (City of Norfolk)

US Customs House in Downtown Norfolk, completed in 1859 and still serving its original function (WRT)

GATHERING PLACES AND SOCIAL INFRASTRUCTURE

Norfolk's neighborhoods that were developed in what is now known as the Traditional Character District are defined by smaller parcels with varied land uses and dense street networks. Today, this supports a great density and variety of gathering places, sometimes known as "social infrastructure" - the places outside of home and work that Norfolk residents and stakeholders gather, socialize, and relax. **These places, such as restaurants, coffee shops, libraries, and other places where a community can engage in social activities are typically within walking distance of most residents and are in some cases integrated within the neighborhood.**

The consolidation of commercial uses along larger arterials can be seen in the eastern part of the city that was developed later in the 20th century. This development pattern is also based on larger parcel sizes with more uniform land uses and a branching street network that funnels residents to the large collector and arterial roads, along which the commercial zoned properties are concentrated. In these areas of the city, secular gathering places are typically limited to those commercial centers and are primarily accessible by automobile. Where commercial or secular gathering places are absent from large regions of the middle and late-20th century-annexed portions of the city, religious institutions fill in those gaps.

The analysis shows a disparity in access to gathering places and daily amenities: neighborhoods that developed early in the traditional pattern have easier access than those that developed later in the auto-oriented era.

Pop-up concert at "The Plot," a repurposed vacant lot in Downtown Norfolk (City of Norfolk)

Norview Community Center (City of Norfolk)

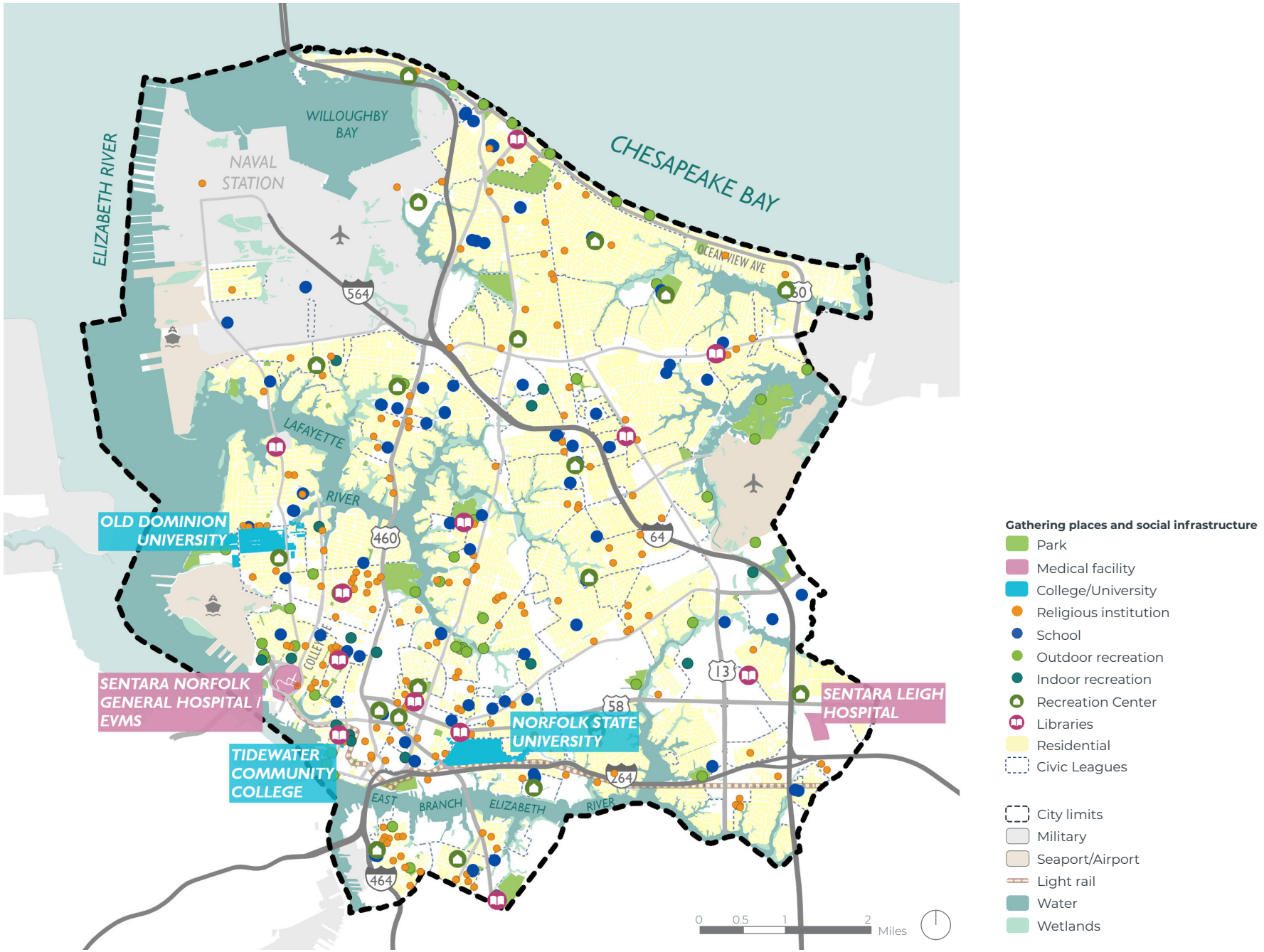


Figure 3: Social infrastructure in Norfolk

City of Norfolk; Open Street Map; WPA

PUBLIC ART AND CULTURE

Norfolk is fortunate to have public art – sculptures, murals, and the city's iconic mermaid statues – throughout the city, with a particular presence Downtown and in the nearby neighborhoods.

PUBLIC ART:

Norfolk has a very active Public Art Commission, known as Norfolk Arts. The commission seeks opportunities to install public art in diverse parts of the city to enhance the public realm. Works are commissioned in all media from artists of varied backgrounds (Norfolk Arts). Sculptures are commissioned to commemorate people, places, and events as well as to reflect individual community's sense of identity. Murals are painted throughout the city on streets and buildings to beautify spaces and provide passersby with delightful moments of inspiration, affirmation, and wonder. Norfolk's Mermaids on Parade was introduced to the community by prominent lawyer and businessman Pete Decker and his wife, Bess Decker (City of Norfolk). Currently there are 85 known mermaids throughout the city put up by residents, businesses, organizations, and institutions (City of Norfolk). Each mermaid is an individual work of art with a distinct theme.

> **"Norfolk will be known for being a diverse city that welcomes all people to celebrate history, arts, and culture**
>
> — Norfolk resident, online engagement, Winter 2023

Painting a leopard-themed Mermaid for public display (City of Norfolk)

One of many murals enlivening Downtown Norfolk (WRT)

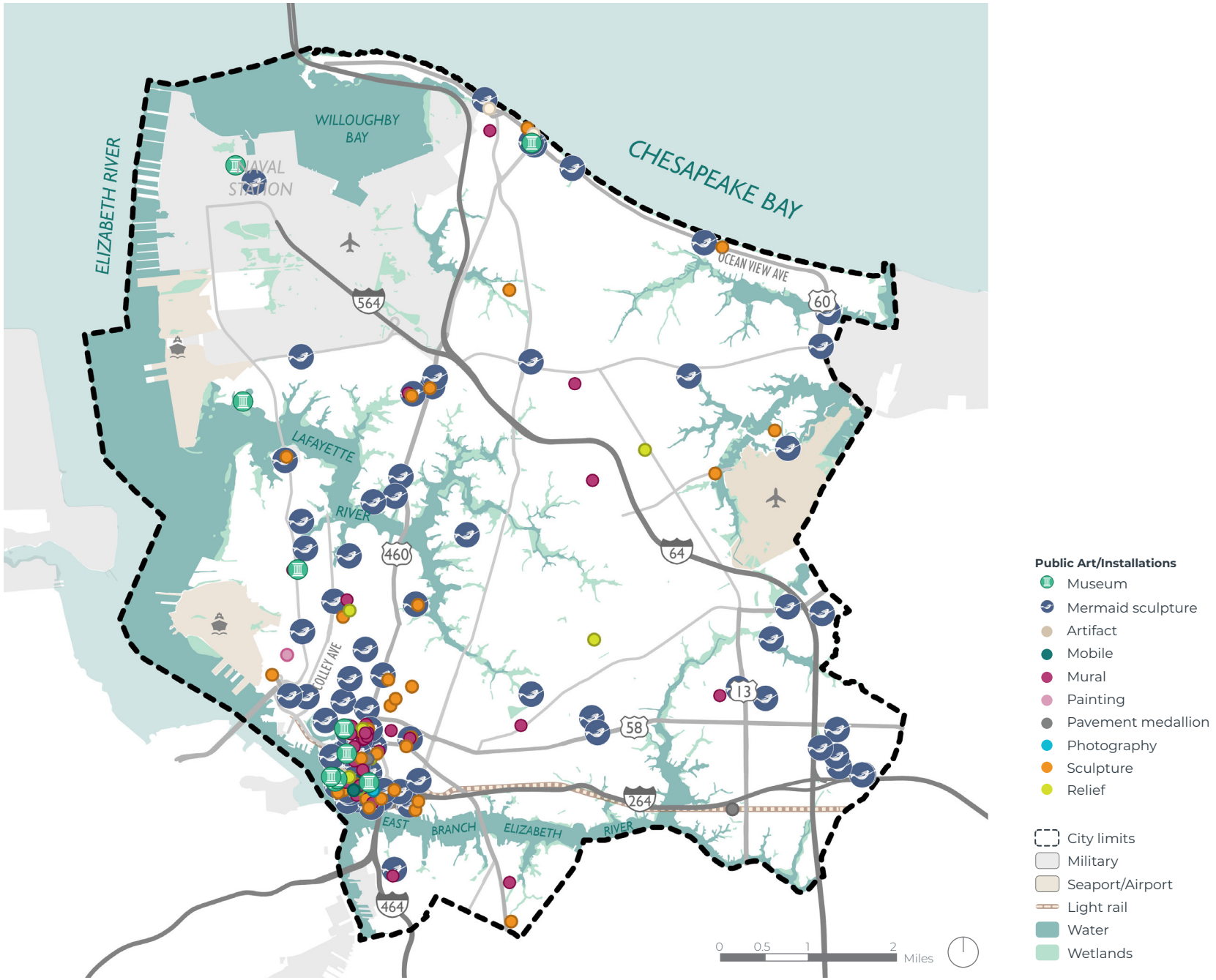


Figure 4: Public art: sculptures, murals, and mermaids; museums and cultural institutions

City of Norfolk; WPA

The NEON Arts District

The NEON Arts District, located just north of Downtown Norfolk, was born out of community-led efforts over a span of several years. The Canvas public art project spearheaded efforts in 2010, bringing art to the vacant storefronts of this former automotive showroom and repair corridor (The NEON District). Through grassroots organizing and strategic planning charrettes, the art communitiy created and quickly updated the district master plan, guiding the rapid redevelopment of the area. The emerging community selected the NEON name to reflect the spirit of the New Energy Of Norfolk that was felt with each new project (The NEON District).

The Downtown Norfolk Council, an independent not-for-profit organization that administers the Downtown Improvement District, was an early supporter of the NEON District and continues to program, plan, and facilitate events within the District like NEON Fest and the annual call-for-artists to add to the District's collection of murals (Downtown Norfolk Council).

MUSEUMS:

Norfolk has several museums dedicated to organizations such as Fire and Police and the Navy, as well as museums that are focused on a specific structure such as the Hunter House Museum and the Moses Myers House. The Chrysler Museum of Art, the Chrysler Museum Perry Glass Studio, the Barry Arts Museum, and the Hermitage Museum and Gardens are the four museums dedicated to the arts.

The Chrysler Museum of Art (City of Norfolk)

Park Place mural (Trevor Lucas)

SUCCESS!

CERTIFIED LOCAL GOVERNMENT

The City was successful in achieving Certified Local Government (CLG) status in 2015, as called for in plaNorfolk2030, to strengthen and expand local preservation efforts. CLG status support local historic preservation efforts with the following:

- Promotes community-wide preservation; recognizes and supports a community's local preservation programs;
- Establishes the credentials of quality for local preservation programs;
- Allows Norfolk to apply for CLG grants through federal Historic Preservation Funds (HPF); and
- Created Architectural Review Board (ARB), streamlining multiple committees into one and increasing its purview.

WALKABLE NEIGHBORHOODS

While much of Downtown and adjacent neighborhoods are quite walkable, neighborhoods across the city are uneven in providing safe, attractive infrastructure for pedestrians.

Through an analysis of factors that encourage walkability - including street trees for shade and cooling, sidewalks, dining and shopping destinations, and proximity to open spaces, schools, and libraries - Norfolk is shown (opposite) to have uneven walkability across the city. Much of the eastern and northern areas of the city, typically developed later in the 20th century when car access was already widespread, is found to lack street infrastructure or meaningful destinations or both.

Not all eastern or northern neighborhoods are found to be lacking in pedestrian amenities, though - some notable exceptions include East Ocean View, Northside, Cottage Road Park, and Glenwood Park.

Neighborhoods with sidewalks and street trees are much more pleasant to walk than those without (WRT)

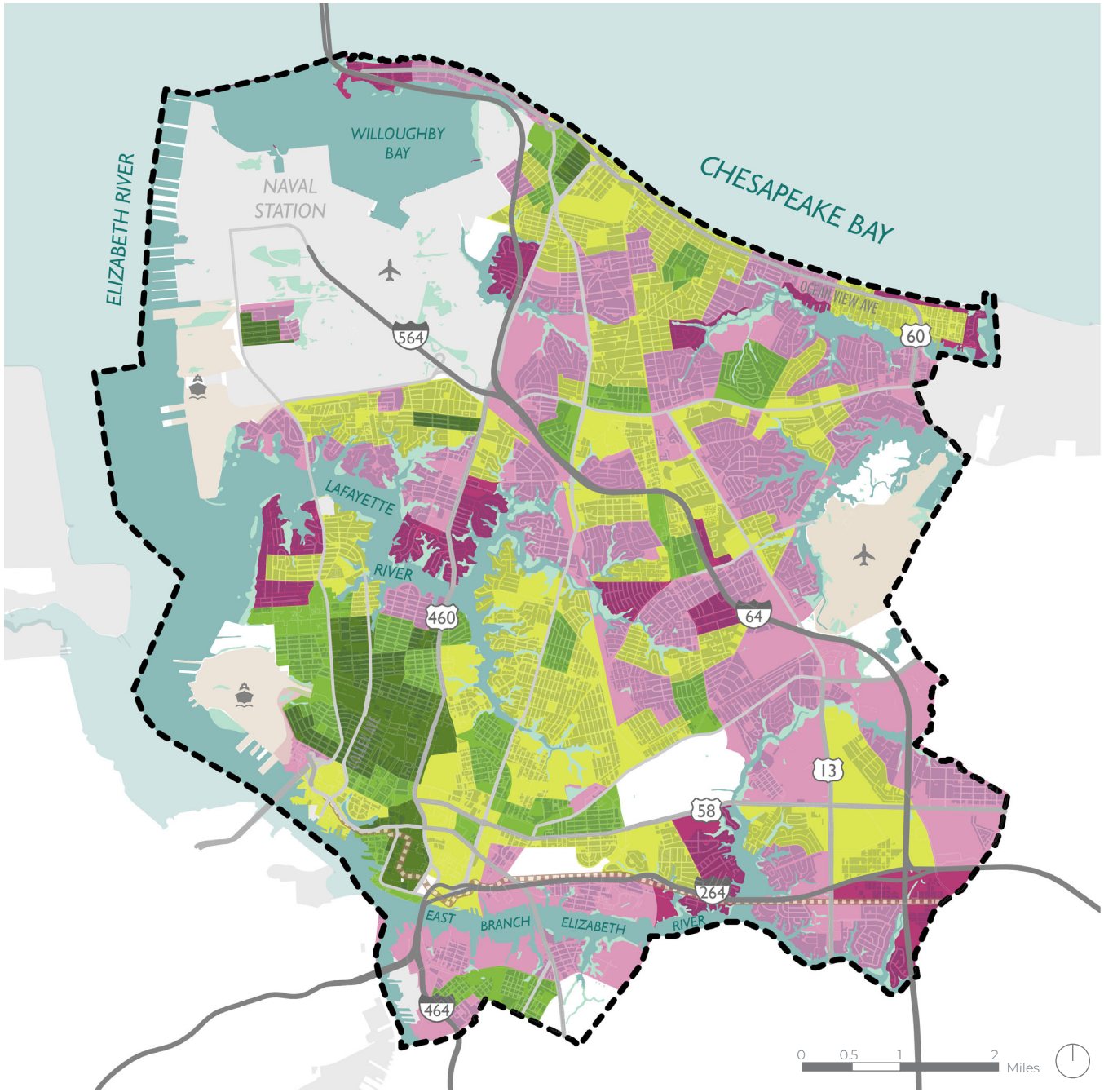


Figure 6: Norfolk neighborhood walkability scores

City of Norfolk; WPA; HRTPO

Ocean View beach (WRT)

ACCESS TO WATER

Norfolk is defined by its relationship to water, but not everyone in the city has equal access. Large sections of the city's shoreline are private, however, there is an emerging and diverse network of trails and public waterfront access.

Public access to the waterfront provides an opportunity for Norfolk's citizens to enjoy many environmental and social benefits. Equitable access to the water is integral for the welfare of the community, especially in a city where every one of the five wards contains at least some shoreline. plaNorfolk2030 envisioned a rich variety of waterfront parks and recreational opportunities for citizens and set a goal of providing public access to the water for every ¼ miles of the shoreline.

In total, Norfolk has almost 190 miles of shoreline.

The 189.72 miles of Norfolk's shoreline can be subdivided into **8 distinct waterfront areas** with different characteristics and access:

- **Chesapeake Bay** stretching along Ocean View Ave has public beaches and parks with walkable access.
- **Little Creek** is surrounded by residential areas with the only public access at Tarrallton Community Park.
- **Lake Whitehurst Reservoir** is surrounded by residential areas and the Airport on the east, but allows recreational access via the Botanical Gardens, though paid membership is required for access. The new Lake Wright and Chesapeake Bay Southside Loop Trails will reinforce the system of Elizabeth River Trail.
- **Mason Creek** has partial access from the Forest Lawn Cemetery and Bay View Park in the southern part, with Northside Park Mountain Bike Trails.
- **Elizabeth River Waterfront** stretches along restricted zones of the Naval base and port. The main water access areas are Plum Point Park, Wisconsin Plaza, and recreation areas around Nauticus and Town Point Park.

- **Chesapeake National Historic Trail** stretches along the riverbed providing access from the water with the Capt. John Smith National Historic Boat/Water Trail.
- **Lafayette River**'s residential waterfront has public access limited to Lakewood Park, Virginia Zoo, Barraud Park, and Calvary Cemetery. plaNorfolk2030 and the 2018 updated Zoning Ordinance introduced a Coastal Resilience Overlay along the waterfronts; if further enforced, this will introduce wetland restoration, green trails, and more opportunities for public access.

Elizabeth River (ONE Architecture)

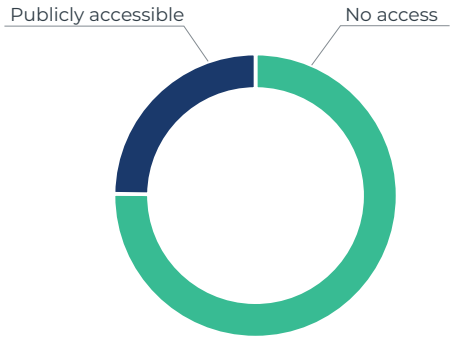


Figure 7: Waterfront accessibility (miles)
City of Norfolk

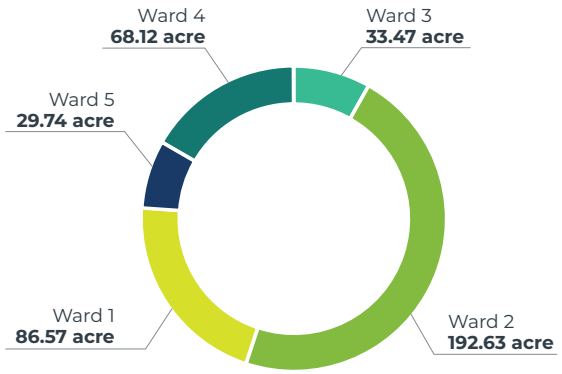


Figure 8: Waterfront parks per Ward
City of Norfolk

Ohio Creek Greenway (ONE Architecture)

"I love the waterfront. It's a very lively place and I think that Norfolk should always incorporate that in everything they do.

— Norfolk resident, Workshop #1, October 2023

- **The Eastern Branch of the Elizabeth River** in Berkley and Campostella have some of the highest concentrations of industrial uses along the water. The mix of commercial and industrial uses in the Downtown area also prevents public access with the exception of Harbor Park and the Eastern Branch Elizabeth River Paddling Trail, which counts with 10.5 miles of trail connecting Eastern Branch with the Lafayette River.
- **Broad Creek** in Chesterfield Heights and Ingleside has privately owned riverfront, with the Azalea Little League Baseball field within the industrial hub and wetlands in the northern sector.

Factors constituting the opportunities to access the water are land use and ownership, public trails, parks, and greenways, and sidewalks within a 10-min walking distance (300-ft buffer) from the shore.

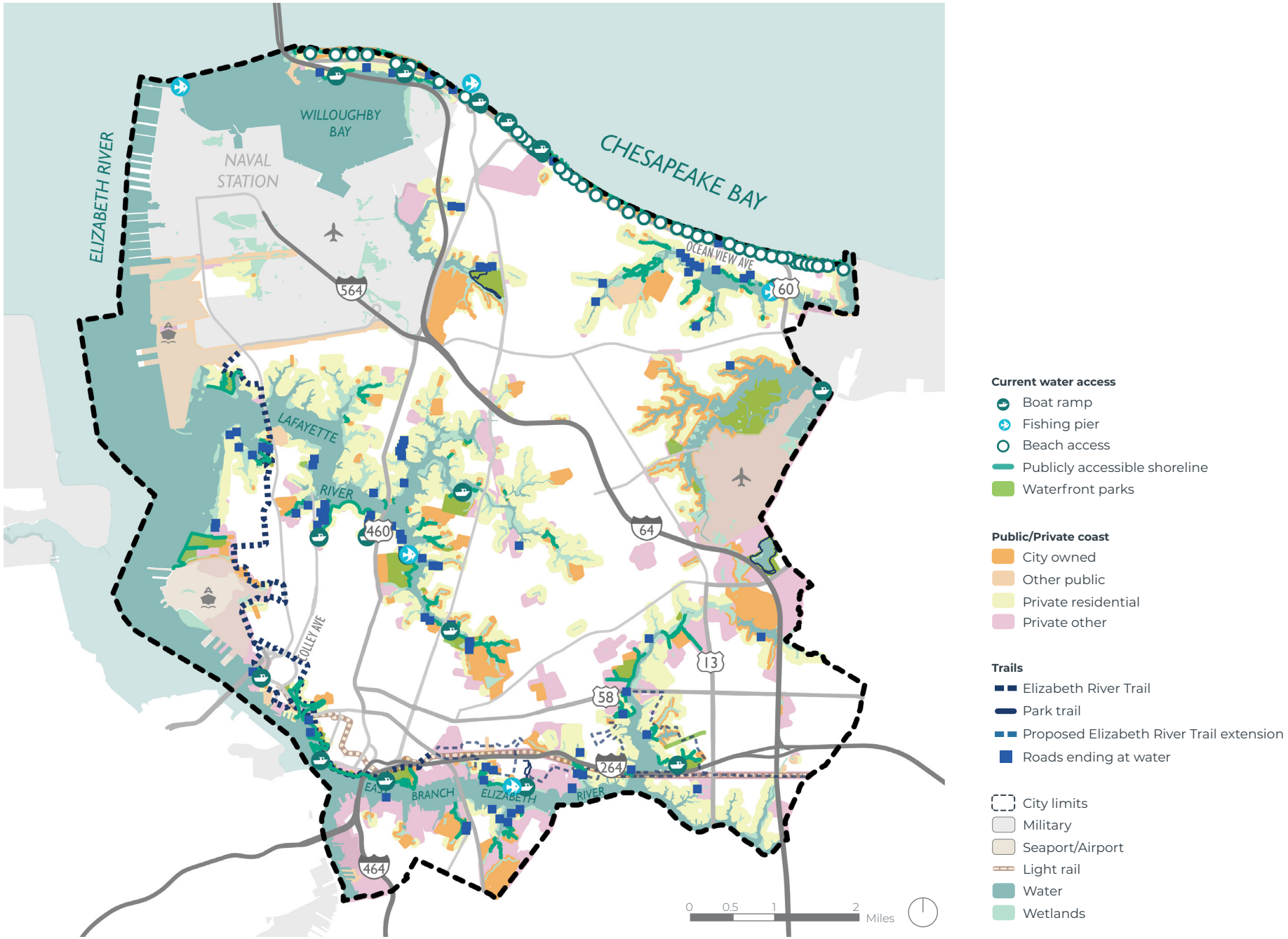


Figure 9: Public waterfront access and proximity to residential areas

Source: City of Norfolk

Downtown and the Elizabeth River (City of Norfolk)

DOWNTOWN NORFOLK: A REGIONAL GEM

Situated on the original 50 acres of the Town of Norfolk, Downtown is the historical, commercial, and cultural heart of the city and the entire Hampton Roads region.

Formerly a center of maritime trade with a waterfront lined with wharves, oyster packing houses, and warehouses, **Downtown has evolved into a regional business center with 1,100 businesses calling it home** (P.U.M.A., 2024). The core of the city features the greatest concentration of class A office space in the area housing a workforce that is 50% knowledge sector workers (P.U.M.A., 2024) Over 18,000 workers commute into Downtown each day, representing 15% of the city's total workforce (P.U.M.A., 2024).

Downtown Norfolk (WRT)

Downtown's cultural attractions include restaurants, performing arts, sports, and outdoor festivals. Of the storefront businesses in Downtown, 46% are restaurants, bars, cafés or other types of dining establishments (P.U.M.A., 2024. Downtown Storefront Inventory). Chrysler Hall, Harrison Opera House, the Wells Theatre, Scope Arena, and Harbor Park are all located within Downtown and respectively house the Virginia Symphony Orchestra, the Virginia Opera, the Virginia Stage Company, the Norfolk Admirals ECHL hockey team, and the Norfolk Tides MiLB baseball team in addition to concerts, speaking engagements, Broadway shows, and many other performances. Chrysler Hall is also the home venue for the Norfolk Forum, "the oldest publicly-subscribed speakers' forum in the country" which hosts "series of lectures from eminent individuals covering cultural, literary, and governmental issues before the nation" (The Norfolk Forum, 2024).

Tourism brings several hundred thousand visitors per year to Downtown through conferences and conventions, cruise ship travel, and the many festivals and events programmed by FestEvents and the Virginia Arts Festival (P.U.M.A., 2024. Downtown Attractions). The Downtown hotel industry has remained strong post-COVID and posted a 6-year high Average Daily Rate in 2023 (P.U.M.A., 2024. Visitation by the Numbers).

Being situated in the first 50 acres, the city Downtown was Norfolk's first neighborhood. However, like many downtowns throughout the United States, Downtown Norfolk transitioned to a commercial and financial center through the mid-twentieth century, providing employment for suburban residents of surrounding communities but being home to very few residents itself. This trend is reversing and **Downtown Norfolk is reemerging as a vibrant neighborhood, increasing in population by over 85% since 2010** (P.U.M.A., 2024). This increase in residents has also resulted in an increase in neighborhood-serving businesses locating in Downtown to provide goods and services to these new residents. This early stage of neighborhood restoration has primarily attracted young people in the 25-34 year old range and empty nesters 65 years and older, resulting in an average household size of 1.44 (P.U.M.A., 2024). To attract and retain larger households and a broader range of ages and family types, Downtown will need to make schools, child care, groceries, and a greater variety of goods and neighborhood-scale services available within a conveniently walkable distance.

Over 18,000 workers commute into Downtown Norfolk every day

Downtown Norfolk (WRT)

MILITARY PRESENCE

Naval Station Norfolk is one of the region's largest employers with over 110,000 employees. Constructed on the site of the Jamestown Exposition shortly after World War I, the naval base occupies 4,600 acres and is currently homeport to 47 ships including six aircraft carriers.

Naval Station Norfolk supports the operational readiness of the US Atlantic Fleet, and is critical to national security in an increasingly volatile time across the globe.

The safety, well-being and mission-readiness of service members as well as private contractors that work at Naval Station Norfolk are of paramount importance. In 2019, the Hampton Roads Planning District Commission developed the Norfolk-Virginia Beach Joint Land Use Study (JLUS) that honed in on addressing accessibility challenges on Norfolk's roads resulting from sea level rise and tidal/nuisance flooding. The Navy depends on the region's local governments for its roadways, utilities, and many support services. Five core challenges were identified that influenced the analysis of interdependencies and vulnerabilities:

GETTING TO WORK

Over 200 miles of regional and local roadways were identified in the JLUS planning process as either primary or secondary corridors serving the Navy, including those corridors that are part of the Department of Defense Strategic Highway Network (STRAHNET). The impacts of tidal flooding on roadways will be exacerbated by additional sea level rise in the future. If these routes are congested, flooded, or otherwise impeded, the ability of Navy personnel and civilians to get to work could be impacted, thereby impacting mission readiness. The conditions can result in operational inefficiencies, impact planned operations or security, and result in loss of work time. A reliable transportation network is essential for ensuring mission readiness and the smooth, efficient movement of both people and goods to and from the Navy installations.

ACCESSING COMMUNITY FACILITIES AND SERVICES

Roadway flooding along key corridors and in neighborhoods also limits access to community facilities that military personnel regularly rely upon, such as schools and hospitals, and life-safety services that they may require, such as police, fire, or emergency response. Floodproofing assets or elevating them above the floodplain will provide minimal benefit to the greater community if large numbers of residents are unable to access the facility due to roadway flooding.

Naval Station Norfolk welcomed over 110,000 employees in 2022

MANAGING STORMWATER

Undersized and/or inadequately maintained stormwater infrastructure can cause or exacerbate flooding issues on roadways and adjacent properties. Each locality owns its own stormwater infrastructure, which is managed and maintained by the City's Public Works department. Likewise, the Navy owns and maintains stormwater management infrastructure that is located on base. However, runoff from the installations often ends up in the localities' stormwater systems, and vice versa. Varying design standards and inconsistent maintenance regimens across the network can contribute to degraded system performance in some areas.

MAINTAINING UTILITY SERVICES

Infrastructure providing utilities such as power, water, and wastewater is critical for maintaining operations on a military base. These networks are provided by the cities and other sources outside of the installations. Any disruption to the utility network infrastructure from current or future flooding could significantly disrupt military operations. Facilities located in vulnerable locations may face additional challenges due to flooded roadways that limit access for repairs.

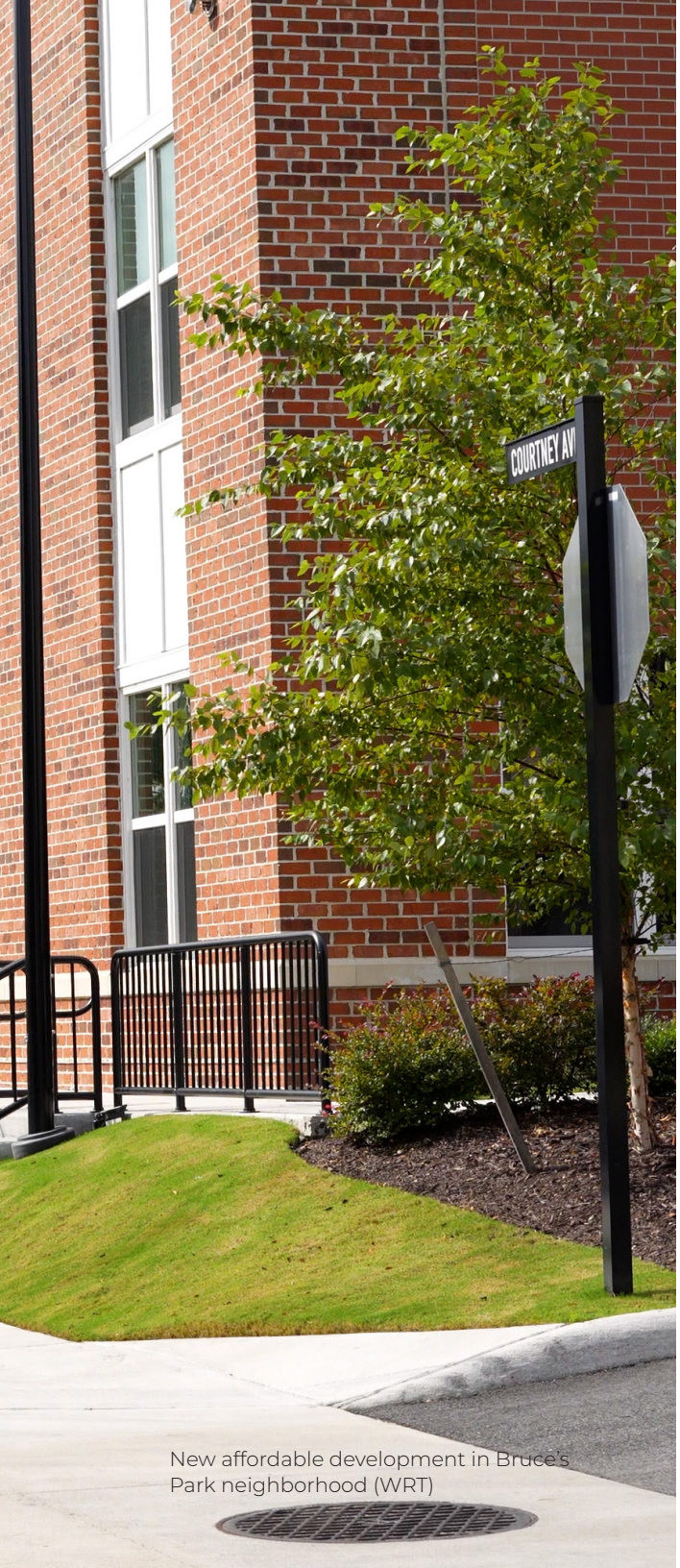
COORDINATING BETWEEN JURISDICTIONS

Effective regional planning requires coordination among federal, state, and local government agencies and the private sector. Good examples of partnering exist and can serve as a model for building on the cities' existing mechanisms for coordination with the Navy moving forward.

Source: Virginia Beach Joint Land Use Study; Hampton Roads Planning District Commission, August 2019; AECOM

Military Service members becoming US Citizens at a ceremony on the USS Wisconsin (City of Norfolk)

Growing Equitably



New affordable development in Bruce's Park neighborhood (WRT)

Norfolk is home to service members, professors, teachers, nurses, small business owners, students, and others looking for opportunity. The next quarter century of equitable growth will shape the city for future generations of Norfolk residents to proudly call the Mermaid City home.

Norfolk's Housing Landscape | Historic Redlining | Housing Affordability | Housing Value | Living with Water
Job & Industries | Commercial Nodes | Regional Job Competition

GROWING EQUITABLY

INTRODUCTION

Housing is top of mind for Norfolk residents. Rising housing costs for residents at all ends of the income spectrum may be compounded by the rising risk of flooding, and macro-level shifts in employment, interest rates, and demographics create large-scale challenges for the whole region. Looking forward, Norfolk's unique neighborhoods and the resilience and ingenuity of residents can be the cornerstone to achieving truly equitable growth.

> **Norfolk will be affordable, walkable, resilient, growing, with a thriving arts and nightlife scene, and full of opportunities for all no matter what your background is!**
>
> — Norfolk resident, Workshop #1, October 2023

Norfolk is not unique in its housing affordability challenges - nationwide costs are spiking, especially in the wake of the COVID-19 pandemic. While housing costs in Norfolk have been rising, especially in recent years, the city as a whole has also not experienced much growth. There are many factors that contribute to this – most notably, perception challenges, lack of desired housing types, challenges from flooding, and disinvestment due to historic injustices. This uneven housing market is Norfolk's primary community development challenge.

Conversations about housing must be intertwined with conversations about income. In Norfolk, concentrations of extreme high income and low income are creating perceptions that the city is not welcoming for households in between. A large-scale, sustainable intervention may be needed to construct, rehabilitate, relocate and upgrade homes in Norfolk, or else residents may continue to be housing insecure and the city will be fiscally vulnerable. The City is looking into housing solutions via a strategic housing study, and NFK2050 will build on those strong foundations currently being laid.

Norfolk will grow equitably when its neighborhoods are invested in fairly. Postcard image-worthy neighborhoods can balance maintaining their timeless character while also inviting in new residents, creating a truly equitable Norfolk for all.

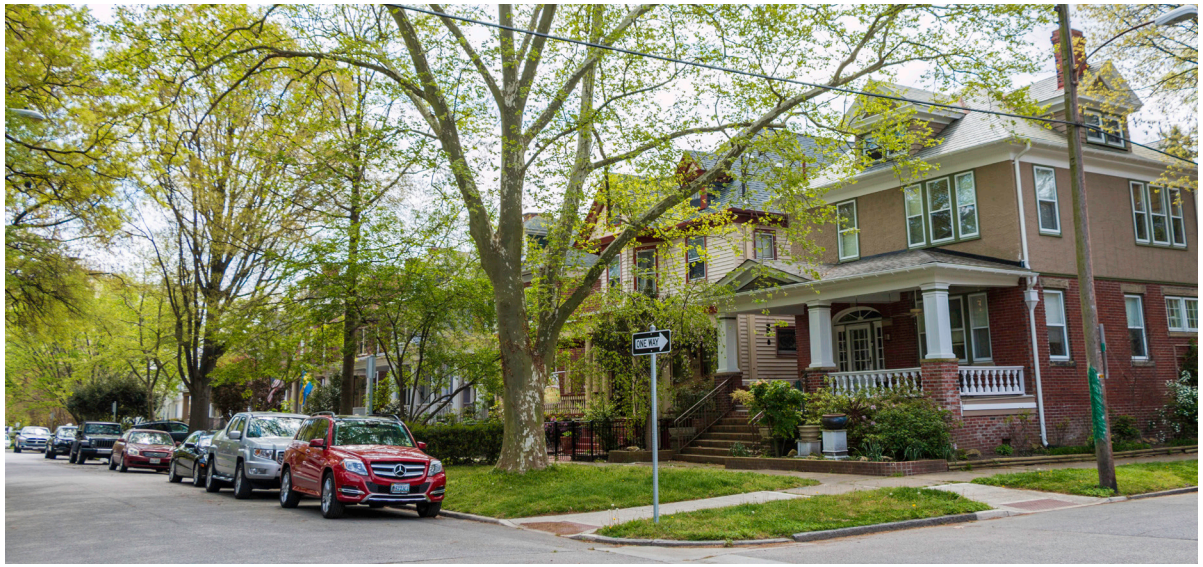
New green infrastructure in historic Chesterfield Heights helps to address flooding inequities (WRT)

NORFOLK'S HOUSING LANDSCAPE

Like most cities, Norfolk produced less new housing in the past decade than in any previous era.

The pace of housing development in Norfolk and the surrounding region has slowed in the past decade. The total number of housing units (both rental and homeownership units) produced fell by 1,000, from about 7,100 in 2000-2009 to 6,150 in 2010-2019. Of that total, only 2,170 were rental units.

Most new housing developments are focused in Downtown Norfolk, East Beach, and the vicinity of Old Dominion University, with average monthly rents of $1,500. These units, predominantly studios to two bedrooms, lack affordability restrictions and thus tend to cater to residents with higher incomes. Additionally, the limited number of bedrooms means they are less suitable for families or larger households, further narrowing their accessibility.



A tree-lined residential neighborhood (City of Norfolk)

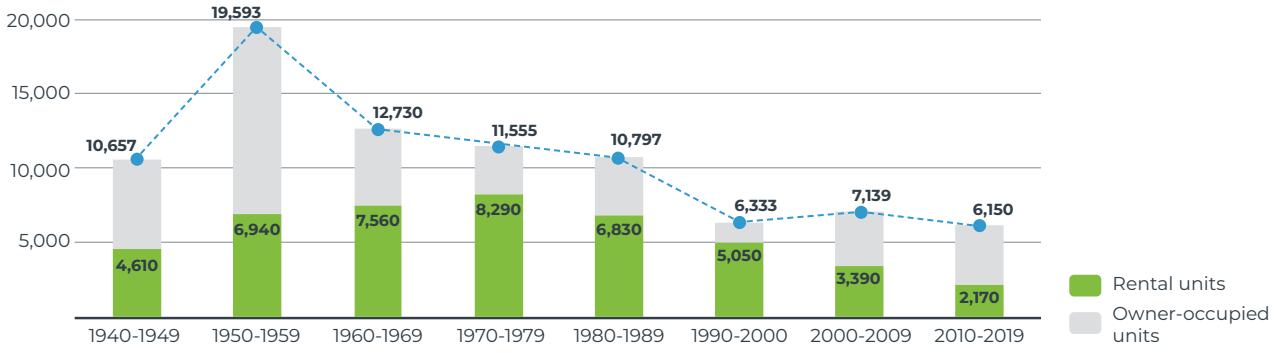
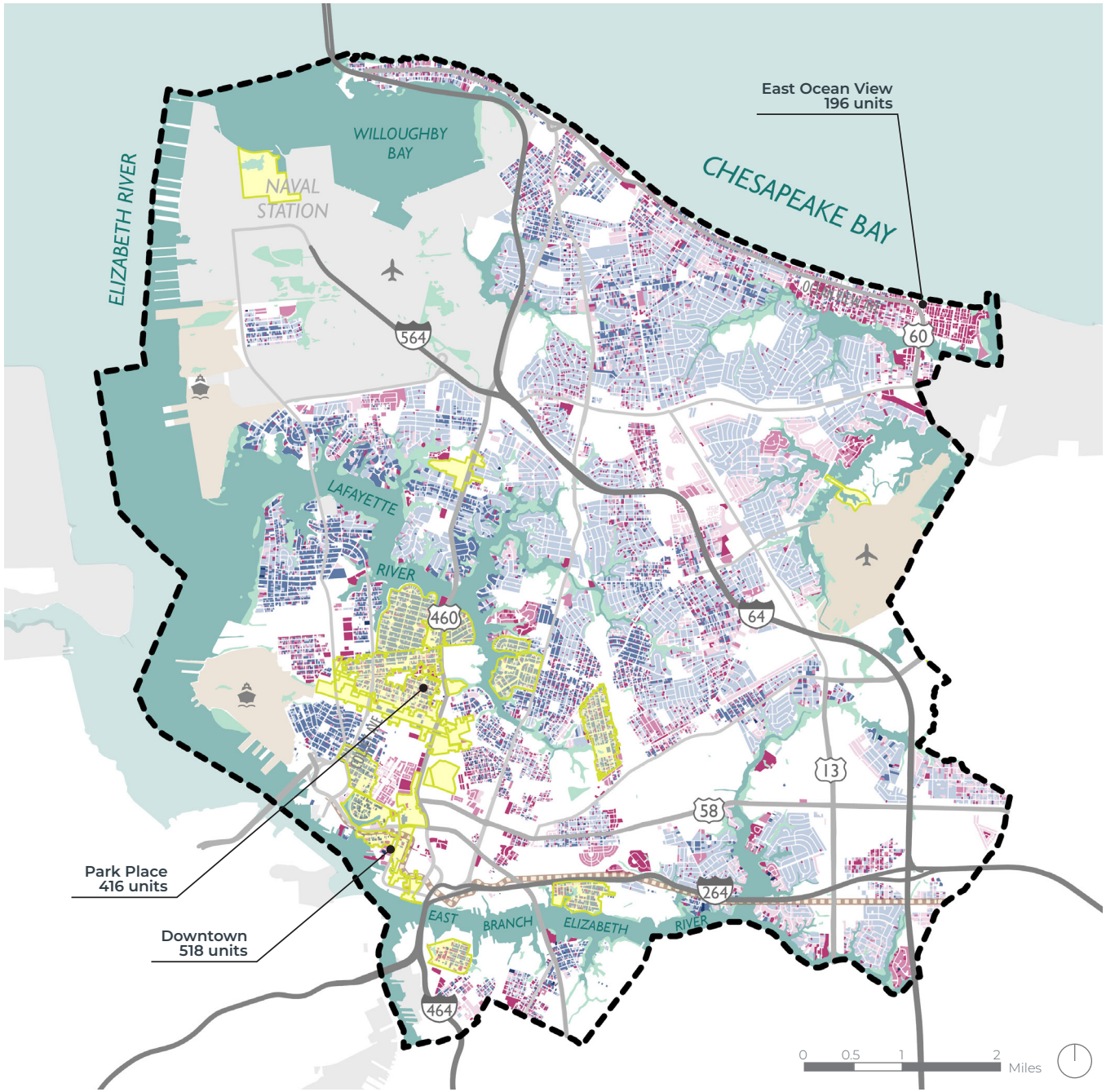


Figure 1: Change in total housing units produced by decade

Source: ACS 2020, 5-year estimates



77% of housing units were built before 1990

Figure 2: Housing age by decade and historic districts

Source: US Census Bureau, ACS 5-Year Estimates, 2022; City of Norfolk

SUCCESS!

Pattern and Plan Books

Since plaNorfolk2030, a number of pattern books have been adopted to help guide the design standards of new development. Taken as a whole, these pattern and plan books contribute to enhancing the form and design of new construction while respecting the character of a specific neighborhood or area of the city. Examples of how these pattern books have improved the quality of Norfolk's built environment include the following:

- Traditional Neighborhoods Plan Book for Olde Huntersville and Bruce's Park
- Huntersville Area Action -- N5.1.15(k). Ensure quality infill development that preserves affordability by creating a plan book and creating development opportunities on vacant lots.
- The Traditional Neighborhoods Plan Book for Olde Huntersville has resulted in more than 56 homes constructed in the six years since the Plan Book took effect in contrast to the 12 homes built in the previous 6 years.

Norfolk's affordable rental housing stock is aging.

In Norfolk, the bulk of rental properties priced under $1,000 per month were constructed prior to 1980, suggesting that the rental options affordable to households earning below 100% of the median household income are predominantly over 40 years old. Consequently, these older properties are more likely to require rehabilitation or repairs than those built more recently. It is vital to maintain the quality of these older homes without significantly raising the rent to ensure long-term housing stability in Norfolk.

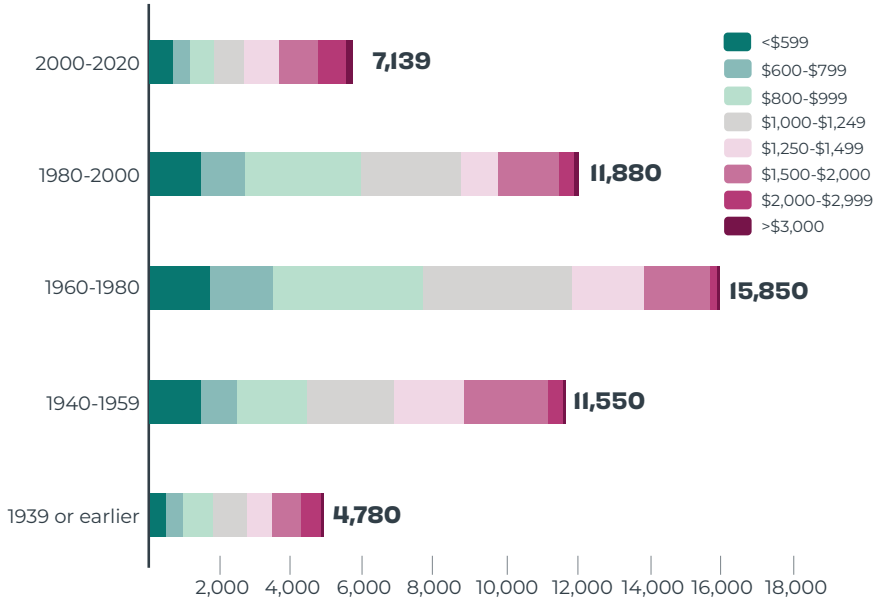


Figure 3: Rental units by monthly rent and decade built

Source: US Census Bureau, ACS 5-Year Estimates, 2022; HR&A

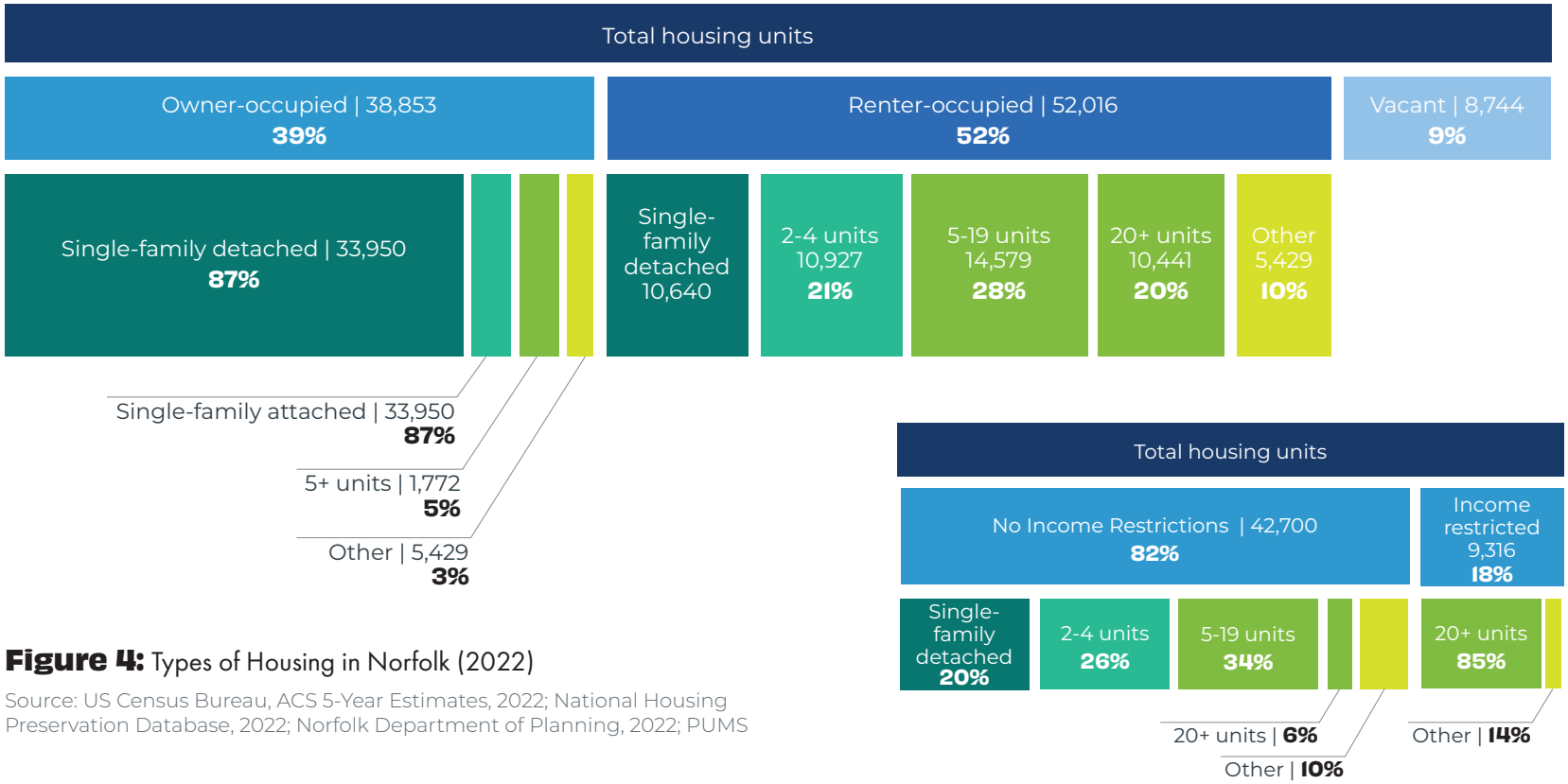


Figure 4: Types of Housing in Norfolk (2022)

Source: US Census Bureau, ACS 5-Year Estimates, 2022; National Housing Preservation Database, 2022; Norfolk Department of Planning, 2022; PUMS

Norfolk has more diversity in existing housing stock than the rest of the region.

Over a third of Norfolk's housing stock is rental housing with two or more units, the highest in the region. Today the city's total housing inventory is comprised of 98,000 units, 91% of which are occupied. Of these, 52,000 are renter-occupied units that are made up of a diverse range of housing types.

Norfolk's households are increasingly renting rather than owning, particularly for moderate to higher income households.

This increase is reflective of both macroeconomic trends such as rising interest rates that drive decreasing homeownership access and local housing inventory trends. Norfolk's rental housing inventory has grown since 2010 while the for-sale inventory declined modestly during that period.

What is Missing Middle Housing?

- **The form, scale, and type of housing that fits in with single-family** walkable neighborhoods.
- **House-scale buildings** that happen to have multiple tenants (both renters and owners).
- **Housing Choice** - broad range of housing types such as duplexes, triplexes, “Norfolk’s six-packs”, town-homes, courtyard apartments, cottage courts and more.
- **Attainability** - high quality homes that are sustainably affordable by, virtue of design, for our workforce - teachers, firefighters, nurses, and long-term care professionals.

SINGLE-FAMILY DETACHED
Lavalette Ave, Norfolk

← *less dense*

DUPLEX | SIDE BY SIDE **Ocean View, Norfolk**

TRIPLEX | STACKED
Westover Ave, Norfolk

FOURPLEX | STACKED
Graydon Ave, Norfolk

SIXPLEX | STACKED + SIDE BY SIDE
Brandon Ave, Norfolk

DUPLEX | STACKED **Harrington Ave, Norfolk**

SIXPLEX | STACKED (NORFOLK SIX PACK)
323 W. 28th St, Norfolk

more dense →

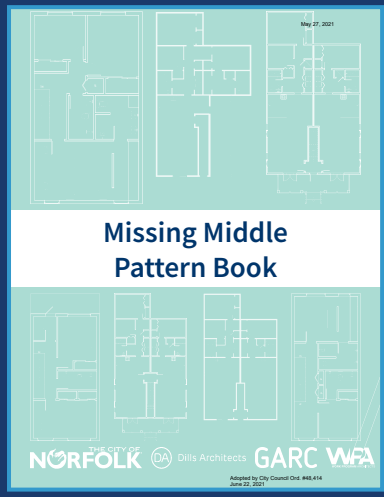
COTTAGE COURT (Small cottages around a central green)
East Beach, Norfolk

ACCESSORY DWELLING UNITS East Beach, Norfolk

COURTYARD APARTMENTS Westover Ave, Norfolk

TOWNHOUSES AND MULTIPLEX Greenway Ct, Norfolk

LIVE + WORK UNITS East Beach, Norfolk



Norfolk's "Missing Middle Pattern Book," adopted in 2021, outlines these housing types and more, and the regulatory and financing steps that can support their development.

MID-RISE APARTMENTS Fort Norfolk, Norfolk

HISTORIC REDLINING

Legacy racial segregation continues to impact Norfolk's housing market

"Redlining" was the discriminatory practice of determining which neighborhoods were "good investments" for mortgage lenders, and which were deemed as too risky. As mapped in the 1930s, **overwhelmingly, the neighborhoods that were seen as too risky to back with federal dollars were communities of color.**

The designation of neighborhoods from "best" to "hazardous" as a consequence of redlining had a significant impact on Norfolk's housing market. Entire neighborhoods graded "hazardous" - comprised primarily of African Americans, immigrants, and low-wealth households - were denied mortgages.

These discriminatory lending practices caused a negative feedback loop. As mortgage loans became harder to federally insure, redlined neighborhoods received less public and private investment. Consequently, home values did not increase at the same pace of comparable homes located in non-redlined neighborhoods, artificially suppressing homeowners' equity creation. Altogether, the effects of redlining have deepened an already present cycle of disinvestment in these communities while exacerbating the racial wealth gap.

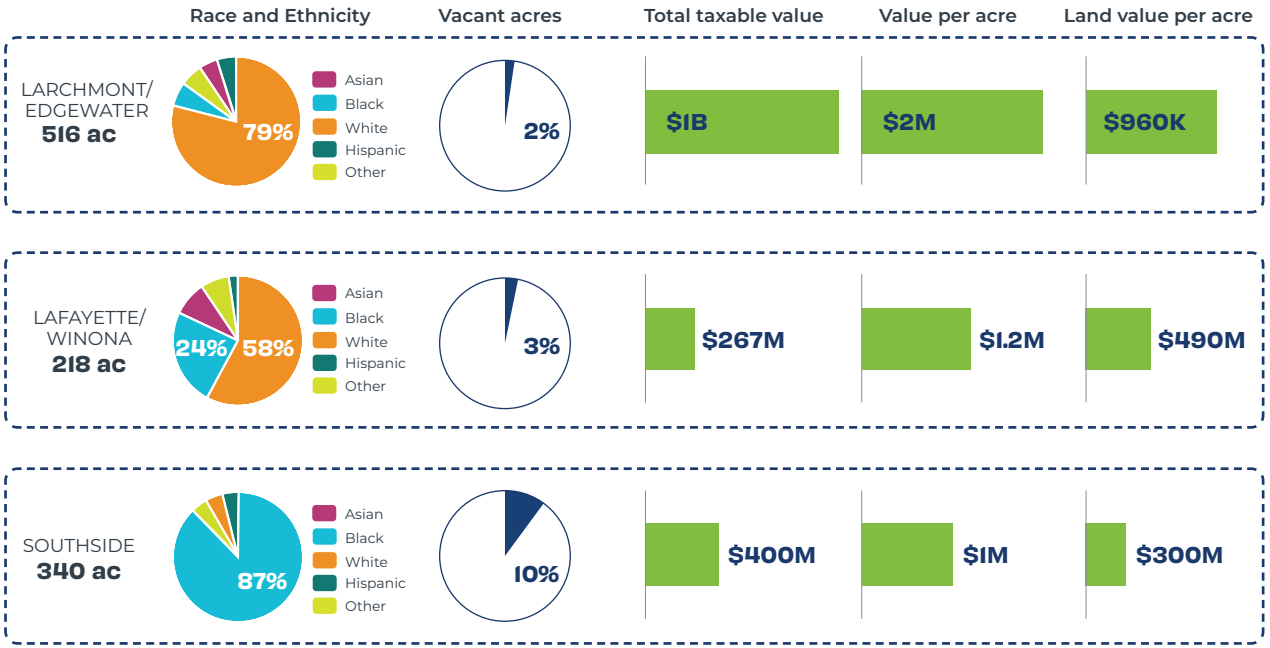


Figure 5: Neighborhood comparison summary

Source: City of Norfolk Assessor, 2023; 2020 Decennial Census; University of Richmond; HOLC

Much like many other historically redlined cities, the lasting effects of this discriminatory practice are still present in Norfolk. This can be illustrated in the figures above that compare the following Civic Leagues: Larchmont/Edgewater (HOLC rating: "B - Still Desirable"), Lafayette/Winona ("C - Definitely Declining"), and Southside ("D - Hazardous"). When looking at demographics, we can see that Larchmont/Edgewater is a predominantly white community, Lafayette/ Winona hosts more diversity, and Southside is nearly 90% African American. Of the three communities, Southside also contains significantly more vacant land, as well as the lowest property and land value per acre (see p.34 for a description of value per acre).

While discrepancies persist, these differences in metrics between the historically "safe to invest" neighborhoods and Norfolk's historically redlined neighborhoods are actually less extreme than many other American cities, due to city policies which have aimed to rectify these injustices.

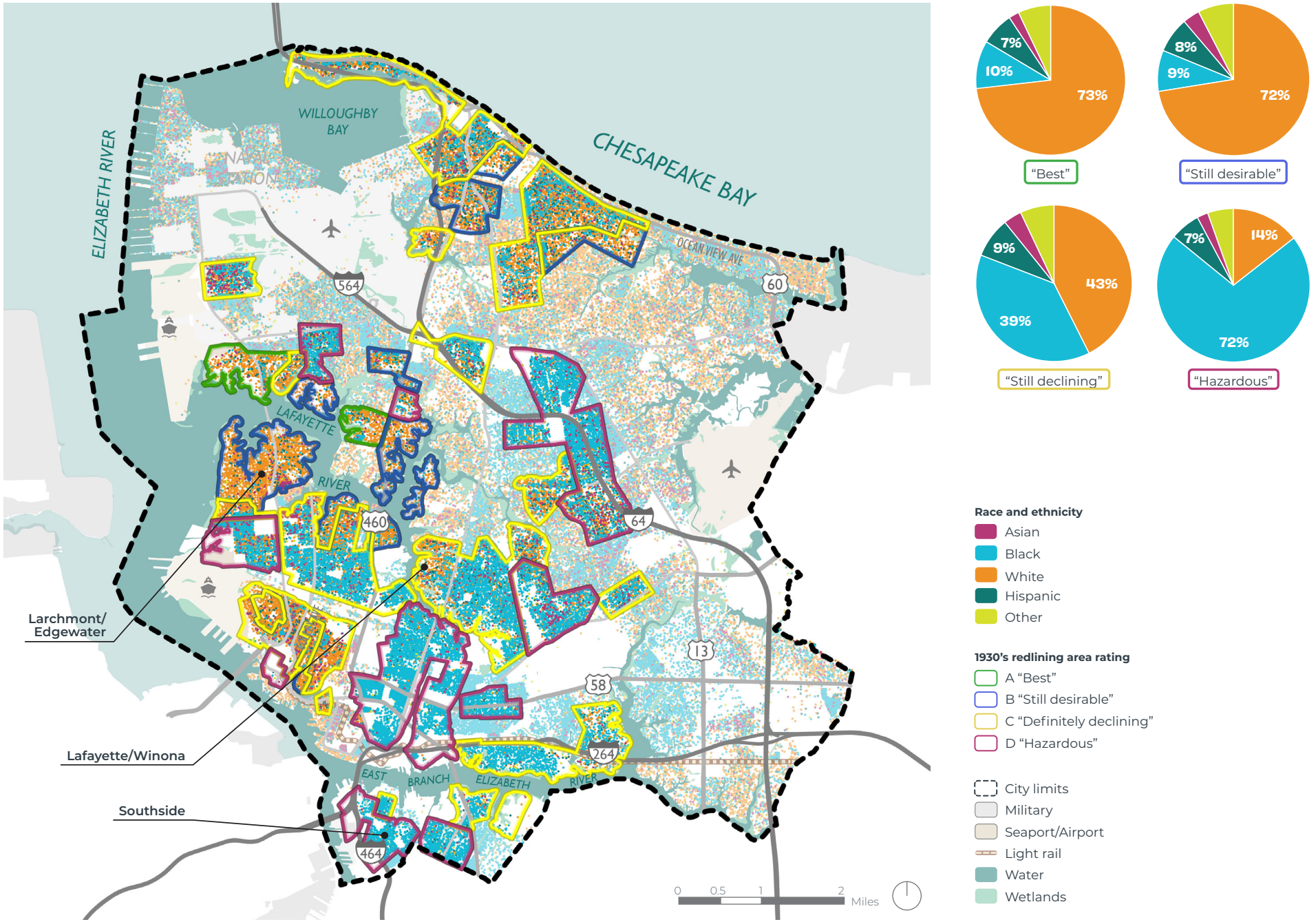


Figure 6: 1930s redlining area ratings and 2020 population demographics

2020 Decennial Census; University of Richmond; HOLC

HOUSING AFFORDABILITY

Recent increases in interest rates have impacted home purchase affordability for Norfolk's average household. Previously, the purchasing capacity of a median-income household was relatively in line with home prices until recently with inflated home values and rising interest rates.

The median gross rent has been consistently unaffordable for the median-income renter household, which makes about $41k annually compared to $90k for owner households.

With persistent poverty and rising prices, rental affordability is a challenge in Norfolk, especially for low-income households.

The majority of Norfolk's low income households struggle to afford rents. Renter households making an annual income between 30-50% AMI are the most severely cost burdened with more than 87% paying over 30% of their income on rent.

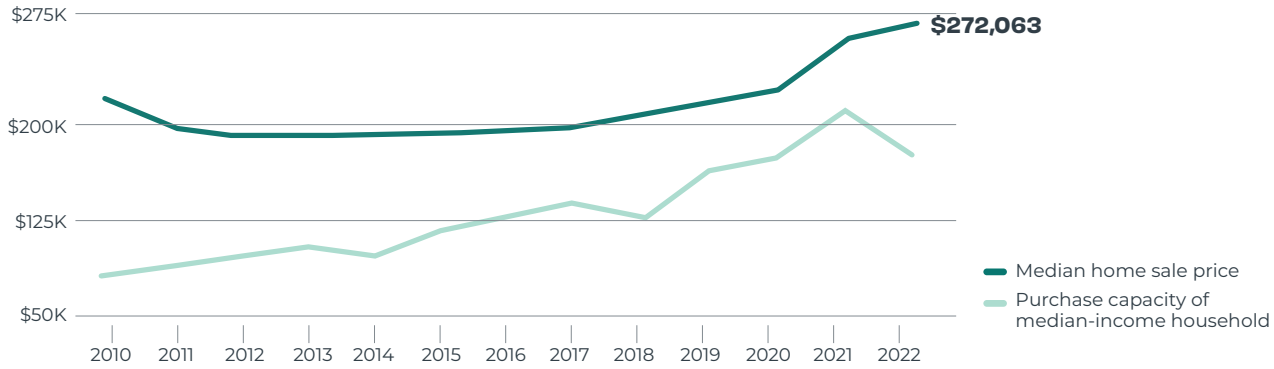


Figure 7: Homeownership affordability

Source: US Census Bureau, ACS 5-Year Estimates, 2022

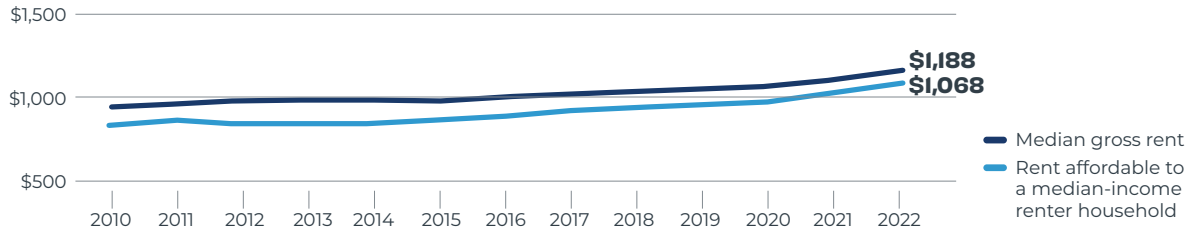


Figure 8: Rental affordability

Source: US Census Bureau, ACS 5-Year Estimates, 2022

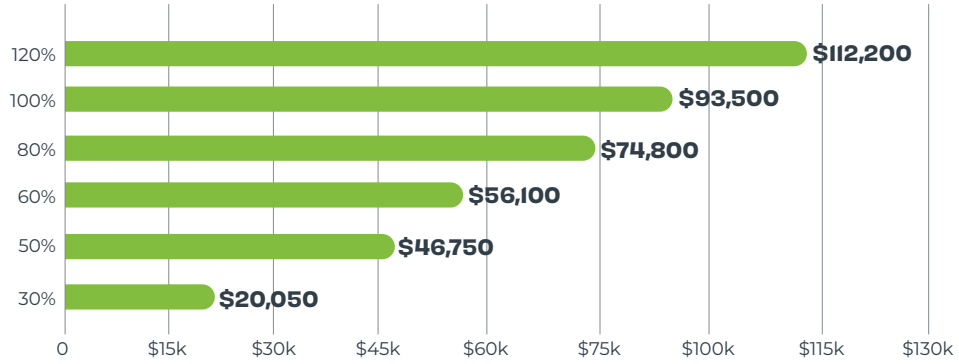
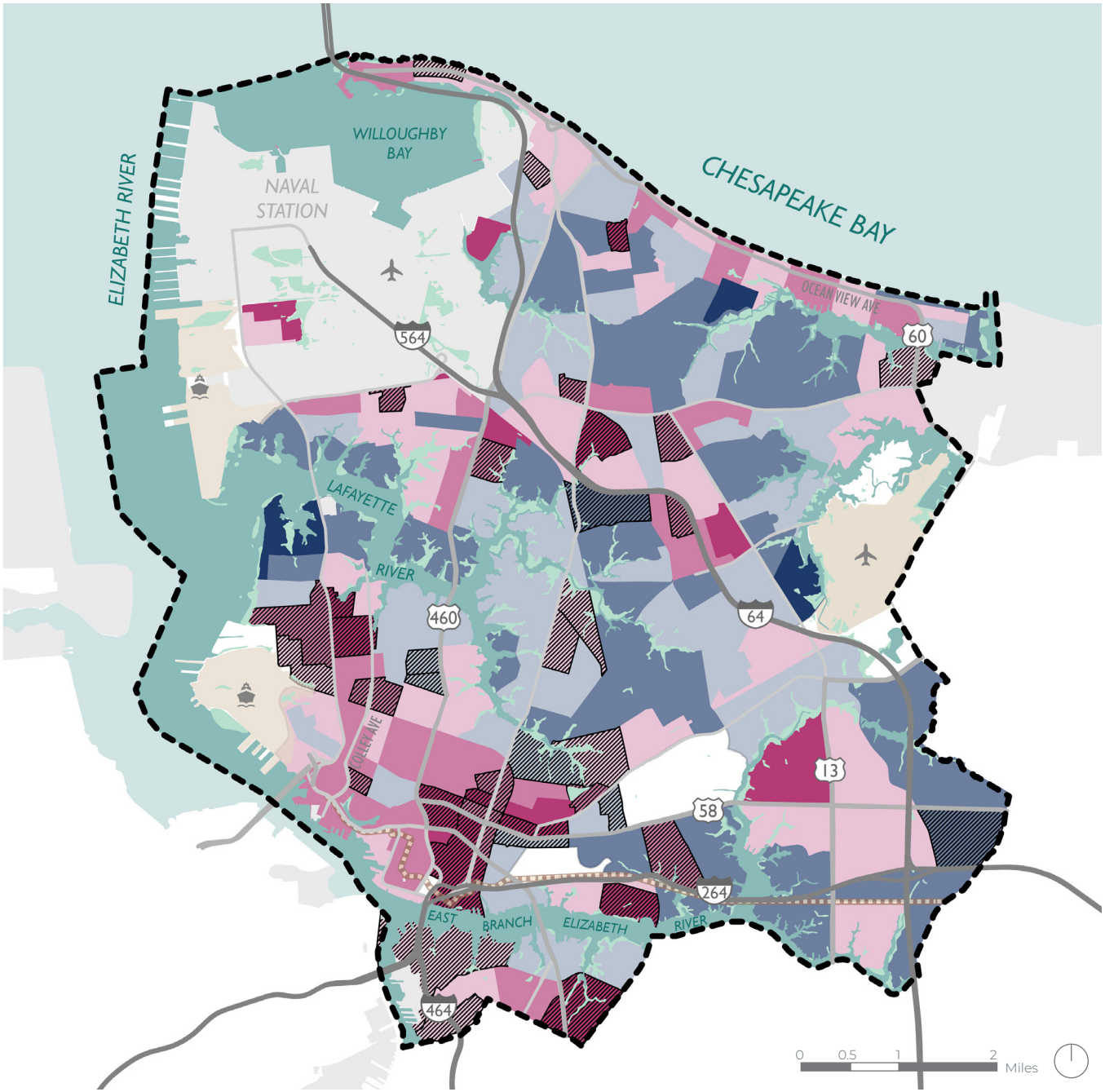


Figure 9: Norfolk AMI thresholds for a family of four

Source: US Census Bureau, ACS 5-Year Estimates, 2022



Households that make below $35k annually make up 28% of Norfolk's population

Owner-occupied households
- 50%-70%
- 71%-90%
- 91%-100%

Renter-occupied households
- 50%-70%
- 71%-90%
- 91%-100%

Population below poverty
- >25% below poverty

- City limits
- Military
- Seaport/Airport
- Light rail
- Water
- Wetlands

Figure 10: Occupied housing units: owners and renters

Source: US Census Bureau, ACS 5-Year Estimates, 2022


(City of Norfolk)

St. Paul's Transformation

As the site of the former Tidewater Gardens, the St. Paul's Transformation Project just east of Downtown Norfolk will fully transform a 1950s distressed housing site into a resilient community of the future, addressing decades of flooding and poverty. The project implementation started in 2023.

Spearheaded in partnership between the City of Norfolk and the Norfolk Redevelopment and Housing Authority (NRHA), the newly redeveloped St. Paul's is slated to become a large-scale mixed-use, mixed-income community, welcoming back former residents and adding in new neighbors from all ends of the socioeconomic spectrum.

As of spring 2024, residents had been temporarily relocated, demolition has been completed and much of the new housing is under construction. The reimagined site infrastructure features new blocks, streets, parks, public spaces, and a generous amount of green infrastructure to help with stormwater capture.

AFFORDABLE RENTAL HOUSING

Approximately 16,300 total low-income renters in Norfolk receive federally subsidized housing. These renters have an average household income per year of $17, 585. 94% percent of households receiving federal assistance are very low income and 76% are extremely low income. Further, 93% of subsidized households are racial/ethnic minorities, with the vast majority being Black Non-Hispanic. A high percentage of subsidized households are single-parent households (39%), and the majority of households are female-headed.

The majority of Norfolk's affordable rental housing (i.e., affordable to households making 80% of the median household income of $60,998) is naturally occurring affordable housing without income restrictions. Norfolk's unsubsidized affordable housing is made up of more diverse, moderate density housing types, while Norfolk's subsidized affordable housing stock is mostly located in high density multi-family buildings.

> **I look forward to seeing the growth of the Community and the Hampton Roads area as a whole.**
>
> — Norfolk resident, Workshop #1, October 2023

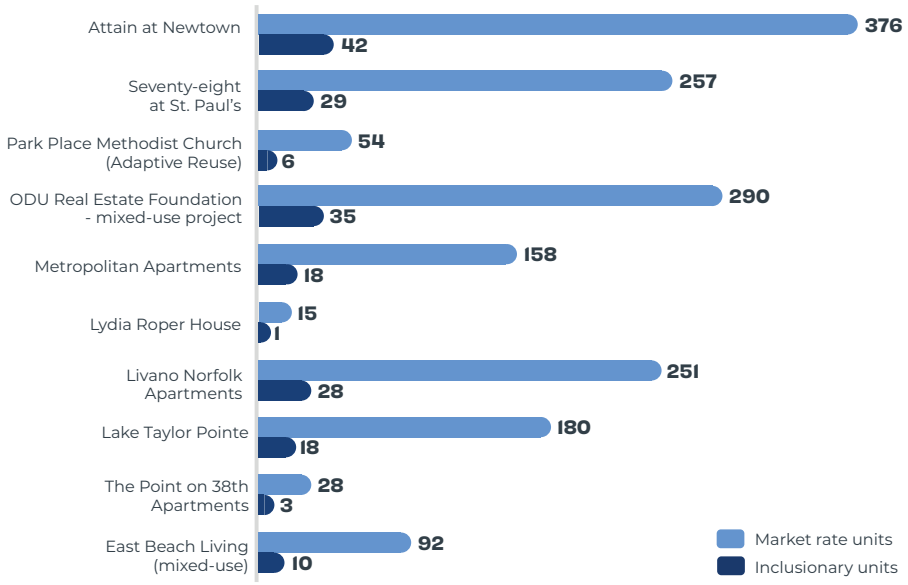


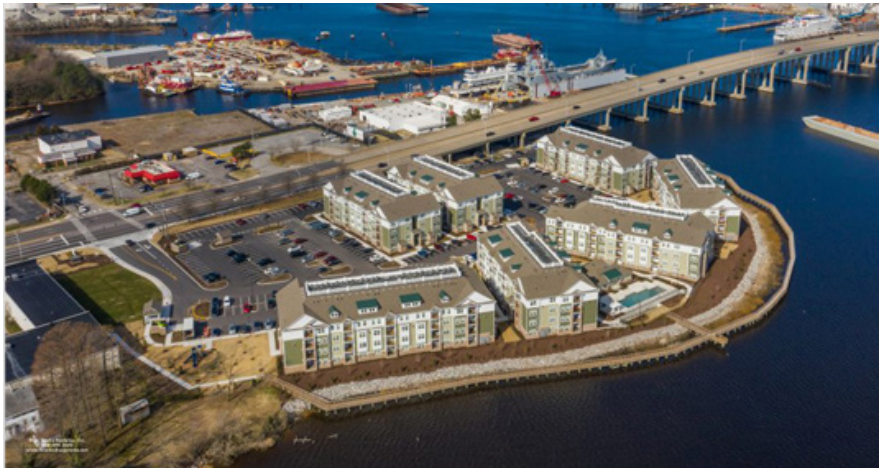
Figure 11: Proposed affordable units created by inclusionary zoning requirements (as of 2022)

Source: City of Norfolk

While Norfolk is home to 13% of the region's population, it possesses 22% of the region's subsidized, income-restricted, affordable housing.

The City's housing stock includes about 36,000 affordable rental homes, 75% of which are naturally occuring affordable housing. While recent rent increases are causing this stock to lose its affordability, the diversity in the inventory creates a strong base that warrants preservation and reinvestment efforts to support long-term affordability and growth.

St. Paul's development (City of Norfolk)



Affordable development in Norfolk (HUD User)

Short-Term Rental Housing

Per the 2024 Norfolk Comprehensive Housing Study and Strategic Plan the supply of short-term rental (STR) housing has increased over the past few years in Norfolk, likely contributing to reducing the housing stock accessible to long-term renters and putting pressure on rental affordability.

Demand for STR housing has risen significantly over the past two years. According to the 2024 study, this demand is likely related to the Navy's presence. Anecdotally, the Navy often moves people between Little Creek and NATO headquarters and naval support entities for short periods of time.

The areas of Norfolk with the highest concentrations of Short-Term Rental housing are Ocean View near the beach, Ghent, and Downtown.

Of approximately ~640 STR listings in the city of Norfolk, the majority (~540) are in the coastal neighborhoods: Willoughby/West Ocean View, Ocean View, East Ocean View. Most of the rest are in Ghent and Downtown Norfolk.

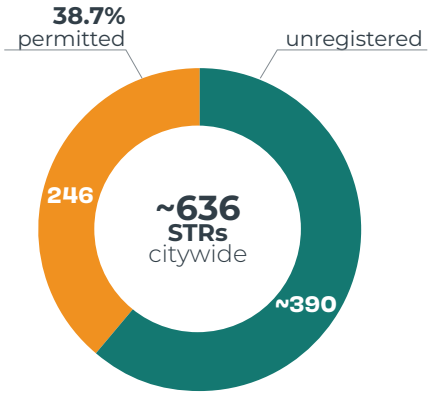


Figure 12: Short-term rentals in Norfolk

Source: City of Norfolk

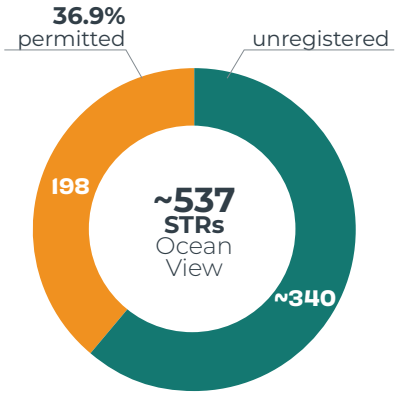


Figure 13: Ocean View short-term rentals

Source: City of Norfolk

Housing by East Beach (WRT)

East Beach development (City of Norfolk)

City-owned property sold at auction, January 2024 (City of Norfolk)

A granular understanding of housing cost burden by income bands sheds light on how Norfolk residents are struggling to keep roofs over their heads.

Stratifying households by tenure (rental vs. owner) and income levels is important because federal and state programs are designed within these parameters. Of the major cities in Hampton Roads, Norfolk's poverty rate is highest, which is evident in the housing cost burden chart (opposite). Housing cost burden is measured against Area Mean Income (AMI), which in the City of Norfolk is $60,998.

Regardless of whether a renter or a homeowner, **a Norfolk household making less than 80% of the AMI ($49K) is very likely housing cost burdened**. In other words, a majority of households making less than $49K in annual income pays more than one third of their income on housing costs – taking away from affording other essential household needs such as fresh foods, childcare, transportation, and recreation.

Public housing is an important social safety net for Norfolk residents. While public housing is eligible for households making up to 80% of AMI (about $49K), most public housing households are extremely low-income (less than 30% AMI, $18K). Norfolk Redevelopment and Housing Authority (NRHA) has recently removed the stigma of public housing by reimagining public housing sites as mixed-income communities. Recent Choice Neighborhoods funding from the federal government has facilitated this transformation at St. Paul's. Low-Income Housing Tax Credits (LIHTC) housing is another program that provides affordable rental housing for Norfolk residents through public-private partnerships. LIHTC housing is eligible for households making below 60% AMI ($36K), and typically targets rental households making between 40%-60% AMI ($24K-$36K). Norfolk uses the following tools to address housing affordability for existing homeowners – HomeNet & Homeward Norfolk, Renovate Norfolk and sale of vacant land with affordability covenants. Some of these programs are eligible for households making up to 120% of AMI ($73K). Many affordable rentals in Norfolk are considered naturally occurring (without deed restrictions) – these units will likely become unaffordable as market conditions change.

By 2050, Norfolk will be well-connected, more equitable, affordable for all walks of life, and have a high quality of life.

— Norfolk resident, Workshop #1, October 2023

* To see Area Median Income thresholds for the City of Norfolk, please reference p.88

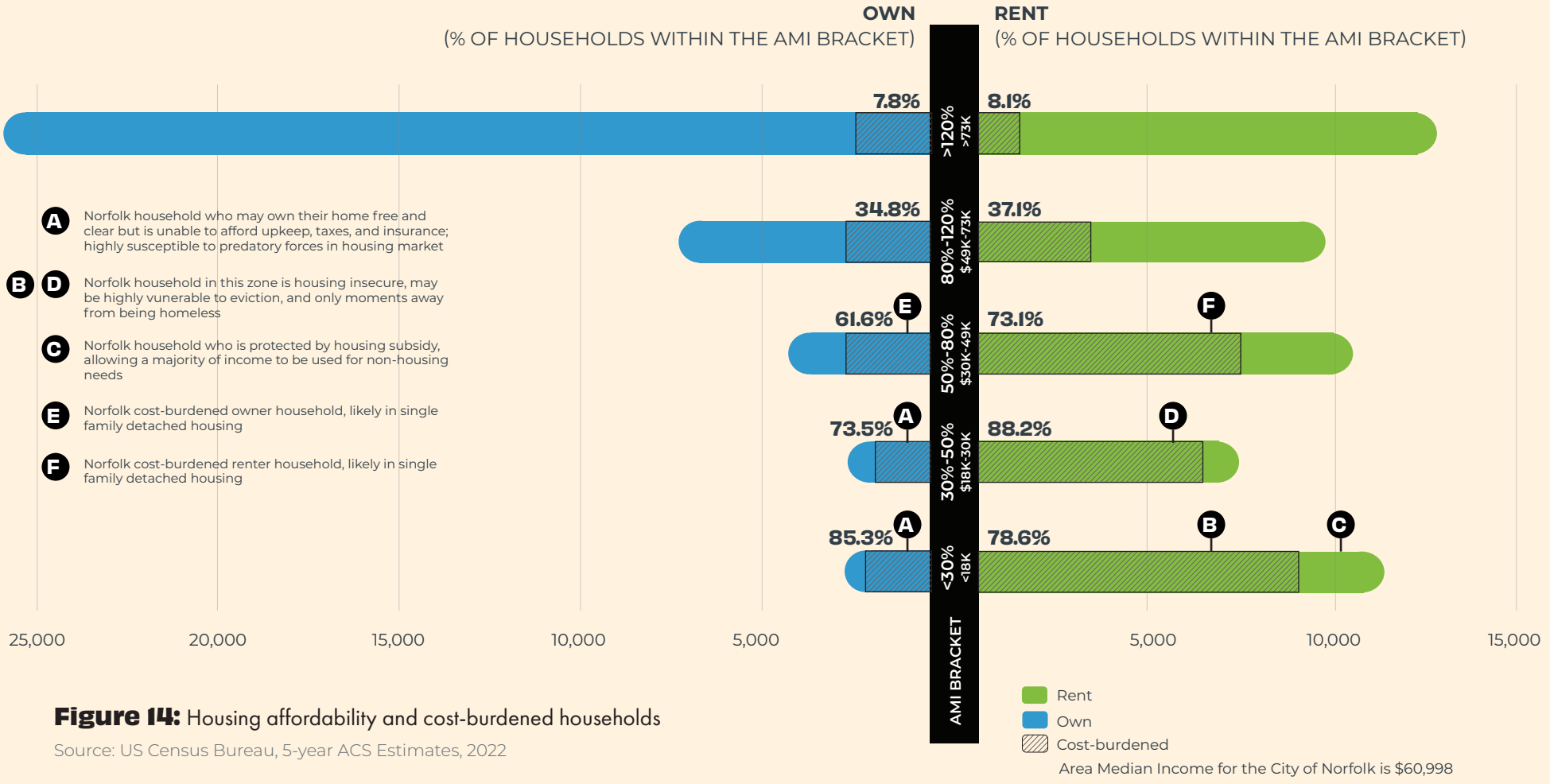


Figure 14: Housing affordability and cost-burdened households

Source: US Census Bureau, 5-year ACS Estimates, 2022

HOUSING VALUE

Density has a tremendous impact on value efficiency.

For residential properties, missing middle housing performs significantly better than other multi-family alternatives. While single family detached housing typically generates less revenue potency, waterfront access also significantly impacts property values. Homes along the Lafayette River and coastline reflect slightly higher values compared to the homes that are located farther inland and adjacent to major highways.

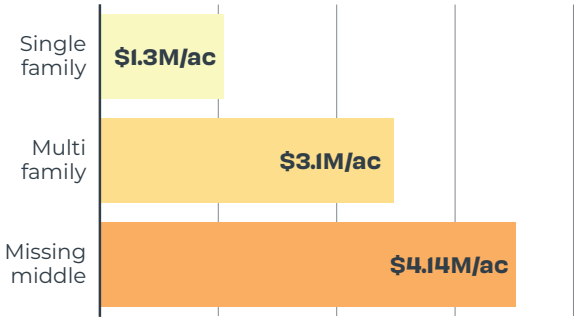
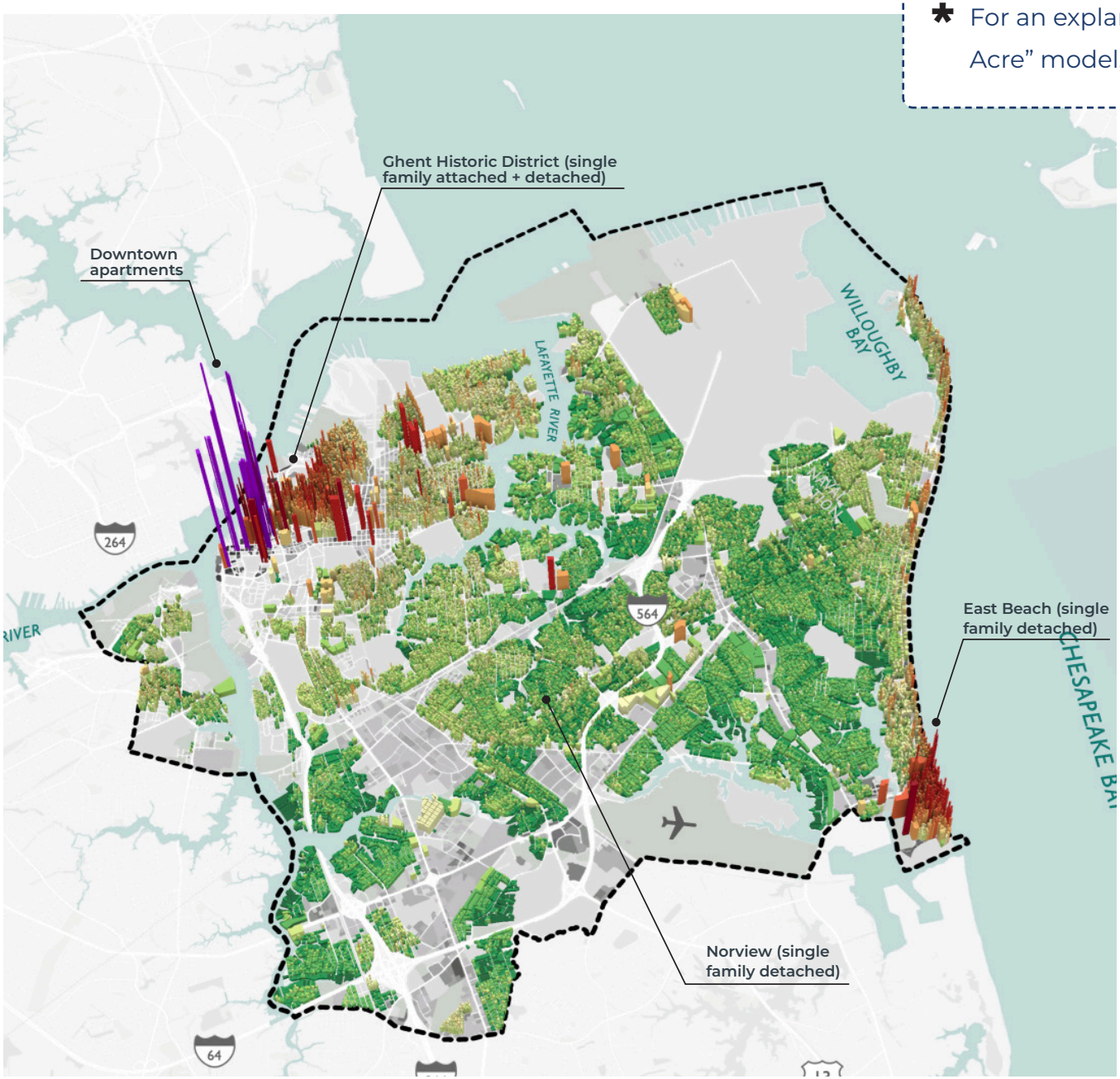


Figure 15: Residential Value per Acre

Source: "Norfolk Comprehensive Housing Study, 2023"

Housing in East Beach (City of Norfolk)

* For an explanation of this “Value Per Acre” model, please reference p.34



While the tall spikes in the apartment complexes of Downtown suggest significant land value per acre, the single family and ‘missing middle’ homes in Ghent historic district are also quite lucrative relative to their size. Similarly, homes in East Beach also demonstrate significant value productivity.

Total value per acre

- >$30M
- $20M-$30M
- $10M-$20M
- $7,5M-$10M
- $5M-$7,5M
- $4M-$5M
- $3M-$4M
- $2M-$3M
- $1,5M-$2M
- $1M-$1,5M
- $500K-$1M
- <$500K
- Tax Exempt

- City limits
- Military
- Seaport/Airport
- Light rail
- Water
- Wetlands

Figure 16: Residential land uses highlighted in Norfolk’s value per acre model

Source: City of Norfolk Assessor, 2023

Many of Norfolk's housing sites face flood risk (WRT)

LIVING WITH WATER

Flood risk poses a threat to renters and owners at all ends of the socioeconomic spectrum in Norfolk. Of note, some of Norfolk's wealthiest residents are actually most at risk of flooding.

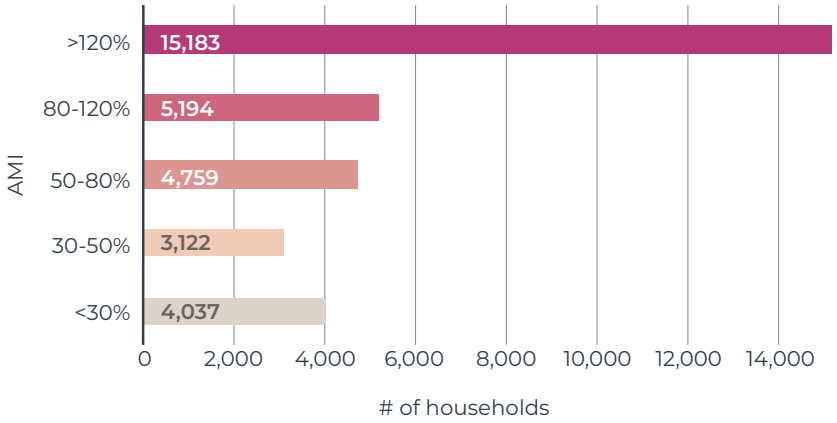


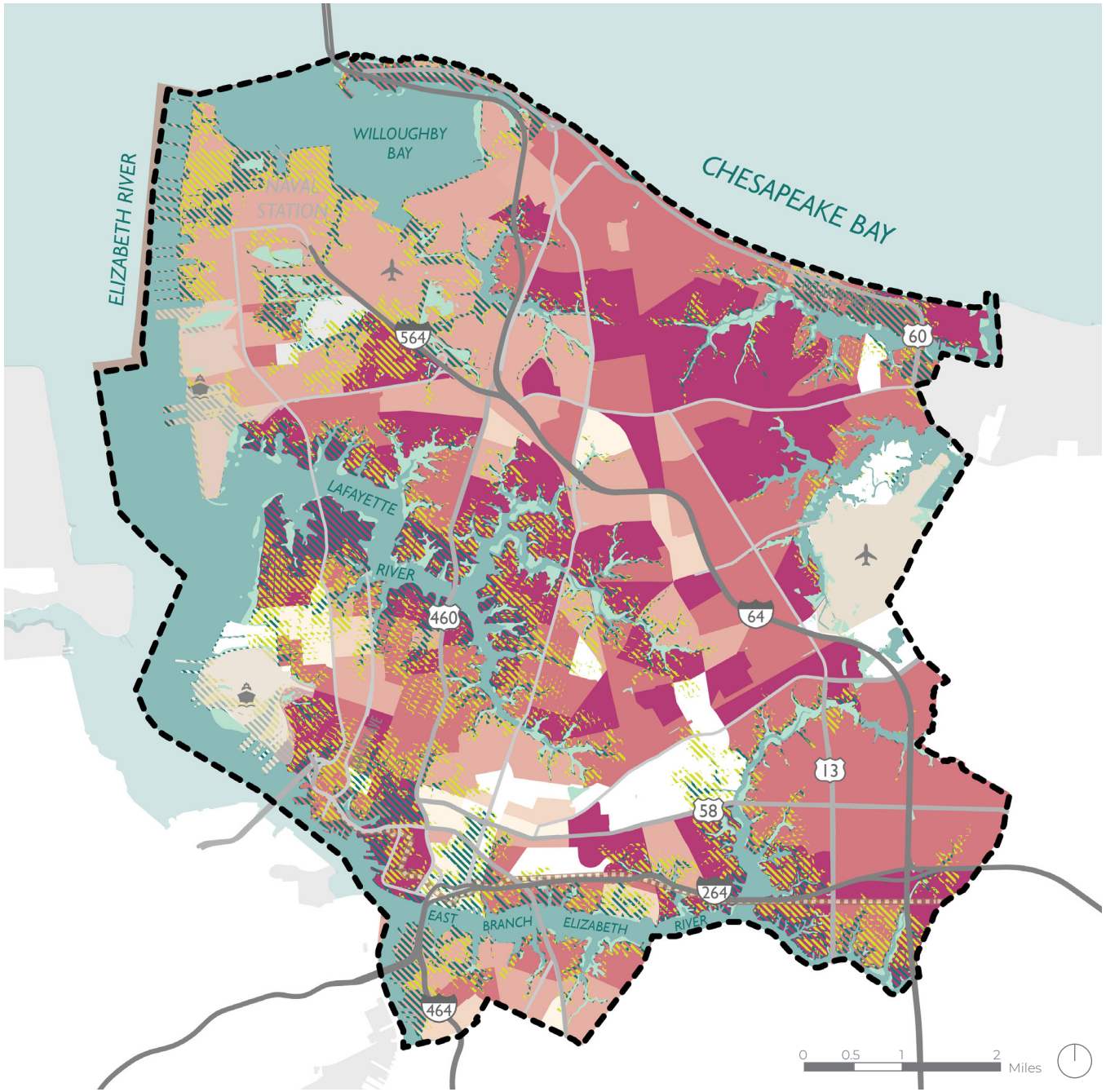
Figure 17: Households by average median income located within a 100-year or 500-year floodplain (combined)

US Census Bureau, ACS 5-Year Estimates; City of Norfolk; FEMA

Increasing flood risk from future storm events, rising sea levels, and rainfall flooding has the potential to economically and physically undermine Norfolk's housing market. Flooding contributes to housing quality issues, further constrains the capacity of the housing ecosystem, exacerbates racial inequities in Norfolk and makes the economics of development more financially infeasible.

Rising costs of flood insurance and maintenance to repair home damage from storms is a challenge for market-rate housing, subsidized housing, and homeownership in Norfolk. Properties in the floodplain with a mortgage are required by lenders to carry flood insurance, but owners who own their homes outright may opt out of coverage. Conversely, property owners outside of the designated floodplain are still able to purchase flood insurance, although most do not. It should be noted that current floodplains are determined from past flood events and other complex models, and do not entirely approximate increasing future risk.

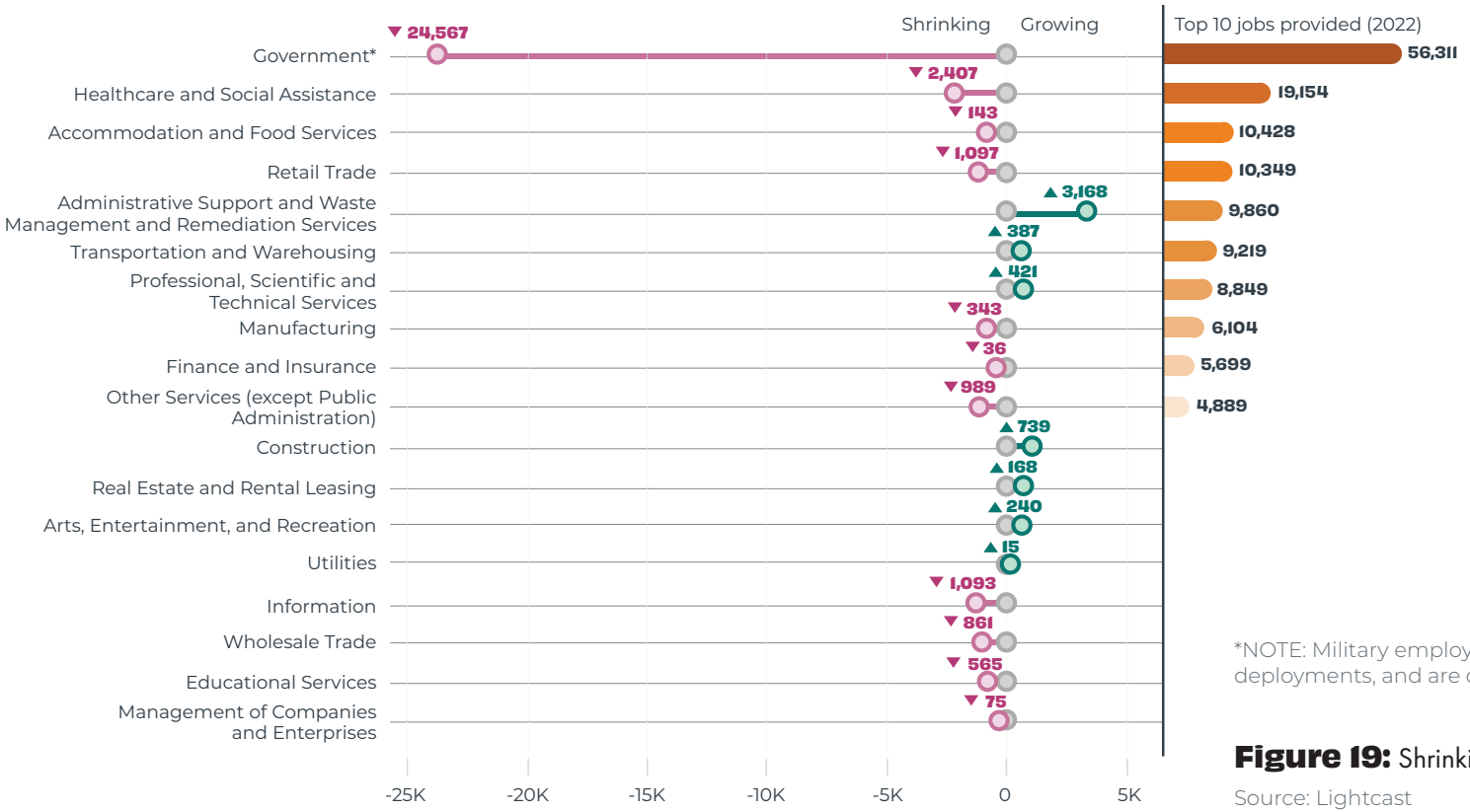
As of February 2024, **7,637 of Norfolk's buildings lie within a FEMA 100-year or 500-year floodplain.** There are approximately 6,650 flood insurance policies in place. Property owners who fall within the designated FEMA flood zones are eligible to participate in the Community Rating System (CRS) which provides a reduction in flood insurance premiums for residents, thanks to the ongoing resilience efforts the City and its partners have been undertaking.



The average annual cost of flood insurance in Norfolk is $693

Figure 18: Living with water: median household income and flood risk

Source: US Census Bureau, ACS 5-Year Estimates, 2022; City of Norfolk; FEMA



*NOTE: Military employment numbers may be skewed by deployments, and are difficult to accurately measure.

Figure 19: Shrinking and growing industries

Source: Lightcast

JOBS AND INDUSTRIES

Norfolk's government sector is the backbone of the city's economy, comprising over 56,000 jobs (35%). Within this sector, federal employment of both civilians and military personnel far outweighs other sub-industries, employing 20,000 and 18,000 respectively.

Healthcare, the second-largest industry, is significantly smaller with approximately 19,000 jobs. Subsequent sectors, including food services, retail, and administrative support, each contribute about 6% to 7% of total employment, reflecting a diverse economic base that underpins Norfolk's growth and resilience. While Norfolk is known for its port, the largest sub-industry related to this economic driver is ship and boat building which only comprises around 3,200 jobs.

Over the last decade, the administrative services sector stands out with a robust growth of +47% in jobs. Other sectors demonstrating growth include construction, professional services, transportation and real estate adding between 739 and 240 jobs. On the other hand, Government saw the largest decline, losing 24,500 jobs between 2012 and 2022 - the majority of loss being with military jobs, while the civilian worforce saw an increase. It should be noted that due to deployments, military data can be difficult to accurately measure.

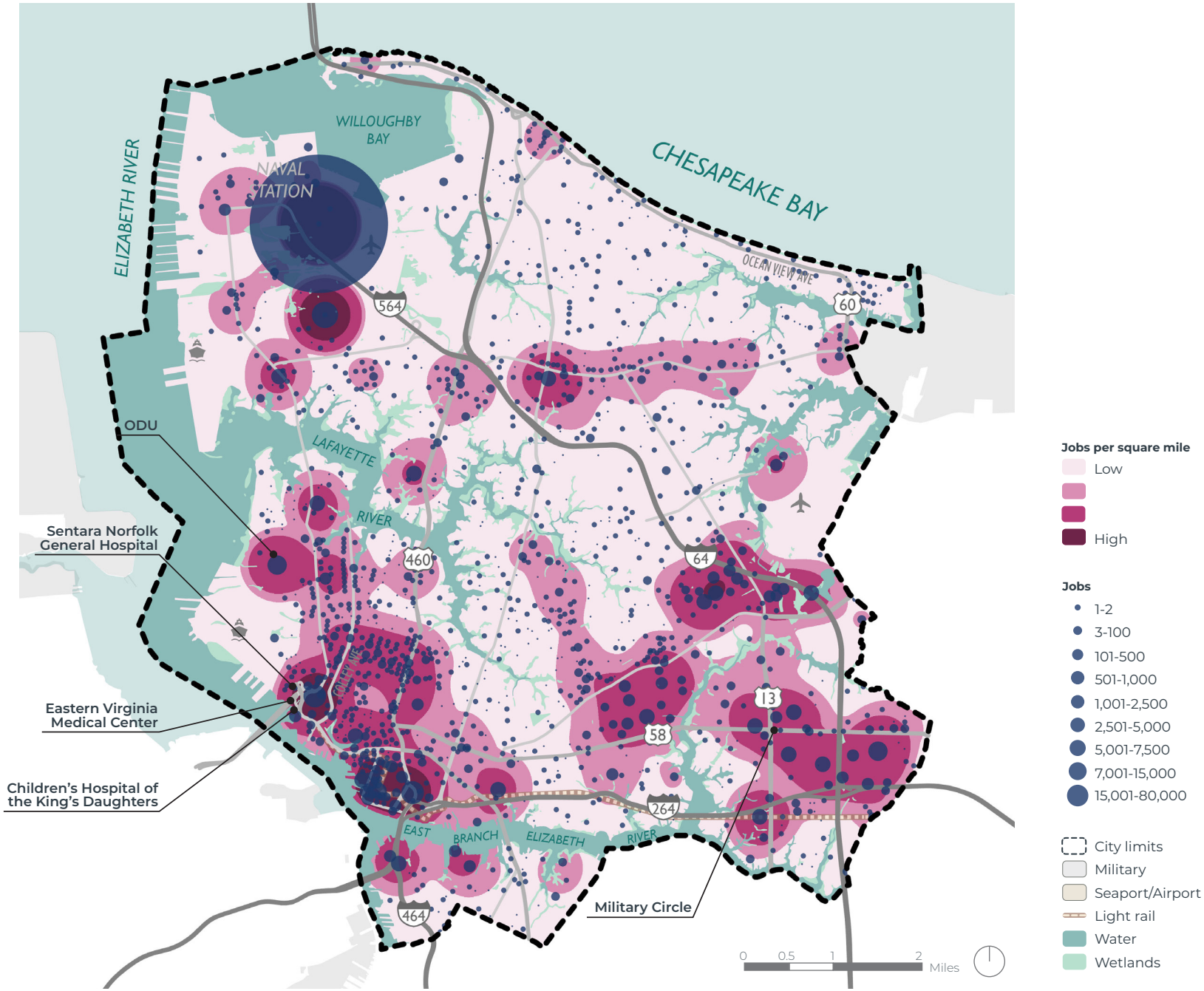


Figure 20: Job centers in Norfolk and employment density

Source: US Census Bureau, On the Map, 2021; City of Norfolk

GOVERNMENT

As the home of the world's largest naval base, Norfolk's government sector is deeply intertwined with defense. This sector holds 35% of the jobs, the largest sector in the city. This industry's strength in Norfolk reflects the city's ongoing importance in national defense and military readiness, contributing significantly to local employment and economic stability.

The region is highly specialized in government work, boasting a location quotient* of 1.9 in 2022, with a projected increase to 2.06 in 2033.

* see "Location Quotient" definition on p.103

Shipyard (WRT)

Within this sector, the most notable sub-industry is comprised of federal, civilian employees which accounts for 20,000 jobs. Jobs in this industry are high-wage and pay on average $110,000 per year.

PROFESSIONAL, SCIENCE & TECHNICAL

Norfolk's emphasis on education, research, and technology, driven by its universities and research institutions, positions it as a burgeoning hub for professional services. These services support a wide array of sectors, from defense to healthcare, highlighting Norfolk's ability to pivot towards innovation and high-tech industries.

The sector saw a 2% increase in jobs growing from 8,400 to 8,800 and is anticipated to experience continued growth, reaching approximately 11,500 jobs by 2033. This resilience and potential for expansion reflect the city's adaptation to technological advancements and the increasing demand for professional services. The projected increase in employment concentration from .9 in 2022 to 1.3 in 2033 highlights the evolving skill set required in Norfolk's workforce, catering to more specialized and technical roles. Like government jobs, on average the jobs in this industry are high wage, with employees earning $98,000 per year.

Norfolk State University (WRT)

Within the industry, the highest concentration of workers are employed in computer systems, design, and engineering services. Behind those, lawyers, management consulting, and accountants make up the remaining top industries.

Sector	Sub-Industries	2012 Jobs	2022 Jobs
Government ▼ 30%	Federal Government, Civilian, Excluding Postal Service	15,739	20,354
	Federal Government, Military	43,642	19,522
	Education (State Government)	6,724	5,870
	Education (Local Government)	3,118	5,411
	Local Government, Excluding Education and Hospitals	9,622	4,937
	State Government, Excluding Education and Hospitals	988	1,115
	US Postal Service	1,045	826
Professional , Scientific, and Technical Services ▲ 2%	Computer Systems Design and Related Services	2,294	2,343
	Engineering Services	1,854	1,841
	Office of Lawyers	1,562	1,200
	Management Consulting Services	366	1,064
	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	752	670
Transporation and Warehousing ▲ 4%	Freight Transportation Arrangement	1,370	1,675
	Marine Cargo Handling	378	1,058
	Deep Sea, Coastal, and Great Lakes Water	1,394	1,008
	Port and Harbor Operations	709	764
	Couriers and Express Delivery Services	352	553
Administrative, Support, Waste Management, Remediation Services ▲ 48%	Temporary Help Services	1,758	2,940
	Investigation, Guard, and Armored Car Services	466	1,943
	Collection Agencies	1,480	1,088
	Telephone Call Centers	233	963
	Landscaping Services	488	565
Manufacturing ▼ 4%	Ship and Boat Building	3,325	3,285
	Printing	410	512
	Pump and Compressor Manufacturing	132	239
	Pharmaceutical and Medicine Manufacturing	19	209
	Medical Equipment and Supplies Manufacturing	152	160

Figure 21: Sector analysis of sub-industries (2012-2022)

Source: 5-Digit NAICS; Lightcast

WHAT IS LOCATION QUOTIENT?

"Location quotient" is a measure that quantifies how **concentrated** a particular industry is in a region as compared to the nation.

- A location quotient of 1 means an industry is as prevalent in a region as in the nation;
- A location quotient below 1 means an industry is less concentrated in a region compared to the nation;
- A location quotient above 1 means an industry is more concentrated in a region compared to the nation.

"Employment concentration" refers to the location quotient, or how concentrated an industry is in a region as compared to the nation.

Norfolk Firehouse (WRT)

Industrial waterfront (WRT)

TRANSPORTATION AND WAREHOUSING

The Port of Virginia, one of the busiest ports on the East Coast, anchors the transportation and warehousing industry. This sector's growth reflects Norfolk's vital role in global trade, logistics, and supply chain management, making it a key player in international commerce.

This sector has seen a substantial growth of about 4% from 8,800 jobs in 2012 to 9,200 in 2022. The city's geographical location likely plays a pivotal role in this industry's steady growth. The sector's employment concentration is anticipated to slightly decrease from 1.48 in 2022 to 0.86 in 2033, yet it remains a vital part of Norfolk's infrastructure and global commerce. Unsurprisingly, the sub-industries with the highest number of jobs are related to maritime trade. Wages in this industry are also high, with employees earning an average of $106,000.

ADMINISTRATIVE, SUPPORT, WASTE MANAGEMENT AND REMEDIATION SERVICES

The expansion of this sector aligns with the city's overall economic growth. These services provide essential support to other key industries, ensuring efficient operations across the board, from healthcare facilities to maritime businesses.

This industry has experienced a remarkable growth of about 48%, from 6,640 jobs in 2013 to 9,852 in 2022. It is projected to slightly decline from here, reaching around 8,950 jobs by 2033. This dynamic expansion and subsequent stabilization indicate the sector's adaptability and its role in supporting other industries. The slight increase in employment concentration from 1.13 in 2022 to 1.43 in 2033 underscores its critical supporting role in the local economy. The largest sub-industries are varied, including temporary help, armored car services, and collection services.

MANUFACTURING

While facing challenges, manufacturing remains an integral part of Norfolk's economic heritage. The city's efforts to modernize this sector, incorporating advanced manufacturing technologies, reflect its commitment to maintaining a strong industrial base while adapting to new economic realities.

Norfolk will be known for being a vibrant hub of creative business start-ups with a well-prepared workforce.

— Norfolk resident, online engagement, Winter 2023

The manufacturing sector faces challenges, with a decrease from 6,400 jobs in 2012 to 6,100 in 2022, and is projected to further decrease to 5,550 jobs by 2033. This trend reflects the industry's need to adapt to global shifts and technological changes. The slight decrease in employment concentration from 0.52 in 2022 to 0.49 in 2033 suggests a consistent, though slightly diminishing, presence in Norfolk's industrial landscape. Further complicating growth in this sector is the scarcity in large parcels of industrial land.

Unsurprisingly, ship and boat manufacturing is extremely present in the region, employing 3,200 workers. However, within the past 10 years there has also been activity in emerging industries like pharmaceutical manufacturing.

Embody, Norfolk Innovation Corridor (City of Norfolk)

COMMERCIAL NODES

Norfolk has commercial districts in every Ward, but not all of them are equally vibrant - or economically productive.

Using the Value per Acre model (page 34), it is easier to understand how commercial land uses also impact value productivity. As illustrated opposite, the density of multi-story mixed use and commercial storefronts that populate Norfolk's downtown are notable, but that is not the only type of development that can produce substantial value for a community. Other commercial nodes throughout the city also bring in a significant revenue stream, particularly along Monarch Way and 21st St.

Commercial and mixed use properties become exponentially more efficient in value when density increases. These land uses also create the potential for more jobs and give small and local businesses a chance to establish themselves.

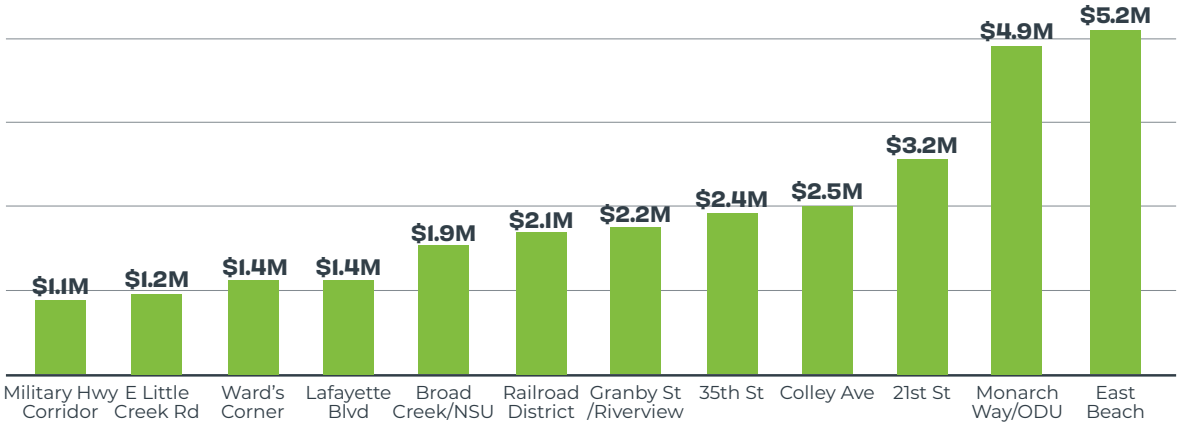


Figure 22: Norfolk commercial nodes: average tax revenue per acre

Source: City of Norfolk Assessor, 2023

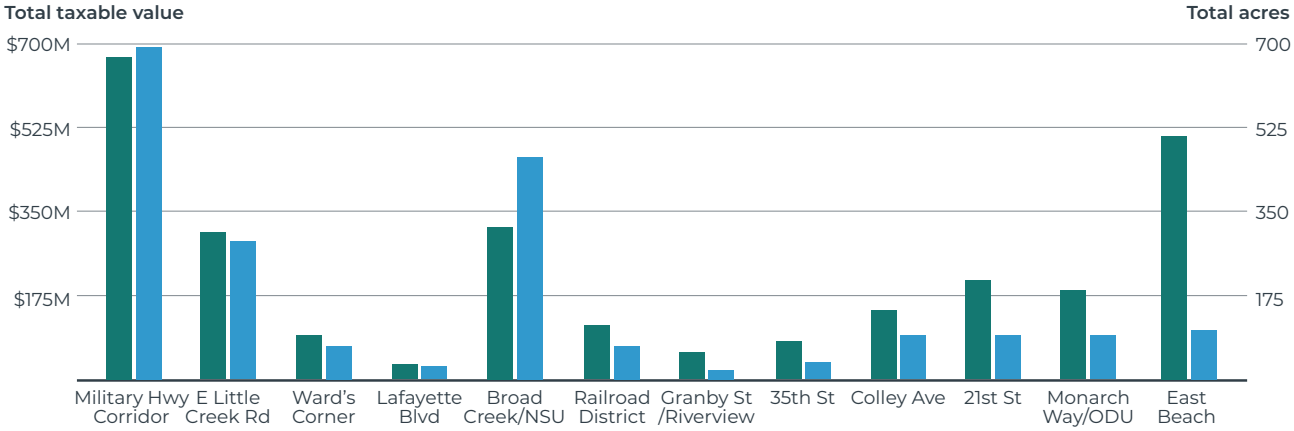


Figure 23: Norfolk commercial nodes: total taxable value

Source: City of Norfolk Assessor, 2023

✱ For an explanation of this “Value Per Acre” model, please reference p.34

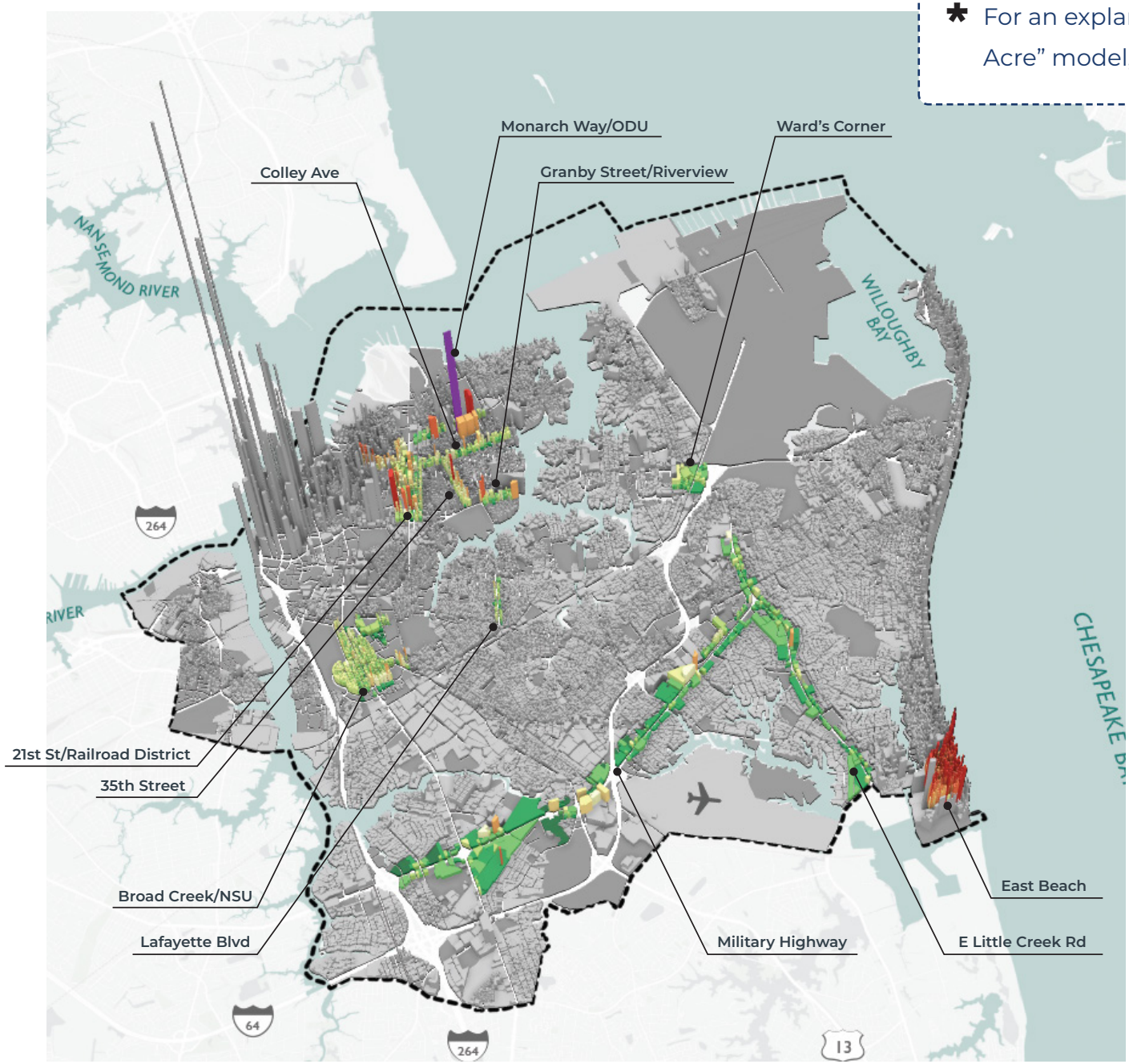


Figure 24: Commercial nodes outside of Downtown Norfolk highlighted in the value per acre model

Source: City of Norfolk Assessor, 2023

SCALING UP:

REGIONAL JOB COMPETITION

Compared to neighboring cities, Norfolk has seen a more diverse shift in jobs by sector.

Virginia Beach has experienced a significant increase in Transportation and Warehousing jobs (+66%), which could suggest an attraction of jobs from Norfolk in this sector, given Norfolk's smaller increase (+9%). In the professional services sector too, although Norfolk has seen growth, Virginia Beach has seen a larger increase in job numbers (+16% compared to Norfolk's +5%). This could point towards a competitive edge for Virginia Beach in attracting professional services jobs. However, Norfolk has shown a significant increase in jobs in administrative services, which is the highest among the compared cities. This suggests that **rather than losing jobs to neighboring areas, Norfolk may be capitalizing on and possibly drawing jobs in the administrative services sector.**

In Norfolk, the medical services sub-industry is experiencing growth, reflecting a burgeoning demand for healthcare expertise. Simultaneously, other sub-industries such as education and shipbuilding are contracting, leading to concerns about talent retention. Contrastingly, neighboring cities exhibit a different pattern, with Virginia Beach showing a decline in government civilian roles and Newport News experiencing an upswing in medical hospital staff. **This dynamic indicates a regional redistribution of jobs,** with Norfolk becoming a hub for certain growing sub-industries while others are shifting elsewhere.

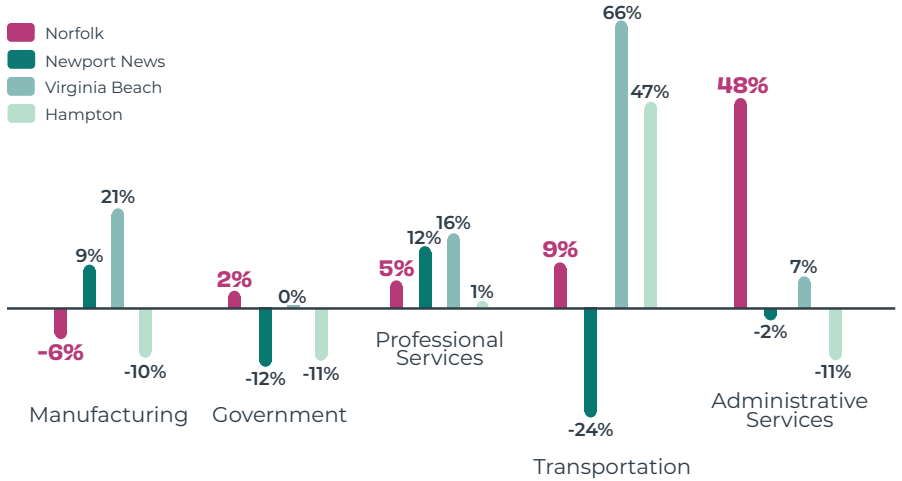


Figure 25: Regional comparison of key industries (2012-2022)

Source: Lightcast

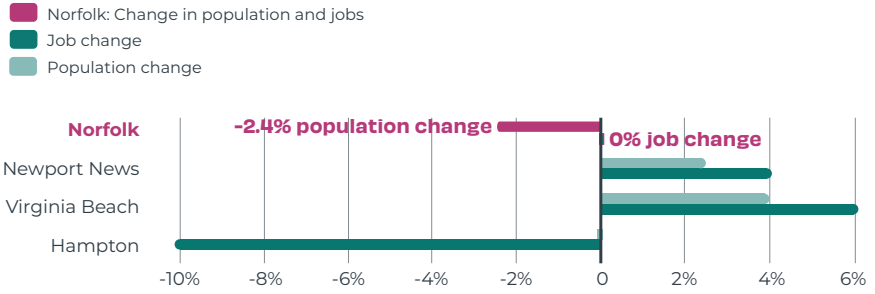


Figure 26: Regional population and employment metrics (2012-2022)

Source: Lightcast

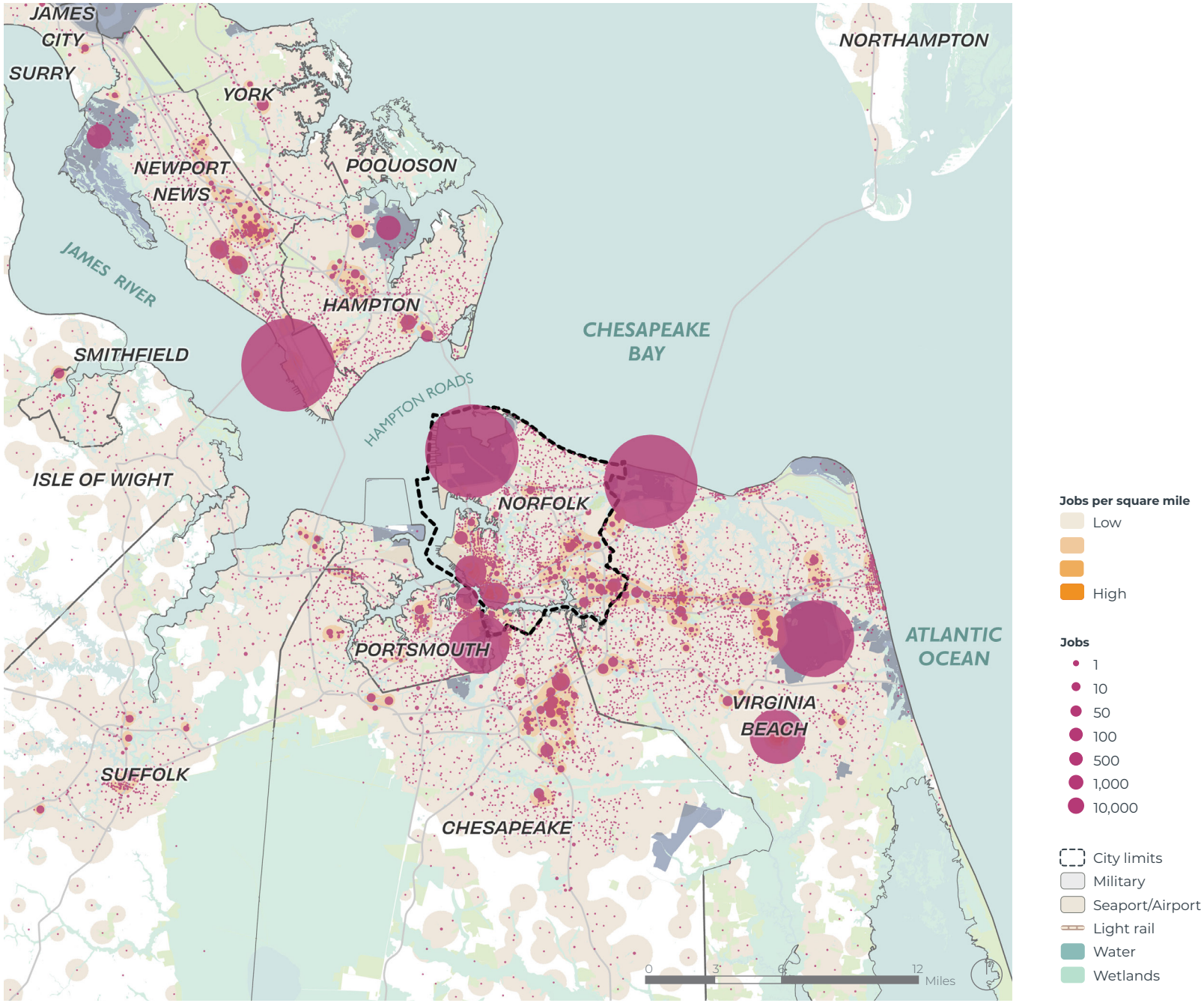


Figure 27: Job centers and employment density in Hampton Roads

Source: US Census Bureau, On the Map, 2021; City of Norfolk

Embracing Nature

Ohio Creek Greenway (WRT)

Defined by its waterfront, Norfolk enjoys meaningful connections to nature in many forms, including trees, parks and trails, and waterfront habitat. This water access can also be harmful, however, as in the frequent tidal and storm flooding that is pervasive across the city. Norfolk's future may well be defined by how it mitigates flooding and embraces nature's many benefits.

Waterfront Character | Living Waterfronts | Park Access | Flood Events | Resilience Strategies | Impervious Surfaces | Extreme Heat & Tree Canopy | Environmental Justice | Regional Flood Exposure

EMBRACING NATURE

INTRODUCTION

Norfolk is surrounded by water on more than three sides, providing many opportunities for residents and stakeholders to experience nature on an everyday basis. But there are more aspects of the natural environment that can be brought into a comprehensive plan: the city's tree canopy is an important defense against urban heat; land cover can be converted to more pervious surfaces to help with stormwater; and city parks provide crucial public spaces for all Norfolk residents.

> **Norfolk will be known for being socially and economically resilient, with walkable neighborhoods... and connections to nature and the water.**
>
> — Norfolk Resident

With NFK2050, Norfolk has the opportunity to embrace being a "Biophilic City" (see p.120): a place where residents love nature and reap the many mental, social, and physical benefits of access to the natural environment. Biophilia - humans' innate love of nature - is a concept born from ecological science but rapidly gaining ground in urban planning as an opportunity for urban residents to have better and more harmonious access to nature on a daily basis.

A biophilic Norfolk likely starts with its water, but living in harmony with the Chesapeake Bay, Elizabeth River, and many inlets and creeks can be quite challenging when that water is also a source of flood risk. Future development will have to be held in balance with flood mitigation and waterfront character.

Norfolk's green infrastructure network of preserved and restored natural spaces is quite robust. The city's tree canopy and wetland shorelines are widespread in many residential neighborhoods, albeit lacking in commercial areas. With increasing storm events, Norfolk will need to better manage rainwater flooding and the use of green infrastructure will maximize benefits. In more commercial areas, management of legacy brownfields will provide opportunities to right environmental injustices of the past.

Finally, we understand that natural systems do not obey political boundaries. Understanding flooding and the potential for regional mitigation is something that Norfolk cannot tackle alone, but will need strong regional partnerships and federal support to build towards a resilient future in balance with nature.

Waterfront access point (WRT)

WATERFRONT CHARACTER

Surrounding the city on almost all sides, Norfolk's waterfront is diverse in character, and has been a cornerstone of industry, economy, habitat, and recreation since the city's inception.

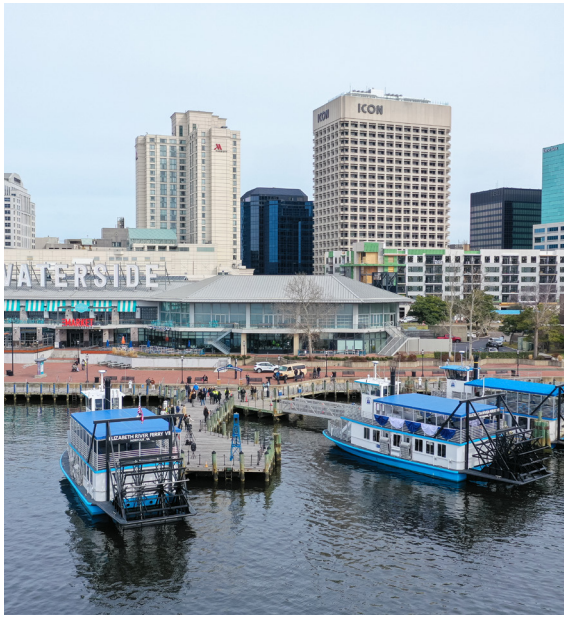
USS Wisconsin (City of Norfolk)

The City of Norfolk continues a 250-year history of maritime industry and activity. This relationship with the water has shaped the city throughout its history. Military, commercial shipping, commercial and recreational fishing, and all manner of support and maintenance industries call Norfolk home, defining much of its coastline as a working waterfront.

Naval Station Norfolk is one of the region's largest employers. Constructed on the site of the Jamestown Exposition shortly after World War I, the naval base occupies 4,600 acres and is currently home port to 47 ships including six aircraft carriers.

The Naval Station fleet provides steady business for a number of large and small ship repair yards and companies up and down the Elizabeth and James Rivers. Many of these are located on the Southern and Eastern Branches of the Elizabeth River. Norfolk Naval Shipyard, operated by the United States Navy and home to Drydock 1, the first drydock constructed in the United States, was originally located in Norfolk County, but is now located in the City of Portsmouth.

Manufacturers of shipboard components and systems are spread throughout the city with many small operations occupying industrial buildings along former rail corridors adjacent to Hampton Blvd and along the Norfolk Southern right of way to Lambert's Point. Larger suppliers occupy facilities in the Norfolk Industrial Park and on the site of the former Ford Assembly Plant in Campostella.



Elizabeth River Ferries (City of Norfolk)

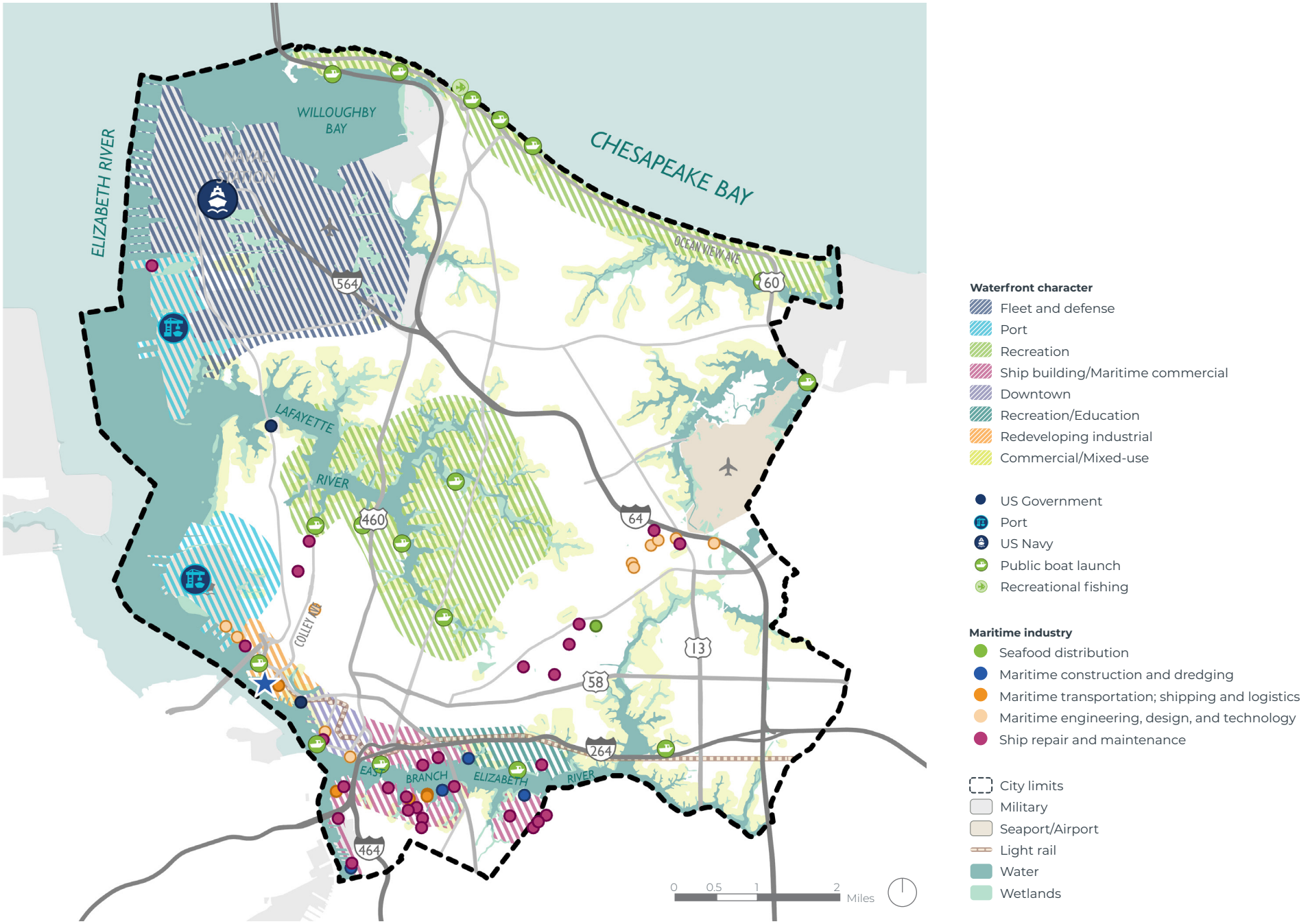


Figure 1: Waterfront character and types of access

City of Norfolk; WPA

Design, engineering, and maritime technology companies as well as large defense contractors such as CACI and Alion Science and Technology locate in Norfolk to be near the opportunities presented by the presence of the large fleet and support activities.

The Port of Virginia operates Norfolk International Terminal, the largest port in Virginia, which can accommodate some of the largest commercial cargo ships on the East Coast. The high volume of cargo moving through this port supports large and small shipping companies with multinational firms like Maersk, CMA CGM, and Zim maintaining headquarters in the Norfolk Industrial Park and the Lake Wright Executive Center.

Lambert's Point Coal Terminal is, according to Norfolk Southern, the "largest, fastest, and most efficient transloading facility for coal in the Northern Hemisphere." The terminal has been in operation since 1865 and continues operating 24/7 today.

Likely in response to the industrial nature of the Elizabeth River frontage, recreational boating and fishing activities are concentrated around the Lafayette River and the Chesapeake Bay shorelines.

Commercial fishing, while once a mainstay of the Norfolk waterfront, has largely left the city and what remains in Hampton Roads is concentrated on the Peninsula in Hampton and Newport News.

Waterfront marsh in a residential neighborhood (City of Norfolk)

Bayfront beaches (City of Norfolk)

> **By 2050, Norfolk will be known for its environmental stewardship, numerous city parks, and bike-friendly streets.**
>
> — Norfolk resident, online engagement, Winter 2023

LIVING WATERFRONTS

Norfolk's shoreline is comprised of a variety of edges. While much of the Norfolk's coast has been "armored" - a manmade constructed edge to hold back the tides - there are still ample areas of soft shores, which can provide future opportunities for ecosystem restoration and nature-based flood risk adaptation projects.

The NOAA Office of Response and Restoration prepares Atlases of Environmental Sensitivity for the coastal geographies potentially most affected by oil spills. Environmental Sensitivity Index (ESI) maps overview biological resources, sensitive shorelines, and human-use resources.

The Chesapeake Bay 2016 dataset identifies five major types of shorelines, establishing protection priorities. Almost one-half of Norfolk's shoreline is armored (93 out of 187 mi), with vegetated shores and beaches making up the balance. Ecosystem restoration is most suitable at Little Creek and Lake Whitehurst, along Broad Creek and inland parts of Elizabeth and Lafayette rivers.

Opportunities for resilience measures along Norfolk's waterfront include the following:

- Sand and vegetated shorelines are the primary opportunity areas for tidal and coastal surge flood impact reduction. The beachfront in Ocean View has been adapted inconsistently – with some parts protected by bulkheads, and other areas with beach replenishment. A more systematic hybrid approach would benefit the communities living next to the beach.
- Existing wetlands and parks create opportunities for green corridors around Downtown, Park Place and Huntersville.
- Beaches along the Chesapeake Bay, on the north side of the city, serve as a natural coastal protection when sand trapping and dune restoration measures are applied. Norfolk's beach is partially protected with structural measures such as bulkheads, levees, and groins.
- Continued use of oyster restoration should be considered city-wide for the substantial ecosystem and coastal protection benefits.

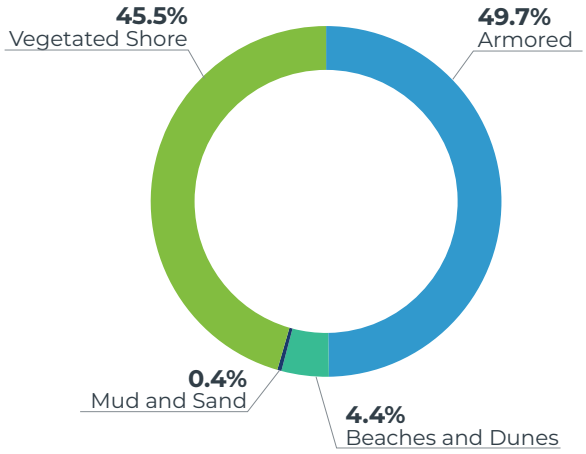


Figure 2: Shoreline types

NOAA, 2016; Office of Response and Restoration, Environmental Sensitivity Index

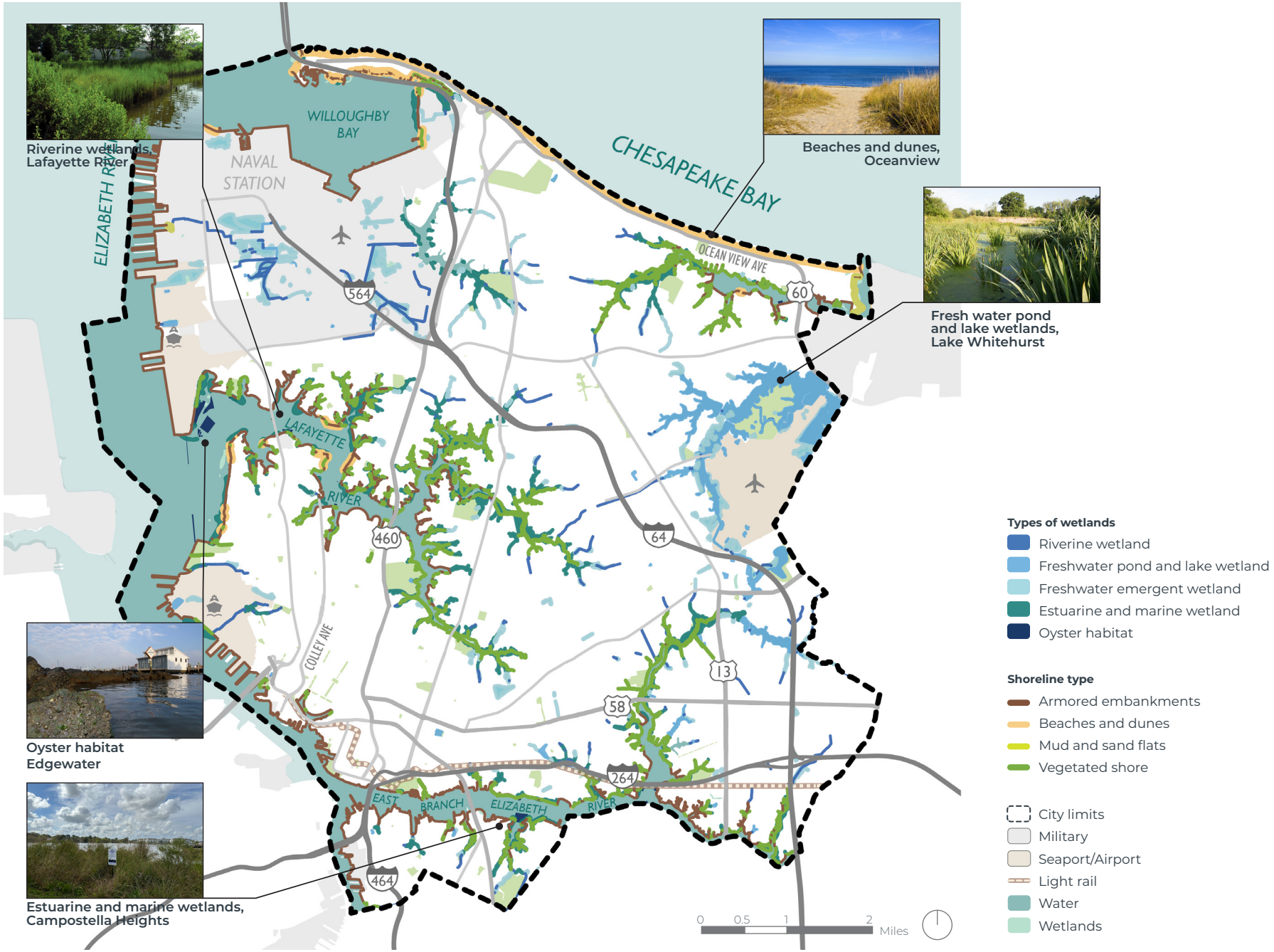


Figure 3: Living waterfronts: wetlands and shoreline types

City of Norfolk; USFWS National Wetlands Inventory; The Virginia Geographic Information Network

Elizabeth River Trail (City of Norfolk)

Norfolk: Biophilic City

As of 2019, Norfolk is part of the Biophilic Cities Network, an organization that prides in building an understanding of the value and contribution of nature in cities to the lives of urban residents. As a central element of their work, Biophilic Cities facilitates a global network of partner cities working collectively to pursue the vision of a natureful city within their unique environments and culture.

Norfolk's commitments as a Biophilic City and part of this network:

(1) Track tree canopy coverage and land area of wetland and shoreline restoration projects;

(2) Track annual number of visits to the Learning Barge;

(3) Incorporate a Biophilic Lens into Planning Practices - includes the next comp plan update;

(4) Track Distribution of Parks and Natural Areas in Norfolk.

City of Norfolk; Biophilic Cities

PARK ACCESS

Norfolk's Parks and Recreation Department manages and oversees over 4,000 acres of parks, facilities, and open spaces, including a diverse range of neighborhood parks, greenspaces, indoor recreation centers, special event spaces, school park sites, cemeteries, and water access points. Residents enjoy public access to the beaches and waterfront (including boating and fishing) along the Chesapeake Bay and in limited locations along the Lafayette River and East Branch of the Elizabeth River.

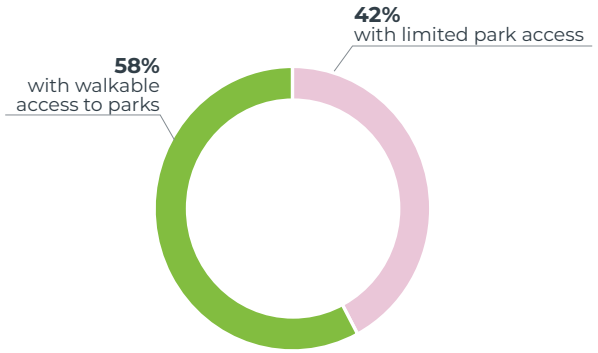


Figure 4: Percent of Norfolk households lacking park access

US Census Bureau, ACS 5-Year Estimates, 2022; City of Norfolk

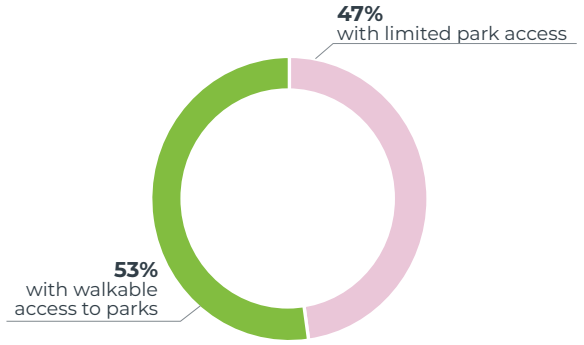


Figure 5: Percent of households with children under 18 and lacking park access

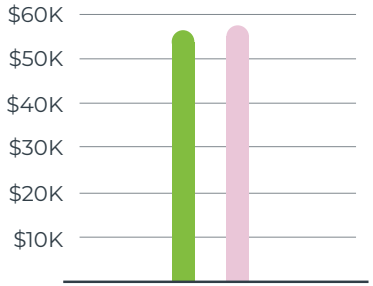


Figure 6: Park access by median household income

US Census Bureau, ACS 5-Year Estimates, 2022; City of Norfolk

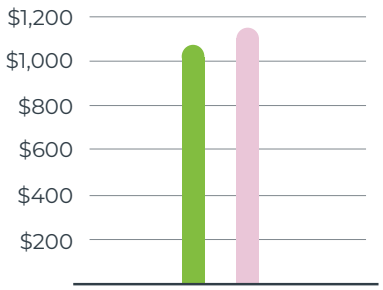


Figure 7: Park access by median household rent

US Census Bureau, ACS 5-Year Estimates, 2022; City of Norfolk

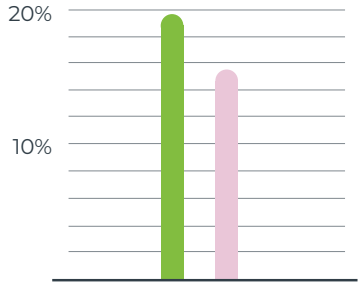


Figure 8: Park access by percent of population below poverty

US Census Bureau, ACS 5-Year Estimates, 2022; City of Norfolk

Households with walkable access to parks
Households with limited park access

As part of the City of Norfolk's 2022 Parks and Recreation Master Plan Assessment, **residents rated beaches and walking / biking trails as the top two most important amenities within the city's parks and recreation network.**

Ease of park access, in terms of walking and biking, is typically measured by a 5-minute (¼ mile) or 10-minute (1/2 mile) walk to a park. In recent years, cities across the US with support from organizations like the Trust for Public Land (TPL) have added park access and walkability metrics as ways to measure community health and determine areas of little or no park access, taking into consideration the sidewalk and road network, as well as roadway and infrastructure barriers.

While parks and facilities are spread across Norfolk, many are concentrated downtown and in the southwestern areas of the city resulting in eastern and northern areas of the city with little walking access to parks. **Overall, about 42% of Norfolk households are not within a ten-minute walk to a park** (as shown in Figure 4). For households with children under the age of 18, the percentage is even higher: 47% of Norfolk family households do not have a park within a ten-minute walk of their home. Opportunities throughout the city exist to strategically expand the park network (e.g., through improving pedestrian connections to parks and trails in underserved areas and linking up with the city's resilience strategies and projects that are underway).

Freemason Playground (City of Norfolk)

Elizabeth River Trail (City of Norfolk)

Trail Expansion

Residents place a high value and need on extended walking and biking trails, beaches, fitness and exercise facilities, indoor pools / aquatics, and neighborhood parks. Given the community interest in multi-use trails (walking and biking trails were ranked as the highest need in the 2022 citywide parks survey), the City plans to invest in and strengthen Norfolk's network of blueways and greenways – seeking opportunities to extend the trail system, providing opportunities for recreation and enhanced mobility via biking and walking. The Elizabeth River Trail is one such opportunity, with plans for expansion, increased environmental awareness, and economic development as described in the Reconnecting the City section. The St. Paul's Blue Greenway, an innovative 22-acre stormwater park in the St. Paul's area is another project that is underway – one that will improve recreation, open space, resilience to flooding, and daylighting of a creek, designed with the community and extending Norfolk's multi-use trail and greenway / blueway network.

In addition to considering how accessible a park is, the quality and condition of a park or recreational facility impacts how residents experience their communities daily. The Parks and Recreation Master Plan includes a condition assessment of Norfolk parks, finding that for the most part the city's parks are in good condition. However, **not all parks are created equal, with some lacking park amenities like playgrounds, paths, benches, or recreational fields,** as illustrated on Figure 10, classified as passive parks

The City provides high quality recreational opportunities for residents,; however, with a large and aging park system and limited resources, maintaining facilities and services across Norfolk is challenging. The park condition assessment identified several common themes and areas of need, including a lack of / limited ADA accessibility, poor neighborhood connectivity, aging amenities, deferred maintenance, and opportunities for improved design and materials.

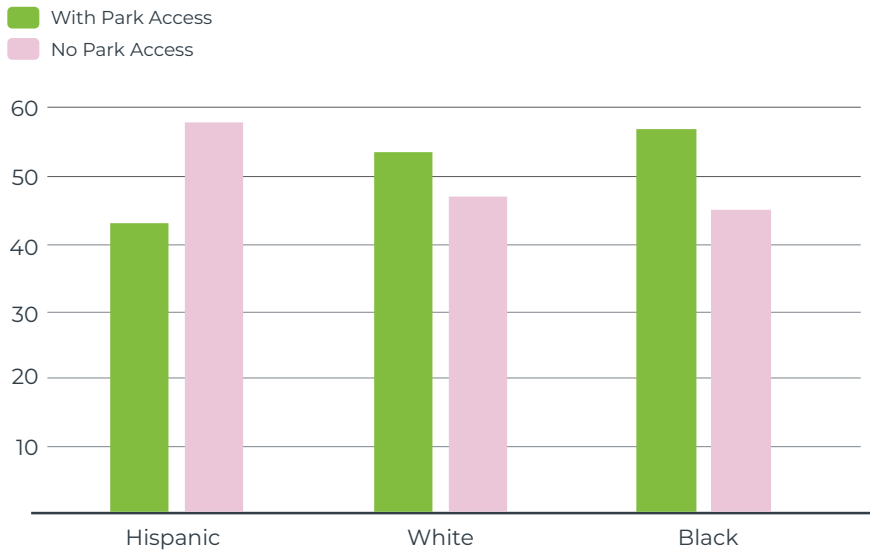


Figure 9: Park access by race and ethnicity

Source: US Census Bureau, ACS 5-Year Estimates, 2022; City of Norfolk

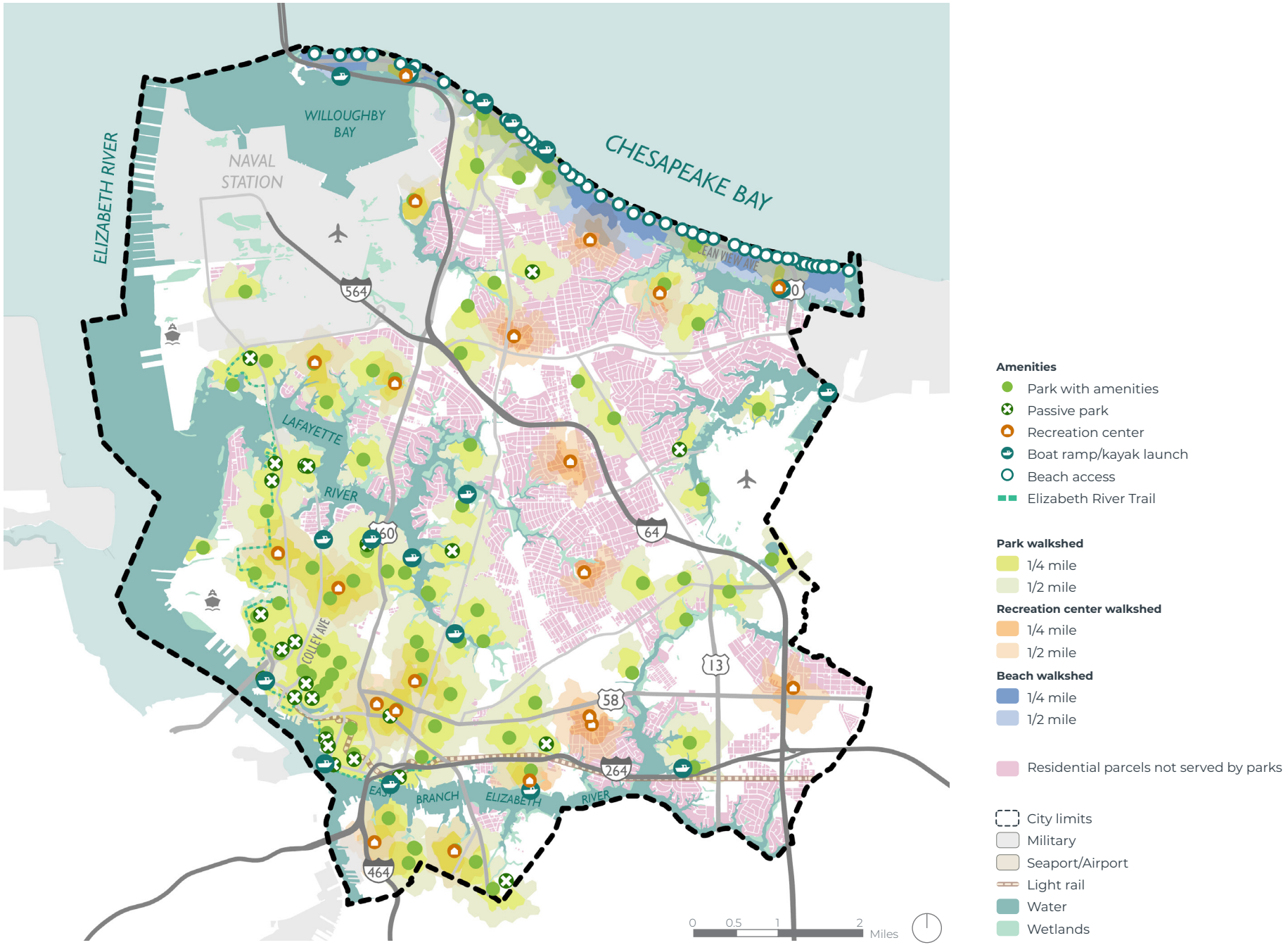


Figure 10: Park access

City of Norfolk, WRT

FLOOD EVENTS

Even in areas of the city not proximate to the coastline, much of Norfolk is prone to flooding. Ocean View, Downtown, and areas around the Lafayette River are particularly vulnerable. Extreme weather events, though not as devastating as coastal storms, are the most frequently occurring. Because stormwater cannot drain at high water levels, sea level rise will increase the impacts of such storms: as it is, "blue sky flooding" due to sea level rise is already on the rise across the city.

As opposed to coastal flooding, which is longer lasting and can be seen coming, rain-driven floods occur suddenly and intensely, and subside quicker. They often affect smaller, dispersed areas intensely, while coastal flooding tends to impact larger, consistent lengths of coastline.

Historic weather records show the high frequency of storm events in the area. From the "Dreadful Hurricane" of September 1667, a record storm in August 1933, the Ash Wednesday storm of 1962, and the costliest disaster in Virginia's history, Hurricane Isabel in 2003, major storms in Norfolk follow similar paths: they are either fall Nor'Easters or they coincide with high tides. Consequently, extreme rainfall – such as that occurring during Hurricane Isabel, 4-7' of rainfall – exacerbates tidal risks and causes more damage.

"Blue sky" flooding in a residential neighborhood (WRT)

> **I know that they should actually fix up the roads…because I know certain parts of Norfolk flood a lot. It causes a lot of car accidents.**
>
> — Norfolk resident, Workshop #1, October 2023

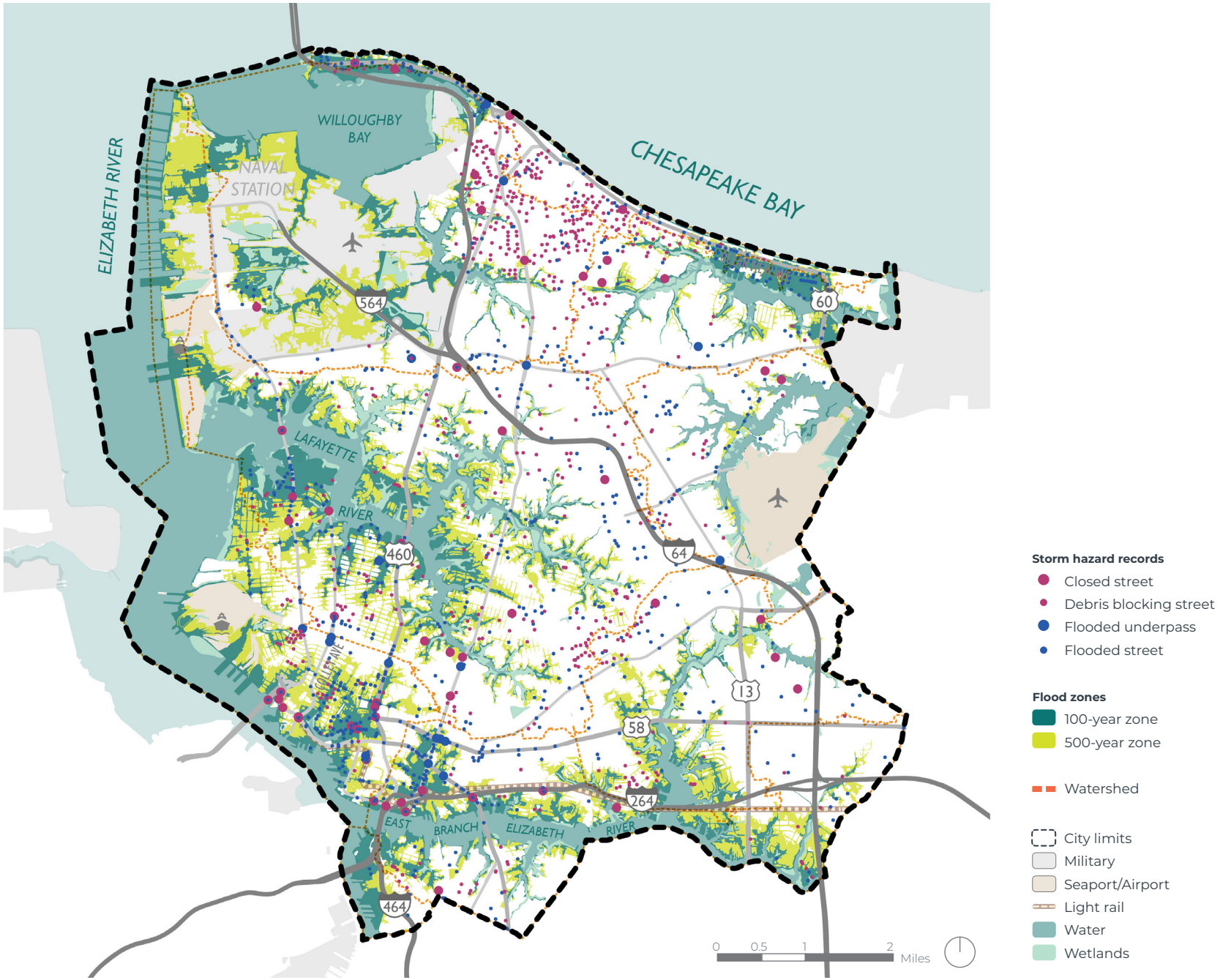


Figure 11: Storm hazard records

City of Norfolk; FEMA; NOAA, 2022; USGS

SUCCESS!

GREEN INFRASTRUCTURE PLAN (2018)

The City adopted an ambitious Green Infrastructure Plan in 2018, pulling from numerous goals and actions found in plaNorfolk2030. For land, the focus is to protect, connect and re-green the landscape to provide pathways for people and wildlife, treat stormwater and reduce flooding, and beautify the city; for water, the focus is to restore shoreline habitats to support aquatic life, buffer areas from storm surge, and foster recreation, including birding, boating, and fishing. Specific plaNorfolk2030 actions tied to the Green Infrastructure Plan include:

- ES1.3.2: Revise landscaping regulations to require the placement of shade trees in parking lots.
- ES1.1.18: Pursue amendments to the Zoning Ordinance to require minimum tree canopy coverage in all zoning districts within the city for replacement or addition of trees on-site to help achieve the tree canopy goals contained in the Green Infrastructure Plan.
- ES1.3.19: Pursue amendments to the Zoning Ordinance that include enhanced requirements for tree protection, conservation, planting, and replacement on public and private properties.

WATERSHEDS AND FLOOD PATTERNS

Norfolk's watersheds are part of the greater Chesapeake Bay watershed, which is comprised of many watersheds across six states (New York, Pennsylvania, West Virginia, Maryland, Delaware, Virginia) and the District of Columbia. **The Chesapeake Bay is the largest and most productive estuary in the United States and holds tremendous ecological, cultural, economic, historic, and recreational value for the region.**

There are nine main watersheds in Norfolk delineated by the river system:

- Eastern Branch Elizabeth River (15,117 acre)
- Lafayette River (10,842 acre)
- Main Branch Elizabeth River (10,002 acre)
- James River (10,002 acre)
- Lake Whitehurst (8,330 acre)
- Mason Creek and Willoughby Bay (7,717 acre)
- Little Creek (5,844 acre)
- Broad Creek (4,939 acre)
- Chesapeake Bay (865 acre)

Though not the largest in size, **the main branch of Elizabeth River has historically experienced the most issues with flooded streets,** especially on Monticello Ave. A number of the streets in the adjacent Eastern Branch watershed – East Virginia Beach Boulevard, Tidewater Drive, and E Brambleton Avenue – were reported to have multiple points of flooding. A considerable concentration of the city's historic flooding events are located along E Little Creek Road, passing by the elevated parts of the Mason Creek and Willoughby Bay watershed. The same issues are observed along I-64, causing "bathtub" effects in the high elevations of Lake Whitehurst watershed.

According to 2022 data from the Mid-Atlantic Regional Integrated Sciences and Assessments (MARISA), there will be 2-3 extreme rainfall events annually exceeding 2 ft of precipitation by 2100. Rainfall in Norfolk in 2006-2035 is projected for 17% more days per year, with total annual rainfalls 1.7 ft greater than in 1976-2005. **The drainage systems of the city must prepare to accommodate these increased storm events.**

2024 Flood Strategy Open House (City of Norfolk)

Ohio Creek Watershed Project (City of Norfolk)

Ohio Creek Watershed

In 2016, Norfolk was awarded a $112 million federal grant from the National Disaster Resilience Competition for the Ohio Creek Watershed Project. The project centers on the predominantly African-American Grandy Village and Chesterfield Heights neighborhoods, east of Downtown along the Elizabeth Riverfront. Strategies include landscape and hardscape options to improve flooding, a large-scale waterfront Resilience Park, and public connections to the waterway and the rest of the city.

Officially completed in June 2023, the Ohio Creek Watershed Project is part of Norfolk's Resilience Strategy and supports its three goals: 1) Design a coastal community capable of dealing with the increased risk of flooding; 2) Create economic opportunity by advancing efforts to grow existing and new industry sectors; and 3) Advance initiatives to connect communities, deconcentrate poverty, and strengthen neighborhoods

RESILIENCE STRATEGIES

Norfolk is already a leader in climate resilience, with many projects in various stages of development to mitigate stormwater, tidal, and coastal flooding risk.

Most of the city's coastal protection projects are expected to be implemented within the next decade, but parts of the city will require longer-term protection to mitigate multi-layered climate threats like increased stormwater flooding and sea level rise.

Norfolk has already implemented over 2,000 green infrastructure best management practices – mostly in Downtown, Ghent, and Ocean View. Coastal protection measures are fewer (24), and only seven of those 24 have been completed. Living shoreline strategies might work effectively as smaller scale adaptation solutions considering the uncertainties of construction horizons for large-scale coastal protection projects, such as the US Army Corps of Engineers (USACE) Norfolk Coastal Storm Risk Management Project.

More adaptation measures are still needed on the Southern shore of the Elizabeth River; Pretty Lake; and the Chesapeake Bayfront. Connecting coastal protection with large transportation facilities will also be important for rapid response in emergencies.

> **"By 2050, Norfolk will be known for finding equitable, just, and innovative ways for living with water and climate change impacts."**
>
> — Norfolk resident, Workshop #1, October 2023

Ohio Creek Watershed Project (City of Norfolk)

Flood adaptation efforts on the local scale include *(see map at right)*:

1. USACE COASTAL STORM RISK MANAGEMENT PROJECT (4 KEY AREAS AND 5 IMPLEMENTATION PHASES):

1.1 Ghent-Downtown-Harbor Park (2028-2032) (16.5 ft). One of the critical components is Harbor Park Brownfields Shoreline/Flood Protection System (Under Design)

1.2 Pretty Lake (2029) 15 ft

1.3 Lafayette (2030) 15.5 ft

1.4 Broad Creek (2030) 16.5 ft

1.5 Citywide - Nonstructural measures (2026, 2032) Critical elements are: Elizabeth Park House Elevations, Floodproofing, and/or Buyout; Ingleside Road House Elevations, Floodproofing, and/or Buyout; Willoughby Bay House Elevations, Floodproofing, and/or Buyout

2. PlaNORFOLK 2030:

2.1 Wetland restoration

2.2 Citywide GI BMP

3. HAMPTON ROADS HAZARD MITIGATION PLAN (14 PROJECTS), INCLUDING:

3.1 Structural protection for beaches and shorelines (Bay Point Drive, Westwood Terrace, Cambridge, and Carroll Place)

3.2 Natural shoreline protection measures (Pleasant Point Living Shoreline, Virginia Port Authority Thimble Shoal Channel deepening)

3.3 Stormwater management Improvements (Glenwood Park, East Ocean View, Glenrock, Coleman Place, Lowery Road, and Janaf Place, St Paul's Blue Greenway, Meadow Lake, Silver Lake, and Lake Whitehurst, Chesapeake Blvd Outfall Extension)

3.4 Critical facilities and infrastructure improvement to minimize flood and wind damage (Norfolk Public Schools food warehouse)

3.5 Flood-prone structures protection (Yarmouth Street)

4. NORFOLK AND VIRGINIA BEACH JOINT LAND USE STUDY

4.1 East Amphibious Drive, Chubb Lake, and Lake Bradford Flood mitigation and stormwater management Strategy

4.2 Hampton Boulevard Comprehensive Flood Mitigation and Stormwater Management Strategy

4.3 Norview Avenue Drainage Study

4.4 Willoughby Bay Shoreline Floodwall Options

4.5 Terminal Boulevard Rail and Roadway grade separation

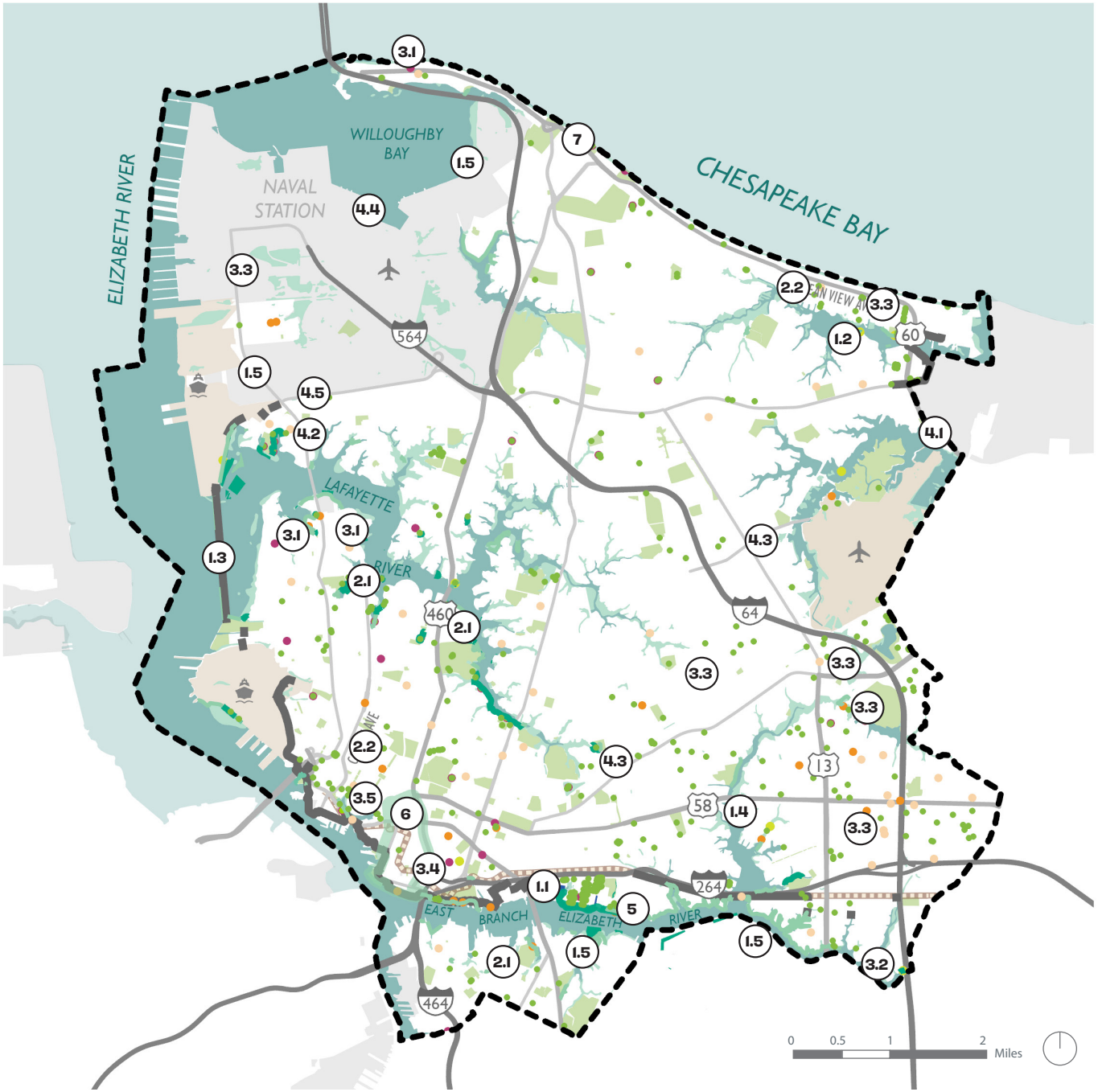
5. OHIO CREEK WATERSHED PROJECT:

5 Coastal defense, Stormwater management with tide gate , Transportation infrastructure community amenities.

6. ST. PAUL'S BLUE-GREENWAY PROJECT:

6 Stream restoration, Blueways, Flood resiliency, safety, housing, availability, and diversity improvements

7 OCEAN VIEW BEACH REPLENISHMENT



Structural adaptation:

- Completed / under construction
- Designed
- Programmed and proposed
- Proposed Floodwall (USACE)
- Constructed floodwalls and breakwaters

Nature-based and hybrid adaptation (Living shorelines, oyster reefs, constructed wetlands)

- Complete
- Construction, maintenance
- Planned, proposed, designed

Green stormwater strategies

- Completed
- Under construction
- Programmed, proposed, or designed

Adaptation Plan References

1. USACE Coastal Storm Risk Management
2. PlaNorfolk2030
3. Hampton Roads Hazard Mitigation Plan
4. Joint Land Use Study
5. Ohio Creek Watershed Project
6. St Paul's Blue Greenway Project
7. Ocean View Beach replenishment

- City limits
- Military
- Seaport/Airport
- Light rail
- Water
- Wetlands

Figure 12: Local resiliency strategies

City of Norfolk; USACE; Hampton Roads Resilience Projects Dashboard

Permeable pavers, such as these in Chesterfield Heights, can help reduce impervious surfaces and stormwater runoff (WRT)

IMPERVIOUS SURFACES

Norfolk and the greater Hampton Roads region rapidly urbanized in the mid-20th century following World War II. **Today the region is one of the most densely urbanized locations on the East Coast.** This urbanization brought with it an increase in impervious area and resultant changes to the land's hydrology.

A high percentage of impervious surface coverage can greatly alter the hydrology of a watershed by increasing the speed at which water enters stormwater systems, and reducing the filtration and infiltration that would otherwise be provided by pervious surfaces (those designed to allow for water infiltration). Increased rainfall flooding and water quality issues can be attributed to an increase in impervious surface coverage.

Based on data from the Chesapeake Bay Program, the City of Norfolk has approximately 49% impervious surface coverage.

Norfolk's surface coverage is 49% impervious.

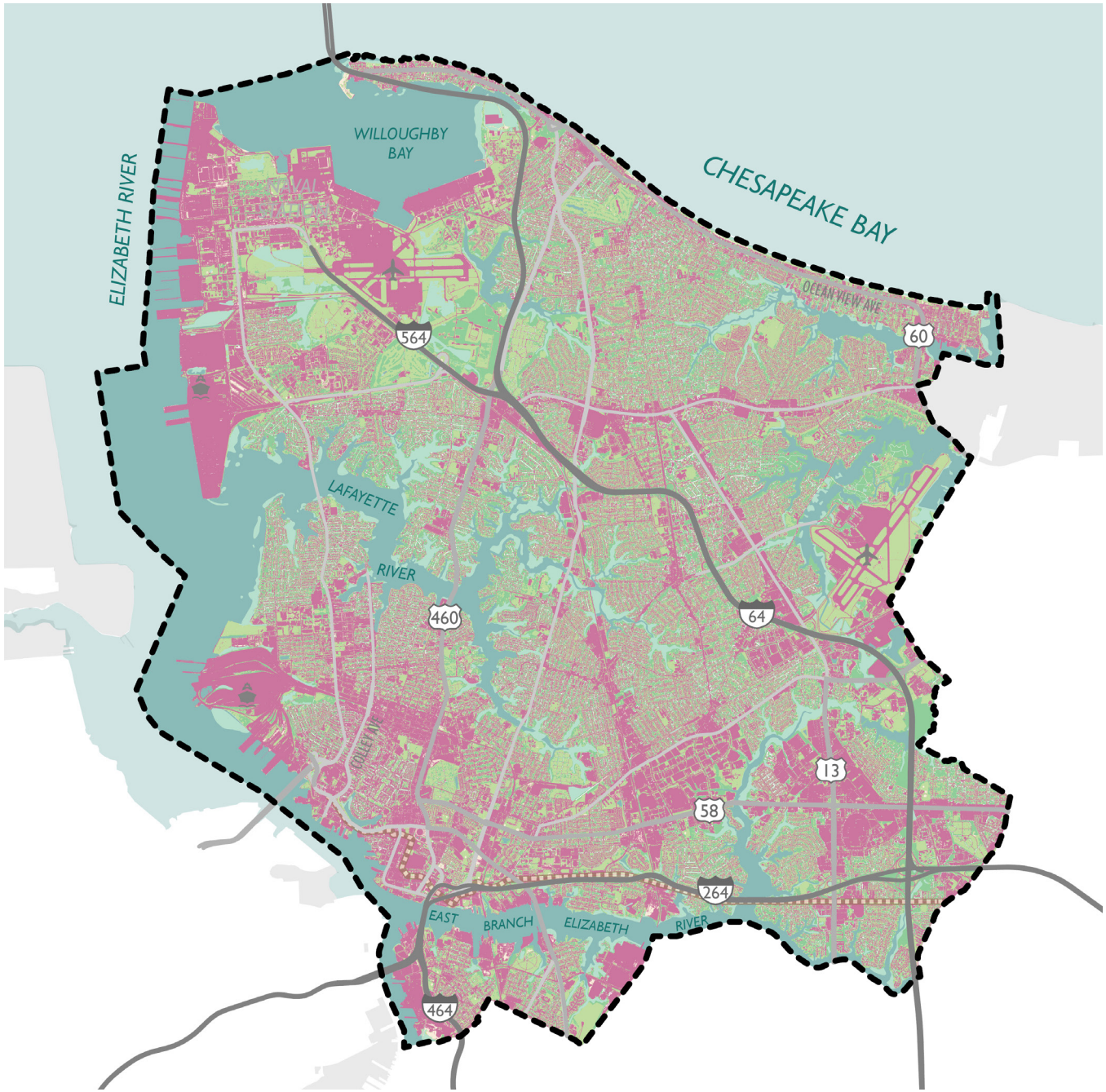


Figure 13: Land cover and impervious surfaces

Chesapeake Bay Program; USGS , City of Norfolk

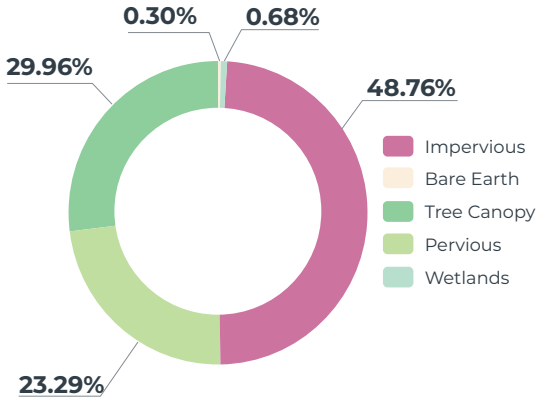


Figure 14: Surface types

Chesapeake Bay Program

EXTREME HEAT AND TREE CANOPY

With over 40% of weather-related deaths in the US due to high temperature (National Weather Service, 2022), extreme heat is the deadliest climate hazard in the country.

Extreme heat causes severe health conditions and higher utility costs. Proximity to water and high humidity in Norfolk are compounded with extreme air temperatures observed in industrial areas and highways to further increase risk during high heat days.

Norfolk Botanical Garden (City of Norfolk)

The city's land use directly impacts heat. There is a 10-degree difference across the city during summer days, with the highest temperatures in neighborhoods historically lacking trees and green spaces. North Ghent, Park Place, Huntersville, and Glenrock experience 100-105F temperatures on a summer day. Exposure to such extreme weather impacts residents' cardiovascular and respiratory systems, affecting the health of vulnerable populations.

Norfolk is a highly urbanized community, 73% of land (National Land Cover Database) with parking lots, roads, and other infrastructure contributing to extreme heat. The industrial and maritime history of Norfolk resulted in extensive impervious paving and a lack of tree canopy, increasing urban heat. **The city's commercial corridors and industrial districts are by far the hottest zones, and also the areas with the most impervious surface and the least tree canopy.**

Meanwhile, the city's residential areas have a relatively even distribution of tree canopy. The highest percentage of tree canopy (>40%) is concentrated in the following areas:

- Algonquin Park
- Cromwell Farms
- Bayview
- Sherwood Forest

Commercial parking lots retain heat (WRT)

These natural vegetation clusters partially mitigate the absence of trees in the adjacent transportation and industrial zones. Due to the lack of capacity to absorb and infiltrate, these corridors accumulate surface stormwater. This causes transportation disruption - dangerous under extreme rain events.

The areas deprived of vegetative cover have the lowest opportunity to convey stormwater, which mainly is the issue in the low-lying communities and the "bathtub" geomorphologies along Highways 64 and 264.

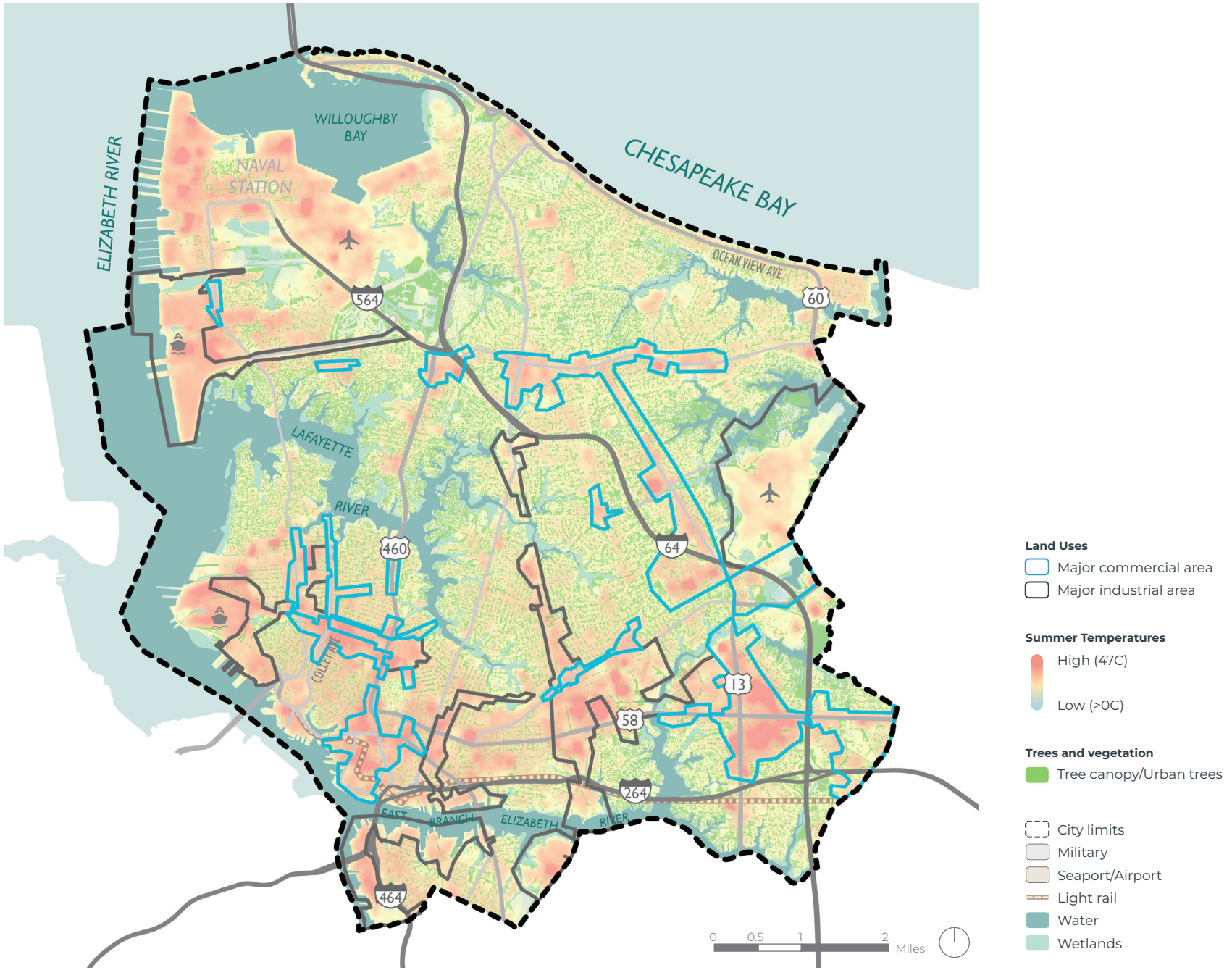


Figure 15: Extreme heat and tree canopies

National Land Cover Dataset, 2016, US Geological Survey; The Virginia Geographic Information Network


Virginia Environmental Justice Collaborative

Globe Iron Site

Norfolk applied for and received assistance from the U.S. Environmental Protection Agency and a brownfield restoration grant from Virginia Economic Development Partnership to redevelop an 18-acre site formerly belonging to Globe Iron Construction Co. The site was vacant until it was purchased by the City of Norfolk in 2020. The City rezoned the parcel for residential use, and a recent 2023 EPA report, in line with community input, recommends that Norfolk advances mixed-use and residential development on-site with a focus on missing middle housing. ~100 for-sale townhomes and a park, five small apartment buildings and community resources, 76,000 SF of biotech office space across four buildings, 29,500 SF for retail use, an additional 4-acre park, and many additional townhomes, single-family homes, triplexes, duplexes, and quadplexes. Located in a historically African-American neighborhood that has been disinvested over decades, this development is seen as an opportunity to bring economic opportunity and neighborhood amenities to the community.

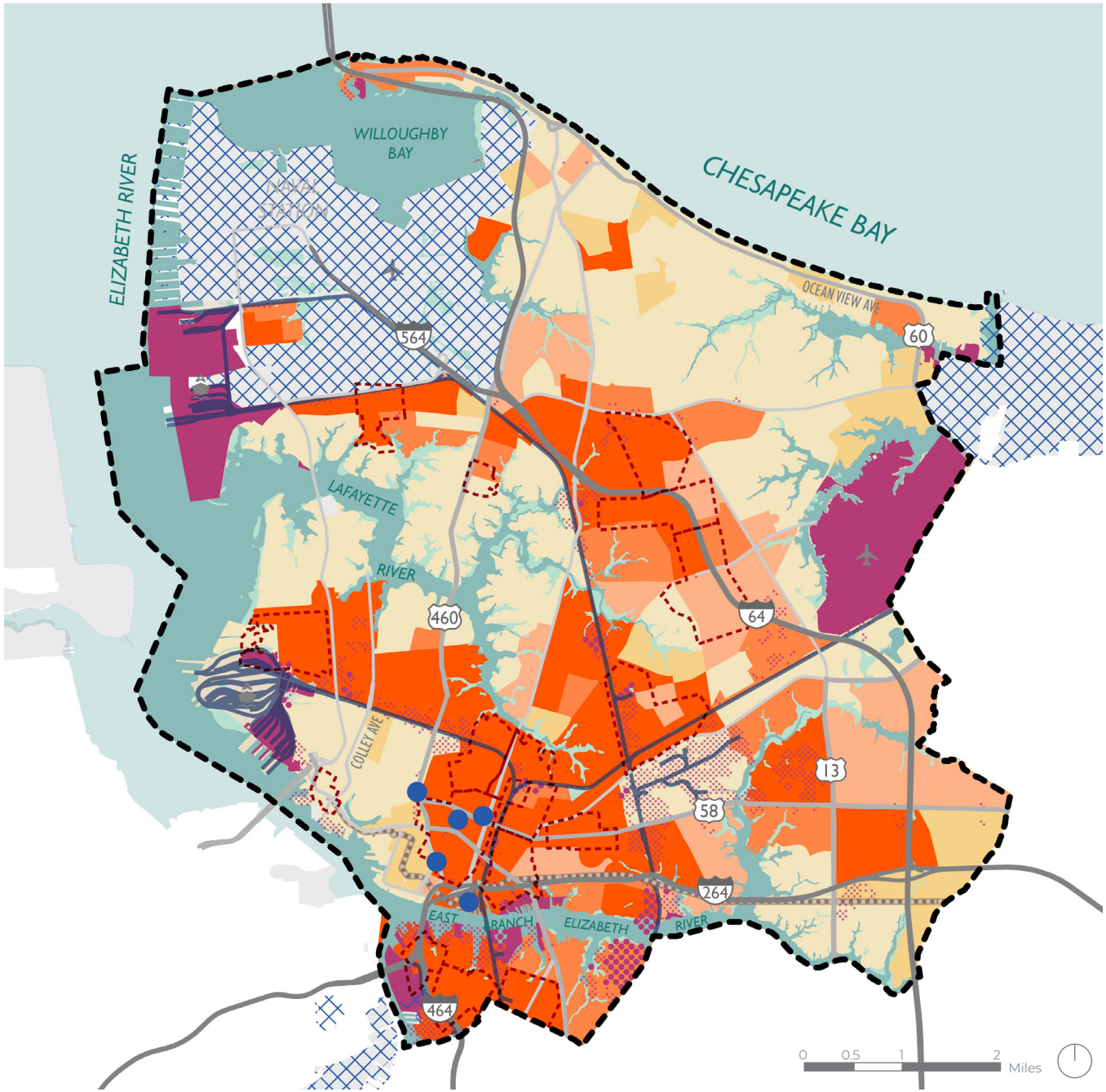
ENVIRONMENTAL JUSTICE

Environmental Justice refers to the movement to reverse enviromental hazards in socially vulnerable communities. Historically, lower-income, minority, or other disadvantaged communities have been disproportionately burdened with a variety of environmental risks - including brownfields and toxic waste sites, air pollution, flood risk, and others.

The Environmental Justice Screen tool (EJScreen) is a tool used by the U.S. Environmental Protection Agency (EPA) to map and screen environmental justice issues, combining environmental and demographic data for user-specified geographic areas, utilizing publicly available data. It provides robust metrics for climate vulnerability and environmental justice concerns. EJScreen includes the following categories of indicators:

- 13 environmental indicators, including air and water quality metrics, and waste management infrastructure;
- 7 socioeconomic indicators, including racial minorities, age, language, income, employment, and education;
- 13 environmental justice indexes, combining demographic factors with a single environmental factor;
- 13 supplemental indexes, combining socioeconomic indicators with a single environmental indicator.

Using the EJScreen analysis, **much of Norfolk rates in the highest two categories of aggregated EJ exposure, most notably aligning with highways and zones of historic redlining.** In the southern part of the city, the distribution of the disadvantaged populations mostly gravitate towards the Elizabeth River and Highway 264. Flooding impacts coastal populations disproportionately, likely causing further displacement from underinvested communities in the future. This is a particular concern around the Naval Base, International Airport, and the inlet of Broad Creek.



"Percentiles" are a way to see how local residents compare to everyone else in the United States. Instead of just showing numbers out of context, EJScreen lets users compare a community to the rest of the state, EPA region and nation, by using percentiles. The national percentile shows what percent of the US population has an equal or lower value, meaning less potential for exposure/ risk/ proximity to certain facilities, or a lower percent minority (EJScreen).

Of the 13 environmental risk indexes mapped, Norfolk has multiple neighborhoods that rank above the 80th national percentile in up to 12 of these.

Figure 16: Environmental justice

City of Norfolk; EPA; HRTPO

SCALING UP

REGIONAL FLOOD EXPOSURE

The Hampton Roads region is at high risk of flooding both now and in the coming decades. All of Norfolk's geography will be at risk of some sort of flooding by 2080, based on the intermediate-high emission scenario (see p.178).

The region's highest flood exposure hotspots were identified with the USACE NAACS combined index (NACCS, 2014). This analysis compares many factors to identify the areas at highest risk, with a focus on population density and infrastructure exposure (80%), followed by social vulnerability (10%) and environmental and cultural resources exposure (10%).

When critical infrastructure is flooded or impaired, the entire region is affected. Compounding the challenge, any adaptation efforts in Norfolk must also take into consideration the level of risk in adjacent Portsmouth - sharing the same estuary and the Elizabeth River waterway.

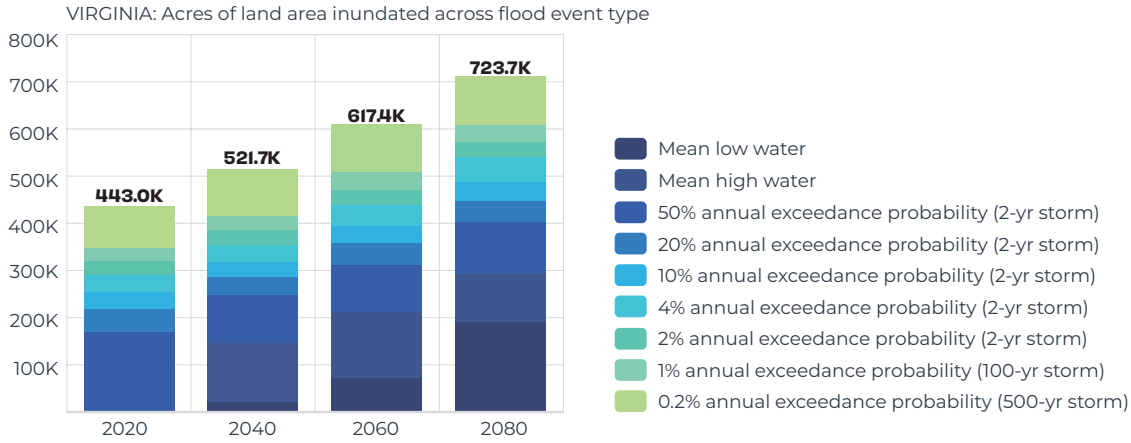


Figure 17: Impacts of projected flood levels, Commonwealth of Virginia

Source: VA CRMP, 2021

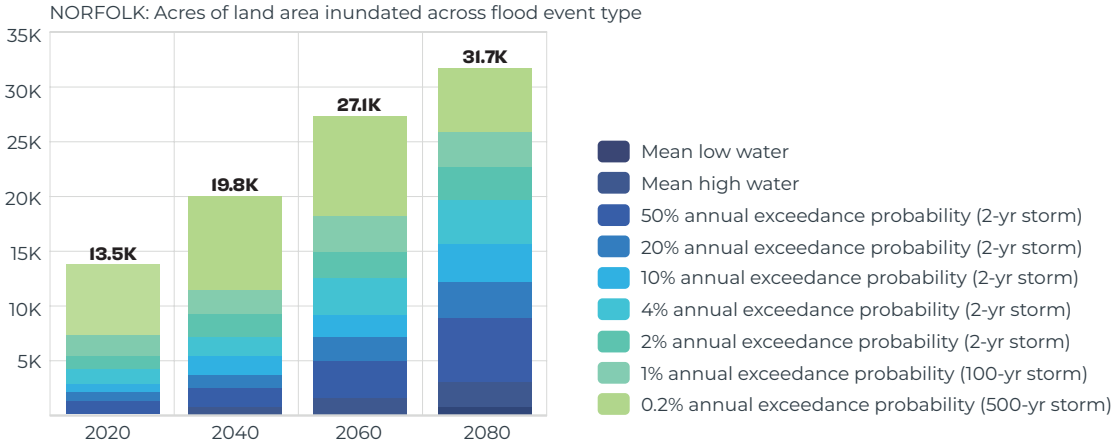


Figure 18: Impacts of projected flood levels, Norfolk

Source: VA CRMP, 2021

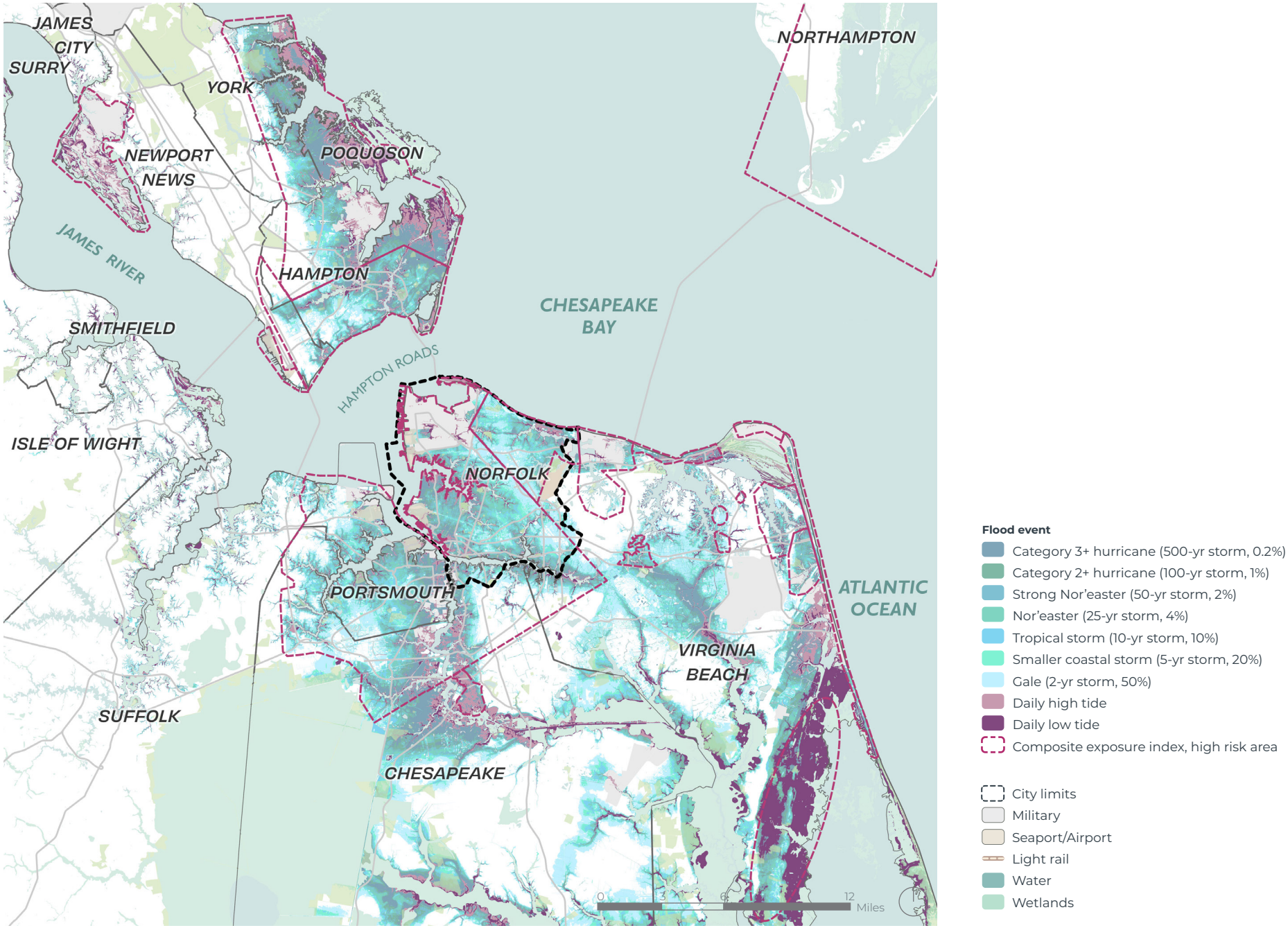


Figure 19: Regional Coastal Flood Risk

USACE NAACS combined flood exposure index, 2015; Commonwealth of Virginia, Virginia Coastal Resilience Master Plan Flood Scenarios, 2017

Connecting the City

Elizabeth River Trail
(City of Norfolk)

Norfolk serves as the central transportation hub for the entire Hampton Roads region. While the City has invested in multimodal transportation options and is enhancing its network of bike lanes and trails, reliance on cars remains predominant among residents. This heavy dependence on automobiles contributes to congestion within the city.

Historic Connections | Past Injustices | Mobility Network
Barriers to Mobility | Utilities & Critical Infrastructure | Broadband
& the Digital Divide | Access to Daily Needs | Regional Hub

CONNECTING THE CITY

INTRODUCTION

At the junction of waterways, highways, rail, utilities, and multimodal systems, Norfolk is the urban hub of the Hampton Roads region. While some of these systems are quite well developed, others create additional barriers for residents moving around the city, and the present and future risk of flooding further hampers mobility and security.

> **Norfolk will be more accessible via public transit, and more connected to other cities in the region.**
>
> — Norfolk resident, Workshop #1, October 2023

Norfolk is well-connected with freight rail and shipping, cross-bay bridges and tunnels, and highway infrastructure. Amtrak and the Tide Light Rail line provide passenger rail around the city and beyond the region. These connections link Norfolk residents and workers to jobs centers, entertainment, and everyday needs.

The city's infrastructure is somewhat fragile, though: a predominant reliance on cars for mobility creates widespread congestion on the few arterials and bridge/highway connections that do connect across the city and beyond. Frequent "nuisance" flooding and at-grade rail crossings further hamper travel. And the ever-present waterfront further disconnects neighborhoods.

Luckily, Norfolk has made great strides in multi-modal mobility systems, with increasing bike infrastructure, a recent overhaul of the bus network, and the rising popularity of the scooter and bikeshare program. But there is more to work towards to ensure that Norfolk residents and stakeholders in all neighborhoods have equitable access and multiple options for easily and safely getting around.

Other utility systems are worth examining as well. Norfolk's water supply and treatment plants serve neighboring cities as well as its own residents. The city is well-served by broadband access, but not all residents subscribe to an internet provider, furthering the digital divide.

Ultimately, the resilience of Norfolk's utilities, infrastructure, and connections is critical not just for the city itself, but for the entire Hampton Roads region and for larger national security.

Part of the infrastructure of the Norfolk Bike Loop (City of Norfolk)

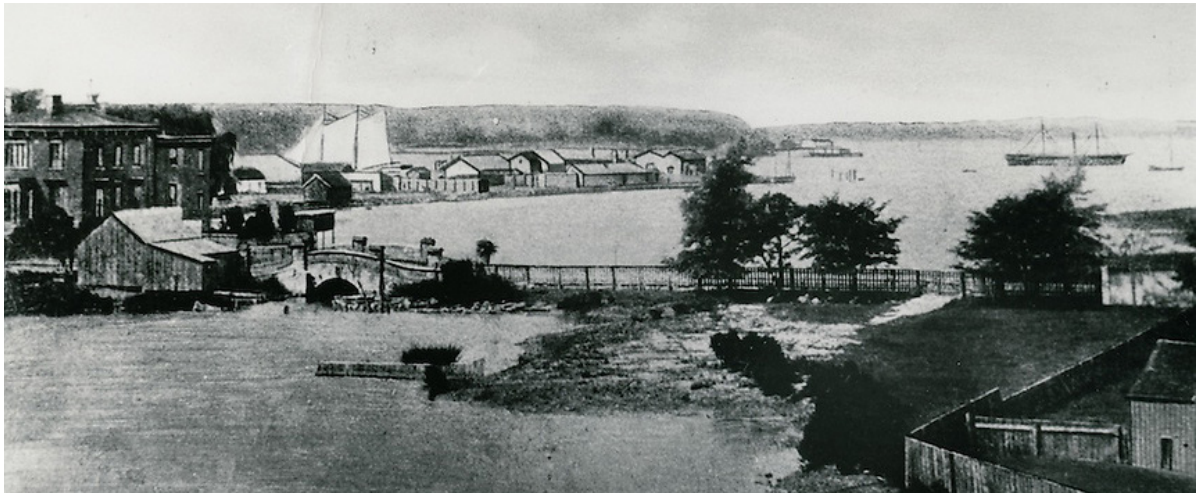
HISTORIC CONNECTIONS

Any conversation about Norfolk's physical connectivity should begin with a look back at the city's past: **historically, Norfolk had a network of granular, neighborhood-to-neighborhood connections that have since disappeared,** including a robust streetcar network and a series of small pedestrian bridges connecting across the city's many inlets and creeks.

Overlaying streetcars onto a 1942 map of Norfolk (opposite) illustrates the development pattern of "streetcar suburbs": neighborhoods that developed in a walkable grid pattern, within 3/4 mile of a streetcar track, for residents to easily hop a streetcar to work. In addition to the streetcars, small bridges served as neighborhood-to-neighborhood connectors for those without cars.

This historic infrastructure has left legal rights-of-way that could potentially be repurposed: the streets that formerly contained streetcars - including Granby; Chesapeake; and Hampton - have retained the width of their historic rights-of-way, while waterfront public access from the former bridges could be reused in the future.

A streetcar in the Norview neighborhood circa 1910 (Virginian-pilot)



Historic pedesrian bridge connection at Granby Street, 1868 (NRHA)

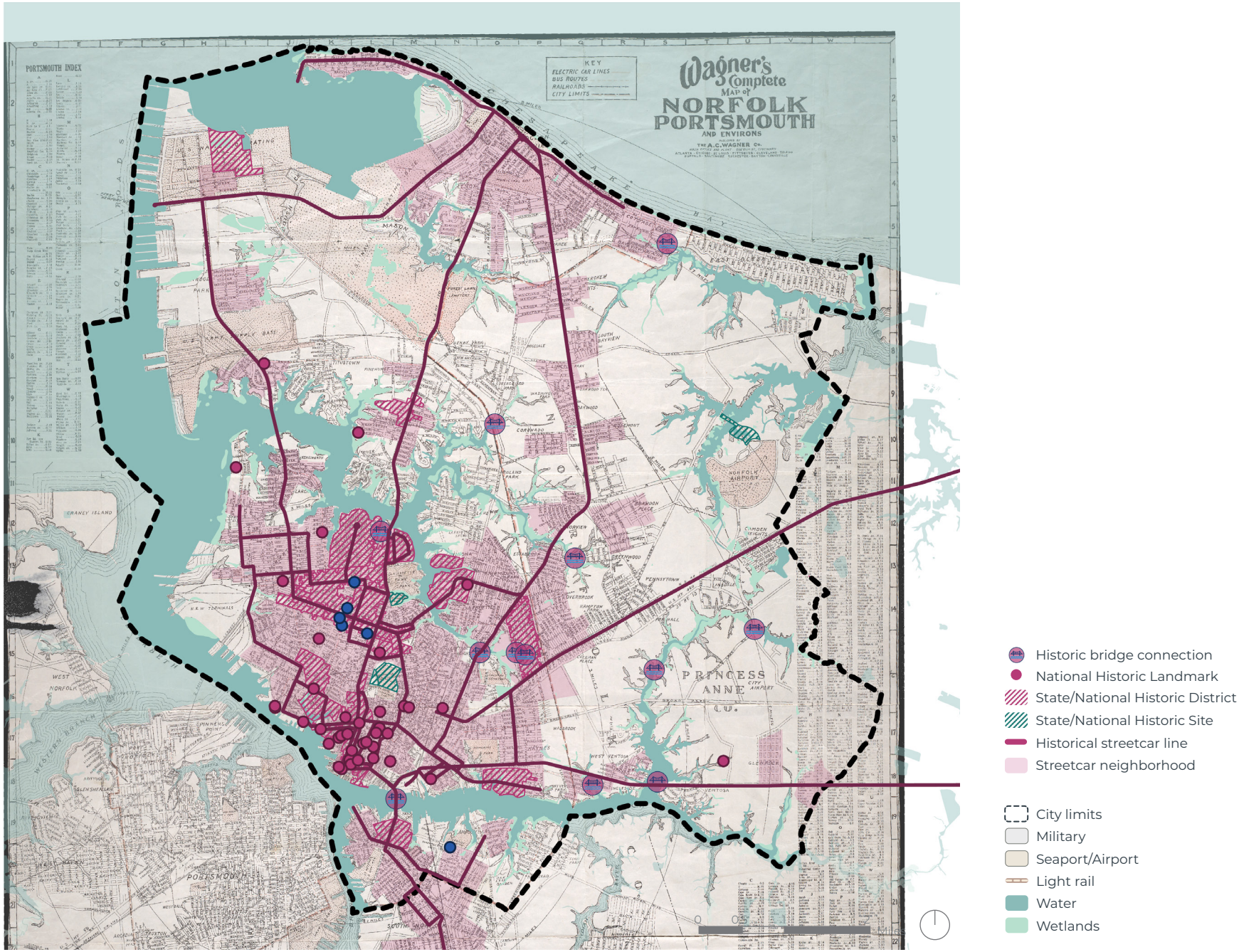


Figure 1: Historic streetcars and bridges show where the city developed before cars

City of Norfolk; Sargeant Memorial Collection; Virginia Department of Historic Resources; WPA

Reconnecting Communities

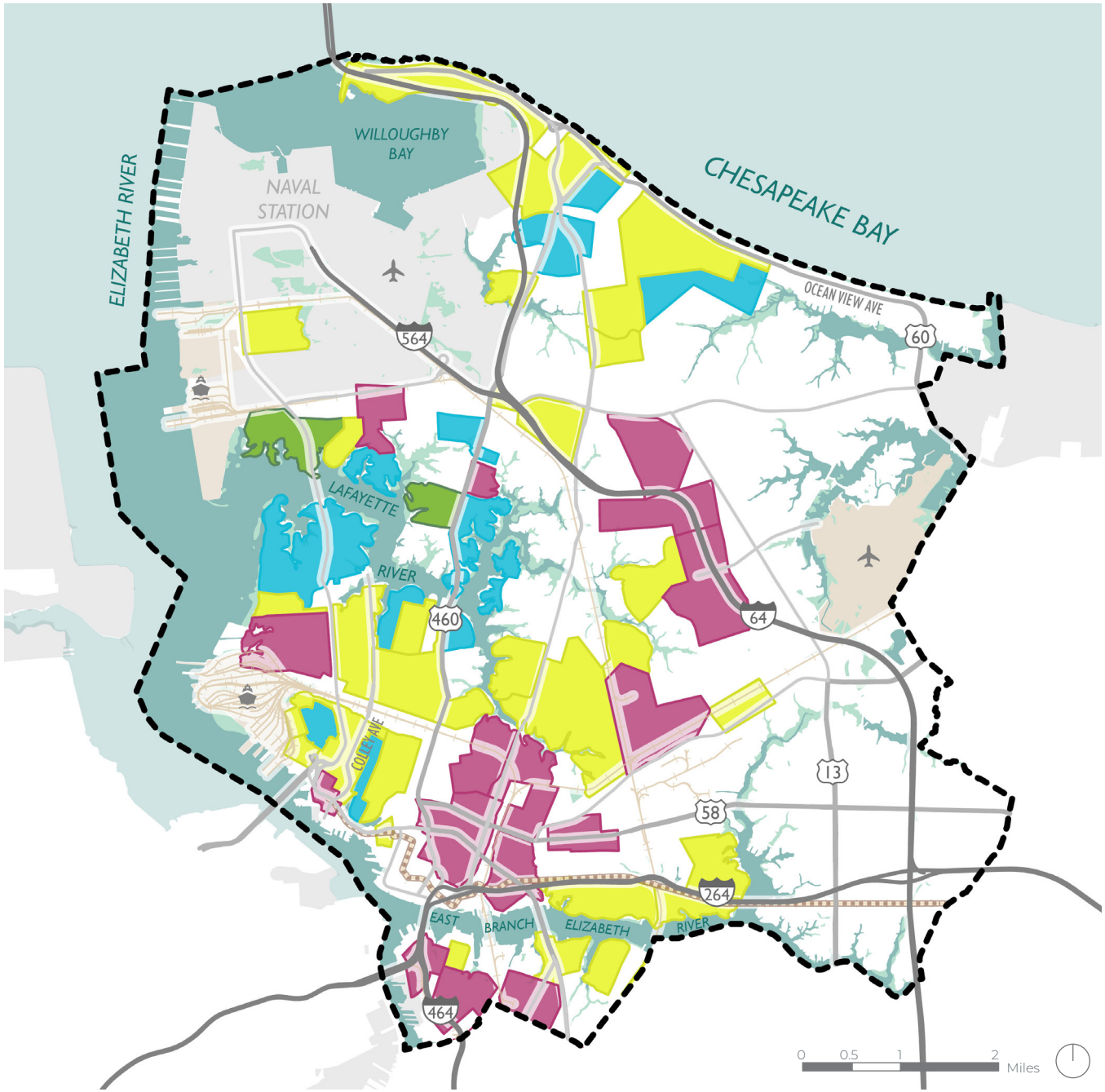
In 2022 Norfolk was awarded $1.6 million by the US Department of Transportation towards planning a solution to the I-264 "spaghetti bowl," a 14-lane jumble of 1960s infrastructure that separates the eastside neighborhoods along the Elizabeth River - lower income and primarily African-American - from Downtown Norfolk. The planning study will be used to address the social inequity and racial and economic disparities created in the wake of I-264's construction. Through this project, Norfolk is positioned to reimagine highway barriers and correct the injustices of the past.

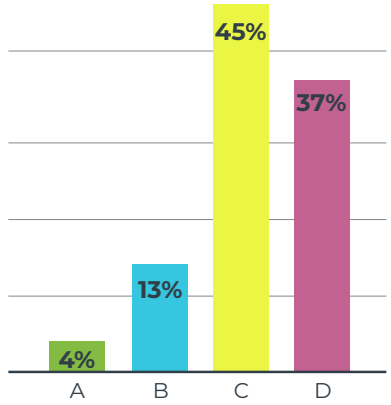
PAST INJUSTICES

"Redlining" and racial discrimination in urban development is often discussed in the context of housing (p.85), but the planning injustices of the 20th century were also enacted by federal transportation projects, specifically in interstate highway construction.

Norfolk, like many American cities, saw a boom in highway construction in the 1950s-60s. More often than not, these highways cut through the city's African-American neighborhoods, further displacing communities of color and creating lasting environmental and spatial impacts.

Surveying the current landscape of the city and its highways, it is important to notice how neighborhoods designated by 1937 U.S. Federal Home Owners' Loan Corporation maps as yellow ("C - Definitely Declining") and red ("D - Hazardous") are disproportionately split by what are now major highways such as I-64, I-264, and 168. Out of all the major roads that intersect with these HOLC boundaries, the vast majority of roads were constructed through the heart of discriminated neighborhoods. This illustrates how **redlining played a significant role in disconnecting the working class and communities of color.**





Percent of Norfolk's highway miles cutting through historically redlined neighborhoods

1930's redlining area rating

- A "Best"
- B "Still desirable"
- C "Definitely declining"
- D "Hazardous"

- City limits
- Military
- Seaport/Airport
- Light rail
- Water
- Wetlands

Figure 2: Historically "redlined" communities and Norfolk highway infrastructure

City of Norfolk Assessor (2023); University of Richmond; HOLC

MOBILITY NETWORK

HOW DO PEOPLE GET AROUND?

While Norfolk has many transportation options available, the way people move around is influenced by factors such as home location, job location, income level, age, personal health, and lifestyle choices. These individual personal factors and choices play out across Norfolk and the Hampton Roads region to impact congestion on roadways, bus speeds, riders on light-rail, investment decisions, and varying levels of government.

While a lot of travel data is focused on commuting, those types of trips only represent a portion of the trips people take in Norfolk. For that reason, the data shown represents the modes taken for all trips, not just commuting.

Figure 3 shows the typical mode type for Norfolk residents traveling within the city, and for non-Norfolk residents traveling to and within the city. Both Norfolk residents and non-residents primarily travel by car, but residents of Norfolk walk much more than non-residents. This is likely due to longer trip distances for non-Norfolk residents traveling into the City. However, vehicle-dominated roads can often create conditions that are unsafe for pedestrians.

Across the board, the data indicates that despite the variety of modes available for travel, there is still a heavy reliance on personal cars. Despite the presence of a robust bus network, a light-rail system, regional rail connections, ferries, and bike and scooter sharing systems, many people in Norfolk still choose to take their cars. This is likely due to land use patterns that make it difficult or dangerous to travel by foot or bike, inconvenient or impossible to take transit, and highly convenient to travel by car.

Low density travel patterns spread residences far distances from places of employment and createconditions that make it hard for transit to be effective. Since the pandemic, we have seen an increase in the number of people driving alone, carpooling, and working from home, and a decrease in the number of people taking public transportation, walking, and biking.

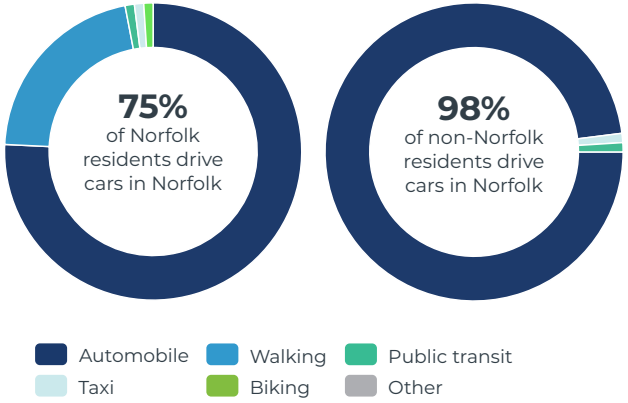


Figure 3: Mode of commute for Norfolk residents and workers commuting to Norfolk, 2019

Source: ReplicaHQ

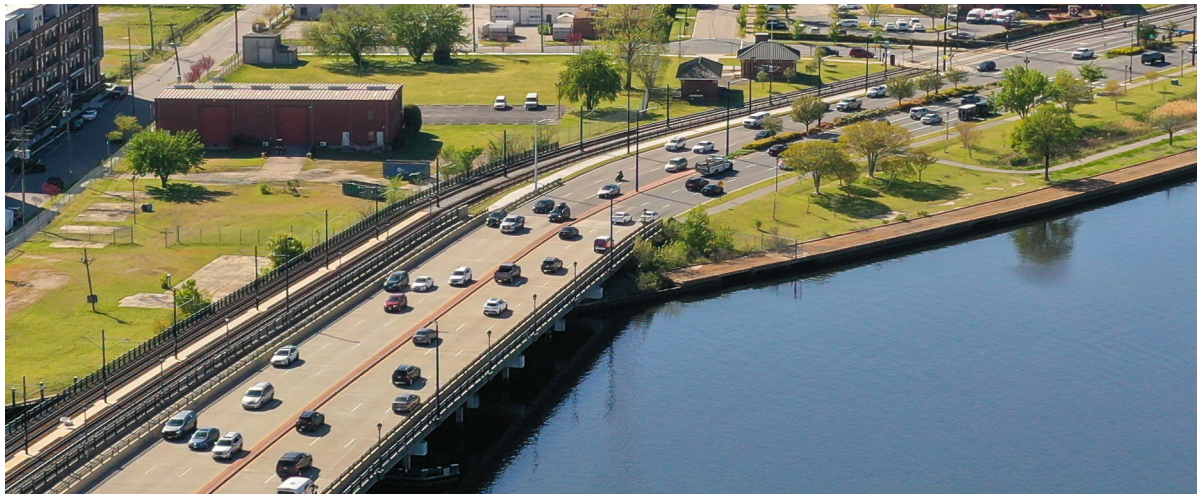
Public Transportation (WRT)

DESTINATIONS

The way people travel is important for Norfolk and the people living there because the city is a top destination for employment in the region. Norfolk holds three of the top ten census tracts by destination and represents the largest percentage of trip destinations of any city in the region. That means that how people decide to get to their jobs in Norfolk directly impacts activity at the street level. **The more people who drive to work in Norfolk, the more traffic congestion there is on the street, the more dangerous it is for residents to walk and bike, and the less healthy the air is.**

Three census tracts bring in the most trips each day: Downtown Norfolk, Military Circle, and Naval Station Norfolk. When combined with the known mode share of trips in Norfolk, it becomes clear that these become areas of heavy traffic.

In 2022, 88.2% of households in Norfolk owned at least one vehicle



Brambleton Bridge (City of Norfolk)

Area	Workers
Virginia Beach	17,910
Chesapeake	10,145
Portsmouth	3,633
Newport News	2,923
Hampton	2,638
Fairfax County	1,622
Henrico County	1,444
Suffolk	1,059
Richmond	962
Chesterfield county	809

Figure 4: Top 10 places Norfolk residents are commuting to

Source: Virginia Employment Commission, 2014

Area	Workers
Virginia Beach	35,277
Chesapeake	18,840
Portsmouth	6,679
Suffolk	4,735
Hampton	4,491
Newport News	3,803
Fairfax County	1,241
Isle of Wright	1,192
Chesterfield County	1,022
York county	1,018

Figure 5: Top 10 places Norfolk workers are commuting from

Source: Virginia Employment Commission, 2014

A CONGESTED AND VULNERABLE SYSTEM

Because the majority of trips in and to Norfolk take place in cars, the roadway network carries a significant amount of the burden. This leads to overly burdensome congestion on some corridors, particularly major highways in and the few connecting arterials that cross the city.

Some of Norfolk's most congested corridors are also those most vulnerable to flooding. In the event of a storm surge, some of the critical roadways that could be used by residents to leave the city or for aid to enter the city could be inundated with water and therefore be unusable.

Flooded streets are a regular occurrence in Norfolk (WRT)

One of Norfolk's main arterials (City of Norfolk)

Rail crossings are also locations where roads can be vulnerable to flooding if they happen to cross underneath the rail line. In the event where the railroad crosses the road directly, there can be long delays increasing congestion on surrounding roadways.

This pattern of congestion and vulnerability is repeated around the city. The congestion, when paired with the known mode share, shows that the transportation system is overburdened. Too many trips are occurring in one single mode, which is creating more traffic on roadways than can be supported. This over-reliance on one single mode can also create vulnerability, when those key roadways are unusable and there isn't infrastructure or knowledge to take other modes to reach key destinations.

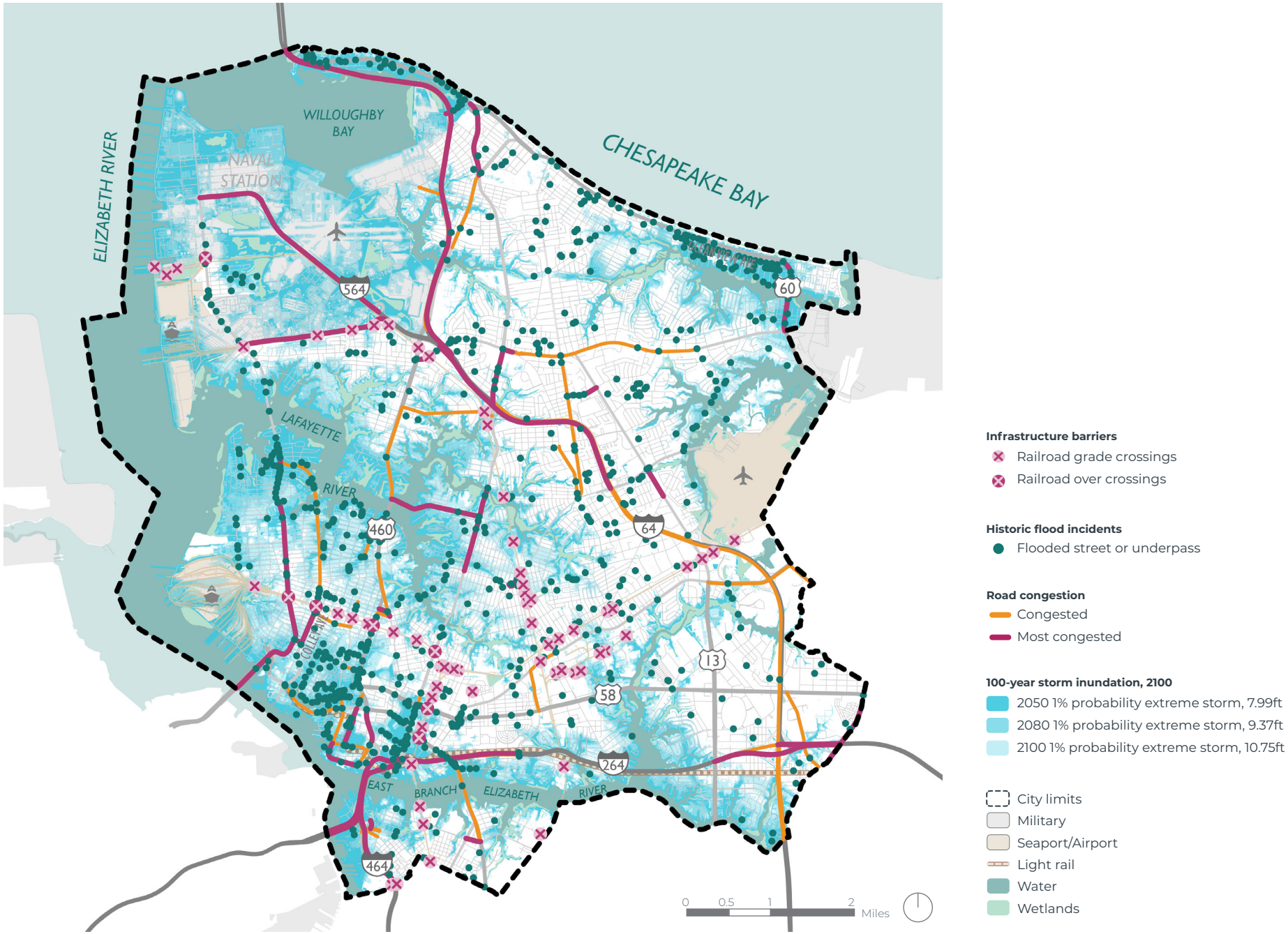


Figure 7: Infrastructure and flooding barriers to transportation systems

City of Norfolk; JLUS; NOAA; Federal Railroad Administration; Virginia DOT

Here are some of the ways Norfolk residents and visitors can move around their city without a car:

ELIZABETH RIVER TRAIL:

Norfolk's Elizabeth River Trail (ERT) is a 10.5-mile urban trail that has connected Norfolk residents to their waterfront since 2003. The trail connects 28 neighborhoods, providing active transportation infrastructure for commuting and recreational travel from Norfolk State University to Norfolk International Terminals. On top of that, **the ERT Foundation has been strategically improving the trail to provide a place for innovative economic development, enhanced environmental awareness, and neighborhood connectivity.**

The ERT has plans to continue expanding, connecting to Virginia Beach, the Virginia Capital Trail, the Birthplace of America Trail (BoAT), and the East Coast Greenway. Many of the successes of the ERT can be used to enhance public spaces, connectivity, and economic vitality throughout the city. The ERT's focus on businesses can be used as a model to improve biking and walking facilities throughout Norfolk. Additionally, the trail's use of historic railroad right-of-ways can function as a model for repurposing additional railroad right-of-ways for public and mobility uses.

ELIZABETH RIVER FERRY:

Hampton Roads Transit runs a small ferry system, called the Elizabeth River Ferry, connecting Norfolk to Portsmouth across the Southern Branch of the Elizabeth River. The ferry typically runs every 30 minutes, and in the summer afternoons and evenings runs on a 15-minute schedule. In early 2024, two new ferry boats were added to the system, modernizing the fleet of boats. **The Elizabeth River Ferry has seen increased ridership indicating that it is still a reliable and important transportation method.** Riders include commuters, residents, and tourists exploring the area. The continued increase in ridership also shows that the ferry can act as a model for connecting additional destinations via the many waterways interlacing Norfolk's geography.

LIGHT RAIL SYSTEM:

Hampton Roads Transit (HRT) operates Norfolk's light-rail system, called The Tide. Opening in 2011, The Tide operates along a 7.4-mile corridor that connects Eastern Virginia Medical School and the Ghent neighborhood, Downtown Norfolk, Norfolk State University, and Newtown Road. The service runs every 15 minutes from 6:00am until 11:00pm, and during peak commuting periods runs every 10 minutes. On the weekends, the service runs until midnight, providing another mode of transportation for people to use when traveling to or from social activities later in the evening. The Tide has been critical to new developments along its path that are increasing density and recreating the urban fabric of Norfolk.

Currently, the eastern terminus of the light-rail system lies directly on the border between Norfolk and Virginia Beach. A park-and-ride lot here provides the opportunity for commuters to leave their cars and avoid driving into the heart of Downtown Norfolk. While ridership on The Tide is currently not as high as it could be, and ridership numbers decreased during COVID-19, the system has potential to provide connection to more jobs, homes, and destinations. NFK2050 will examine potential plans to expand the system for more meaningful connections. **As the City of Norfolk looks to expand mobility options, the light-rail system can provide a critical spine for connection between modes and an opportunity to expand an existing system to new destinations.**

LIME SCOOTER AND BIKE SHARE:

Norfolk has had access to electric scooters since 2019, when Lime began operating in the city. Dockless bikes were added in 2021, providing additional options for people to move around. Use has steadily increased each year. In 2023, the system saw its highest level of use so far, with nearly 750,000 trips and over 700,000 miles ridden. **There is a direct relationship between where the trips are occurring and where there is physical infrastructure like bike lanes, bike parking, and docking corrals to support the safe use of the bikes and scooters.** As the City looks to provide more mobility options, the growing success of this system should be used as a model for expansion elsewhere in Norfolk.

The Tide (City of Norfolk)

TRANSIT NETWORK

Norfolk has a robust transit network, operated by Hampton Roads Transit. This consists primarily of the bus network and is supplemented by the light-rail transit system. Amtrak operates a regional station directly in downtown Norfolk, which can connect riders to Richmond and the entire Northeast Corridor. Amtrak also operates a bus connector to Newport News, which provides another method of connecting to Richmond via a route north of the James River.

Norfolk has done a considerable amount of work studying its transit network and developing plans to improve it. One of the key efforts that was completed during the COVID-19 pandemic was the Norfolk Draft New Network. One of the key changes that this plan made was to increase bus frequency on a key number of routes, while removing some routes that were redundant or underused. If this plan is implemented, as shown in Fig.8, **accessibility of jobs via the bus network will increase by 31%.** Consequently, under the new bus network, the average Norfolk resident will be able to access 41,700 jobs within a 45-minute journey that includes walking and using transit.

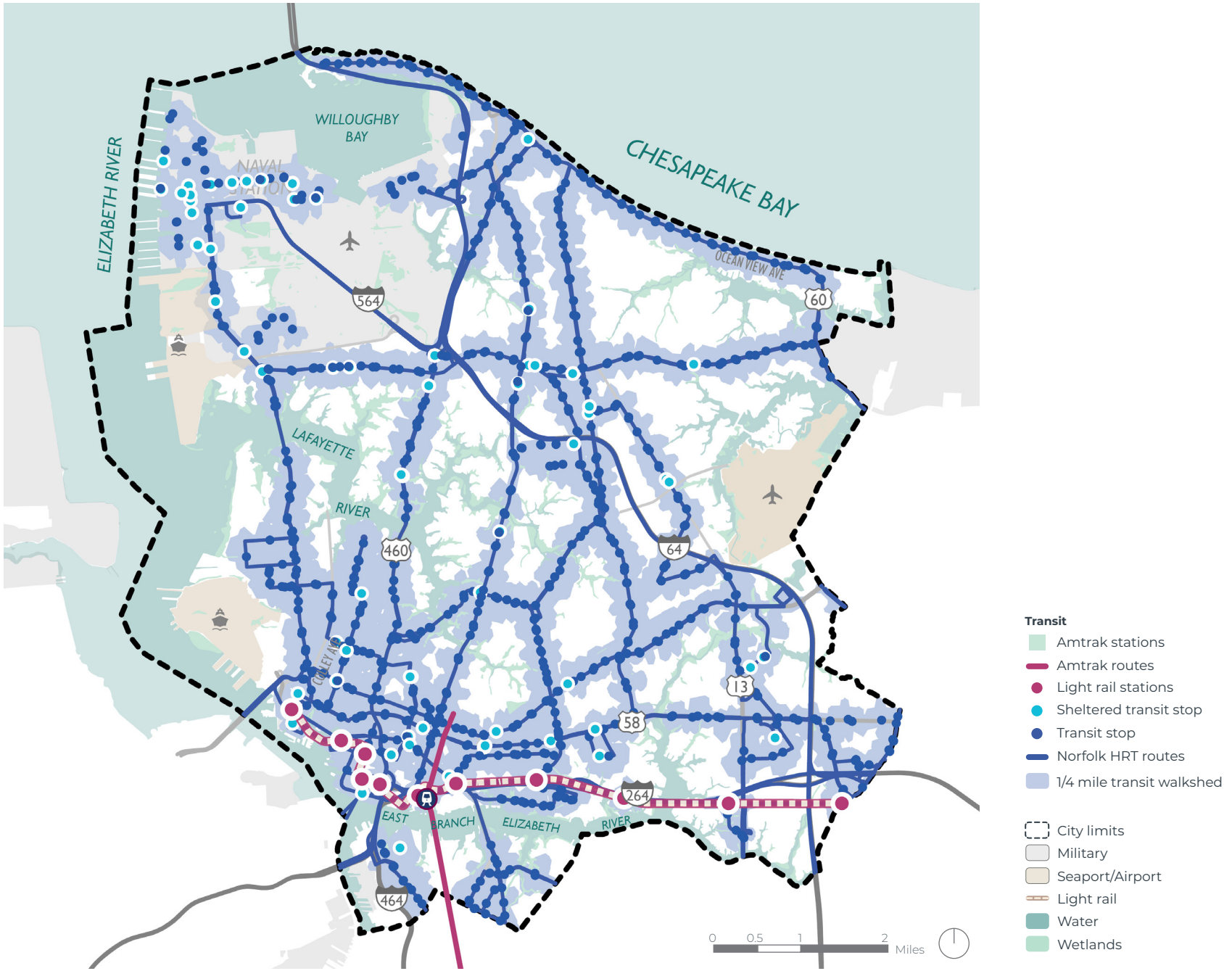


Figure 8: Norfolk Transit Network: Bus, Light Rail, and Amtrak connections

City of Norfolk; HRTPO; Amtrak

SUCCESS!

MULTI-MODAL TRANSIT OPTIONS

Prior comprehensive plans failed to embrace multi-modal transportation options. plaNorfolk2030 was the first plan to stress the importance of pedestrians, cyclists and mass transit riders in the planning for transportation.

Following the adoption of plaNorfolk2030, numerous actions have occurred in support of creating and supporting a multi-modal transportation system. The following actions are just few examples:

- DL3.1.8: Revise the Zoning Ordinance to require provisions for bicycles in the design of new facilities.
- T2.1.6: Support the re-establishment of intercity passenger rail service to Norfolk with increased service frequencies above the initial single daily train that is currently proposed.

FREIGHT RAIL

In the last several decades, the share of containerized rail cargo handled by the Port of Virginia has steadily increased. In recent years, the percent of rail cargo has hovered around 32% of all cargo handled at the Port of Virginia (Source: Port of Virginia). This means that the amount of freight rail traffic in the city has also increased. Freight rail is an important component of the city's economy, and it represents a more efficient way to ship cargo when compared to on-road trucking. A higher percentage of freight is transported by rail at the Port of Virginia than at any other east coast port (Hampton Roads Regional Freight Study 2017).

Norfolk Southern owns a large part of the rail lines within the city limits, notably those going to the Port of Virginia and the Norfolk Southern rail yard. The location of the Norfolk Southern rail lines, surrounding the downtown area and bisecting the city north to south, results in significant at-grade road crossings throughout Norfolk. While there is no data available about freight rail schedules, anecdotal evidence indicates that these crossings create frequent delays on roadways (Virginian Pilot). In addition, the length of freight-rail trains has increased over time, which increases the amount of time it takes for a train to pass through a road crossing.

At-grade crossings create safety hazards for all road users – drivers, pedestrians, and cyclists alike. Since 2017, there have been four incidents at railroad crossings in Norfolk, one of them resulting in injury (Federal Railroad Administration). On the other hand, instances where the roadway passes underneath a railroad crossing creates opportunities for flooding, which causes other safety and delay issues for road users. Rail lines can create barriers between neighborhoods, limiting connection and creating possible inequities between different communities. Efforts are underway to rethink and improve rail crossings throughout Norfolk.

Norfolk also has several abandoned freight rail lines (Justice 40 Rail Explorer). The Tide light-rail currently uses the corridor of one of these lines, and the continuation of the corridor into Virginia Beach presents an opportunity to extend the light-rail system. Abandoned rail lines can also be converted into multi-use trails and other means of connecting neighborhoods and increasing park space.

MULTI-MODAL CONNECTIONS

One of the best ways to amplify the impact of public transportation is by creating numerous connections to other modes. At the east end of the light-rail line there is a park-and-ride lot providing a good connection for drivers to switch modes. There are also numerous points throughout the city where bike lanes intersect with bus routes. These connections help solve "first- and last-mile" connection issues for public transit, connecting residents with their final destinations. While there are places where these modes overlap, there are many neighborhoods in Norfolk that lack these connections.

One of the key issues currently facing the transit network in Norfolk is the low ridership on the lightrail system. One of the causes of low ridership is the COVID-19 pandemic, an event which has affected ridership on transit systems across the country. On the light-rail specifically, many residents cite the lack of relevant destinations as the reason they don't take the light-rail. Efforts to connect the light-rail to destinations in Virginia Beach and northern areas of Norfolk have not yet been successful limiting the potential of this critical piece of transportation infrastructure. Infrequent headways on bus routes have impacted ridership on certain routes as well. The Norfolk Draft New Network addresses these concerns for bus routes, removing some redundant or lightly ridden lines in favor of increased frequency on specific routes.

Ridership has slightly increased since the pandemic, but is hovering around 50% of the pre-pandemic ridership for bus and light-rail. The exception to this is the ferry, which has 80% of the ridership it did pre-pandemic.

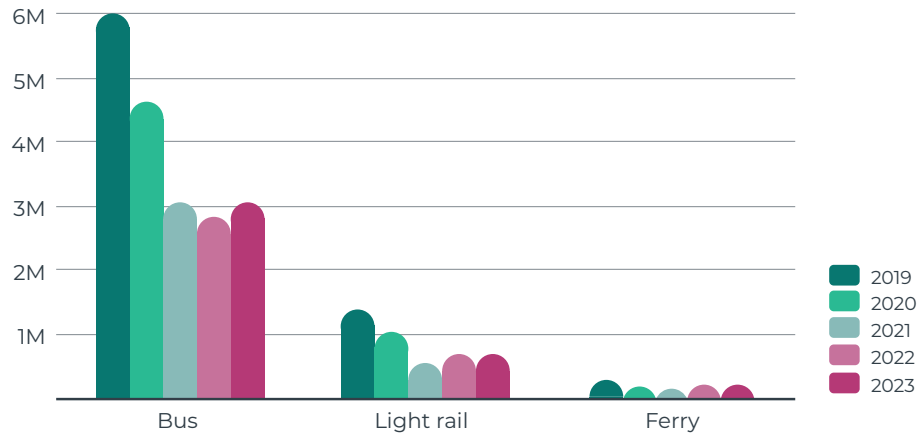


Figure 9: Annual Transit Ridership
Hampton Roads Transit

Non-vehicular modes of transportation are particularly important for disadvantaged communities. Currently, disadvantaged communities are served well by the bus network. However, they have little access to the light-rail system and to bike infrastructure. This limits mobility options for residents in those neighborhoods, especially if they have limited access to a vehicle.

Park and ride for The Tide (WRT)

ELECTRIC VEHICLES

The City of Norfolk is expanding the number of public chargers available throughout the city. Electric vehicle (EV) chargers allow EV owners to charge their vehicles away from home, reducing range anxiety and increasing the distance they can drive using their battery. This is especially beneficial for plug-in hybrid electric vehicle (PHEV) owners, who can significantly increase their gas savings if they can recharge their batteries away from home.

Currently, there are 47 public charging stations in Norfolk. 30 of those chargers are Tesla chargers, and the remaining 17 are universal chargers. **All but one of the public chargers are located at parking garages in Downtown Norfolk, with the exception being one universal charger at Pretlow Library.**

Regionally, there are 94 public charging stations within 9.3 miles of Norfolk. 68% of these are Level 2 chargers, and 32% are Level 3 chargers. Increasing charger availability is crucial for encouraging EV adoption, although many Norfolk residents will likely be able to charge at their homes due to the high prevalence of off-street parking.

The City of Norfolk is currently working on an EV Infrastructure Development Strategy, which will include a comprehensive examination of the City's current fleet and provide a pathway to electrification. The plan will also include recommended policies, programs, and strategies for implementation, especially for low- and moderate-income communities. These recommendations will be integrated into NFK2050.

Norfolk multi-modal transportation options (City of Norfolk)

ACTIVE TRANSPORTATION

Norfolk has a strong foundation of bike lanes that provide safe infrastructure for commuters, families, and visitors. Many of these bike lanes are focused in the neighborhoods surrounded by the Elizabeth and Lafayette rivers. The bike network provides connections between the Elizabeth River Trail, parks, homes, jobs, The Tide, shopping, and other recreational destinations.

The City of Norfolk analyzed available bike crash data for the years 2016-2020 and found that 85% of crashes occurred outside of the bike network, and 70% of those off-network crashes occurred at intersections. This data illustrates the importance of bike infrastructure at intersections as well as the overall safety benefits of bike lanes and indicates that **there is still a lot of progress to be made in Norfolk to make it a bike-friendly city.**

Norfolk has 60 miles of dedicated bike lanes and shared lane markings.

The City of Norfolk initiated a Bike-Pedestrian Counter Program in 2021 to provide a more reliable method of data collection. The first phase included 15 counters, and the total number has since expanded to 22 counters. This program allows for a quantitative measure for tracking the success of the Multimodal Transportation Master Plan and the City of Norfolk Bicycle and Pedestrian Strategic Plan. While the counters have not been functional long enough to derive long-term trends from the data, many of the locations where the counters were installed have seen increases in bike counts since 2021.

As of 2024, the bike network is currently far from complete. The Norfolk Multimodal Study lays out key corridors and recommendations for improving this network.

Improving bike infrastructure across the city increases safety for all road users and provides more mobility options for people to travel. This can support residents who may want to live a more active lifestyle, as well as residents who do not or cannot own vehicles. This is especially beneficial for young people who still need to travel to schools, stores, sporting events, and many activities that allow them to thrive.

As Norfolk continues to advance its goal of becoming the most bike-friendly city in Virginia, the existing bike infrastructure throughout the city provides best practice examples for residents to explore. The City's Bike and Pedestrian Strategic Plan provides a strong framework for building out a more robust network citywide.

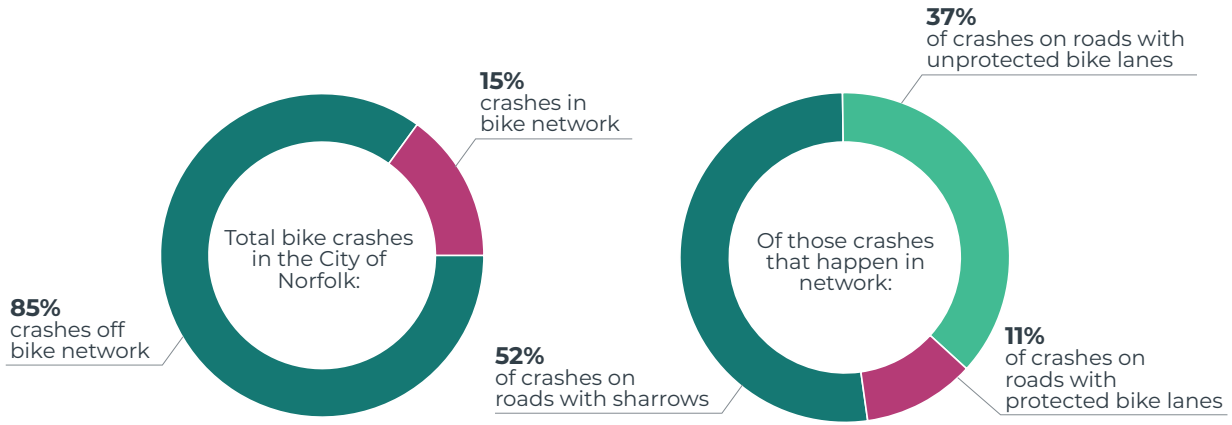


Figure 10: Bike crashes in Norfolk (2016-2020)
City of Norfolk

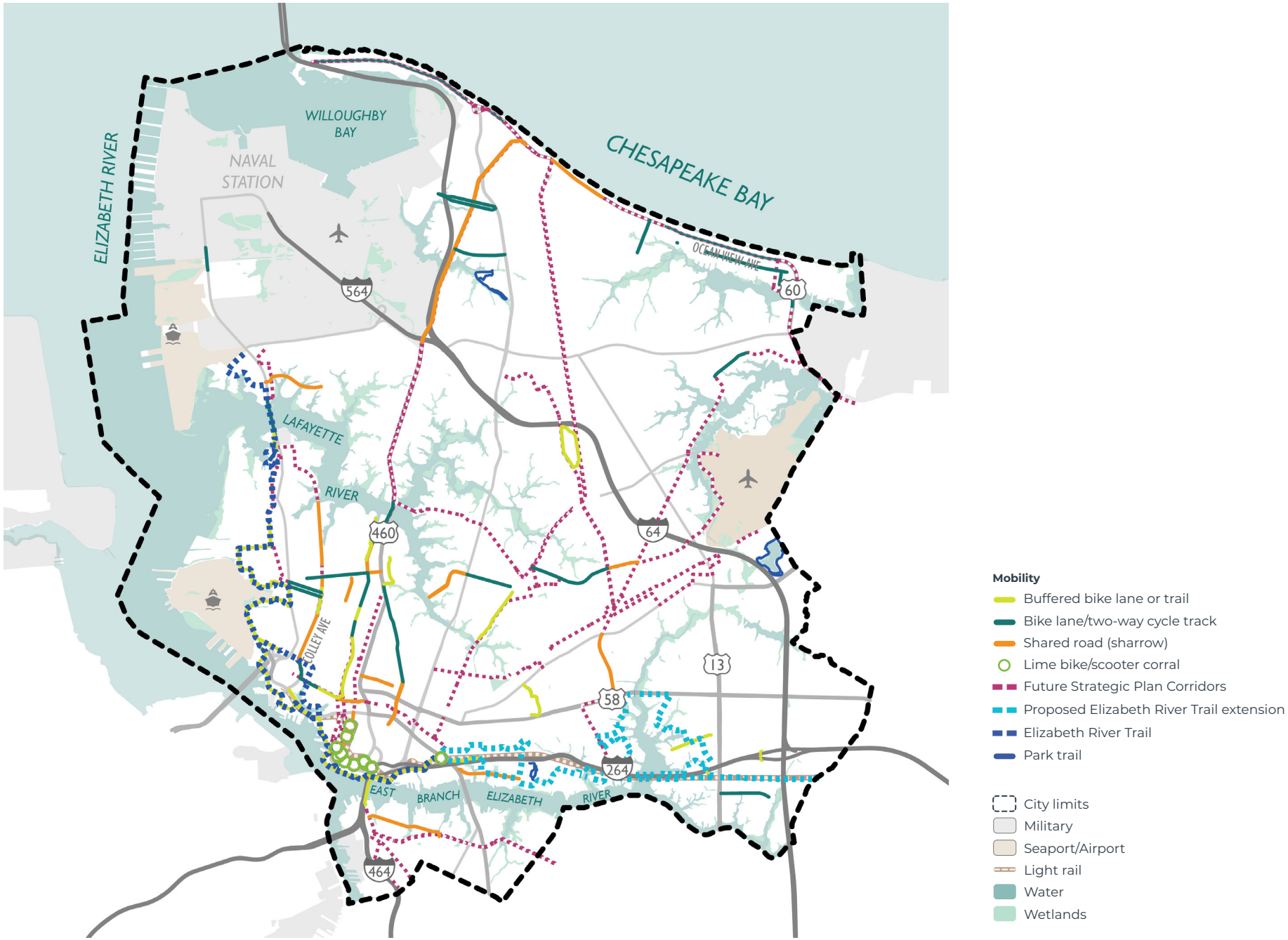


Figure 11: Existing and planned bike infrastructure

City of Norfolk; HRTPO

BARRIERS TO MOBILITY

Norfolk's neighborhoods feel distinct from each other, both socially and physically, because they are geographically disconnected; more often than not, the streets within Norfolk's many neighborhoods do not connect to other communities. Many streets do not connect due to dead ends at water, rail infrastructure, or highway barriers.

The primary characteristic that defines Norfolk's identity - its access to water - is also the aspect of the city's development that most acts as a barrier to connections across the city. The frequent inlets, creeks, and rivers cut off streets and necessitate bridges or, more frequently, detours to major arterials. **Few roads actually connect across the entire city, especially south to north**. Through an analysis of through-streets (page 163), non-Interstate arterials running north/south across the city are found to be generally limited to Hampton Blvd; Granby St; Tidewater Dr; Chesapeake Blvd; and Military Highway. Major east-west connections are primarily Ocean View Ave; Little Creek Rd; Princess Anne Rd; and Virginia Beach Blvd.

Norfolk's waterways are key to the city's identity and economy, but create challenges for connecting roads, as seen in this dead-end street (WRT)

Accordingly, **these streets carry heavy traffic on a daily basis and can get quite congested.** This congestion also maintains the need for these roads to carry high volumes and challenge attempts to redesign roadways to accommodate bike lanes or bus-only lanes.

Norfolk's primary mobility challenge may be what makes the city a pleasant place to live: the neighborhoods are quiet and do not have to field much through-traffic. But these barriers to mobility become quite challenging when residents need to move beyond their neighborhoods to connect to jobs, recreation opportunities, Downtown Norfolk, the beachfront, and other citywide assets.

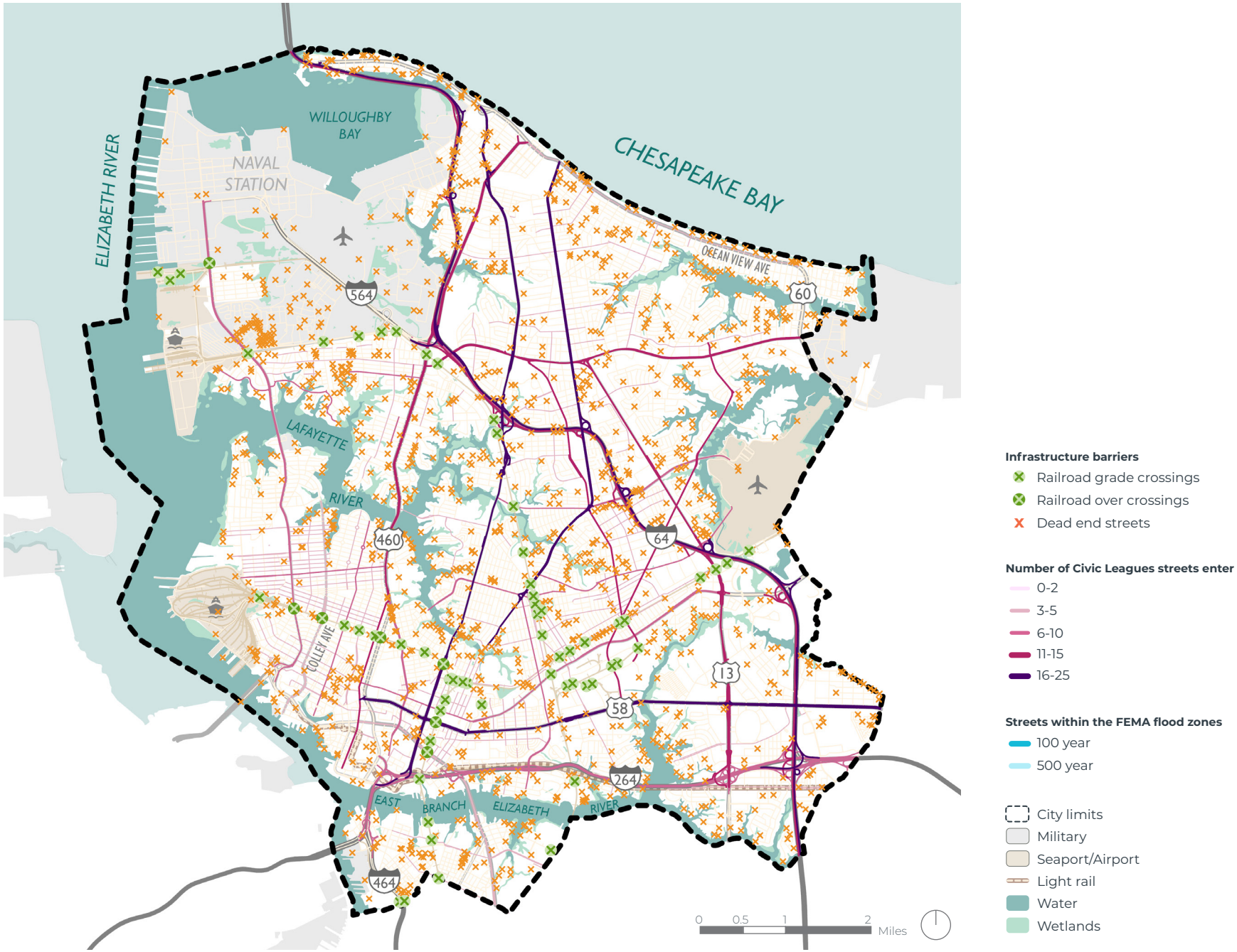


Figure 12: Mobility barriers

City of Norfolk; Federal Railroad Administration; NOAA 2022

UTILITIES & CRITICAL INFRASTRUCTURE

WATER SUPPLY

The City of Norfolk Department of Utilities provides potable water to city residents, businesses, U.S. Navy facilities, and some residents of Chesapeake and Virginia Beach.

When Norfolk originally purchased water reservoirs across the region, Norfolk was the primary consumer of water in the region. However, growth of the surrounding cities has led to increased demands for raw water across the Hampton Roads region. **Now more than 800,000 residents of Norfolk, Chesapeake, and Virginia Beach get their drinking water from one of Norfolk's water sources.**

Norfolk owns several water sources throughout the Hampton Roads region, including eight reservoirs, two rivers, and four deep wells. Raw (untreated) water is pumped from these sources to one of the Department of Utilities' two water treatment plants where it is filtered, disinfected, and tested against water quality standards. It is then pumped to demand to its end users.

As the Hampton Roads region draws from the Potomac Aquifer faster than the groundwater can naturally replenish itself, land subsidence and saltwater intrusion have become important considerations for Norfolk and the greater region. The issue of sea level rise further exacerbates the issue of saltwater intrusion into the region's freshwater sources. The Hampton Roads Sanitation District (HRSD) has developed the Sustainable Water Initiative for Tomorrow (SWIFT) program with aim to replenish the aquifer.

Norfolk's two water treatment plants, Moore's Bridges Water Treatment Plant and Kristen M. Lentz Water Treatment Plant (previously known as 37th Street Water Treatment Plant) have a combined capacity to treat approximately 72 million gallons per day (MGD) of water. The treated water is delivered to customers via distribution infrastructure including: over 800 miles of distribution mains, two pump stations, four ground storage tanks, two elevated tanks, and two elevated clear wells.

The drinking water produced in Norfolk is tabulated by year in Figure 15.

Year	Million Gallons per Day (MGD)	% Change
2017	60	2.9%
2018	59.9	-0.16%
2019	58.5	-2.3%
2020	56.4	-3.6%
2021	57.9	2.7%
2022	58.6	1.2%
2023	59.4	1.4%

Figure 15: Drinking water produced in Norfolk (2017-2023)

City of Norfolk

Kristen M Lentz Water Treatment Plant (City of Norfolk)

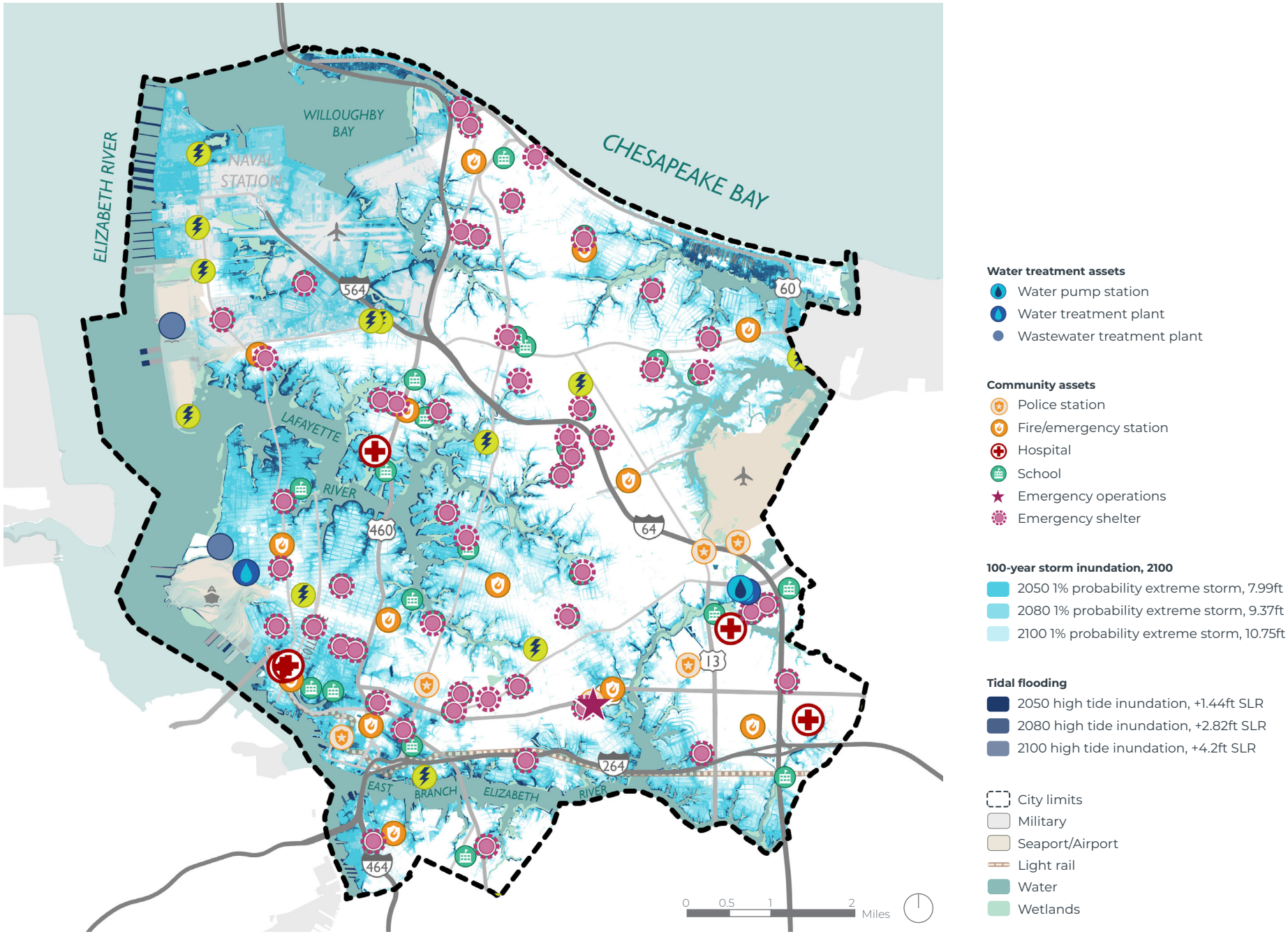


Figure 16: Critical Infrastructure affected by potential flood risk (SLR & Storm inundation projections)

City of Norfolk; JLUS; NOAA 2022


HRSD

SWIFT Initiative

As part of their Sustainable Water Initiative for Tomorrow (SWIFT), the Hampton Roads Sanitation District (HRSD) takes treated wastewater and places it through additional advanced water treatment, bringing it to drinking water quality standards. The SWIFT water is then added back to the Potomac Aquifer, in a first-of-its-kind program for the State of Virginia. By replenishing the Potomac Aquifer - the primary source of groundwater in Hampton Roads - the SWIFT project seeks to alleviate issues of land subsidence and saltwater intrusion.

WASTEWATER TREATMENT

Regional wastewater is treated by facilities owned and managed by the Hampton Roads Sanitation District (HRSD). HRSD is a political subdivision of the Commonwealth of Virginia, serving 1.9 million people in 20 cities and counties in coastal southeastern Virginia. **HRSD operates eight major treatment plans and eight smaller plants with a combined treatment capacity of 225 million gallons per day (MGD).**

Within Norfolk there are three sewerage districts. Each district's wastewater is treated by one of three wastewater treatment plants, two of which are located within the city of Norfolk limits and the third located in Virginia Beach: Army Base Treatment Plant (9.68 MGD), Virginia Initiative Treatment Plant (28.94 MGD), and Atlantic Treatment Plant (33.32 MGD).

The Norfolk Department of Utilities is responsible for providing and maintaining the infrastructure to convey wastewater from users to the HRSD plants, which includes 129 pump stations and 879 miles of sewer mains. Figure 17 is a tabulation of the linear feet of sewer cleaned each fiscal year since 2013.

Fiscal Year	Linear Feet Cleaned
2013	1,335,840
2014	1,246,080
2015	1,172,160
2016	670,560
2017	854,304
2018	827,904
2019	756,624
2020	685,344
2021	633,600
2022	975,744
2023	1,040,071

Figure 17: Linear feet of sewer cleaned by Norfolk Department of Utilities (2012-2023)

Source: City of Norfolk

Moore's Bridges Water Treatment Plant (City of Norfolk)

BROADBAND & THE DIGITAL DIVIDE

In light of the COVID-19 pandemic and the rise of remote work and learning, internet access can be viewed as an essential service for participation in today's society.

In Norfolk, the question of internet access is not an infrastructure question, as all of the city has fiber availability: Cox Communications, the primary broadband provider, has installed 1 GB data fiber throughout the city, to which all businesses and homes have the ability to subscribe.

As part of their Digital Equity Programs, Cox offers $9.99 monthly service to governmentally-assisted households with a K-12 student in their household and $29.99 monthly service to assisted households without a student. **Despite these more affordable options, 11.1% of Norfolk households still do not have internet access at home.** For those households, resources like local libraries become of vital importance. For Norfolk's K-12 students, schools are another crucial resource for internet and computing access.

MetroNet, another internet service provider, is currently about halfway through their construction of 100% fiber optic network in Norfolk. Construction began in November 2021 and is estimated to last four years.

Regionally, the Greater Norfolk Corporation (GNC) and its Virginia Beach counterpart Virginia Beach Vision have established a joint Broadband Task Force to leverage the Southside Fiber Ring. Once complete, the Southside Fiber Ring will be a 103-mile-long fiber ring connecting government, business, and education centers in the five Southside cities, also with connection to one or more transatlantic cables that have landed or will land in Virginia Beach. The Southside Cities look to provide this dark fiber network and then allow private-sector companies to provide businesses with ultra-high-speed broadband at an affordable price.

13.7% of Norfolk households do not have home internet subscriptions

6.3% of Norfolk households do not have computing devices

US Census Bureau, ACS 5-Year Estimates

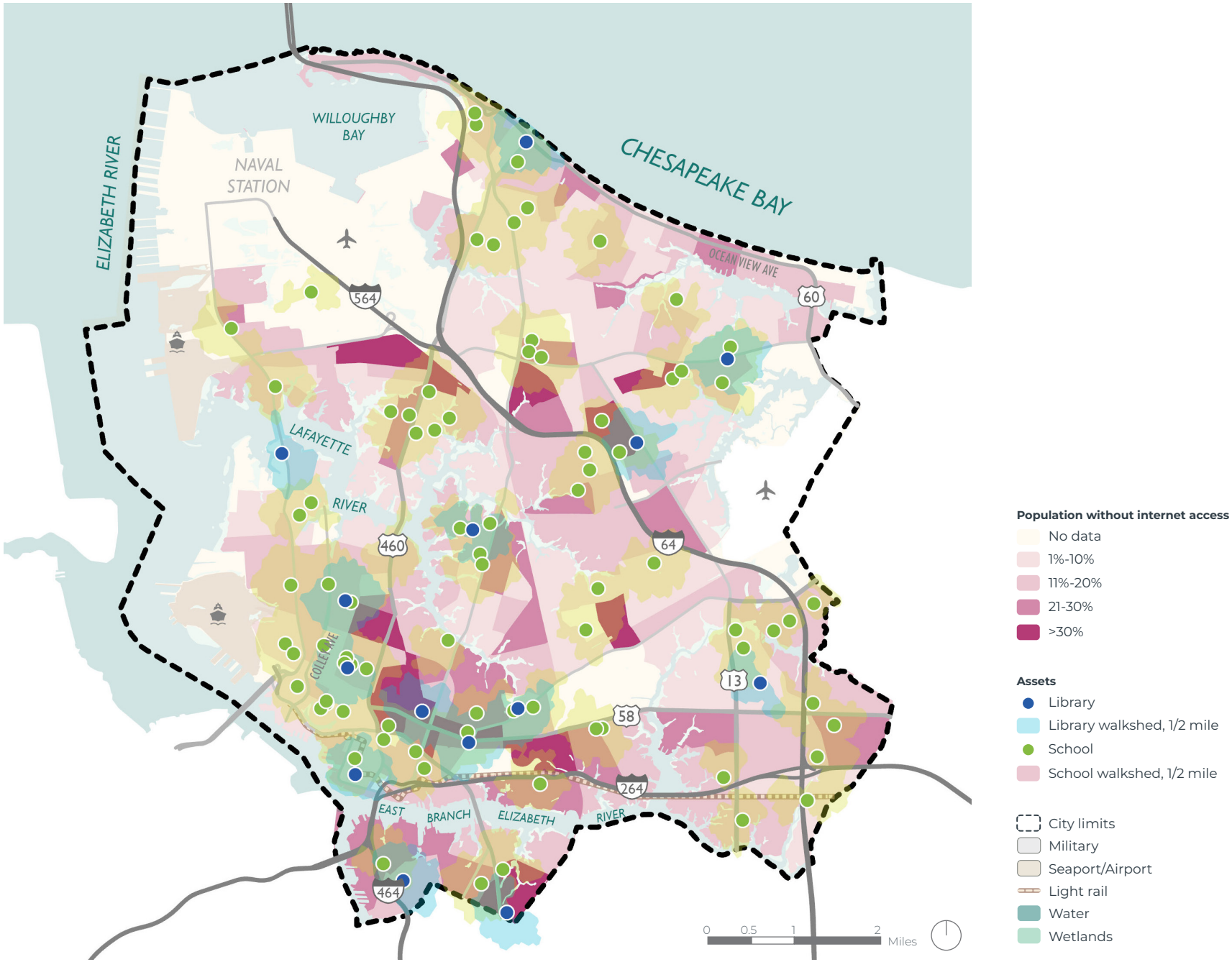


Figure 18: Households without internet access, walkability to schools and libraries

Source: US Census Bureau, ACS 5-Year Estimates, 2022

Lack of sidewalks and crossings and isolation of neighborhoods make the access to daily needs difficult for residents (WRT)

ACCESS TO DAILY NEEDS

Because of its development over time, some parts of Norfolk are more heavily car-dependent than others, hampering access to daily needs for pedestrians.

Grocery stores, retail and restaurants, and parks are unevenly distributed throughout Norfolk. A “walkshed” analysis illustrating where Norfolk residents can walk no more than 15 minutes to reach these amenities shows that the downtown and southwest areas of the city - not coincidentally, the neighborhoods which historically developed before widespread car ownership - are still the areas best served by pedestrian infrastructure and access to sevices and amenities.

Meanwhile, the east and north sides of the city see almost all of their daily needs located along major vehicular corridors like Little Creek Road and Military Highway, while the rest of the neighborhood area is primarily comprised of single-family residences relatively far in walking distance. While buses run along these vehicular routes, walking to bus stops is still quite far for many of these neighborhoods, further increasing the need for car access.

Unlike retail and grocery stores, schools and libraries are more evenly distributed throughout the city, and easier to access for residents on foot.

These analyses help understand where Norfolk’s “complete neighborhoods” are - places where residents do not have to get in a car to drive across the city, but can keep both their economic activity and their social and recreational time in their local communities.

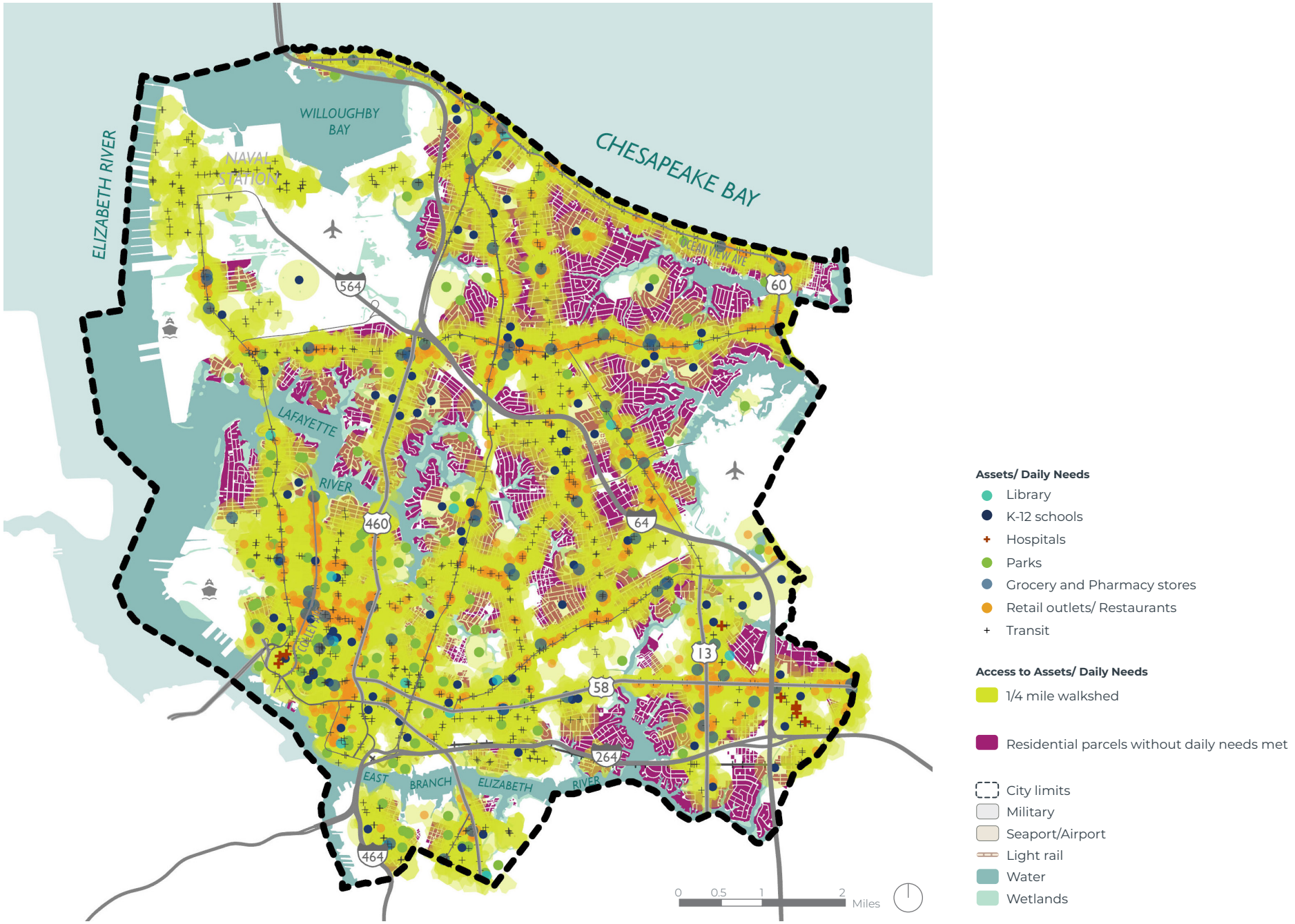


Figure 19: 15-minute walking distances to residents' daily needs and transit access

Source: US Census Bureau, ACS 5-Year Estimates, 2022; City of Norfolk

SCALING UP

NORFOLK AS A REGIONAL HUB

Norfolk is unique in the Hampton Roads region due to the concentration of transportation systems that converge in the city.

These transportation assets include Amtrak rail links which connect riders to the Northeast Corridor, interstate highways that connect residents and non-residents with jobs in the city, an international seaport and airport, freight rail connections, a bus network, light-rail system, and miles of trails for bikers and pedestrians. Multiple rivers and bays also provide a natural network for connections by water.

The convergence of these transportation assets has been driven by, and in turn has supported, unique clusters of job opportunities, entertainment attractions, and residential density. This includes Naval Station Norfolk (the world's largest naval station), Norfolk's downtown, Norfolk Industrial Park, Military Circle, Harbor Park Stadium, William "Dick" Price Stadium, Norfolk Scope Arena, Norfolk State University, Old Dominion University, and Norfolk General Hospital.

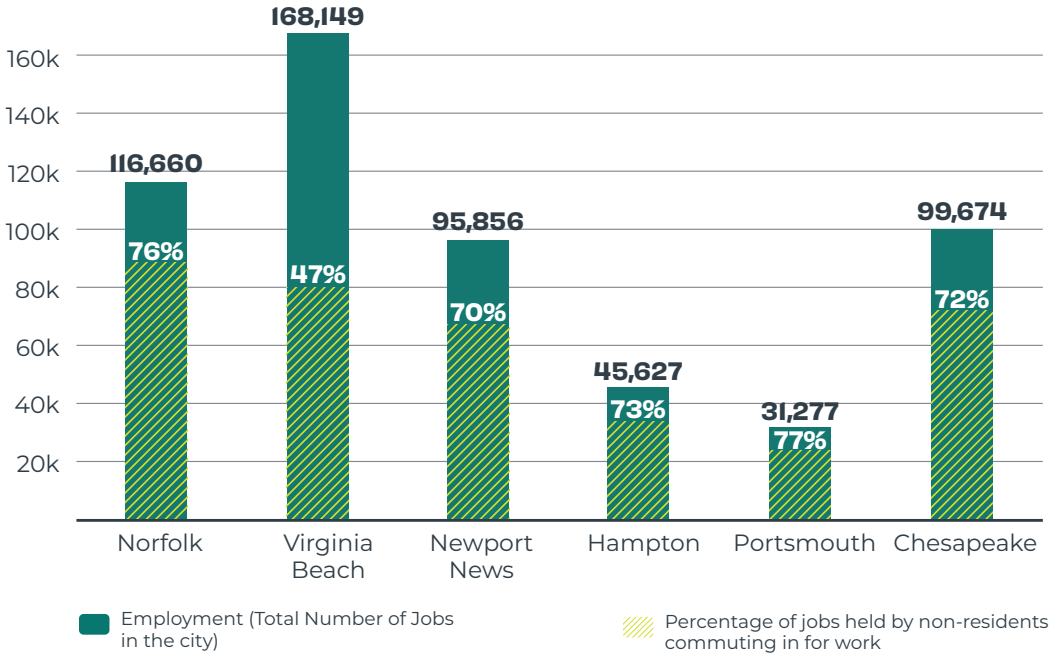


Figure 20: Jobs and commuting in the Hampton Roads Region

Source: US Census Bureau, On the Map 2021

This convergence of transportation assets and destinations supports the fact that Norfolk is an anchor for the Hampton Roads region, and the activity in the city supports the lives of hundreds of thousands of people in neighboring cities in many ways. Therefore, **the health and resilience of the transportation network within Norfolk is critical not just for the city itself, but for the region.**

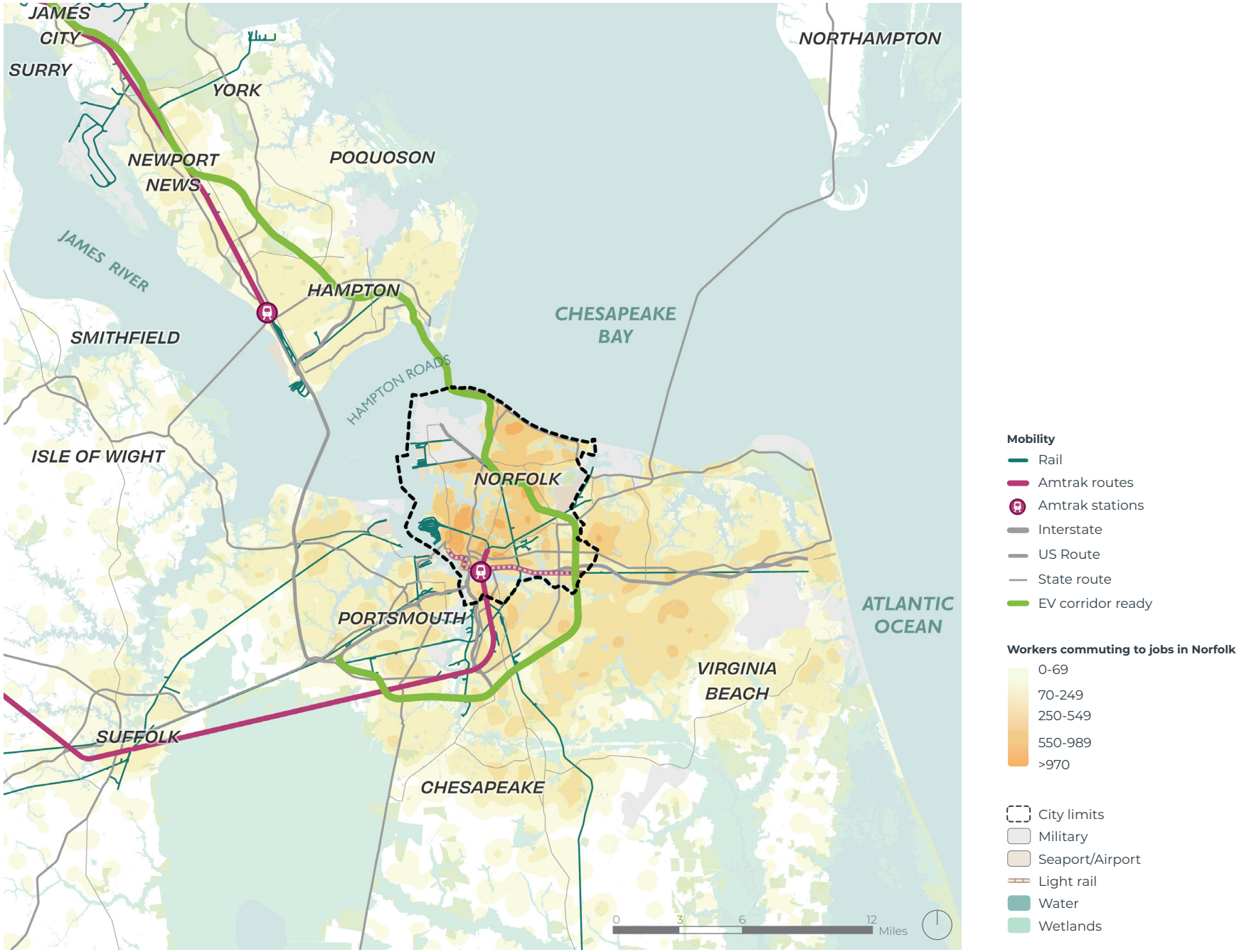


Figure 21: Hampton Roads regional connectivity: transit, rail, and highways

Source: City of Norfolk; US Census Bureau, On the Map, 2021; ESRI; ARUP

Looking Forward

Harbor Fest 2023 (City of Norfolk)

WHAT'S NEXT FOR NFK2050?

With a broad understanding of Norfolk's existing assets and challenges, NFK2050 will turn to the future: projecting the city's future population, employment, and the impacts of sea level rise, and finding more opportunities for growth and prosperity for all.

Population Projections | Employment Projections
Flood Risk and Sea Level Rise | Room to Grow | Next Steps

POPULATION PROJECTIONS

According to the University of Virginia's Weldon Cooper Center, by 2030 the city is estimated to have approximately 230,000 residents, a negligible drop from current estimates (232,995). From there, the population may slightly increase again by 2050. Compared to the state of Virginia as a whole (15% projected growth), and neighboring Chesapeake (17% projected growth) and Virginia Beach (6% projected growth), however, Norfolk is projected to lag behind its neighbors in growth.

The Hampton Roads Transportation Planning Organization (HRTPO) similarly has projected a static population or slight decline in the majority of the city by the year 2045, as part of their long-range transportation planning (Fig.2, opposite). This data shows the probability that **the "exurbs" to the south in Norfolk's neighboring cities will likely see the sharpest growth, as residents presumably relocate to newly developing areas.**

Norfolk's population is projected to remain stable between now and 2050

Slover Library (City of Norfolk)

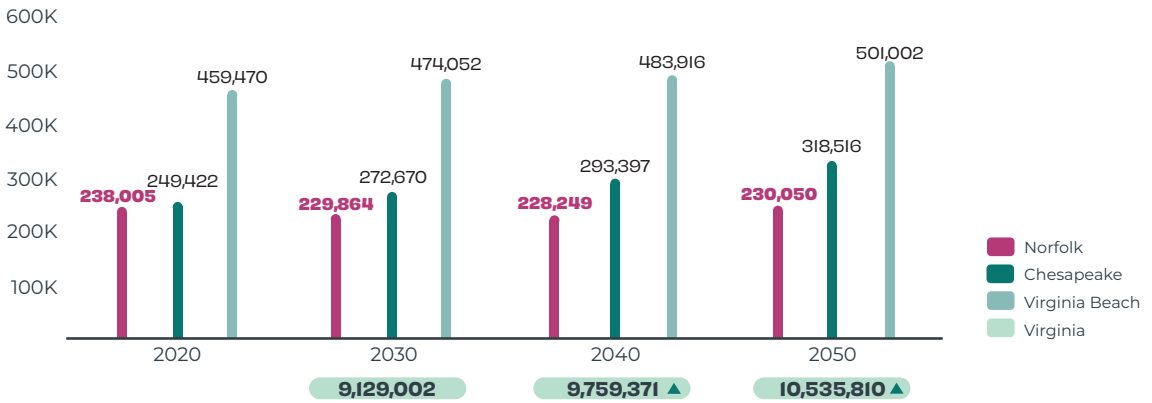


Figure 1: Population change: 2020-2050 (projected)
Weldon Cooper Center Population Estimates

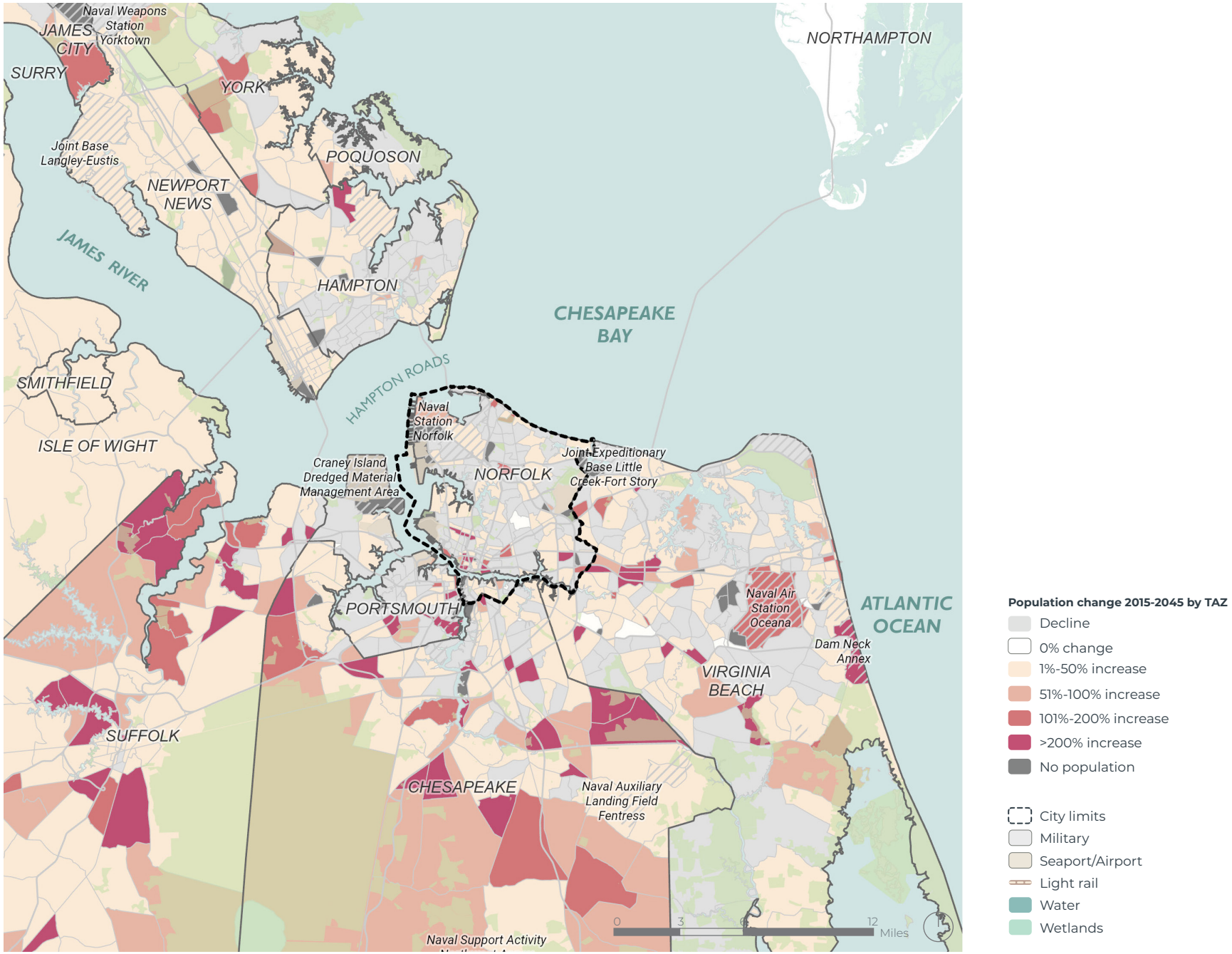


Figure 2: Regional population: projected change from 2015-2045

Source: HRTPO, 2019

Shipyard (City of Norfolk)

EMPLOYMENT PROJECTIONS

While there is evidence of job growth in neighboring counties that may pose a competitive threat to Norfolk's industry sectors**, Norfolk is showing signs of job growth in certain key areas**. The city's economic development efforts might need to focus on strengthening and diversifying its key industries, improving job retention, and enhancing its competitive advantages to mitigate concerns about industry migration. It is also crucial to consider the broader regional economic dynamics, as collaborative efforts across the region may bolster resilience against the potential migration of industries.

Given that the current population in Norfolk is skewed toward high school graduates and associate degree holders, **future employment strategies should target sectors that support well-paying jobs without requiring a bachelor's degree.** Industries like offshore wind are comprised mostly of these types of jobs not requiring a bachelor's degree. These industries provide ample manufacturing jobs and, importantly, they leverage existing assets in Norfolk: these jobs can be accommodated by existing shipyards, which can support secondary steel components; they support local human capital and talent being created at Norfolk-based and regional community colleges, trade schools, and universities; and they build off of historic and existing maritime and defense industries.

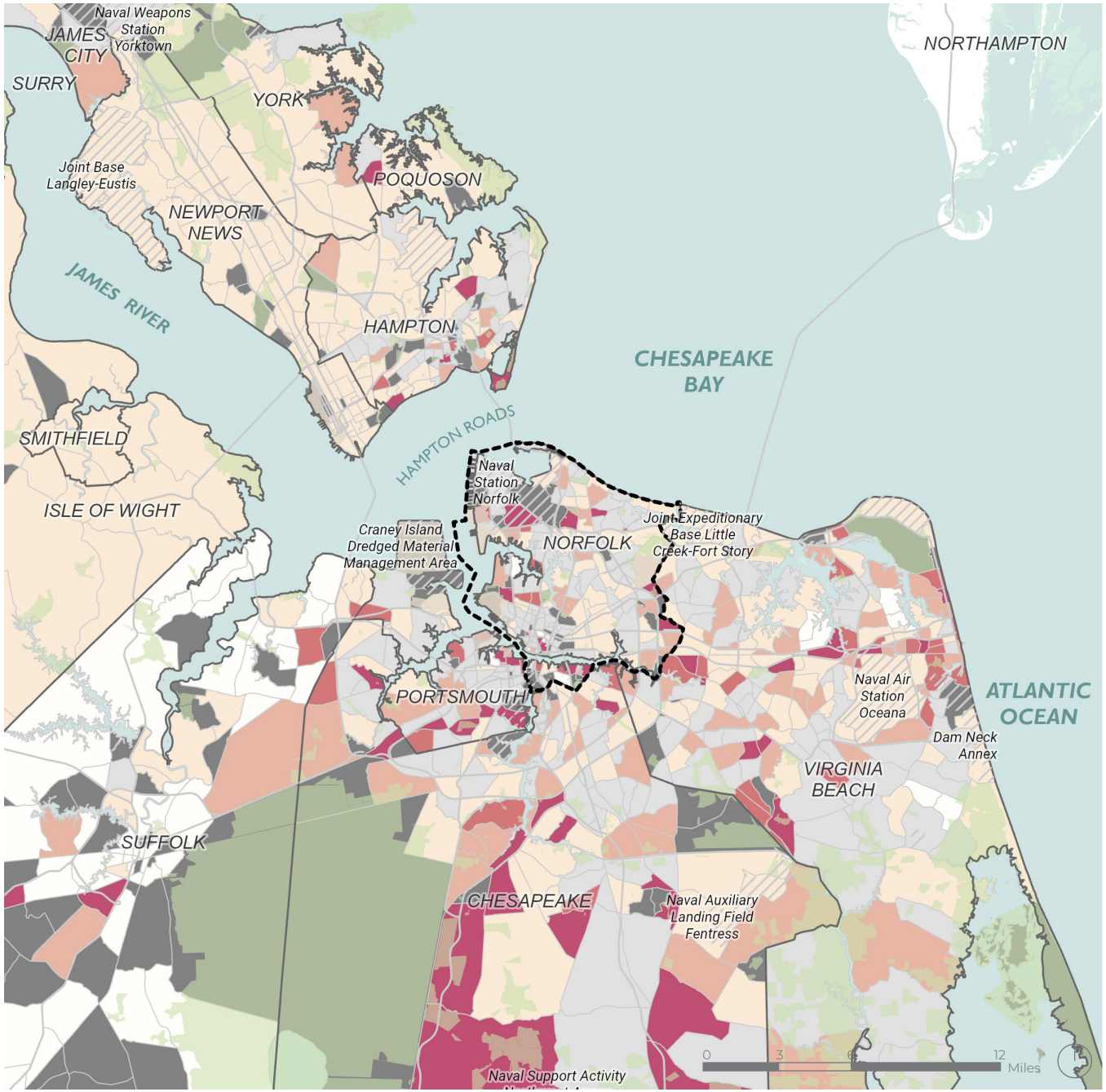


Figure 3: Regional employment: Projected change from 2015-2045

Source: HRTPO, 2019

Flooded street in Norfolk (WRT)

FLOODING RISK AND PLANNING HORIZONS

Flood risk is the most prominent climate risk in Norfolk, and will continue to grow as sea levels are rising. The rising sea level will lead to more frequent tidal flood events and eventually daily or permanent flooding in certain areas, exacerbating flood impacts from coastal storms and threatening human life.

The speed and magnitude of Sea Level Rise (SLR) are uncertain. The NFK2050 planning approach must consider different climate models, time horizons, and probabilities.

To navigate this planning process, the NFK2050 team has developed an approach about which climate model, which range of probability, and which time horizon to work with, and how to navigate the uncertainty inherent in the models and the uncertainties about future adaptation.

- **Models and probability ranges:** For Norfolk and the Hampton Roads area, the NOAA 2017 model has been used in the most recent planning efforts (the Virginia Coastal Resilience Master Plan, 2021). As the latest available scientific data, a 2022 update is proposed for this planning effort, with the "Intermediate" scenario as the basis. In addition, the Virginia Institute of Marine Science (VIMS) projects SLR in Coastal Virginia up to the year 2050. For the purposes of this plan, the VIMS projection is used for 2050, and the NOAA 2022 Intermediate projection used beyond that date.
- **Year to plan for:** The time horizon of this plan is 2050, but the actual lifespan of a home is more than 50 years (Fox Hall, Norfolk's oldest house, dates from 1725). Relocating communities from water is costly, and the time horizon for sea level rise must be at least 50 years, plus the planning span, resulting in the year 2100.
- **Managing sea level rise uncertainty:** The proposed SLR model and the proposed time horizon come with a caveat. SLR will continue after 2100 (and for the following centuries, although one needs to know to what extent and with what speed). The

50-year time horizon will allow for ample time to adapt to new circumstances at a later stage. However, for investments with a longer lifespan, a longer time horizon should be taken into account. There is also a chance that actual SLR and flood risk are over- or underestimated. Future modeling can make estimates more precise. It is essential to acknowledge this chance now and, in the future, assess the level of uncertainty as new models become available (see Fig.4 to the right for a summary).

- **Resilience:** Adaptation measures, such as the US Army Corps of Engineers' Norfolk Coastal Storm Risk Management Project, are and will be planned, but will need to be implemented. It can be expected that measures to protect against or adapt to SLR, storm surge and urban flooding will be implemented. It is, however, still being determined what these exact measures will be and when they will be built. Showing only inundation and flood risk maps with measures would create the misperception that Norfolk would be flooded in the future. This would undermine confidence in the long-term viability of the city. The flood maps should include a best informed estimate of the measures in place.

NFK2050 will plan, design, and adapt to projected sea level rise in 2050 and beyond

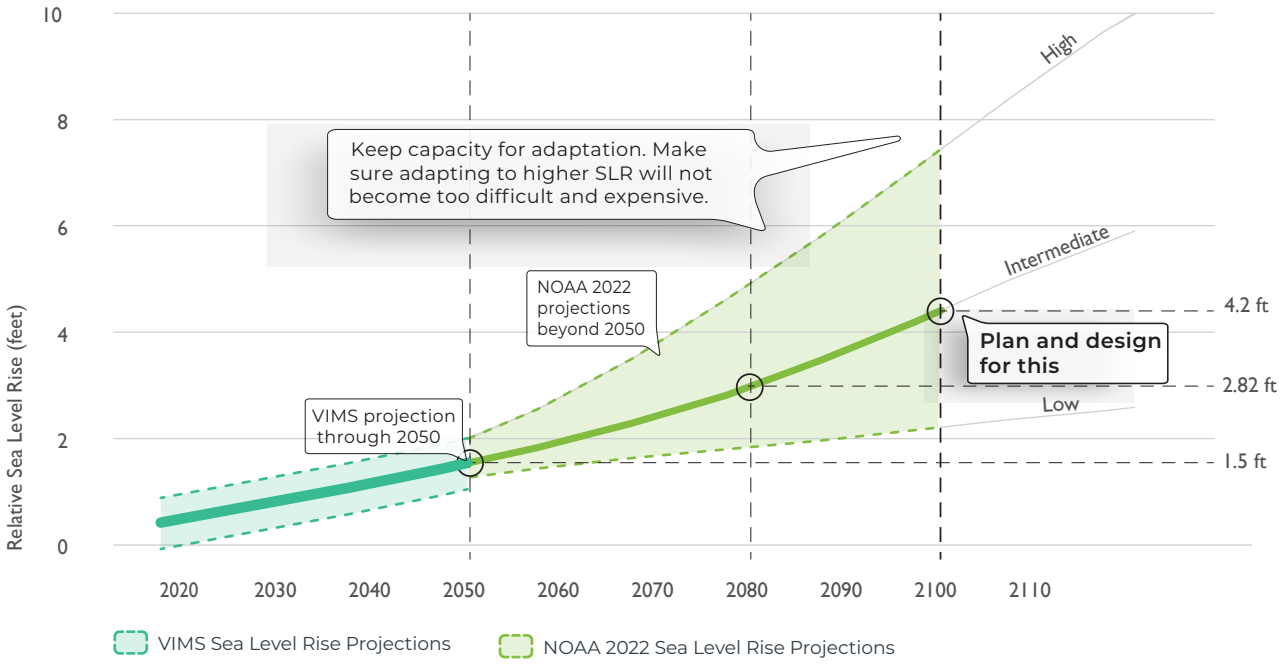


Figure 4: Sea Level Rise Scenarios for Sewells Point, Norfolk
Virginia Institute of Marine Science (VIMS); NOAA 2022; ONE Architecture

Future Tidal Flood Risk (Sea Level Rise)

Without intervention, sections of Norfolk's scenic waterfront are at risk of daily flooding. The NOAA 2022 report, providing the latest sea level rise (SLR) data for US territories, reveals that the Sewells Point tidal gauge station—the benchmark for Norfolk's local projections—shows lower SLR levels than previously anticipated. However, Norfolk's commitment to updating its climate projections with the latest models means these forecasts may evolve.

Norfolk and the rest of Coastal Virginia is identified as the US region facing the second-fastest rate of sea level rise.

According to the current models, by 2100, the daily high tide levels in Norfolk are expected to rise by 4.2 feet above current levels, posing significant risks to the community. The progression of sea level rise is projected at an increase of 1.5 feet by 2050 (VIMS), 2.82 feet by 2080, and 4.2 feet by 2100 (NOAA 2022 Intermediate), equivalent to 2.34, 3.72, and 5.1 feet above the North American Vertical Datum of 1988 (NAVD 88) respectively.

Coastal nuisance flooding, for instance during king tides, will begin inundating larger areas than it does now. This will especially affect the communities in Harbor Park, along Ocean View and the Southern shore of the Lafayette River.

As sea level rises, there will be more coordination required between the neighboring localities in Virginia. Norfolk might need to consider elevating the projected risk level to the Intermediate-High scenario based on the Virginia Coastal Resilience Master Plan. This change is to be considered further, as a tool to leverage cross-jurisdictional collaboration across the region.

Norfolk beach (WRT)

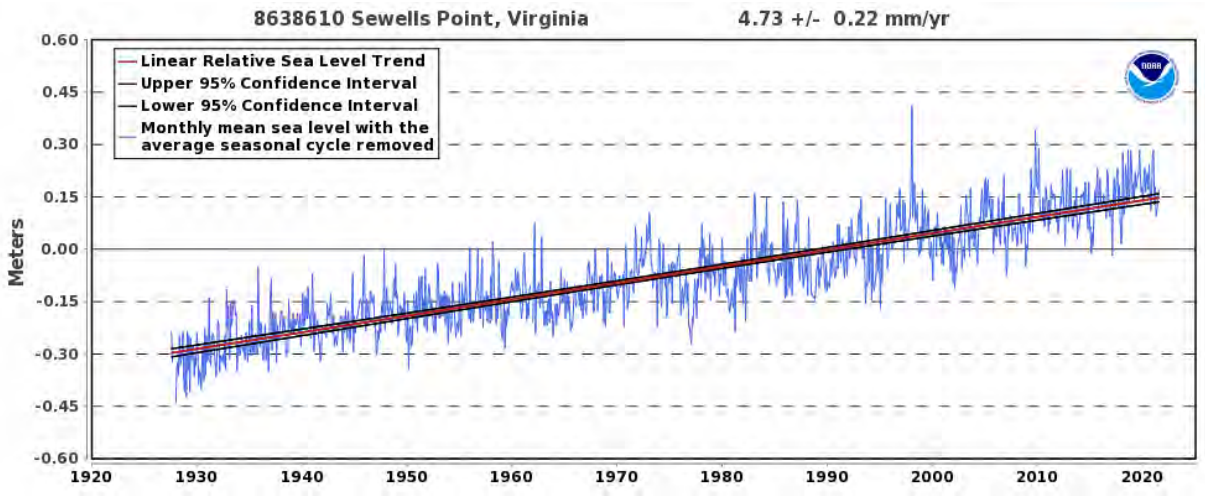


Figure 5: NOAA tides and currents, station at Sewells Point, VA

Source: https://tidesandcurrents.noaa.gov/est/est_station.

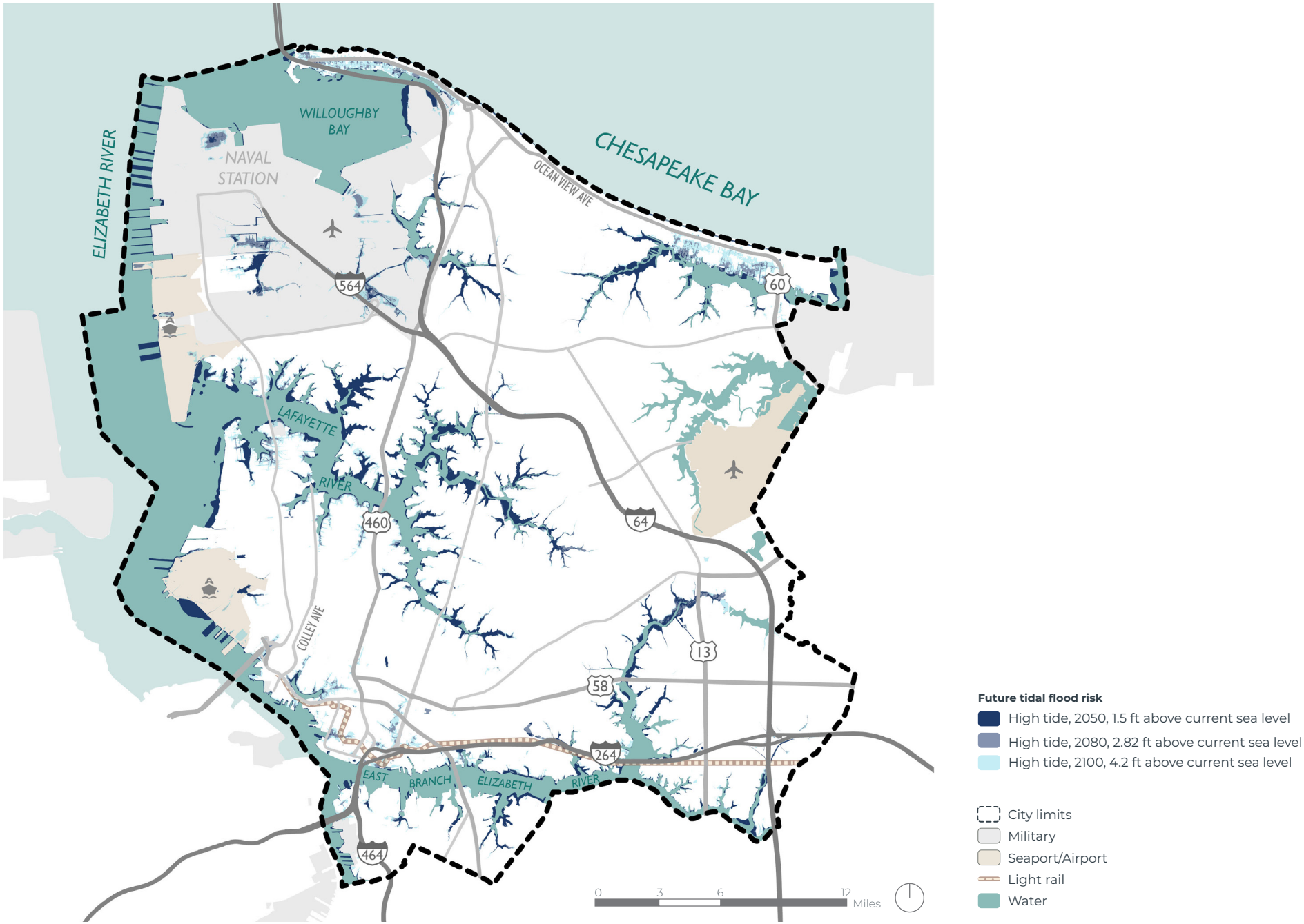


Figure 6: Future Tidal Flood Risk Schematic

Source: Virginia Institute of Marine Science (VIMS); NOAA, 2022

Future Coastal Flood Risk (Storm Surge)

Much of the city falls within the 100-year floodplain, where the annual risk of flooding exceeds 1%. Combined with the projected sea level rise, the tides can reach 11 feet over the current sea level at some parts of the coast.

The frequency of storms affecting Norfolk is growing. The highest extreme water levels observed at Sewells Point in this century came with extreme weather events—Hurricane Isabel in 2003, a Nor'easter ("Nor'Ida") in 2009, Hurricane Irene in 2011, and Tropical Storm Sandy in 2012.

The maximum storm tides caused by these events were 9.25' (Isabel, September 18th), 9.03' (Nor'Ida, November 13th), 8.9' (Irene, Aug 28th), and 8.12' (Sandy, October 29th) over the Mean Sea Level as recorded at the tidal gauge.

With no protection measures in place, by the end of the century the areas at risk will extend beyond the levels of these devastating historic events. The map shows the schematic extent of this risk with the areas of Norfolk lying below the levels of future 100-year storm tides with the projected SLR in 2050 (VIMS), 2080, and 2100 (NOAA 2022 Intermediate scenario). This risk will impact the communities along Ocean View Ave, Pretty Lake, River Forest Shores, Norview, Lakewood, and other communities adjacent to the inlets and riverfronts.

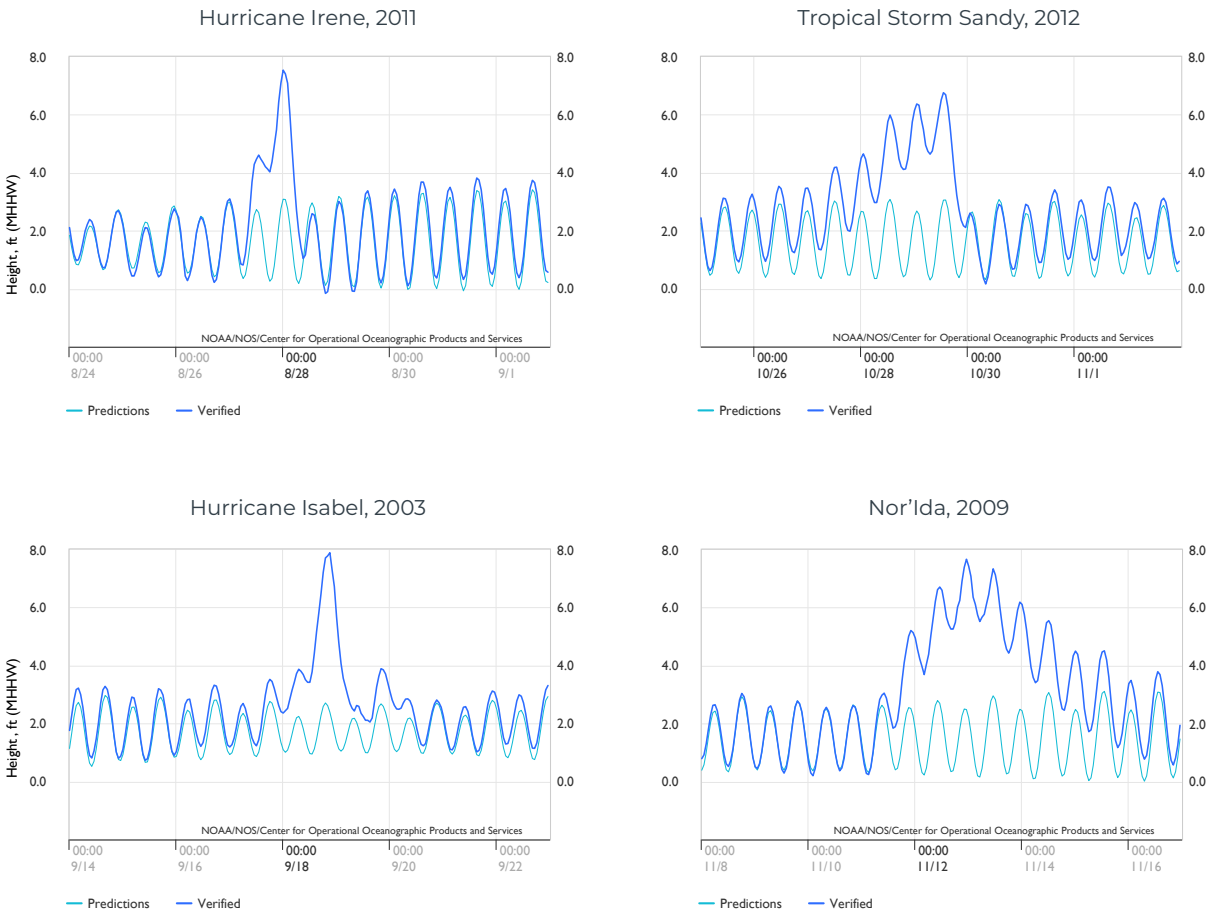


Figure 7: Water levels mapped during extreme weather events, Sewells Point Station

Source: NOAA 2022

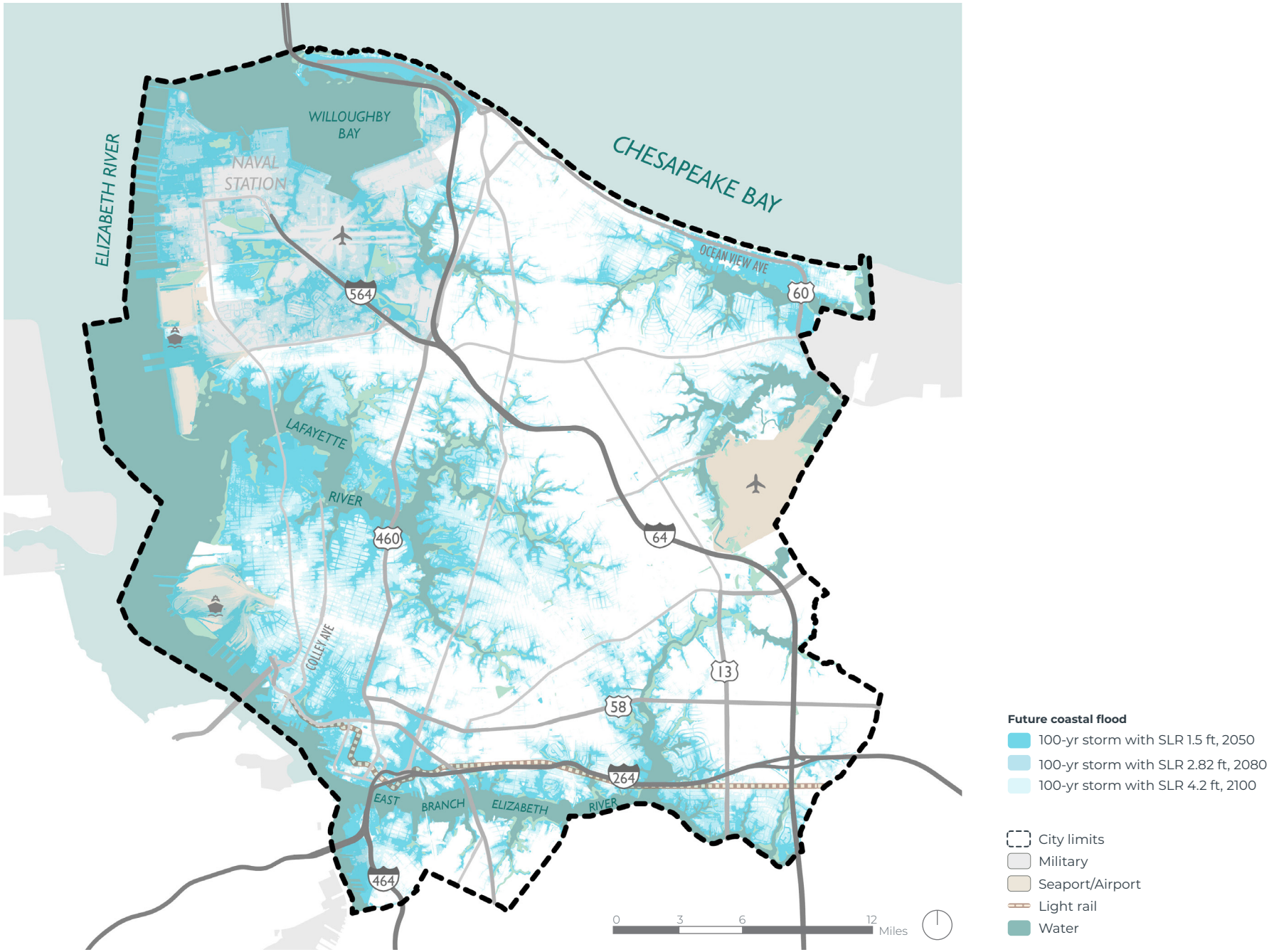


Figure 8: Future Coastal Flood Risk Schematic

Source: Virginia Institute of Marine Science (VIMS); NOAA, 2022

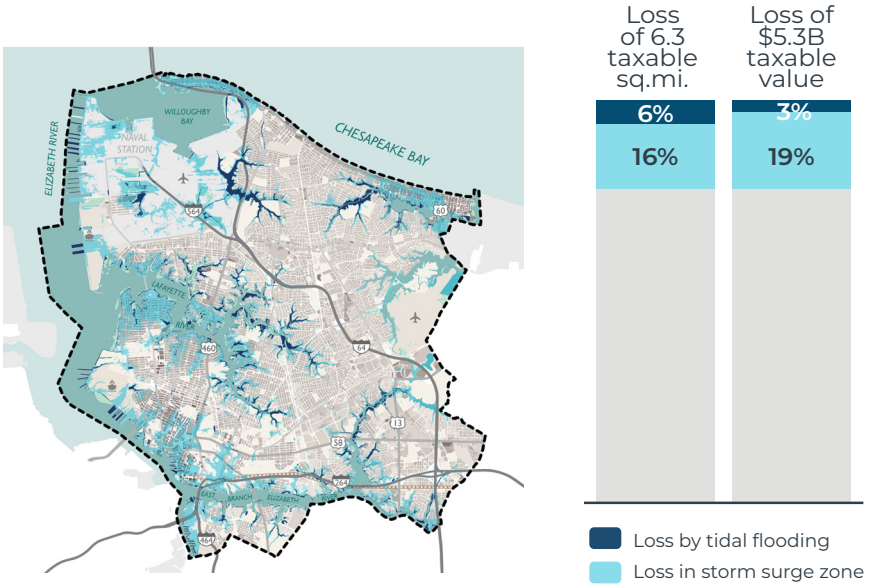


Figure 9: Sea level rise and storm surge risk, 2050

Source: VIMS; City of Norfolk Assessor, 2023; ONE Architecture

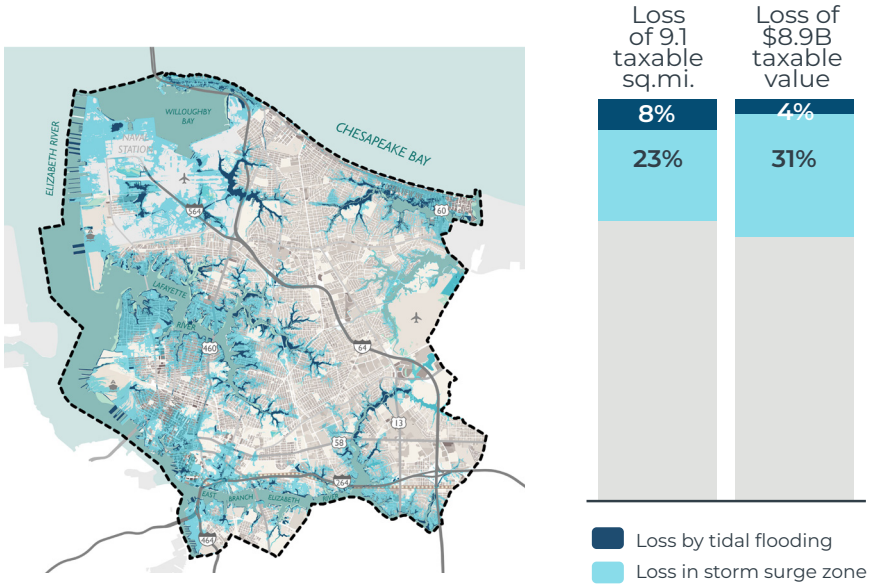


Figure 10: Sea level rise and storm surge risk, 2080

Source: NOAA, 2022; City of Norfolk Assessor, 2023; ONE Architecture

SEA LEVEL RISE & FISCAL IMPACTS

Water is deeply embedded into the life and culture of Norfolk. Adapting and fostering a positive relationship with water will determine the future success of the city.

Sea levels in Norfolk are rising faster than any other city on the East Coast, resulting from the combined impacts of a changing climate and land subsidence. Sea level rise poses significant threats to Norfolk's property tax base through permanent flooding by tidal inundation, and precipitation-induced flooding as a result of storm surge. Norfolk's ability to respond to sea level rise now will foster a more resilient city for the future.

Figures 9, 10, and 11 outline the potential impacts of sea level rise on properties. By 2050, oceans are anticipated to rise by at least 1.5 ft. Without additional adaptation measures, **tidal inundation is projected to permanently flood approximately 1.8 square miles, and reduce Norfolk's property tax base by $615 million.** In addition, storm surge flooding expands to an additional 4.5 square miles of taxable city land, and threatens the property values of approximately $5.1 billion appraised value.

If sea level rise continues to accelerate, it has the potential to impact over half of the city area and its property tax base. These projections illustrate the urgent need for cultivating more efficient and productive land uses.

As we look forward to Norfolk's future in 2050 and beyond, incorporating development decisions that promote building more in less space will be imperative for building the city's resilience to climate change and other challenges.

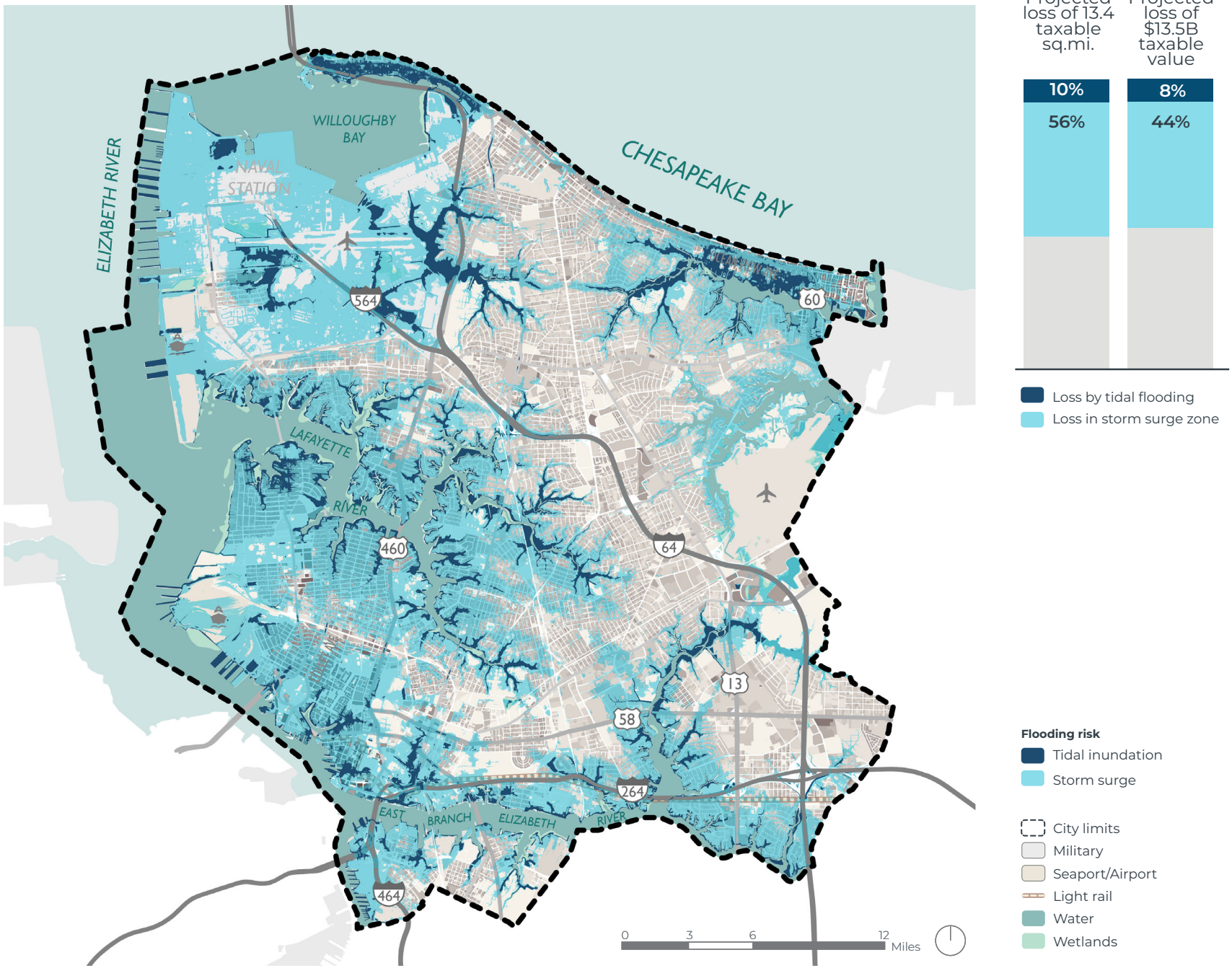


Figure 11: Sea level rise and storm surge risk, 2100

Source: NOAA, 2022; City of Norfolk Assessor, 2023; ONE Architecture

ROOM TO GROW

Despite seeming built to the limit, there are more opportunities for redevelopment and growth in Norfolk than one might think.

A young Norfolk resident boarding the Tide (City of Norfolk)

When we are creative and open-minded about ways to rethink our existing land, we can think differently about our future development decisions. Figure 12 highlights just a few of the possibilities for growth that NFK2050 may continue to explore in the coming months:

- Most of Norfolk is zoned for single-family residential housing. In 2018, Norfolk designated Accessory Dwelling Units (ADU's) as a by-right use on any single-family residential lot with an area of 6,000 square feet (SF-6) or larger. A big success to boost the overall supply of affordable housing in the city, this could potentially fill a gap for both homeowners and renters by adding over 30,000 homes literally in our backyard, without any changes to zoning.
- Norfolk boasts a considerable supply of single family parcels larger than 10,000 sq. ft (zoned SF-2 and SF-4). Depending on the development patterns and building placement, some of these parcels could conceivably be split in two to provide an additional buildable lot.
- Several neighborhoods such as Military Circle and Norfolk Industrial Park are home to commercial strip malls, light industrial warehouses and big box stores with high vacancy rates and less consumer traffic that if redeveloped in denser, mixed-use communities could considerably increase the city's housing supply.
- Large parking lots along the commercial spines of the city also provide an opportunity to address the increase in urban heat island effect and improve stormwater absorption.
- While much of the city is developed, parcels of vacant land in residential areas are an opportunity to increase access to parks, open spaces and recreation centers, increase the city's resilience to flooding, and re-envision Norfolk as a model of complete neighborhoods.

These and other potential explorations will be examined much more fully across the course of 2024, and fully vetted with a wide range of stakeholders and community advocates.

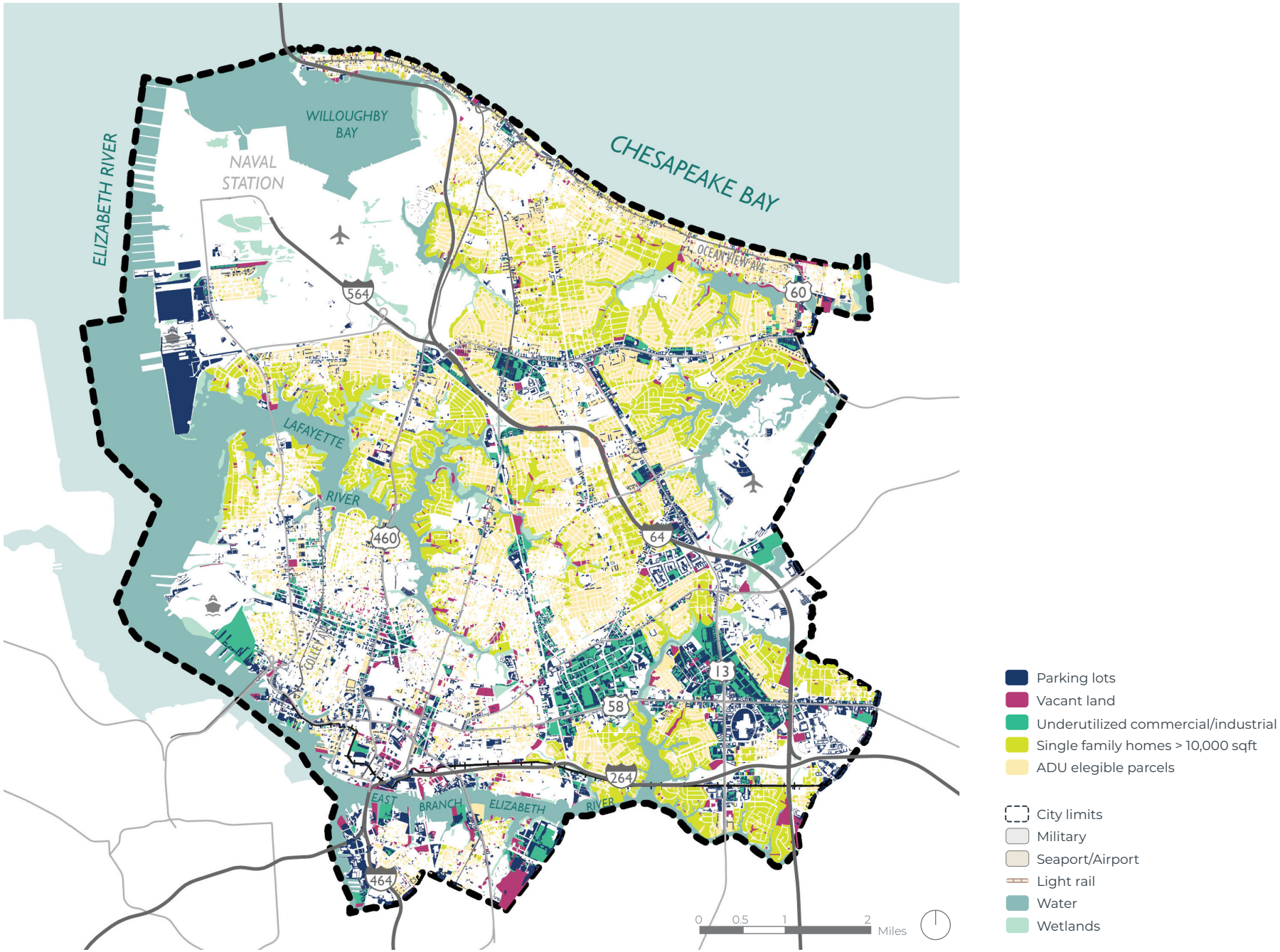


Figure 12: Larger single-family parcels, underutilized commercial and industrial land, parking lots, and vacant land

Source: City of Norfolk

Next Steps

Norfolk is a truly world-class city, with a strong history and heritage, distinct neighborhoods with good quality of life, access to a diversity of jobs, a wide range of housing stock, a multimodal transit network and bike infrastructure, a strong urban downtown, a long-term national anchor in the Naval Base, and access to nature in every ward.

Despite these assets, Norfolk will likely grapple with some challenges across the next 25 years. Rising waters, stronger storms, and an increased risk of flooding, coupled with a growing community mandate for more affordable housing, call for Norfolk to be bold in rethinking existing patterns of land use and development. Complicating matters, the city's population is not growing, which could cause some fiscal challenges as long-range infrastructure demands become greater.

Determining how—and where—we want to grow will be the next step for NFK2050. As we move into the Visioning phase of the Comprehensive Planning process, we will at all points endeavor to center Norfolk residents and stakeholders in order to build the city we collectively imagine by 2050 and beyond.

Walk to School Day 2023 (City of Norfolk)

(City of Norfolk)

NFK 2050

THE CITY OF NORFOLK

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