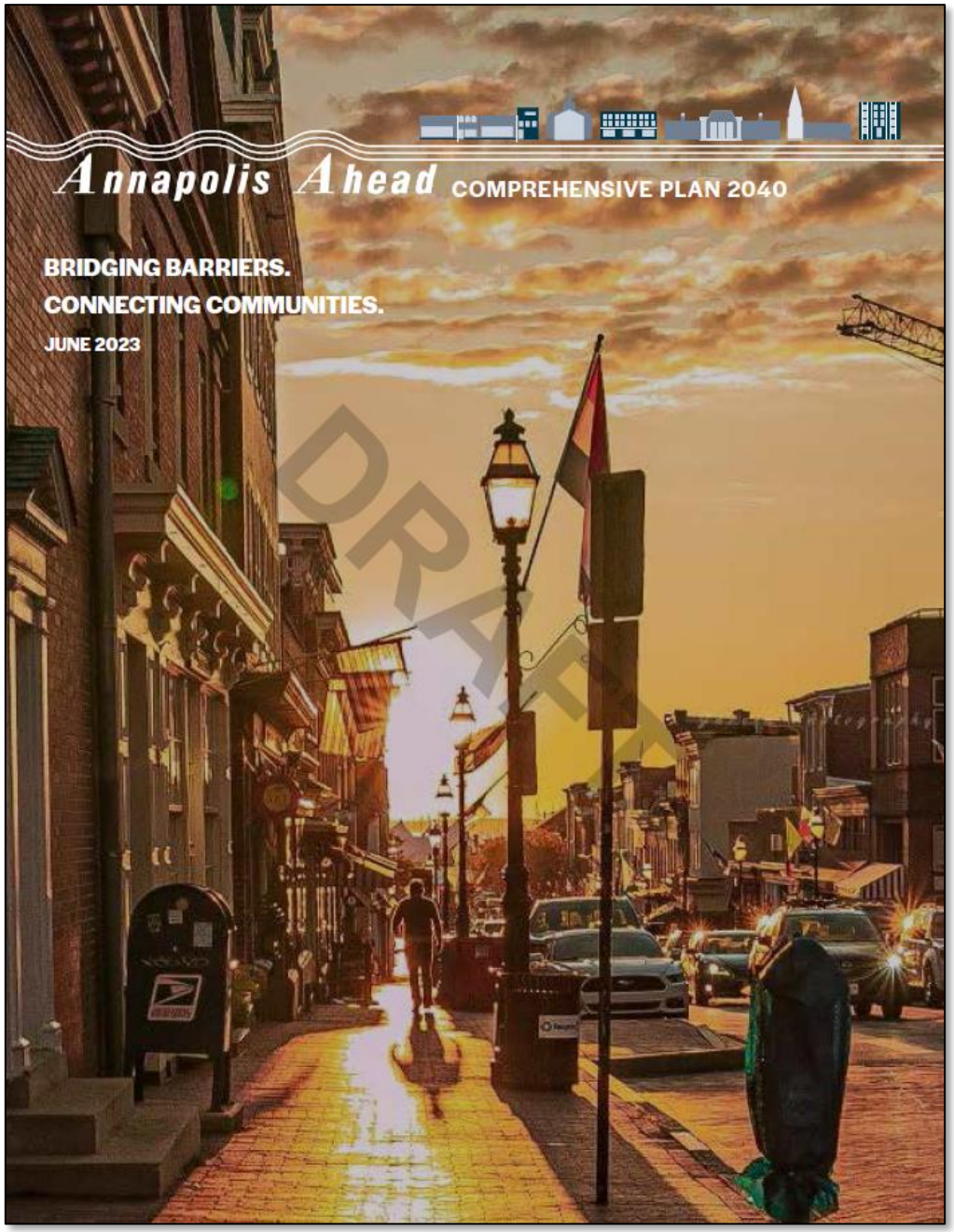
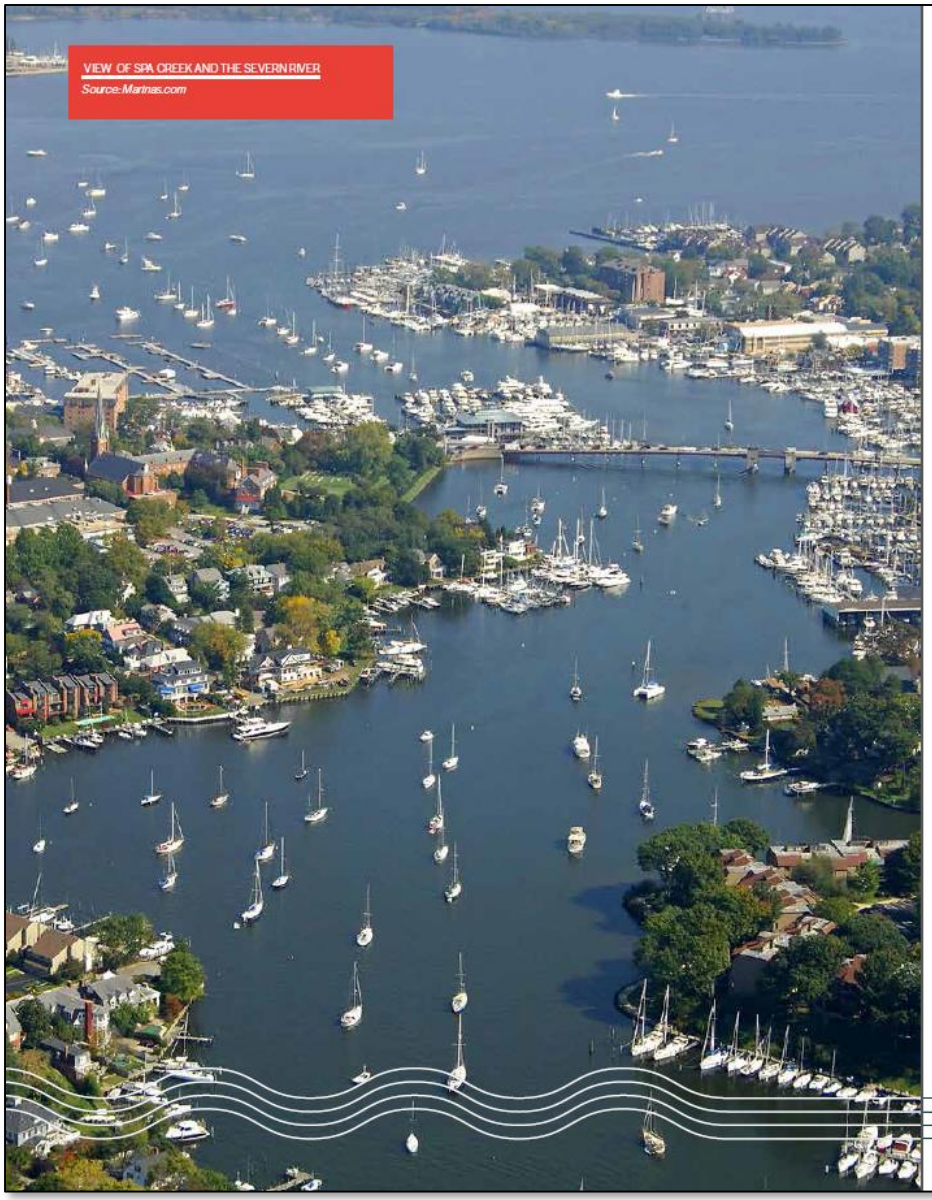


City Council Environmental Matters Committee

DRAFT Comprehensive Plan

July 13, 2023



VIEW OF SPA CREEK AND THE SEVERN RIVER
Source: Marinas.com

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Bridging barriers.
Connecting communities.

1. INTRODUCTION

ANNAPOLIS AHEAD

Annapolis Ahead 2040 is the City of Annapolis' Comprehensive Plan update, a citywide plan required by Maryland Land Use Code to be updated approximately every ten years following the release of new Census data. Like previous plans, this plan's essential purpose is to bring about the careful development of the City and conservation of what is most exceptional about it. As a general and city-wide Plan, it does this by guiding public and private decisions that work toward achieving the vision set forth by the City and its residents over the use of land, water and other natural resources; streets and other infrastructure; parks, open spaces and other community facilities; and many other aspects of the city related to development through the year 2040. The guidance within this Plan is a representation of the agreement that Annapolis, as a whole, has come to over long-range goals and outcomes. With it, the City's government has a roadmap to make wise and popular decisions on development proposals, the expenditure of public funds, the City's development code, cooperative efforts, and issues of pressing concern. Likewise, the Plan provides city residents, property owners, business owners, and those looking to invest in the city with a clear view of the city's direction.

This Plan explores conditions as they are today, how these conditions may have changed since the last comprehensive plan, and anticipates what the future may hold. From this analysis, the Plan provides goals, performance metrics, and recommended actions that will guide Annapolis toward a healthy, balanced and harmonious future over the next 20 years.

There are many features of this Plan that distinguish it from prior comprehensive plans and reinforce its relevance to the Annapolis of today. The most important of these features are the following three themes which are interrelated and guide all goals, performance metrics, and recommended actions of the Plan.

Equity

The Plan's focus on equity is guided by an awareness of longstanding racial inequities in how public and private resources are invested in Annapolis communities. The Plan's includes many goals, metrics, and recommended actions aimed at reversing these decades long trends and ensuring that all residents and communities have access to the opportunities and resources they need to be successful.

Health

The Plan's focus on health is grounded in an appreciation for how the built and natural environment of the city plays an influential role in the physical and mental health of the city's residents and communities. The Plan offers many goals, metrics, and recommended actions aimed at ensuring that our surroundings are designed to improve our health.

Resilience

The Plan's focus on resilience is based on the fact that Annapolis will continue to face challenging environmental conditions driven by climate change which in turn have economic and social consequences. The Plan offers goals, metrics, and recommended actions designed to help the city better prepare for, respond to, and adapt to more frequent storms, increasing flooding, extreme heat, and other climate driven conditions.

FIGURE 1-1: ANNAPOLIS' FIRST ANNUAL JUNETEENTH PARADE IN 2022
Source Paul W. Gillespie / Capital Gazette

2.
DEMOGRAPHIC TRENDS

OVERVIEW

The demographic trends in Annapolis over the past 10 years are a product of the demand to locate in the City, new development or redevelopment, and broader trends in the region and nation. This Plan is designed to address the needs of Annapolitans living in the city today as well as the future residents, so it is imperative to understand the composition of the city and the trends which are driving demographic change. As a historic peninsular city with limited land availability, Annapolis continues to grow at a slower rate than the State and County as a whole. The increase in population between 2010 and 2020 was nearly the same as between 2000 and 2010, but at a slightly slower rate. Unlike at the County and State level, some of this population growth is attributed to an increase in the average household size rather than solely an increase in the number of households, meaning new construction has lagged behind the rate of that outside of Annapolis.

Similar to national and regional trends, Annapolis has an aging and a diversifying population. The fastest growing cohorts are the retirement age households and to a lesser extent new families with children of school age. Recent college graduates and young professionals are one of the few cohorts to decrease in population, meaning more of them are deciding to locate elsewhere. Meanwhile, Annapolis continues to diversify. All minority groups experienced an increase in population, with the largest increase occurring in the Hispanic/Latino population, while the proportion of white residents continues to decrease.

Economic trends within the population are also significant as the gap between the high earning and low earning households continues to grow. Annapolis has both a relatively large proportion of households at a high income level and households that earn below the regional poverty level. According to the U.S. Department of Housing and Urban Development (HUD), a household is considered housing cost-burdened if it pays more than 30 percent of its gross monthly income for housing costs. Reflecting national trends, a larger proportion of renter households in Annapolis are cost-burdened while a lesser proportion of owner households are cost-burdened. That the amount of owner-occupied housing in Annapolis increased at the same time that renter-occupied housing decreased has likely exacerbated cost-burden among renters. The cost burden is not only worsening among low-income earners, however. More than half of households that are considered moderate-income earners are also cost-burdened.

Trends in the local economy have been more volatile than in the population itself since the start of the global pandemic in 2020, but overall, employment growth in more advanced professions has been more positive than in service professions. Annapolis continues to host a large number of residents that are highly educated and employed in professional occupations. Retail and food services make up a lesser proportion of employment among residents even with the significant tourism economy, likely given the relatively high cost of living. Even though a large proportion of Annapolis residents work outside of the city, a recent trend has been for more of those that previously commuted to now work from home instead. The unemployment rate has remained lower than in the County and State as a whole throughout the last decade as residents have both the regional economies of Baltimore and Washington, D.C. to draw from.

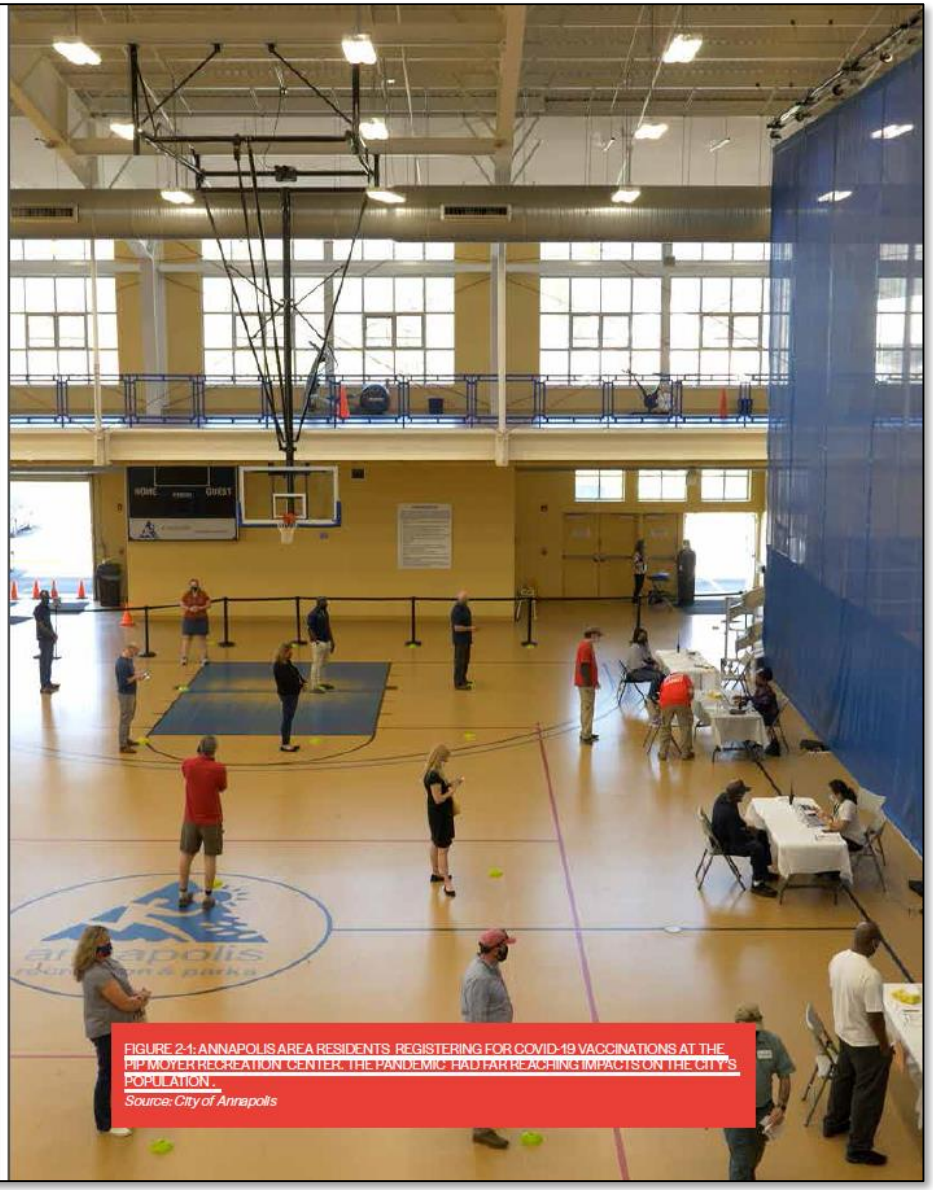


FIGURE 2-1: ANNAPOLIS AREA RESIDENTS REGISTERING FOR COVID-19 VACCINATIONS AT THE PIP MOYER RECREATION CENTER. THE PANDEMIC HAD FAR REACHING IMPACTS ON THE CITY'S POPULATION.
Source: City of Annapolis

SOCIAL TRENDS

Understanding the factors contributing to a changing demographic is key to planning for a more healthy, resilient and equitable Annapolis. These factors reveal what policies should be implemented and for whom they should be implemented. Like any other City, Annapolis is an ever changing social environment with an influx and outflux of residents and even evolving conditions among long-term residents. The 2020 Census provides a complete picture of the social and economic trends of the populace when comparing to those same variables from ten years ago. This also reveals in what ways communities have become more or less vulnerable to disruptions in society.

Social Vulnerability

The segments of the population that are vulnerable to current and future risks whether social, economic or environmental are of particular note. Factors such as socioeconomic status, household composition, minority status, and housing type and transportation are the factors dictating social vulnerability. A methodology created by the U.S. Centers for Disease Control and Prevention (CDC), a person or community's degree of social vulnerability is measured by 15 Census variables which the CDC includes in its Social Vulnerability Index (SVI). The social vulnerability index is applied to Annapolis in the accompanying map based on Census Block and is included both in Chapter 7: Community Facilities and Chapter 9: Environmental Sustainability. The process for calculating the SVI for Annapolis is based on the CDC's methodology where each of the 15 variables is weighted evenly and makes up one of two to five variables for each of the four categories as seen below. The sum of the values for each category then produces the overall social vulnerability.

The importance in measuring and tracking social vulnerability in the City lies not only in identifying who is potentially at risk and where the risk is most harmful, but in charting the course for future action to make Annapolis overall healthier and more equitable which in turn will make it more resilient. The four main components of social vulnerability tell each side of the

What Makes a Community Socially Vulnerable?

A distinguishing feature of this Plan in comparison to past comprehensive plans is its emphasis on equitable outcomes. Of course, to be equitable requires an understanding of those communities which are already at a disadvantage due to social circumstances. Many of these communities are historically disadvantaged, meaning that past investment and policies have not helped these communities to succeed. Today these communities are less equipped and more vulnerable to social, economic, or environmental challenges. To create a baseline for where these communities are located in Annapolis, the Plan uses the Center for Disease Control (CDC) Social Vulnerability Index (SVI) which combines Census data from the following fifteen factors to establish levels of social vulnerability.

Socioeconomic Status
- Below Poverty
- Unemployed
- Income
- No High School Diploma

Household Composition + Disability
- Aged 65 or Older
- Aged 17 or Younger
- Older than Age 5 with a Disability
- Single Parent Household

Housing Type + Transportation
- Multi-Unit Structures
- Mobile Homes
- Crowding
- No Vehicle
- Group Quarters

Minority Status + Language
- Minority
- Speaks English "Less than Well"

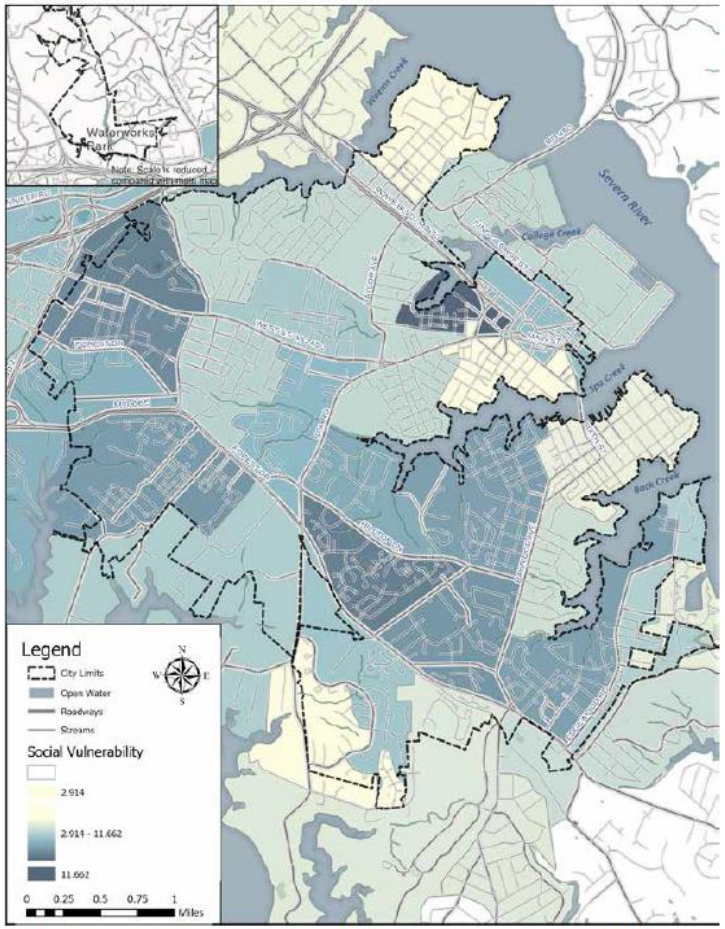
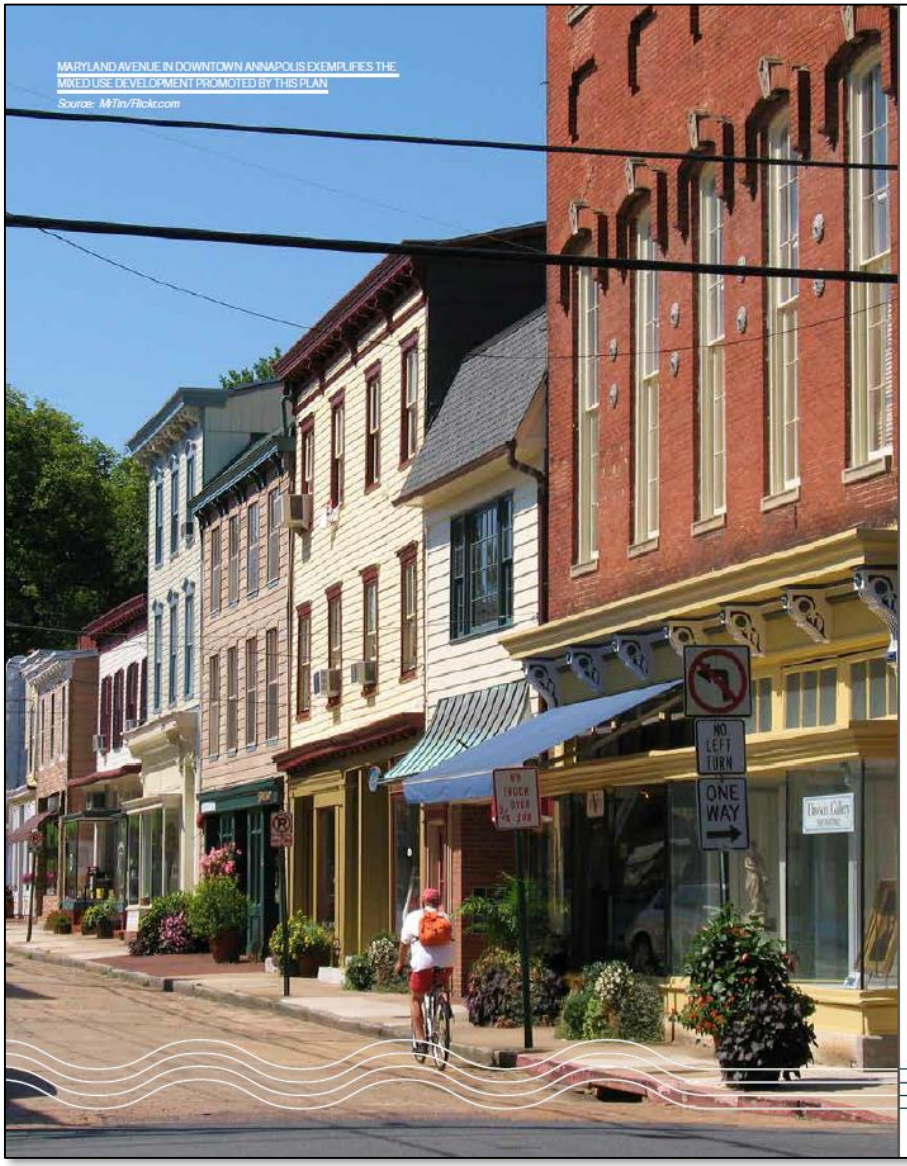


FIGURE 2-7: MAP OF SOCIAL VULNERABILITY FOR ANNAPOLIS CENSUS TRACTS BASED ON THE CENTER FOR DISEASE CONTROL'S SOCIAL VULNERABILITY INDEX FOR 2020

Source: U.S. Census



MARYLAND AVENUE IN DOWNTOWN ANNAPOLIS EXEMPLIFIES THE MIXED USE DEVELOPMENT PROMOTED BY THIS PLAN

Source: MrTin/Flickr.com

THE THRIVING CITY

Bridging barriers.
Connecting communities.

Future Land Use

This Comprehensive Plan guides the pattern, distribution, and relative intensity of land uses. The Future Land Use Map embodies the plan and succinctly illustrates its vision. This map, shown on the facing page, is to be used along with the supporting text in this chapter to guide the location, type, intensity and character of development and redevelopment. Every parcel of land is assigned a general land use category.

The City's successive land use plans, adopted nearly every ten years, reflect a long term continuity in development policy. When adjustments are made to that policy, even modestly as recommended in this Plan, they can be understood by comparing the existing plan with the newly proposed plan. Implementing this new plan over the coming years would not reshape or transform the City or alter its essential character. In fact, the adjustments are subtle but important and include:

- Elevating the protection of the City's remaining forests, wetland and natural resource areas, by specifically designating them for conservation as "Environmental Enhancement" areas.
- Removing the standalone "commercial" classification and merging all commercial areas to "mixed-use" which is already established by City zoning. Through the expansion of mixed-use, housing is permitted by right in all commercial areas.
- The conversion to mixed-use of some specific parcels along major corridors currently assigned as residential, institutional, and industrial uses. These are locations which could serve their communities better as mixed use.
- "Recreational Enhancement" replaces "Recreation" as a new land use designation that encompasses all existing parks as well as other open spaces best intended for recreation such as school yard properties which are community open space assets.

Each of the major land use categories are described on the following pages with emphasis on how this plan envisions their role in the larger approach to land use.

The Future Land Use Map is not a zoning map. It is intended to be a guide. The zoning map however is law. It divides the City into districts (zones), each having its own set of use and development regulations. For example, some districts permit housing while excluding most commercial uses and some favor commercial or industrial uses over residential. Because zoning is meant to implement a land use plan, it must be consistent with the land use plan. Therefore in order to realize many of the recommendations in this chapter, the zoning map and zoning ordinance will need to be updated and revised. Chapter 12: Developer Regulations provides further detail on how this Plan recommends amending the City's zoning to better reflect the land use vision.

Natural Resource Conservation

The City is on a peninsula and land use conditions have a direct bearing on its coastal environment. The Environmental Enhancement designation on the Future Land Use Map identifies natural lands and open spaces that cannot safely support development, would be irreparably harmed by development, or whose loss would impair local water quality, flood management, wildlife habitat, and scenic beauty.

As discussed in Chapter 9: Environmental Sustainability, natural areas play vital roles in sustaining the quality of life, public health and natural beauty in Annapolis. Wetlands help attenuate flooding, improve local water quality, and provide habitat for native plants, fish and wildlife. Steep slopes and shorelines left in a natural wooded conditions minimize soil erosion and pollutant runoff to Weems Creek, College Creek, Spa Creek, Back Creek, Church Creek, Crab Creek and Aberdeen Creek and by extension the Severn and South Rivers and the Chesapeake Bay. Forested areas moderate local temperatures for nearby residents and provide habitat for the birds and wildlife that visit the City's parks and the back yards of residents.

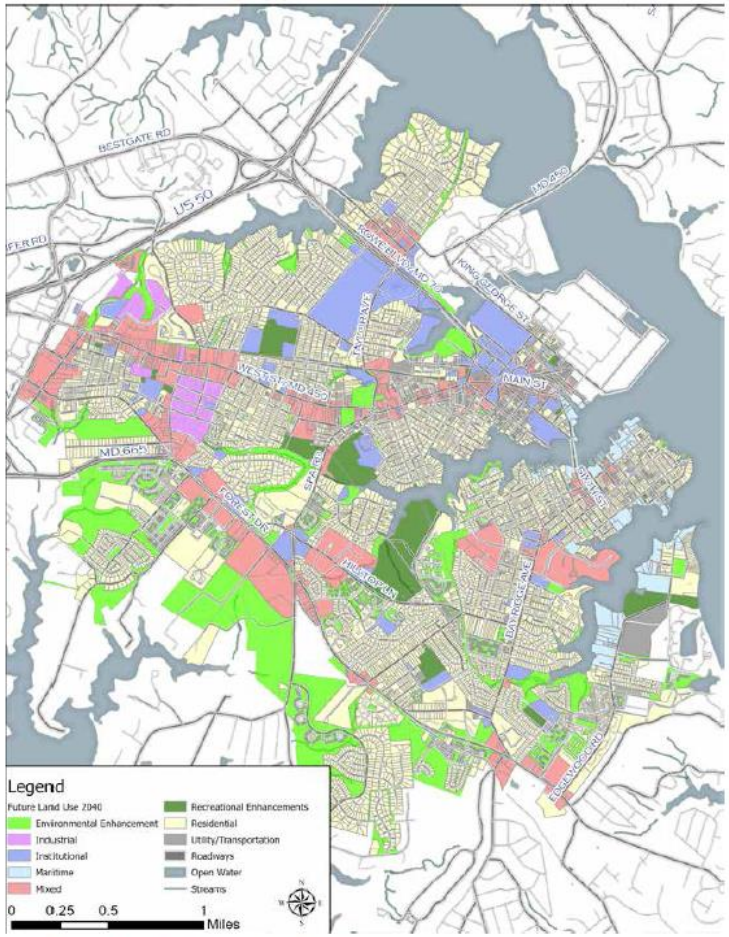


FIGURE 4-5: MAP OF FUTURE LAND USE DESIGNATIONS
Source: City of Annapolis

Performance Standards for Mixed Use Development

Enhanced Neighborhood Character

- Architecture that harmonizes with an adjacent residential neighborhood through design which references its context.
- Street trees and landscape design that harmonizes with nearby surroundings.
- Distribution of parking into smaller pods and away from primary street frontage.
- Appreciation of local culture through preservation and/or artful design elements.

Enhanced Public Realm

- Public spaces for community gathering such as small parks, plazas, and outdoor dining spaces.
- Architecture that improves the pedestrian experience with active ground floors and facade variation.
- Architecture which creates place through distinctive building features and site elements.

Compact and Connected

- Extension of neighboring land use types to promote continuity and gradual transitions from lower to higher intensity uses and site design.
- Placement of buildings on the street and in arrangements based on patterns that encourage walkability and less dependence on personal vehicle use.
- Buildings are oriented to linked public spaces which help to connect communities.

Connected Street Networks

- Extension of existing streets into and through the site to foster connectivity.
- Extension of existing bicycle and pedestrian connections into, around, and through the site, and/or establishment of new connections.
- Repair and enhancement of needed sidewalks and streetscapes within the nearby neighborhood.

Commercial and Institutional Uses Balanced with Community Needs

- Retain or expand shopping and services to meet everyday community needs.
- Facilitate major civic uses, commercial office, professional services, community level retail along major thoroughfares.

Green Infrastructure

- Functional use of setback areas for green infrastructure and public use.
- New and preserved tree canopy planted to provide multiple benefits including shade, stormwater management, and habitat.
- Paved areas are broken up with planted areas designed to capture and treat stormwater runoff.
- Innovation in environmental and energy performance.

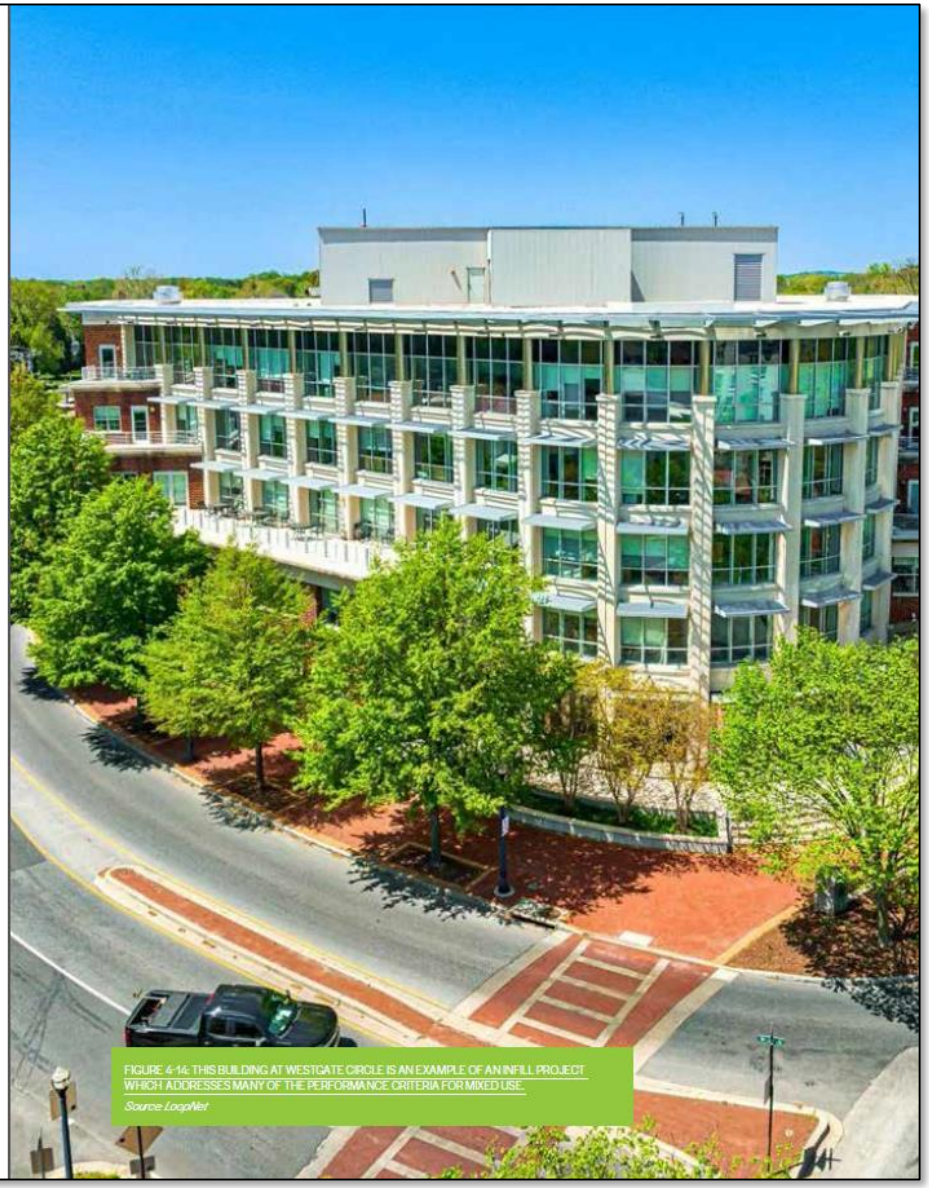


FIGURE 4-14: THIS BUILDING AT WESTGATE CIRCLE IS AN EXAMPLE OF AN INFILL PROJECT WHICH ADDRESSES MANY OF THE PERFORMANCE CRITERIA FOR MIXED USE.
Source: LoganNet

Infill Redevelopment Priorities

Future development is challenging to predict and Annapolis' existing zoning code provides very few incentives to stimulate or encourage specific development in specific locations. The 2009 Comprehensive Plan included a focus on "Opportunity Areas" with an intent to steer development to four key areas identified as primed for infill redevelopment. Yet, without any accompanying zoning changes aimed at these areas, the envisioned redevelopment has largely not happened.

This Plan takes a different approach than the 2009 Comprehensive Plan by not trying to predict a few places where development will happen but by articulating the key criteria to consider for infill redevelopment priorities. These criteria provide an infill redevelopment framework that can be used to both evaluate proposed projects and prioritize sites for redevelopment over the next twenty years. This plan acknowledges that while the city's context may change over time, the following criteria will provide an adaptable guide for evaluating development opportunities.

- Proximity to a Major Corridor:
  Redevelopment will leverage nearby mobility infrastructure;
- Proximity to Public Facilities:
  Redevelopment will leverage nearby public facilities;
- Catalytic Value:
  Redevelopment will add value to surrounding properties, and trigger other positive impacts;
- Environmental Value:
  Redevelopment will bring improved environmental performance;
- Character Value:
  Redevelopment will enhance the character of the surrounding area;
- Land Use Synergy:
  Redevelopment will reflect the City's future land use goals of the optimize existing site features;

Why Infill Redevelopment ?

Infill redevelopment refers to strategic redevelopment of land so that it better reflects the city's goals. Although Annapolis has very few undeveloped areas, it has many sites developed in the last several decades which are either functionally obsolete, or not serving their surrounding communities and larger city as well as they could be. Over time, as populations change, city goals also change to better respond to resident needs, the economy, and impacts to the natural resources. While many cities grow outward to address their changing goals, Annapolis is located on a peninsula and otherwise bordered by some of the most developed areas of Anne Arundel County within the Parole area. The City's only option is to therefore more efficiently use the land already within its limits. This Plan prioritizes the infill redevelopment of many large sites dominated by single uses that could better address the city's housing and environmental goals and help to change the prevailing land use pattern from one that is designed for cars to one that is designed for people. In general, these are sites that are located on major corridors, adjacent to transit, and in close proximity to higher densities of residents. Converting these areas into more dynamic and walkable mixed use places that will combine retail, residential, and institutional uses with updated stormwater management, public open space, and more strategic use of parking is a signature strategy for implementing the vision of this Plan.

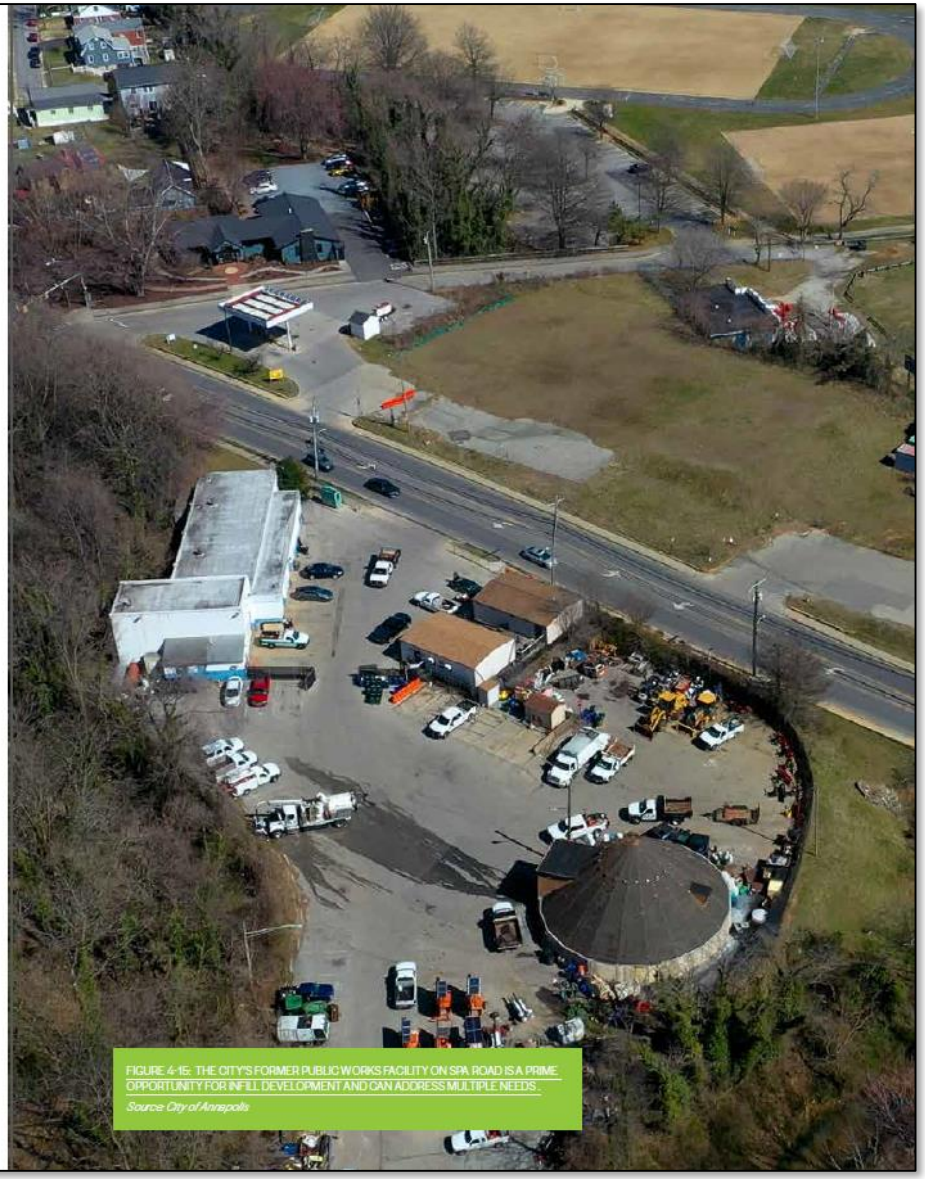


FIGURE 4-15: THE CITY'S FORMER PUBLIC WORKS FACILITY ON SPA ROAD IS A PRIME OPPORTUNITY FOR INFILL DEVELOPMENT AND CAN ADDRESS MULTIPLE NEEDS.
Source: City of Annapolis

Large Infill Sites

Although Annapolis is considered "built out"-- meaning there are very few undeveloped parcels of land in the city-- there are many aging properties that may transition to new uses through redevelopment in the next twenty years. The largest of these sites are shown in the map on the facing page and their redevelopment could have transformative effects on surrounding neighborhoods. This Plan envisions all of these sites becoming exemplary models of mixed use redevelopment including a residential component and generous public realm investment. While the sites have a variety of existing conditions, they share a consistent set of values which make them ideal opportunities for mixed use redevelopmen:

This Plan offers no predictions on when these sites will transition to new uses, and the definition of the sites may change over time as properties are consolidated, ownership changes occur, and the surrounding context is altered. Yet the value in identifying the sites now, in this Plan, is to raise the visibility of their potential value to the city, and provide guidance on how they could best advance the goals of this Plan. The chart on the following pages offers a summary of opportunities and considerations for each site.

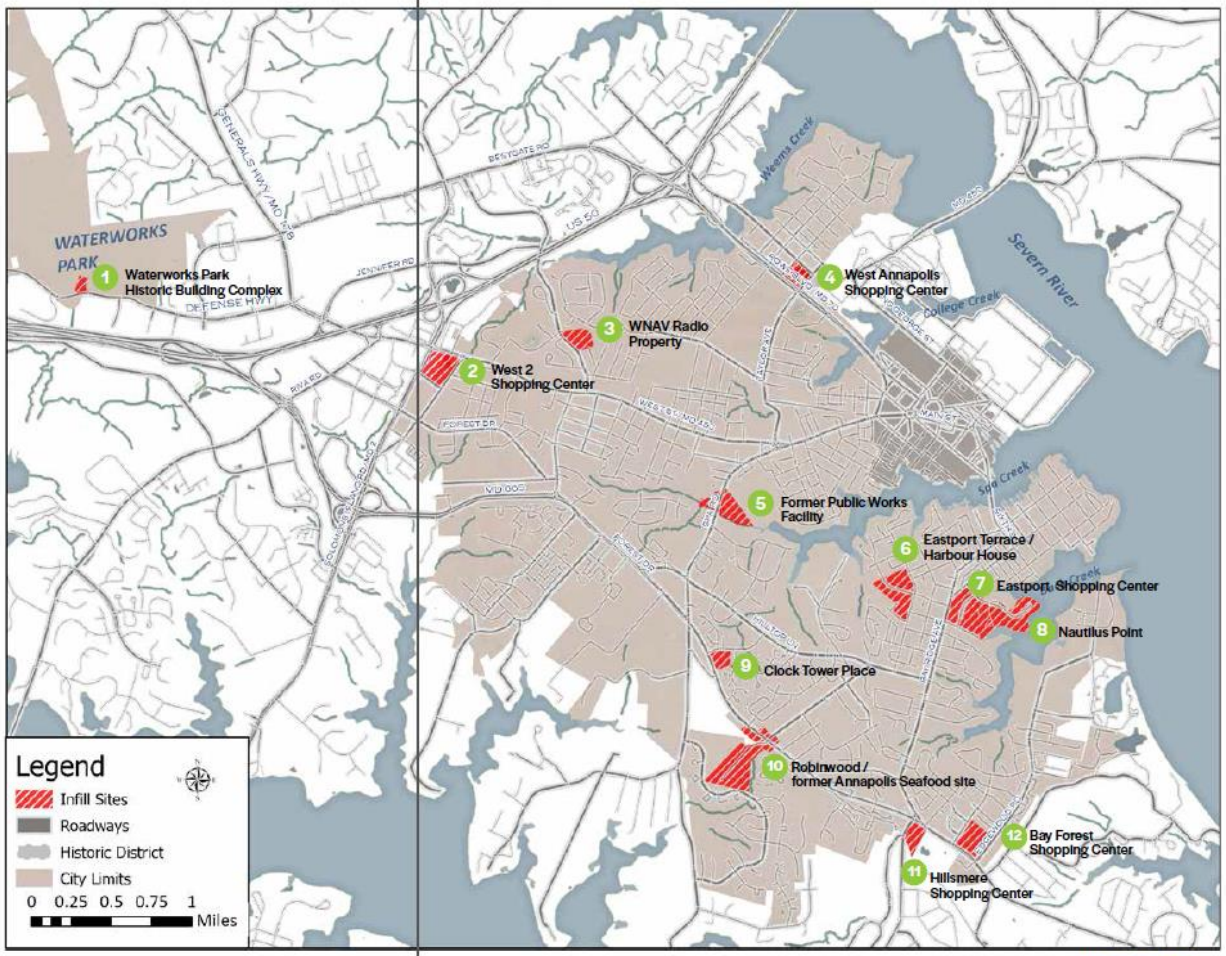


FIGURE 4-16: MAP OF LARGE SITES ANTICIPATED FOR INFILL MIXED USE REDEVELOPMENT

Source: City of Annapolis

Implementation Tools:
Creekshed Framwork

A defining feature of Annapolis is its location on a peninsula with approximately twenty two miles of shoreline. Land use decisions therefore have a direct bearing on the conditions of the city's creeks, waterfront, and generally its riparian and coastal environments. This particular context, and the value that it provides to the city in terms of environmental and community benefits, property values, cultural heritage, tourism, and other economic opportunities, guides many of the goals and recommendations of this Plan.

Comprehensive planning has traditionally used small area planning as a tool for determining neighborhood scale land use recommendations following the adoption of a citywide comprehensive plan. Whereas small area planning commonly uses established neighborhood boundaries or roadway corridors to define the limits of a plan's focus, a signature strategy recommended by this Plan is to use creekshed boundaries instead. A creekshed is a type of watershed that represents the drainage area to a specific creek and encompass all elements of the built environment within that area. The map on the facing page illustrates that Annapolis has four major creeksheds connected to the Severn River: Weems Creek, College Creek, Spa Creek, and Back Creek. The city also has small portions of five other creeksheds that feed into the South River: Church Creek, Crab Creek, Aberdeen Creek, and Harness Creek.

Although creekshed boundaries in Annapolis do split some established neighborhoods-- for example, half of Eastport drains into Spa Creek and the other half into Back Creek-- a small area plan focused on Back Creek could still address the issues that do not end at the creekshed boundary such as mobility.

A precedent for using the creeksheds as a planning framework can be found nearby in Ellicott City, another small historic city. Following the impact of devastating floods in 2018, the city pivoted its need for a comprehensive plan update into the *Ellicott City Urban Watershed Master Plan* which uses the boundary of the Tiber Hudson watershed and the impacts to it from land use decisions as the foundation for the plan. Common planning issues like transportation, economic development, and community character are addressed through the watershed lens as well as issues of flood mitigation and environmental stewardship which are also highly relevant to Annapolis.

FIGURE 4-22: THE PLANNING FRAMEWORK FROM ELLICOTT CITY'S AWARD-WINNING URBAN WATERSHED MASTER PLAN IS THE MODEL FOR FUTURE SMALL AREA PLANNING IN ANNAPOLIS.

Source: Mahan Rykiel Associates / Ellicott City

By elevating a creekshed planning framework for the city, the environmental impact of policy decisions can be better calibrated, and residents, property owners, and business owners will become more aware of the impact of their own land use decisions on the city's waterways.

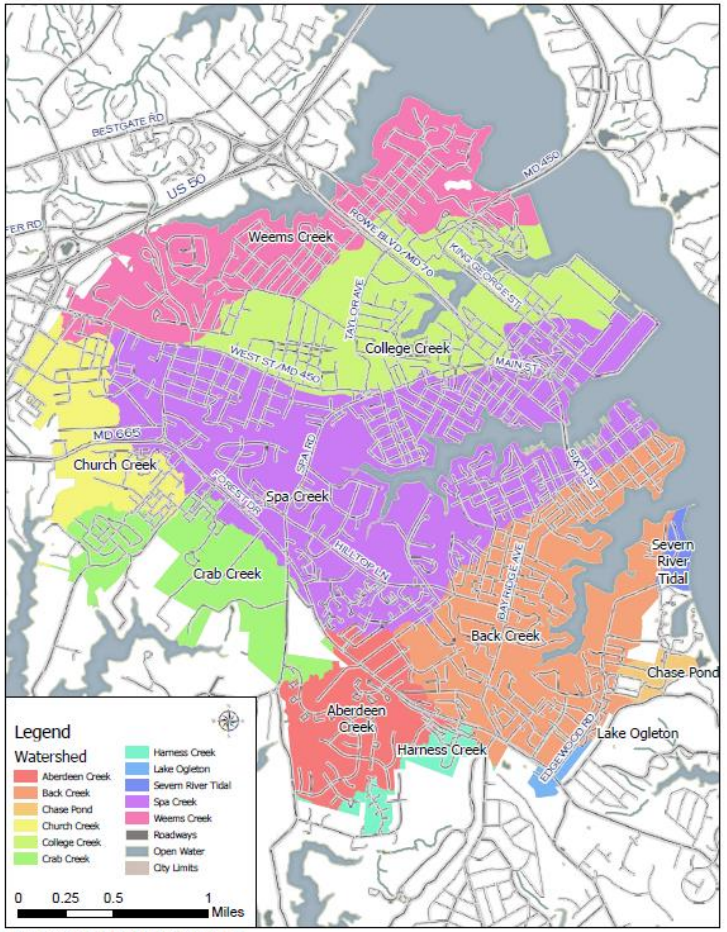


FIGURE 4-23: MAP OF ANNAPOLIS' CREEKSHEDS

source: City of Annapolis

Implementation Tools:
Greenway Map

The intent of identifying Environmental and Recreational Enhancement areas on the Future Land Use map is to better integrate and protect lands of high natural resource or recreational value into the city's comprehensive planning and development process. A primary means of doing this is through a formalized *Greenway Map* that depicts all land parcels worthy of conservation. In many cases, these are areas that are simply not developable for various reasons, perhaps because they lie in the flood plain, or along a riparian corridor, or awkwardly configured remnants of earlier developments. Nevertheless, these lands retain value and can provide significant ecological benefits to the city if managed with intention. These values include providing tree canopy, stormwater management, wildlife habitat, recreational trails, and water access. Moreover, with these ecological benefits come broader economic and public health benefits such reduction in harmful impacts from flood events and other natural hazards. The ultimate goal in identifying, organizing, prioritizing, and visualizing these lands is to create a coherent greenway network which links together these diverse parcels across the city and complementing the built fabric. The Greenway Map featured on the facing page is relevant to other elements of this Plan, and is also addressed in Chapter 7: Community Facilities, Chapter 9: Environmental Sustainability, and Chapter 10: Water Resources.

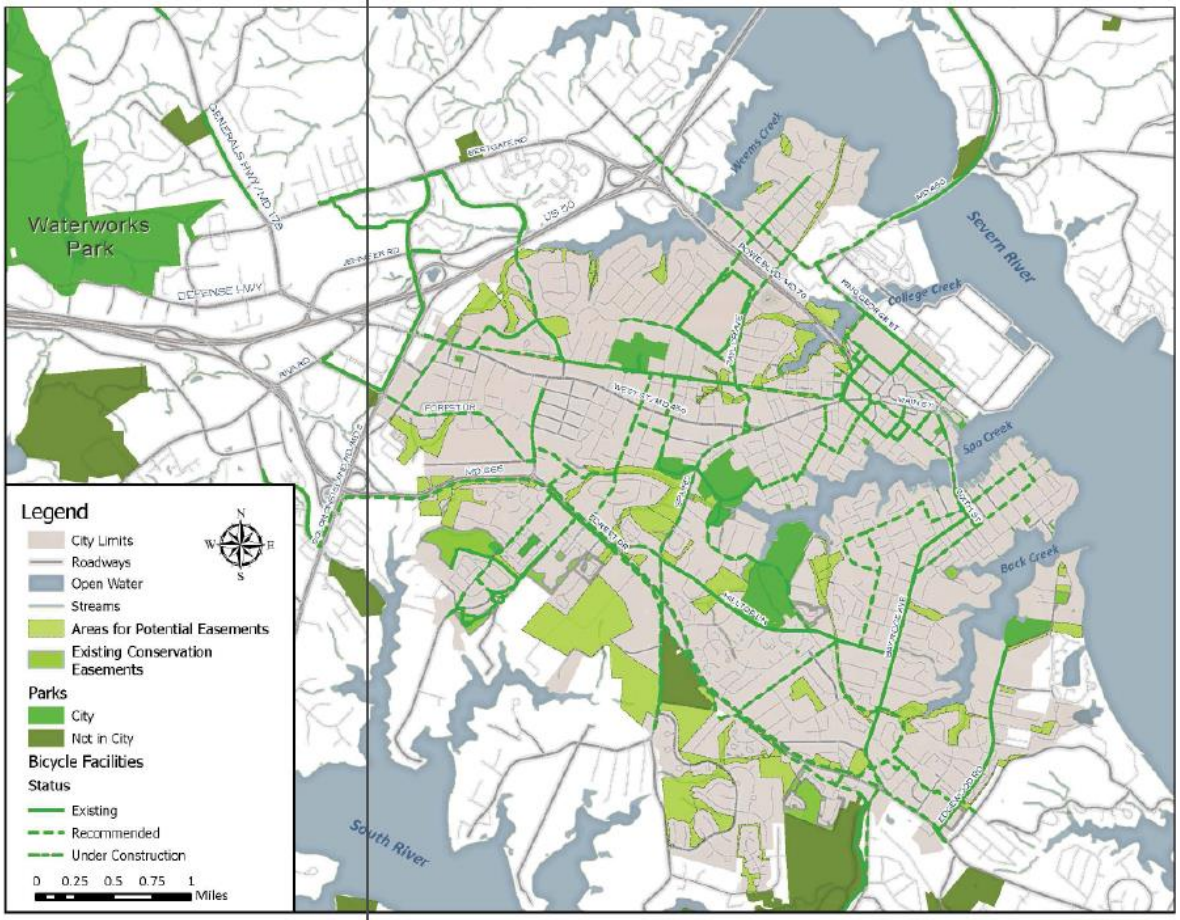


FIGURE 4-24: GREENWAY MAP SHOWING POTENTIAL CONSERVATION EASEMENTS AND EXISTING PROTECTED AREAS.
source: City of Annapolis

TRANSPORTATION, COMMUNITY FACILITIES, AND CULTURE INTERSECT ON INNER WEST STREET.

Source: City of Annapolis

THE FUNCTIONAL CITY

Bridging barriers.
Connecting communities.

6. TRANSPORTATION

OVERVIEW

Few aspects of the public realm are as important to as many people as transportation; fewer still are controlled by so few public sector entities. Local, state, and federal governments have created a transportation system in the United States that has been the standard of excellence for nearly every other country in the world. The development of the Eisenhower Interstate System beginning in the late 1950's propelled the economy forward for millions of people.

Times change. While other countries have moved ahead on high speed passenger rail or separated bicycle networks, for example, the U.S. lags far behind. More importantly, cultural shifts building on smart growth and walkable places, greater awareness of historic transportation inequities, changing family structures, increasing construction costs, declining rates of driver licensing for younger people, aging populations, and concerns about environmental degradation from vehicle emissions have shifted the goals for many cities in the United States, including Annapolis. Congestion levels on public roadways, parking management, and a greater desire for streets that offer a complete set of mobility options are at the forefront of a new transportation paradigm. Overlaying these changes are advances in micromobility and enhanced technologies that may make some systems less important or in need of innovative redesigns to remain relevant. Many of these 21st century considerations became the foundation for the Infrastructure Investment and Jobs Act (IIJA), the most significant investment in America's infrastructure in nearly fifty years.

Annapolis today is at a crossroads in shaping its transportation policies in response to these rapidly changing urban needs and preferences. These policies will in turn shape the transportation modes that residents and visitors will use in the future to move more efficiently, safely, comfortably, and with less environmental impact. Transportation policy changes and infrastructural investments can have far reaching positive impacts on the broader environment of the city .

"Almost no matter what you want to do with cities, transportation is the fastest and most cost-effective way of achieving your goals. If you want to reduce CO2 emissions, if you want to advance social equity, if you want to foster small business success, if you want to increase land value, if you want to increase public health, if you want to reduce fatalities and injuries—transport is the place to do it."

- Jeff Tumlin, San Francisco MTA

The following chapter will outline the current context of Annapolis both internally and with respect to the external changes and challenges mentioned. Reviews of this information and future amendments will address recommendations to meet the most pressing transportation needs of Annapolis' residents, businesses, and visitors.

FIGURE 6-1 AN ELECTRIC BIKESHARE AND SCOOTER SHARE PROGRAM IS ONE OF THE WAYS THAT ANNAPOLIS IS ADAPTING TO CHANGING TIMES

Source: City of Annapolis

Active Transportation

As previously noted, Annapolis' location on a peninsula and being largely built-out means that it has fewer tools than other places for improving mobility. One tool that it does have, but has yet to fully leverage, is active transportation, which refers to walking and biking as a primary means of trasnportation. In fact, dollar for dollar, active transportation is the best investment the City can make in improving mobility. When more people choose to walk or bike, not only do they lessen the vehicles on the road, thereby reducing traffic and vehicle pollution, they also improve their own health, stimulate the economy, and make streets safer simply by being present and providing "eyes on the street".

As a relatively flat and compact city, and one which welcomes millions of visitors each year who come to enjoy the city by foot or bike, Annapolis should have a far more developed active transportation network than it currently does. The city's bicycle network is fragmented and poorly marked, and many of the city's sidewalks are too narrow, blocked by utilities, or otherwise not ADA compliant. Of course many of these conditions are due to the City being hundreds of years old and not designed to contemporary standards. But at the same time, the City has not until recently prioritized active transportation and the significant investment it requires.

Using the Walkscore methodology which analyzes the urban features of the city, the "walkability" of Annapolis varies dramatically from the historic downtown core with a Walkscore of 84 to the edges of the City with Walkscores in the 30s (the overall Walkscore of Annapolis is 50 - "Somewhat Walkable"); The image above is a citywide "heat map" of the walkability scores.

The app Strava records travel by bicycle and on foot by its users for the prior two years to produce compelling maps of where people are travelling. While downtown ranks highly again for walking and biking, it is noteworthy that other, higher-level roads are used by cyclists and pedestrians, like Rowe Boulevard, Forest Drive, West Street, Spa Road, and Bay Ridge Avenue. However, in many cases, those who walk or bike as a primary means of transportation do not have a choice which street they take to get to their destination. They simply take the most direct route.

FIGURE 6-17: ANNAPOLIS WALKSCORE HEAT MAP

source: Walkscore.com

*The Walkscore metric is used broadly to compare relative "walkability" between cities and neighborhoods, but actually measures the proximity and number of destinations within a 5-(high score) to 30-minute (low score) walk, population density, and block sizes to calculate these reported values - barriers like sidewalk gaps aren't a factor.

If more people do choose to walk or bike, the national data is clear that roads become dramatically safer for walking and biking. There is "safety in numbers" as drivers become more aware of other road users and their behavior adjusts accordingly. The chart above clearly shows how cities with more bicycle commuters on their streets see a dramatic reduction in traffic fatalities.

In 2022, Annapolis launched its first "Micromobility Program" as a means of offsetting the impacts of the Hillman Garage reconstruction and providing alternative ways to get into and around Downtown

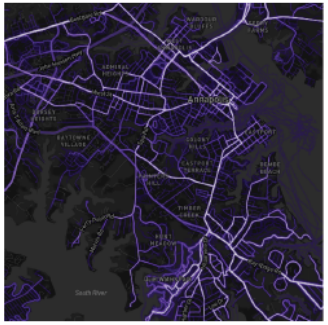


FIGURE 6-18: BICYCLING PATTERNS IN ANNAPOLIS BASED ON 2-YEAR DATA FROM THE APP STRAVA (LIGHTER LINES INDICATE MORE HEAVILY USED STREETS)

source: Strava

FIGURE 6-19: WALKING PATTERNS IN ANNAPOLIS BASED ON 2-YEAR DATA FROM THE APP STRAVA (LIGHTER LINES INDICATE MORE HEAVILY USED STREETS)

source: Strava

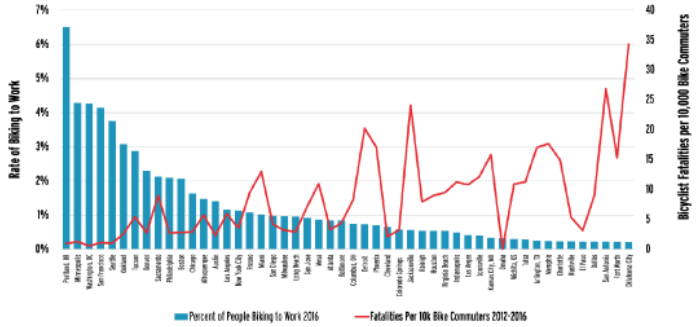


FIGURE 6-20: DATA FROM CITIES ACROSS THE U.S. SHOWS A STRONG TREND THAT WHEN THERE ARE MORE BICYCLE COMMUTERS, BICYCLIST FATALTIES REDUCE DRAMATICALLY

source: League of American Bicyclists

Safety

Crashes and transportation injuries

The negative consequences of vehicular crashes in the lives of Annapolis residents, drivers, and the economy is substantial. About 93% of crashes are caused by driver error: these events should be called "crashes," not "accidents," since almost all of them are preventable. A ban on texting while driving has been in effect in Maryland since 2009, and roadway design changes can also make a tremendous difference in the number and severity of crashes. Controlling access points along major roadways, improving sight distance, separating bicycle / pedestrian traffic from cars, and managing speeds are important components of safety programming. Crashes, especially in urban areas, are a major source of vehicular delay (25% to 40% of all delay), and this is delay that is felt particularly keenly since it is unexpected and cannot be anticipated.

Understanding crash data includes several considerations. For example, a large number of pedestrian-related crashes or injuries likely means that the location has a large pedestrian generator of traffic (like a shopping area nearby or is in a generally favorable area for walking). Crashes should be considered against the volume of traffic, since larger number of vehicles moving around translate into more collisions - note the cluster of crashes at the high-volume intersections around US 50 and MD 2. On the opposite page is a "heat map" of the crashes in Annapolis between 2015 and 2021, and on this page is a chart showing the distributions of crashes by time of day in comparison to trends across the county and state.

Finally, it should be kept in mind that the number of reported crashes doesn't represent all crashes: estimates suggest that 30% of all crashes go unreported, mostly property damage-only but some injury crashes as well (source: USDOT National Highway Safety Administration, Report DOT HS 812 183, July 2015).

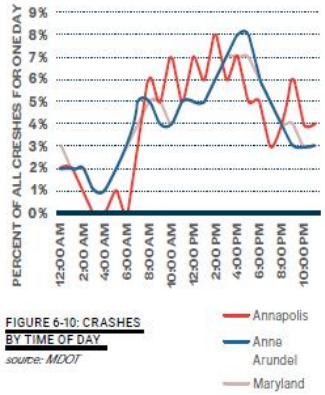


FIGURE 6-10: CRASHES BY TIME OF DAY
source: MDOT

FIGURE 6-11: CRASHES BY TIME OF DAY
source: MDOT

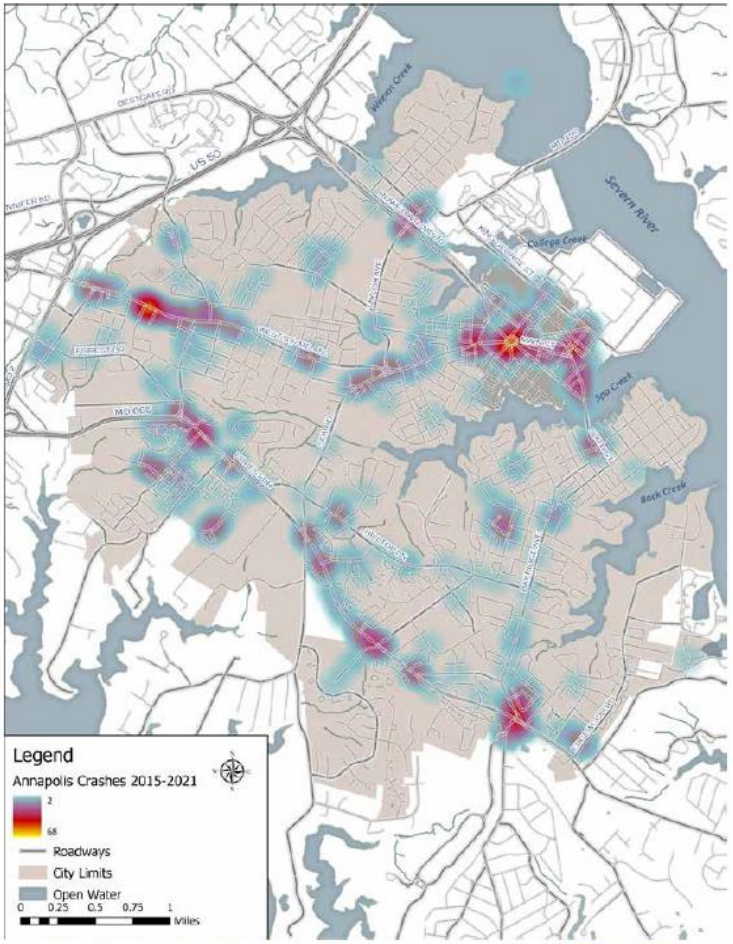


FIGURE 6-12: ANNAPOLIS VEHICLE CRASH MAP (2015-2021)
source: City of Annapolis

Pedestrian Network

A city's sidewalk network is the best indicator of just how accessible and equitable the larger transportation network is. Indeed walking may be a great form of exercise but for many residents it is the only means of getting where they need to go, often in combination with public transit. A walkable city is one in which someone does not need to think twice about whether walking will put them in danger or will be less pleasant than driving. A walkable city unlocks a range of related benefits from improved health outcomes, to public safety, to community investment, and economic vitality.

For these reasons, cities aspire to have a completely connected sidewalk network that allows someone to walk safely and comfortably wherever they need to go. This means sidewalks of adequate width (the Annapolis City Code requires 5' width for new sidewalks), free of barriers such as utility poles, with ramps at the corners compliant with the American Disabilities Act (ADA), and crosswalks at major intersections. These are the basic criteria for a connected sidewalk network. Street trees which provide shade and managed curb cuts that limit how often the sidewalk is interupted for a driveway are among other features that can make a sidewalk network truly comfortable for all users.

In 2022, to help analyze gaps in the city's sidewalk network and help prioritize improvements, Annapolis participated in the development of a Pedestrian Infrastructure Assessment Tool (PIAT) led by a team from the Baltimore Metropolitan Council. As part of the tool development, Annapolis was one of two jurisdictions in the Baltimore region which which served a test location. The PIAT uses highly precise sidewalk infrastructure data -- including locations of barriers, ramps, and crosswalks -- combined with Geographic Information Systems analysis tools to identify where adequate sidewalks exist and where they do not.

The map on the facing page is an outcome of the PIAT's analysis and is combined with the city's Social

FIGURE 6-25: SIDEWALK CONDITIONS IN ANNAPOLIS VARY WIDELY AND ARE RARELY ABLE TO BE IMPROVED WITHOUT IMPACTING OTHERS PARTS OF THE STREET SUCH AS PARKING, DRIVE LANE, OR ADJACENT PROPERTY WHICH REQUIRES COMPROMISE.

source: City of Annapolis

Vulnerability data to understand where sidewalk improvements could have the most impact. There are several neighborhoods adjacent to Forest Drive that score poorly on the sidewalk analsysis and have high social vulnerability.

Improving sidewalk connectivity is often more challenging than it might seem and frequently involves balancing multiple needs that might all seem equally important. With Annapolis' streets generally very constrained for space, widening a sidewalk might impact an ajacent parking lane, a vehicular lane, or might require using part of an adjacent property. It might require the relocation of a utility pole or a tree. All of these scenarios add time, cost, and complexity. Regardless of these challenges, this Plan seeks to make Annapolis a more walkable city and to do this the City must recognize that improving the sidewalk network -- to make it truly connected -- requires commitment and often difficult compromises. However, the return on investment will be substantial in terms of social, environmental, and economic value.

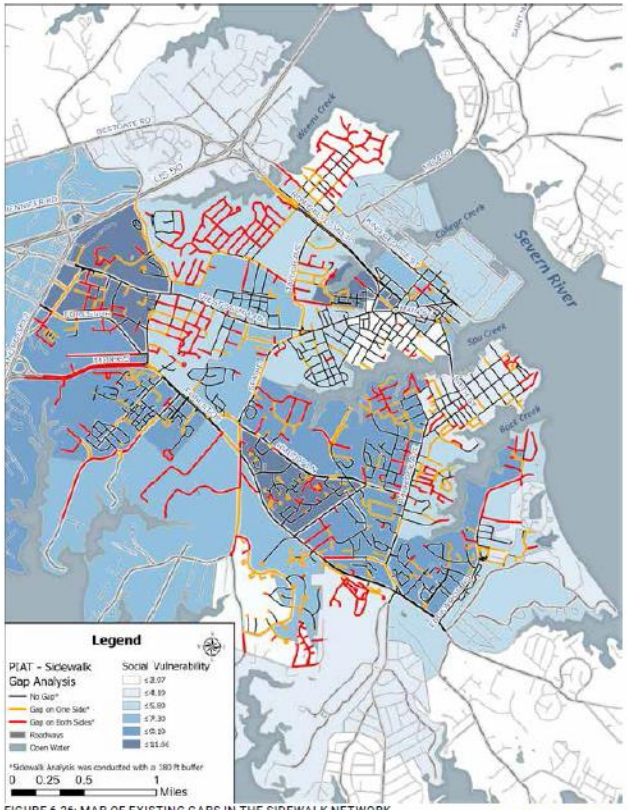


FIGURE 6-26: MAP OF EXISTING GAPS IN THE SIDEWALK NETWORK COMBINED WITH SOCIAL VULNERABILITY DATA TO HELP PRIORITIZE FUTURE IMPROVEMENTS.

source: City of Annapolis

Bicycle Network

Annapolis' bicycling infrastructure network includes a variety of different facilities including off-street shared use paths, striped bike lanes, and shared lane markings, but the network overall is extremely fragmented and not serving the city well. Similar to the predestrian network described on the previous pages, bicycling is great exercise but for many residents, it is the primary means of getting around the city whether to a job, to services, or another destination. And just like a walkable city, a bikeable city is one in which someone does not need to think twice about whether biking will put them in danger or will be less pleasant than driving. Along with walking, a safe and connected bike network unlocks a range of related benefits from improved health outcomes, to public safety, to community investment, economic vitality, and reduced traffic and vehicle emissions. Indeed, for many residents and visitors to Annapolis, biking has even more potential to replace trips that would typically require a personal vehicle trip in today's Annapolis because the roadways are either not safe for bicycling or adequate bike infrastructure is not available.

Annapolis adopted its first Bicyle Master Plan in 2011 which provided direction on how to better invest in this key component of the city's mobility network. However until recently, very little was done to improve safety and connectivity for cyclists in the city. Beginning in 2018, the City launched a new initiative to prioritize the bicycle network based on recommendations from the 2011 Master Plan as well as new strategies. Over the last five years, the City has focused on investments into major bike corridors such as the West East Express, College Creek Connector, and Spa Creek Trail, as well as more straightforward lane marking improvements when streets are repaved. With this renewed focus, the City has raised over $5 million in funds through State and Federal grants, the most funding dedicated to bike network improvements in the City's history.

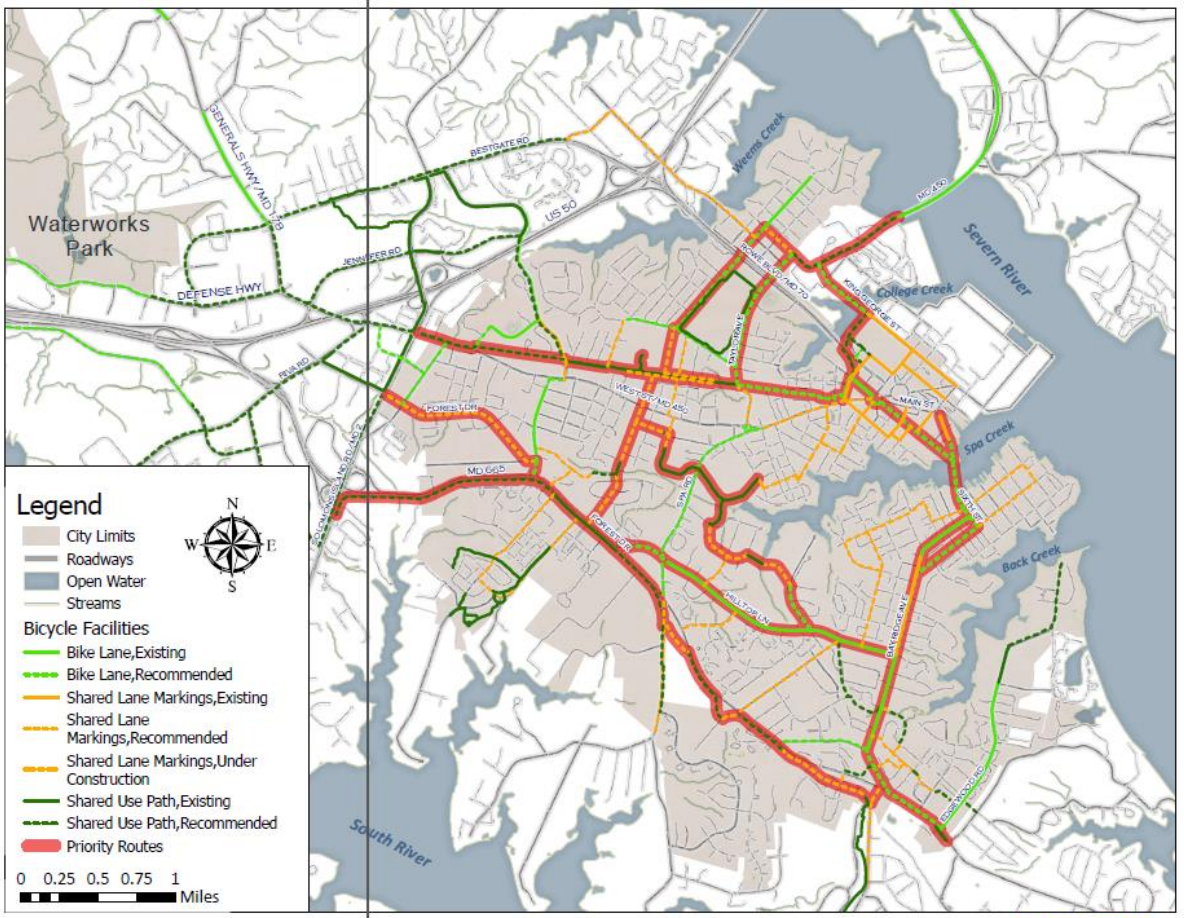


FIGURE 6-27: MAP OF EXISTING AND RECOMMENDED BICYCLE FACILITIES INCLUDING PRIORTY ROUTES.

source: City of Annapolis

Complete Streets

Policies which guide street improvements that benefit the safety of all street users– particularly those most vulnerable such as pedestrians-- are a critical tool for creating a safe transportation network. In recent years, municipalities all over over the United States have adopted "Complete Street" policies as a way to standardize and prioritize the types of improvements that will have the most impact on safety. The U.S. Department of Transportation has helped to expand these policies by promoting best practices and dramatically increasing the funding to state and local governments looking to create Complete Street plans and implement the improvements. The State of Maryland's "Context-Driven" program initiative is another example of how Complete Street policy has become the standard approach to roadway planning and design.

The exact look and feel of a Complete Street will vary by community context, but the idea is always the same: provide design features that improve the safety and comfort for all street users such as wider sidewalks, street parking, and bike lanes; improve the environmental functions of the street through features such as street trees and rain gardens; and enhance the identity of the street through features such as wayfinding signage and public art. All of these features can be scaled up or down depending on the available space and specific community needs.

While Annapolis has not yet established a policy for implementing Complete Streets, Anne Arundel County did adopt a policy in 2014 through Resolution 45-14 which established guiding principles and a framework for ensuring that future roadway improvements would follow a Complete Street approach.

Unlike Anne Arundel County, Annapolis builds very few new or widened roadways, and the roads which the City already maintains are generally constrained for space. Therefore, any Complete Street policy tailored to Annapolis will need to first acknowledge that future improvements in many cases will be highly strategic and surgical – a particular project might only improve an intersection or an individual segment of a longer street. That being said, there are streets in Annapolis that could benefit from Complete Street makeovers, namely Upper West Street and Forest Drive. These are streets where a high concentration of crashes occur, where vehicles drive at high speeds, and where walking is usually a last resort because it it does not feel safe or comfortable.

"Complete Streets are streets designed and operated to enable safe use and support mobility for all users. Those include people of all ages and abilities, regardless of whether they are travelling as drivers, pedestrians, bicyclists, or public transportation riders. The concept of Complete Streets encompasses many approaches to planning, designing, and operating roadways and rights of way with all users in mind to make the transportation network safer and more efficient."

- U.S. Department of Transportation

For Annapolis to establish a Complete Street policy that is specific to the unique conditions of the city, it needs two essential things: it needs the support of City Council to recognize that improvements to streets should be treated as a major investment in the health and character of the city and not simply basic road repairs; and Annapolis needs a Complete Street design manual that will help staff, property owners, developers, and community stakeholders make decisions on context-sensitive improvements that will add value to the city.

FIGURE 6-14: RENDERING OF A PROTOTYPICAL NEIGHBORHOOD COMPLETE STREET FROM THE 'URBAN STREET DESIGN GUIDE' BY THE NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS (NACTO)

source: NACTO

FIGURE 6-15: THIS RECENT INTERSECTION IMPROVEMENT ON CHESAPEAKE AVENUE SHORTENS THE CROSSING DISTANCE FOR PEDESTRIANS, CALMS VEHICULAR TRAFFIC, AND ADDS PLANTINGS.

source: City of Annapolis

Electric Mobility

Transitioning the Annapolis Transit bus fleet from conventional diesel buses to zero-emissions electric vehicles is another means of improving efficiency and ridership. The transition can also have a dramatic impact on reducing the city's carbon footprint given that the transportation sector is the largest emitter of greenhouse gas emissions in the city (Chapter 8: Environmental Sustainability addresses the broader goal of carbon reduction). However, transitioning the bus fleet requires more than simply purchasing new vehicles. New maintenance facilities and equipment, new staff capacity and expertise, and new scheduling based on electric charge durations and requirements are all aspects of a successful transition.

In 2022, to jumpstart this effort, a conceptual plan was created to envision an initial investment in an electric transit system. The plan focused on three primary electric modes: transitioning the successful Downtown Circulator buses to an electric vehicles, creating new 10-minute trolley service in the Downtown and Eastport areas with small General Electric Motor (GEM) vehicles, and creating a new electric passenger ferry that would connect Easport to Downtown. Separate from this plan, the privately-operated Annapolis GO service, designed and operated by Via, was created in conjunction with the Hillman Garage reconstruction and offers on-demand service for $2 per ride using electric SUVs. The City also launched its first e-bike and e-scooter share program operated by Bird. Both of these programs have proven to be successful and expanded since their inception which shows that there is both strong public support for and significant value in electric mobility in Annapolis. However, there needs to be far more coordination and integration among the various programs as they evolve. Currently each service operates on its own platform through a proprietary app which is neither efficient nor serving the broader goal of providing more convenient and connected service.

Investing in and promoting electric mobility is a huge opportunity for the City, and specifically Annapolis

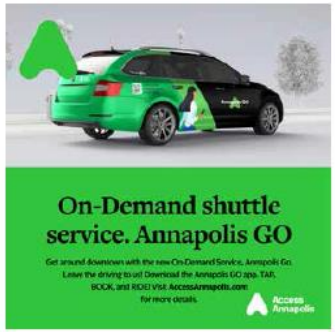


FIGURE 6-35: AN ADVERTISEMENT FOR ANNAPOLIS GO, THE PRIVATELY-MANAGED ON-DEMAND TRANSIT SERVICE THAT WAS LAUNCHED IN CONJUNCTION WITH THE HILLMAN GARAGE RECONSTRUCTION. THE NEW SERVICE HAS BEEN POPULAR AND IS A MODEL FOR EXPANDED SERVICE BY ANNAPOLIS TRANSIT.

Source: City of Annapolis

Transit, to promote the value of public transit and to reimagine public transit for the 21st century. There are clear lessons to be learned from the success of the privately managed transportation services-- the ease of use, the real-time information provided to users, the reliability, the branding, and the visibility of their marketing efforts. In fact, these are precisely the areas of improvement for Annapolis Transit recommended in the City's Transit Development Plan.

It is difficult to imagine public transit in Annapolis becoming a more viable transportation option without embracing current technologies. To fully update its technology will require additional investment but Annapolis Transit is well positioned to take on more of a leadership role for a greener and cleaner Annapolis.

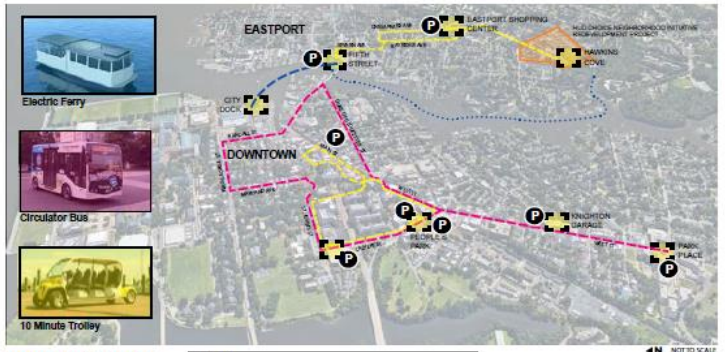


FIGURE 6-36: THE MAP ABOVE SHOWS A CONCEPT PLAN FOR THE ANNAPOLIS ELECTRIC MOBILITY PILOT PROGRAM WHICH PROPOSES A SUITE OF ELECTRIC MOBILITY PUBLIC TRANSIT OPTIONS..

Source: City of Annapolis

FIGURE 6-37: AS PART OF THE ANNAPOLIS ELECTRIC MOBILITY PILOT PROGRAM, THE CITY LAUNCHED TWO GEM ELECTRIC VEHICLES AS 10-MINUTE TROLLEYS AND BRANDED THEM THE 'ANNAPOLIS CURRENT'.

Source: City of Annapolis

Public Transit

Public transit, like active transportation, is an available but under-invested tool that could be far better leveraged to improve mobility in Annapolis. The city has no shortage of existing public transportation services which connect residents to destinations within the city as well as the larger metropolitan region. These services include transit lines operated by the City, Anne Arundel County, Maryland Transit Administration (MTA), as well as private operators. In fact, 80% of Annapolis residents are within a quarter-mile of a public transit stop as illustrated by the graphic on this page, and the most socially vulnerable communities in the city are all served by public transit, as illustrated in the map on the following pages. However, despite all of the existing service, transit is not considered a viable option by many city residents and is not growing ridership. Moreover, although the various transit services are coordinated between City, County, and State agencies, they still lack a unified resource for providing route information across all systems which is needed to create a truly efficient and seamless regional transit system.

The foundation of the city's transit services is Annapolis Transit which operates six fixed-bus routes within the City, referred to as the "Rainbow Routes", and two downtown shuttles. Since 2019, two routes historically operated by Annapolis Transit are now operated by Anne Arundel County: the Gold which services Edgewater and Arnold and the Yellow which services Riva Road. Frequencies for Annapolis Transit range from 30 minutes during peak hours to 120 minutes during off-peak hours, with a base fare of $2.00. Senior, student, and disabled-eligible fares are $1.00, while 7-day, 30-day, 90-day passes, and annual passes are available at reduced prices. On regular school days Annapolis students K-12 ride for free from 6am to 6pm. Annapolis Transit also offers complimentary on-demand service known as "paratransit" for seniors and those with disabilities unable to use the normal fixed-route service.

FIGURE 6-31: SHOWN IN DARK GREEN ON THIS MAP ARE THE PERCENT OF ANNAPOLIS RESIDENTS (82%) AND WORKERS (93%) WITHIN 0.25-MILES OF A TRANSIT STOP

Source: City of Annapolis

"Much of the input collected from riders, stakeholders, and the general public focused on improvements that would make service more reliable and convenient. These improvements included changes to existing services, new services, more information and marketing, and capital needs. Improved services would benefit existing riders and attract new transit users – subsequently resulting in ridership growth and contributing to service performance improvements (though the latter also depends on the amount and costs of services provided)."

- Annapolis Transit Development Plan (2019)

FIGURE 6-32: ANNAPOLIS TRANSIT'S FREE DOWNTOWN CIRCULATOR SHUTTLE WAS REBRANDED AND ITS SERVICE SCHEDULE EXPANDED IN 2022 TO INCREASE RIDERSHIP DURING THE HILLMAN GARAGE RECONSTRUCTION. THE CHANGES HAVE PROVEN TO BE SUCCESSFUL AND PROVIDE A POTENTIAL MODEL OF IMPROVED SERVICE IN OTHER AREAS OF THE CITY.

Source: City of Annapolis

MTA requires Annapolis Transit to update its Transit Development Plan every five years and the most recent plan was completed in 2019. The top issues that emerged from the analyses, reviews of existing documents, and public inputs through surveys and stakeholder interviews were:

- The need to increase ridership, and
- More reliable and convenient service

It is important to note that these issues are related and became more dominant following the Annapolis Transit service reduction in November 2014. Annapolis Transit lost about one-quarter of its ridership in the first year following the cuts and an additional 13% in the second year. A ridership loss of 36% between 2017 and 2019 has resulted in lower productivity on every route.

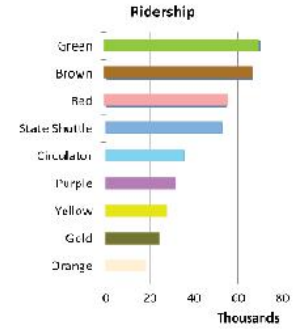


FIGURE 6-33: RIDERSHIP RANKING BY ANNAPOLIS TRANSIT ROUTE. THE GOLD AND YELLOW ROUTES WERE CONSISTENTLY AMONG THE LOWEST PERFORMING ROUTES BUT ARE NOW OPERATED BY ANNE ARUNDEL COUNTY WITH MODIFICATIONS AND PERFORMING BETTER.

Source: Annapolis Transit Development Plan (2020)

Regional Transit

Annapolis is fortunate to be located within a metropolitan region that includes two major cities, multiple airports, multiple commuter train lines, and Amtrak's Northeast Corridor service, which is the most heavily used rail corridor in the U.S. Proximity to these connections adds value to the city for economic development, quality of life, and sustainable transportation options. At the same time, it has been over sixty years since Annapolis was directly served by passenger rail, and traffic congestion along the major highways linking Annapolis to the region has increased over time. Annapolis should be far better connected to the region via improved transit options which include rail and bus rapid transit (BRT).

Annapolis coordinates with Anne Arundel County,Maryland Department of Transportation (MDOT) / Maryland Transit Administration (MTA), and the Baltimore Metrolitan Council (BMC) on regional transit plans, and there have been three significant plans completed in recent years that affect Annapolis with both short-term and longer-term recommendations.

Move Anne Arundel !

Anne Arundel County's Transportation Functional Master Plan, *Move Anne Arundel!*, was adopted in 2019 and recommends improved commuter bus service along US-50 connecting Annapolis to College Park, Silver Spring, and Bethesda to compliment existing service to downtown Washington, D.C. The plan also stresses the importance of establishing an Annapolis Transit Center near the interchange of US-50 and I-97as a regional multimodal transportation hub which could accomodate City, County, MTA and private bus services, with the potential for a future rail connection. A site selection study was completed in 2020 which identified a site at the intersection of Bestgate Road and Generals Highway as the preferred site. As of 2022, this project is in the design phase and fully funded.

MaxImize 2045

MaxImize2045: A Performance-Based Transportation Plan was completed in 2019 is the regional long-range transportation plan (LRTP) that is produced every four years by the Baltimore Metropolitan Council (BMC). BMC is the metropolitan planning organization representing the Baltimore region which includes the City of Annapolis, seven nearby counties, and the City of Baltimore. A key component of the plan is a list of priority capital transportation projects totaling $12 billion, which the region expects to implement from 2024 to 2045 and while there are no projects within the City of Annapolis limits, there are several within Anne Arundel County that will have direct benefit to Annapolis. These include a new BRT service on US-50 between Parole and the New Carrolton METRO station, roadway improvements to MD-2 to accomondate improved bus service between Annapolis and Baltimore, and improvements to US-50 between I-97 and MD-2 that will support improved bus service.

Connecting Our Future

Connecting Our Future is the regional transit plan (RTP) for Central Maryland completed in 2020 by MDOT/MTA. Short-term improvements recommended by this plan that will benefit Annapolis include improvements to fixed route bus service to/from Parole (Westfield Annapolis Mall), new local or express bus service between Annapolis and Crofton, and the planned Annapolis Transit Hub at Parole. The plan also advances two long-term recommendations benefitting Annapolis and illustrated in the map on the facing page: dedicated transit corridors between Annapolis and Glen Burnie, and Annapolis and Union Station in Washington, D.C.

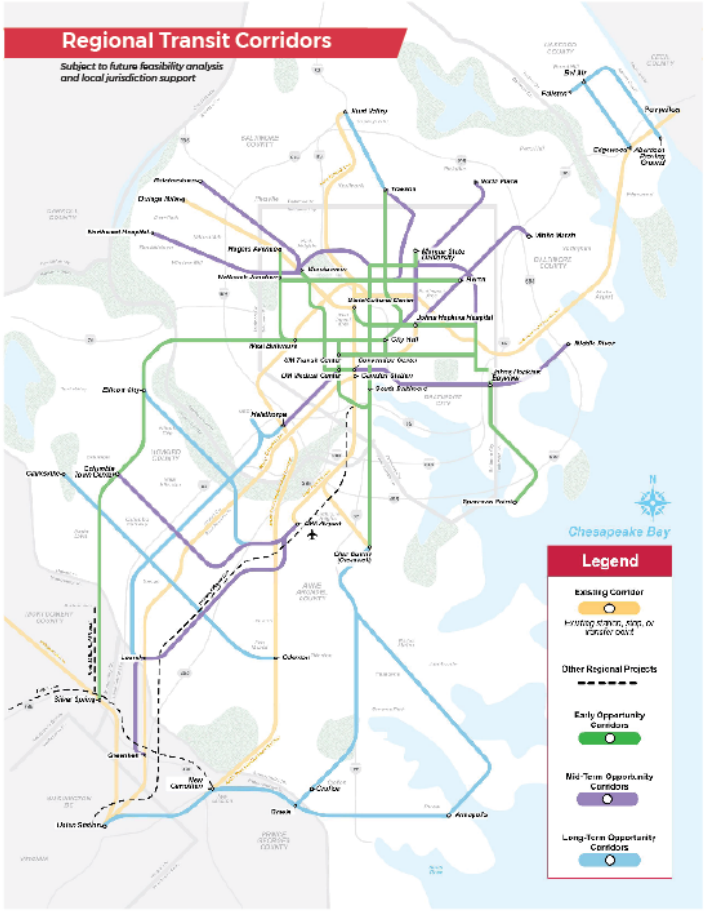


FIGURE 6-38: MAP OF RECOMMENDED REGIONAL TRANSIT CORRIDORS FOR CENTRAL MARYLAND AS IDENTIFIED IN THE 2020 REGIONAL TRANSIT PLAN (RTP) FOR CENTRAL MARYLAND *CONNECTING OUR FUTURE.*

source: MDOT / MTA

Ferry Service

Although passenger ferry service, like train service, no longer connects Annapolis to the region, it warrants attention in this Plan as it remains a viable alternative form of transportation, and a return of ferry service is currently in the planning stages.

Prior to the construction of the Bay Bridge, ferry terminals at the City Dock and later at the future location of Sandy Point State Park provided service to the Eastern Shore and Kent Island. The service ended in 1952 with the completion of the bridge and ferry service elsewhere on the Chesapeake Bay would soon become obsolete.

Renewed interest in ferry travel service both within Annapolis and regionally is spurred by a few different factors. First, the redevelopment of the City Dock has aimed to improve mobility into and around Downtown Annapolis and it set in motion several new mobility options addressed in this chapter and together form the City's vision for an electric mobility plan. Among these new options, the City conceived a new fixed route electric ferry service that would run between Eastport and the City Dock and similar to the downtown circulator, it would be fare-free to make it truly accessible. The ferry was conceived as a way to expand the city's existing water taxi service that is privately operated and services many locations on Spa Creek and Back Creek. The route for the planned service can be seen in the section of this chapter focusing on Electric Mobility. Funding for these types of innovative mobility solutions increased dramatically with the passage of the Infrastructure Investment and Jobs Act (IIJA) by the Federal government and in 2021. The next year, Annapolis was awarded a $3 million grant from the Federal Transit Administration's newly established Electric or Low Emitting Ferry Pilot Program to implement the electric ferry project.

The City Dock redevelopment has also brought new thinking about the role of Annapolis as a gateway to the broader Chesapeake Bay region. The National Park Service reconceived its role in the Chesapeake

FIGURE 6-39: POSTCARD OF THE ANNAPOLIS TO CLAIBORNE FERRY SERVICE WHICH THRIVED DURING THE YEARS PRIOR TO THE BAY BRIDGE CONSTRUCTION. FERRY SERVICE FROM ANNAPOLIS MAY SOON RETURN AS FACET OF THE REGIONS EVOLVING TOURISM ECONOMY AND AN INTEREST IN ALTERNATIVE MODES OF TRAVEL.

source: N/A

region and developed a new vision for its longtime Chesapeake Gateways program. The Chesapeake National Recreation Area (CNRA), with Annapolis as a major hub, was proposed by Sen. Chris Van Hollen and Rep. John Sarbanes as a way to elevate protection and appreciatation of the Chesapeake Bay watershed in a model similar to the San Francisco's Golden Gate National Recreation Area. Although passage of the Federal legislation needed to authorize the CNRA is still pending, the proposal has triggered a wave of enthusiasm for new tourism opportunities across the Chesapeake.

With this in mind, in 2022, Visit Annapolis and Anne Arundel County (VAAAC) was awarded a grant from the U.S. Economic Development Administration (EDA) for a feasibility study of new cross-bay ferry service that would operate between Annapolis and many other locations on both sides of the Chesapeake Bay. The study is being led by VAAAC alongside a five-county consortium that includes many locations– Kent Island, Crisfield, Chesapeake Beach, Solomons– which were once served by passenger ferries before the prevalence of the automobile.

FIGURE 6-40: WITH OVER 60,000 DAILY TRIPS AND MANY MORE ON BUSY HOLIDAY WEEKENDS, THE BAY BRIDGE PROVIDES ENORMOUS ECONOMIC BENEFIT TO ANNAPOLIS AS WELL AS TRAFFIC CONGESTION. AS MDOT/SHA ADVANCES THE DTHE BRIDGE EXPANSION, ANNPOLIS HAS A VESTED INTEREST IN DESIGNS THAT WILL IMPROVE TRAFFFIC MANAGEMENT AND PROMOTE MORE ALTERNATIVE MODES OF CROSSING.

source: MDOT/SHA

Bay Bridge Expansion

Ironically, although the construction of the Bay Bridge essentially ended ferry service across the Chesapeake Bay, current plans for expanding the bridge may help to bring ferry service back.

Following a nearly six-year study of eight different corridor alternatives for improving traffic flow across the Bay in central Maryland, adding a third span to the current bridge alignment was determined to be the best option. In 2023, MDOT/SHA will commence the Tier 2 Study of this preferred option which will explore a wide range of design options for new span that will ultimately have great bearing on the Annapolis area.

The City has much to gain from being an active participant in the planning process for the bridge expansion. It is an important gateway to the Annapolis area and despite the challenges from summer traffic, the bridge generates significant economic benefits as well. With the expansion, the City and region have an opportunity to gain new options for crossing the Bay that could both offset the impact of the current design and provide new ways of experiencing the Bay.

These options could include ferry service, but also bus rapid transit, a future rail connection, and of course a dedicated trail for safe crossing by bike or foot. While these alternative modes of travel may not all have a sizable impact on vehicular traffic, they could have a dramatic impact on how visitors experience the region. For example, at the approach to the bridge, a ferry landing at Sandy Point State Park could provide visitors improved access from Annapolis to the park without a car. From there, new trail connections could connect Sandy Point State Park to Holly Beach Farm and across the Bay to connect with Kent Island's Cross Island Trail. This type of experience could be integral to the reimagined Bay Bridge.

7. COMMUNITY FACILITIES

OVERVIEW

Community facilities in Annapolis provide a wide range of public services designed to ensure an optimal quality of life, safety, and wellness of residents. At no time in the City's recent history was this more evident than during the COVID-19 pandemic in which community facilities were in high demand to provide critically needed support to residents. From around the clock use of parks and trails, to distant learning at schools, touchless technologies at libraries, and of course the overwhelming demand for hospital space, community facilities were strained and forced to adapt to an unprecedented public health nightmare.

While the factors that determine one's health are complex, a great many of them are guided by the quality of a person's surrounding environment. The social and environmental determinants of health include income level, particularly for those who live in poverty, access to healthy food and health services, emotional stability, the cleanliness and safety of the environment, and access to nature and recreational opportunities.

Numerous recent studies have confirmed a direct correlation between health outcomes and stress reduction with access to parks, open space, or even just tree-lined streets. Fundamentally, when people have access to parks and trails, they breathe better and exercise more.

According to a 2013 study conducted by the RAND Corporation for the National Institutes of Health, approximately 14 percent of moderate exercise and 50 percent of vigorous exercise deemed "heart healthy" takes place in nearby neighborhood parks.

Although Annapolis has a high standard of living overall, high density pockets of poverty and limited access to health resources create wide disparities in health outcomes among communities sometimes in very close proximity to one another. The COVID-19 Pandemic highlighted many of the inequities already present among Annapolis communities.

As Chapter 1 of this plan makes clear, healthy and resilient communities are those that have ample access to the resources that support healthy lives. Thus, in regard to community facilities, priorities lie in expanding equitable access so that anyone in Annapolis regardless of where they live, their income, their race, their age, or other social factors, has the same opportunities for recreation and other quality of life amenities.

At present, not all residents have access to the same quality of park facilities, and investments could be prioritized to ensure equity for every Annapolitan to enjoy parks of all shapes and sizes. Taking it one step further, our creeks and rivers are a major defining feature of the City and community asset to all residents as a place to recreate or relax. Yet today, only a small percentage of the shoreline is truly accessible to all and much more can be done to strategically invest in public water access throughout the City. The following chapter will expand on these examples in assessing community facilities in Annapolis today and providing a vision for enhanced service in the future.

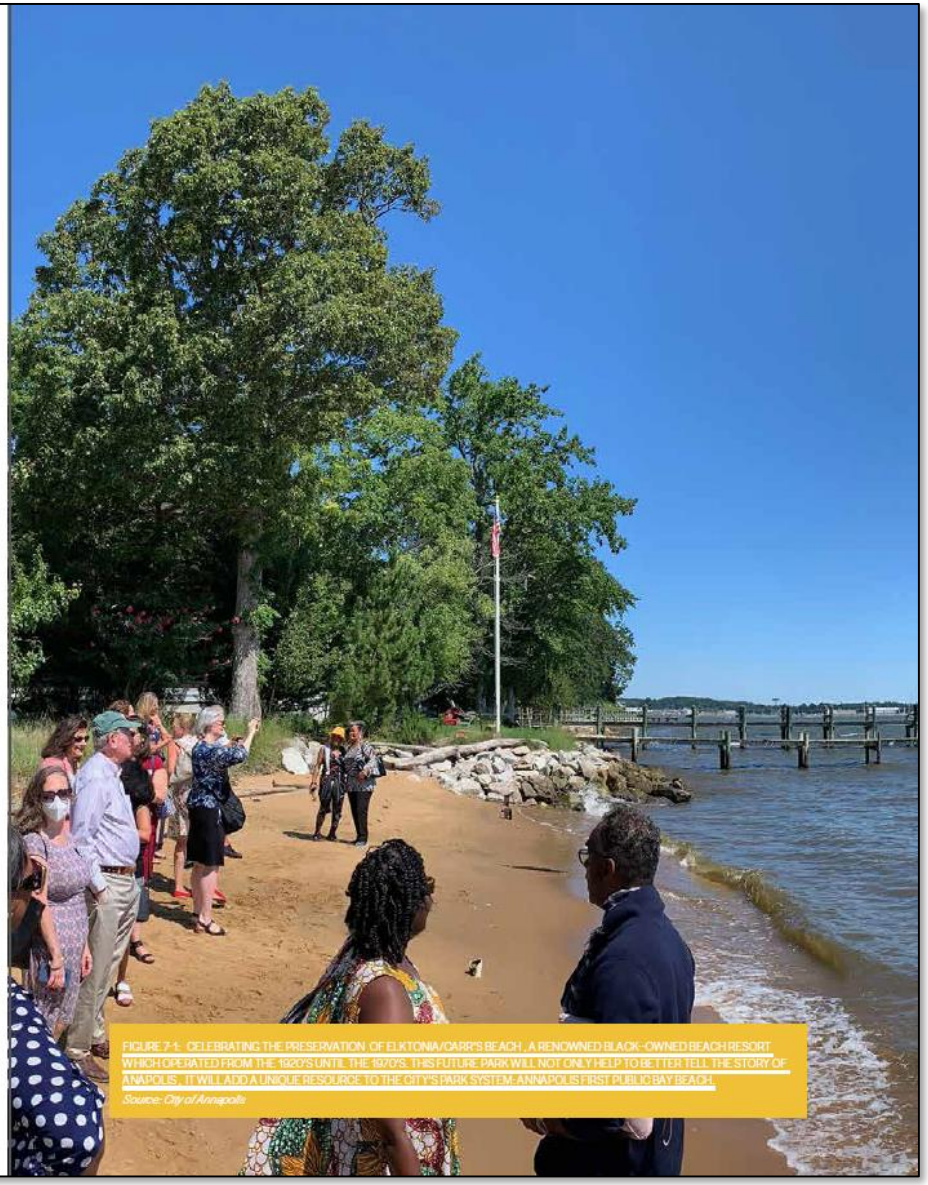


FIGURE 7-1: CELEBRATING THE PRESERVATION OF EUKTONIA/CARR'S BEACH, A RENOWNED BLACK-OWNED BEACH RESORT WHICH OPERATED FROM THE 1920'S UNTIL THE 1970'S. THIS FUTURE PARK WILL NOT ONLY HELP TO BETTER TELL THE STORY OF ANAPOLIS, IT WILL ADD A UNIQUE RESOURCE TO THE CITY'S PARK SYSTEM: ANNAPOLIS FIRST PUBLIC BAY BEACH.

Source: City of Annapolis

Access to Parks & Open Space

General Access Considerations

Access to parks and open space by all residents of Annapolis is one of the keys to more equitable health and economic outcomes. The vision in this Plan of what equitable access to parks and open space looks like is the ability to walk or bike to all desired types of recreation and open space regardless of one's background, ability, or place of residence. Particular attention is given to areas of higher social vulnerability, which are those areas that have more residents of residents living under the poverty line, with lesser access to a personal vehicle, and have a larger proportion of minority populations, among other characteristics. The City's map of social vulnerability was developed using the Center for Disease Control's Social Vulnerability Index which uses 15 U.S. Census variables to determine the communities of greatest need. Chapter 2: Demographic Trends provides additional information about the social vulnerability methodology.

The tale that social vulnerability tells is that within the distance of only a few short blocks, wealth and opportunity can change drastically. South of West Street, the Murray Hill neighborhood, with high income and almost no persons from a minority community, has among the lowest vulnerability, while immediately north of West Street, the Clay Street neighborhood has the highest vulnerability in the whole city, due to a large minority population combined with high poverty and unemployment. Other areas with higher vulnerability include the Tyler Heights and Parole neighborhoods - Tyler Heights for low educational attainment and high unemployment, and Parole for a high minority population and low vehicle access. Access to parks and recreational opportunities must be prioritized particularly in these areas.

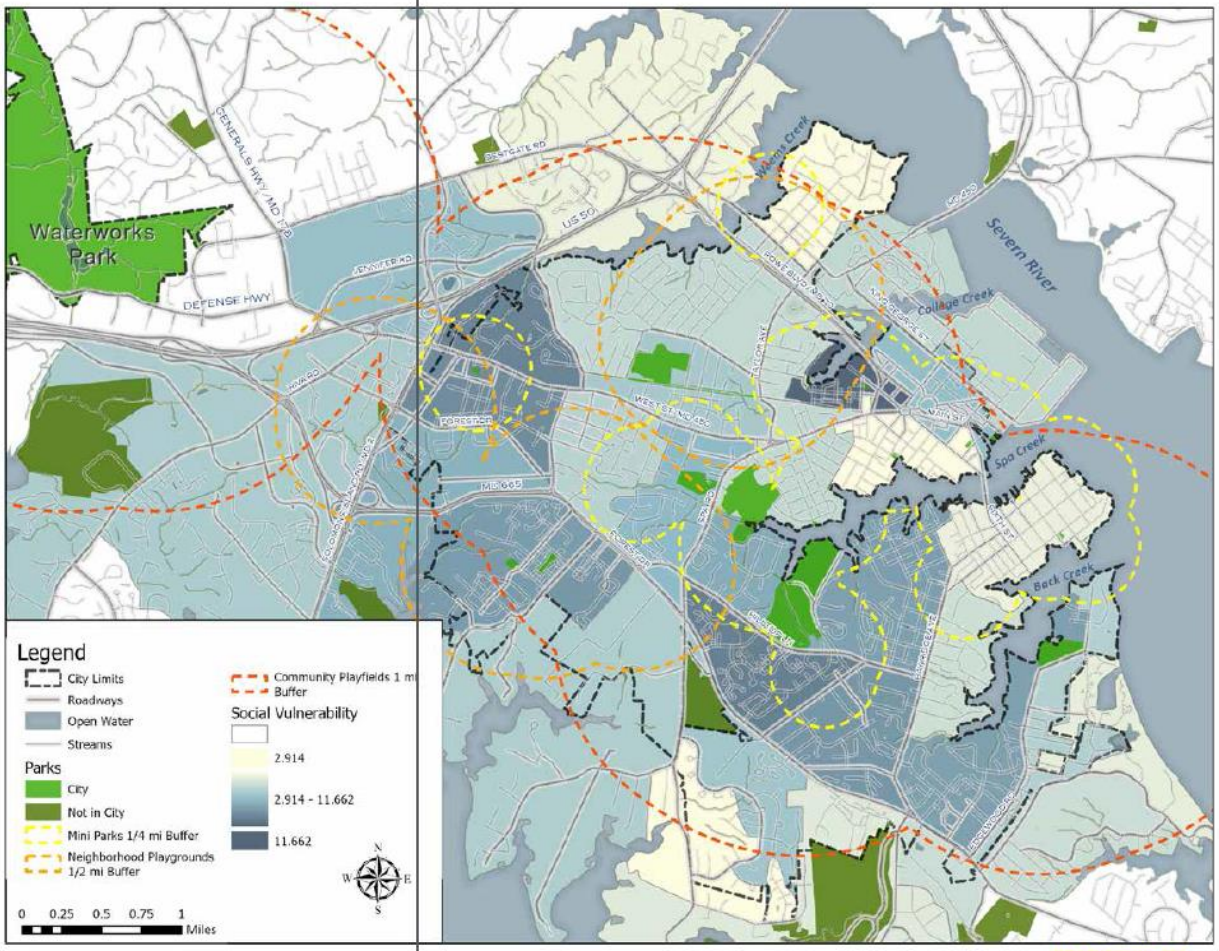


FIGURE 7-11: THIS MAP OVERLAYS THE CITY'S PARK SYSTEM WITH WALKING DISTANCE BUFFERS (BASED ON PARK TYPE) OVER SOCIAL VULNERABILITY DATA TO SHOW WHERE ACCESS IS ADEQUATE AND WHERE ACCESS GAPS EXIST.

source: City of Annapolis

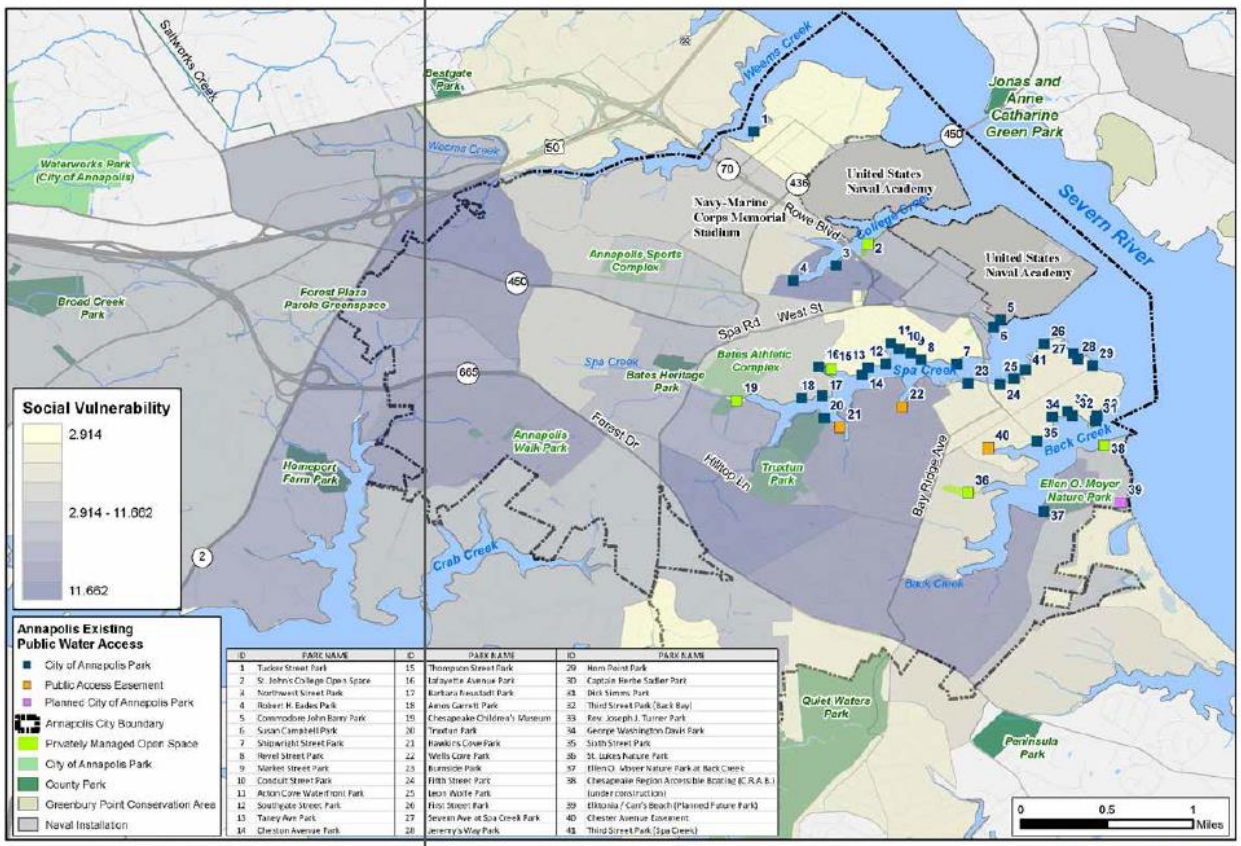
The fundamental goal for park access is for all residents to be within ¼ mile of a Mini-Park, ½ mile of a Neighborhood Playground, and within 1 mile of a Community Playfield. Nearly the entire city is within one mile from the largest parks such as Truxtun Park. However, fewer are within the recommended range of the smaller Neighborhood Playgrounds and Mini-Parks. The map of park access on the previous page overlays the City's park system onto the social vulnerability map, and adds a service area in dotted line around each park based on its park type. This tells us where we find the greatest park need and can help guide more equitable park and trail investments. While the socially vulnerable Tyler Heights neighborhood has generally poor access to smaller neighborhood-scale parks, Truxtun Park, with its abundance of recreational facilities, is immediately adjacent. The Parole neighborhood is among those with the poorest access to parks and recreational facilities of all types, being constrained by nearby major roadways, and thus could benefit the most from targeted investment. By comparison, the Wardour community in West Annapolis has equally poor if not even worse access to parks, although here it may be less of a need given minimal social vulnerability.

Adequate Public Facilities

The City's Adequate Public Facilities Ordinance is a critical tool for expanding the park network but could be improved significantly to better address equity goals. In its current form, the ordinance, which is designed to ensure that the City has adequate park space to support the new population associated with a development, does not include any reference to equity and its requirements of developments do not typically lead to a noticeable improvement to the park system. An overhaul of this ordinance should be a priority with a particular focus on stretching any investment from a

FIGURE 7-12: THIS MAP OVERLAYS THE CITY'S EXISTING AND PLANNED WATERFRONT PARKS OVER SOCIAL VULNERABILITY DATA TO SHOW WHERE ACCESS IS ADEQUATE AND WHERE ACCESS GAPS EXIST.

Source: City of Annapolis



College Creek

College Creek warrants particular attention as an opportunity area for expanded public water access. Land bordering the creek is almost entirely publicly owned or by nonprofit institutions, including large tracts owned by Anne Arundel County Public Schools, Housing Authority of the City of Annapolis (HACA), St. Anne's Parish, St. John's College, State of Maryland, and the Navy. Yet, very little of this land is currently accessible to the public.

With minimal waterfront development and no marinas, the creek has always had a distinct identity from the City's other major creeks, and has the potential to become a more accessible natural refuge for both wildlife and people. A visioning process is needed that brings together the many stakeholders along the Creek, especially residents, to develop a consensus plan. The City is starting the process by rebuilding the newly renamed Robert H. Eades Park, formerly known as College Creek Park, which had been deteriorating for many years. As one of only two small properties owned by the City of Annapolis on College Creek, the hope is that this project will jumpstart a broader plan for the creek. The City is also advancing plans for a major trail connection along the waterfront called the College Creel Connector. Linking King George Street to Calvert Street, the trail provide a safer and more pleasant means of connecting the B&A Trail to downtown. The map provided here is a preliminary effort to illustrate the potential water access opportunities around College Creek through new or improved open space and trails connections.

FIGURE 7-18: THIS MAP PROVIDE A CONCEPTUAL VISION FOR THE PUBLIC WATER ACCESS AND OPEN SPACE OPPORTUNITIES THAT COULD MAKE COLLEGE CREEK A MORE INVITING NATURAL RESOURCE FOR THE CITY.

Source: City of Annapolis

EFFORTS TO RESTORE OYSTER REEFS IN WATERWAYS AROUND ANNAPOLIS, INCLUDING THIS PROJECT ON THE SEVERN RIVER, PROVIDE A MULTITUDE OF BENEFITS TO THE CITY INCLIDING IMPROVED WATER QUALITY, BIODIVERSITY, AND STORM SURGE MITIGATION.

Source: Oyster Recovery Partnership

THE ADAPTIVE CITY

Bridging barriers.
Connecting communities.

EXISTING CONDITIONS

Climate Vulnerability

Climate Change Trends and Pedictions

Annapolis is a city with national and historical significance and is threatened by rising sea levels and other environmental impacts as a result of climate change. On a local and global scale, the effects of climate change are already being experienced and are worsening at an accelerating rate. In conjunction with growing levels of greenhouse gases in the atmosphere, the overall temperature has been warmer in the last four decades in succession than in any other decade since 1850, or when records began being kept. Temperatures have warmed by roughly 1 C compared with temperatures from 1850-1900. Under all future emissions scenarios the temperature will continue to increase. They will exceed 2 C above temperatures during the same time period by 2100 unless emissions rapidly decline to net zero and net negative around 2050 or later. All of these trends have and will lead to dryer conditions in some places and wetter conditions accompanied by more extreme precipitation in others, particularly here in Annapolis. Climate disasters, arguably the most severe environmental threats to communities, are on the rise, and, in order for communities to remain resilient and sustainable, they must follow a course of action for events including heat waves, coastal storms, extreme precipitation, to minimize their likelihood and impact. In short, the impacts of climate change on Annapolis are through:

- Extreme temperatures
- Extreme precipitation
- Sea level rise
- Coastal storms

FIGURE 9-2: RANDALL STREET AT DOCK STREET FOLLOWING HURRICANE ISABEL
Source: Susan Walsh / Associated Press

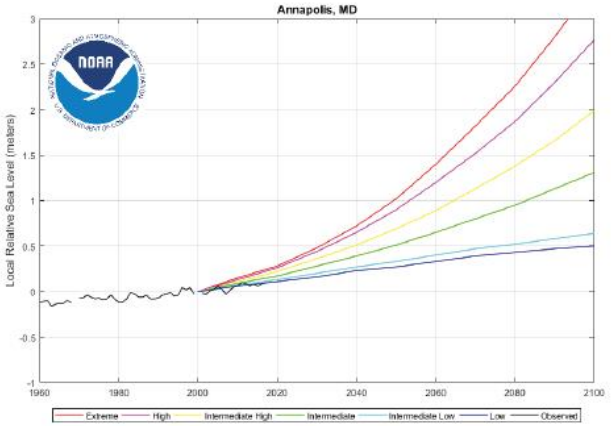


FIGURE 9-4: SEA LEVEL RISE PROJECTIONS FOR ANNAPOLIS

Source: NOAA

vary greatly. The figure below shows how the number of tidal flooding days could be more than twice as much in a high emissions scenario than in a low emissions scenario. The threat of rising sea levels also contributes to coastal erosion in places where the shoreline is not adequately protected. This contributes to shoreline retreat and damage to nearby properties. All of this equates to tens of thousands of dollars in lost economic activity and hundreds of thousands in damage to local properties annually as of 2020, that will only increase each year.

Numerous studies have been conducted in the last 10 years both to assess the vulnerability to sea level rise and coastal flooding and to weigh solutions to mitigate their impact. As the two areas of the city most susceptible to tidal flooding, Eastport and Downtown, in particular, have received the most substantial attention in addressing the issue. Among the first studies of their kind to be conducted for Annapolis were completed in 2011 to examine the prospect of coastal flooding in both Eastport and Downtown Annapolis. Each study identified the extent of sea level rise in each area, areas susceptible to flooding, and options to alleviate the flooding. Recent projects to address the flooding Downtown have included the City Dock bulkhead replacement which was elevated and a multi-phase pump station that is currently under construction at Newman Park.

Every several years, in order to receive disaster

FIGURE 9-5: FLOODING AT CITY DOCK IN OCTOBER 2021

Source: Paul W. Gillespie / Capital Gazette

funding, the Office of Emergency Management updates the city's Hazard Mitigation Plan that accounts for the impacts of sea level rise and coastal flooding in addition to all other threats the city faces. The most recent plan was updated in 2018, and an update is anticipated in 2023. Though Eastport and Downtown experience the most impactful flooding, no community is immune to the effects of the changing climate. Future efforts to plan for resilience must include participation from all communities in the city.

FIGURE 9-6: VISUALIZATIONS OF PROJECTED SEA LEVEL RISE AT THE CITY DOCK

Source: Maryland Sea Grant

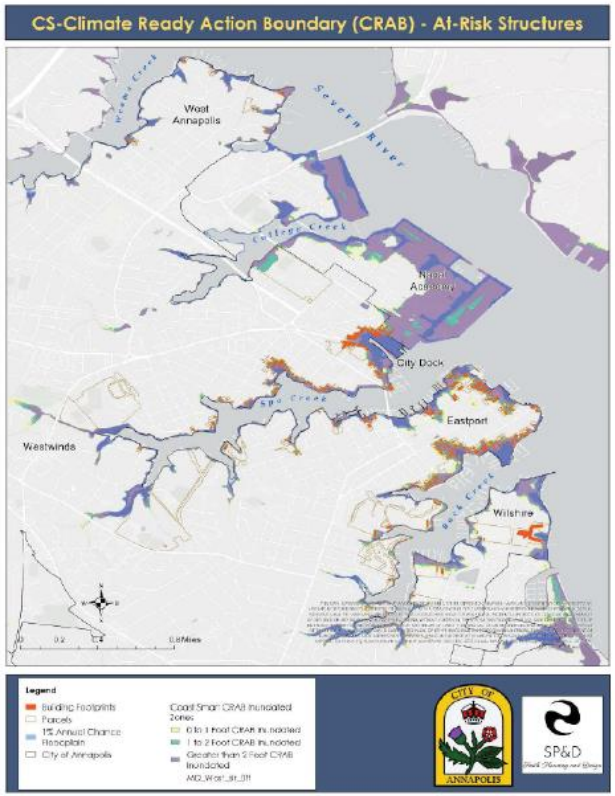


FIGURE 9-7: MAP OF CITYWIDE AT-RISK STRUCTURES BASED ON COAST SMART - CRAB MODEL

Source: Smith Planning & Design

FIGURE 9-8: MAP OF EASTPORT AT-RISK STRUCTURES BASED ON COAST SMART - CRAB MODEL

Source: Smith Planning & Design

Recent Climate and Resilience efforts

The City of Annapolis has been extremely active the past few years to tackle the issue of coastal flooding and resilience more broadly. The Weather It Together initiative kicked off in 2015 to build partnerships and engage the community around flooding and protecting the Annapolis Historic District. The initiative concluded with the Cultural Resources Hazard Mitigation Plan that highlighted the work accomplished through stakeholder cooperation and outlined strategies to protect flood-prone areas. In 2018, the city forged a partnership with the University of Maryland to complete a resilience financing assessment. The study, through a set of recommendations, served as a roadmap for the city to expand its financing system for the inclusion of resilience. The assessment then paved the way for the creation of the Climate Resilience Authority through State authorizing legislation who is charged with coordinating the funding to future resilience projects. Building on the partnership with the University of Maryland, resilience experts from the University and City staff came together as a working group to develop Annapolis' first Climate Resilience Action Strategy. Rather than solely focus on climate resilience the study also accounted for the social and economic aspects of resilience.

In 2022, the City's Office of Emergency Management completed a Flood Mitigion Plan funded by FEMA which included an updated in-depth analysis of flood risks and recommendations for mitigating the risk. For example, the maps on the previous pages identify at-risk structures based on the State of Maryland's Coast Smart - Climate Ready Action Boundary (CRAB) which is designed to assess vulnerability. The CRAB model is the 1% annual chance floodplain remaining inundated with an additional three feet of water added to it.

Most recently, the city has been working together with Naval Support Activity Annapolis to undertake the Military Installation Resilience Response Study, a regional resilience plan funded by the U.S. Department of Defense Office of Local Defense Community Cooperation. This planning effort represents the City's first truly comprehensive resilience plan and will be complete in 2022.

One approach to mitigating coastal flooding is to encourage nature to take a more central role. Nature-based solutions such as planting trees, establishing living shorelines, and land conservation require little to no built infrastructure while producing multiple benefits. FEMA's National Flood Insurance Program (NFIP) provides flood insurance to property owners, renters and businesses in Annapolis provided that we continue to implement minimum floodplain management standards. The Community Rating System (CRS) is a voluntary program within the NFIP that incentivizes additional floodplain management strategies, for instance preserving undeveloped open space in the floodplain, by offering discounts on community flood insurance premiums. The City plans to join other jurisdictions in Maryland including Baltimore City, Frederick, and Howard County in participating in the program as a means to encourage more resilient development practices.

Extreme Temperatures

As the world warms, Annapolis is expected to warm with it. Compared with locations elsewhere in the country, the city is expected to receive more precipitation on average, slightly mitigating the increases in average temperature that other locations are likely to experience. Nonetheless, extreme temperatures in the form of heat waves are still expected to occur here as well. According to the figure below, regardless of future global emissions, extreme heat is expected to increase every year from 50 days on average where the temperature exceeds 90 F as of 2020 to 70 days by 2050.

Extreme heat is among the greatest climate risks to the livelihoods of people no matter their health, but particularly among children and the elderly, and those with underlying health conditions. Exposure to heat for an extended period of time can exacerbate underlying conditions and induce a number of other health complications. The economically disadvantaged are especially vulnerable to extreme heat, often spending more time outdoors and with less access to air-conditioned spaces. Cities with large swaths of impervious cover in the form of parking lots, large building footprints and roadways experience what is called an urban heat island effect where the temperature is raised even higher than in other more vegetated areas. Making matters worse, there is often a correlation between lower income communities and instances of greater impervious cover.

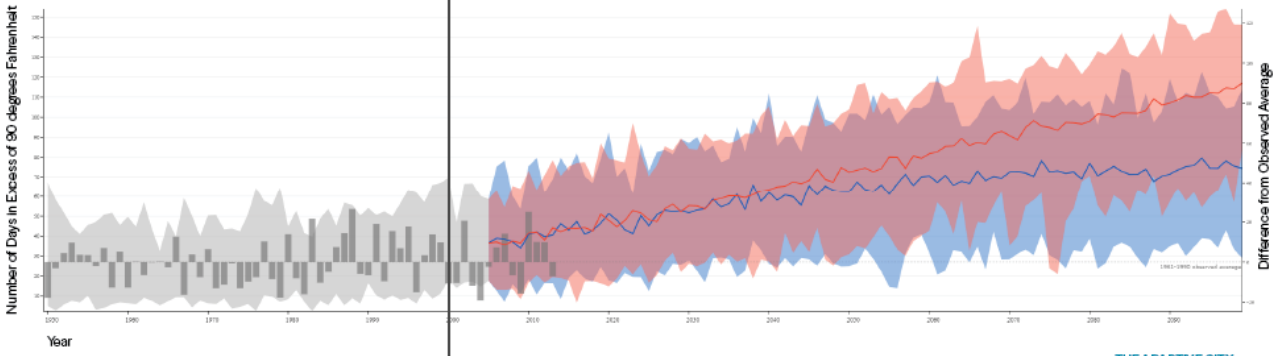


FIGURE 9-9: NUMBER OF DAYS ON AVERAGE WHERE THE TEMPERATURE EXCEEDS 90 F

Source: NOAA

FIGURE 9-13: : CRYSTAL SPRING FOREST, ANNAPOLIS' LARGEST REMAINING CONTIGUOUS FOREST WILL BE LARGELY CONSERVED THROUGH AN HISTORIC CONSERVATION AGREEMENT IN 2022. THE FOREST CONSERVATION WILL HELP TO OFFSET HEAT ISLAND IMPACTS ALONG THE FOREST DRIVE CORRDIOR.

Source: City of Annapolis

apparent in the Design District along Chinquapin Round Road and along MD-2 / Solomon's Island Road, when mapping the impacts the urban heat island effect has on ground temperature. Temperatures can run several degrees warmer compared with another location only a mile away, especially in cases of dark impervious surfaces that absorb heat. Conversely, areas with large tracts of tree canopy correlate strongly with minimal urban heat island effect and thus temperatures cooler than the local average. The contrast between these conditions is evident across the city where adjacent neighborhoods might differ dramatically in tree canopy and thus surface temperature. For example, along Forest Drive, the neighborhoods of Hunt Meadow, Heritage, and Beechwood Hill are places with dense tree canopy and one could expect cooler temperatures. Whereas the neighborhoods of Annapolis Walk, Village Greens, Kingsport, and Bywater Homes have less canopy, and therefore hotter surface temperatures. Appreciating these variations is one way of guiding tree canopy enhancements.

A heat island map helps to illustrate the varying conditions across the city.The darkest red hues on the map represent areas of impervious cover that present the highest potential to absorb heat throughout the day and the blue hues represent areas with considerable vegetation that effectively shade the ground from the incoming daytime heat. In a few instances, lighter shades of impervious cover may appear counterintuitive to expectation when mapping heat impacts at the ground level, however, these areas still pose the same detriment to environmental quality.

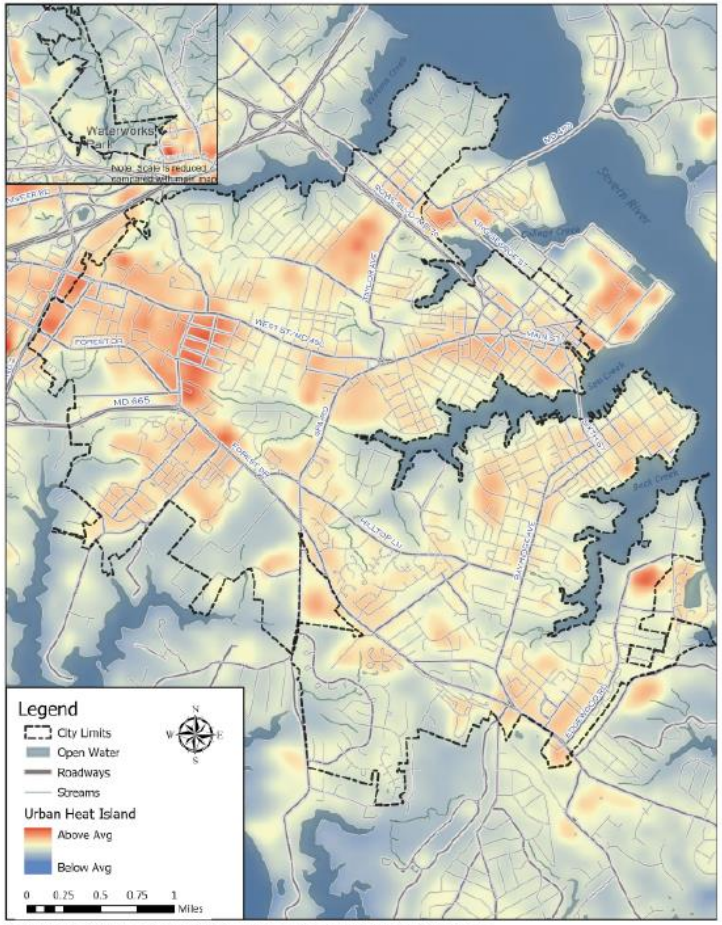


FIGURE 9-14: THIS MAP OF URBAN HEAT ISLAND EFFECT INTENSITY ILLUSTRATES THAT HEAT ISLANDS ARE CONCENTRATED ALONG MAJOR TRANSPORTATION CORRIDORS, IN THE DOWNTOWN AREA, AND IN THE PAROLE AREA.

Source: City of Annapolis / NOAA

Tree Canopy and Impervious Coverage

The preservation and expansion of the City's tree canopy coupled with a reduction in impervious cover is one of our best tools for mitigating the impacts of rising temperature in Annapolis. Trees function to reduce heat in three critical ways: first, by simply providing shade which is a valuable asset to anyone who spends time outdoors in warm weather months, and particularly to pedestrians who may not have the benefit of an air-conditioned vehicle; secondly, by offsetting the impact of impervious coverage which is explained further below; and thirdly by capturing heat trapping greenhouses gases from the environment. In fact, trees are one of the most effective ways of reducing greenhouse gas emissions. Through the process of photosynthesis, trees absorb carbon dioxide from the air, and process it into oxygen for humans and other species to breathe, as well as into sugar that becomes a nutrient for the tree and a variety of dependent species. The embodied carbon in the tree then stays there until the tree dies and decomposes. This is among the reasons why tree canopy preservation has been a major priority in Annapolis over the last few years especially with the adoption of the Forest Conservation Act in 2016.

The act requires the owner of any property roughly an acre or larger (more than 40,000 square feet) to submit a Forest Stand Delineation and a Forest Conservation Plan when they apply for a subdivision, grading, planned development, special exception, or site design.

The City's tree canopy now stands at roughly 40 percent of the city's total land area based on estimates from a recent tree canopy assessment conducted by the University of Vermont, of which the map in figure x is based on. The assessment of the City's canopy was developed in 2020 using high-resolution imagery and LiDAR from 2011 and 2017. Change in tree canopy was mapped as points, but also to the parcel level and by land use, to examine trends in canopy change over that time period.

Between 2011 and 2017, statistically speaking, tree canopy did not change substantially. On the whole, the city did lose more trees than it gained, however, the net loss only amounts to a 4% reduction to 2,907 acres of canopy - 180 acres of canopy was lost compared with 48 acres gained. Much of the loss is not attributed to new development. The largest contiguous area of canopy loss is at the proposed

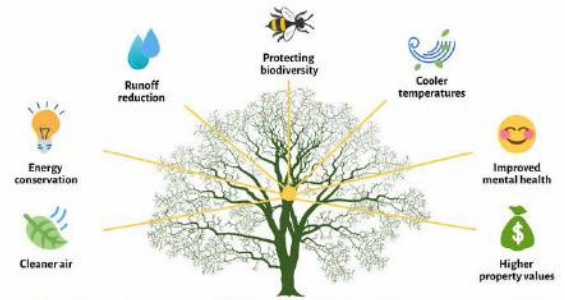


FIGURE 9-10: THIS PLAN PUTS SIGNIFICANT EMPHASIS ON PROTECTING AND EXPANDING THE CITY'S TREE CANOPY BECAUSE THE BENEFITS ARE SUBSTANTIAL AND FAR-REACHING, AND ADDRESS ALL THREE OF THIS PLAN'S FOUNDATIONAL THEMES: EQUITY, HEALTH, AND RESILIENCE.

Source: Nashville Tree Foundation

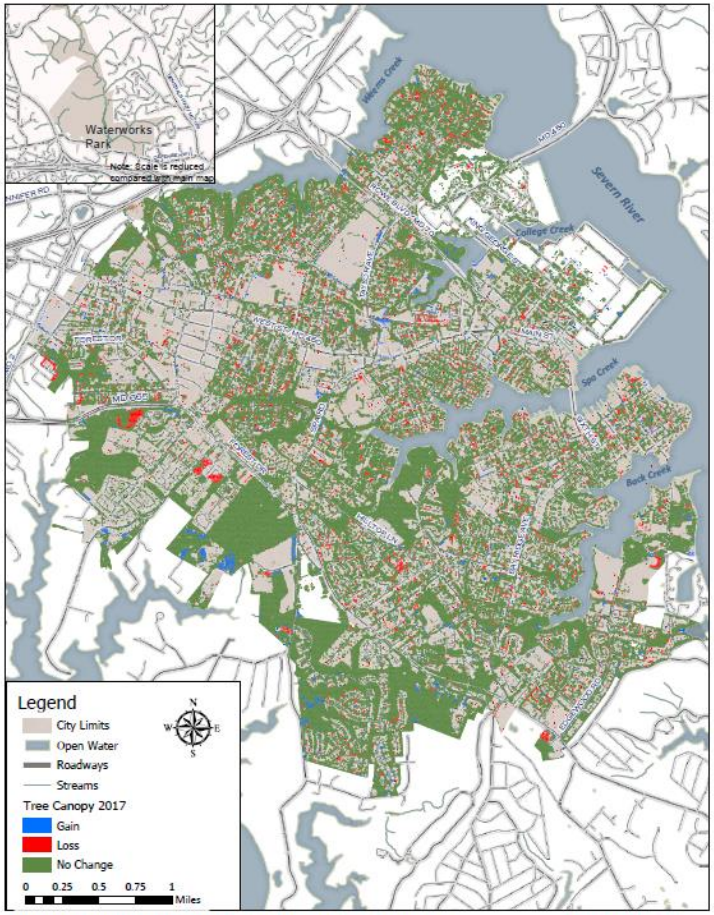


FIGURE 9-11: MAP OF TREE CANOPY CHANGE 2011-2017 WHICH SHOWS THE MAJORITY OF THE LOSS SCATTERED IN RESIDENTIAL AREAS.

Source: City of Annapolis / University of Vermont

Tree Canopy Expansion

This Plan places significant emphasis on tree canopy expansion because it addresses so many of the Plan's broader goals ranging from stormwater management to walkable places, to biodiversity, and community health. However, planting trees in any urban environment is challenging because of constraints on available space, maintenance and stewardship, and cost. Given that that city is currently challenged to simply maintain its existing tree canopy, let along expand it, this Plan sets a performance measures of canopy preservation in the short term, with canopy expansion to 45% coverage by 2040. While 45% coverage from the City's current coverage of 42% may not seem subststantial, it would require approximately 6,716 new trees planted based on 45 trees per acre. By contrast, to get to 50% coverage, 17,910 trees are needed. Another basis for aiming to reach 45% is that 44.6% canopy coverage has been found to be associated with stream health ratings of 'good' from a 2003 study of tree canopy in Montgomery County, MD (Goetz et al.).

Available data from the Annapolis' most recent tree canopy survey estimates that the city has approximately 1219 acres of available land for tree canopy expansion with more than half of this space, 678 acres or 55.5%, in the City's residential areas. As mentioned earlier in the chapter, the residential areas are also where the city is losing most of its canopy. The city's commercial, institutional, and open space areas also offer space for additional canopy but residential area offer far greater potential for ongoing stewardship which is critical to the long term health of the trees. Goal ES2 in this chapter which focuses on tree canopy, provides a variety of specific strategies for canopy expansion including changes to mitigation requirements in the Critical Area, legislation to protect heritage trees, and ways to incentives new planting.

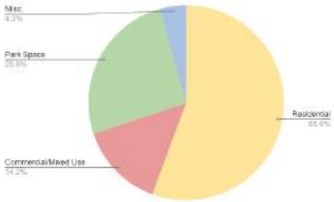


FIGURE 9-15: CHART OF POTENTIAL AREA FOR TREE CANOPY EXPANSION BY LAND USE PERCENTAGE.
Source: City of Annapolis

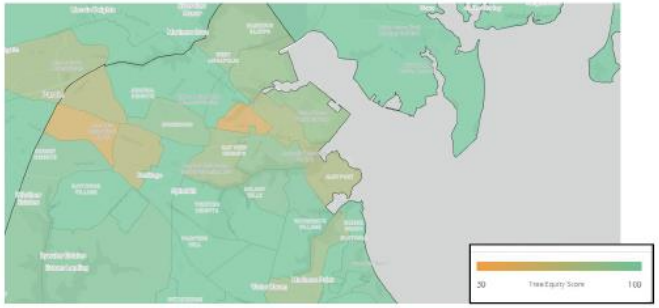


FIGURE 9-16: THIS TREE EQUITY MAP USES EIGHT DIFFERENT ECONOMIC AND DEMOGRAPHIC FACTORS TO ASSESS THE EQUITABLE DISTRIBUTION OF TREE CANOPY IN ANNAPOLIS. AREAS THAT ARE MORE ORANGE REPRESENT PLACES WHERE TREE CANOPY EXPANSION IS MORE NEEDED.
Source: American Forests

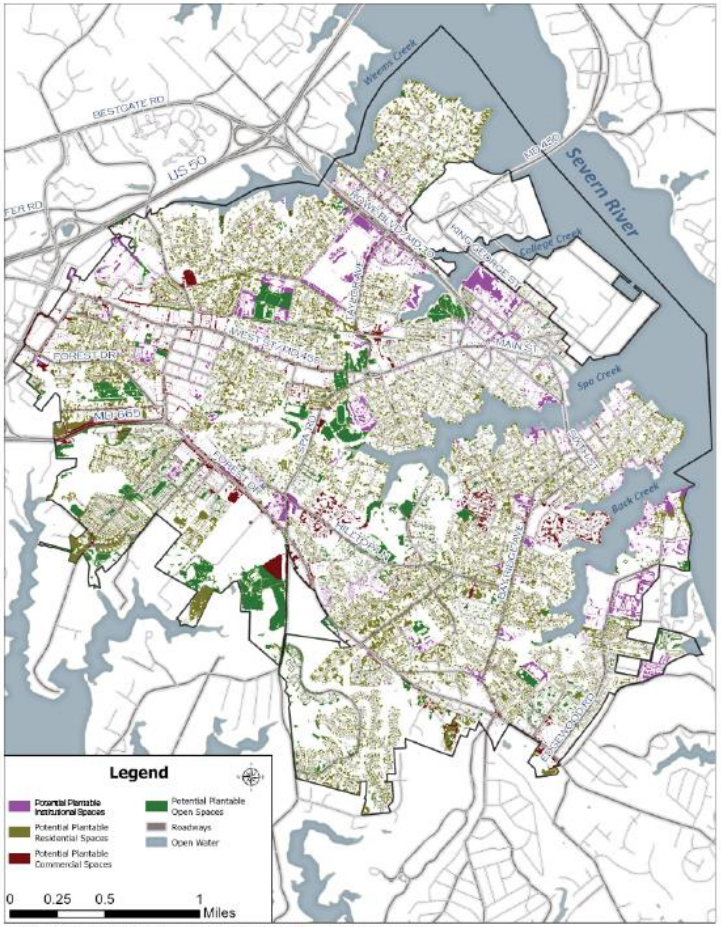


FIGURE 9-17: : MAP OF POTENTIAL AREAS FOR TREE CANOPY EXPANSION ORGANIZED BY LAND USE.
Source: City of Annapolis / University of Vermont

Air Quality

The cleanliness of the air can be directly attributed to the quality of the environment, and if not managed can have chronic impacts on human health. A changing climate affects air quality through the production of aeroallergens like pollen and mold spores and with increases in regional ambient concentrations of ozone, fine particles, and dust. These pollutants can cause or worsen respiratory disease particularly in vulnerable populations.

The Maryland Department of the Environment (MDE) reports on air quality regionally through its Ambient Air Monitoring Program for ground-level concentrations of criteria pollutants and air toxics, as required by the EPA. In 2015, a more protective health-based air quality standard for ozone was instituted, meaning the benchmark to meet for attainment is even higher. Despite the more stringent standard, the ozone classification assigned to Anne Arundel County actually improved from moderate to marginal between 2008 and 2015. The county is still listed as a nonattainment area but is at the lowest level of severity, as are many other jurisdictions in the region. Air quality improvement across the region is notable given air quality's tendency to depend on sources of pollution more broadly than locally.

Air quality in Annapolis is also closely tied to both tree canopy, which helps to capture greenhouse gases from the air (an analysis of which is provided earlier in this chapter) and vehicle emissions as a major source of greenhouse gases, which are addressed below in the section related to carbon reduction. Annapolis is somewhat fortunate to not have any major point sources for harmful emissions from factories, industrial farms, landfills, or energy production facilities. The U.S. Environmental Protection Agency (EPA) defines point source pollution as "any single identifiable source of pollution from which pollutants are discharged, such as a pipe, ditch, ship or factory smokestack." The two major highways near Annapolis, US-50 and I-97, aggregate harmful emissions through the large

FIGURE 9-22: VEHICLE EMISSIONS FROM MAJOR ROADWAYS IN THE ANNAPOLIS AREA SUCH AS FOREST DRVE ARE THE LARGEST SOURCE OF GREENHOUSE GAS.

Source: Capital Gazette

volumes of gasoline-powered vehicles they carry, particularly freight vehicles, and are considered significant non-point sources of pollution. Regulating emissions from these sources would happen through the ongoing transition away from internal-combustion engines which is further described below. However, Annapolis is impacted by emissions from point sources in the broader region and even farther afield as prevailing winds will carry harmful emissions thousands of miles. To best address air quality improvements in Annapolis, efforts must be directed at the factors the City can control, namely tree canopy preservation and enhancement, and vehicle emissions reductions, as well as coordinate with other jurisdictions at the regional and state levels which control how other sources of pollution impacting Annapolis are regulated.

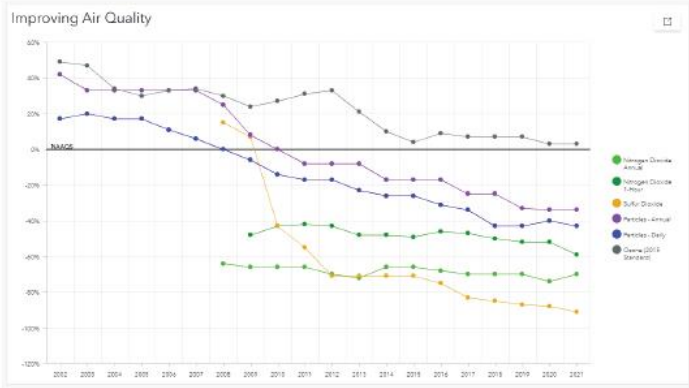


FIGURE 9-23: WHILE MARYLAND'S AIR QUALITY IS OFTEN STRONGLY INFLUENCED BY TRANSPORTED POLLUTION FROM NEIGHBORING STATES, PROGRESS HAS BEEN MADE IN REDUCING BOTH TRANSPORTED POLLUTION AND POLLUTION FROM LOCAL SOURCES.

Source: City of Annapolis

Note: *Maryland Department of the Environment*

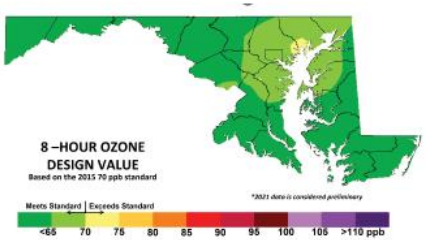


FIGURE 9-24: MOST OF MARYLAND INCLUDING ANNAPOLIS MEETS THE NATIONAL STANDARD FOR 8-HOUR OZONE DESIGN VALUE. A DESIGN VALUE IS A STATISTIC THAT DESCRIBES THE AIR QUALITY STATUS OF A GIVEN LOCATION RELATIVE TO THE LEVEL OF THE NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS).

Source: Maryland Department of the Environment

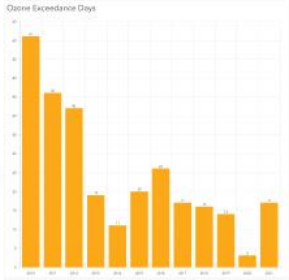


FIGURE 9-25: DAYS IN WHICH THE STATE HAS EXCEEDED NATIONAL STANDARDS FOR OZONE HAVE DECREASED DRAMATICALLY OVE THE LAST DECADE.

Source: Maryland Department of the Environment

Carbon Footprint

Municipal Energy Usage

The City has not completed an Energy Inventory of municipal facilities and operations or a Community-wide Energy Inventory since 2008, which was done in conjunction with the Sustainable Annapolis Community Action Plan. Unfortunately it is difficult to set carbon reduction goals without having current baseline data to inform the policy. However we do know the types of efforts which are required for cities to meet dramatic carbon reduction goals, many of which are highlighted below. Other factors are tied to land use and transportation which are better documented in the chapters dedicated to those topics.

However, an update to the 2008 Energy Inventory is expected to be completed in 2022, and numerous energy saving programs and tools have been implemented since the last inventory. Based on the 2008 Inventory, within city government the largest contributors to greenhouse gas emissions are the vehicle fleet (28.6%), water and sewage systems (26.6%), and city buildings (24.6%). In terms of total energy consumption, the vehicle fleet takes up an even larger share at 44.0%, while buildings and water/sewage systems make up 25.5% and 22.8% of energy usage, respectively.

In 2020, the State updated the Greenhouse Gas Emissions Reduction Act signed into law in 2016 to increase the reduction goal from 40% of statewide emissions at 2006 levels by 2030 to 50%. This is more in alignment with the Intergovernmental Panel on Climate Change's (IPCC) finding that emissions among developed countries need to be net zero by 2045. Since the state's largest sources of emissions are from transportation and electricity generation, the plan focuses most heavily on programs and investments in these areas. In adopting the City of Annapolis' resolution to uphold the commitments

FIGURE 9-26: KEY ABATEMENT OPTIONS TO ACHIEVE ZERO-CARBON CITIES

Source: Coalition for Urban Transitions

within the United Nation Paris Climate Agreement in 2017, the City has continued to work toward reducing its emissions.

Energy Sources and Renewable Energy

Waterworks Park is now home to the nation's largest solar energy park constructed on a closed landfill at 55,000 solar panels on 80 acres of land and a production capacity of 18 megawatts. The Annapolis Solar Park, made fully operational in 2018, is supported by power purchasing agreements with the City, Anne Arundel County, and the Anne Arundel County Board of Education. The State offers many

FIGURE 9-27: ACCORDING TO THE EPA, THE ANNAPOLIS SOLAR PARK AT WATERWORKS PARK IS THE LARGEST SOLAR INSTALLATION ON A CLOSED LANDFILL IN NORTH AMERICA.

Source: Reliable Contracting

residential incentive programs for energy use and efficiency. Energy efficiency programs include grants to low and moderate income households, and loans for homeowners, to make a variety of efficiency upgrades. Subscriptions to community solar arrays, low income solar pilot grants, residential clean energy rebates, and residential wind energy grants are just some of the other programs offered.

Even with gradual reduction in reliance on fossil fuel-based energy, according to the Energy Information Administration (EIA), as a whole, Maryland still generates a slight majority of its electricity from coal and natural gas. However, coal-fired power plants are now the 3rd largest source of energy generation, a substantial reduction from a decade ago when they were still the greatest source of electricity. Nuclear power, at 38.8% of total utility-scale electricity generation, is now the largest source of energy in the state. Customers of BGE, the sole utility-scale electricity provider serving Annapolis, then get their energy from a similar breakdown of these sources.

Buildings

At the community-wide scale, buildings contribute roughly two-thirds of total emissions, with commercial at 31%, residential at 27%, and industrial at 9%. Buildings contribute a similar amount to the community's overall energy use at 65%. Commercial makes up 29% of total energy use, residential makes up 24% and industrial 12%.

Food

Food Insecurity

Generally speaking, Annapolis has sufficient access to food compared with more isolated locales. However, one of the long rooted products of inequity not only in Annapolis but in many other cities across the country, is the discrepancy in the quality of food available to communities. Depending on where you live and your economic status, access to a grocery store or other adequate food supply can vary greatly. Being within walking distance to a source of healthy food is more important in low income communities where access to a vehicle is lower. More often, it is in these areas that there is little to no access to fresh fruit, vegetables, and other healthy foods, attributed to a lack of grocery stores, farmers markets, and other healthy food providers, thus meeting the definition for a "food desert".

Causes of food inequity in neighborhoods with limited access to healthy food range from transportation challenges to the convenience of unhealthy food nearby to the perceived investment risk of locating supermarkets in lower-income areas. The recent COVID-19 pandemic exacerbated food access issues as food prices increased, stores closed or reduced hours in some cases, and many families faced economic hardship. One area of the city classified as a food desert by the USDA according to 2019 data is the Eastport neighborhood between Tyler Avenue/ Hilltop Lane and Adams Street to the west of Bay Ridge Avenue, where there is a high rate of poverty for the region, low vehicle access, and poor proximity to supermarkets. Although the area once supported a grocery store, today many residents rely on seasonal farm produce stand operating in the parking lot of the Eastport Shopping Center or convenience stores.

Even though the Murray Hill neighborhood also has relatively poor access to a supermarket, the rate of poverty is much lower and so the need is not as

FIGURE 9-30: CONVENIENCE STORE ON WEST STREET

Source: City of Annapolis

significant. The map on the facing page reveals that while supermarkets may be within a 10 minute drive for many, for those without access to a vehicle, the trip is out of reach. In contrast, the Parole neighborhood has more than sufficient access to supermarkets by foot or bike with several in the Greater Parole area, although many of the streets connecting residents to these groceries are not adequately safe for pedestrians and cyclists.

Regional Foodshed

Being a relatively urban area with little excess land, agriculture inside the city limits is relegated to very small-scale operations. Yet, Annapolis can still take advantage of the local agriculture economy as a primary market for nearby farms. Farmers' markets serve as a gateway to the agricultural producers in the area, offering fresh, local produce. The benefits of local agriculture and supporting local agriculture can be reflected in the economy, the health of residents, and the environment. Food that comes from local farm businesses tends to be more nutritious and produce a smaller environmental footprint as transportation costs are reduced. The support of the local farms then

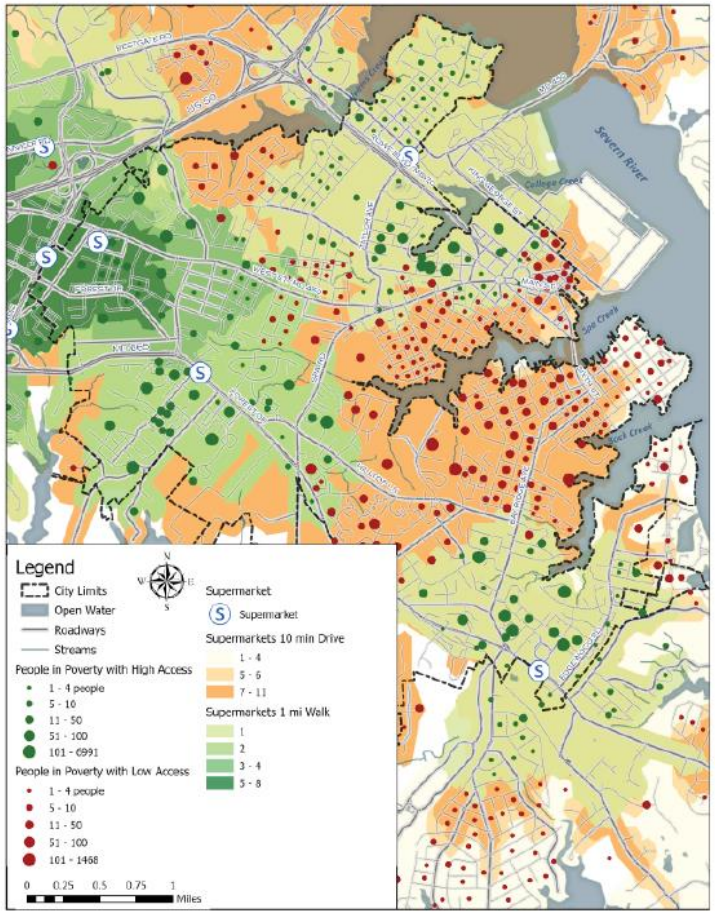


FIGURE 9-31: MAP OF FOOD ACCESS

Source: City of Annapolis

Waste

Waste Generation and Collection

Waste, if not collected, becomes a major source of pollution and emissions. The Department of Public Works continues to operate curbside collection programs for recycling, yard trim, and refuse. Recyclables collected include paper, plastic, metal, and glass products. The City's curbside collection program has been successful in reducing the amount of waste going to landfills. The City currently contracts these collection services through a private contractor, which was determined to be more cost-effective than collecting the materials with City staff. Given that the City no longer operates a landfill, the collected waste and recycling is processed outside of the City.

A list of recent City accomplishments in the area of solid waste management appears below.

- The number of residential customers on each collection day was balanced to improve efficiency.
- A multi-year refuse disposable contract was negotiated in order to have some predictability from year to year.
- An Intergovernmental Agreement was executed with Prince Georges County for the processing of yard trim which creates a marketable compost. This provided the City predictability as well as a cost savings from past practices.
- The City partnered with Anne Arundel County to share in the cost of household hazardous waste disposal from City residents.
- The City enhanced the collection of metal and non-metal bulk for residential customers. Metal bulk is able to be scheduled for collection and up to 3 non-metal bulk items can be placed at the curb on each collection day.

FIGURE 9-34: BRANDING FOR THE ANNAPOLIS RECYCLING PROGRAM
Source: City of Annapolis

- In order to increase recycling tonnage, the City provided residential customers with large 64 gallon recycling carts in addition to the smaller 32 and 18 gallon containers.
- In order to eliminate plastic bags from yard trim collection, the City provided residential customers with 64 gallon yard trim carts.
- In order to reduce contamination in the recycling stream, the City embarked on a multi-faceted campaign to better educate residential customers. First, film plastics and plastic bags were prohibited in the recycling containers. Second, recyclables were required to be loose in the recycling container. Lastly, the education on the acceptable and non-acceptable items was increased..
- An aggressive on-going enforcement program to maintain a high quality recycling stream has been established through a tag-and-leave stickering program.
- The City employs a wide range of methods to communicate with its residents including direct-mail postcards, social media posts and a comprehensive solid waste and recycling website.
- The City has created a new brand titled Rethink Recycling and has established a recycling challenge on its website. Metrics on the amount residents recycle on each collection provides for ongoing tracking of program improvements.
- Public works acquired a new phone app "TextMyGov" that works in concert with the work order management system (IWorqs) to report problems or receive notification via text message for refuse, recycling and yard trim.
- The City enhanced the enforcement of the curbside collection contract by utilizing a vehicle tracking software program (Network Fleet) that provides real-time locational data.
- The City worked with Annapolis Green to have a drop-off location for pumpkin collection at the end of the fall season.

Waste Reduction Efforts

In addition to its ongoing recycling program, the city recently initiated a food composting pilot program running from October 1, 2021 through March 30, 2022 to demonstrate the feasibility and impact of food waste collection as a municipal service. This program stemmed from a 2019 feasibility study commissioned by the City to explore the establishment of an organics resource recovery facility to be sited near Waterworks Park. As part of the program, two food waste composting options are planned including a curbside pilot program serving the Hunt Meadows community and a food waste drop-off location at Truxtun Park.

Another initiative aimed at waste reduction and broader environmental goals is the effort to discontinue the use of plastic bags. Both the city and state have explored passing legislation to ban the use and sale of plastic bags, a major source of harmful waste, in all retailers.

FIGURE 9-35: RECYCLING TRENDS
Source: City of Annapolis

10. WATER RESOURCES

OVERVIEW

The water which made Annapolis a fitting location for settlement, and the City we know today, continues to be vital to its existence and to the people who choose to live here, work here, and recreate here. Annapolis' complex and dynamic position between the Severn and South Rivers has always meant that any impact on water inside the City's boundaries has impacts downstream and in the Chesapeake Bay. Conversely, the City is easily inundated with tidal impacts from beyond its city limits. These conditions demand that nearly everyone in Annapolis is in some way accountable for the collective stewardship of the City's water resources, whether they know it or not. Water resources in the context of the Comprehensive Plan refer to an interconnected network of water that includes the major rivers that give shape to the Annapolis Neck peninsula and the creeks that flow into them, in addition to the drinking water that flows through pipes and into homes and businesses, and in turn the water that is piped out as waste. Climate change, whose impacts on Annapolis are detailed thoroughly in Chapter 9, Environmental Sustainability, threatens to undermine that stewardship of drinking water, wastewater, and creeks and rivers alike.

Because future development will primarily occur as infill and redevelopment, the City is largely built out, as detailed in Chapter 4, Land Use. Thus the goals for water resources in this chapter encompass restoration, protection, and conservation. Rather than expanding the footprint of water and sewer infrastructure, this Chapter will examine the state of existing infrastructure, and opportunities to ensure its sustainability and resilience to future conditions and threats. The health of the City's water resources depends on the health of those Sensitive Areas identified in Chapter 9, Environmental Sustainability. Stream corridors, habitat, and forested areas are a critical lifeline to all creeks and rivers and their respective watersheds in Annapolis.

Nearly all water which hits the surface of the Annapolis Neck peninsula, on which the City is situated, drains to the Severn and South Rivers, with Forest Drive representing an approximate dividing line between the two watersheds. The sub-watersheds of Weems Creek, College Creek, Spa Creek and Back Creek, tributaries of the Severn River, contain the majority of the City's population but face varying challenges and opportunities. Likewise, the Crab, Harness and Aberdeen Creeks, portions of which are in the City, are tributaries of the South River and pose different challenges.

In past plans for Annapolis, it has been common practice to make land use recommendations for neighborhoods, roadway corridors, and other areas of the City based on where there is opportunity for change or for improvement. A major distinction of this plan, as already mentioned in Chapter 4, Land Use, and Chapter 9, Environmental Sustainability, is to foreground the important nuances of watershed areas as the basis for future development and improvements to neighborhood quality of life to best meet the needs of residents. Therefore, the goals and recommendations found at the end of this chapter for water resources will not only guide future decisions but ultimately be integrated into watershed-based land use plans.

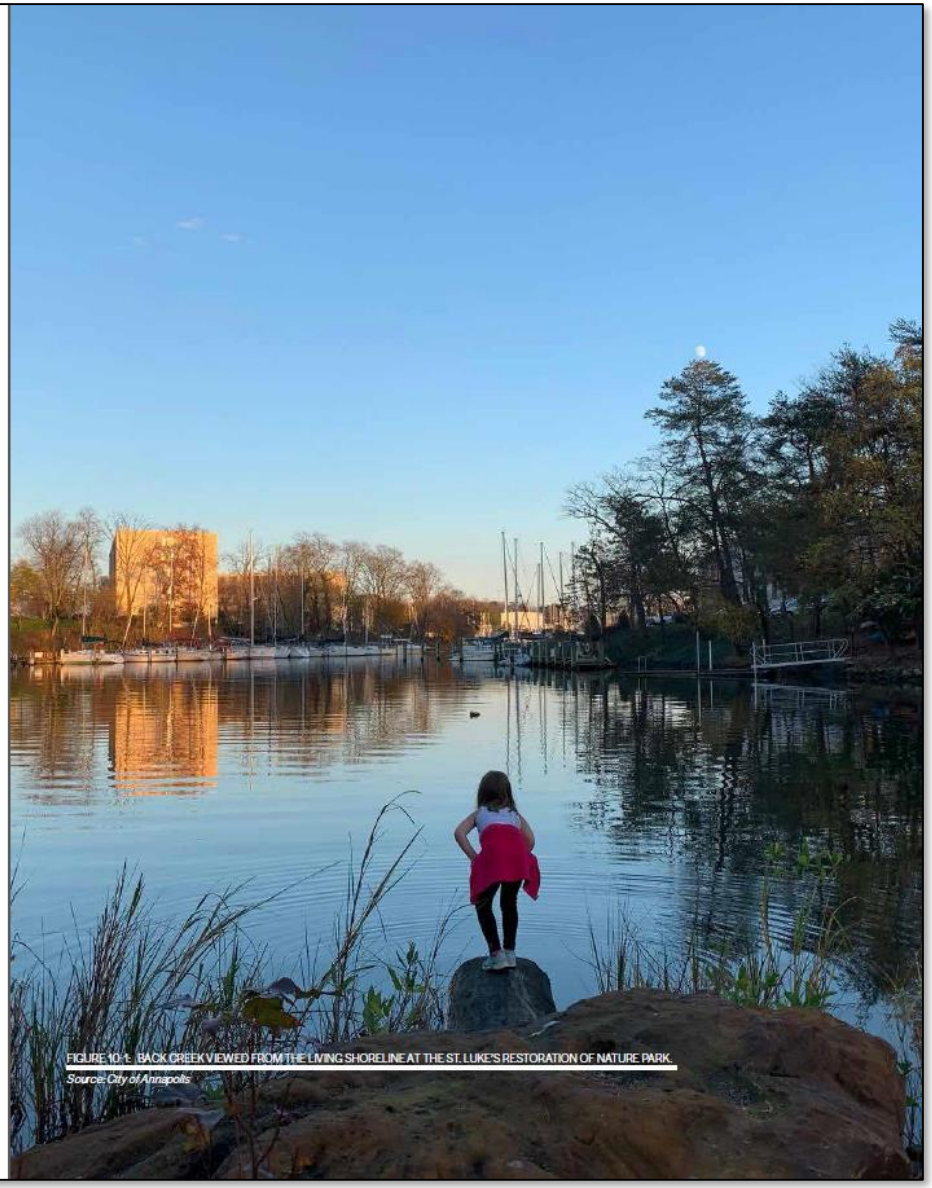


FIGURE 10-1. BACK CREEK VIEWED FROM THE LIVING SHORELINE AT THE ST. LUKE'S RESTORATION OF NATURE PARK.
Source: City of Annapolis

Condition and Maintenance of Stormwater Best Management Practices (BMPs)

Of the BMP inspections that were completed in the 2021 survey, 68 of them were of BMPs not previously included in the BMP database. Altogether inspections were successfully completed for 296 of those BMPs, while another 26 were inaccessible and 73 not present. The successful inspections revealed that a great deal of installed BMPs required at a minimum some maintenance or repair to achieve their desired function. A little under half of those inspected this way were deemed functioning properly, while about a quarter of those inspected were considered to need maintenance and repairs, and another quarter not functioning as intended. The BMPs were designated as such based on whether BMPs had been removed, or whether there was failure of structures, significant erosion, evidence of clogging, or standing water. This is evidence of the amount of stormwater and debris that flows through these BMPs. Large swaths of impervious surfaces upstream accelerate the speed and volume of stormwater and debris or sediment that is pushed downstream or into larger stormwater BMPs like bioretention and stormwater ponds. Therefore, reduction in impervious surfaces, tantamount to an increase in greening through landscape planting or forestation, could alleviate the stress and subsequent maintenance needed to keep BMPs in working condition. Chapter 9, Environmental Sustainability, highlights locations with high concentrations of impervious cover and in need of greening.

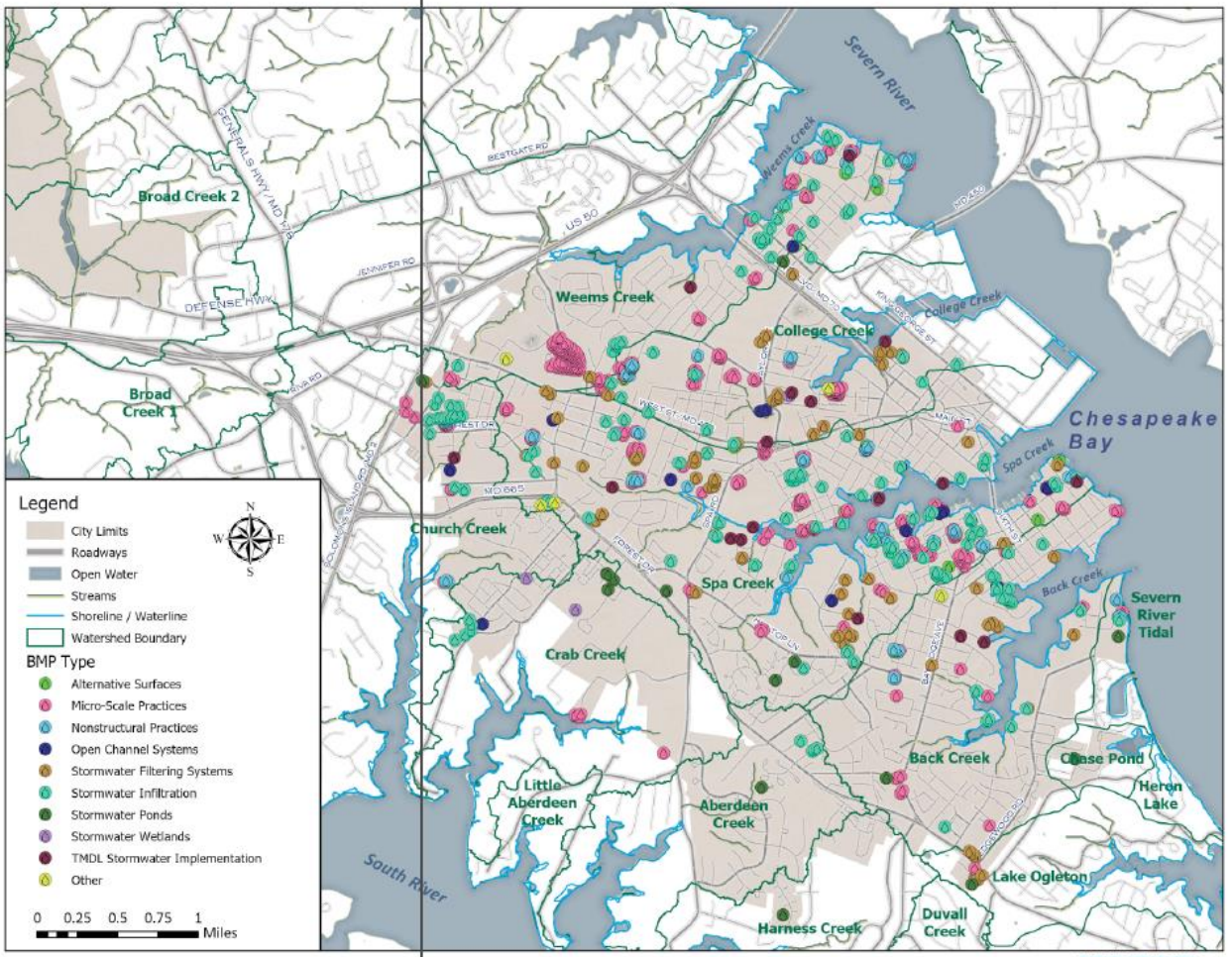


FIGURE 10-3: MAP OF STORMWATER BEST MANAGEMENT PRACTICE (BMP) FEATURES BY TYPE

Source: City of Annapolis

1.5 BILLION GALLONS OF POTABLE WATER PRODUCED PER YEAR	8 MILLION GALLONS PER DAY (MGD) WATER TREATMENT CAPACITY	137 MILES OF WATER PIPES
1 WATER TREATMENT PLANT	5 ELEVATED WATER STORAGE TANKS	2,900 WATER VALVES
8 GROUNDWATER WELLS (3 AQUIFERS)	2 1-MG/EACH FINISHED WATER STORAGE TANKS	1,240 FIRE HYDRANTS

FIGURE 10-9: SUMMARY CHART OF WATER SUPPLY ASSETS, NETWORK, AND CAPACITY

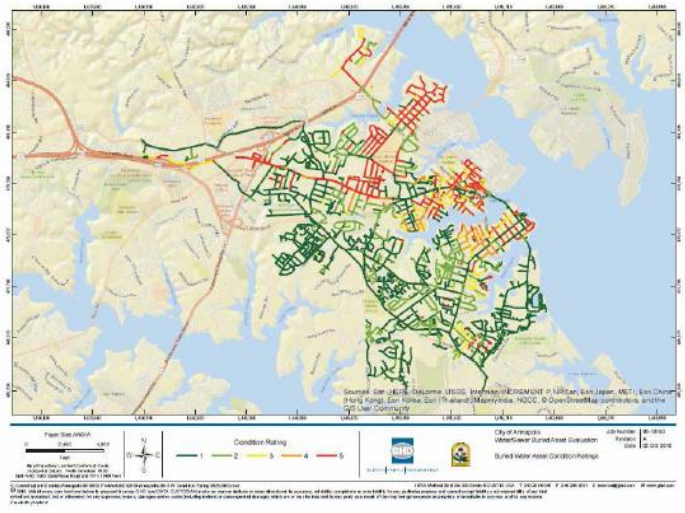
Source: City of Annapolis

include a standpipe on Jefferson Street, an elevated tank on the Naval Academy Stadium site, two elevated tanks at the intersection of Janwal Street and Barbud Lane, and an elevated tank on Edgewood Road at the site of the Ellen O. Moyer Nature Park at Back Creek. The combined total volume of the water tanks is 5.5 MG, though usable storage volume is approximately 4.2 MG. The City water distribution system serves all areas within the City limits and also extends outside the City to supply areas including parts of Parole to the west, Lindamoor and Dreams Landing north of Weems Creek, and the Chesapeake Harbor complex to the southeast of the city limits.

Aging Infrastructure and Challenges to Water Distribution System

A desktop condition assessment has been performed for the City's water pipes, which determines the condition rating of water pipes based on age, material, and manufacture year, soil corrosivity, average operating pressure, and work order history.The vast majority of the City's water pipes (~95 miles) have a condition rating of 1 (excellent/new) and 2 (good). Approximately 25 miles of City's pipes have registered a condition rating of 5 (very poor). This does not tell the whole story of the state of the City's water infrastructure, however. The vast majority of the water infrastructure in poor condition is located in areas that are built out the most and with the greatest demand for water such as the Historic District, West Annapolis, Eastport and Germantown-Homewood. Further, with the threat of sea level rise and saltwater intrusion in Eastport and Downtown, the stress on water infrastructure in these areas is of greater risk.

In recent years, other Cities have faced challenges to the quality of drinking water, specifically regarding the presence of lead and copper. Lead that is detected in



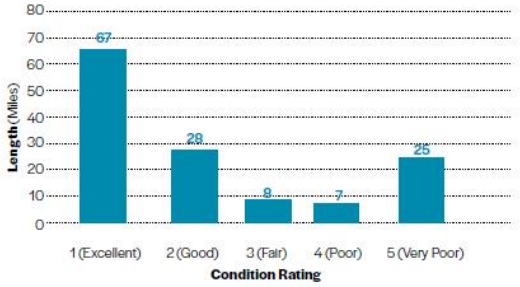


FIGURE 10-10: (ABOVE) MAP OF THE CITY'S WATER SUPPLY DISTRIBUTION NETWORK WITH CONDITION RATING

Source: City of Annapolis

FIGURE 10-11: (LEFT) SUMMARY CHART OF WATER SUPPLY NETWORK BY CONDITION

Source: City of Annapolis

Wastewater

Wastewater Collection

The City provides sewer service to the residents of the City, the United States Naval Academy (USNA) and a relatively small number of residents located outside the city limits. The City sewer system serves about 38,000 people through 11,200 sewer service accounts. The City owned and operated collection system consists of a network of gravity collectors and force mains, and includes 28 wastewater pumping stations. The system of 123 miles of sewer collection serves approximately 98% of the City. Flows from the USNA pass through the City collection system before reaching the Annapolis Water Reclamation Facility (WRF).

More than half or 77 miles of the City's sewer pipes have been installed between 1950 and 1990, over 30 miles of which were installed in the 1950s. A desktop condition assessment has been performed for the City's sewer pipes as part of the Evaluation Project. The desktop condition assessment model determines the condition ratings of the sewer pipes based on pipe age, pipe material, basement back-ups, and work order history.

Status of Wastewater Treatment Infrastructure

The Annapolis Water Reclamation Facility (WRF) is a wastewater treatment plant jointly owned and supported by the City and Anne Arundel County, but is operated and maintained by the County. As a joint facility, it treats sanitary sewage collected from the City, County, and USNA. The plant's capacity is 13 MGD, of which the City (with the USNA) has been allotted 6.7 MGD. The treated effluent from the WRF is discharged to the Severn River. With the recently completed Enhanced Nutrient Removal upgrade, the facility is now able to meet the current limits of technology of 3.0 mg/L effluent total nitrogen and 0.3 mg/L total phosphorus in the discharged treated effluent. In 2021, the Annapolis WRF was awarded a National Association of Clean Water Agencies (NACWA) Peak Performance Platinum award. The facility has gone five consecutive years without a permit violation and has had perfect permit compliance in 21 out of the last 22 years.

Consequences of Failure in System

A desktop consequence of failure (COF) assessment has been performed for the City's sewer pipes as part of the Evaluation Project. The desktop consequence of failure assessment model determines the consequence of failure ratings of the sewer pipes based on pipe diameter, location, and proximity to attributes such as buildings, roads, historic district, etc.

Challenges to Wastewater Collection System

Similarly to changes in future water demand, wastewater flows are only projected to increase at a slow and manageable rate. Again, as was mentioned earlier, the increased use of water saving fixtures has led to a reduction in the average water demand. As a result, the projection for wastewater flow of 5.76 MGD by 2035 is well within the allocated 6.7 MGD average daily flow treatment capacity at the Annapolis Water Treatment Facility.

Inflow and infiltration can be a problem for older municipal sewer systems. Inflow is stormwater that enters the wastewater collection system as a result of insufficient stormwater management on lots. Infiltration is flow from groundwater that enters the system through cracks in pipes, for example. The Annapolis Water Reclamation Facility is operating under capacity and neither inflow or infiltration have been identified as a problem.

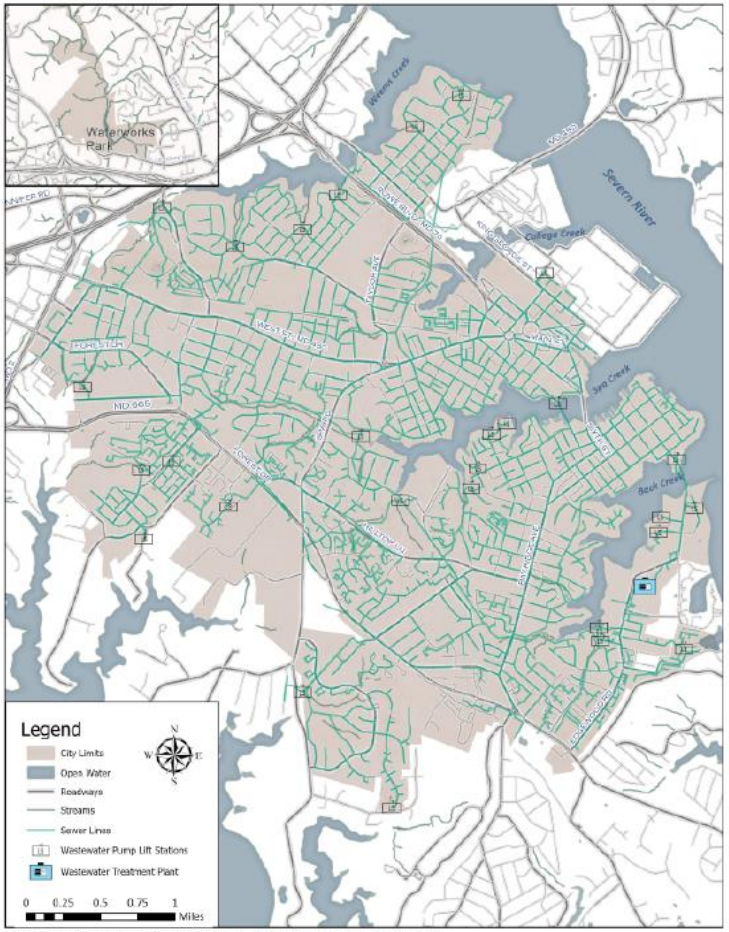


FIGURE 10-14: MAP OF THE CITY'S WASTEWATER CONVEYANCE NETWORK AND TREATMENT FACILITY

Source: City of Annapolis

Marine Waste Management

Maritime and recreational boating waste discharges are regulated by DNR and the U.S. Coast Guard. Collection and conveyance to the City sewer system are the responsibility of boaters and individual marina operators. In 2019, Annapolis and Anne Arundel County jointly signed an application for a No Discharge Zone (NDZ) for an area that includes the Annapolis Harbor, all waterways that feed the Chesapeake Bay that begin in Anne Arundel County (including the Severn River, Magothy River, South River, and West/Rhode Rivers) and major creeks of those rivers. In a NDZ, boats with a hold are not permitted to discharge either treated or untreated boat sewage. By keeping human waste out of area waterways, it will help to clean up an area that runs from Gibson Island in the northern end of the County to Deale in the southern end of the County. One of the key components to an effective NDZ is the adequate capacity for mariners to offload their holds. The Annapolis City Harbormaster operates a pump-out boat that will go to boats at a slip, on a mooring or private pier. In addition, there are more than 50 pump out locations located around Annapolis and Anne Arundel County.

Additionally, numerous marinas within Annapolis have been certified through DNR's Clean Marina program which has proven to be another effective means of limiting the discharge of pollution into the City's waterways by promoting responsible pollution prevention practices. According to DNR, "Certified Clean Marinas have voluntarily adopted a significant portion of recommendations from the Maryland Clean Marina Guidebook, complied with all applicable environmental permits and regulations, and have passed a site inspection conducted by Dept. of Natural Resources staff and another Clean Marina manager." The certification lasts for three years, after which time a marina must pass another certification visit.

FIGURE 10-15: TO HELP MANAGE MARINE WASTE, THE ANNAPOLIS HARBORMASTER OPERATES A PUMP OUT BOAT THAT WORKS YEARROUND. AS OF JULY 1, 2022, ALL WATERS OF THE CITY AND ANNE ARUNDEL COUNTY ARE DESIGNATED NO DISCHARGE ZONES (NDZ).

Source: Capital Gazette

Recent Sewer Plan

As with the City's water supply and distribution infrastructure, the City last completed and adopted its Ten-Year Water and Sewerage Plan in 2019. The plan, which assessed the conditions of the City's wastewater collection and treatment infrastructure, with an objective of ensuring the disposal of wastewater in a manner that will not degrade, and where possible, improve the surface and groundwater quality, was incorporated into this section.

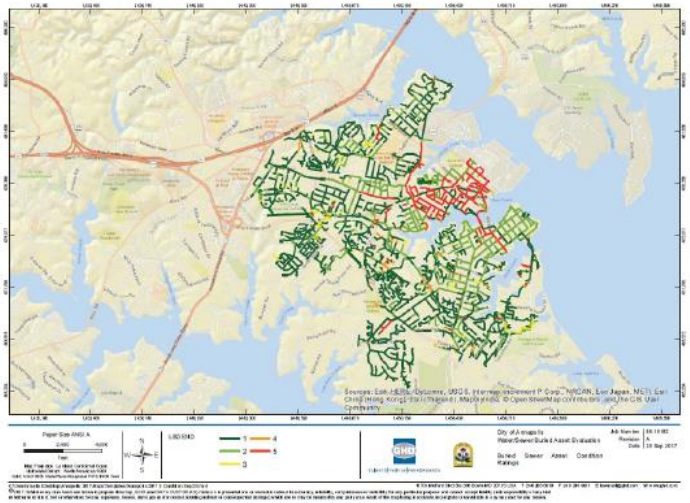


FIGURE 10-16: (ABOVE) : MAP OF THE CITY'S WATER WASTEWATER CONVEYANCE NETWORK WITH CONDITION RATING

Source: City of Annapolis

FIGURE10-17: (LEFT) AERIAL IMAGE OF OF THE CITY'S WASTEWATER TREATMENT FACILITY WHICH IS CO-OWNED AND OPERATED BY ANNE ARUNDEL COUNTY

Source: City of Annapolis

THANK YOU!

Questions?

Annapolis Ahead
ANNAPOLIS COMPREHENSIVE PLAN 2040

LAND USE

GOAL

LU6 **Link the city together with a network formed by the city's remaining natural areas, improved open spaces, parks, and institutional uses.**

PERFORMANCE MEASURE 1: The Greenway Map is updated annually.

PERFORMANCE MEASURE 2: Establish at least one contiguous greenway within each of the City's creek watersheds by 2030.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
LU6.1	Design, adopt and implement a Greenway Plan that identifies lands which provide significant environmental, recreation, aesthetic, and/or health benefits and details strategies to maintain the values these lands provide; The plan should be managed jointly by the Annapolis Conservancy Board and the Department of Planning and Zoning, updated annually, and coordinated with Anne Arundel County's Green Infrastructure Plan. (also listed Chapter 7: Community Facilities under Goal CF1)	SHORT TERM	$	DPZ	
LU6.2	In the review and approval of infill and redevelopment projects, align parkland dedications and required open space set-asides to promote the interconnection of open spaces across parcels.	ONGOING	$	DPZ	
LU6.3	Require that public access easements be established within areas set aside for future open space or planted for required forest conservation.	SHORT TERM	$	DPZ	
LU6.4	Recognizing the innumerable benefits of street tree planting including reducing the heat island effect, air quality improvement, carbon sequestration, wildlife habitat, and traffic calming, design certain streets to be part of the Greenway Plan and elevate the importance of street tree planting and coordinated landscaping along properties with street frontage.	SHORT TERM	$$	DPZ	

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
LU6.5	Use the City's forest conservation requirements to direct conservation and afforestation in ways that build larger networks of connected forests in Annapolis. (Also listed in Chapter 9: Environmental Sustainability under goal ES 2)	SHORT-TERM	$	DPZ	
LU6.6	Explore opportunities to plant trees on institutional properties within the city limits such as those owned by HACA, Anne Arundel County schools and libraries, State of Maryland offices, and the Navy, for the purposes of meeting mitigation requirements and the general tree canopy goals. (also listed in Chapter 9: Environmental Sustainability under Goal ES 2)	SHORT TERM	$	DPZ	ES2
LU6.7	Amend the zoning ordinance and map to create and apply Environmental Enhancement areas guided by the Future Land Use Map of this Plan. Environmental Enhancement areas are property parcels that either already offer ecological benefits or should be improved to do so, but are not appropriate to serve as active parkland.	SHORT TERM	$	DPZ	
LU6.8	Enact an agreement with the County that establishes the City's right to direct and use its share of Program Open Space funds for the protection and enhancement of lands within its jurisdiction. Such an agreement should detail the specific uses of the funds.	SHORT TERM	$	DPZ	
LU6.9	Improve coordination between City departments and City Boards/Commissions tasked with environmental protection, including the Annapolis Conservancy Board, to ensure properties being reviewed for development or permitting are considered in a fuller context, taking into account the property's opportunities for conservation and easements within the property as well as connections to surrounding open space, conservation and trail systems.	SHORT TERM	$	DPZ	

TRANSPORTATION

GOAL

T1 **Shift the mix of mobility investments towards public transit, micro-mobility / ridesharing, active transportation, and support for telework options to double the usage of these modes by 2040.**

PERFORMANCE MEASURE 1: Capital investments in transportation for public transit, walking, biking, and Mobility-as-a-Service (MaaS) will increase from 7% to 15% of General Fund expenditures by Fiscal Year 2025 and 25% by 2030

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
T1.1	Complete the Bike network improvements identified in the 2011 Bike Master Plan and this Plan, and regularly track progress on all proposed improvements..	ONGOING	$	DPZ	
T1.2	Ensure that all approved bike facility recommendations are budgeted and implemented with CIP roadway improvements.	SHORT TERM	$	DPZ	
T1.3	Prioritize the design and construction of the West East Express (WEE) bike corridor as the spine of the City's bike network.	ONGOING	$	DPZ	
T1.4	Continue to support and expand micro-mobility options particularly to improve mobility into and through the downtown area, including micro-transit, bikeshare, paddleshare, ridesharing services, carshare, ferries, and an integrated Annapolis Mobility App integrated with Annapolis Transit.	ONGOING	$	DPZ/ ADOT	
T1.5	Implement a no-fare pilot program for public transit to encourage more ridership and test its feasibility.	SHORT TERM		ADOT	
T1.6	Reimagine Annapolis Transit including its route network, frequency, and vehicle fleet, to provide improved service and expand ridership.	SHORT TERM		ADOT	
T1.7	Implement a micro-transit pilot program to expand ridership and test the feasibility of on-demand service.	SHORT TERM	$	ADOT	
T1.8	Coordinate and connect Annapolis Transit to regional transit options including park-and-ride stations, Anne Arundel County's planned multi-modal transit center, and MTA's express route stops.	SHORT TERM	$	ADOT	
T1.9	Work with MTA and private commuter bus services to establish rush hour stops along Forest Drive and explore the feasibility of a dedicated intermodal transit hub in the Bay Ridge/Hillsmere area.	SHORT TERM	$	ADOT	
T1.10	Implement the planned electric ferry pilot program connecting Eastport to downtown Annapolis and work with regional partners to envision Annapolis as a hub for ferry connections to other destinations.	MID TERM	$	DPW/ DPZ	

TRANSPORTATION

GOAL

T2 **Build a policy environment in Annapolis that is mode-neutral, equitable, oriented to safety, and prioritizes connectivity of the city's streets, sidewalks, and trails.**

PERFORMANCE MEASURE 1: Crash rate is lower than rate of population and employment increase by 2030; Reduce serious injuries from car crashes to 3.0 per million Vehicle Miles Travelled (VMT) by 2040.

PERFORMANCE MEASURE 2: Allow no new full-movement driveways on major arterials (and reduce the total number of existing driveway cuts).

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
T2.1	Adopt a Complete Street policy and design manual to guide every public and private development project through planning, design, and maintenance.	MID TERM	$	DPZ/ DPW	
T2.2	Adopt standards for implementing bicycle facility infrastructure that improve safety for cyclists and are tailored to Annapolis.	SHORT TERM	$	DPZ/ DPW	
T2.3	Revise the Traffic Impact Analysis requirements to incorporate safety assessments and to be fully multimodal, including Quality/Level of Service (Q/LOS) assessments for bike, pedestrian, and transit modes.	SHORT TERM	$	DPZ	
T2.4	Adopt a Vision Zero policy, which is an initiative aimed at eliminating all traffic fatalities and severe injuries, that includes at minimum coordinated guidance on engineering, education, enforcement, and emergency medical services, and is aligned with Anne Arundel County's Vision Zero policy.	SHORT TERM	$	DPZ	
T2.5	Prioritize bike and pedestrian facility improvements to the City's major thoroughfares, where the highest number of traffic fatalities and injuries currently happen, as means of improving safety, minimizing conflicts between modes of travel, and lessening congestion.	ONGOING		DPZ/ DPW	
T2.6	Prioritize improved bike and pedestrian connections to schools, particularly along Cedar Park Road, Forest Drive, and Spa Road.	ONGOING	$$	DPW/ DPZ	
T2.7	As part of future small area planning, address all physical barriers to mobility in the City and identify targeted actions for improving connections between neighborhoods particularly along the Forest Drive corridor.	MID TERM	$	DPZ	
T2.8	Prioritize the hiring of a fulltime transportation engineer for the City's Department of Public Works who will help to accelerate improvements to the City's street network.	SHORT TERM	$$	DPW	

TRANSPORTATION

GOAL

T3 **Transportation will take a leadership role in creating a greener and healthier Annapolis to sustain the economic, environmental, and social quality of the City.**

PERFORMANCE MEASURE 1: Triple the mileage of walking and biking facilities from 2020 to 2040.

PERFORMANCE MEASURE 2: Increase bike and walk mode share to 15% by 2040.

PERFORMANCE MEASURE 3: Expand the number of publicly accessible EV charging stations tenfold by 2025.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
T3.1	Adopt "Green Street" design standards that include maximum tree planting, use of silva cells, micro bioretention, permeable pavers, and other integrated stormwater best management practices.	SHORT TERM	$$	DPZ	LU6 / ES2 / WR 2
T3.2	Plan for the transition of the City's fleet vehicles and transit vehicles to zero emissions vehicles with the goal of complete transition by 2030	SHORT TERM	$$	ADOT/ DPW	ES6
T3.3	Work with BGE and other partners to establish more public car-charging stations in Annapolis, particularly downtown, as well as incentives to establish charging stations at existing multifamily and commercial developments.	ONGOING	$$	DPZ	ES6
T3.4	Revise the City's parking standards to require car-charging parking spaces for new or redeveloped residential and commercial properties that require major site plan review.	SHORT TERM	$	DPZ	
T3.5	Require existing parking lots to include one EV charging unit for the first 100 parking spaces and an additional EV charging unit for every additional 50 parking spaces.	SHORT TERM	$	DPZ	
T3.6	Study and propose reductions to the City's parking requirements for all land uses to incentivize the sensible development of underutilized land, reduce impervious coverage, improve stormwater management performance, and encourage walking, biking, and transit use, among other benefits to the City. (Also listed in Chapter 4: Land Use under Goal LU2, and Chapter 9: Environmental Sustainability under Goal ES6)	SHORT TERM	$	DPZ	
T3.7	Become a Silver-level bike-friendly and Bronze-level walk-friendly community, designated by the League of American Bicyclists and Walk Friendly Communities, respectively.	SHORT TERM	$	DPZ	

COMMUNITY FACILITIES

GOAL

CF1 **Merge Annapolis' parks and recreation system with its evolving network of conservation areas and trails to create a comprehensive greenway system.**

PERFORMANCE MEASURE 1: The Greenway Map is updated annually.

PERFORMANCE MEASURE 2: The Annapolis Conservancy Board assists the Department of Recreation and Parks with at least one conservation project every two years.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
CF1.1	Revise the mission of the Annapolis Conservancy Board to include regular coordination with the Department of Recreation and Parks.	SHORT TERM	$	DPZ	
CF1.2	Refine and publish an official park system map that includes detailed information on access to conservation areas, water access, and trail connections, in addition to updated information on active recreation facilities.	SHORT TERM	$$	DRP/ DPZ	
CF1.3	Design, adopt and implement a Greenway Plan that identifies lands which provide significant environmental, recreation, aesthetic, and/or health benefits and detailed strategies to maintain the values these lands provide. The plan should be managed jointly by the Annapolis Conservancy Board and the Department of Planning and Zoning, updated regularly, and coordinated with Anne Arundel County's Green Infrastructure Plan.	SHORT TERM	$$	DPZ/ DRP	LU6
CF1.4	Explore training opportunities for Parks maintenance staff to include habitat restoration, conservation land management, and green stormwater infrastructure maintenance.	SHORT TERM	$$	DRP	WR3
CF1.5	Prioritize the development of a dedicated parks maintenance facility at Truxtun Park, or at another feasible location.	SHORT TERM	$$	DRP	
CF1.6	Expand Recreation & Parks staff to include a dedicated trail manager, and two naturalist/park rangers.	SHORT TERM	$$	DRP	

GOAL

CF2 **Expand parks facilities strategically, and the connections to them, to achieve equitable access for all.**

PERFORMANCE MEASURE 1: All residents are within a 10-minute walk of a park space maintained by the City of Annapolis Department of Recreation and Parks.

PERFORMANCE MEASURE 2: The citywide Recreation and Parks Master Plan is updated by 2025 and regularly updated every 10 years.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
CF2.1	Update the Adequate Public Facilities Ordinance to meet this goal's performance metric of proximity to parks by clarifying the level of service standards, updating the fee-in-lieu structure to reflect current park development costs, and simplifying the process.	ONGOING	$	DPZ	
CF2.2	Prioritize the update of the 2004 Recreation and Parks Master Plan, with future updates to occur every ten years; The master plan will not only serve to update equitable level of service standards, recreational program priorities, and opportunities for park and trail enhancements, but also opportunities for new diversified funding sources, as well as updated maintenance guidelines and efficiencies.	SHORT TERM	$	DRP DPZ	
CF2.3	Identify opportunities for enhancements to existing parks, such as at Annapolis Walk Community Park that will expand use to more diverse users and activities.	ONGOING	$$	DPZ DRP	
CF2.4	Work with Anne Arundel County Recreation and Parks, and Anne Arundel County Public Schools, to implement enhancements to various Anne Arundel County facilities within the City, or create new facilities, that could help to address equity goals.	ONGOING	$	DRP	
CF2.5	Include improvements to bike and pedestrian access in all new park projects or investments at existing parks.	ONGOING	$$	DRP DPW	

COMMUNITY FACILITIES

GOAL

CF3 **Prioritize equitable water access by investing in new and improved public open spaces along the waterfront, and the connections to them.**

PERFORMANCE MEASURE 1: The linear feet of publicly accessible waterfront is doubled by 2040 from approximately 10,000 LF to 20,000 LF.

PERFORMANCE MEASURE 2: Funding for ongoing improvements to existing water access infrastructure is a line item in the annual Capital Improvement Program.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
CF3.1	Continue to work with public and private partners to plan, design, and build the future Elktonia/Carr's Beach Park as a signature investment in the City's public waterfront. (also listed in Chapter 8: Arts & Culture under Goal AC1)	ONGOING	$	DPZ	AC1
CF3.2	Continue to work with HACA and other community partners to restore and activate the open space area at Hawkins Cove as an accessible and functional recreational amenity, and improve trail connectivity to Truxtun Park. (also listed in Chapter 9: Environmental Sustainability under Goal ES3)	SHORT TERM	$	DRP/ DPZ	
CF3.3	Work with public and private property owners along College Creek to create a parks and trails master plan for the area that will create new and improved water access opportunities, preserve existing open space and cultural sites, restore habitat, and improve bicycle/ pedestrian connections throughout the area; Prioritize the development of the College Creek Connector trail and Capital City Gateway Park as central to this effort.	SHORT TERM	$$	DPZ/ DRP	
CF3.4	Deferred maintenance to the City's existing waterfront parks is addressed through consistent funding in the annual Capital Improvement Program.	ONGOING	$$$	DPW DRP	WR3
CF3.5	Update the adequate public facilities ordinance to require public waterfront access for all new waterfront development, excluding single family parcels.	ONGOING	$	DPZ	
CF3.6	Develop a clear and consistent signage program for all public water access sites, including wayfinding, regulatory, and interpretive signage, to clarify access and encourage more public use of the waterfront. As part of this, ensure that clear and consistent public water access signage is required at all future public access easements not maintained by the City.	SHORT TERM	$$	DRP DPZ	
CF3.7	Establish an accessible system of paddle share locations at multiple public water access locations in the city. The system would provide storage for paddle craft and a means for residents and visitors to affordably access them.	SHORT TERM	$$	DPZ/ DRP	
CF3.8	Update City standards to ensure that all new, replaced, or enhanced stormwater outfall facilities are designed in coordination with public water access so that recreational opportunities are not negatively impacted.	SHORT TERM	$	DPW	WR3

ENVIRONMENTAL SUSTAINABILITY

GOAL

ES1 **Practice a comprehensive and equitable approach to resilience that is relevant to all residents.**

PERFORMANCE MEASURE 1: A Resilience Plan is adopted by the City by 2025 with annual updates on implementation.

PERFORMANCE MEASURE 2: The CIP includes resilience-related projects in all Wards.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
ES1.1	For the purposes of ensuring equity in resilience investments, utilize the definition of Sensitive Area provided in this Plan that includes not only natural resource areas of significant value but also areas deficient in ecological value. Based on this definition, a place with both high impervious coverage and lacking in tree canopy would be deemed a Sensitive Area.	ONGOING	$	DPZ	
ES1.2	Complete the City's Resilience Plan and ensure that it includes an emphasis on equitable resilience for communities with higher social vulnerability.	SHORT TERM	$$	CM	
ES1.3	Create a strategy for implementing "resilience hubs" within the City's most socially vulnerable communities based on the Maryland Energy Administration funding guidelines.	SHORT TERM	$$$	DPZ CM	
ES1.4	Utilize the creekshed small area plans recommended in this Plan as a means to identify specific opportunities for neighborhood-scale resilience investments. (see Chapter 4: Land Use for more detail on the creekshed planning framework.)	MID TERM	$	DPZ	LU1
ES1.5	Work with Anne Arundel County to leverage the full capabilities of the newly created Resilience Authority to implement projects that not only protect the City from sea level rise and other climate change impacts but also improve ecological functions.	ONGOING	$	CM OEM DPW	
ES1.6	Work with BGE, Anne Arundel County, NSA-Annapolis, and other partners to implement the recommendations of the Military Installation Resilience Response Study (MIRR), particularly to ensure a strategy is in place for energy resilience.	ONGOING	$	CM DPW OEM DPZ	

ENVIRONMENTAL SUSTAINABILITY

GOAL

ES2 Expand the City's tree canopy particularly within heat islands and along riparian corridors.

PERFORMANCE MEASURE 1: No net loss of tree canopy by 2028.

PERFORMANCE MEASURE 2: Increase the City's tree canopy to 45% of its total land area by 2040.

PERFORMANCE MEASURE 3: Establish a consistent budget line is introduced in the City's capital budget for tree planting and proactive tree maintenance.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
ES2.1	Introduce new city policies that incentivize tree planting in residential areas of the city, protect heritage trees, and expand mitigation planting requirements within the Critical Area.	SHORT TERM	$	DPZ	
ES2.2	Revise the City's tree mitigation policy to require a 5-year maintenance agreement rather than a perpetual easement to expand those areas where new canopy may be created.	SHORT TERM	$	DPZ	
ES2.3	Create an Urban Forest Master Plan that includes updates to the City's Street Tree standards, new guidelines for tree preservation, and priority areas feasible for new tree planting in the public realm.	SHORT TERM	$$	DPZ/ DRP	LU6 T3
ES2.4	Initiate a pilot planting program for Minority-owned businesses based in the communities where the planting is targeted.	ONGOING	$	CM DPZ	
ES2.5	Develop soil amendment and watering guidelines for new street trees to enhance the survival rate of new street trees.	SHORT TERM	$$	DPZ	
ES2.6	Promote and expand RePlant Annapolis, a community tree planting initiative in partnership with the Watershed Stewards Academy modeled after the RePlant Anne Arundel program.	ONGOING	$$	CM DPZ	
ES2.7	Create an online dashboard for tracking the City's tree canopy year by year to ensure the goal of 45% coverage is met by 2040.	SHORT TERM	$	DPZ DIT	
ES2.8	Continue to utilize fees collected through Critical Area mitigation to offset the costs of new tree planting initiatives elsewhere in the City.	ONGOING	$	DPZ	
ES2.9	Establish a consistent budget line item in the Capital Improvement Program for tree planting and proactive tree maintenance.	ONGOING	$$	DPZ	
ES2.10	Explore opportunities to plant trees on institutional properties within the city limits such as those owned by HACA, Anne Arundel County schools and libraries, State of Maryland offices, and the Navy, for the purposes of meeting mitigation requirements and the general tree canopy goals. (also listed in Chapter 4: Land Use under goal LU6)	ONGOING	$	DPZ	
ES2.11	Support the establishment of a dedicated non-profit advocacy organization focused on tree canopy preservation, enhancement, and expansion.	ONGOING	$	CM DPZ	
ES2.12	Use the City's forest conservation requirements to direct conservation and afforestation in ways that build larger networks of connected forests in Annapolis. (Also listed in Chapter 4: Land Use under goal LU6)	ONGOING	$	DPZ	LU6

ENVIRONMENTAL SUSTAINABILITY

GOAL

ES3 Reinforce vulnerable shoreline areas by addressing the root causes of soil erosion and natural landscape degradation.

PERFORMANCE MEASURE 1: A comprehensive erosion control and slope stabilization plan is commenced at Truxtun Park by 2023 and completed by 2025.

PERFORMANCE MEASURE 2: At least two living shoreline, stream restoration, or oyster bed restoration projects are implemented by the City or local partners every year.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
ES3.1	Conduct a flood resilience study for the Eastport Peninsula to identify feasible strategies for flood mitigation.	ONGOING	$$	DPZ	
ES3.2	Continue to work with HACA and other community partners to restore and activate the open space area at Hawkins Cove as an accessible and functional recreational amenity, and improve trail connectivity to Truxtun Park. (also listed in Chapter 7: Community Facilities under Goal CF3)	SHORT TERM	$$	DPW DPZ DRP	CF3
ES3.3	Develop a comprehensive erosion control and slope stabilization plan for Truxtun Park's waterfront areas including priority actions.	SHORT TERM	$$$	DPZ/ DRP	
ES3.4	Work with local partners such as Chesapeake Bay Trust, the Chesapeake Bay Foundation, Anne Arundel County, Severn River Association, Arundel Rivers Federation, Severn Riverkeeper Program, Spa Creek Conservancy, and the Watershed Stewards Academy, to augment the number of living shorelines, stream restorations, wetland restorations/creations, and oyster bed restorations/creations, both within the City and along riparian areas that impact City waterways.	ONGOING	$	CM DPW	

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
ES3.5	Conduct an assessment of existing wetlands within the City which prioritizes opportunity areas for wetland restoration and expansion.	MID TERM	$$	DPW	
ES3.6	Explore the feasibility of a buyout program for flood-prone properties in Annapolis that could be converted into public waterfront open space. Such a program would expand on a pilot program developed by Anne Arundel County.	SHORT TERM	$	DRP/ DPZ	
ES3.7	Promote the use of natural shoreline solutions over gray infrastructure to create shoreline resilience to climate change impacts; as part of such efforts, expand public education to property owners of the resilience value of creating natural shorelines and retaining vegetation, particularly trees, on waterfront properties.	ONGOING	$	DPW	

ENVIRONMENTAL SUSTAINABILITY

GOAL

ES4 Promote a coordinated approach to food access that ensures all residents have access to high quality foods, and particularly foods which are locally harvested.

PERFORMANCE MEASURE 1: Elimination of food deserts by 2030.

PERFORMANCE MEASURE 2: At least four (4) pop-up events focused on local and/or healthy food organized annually within the City.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
ES4.1	As part of the City's Resilience Plan, create a map of food deserts and/or healthy food access gaps to help prioritize interventions.	ONGOING	$	DPZ	
ES4.2	Work with public and private partners to create new opportunities for farmers markets and other healthy food pop-up events within food deserts and other socially vulnerable communities.	SHORT TERM	$	CM DPZ DRP	
ES4.3	Work with Recreation and Parks staff, Master Gardeners program, and/or other partners to create more opportunities for community gardening education, creation, and stewardship.	ONGOING	$	DRP	
ES4.4	Work with Recreation and Parks staff and other partners to expand opportunities for recreational fishing and crabbing.	ONGOING		DRP	
ES4.5	Work with the Maryland Department of the Environment and Department of Natural Resources to promote current fish consumption advisories and a program of regular testing of fish from local waters.	SHORT TERM	$	DRP	WR3

GOAL

ES5 Increase the City's biodiversity particularly in areas that currently have limited ecological value.

PERFORMANCE MEASURE 1: All new and improved parks and open spaces in the City include plantings or other natural features that will increase biodiversity.

PERFORMANCE MEASURE 2: No net increase in impervious coverage.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
ES5.1	Prioritize new planting and restoration work to increase biodiversity using the Environmental Enhancement areas identified on the Future Land Use Map in this Plan.	ONGOING	$	DPZ	LU6
ES5.2	Develop management guidelines for conservation easements, and particularly in regard to parcels identified as Environmental Enhancement areas on the Future Land Use Map in this Plan.	SHORT TERM	$	DPZ	
ES5.3	Prioritize potential conservation easements on the Greenway Map included in this Plan that are contiguous with existing conservation areas. (see Chapter 4: Land Use for detail on the Greenway Map)	ONGOING	$	DPZ/ DRP	
ES5.4	Promote the City's Pollinator Friendly Garden and Certified Wildlife Area programs to increase the population of pollinating insects and birds and wildlife habitat.	ONGOING	$	CM	
ES5.5	Work with the Department of Recreation and Parks, Annapolis Environmental Commission, the Annapolis Conservancy Board, RePlant Annapolis and other partners to create a comprehensive stewardship guide and training program for city residents aimed at preserving and expanding biodiverse areas.	SHORT TERM	$	CM DRP DPZ	
ES5.6	Explore amendments to the City's site design standards that will increase biodiversity.	SHORT TERM		DPZ	

ENVIRONMENTAL SUSTAINABILITY

GOAL

ES6 **Shrink the City's carbon footprint through a comprehensive approach that includes emissions reductions, energy generation, carbon sequestration, carbon offsets, and other evolving strategies.**

PERFORMANCE MEASURE 1: Achieve a 60% reduction in greenhouse gas emissions by 2031, and net-zero emissions by 2045, which is consistent with the State of Maryland's Climate Solutions Now Act, enacted in 2022.

PERFORMANCE MEASURE 2: A city government greenhouse gas emissions inventory is completed by 2024, and a community greenhouse gas emissions inventory is completed by 2025.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
ES6.1	Implement the recommendations of the City's compost study, including a curbside compost pilot project and the development of a City-managed composting facility.	ONGOING	$	CM DPW	
ES6.2	Plan for the transition of the City's fleet vehicles and transit vehicles to zero emissions vehicles with the goal of complete transition by 2030 (also listed in Chapter 6: Transportation under Goal T3)	ONGOING	$$$	ADOT DPW	T3
ES6.3	Work with BGE and other partners to establish more public car-charging stations in Annapolis, particularly downtown, as well as incentives to establish charging stations at existing multifamily and commercial developments.	ONGOING	$	CM DPW ADOT	T3
ES6.4	Study and propose reductions to the City's parking requirements for all land uses to incentivize the sensible development of underutilized land, reduce impervious coverage, improve stormwater management performance, and encourage walking, biking, and transit use, among other benefits to the City. (Also listed in Chapter 4: Land Use under Goal LU2 and Chapter 6: Transportation under Goal T3)	SHORT TERM	$	DPZ	T3
ES6.5	Update the City's green building requirements to include new standards for energy efficiency, water efficiency, and site design.	MID TERM	$$	DPZ	
ES6.6	Develop planting guidance for maximum carbon absorption for all public and private properties.	SHORT TERM	$$	DPZ	
ES6.7	Complete inventories of greenhouse gas emissions from both city government and community level sources.	SHORT TERM	$$	CM	
ES6.8	Provide incentives to include solar power and green roofs in all new development projects and for building retrofits.	SHORT TERM	$$	DPZ	
ES6.9	Require all new City facilities to include solar power when adequate sun exposure is available, and maximize energy efficiency measures, use of low carbon building materials, adoption of green maintenance practices, as well as conversion of maintenance equipment to electric options.	SHORT TERM	$	CM DPW	

ENVIRONMENTAL SUSTAINABILITY

GOAL

ES7 Reduce the amount of waste reaching landfills through an expansion of existing and new programs.

PERFORMANCE MEASURE 1: The amount of solid waste by ton produced by the City decreases each year.

PERFORMANCE MEASURE 2: Single-use plastic bags within the City are eliminated by 2024.and all single-use plastics are phased out by 2030.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
ES7.1	Continue to explore the development of a City-managed composting facility.	ONGOING	$	CM DPW	
ES7.2	Single-use plastics within the City's waste stream are phased out through legislation and an educational campaign each year until 2030.	SHORT TERM	$$	CM DPW	WR1
ES7.3	Regularly assess the performance of the City's recycling program to identify opportunities for improved performance, expansion, and educational messaging.	ONGOING	$	DPW	
ES7.4	Continue to improve and/or expand resident awareness for how and where to properly dispose of waste materials.	ONGOING	$	DPW	

WATER RESOURCES

GOAL

WR1 **Reinforce an ethic of proactive watershed stewardship through all sectors of the city, including residents, businesses, and institutions.**

PERFORMANCE MEASURE 1: The number of residential and commercial properties utilizing the stormwater fee incentive policy is doubled by 2030.

PERFORMANCE MEASURE 2: Single-use plastic bags within the City are eliminated by 2024 and all single-use plastics are phased out by 2030.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
WR1.1	Require community engagement, minority subcontracting, and other possible programs to broaden community awareness of stormwater management by all City stormwater contractors	SHORT TERM	$	DPZ DPW	
WR1.2	Develop an economic development strategy to promote and attract more green jobs in the city, including businesses focused on stormwater management, restoration, blue technology, renewable energy, and green building.	SHORT TERM	$	DPZ	
WR1.3	Expand the marketing and outreach around a revised incentive policy for the stormwater improvements to encourage more residential and commercial property owners to implement the improvements.	SHORT TERM	$	CM DPW	
WR1.4	Single-use plastics within the City's waste stream are phased out through legislation and an educational campaign each year until 2030.	MID TERM	$$	CM	ES7
WR1.5	Update the Adequate Public Facilities Ordinance to require all new on-site stormwater Management facilities at multifamily residential, commercial, and institutional projects to include interpretive signage that educates passersby on the value of the facility.	SHORT TERM	$	DPZ	
WR1.6	Explore ways of better supporting, leveraging, and coordinating the work of watershed organizations in the Annapolis area that may include: changes to the functioning of the Waterways Cabinet; the establishment of a new organization that consolidates the efforts of multiple organizations; and a dedicated fund, among others strategies.	SHORT TERM	$	CM	

GOAL

WR2 **Reduce the City's volume of stormwater runoff, using a wide array of means to do so.**

PERFORMANCE MEASURE 1: Meet the TMDL goal of a 20% reduction based on the EPA's Chesapeake Bay pollution diet.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
WR2.1	Revise the incentive policy for the Stormwater improvements to encourage more existing residential and commercial properties to implement the improvements particularly sites that currently have large impervious areas and limited or no stormwater treatment facilities.	SHORT TERM	$	CM DPW	
WR2.2	Work with local partners such as Chesapeake Bay Trust and Watershed Stewards Academy to develop a dedicated program that encourages Annapolis homeowners associations to implement green infrastructure projects to capture and treat more stormwater on site. Such a program would leverage funds already available through the Watershed Restoration Fund.	SHORT TERM	$$	CM DPW	
WR2.3	Work with local partners such as the Chesapeake Bay Trust, the Watershed Stewards Academy, and business associations to develop a dedicated program aimed at Annapolis commercial property owners and stormwater improvements on large impervious areas. Such a program would leverage funds already available through the Watershed Restoration Fund.	SHORT TERM	$$	CM DPW	
WR2.4	Utilize the Greenway Plan and assistance from the Annapolis Conservancy Board to prioritize the conservation of undeveloped areas that would have the highest benefit to reducing stormwater runoff. (see Chapter 4: Land Use for details regarding the Greenway Plan)	SHORT TERM	$	DPZ	
WR1.5	Adopt "Green Street" design standards that include maximum tree planting, use of silva cells, micro bioretention, permeable pavers, and other integrated stormwater best management practices.	SHORT TERM	$$	DPZ DPW	T3

WATER RESOURCES

GOAL

WR3 **Practice a comprehensive approach toward watershed restoration that reinforces the both ecological and cultural value of Annapolis' waterways.**

PERFORMANCE MEASURE 1: By 2030, all of the City's major creeks will meet water quality standards for fishing and swimming, and by 2040 all of the City's major creeks will meet the same standards after a major rain event.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
WR3.1	Prepare small area plans for each of the City's creek watershed areas that coordinate land use with environmental goals to support both the continued improvement of the City's waterways and a model for sensible infill development.	MID TERM	$$	DPZ	LU1
WR3.2	Leverage the City's share of Anne Arundel County's Watershed Protection and Restoration Fee (WPRF) to address stream and shoreline restorations that will improve both ecological function and public use.	SHORT TERM	$	DPW DPZ	
WR3.3	Ensure that the majority of the funds from City's stormwater fee is used for new restoration projects.	SHORT TERM	$	DPW	
WR3.4	Ensure that a maintenance strategy is included in the planning, design, and budgeting for all watershed restoration projects, which should include the identification of dedicated funding sources for maintenance.	ONGOING	$	DPW	
WR3.5	Conduct more regular and comprehensive water quality testing of all waterways in the city by supporting the work of the Spa Creek Conservancy through funding, collaboration, or other means.	SHORT TERM	$$	DPW DPZ	
WR3.6	Explore training opportunities for Parks maintenance staff to include habitat restoration, conservation land management, and green stormwater infrastructure maintenance.	ONGOING	$	DRP	CF1
WR3.7	Work with the Maryland Department of the Environment and Department of Natural Resources to promote current fish consumption advisories and a program of regular testing of fish from local waters.	SHORT TERM	$	DRP DPZ	ES4
WR3.8	Update City standards to ensure that all new, replaced, or enhanced stormwater outfall facilities are designed in coordination with public water access so that recreational opportunities are not negatively impacted. (Also listed in Chapter 7: Community Facilities under Goal CF3)	ONGOING	$	DPW DRP DPZ	CF3

WATER RESOURCES

GOAL

WR4 Provide high quality, safe drinking water to all customers.

PERFORMANCE MEASURE 1: Field data gathering strategies for input into the City's water distribution system asset condition assessment model are fully implemented by 2024.

PERFORMANCE MEASURE 2: Identified water distribution system replacement projects as informed by the updated condition assessment and consequence of failure models are completed by 2035.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
WR4.1	Continue to gather water distribution system condition data to inform the projects to be completed.	ONGOING	$	DPW	
WR4.2	Ensure that the 10-year Water and Sewer Plan continues to be updated regularly.	SHORT TERM	$	DPW	
WR4.3	Continue to budget for and complete the water pipe replacement projects as identified in the 10-year Water and Sewer Plan and/or as informed by updated condition assessment and consequence of failure models.	ONGOING	$$	DPW	

GOAL

WR5 Manage the City's wastewater infrastructure proactively to mitigate instances of failure, backups, and overflows.

PERFORMANCE MEASURE 1: Complete the baseline inspection of all City sewers per National Association of Sewer Service Companies (NASSCO) standards by 2032.

PERFORMANCE MEASURE 2: Identified sewer replacement or relining projects as informed by the updated condition assessment and consequence of failure models are completed within 2 years of identification.

ACTION #	RECOMMENDED ACTION	TIMING	COST	AGENCY	RELATED GOALS
WR5.1	Continue sewer inspections and ramp up the pace of inspections per NASSCO standards.	ONGOING	$	DPW	
WR5.2	Ensure that the 10-year Water and Sewer Plan continues to be updated regularly.	SHORT TERM	$	DPW	
WR5.3	Continue to budget for and complete the wastewater collection system projects as identified in the 10-year Water and Sewer Plan and/or as informed by updated condition assessment and consequence of failure models.	ONGOING	$$	DPW	
WR5.4	Explore with Anne Arundel County the feasibility of generating commercial compost using the bio-solids produced at the Annapolis Water Reclamation Facility.	MID TERM	$$	DPW	