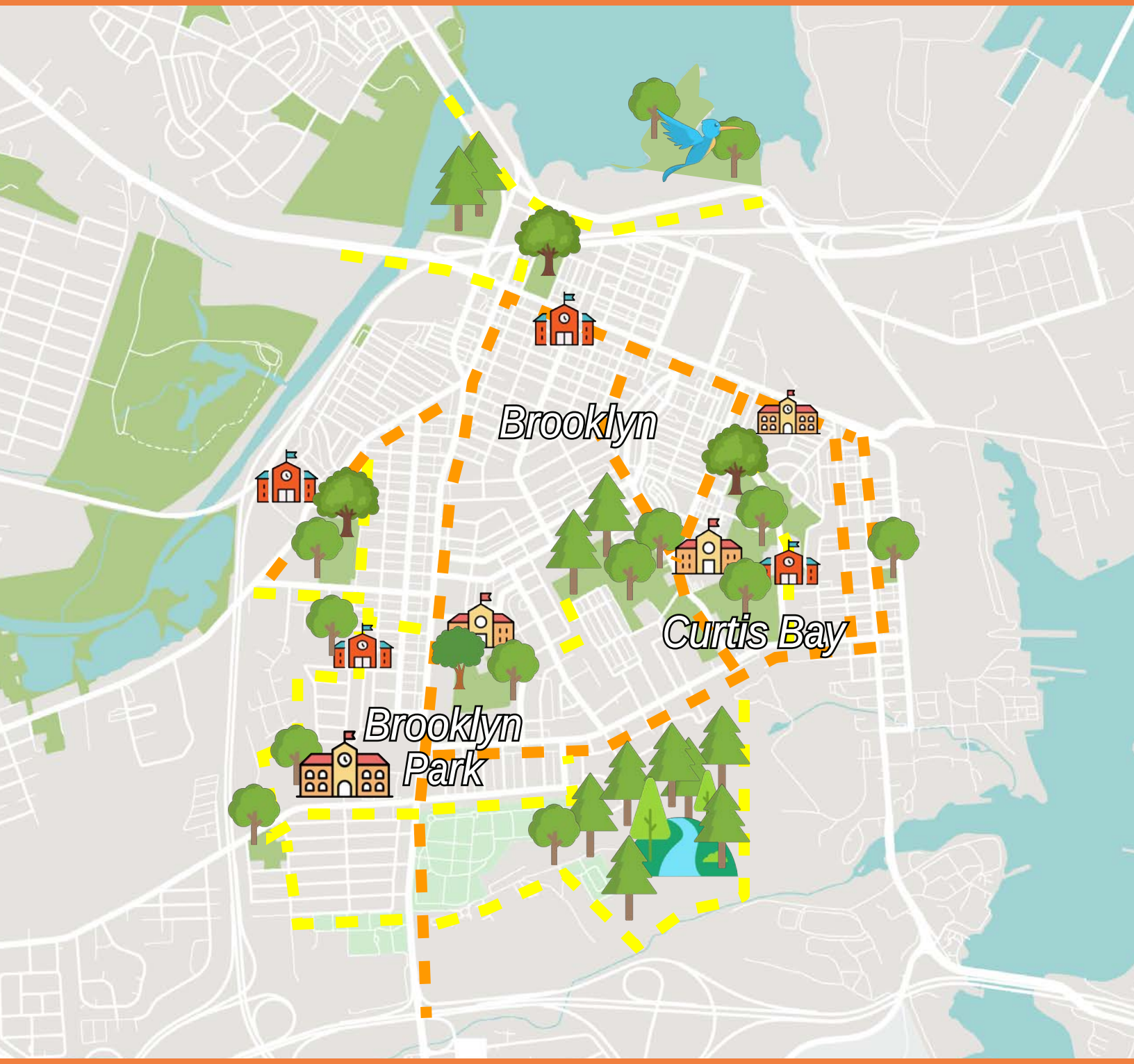
GREATER BAYBROOK
GREEN NETWORK PLAN

A COMMUNITY VISION PLAN FOR INCREASING CONNECTIVITY & ENHANCING GREEN ASSETS



June 2022

GREEN NETWORK PLAN
CONTRIBUTIONS

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A1. WHAT IS A GREEN NETWORK PLAN?

The Green Network Plan was designed by determining ongoing investment strategies in the neighborhood, evaluating opportunities and constraints, and analyzing demographics, park equity, environmental justice, and other current site conditions. This green network plan can be used as a guide for creating community priorities for short-term and long-term development related to ***economic*** and ***environmental sustainability***.

The goal of this ***Green Network Plan*** is to ***enhance and strengthen*** the community of the Greater Baybrook by connecting the area's ***green infrastructure*** into a ***unified network of safe and vibrant neighborhoods***. It is a ***Vision Plan*** for how the neighborhood can enhance its existing natural resources and grow its infrastructure to ***improve the health and well-being of residents.*** It has been widely researched that communities with green infrastructure have increased economic, environmental, and social benefits (EPA, 2014). This increased exposure to the natural environment promotes physical health (McCurdy, 2010), mental well-being (Kaplan, 1995), and social connectivity (Jennings, 2019).

Figure 1: Photo of Mural on S Hanover Street by Maura Dwyer

Source: Original Image

A.2 OPPORTUNITIES & CONSTRAINTS

Inventory and analysis were performed through geographical information system mapping, site visits, and studying existing transportation and other master plans. The following opportunities and constraints were identified based on this research:

OPPORTUNITIES

After analyzing the existing conditions of the Greater Baybrook, the following opportunities were identified as areas that could be capitalized on for future development projects:

Existing & Planned Trails

There are several parks with existing trail systems and areas where planned trails and cycleways have been identified as future projects. These existing and planned multimodal transportation options should be prioritized and used for implementing further non-vehicular connections within and outside the community.

Existing Undeveloped & Vacant Land

The Greater Baybrook includes several large areas of forested undeveloped land. These scarce natural resources provide ecosystem services such as clean air and water, flood control and provide habitat for wildlife. Land conservation or sustainable development planning is important to preserve what little natural resources are left within this community. In addition, there were many areas within the Greater Baybrook with Vacant and often treeless lots being underutilized.

Bridges Across Patapsco River

The S Hanover Street Bridge and the W Patapsco Avenue Bridge provide opportunities to connect with communities outside the Greater Baybrook. These multiple lane bridges with existing sidewalks can be redesigned to be more pedestrian and bike friendly, providing multimodal connectivity and creating a more inviting gateway into the neighborhood.

Existing Waterways

With its peninsular location, the Greater Baybrook is surrounded by water on two sides and includes several natural and man-made waterways. By prioritizing these blue assets, the identity of the community can be strengthened, and the natural benefits that are provided by water can be experienced.

CONSTRAINTS

After analyzing the existing conditions of the Greater Baybrook, the following constraints were identified as areas that require prioritization for improvement and redevelopment:

Highway & Industrial Barriers

Industry and transportation have been prioritized over residential living. Large highway systems create barriers to the west and south and industrial zoned land cut off the coastline to the north and east. Waterways are part of the identity of the Greater Baybrook, yet almost all of the coastline is not accessible to residents.

Fragmentation of Parks and Greenways

The Park system of the Greater Baybrook is fragmented, with little to no connections between parks and other green assets. Multimodal transportation options like bikeways and trails connecting green assets would create a unified network of accessible public spaces.

Condition of Existing Parks

Site visits to each of the Greater Baybrook parks showed that overall, park maintenance and amenities are lacking, especially in low income and minority neighborhoods. Many parks are missing basic park necessities like picnic tables and water fountains in addition to evidence of neglect resulting in excessive litter and illegal dumping. Certain neighborhoods inventoried were noted to have an extremely low percentage of public park land.

Low Canopy Coverage

Areas nearby industrial sites, commercial corridors, certain low income areas, and even some schools and parks have been inventoried in the Greater Baybrook as having low canopy coverage. Heat island effect, caused by a high percentage of asphalt and low tree canopy increases temperatures and can lead to mild or severe heat-related illness. Trees are critical infrastructure for communities that provide immeasurable rewards for communities, such as numerous environmental, social, economic benefits.

Areas with Poor Water Infiltration

Due to a combination of low canopy coverage, high impervious surfaces, and lack of low impact development, several areas of the Greater Baybrook suffer from poor water infiltration causing flooding during significant rain events.

A3. GOALS

Based on the inventory and analysis performed and opportunities and constraints of the community identified, the following Goals and Recommendations were developed as part of the Greater Baybrook Green Network Plan:

Goal 1 - Design Multimodal Infrastructure that Connects the Community

Recommendations:

1: *Design Complete Streets*
2*: Design Roads for Shared Use*
3: *Design Off Road Trails and Shared Use Paths*
4: Increase Safety of Governor Ritchie Highway & Selected Intersections
5: Support connections to Regional Greenways & Nearby Points of Interest

Goal 2 - Enhance Existing Parks

Recommendations:

1: Improve Park Accessibility
2: Increase Recreation Facilities
3: Increase Park Amenities & Park Programming
4: Improve Natural Park Features
5: Improve Non-Natural Park Features
6: Improve Park Incivilities and Maintenance
7: Improve Significant Natural Features

Goal 3 - Expand Park Acreage in Areas of Need

Recommendations:

1: Increase Tree Canopy on Major Roads
2: Increase Tree Canopy in Schools
3: Increase Tree Canopy in Parks

Goal 4 - Increase Tree Canopy Coverage

Recommendations:

1: Increase Tree Canopy on Major Roads
2: Increase Tree Canopy in Schools
3: Increase Tree Canopy in Parks

Goal 5 - Improve Stormwater Management Through Green Infrastructure

Recommendations:

1: Improve Permeability in Commercial Districts through Roadside Bioretention
2: Increase Green Infrastructure along Industrial Areas that Border the Greater Baybrook
3: Improve Stormwater Management in Other Problem Areas

Goal 6- Provide Greater Access to Community Waterways

Recommendations:

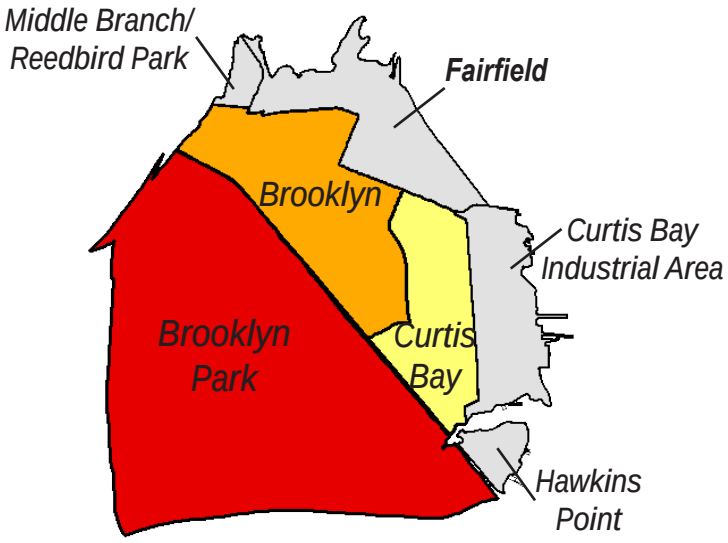
1: Establish a land and estuary restoration plan for the northern shoreline
***2: Create wayfinding devices and quality** signage*
3: Increase multimodal transportation options to Masonville Cove
4: Continue improvements to the Farring-Baybrook Park stream corridor
5: Create a Land Development Plan & Stream Restoration for the Cabin Branch

B1. INTRODUCTION & CONTEXT

The Greater Baybrook is a suburb of Baltimore, Maryland, and located on the peninsula south of downtown Baltimore across the Patapsco River. It is located northeast of the Baltimore-Washington Airport and north of Glen Burnie, MD. Surrounding the area to the west across the Patapsco River is the neighborhood of Cherry Hill and to the east is Wagner's Point. The Greater Baybrook is divided between Baltimore City and Anne Arundel County and there are three main neighborhoods that make up this area; Brooklyn and Curtis Bay, located in Baltimore City, and Brooklyn Park, located in Anne Arundel County. The entire Greater Baybrook area is approximately 3,440 Acres, according to measurements from Google Earth. This area also includes non-residential neighborhoods, such as Fairfield, Curtis Bay Industrial Area, Hawkins Point, and Reedbird Island Park.

Figure 2: Greater Baybrook Context Map

Figure 3: Map of Greater Baybrook Counties



Source:, Anne Arundel County and Baltimore City Open Source Data

Figure 4: Map of Greater Baybrook Neighborhoods

Source:, Anne Arundel County and Baltimore City Open Source Data

B2. NEIGHBORHOODS

Brooklyn

Located at the northeast is Brooklyn, the northern gateway neighborhood for Greater Baybrook. The neighborhood is more urban than the other neighborhoods and is made up of a retail district on Hanover Street and Patapsco Avenue and several different smaller residential areas with a mix of affordable housing, townhouses, and single-family detached homes. Garrett Park is the major asset of the neighborhood and provides beautiful views of the Baltimore skyline.

Curtis Bay

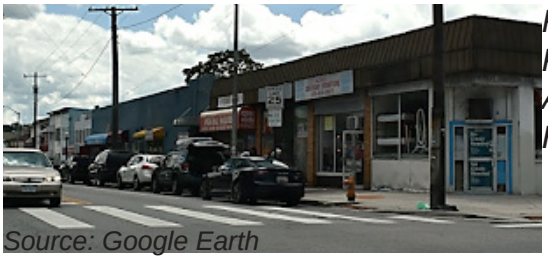
Located on the east side of the Greater Baybrook peninsula, this neighborhood borders heavy industrial areas along the coast with retail and light industrial areas on Pennington Avenue. Along the west, more residential side, the neighborhood borders Farring-Baybrook park, and includes other great assets, such as the Myers Soccer Pavilion, Filbert Street Community Garden, and the historic Curtis Bay Water Tower.

Brooklyn Park

To the south is the neighborhood of Brooklyn Park. Less diverse than the other neighborhoods, Brooklyn Park includes the highest number of parks and greenspaces and is less densely populated. There are several large shopping plazas along Governor Ritchie Highway with major big-box retailers. This neighborhood is highly residential and includes several smaller neighborhoods, including Old Brooklyn Park, Brooklyn Heights, Arundel Village, and Arundel Gardens.

Source: Original Photo

Figure 5: Garrett Park Views



Source: Google Earth

Figure 6: Patapsco Ave & Hanover

Figure 7: Filbert Street Garden

Source: Original Photo

Figure 8: Curtis Bay Water Tower

Figure 9: New Development

Source: Original Photo

Figure 10: Single-Family Homes

B3. HISTORY

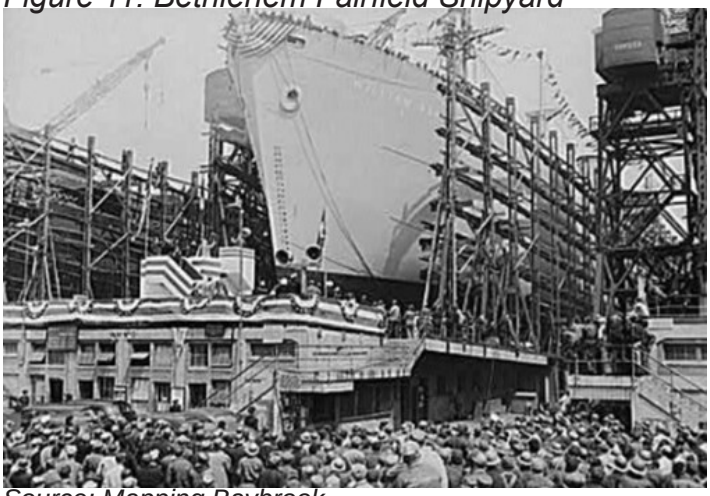
Originally a rural farming community, major development began in the 1850s when two farmers created a land company and built the "long bridge" connecting Brooklyn to Baltimore City's Federal Hill across the Patapsco River (Mapping Baybrook, n.d.). By the 1890s, there were railroad tracks and streetcars connecting the area to Baltimore. The bridge began to wear down, and in 1915 was decommissioned (Forgo, 2019).

Brooklyn and Curtis-Bay were part of Anne Arundel County until annexation by Baltimore City in 1918. The name "Baybrook" comes from combining the names of Brooklyn and Curtis Bay. The coastline and railroad, made this a perfect location for industry and in World War II, this was home to the largest shipyard on the east coast, constructing nearly 400 ships by the end of the war (Mapping Baybrook, n.d.). This boom in industry led to many immigrants flocking into the area including a large Polish immigrant community. After the great prosperity during the war, much like the rest of Baltimore, industry declined and many factories moved south, leading to unemployment of many area residents (Baltimore Heritage. n.d.).

Today, historic buildings have been repurposed for other businesses, however, much of the retail districts of the Greater Baybrook are in need of restoration. Most of the coastline on the peninsula is used for industrial sites, cutting off views of the water for residents. Located nearby is a coal-burning power-plant, a chemical-processing plant, a medical waste incinerator, and many highways that transport large trucks through the area.

Environmental activism has become an important part of the culture of this area. This activism has led to land preservation for wildlife, community revitalization, and is making strides in the Greater Baybrook's battle over cleaner air. In 2016, local activists, including many students, prevented a new waste incinerator from being built in Curtis Bay, which would have burned 4,000 tons of trash per day (Fears, 2016).

Figure 11: Bethlehem Fairfield Shipyard



Source: Mapping Baybrook

Figure 12: Waste Incinerator Protest

Source: Chesapeake Climate Action Network

B4. DEMOGRAPHICS

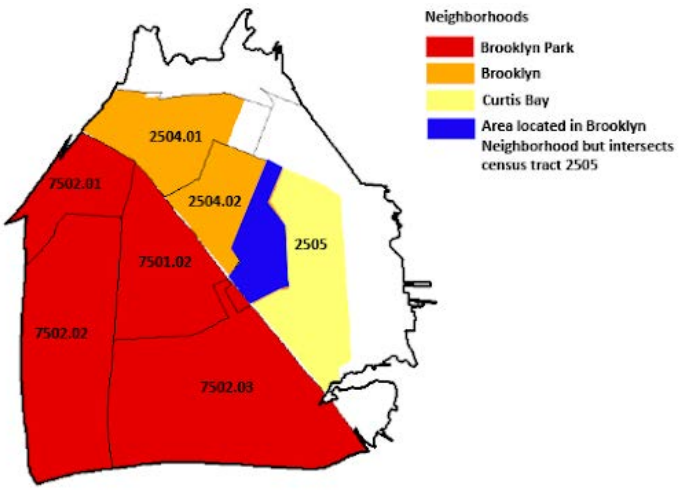
The demographics data below is summarized by each neighborhood in the Greater Baybrook. The data was extracted from the U.S. Census 2019 American Community Survey and aggregated by census tract for the corresponding neighborhood where each census tract resides. Please note that census tract 2505, which is primarily part of the Curtis Bay neighborhood, also has a small area that is considered the Brooklyn neighborhood, see blue area in figure below. For that reason, the table below includes an additional column that totals both Brooklyn and Curtis Bay neighborhoods. Additionally, census tract 2505 extends farther than the Greater Baybrook area of interest, however, those additional areas are exclusively industrial and therefore do not alter the validity of the demographics data as there is no residential population.

Overall, the Greater Baybrook is composed of approximately 24,000 residents, 25% are children under the age of 18 and 11% are seniors over 65 years of age. Although it is a very small region, each neighborhood is very distinct in its demographics and cultural identity. Based on the table and maps presented, Brooklyn Park has the largest population and total area of the three neighborhoods. This neighborhood is considered Anne Arundel County and ranks highest in educational attainment, has the highest median household income, an extremely high percentage of owner-occupied units, and the lowest percentage of vacancy. The racial composition of the Brooklyn Park neighborhood is primarily white (non-Hispanic or Latino), followed by much lower percentages of black and Hispanic residents. The Brooklyn neighborhood is the second highest population which is composed of mostly black or African Americans, followed by white (non-Hispanic or Latino) and then Hispanic residents. The Brooklyn neighborhood has the largest commercial area out of the three neighborhoods which is why there may be more apartments and mixed-used developments which could account for the neighborhood having the lowest owner-occupied units and the most total units overall. Brooklyn ranks second in median household income, vacancy and educational attainment.

The neighborhood of Curtis Bay has the lowest total population and makes up the smallest neighborhood in total area. The racial composition is primarily white (non-Hispanic or Latino), followed by black or African American, and then Hispanic residents. Curtis Bay has the lowest median household income, lowest educational attainment, lowest total housing units, and highest vacancy.

Based on the comparison charts in Figures below, the Greater Baybrook has a larger Hispanic or Latino composition than both Maryland and Baltimore City and has a much lower median household income compared to the state of Maryland.

Figure 13: Census Tracts by Neighborhood



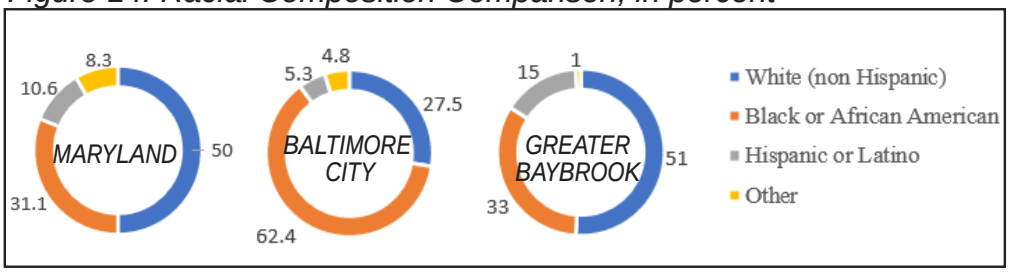
Source: U.S. Census Tiger Data, Baltimore City Open Source Data

Table 1: Demographics by Neighborhood

Topic	Brooklyn Park Census Tract 7501.01, 7501.02, 7502.02, 7502.03	Brooklyn Census Tract 2504.01, 2504.02	Curtis Bay Census Tract 2505	Brooklyn & Curtis Bay Census Tract 2504.01, 2504.02, 2505	Total
Population	11,455	8,573	4,252	12,825	24,280
Child (<18)	23%	29%	23%	27%	25%
Senior (65+)	14%	8%	11%	9%	11%
Racial Composition	White (Non-Hispanic): 62% Black: 21% Hispanic: 14%	White (Non-Hispanic): 36% Black: 45% Hispanic: 17%	White (Non-Hispanic): 54% Black: 38% Hispanic: 12%	White (Non-Hispanic): 42% Black: 43% Hispanic: 15%	White (Non-Hispanic 51% Black: 33% Hispanic: 15%
Educational Attainment (25+)	< HS Diploma: 16% HS Diploma: 39% Some College: 22% Associates: 9% Bachelors or > : 13%	< HS Diploma: 23% HS Diploma: 41% Some College: 21% Associates: 4% Bachelors or >: 11%	< HS Diploma: 35% HS Diploma: 37% Some College: 19% Associates: 3% Bachelors or >: 7%	< HS Diploma: 27% HS Diploma: 40% Some College: 20% Associates: 3% Bachelors or >: 10%	< HS Diploma: 22% HS Diploma: 39% Some College: 21% Associates: 6% Bachelors or >: 11%
Median Household Income	$64,294	$42,386	$37,395	$40,722	$54,192
Housing Units	Total: 3,467	Total: 3,677	Total: 2,467	Total: 6,144	Total: 9,611
Housing Tenure	Owner-Occupied: 75% Renter-Occupied: 17% Vacant: 8%	Owner-Occupied: 29% Renter-Occupied: 50% Vacant: 22%	Owner-Occupied: 31% Renter-Occupied: 38% Vacant: 32%	Owner-Occupied: 30% Renter-Occupied: 45% Vacant: 26%	Owner-Occupied: 46% Renter-Occupied: 35% Vacant: 19%

Source: U.S. Census Data by Census Tract

Figure 14: Racial Composition Comparison, in percent



Source: U.S. Census Bureau Quick Facts,

Figure 15: Median Household Income Comparison, in dollars

Source: U.S. Census Bureau Quick Facts,

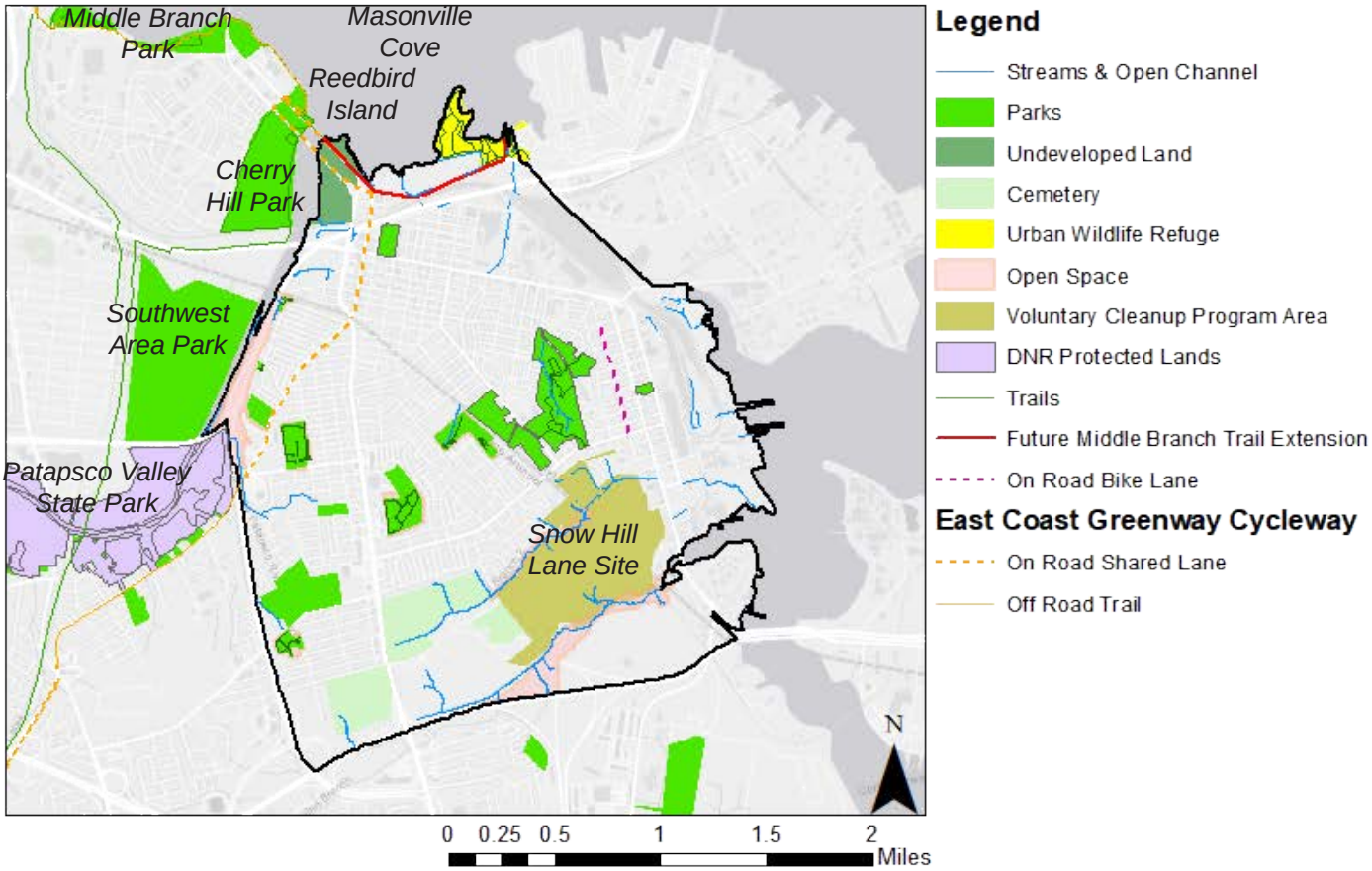
B5. EXISTING PARKS, TRAILS, AND GREENSPACES

The figure below is a compilation of all parks, trails and green spaces within the area. This summary also includes cemeteries, undeveloped land, urban wildlife refuge, voluntary cleanup program area, open spaces, in addition to the previously mentioned parks, schools, and trails. Outside of the Greater Baybrook area of interest, there are additional parks and Maryland Department of Natural Resources (MDNR) protected lands, all of which make up the “emerald necklace” in the Olmsted Baltimore Park Plan. These parks, all along the coast line, include Middle Branch Park, Cherry Hill Park, Southwest Area Park, and Patapsco Valley State Park. As shown in Figure 33, greenspace made up of parks and schools, undeveloped land, cemeteries, and the wildlife refuge accounts for 11.1% of total land in the Greater Baybrook.

The undeveloped land along the water to the northwest is Reed Bird Island, the site that became a dumping ground for the waste from the construction of the highly protested Cherry Hill waste incinerator that was demolished in 1976 (Chapman, 2014). There is no entrance, trails or signage, but it is used by some locals for camping and exploring as well as providing shelter for a small homeless population.

To the south, there is a large wooded area called Snow Hill Lane can be considered a brownfield because it was the site of an unpermitted dump in the 1950s through 1970s (Maryland Department of the Environment [MDE], 2008). In 1991, the U.S. Environmental Protection Agency conducted a removal action and in 2003, an environmental site assessment was performed. Towards the northern portion of the site, four acres were found to be filled with construction materials and other miscellaneous debris and laboratory analysis detected levels of antimony, arsenic, lead, and mercury (MDE, 2008). The property was accepted into the Voluntary Cleanup Program (VCP) in 2005 and The Maryland Department of the Environment is currently overseeing the development of this area (R. Hanson, MDE, personal communication, December 3, 2020). According to Hanson, The majority of the area is planned for residential development, with the exception of the northernmost area where no development plans have been communicated. There may be stream restoration efforts occurring along the Cabin Branch in this area.

Figure 16: Map of Greater Baybrook Green Infrastructure



Source: Maryland, Baltimore City, and Anne Arundel County Open Source Data, Open Street Map

Figure 17. 1904 Olmsted Baltimore Park Plan

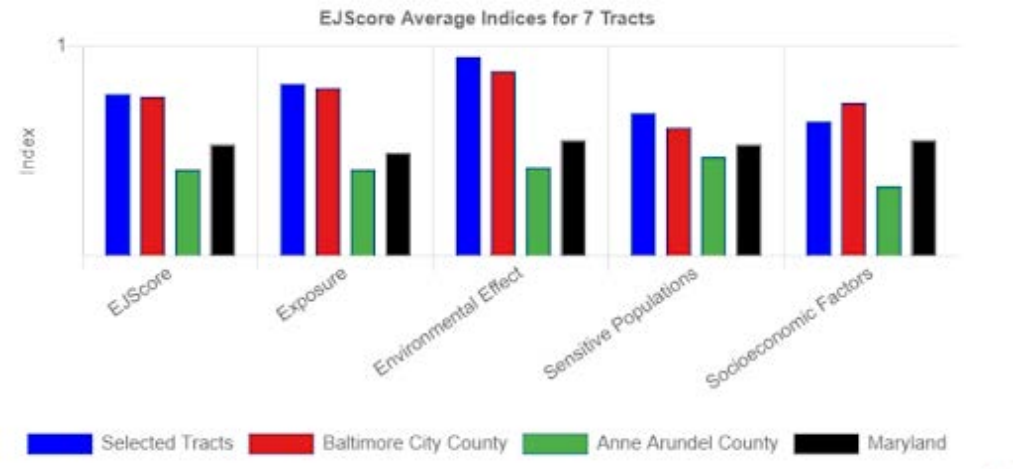
Source: Wordpress.com

B6. ENVIRONMENTAL JUSTICE

Maryland EJ Screen is a tool used for mapping environmental justice in Maryland. It is scored by combining the pollution burden of environmental effects and exposure by population characteristics, such as sensitive populations and socioeconomic factors. Based on Maryland's Environmental Justice Mapper, the census tracts within Brooklyn, Curtis Bay, and the northern portion of Brooklyn Park scored higher in environmental justice concerns than 83-90% of census tracts within the state of Maryland. Within the southern portion of Brooklyn Park, these census tracts scored higher than 58-63% of census tracts in the state.

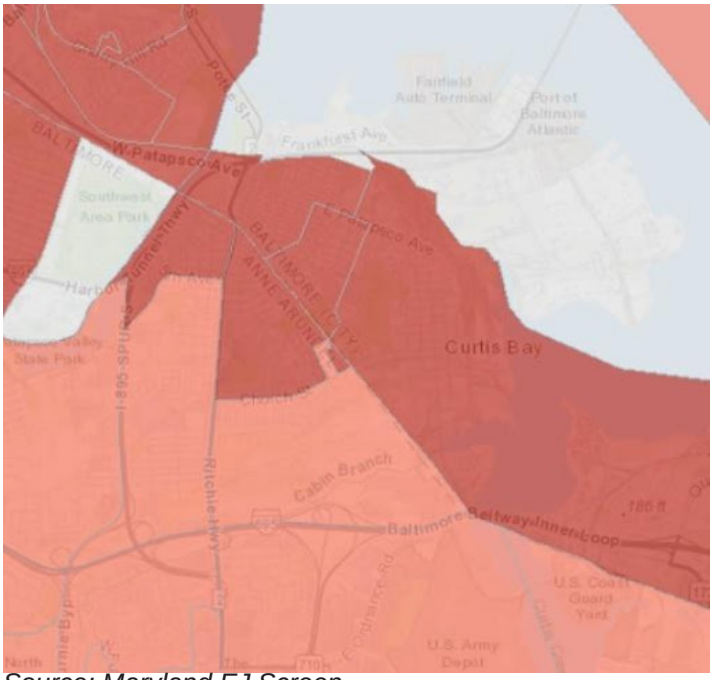
Comparisons within the state show that the Greater Baybrook Census tracts scored higher than Baltimore City, Anne Arundel, County, and the State of Maryland in environmental effect and sensitive populations. Greater Baybrook scored similarly to Baltimore City in EJ score and exposure, with both Greater Baybrook and Baltimore City showing vastly higher scores than Anne Arundel county or the state.

Figure 18: Environmental Justice Comparisons



Source: Maryland EJ Screen

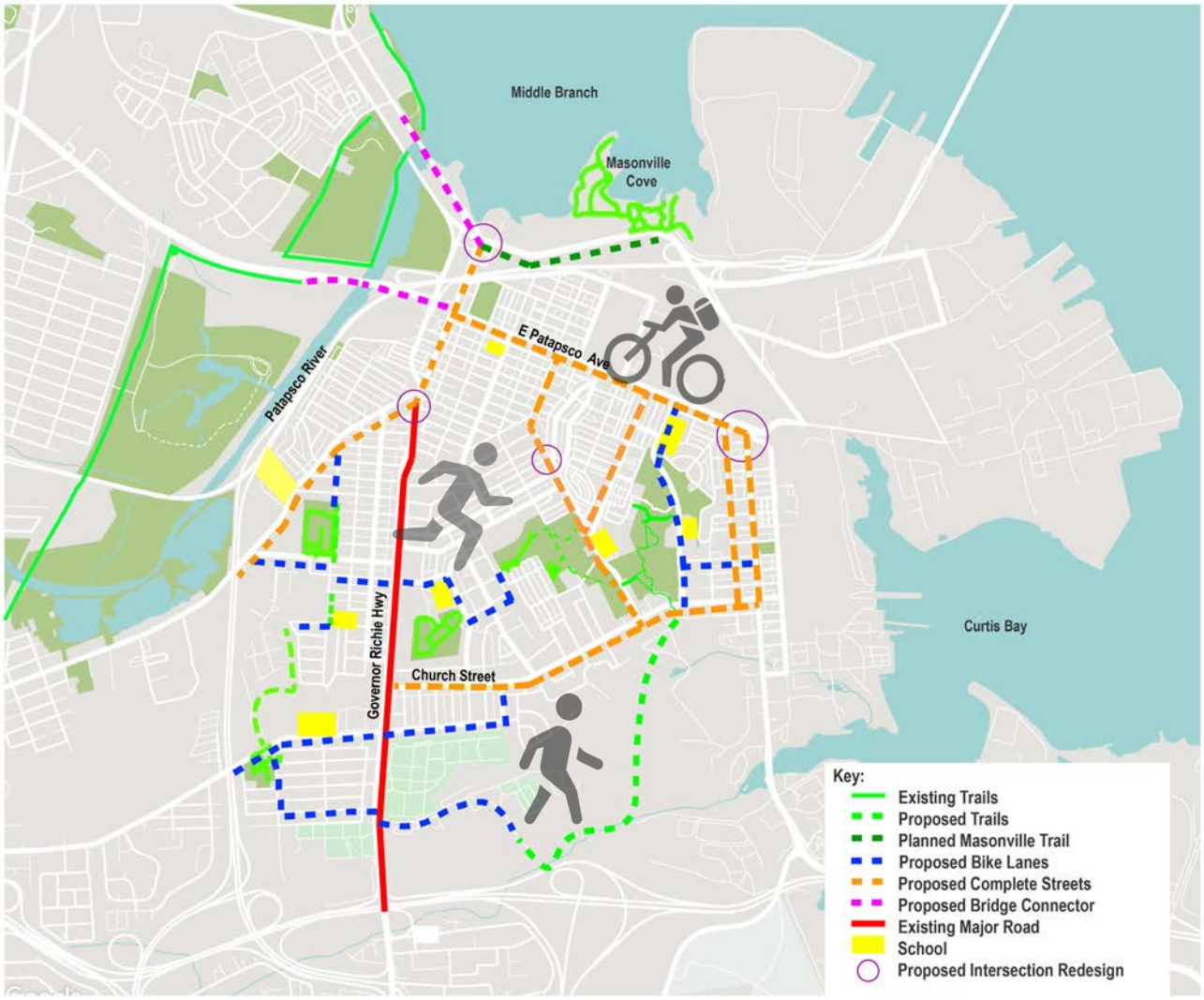
Figure 19: Map of Environmental Justice Concerns



Source: Maryland EJ Screen

GOAL 1

DESIGN MULTIMODAL INFRASTRUCTURE THAT CONNECTS THE COMMUNITY

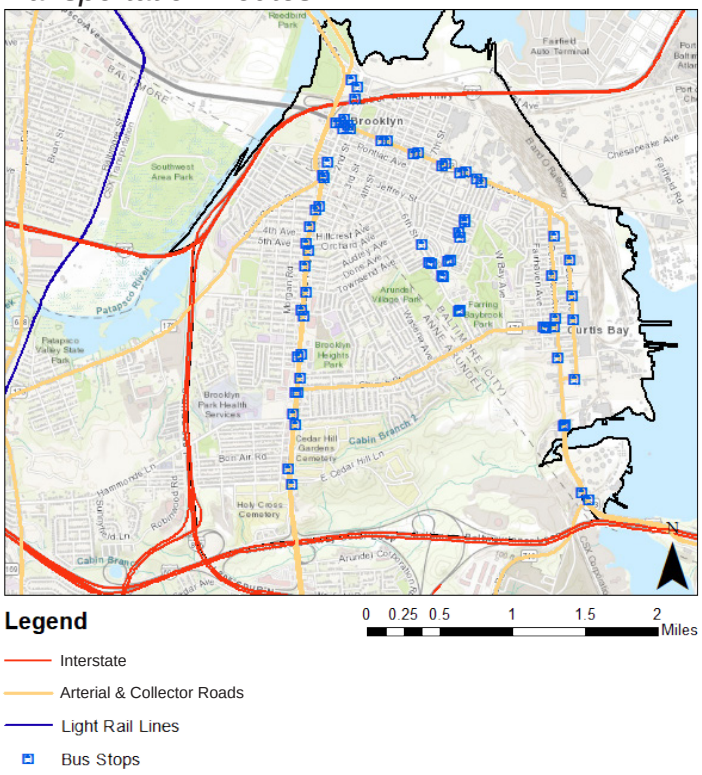


C1. TRANSPORTATION INVENTORY

The Greater Baybrook is formed by the shape of interstate 695 and 895 that wraps around the north, south, and west sides, creating a barrier between neighboring communities and the Patapsco River. At the North, Highway 895 becomes the Baltimore Harbor Tunnel, connecting the Greater Baybrook to the Baltimore inner harbor and is also a main route for travelers moving through Baltimore.

Maryland Route 2, (Governor Ritchie Highway), East Patapsco Avenue, Pennington Avenue, Curtis Avenue, and Church Street form a connection of arterial and major collector roads that circles the area. The other roadways are collector and local roads that connect the Greater Baybrook residential neighborhoods.

Figure 20: Greater Baybrook Map of Transportation Routes

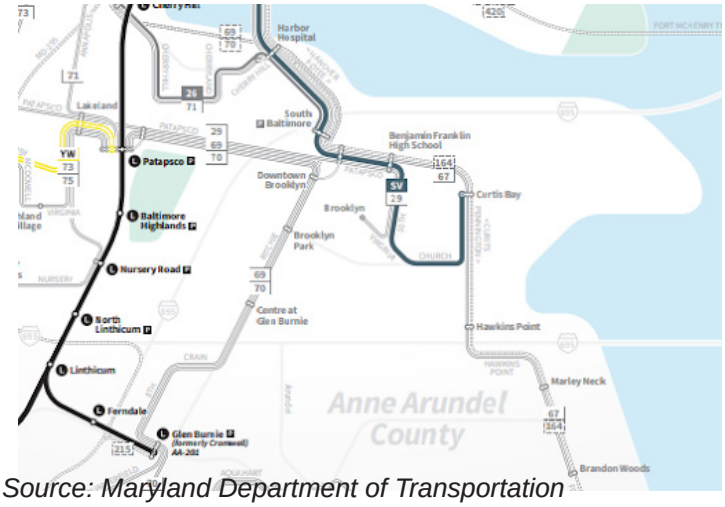


Source: Open Street Map, Maryland Open Source Data

Bus Stops run along most of the arterial and major collector roads as well as 6th street and 10th street that connect the inner Brooklyn neighborhoods just north of the Farring Baybrook Park. The city Link Route "SV" Curtis Bay to Johns Hopkins or Morgan state runs through the north of the area and is considered frequent service that runs 24 hours a day. Local Link routes are the other bus routes that are considered daily service and run every 20 to 60 minutes daily, often with more frequent service during AM and PM peaks.

A light rail train route does not directly run through the area, but the Patapsco Light Rail

Figure 21. Map of Baltimore Bus Routes



Source: Maryland Department of Transportation

C2. TRAILS INVENTORY

The trails within the Greater Baybrook include both cycleways and pedestrian trails. There are also trails located in many of the public parks as well as within Masonville Cove, an urban wildlife refuge partnership and environmental education center.

The Rails-to-Trails Conservancy is planning to create a trail corridor that will connect the Cherry Hill and Middle Branch parks, located across the Patapsco river to the northwest, to Masonville Cove. This would connect the Baltimore Greenway Trails Network to the Greater Baybrook.

Additionally, the East Coast Greenway, the walking and biking route stretching from Maine to Florida, runs through the Greater Baybrook as an “on road” connection. It runs along Bell Grove Road connecting to South Hanover Street and Potee Street and running northwest to Cherry Hill across the Patapsco River.

Figure 22. Image of Masonville Cove Trails Map

Source: MasonvilleCove.org

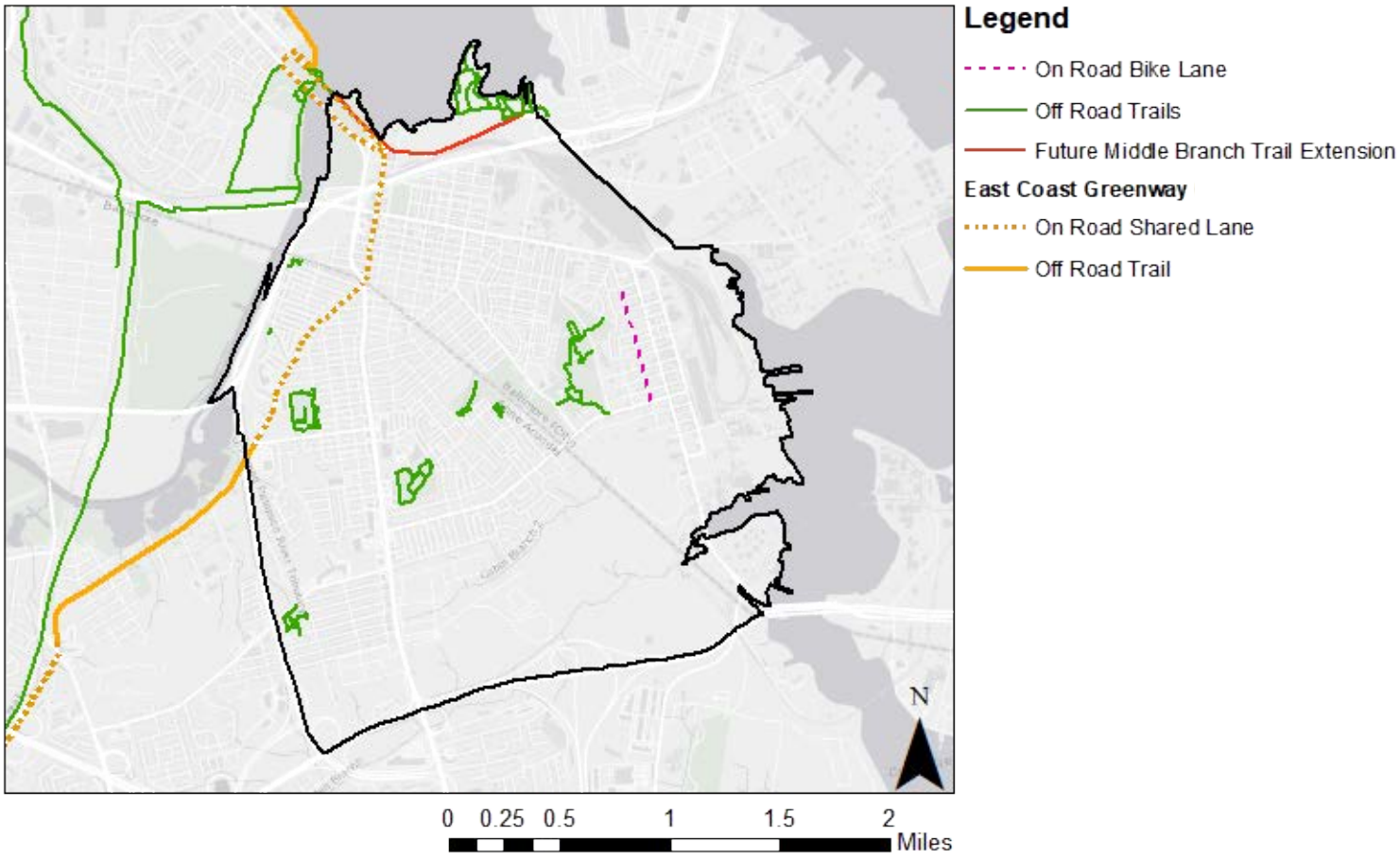
Figure 23: Baltimore Greenway Trails Network

Source: Baltimore Greenway Trail Network

Figure 24: Map of the East Coast Greenway

Source: eastcoastgreenway.org

Figure 25: Map of Existing Greater Baybrook Trails and Bike Routes



Source: Baltimore city and Anne Arundel County Open Source Data s and Bike Routes

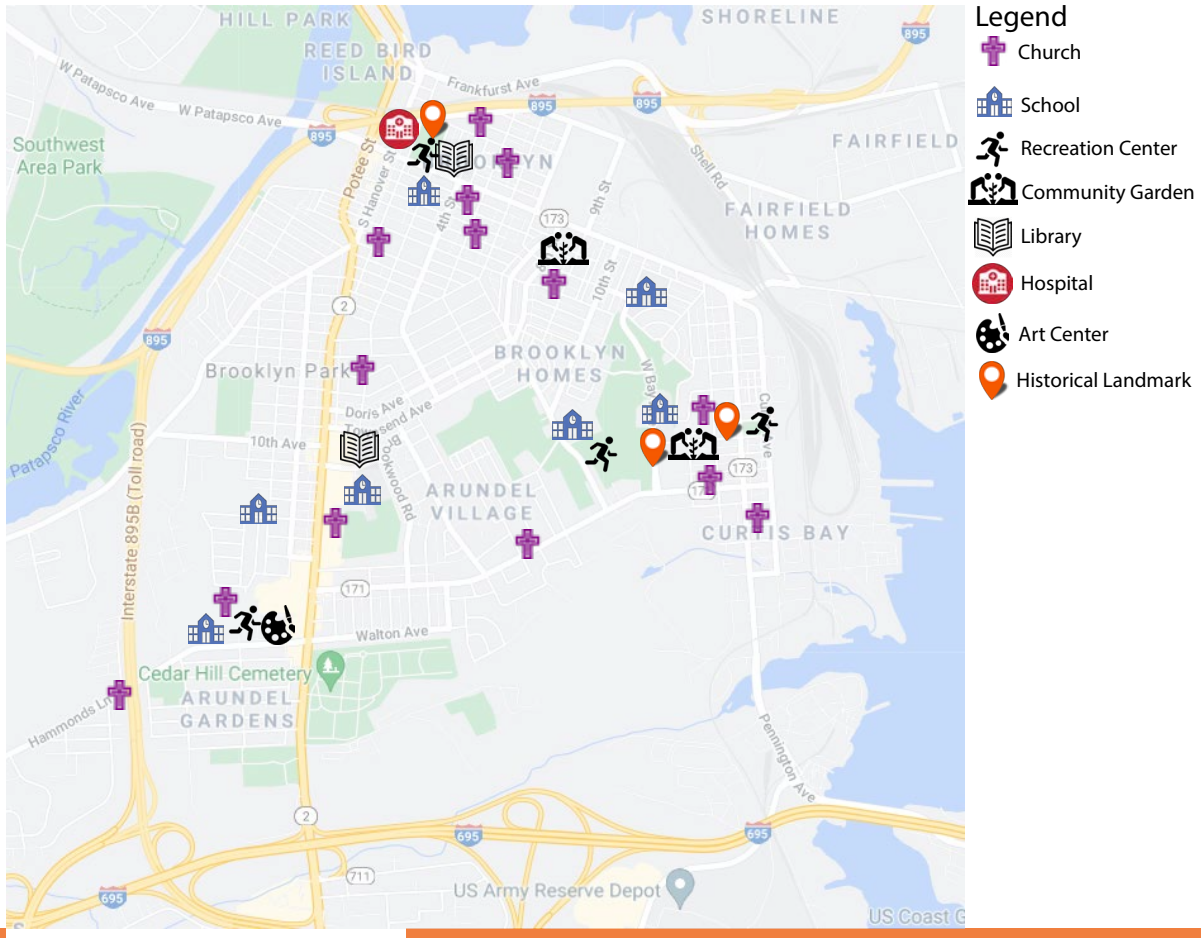
C3. COMMUNITY LANDMARKS AND CULTURAL ASSETS

Understanding cultural assets is important because these valuable places describe the identity, cultural resources, and patterns that exist in a community. The map below shows that churches are an important part of this community by looking at the high number of them in the neighborhoods. Most schools are located within a few blocks of a park and both libraries are located next to schools. Curtis Bay Water Tower is a historical landmark designed by the Bureau of Public Works. The water tank has a masonry shell using bricks of 20 different shades of brown. It is considered one of the most beautiful and intricate architecture designs in Baltimore (Baltimore Heritage Inc., 2021).

According to Baltimore Heritage, Inc. (2020), Garrett Park was the first park in the Greater Baybrook and was named after Robert Garret, a famous Olympic athlete that later became the head of the Baltimore Parks Commission.

There are two community gardens in the area, Filbert Street Garden in Curtis Bay and City of Refuge Victory Garden in Brooklyn. The Filbert Street Gardens is a community garden and farm that was created as part of Baltimore's adopt a lot program. Their mission is to "provide the community with fresh food through farming and education". The City of Refuge Victory Garden is a smaller garden whose mission is "to create, educate and inspire green living in Baltimore." (Farm Alliance Baltimore, n.d.)

Figure 26. Map of Greater Baybrook Cultural Assets



C4. EXISTING GREENWAY & MASTER PLAN INITIATIVES

Greater Baybrook is an area that is fragmented and lacks accessible connections to infrastructure and amenities within the community as well as outside its borders. There are many different capital improvement projects and master plans that include an alignment through Greater Baybrook, however, there are currently no safe connections that exist to connect local and regional green infrastructure. Designing an alignment that improves connectivity to surrounding areas could benefit the community by increasing visitors that will spend money at local businesses, making the community more attractive, increasing property values, encouraging exercise and healthy lifestyles, and providing residents with alternative transportation options (Greater Washington Partnership, 2020). A multi-modal street and trail alignment would increase access for residents and connect the Greater Baybrook neighborhoods to Regional Greenways, local trail systems, nearby parks, and other important amenities.

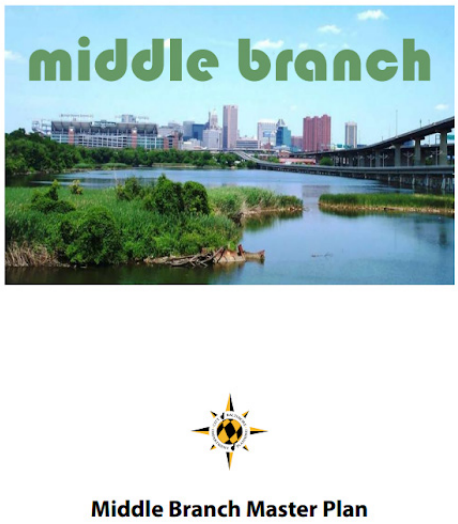
These following recommendations are supported by other master planning initiatives such as:

- ***Baltimore Green Network Plan (2018)*** –The proposed trail connecting Middle Branch Park and Masonville Cove is considered a priority corridor "with the strongest potential to create a connected network between major parks, institutions, neighborhoods, employment, and transportation centers (Baltimore City Department of Planning, 2018)".
- ***Middle Branch Master Plan (2007)*** –Part of the recreational path system that links existing and new communities shows the proposed alignment connecting Middle Branch Park and Masonville Cove.
- ***Patapsco Regional Greenway Concept Plan and Implementation Matrix (2019)*** – The proposed Masonville Trail connects Masonville Cove to the Patapsco Regional Greenway through an off-road trail along the Frankfurst Ave.

Figure 27: Baltimore Green Network Plan

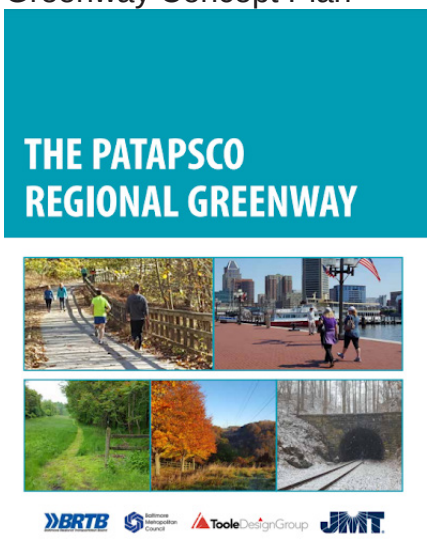
Source: Baltimore City Planning Department

Figure 28: Middle Branch Master Plan



Source: Baltimore City Planning Department

Figure 29: The Patapsco Regional Greenway Concept Plan



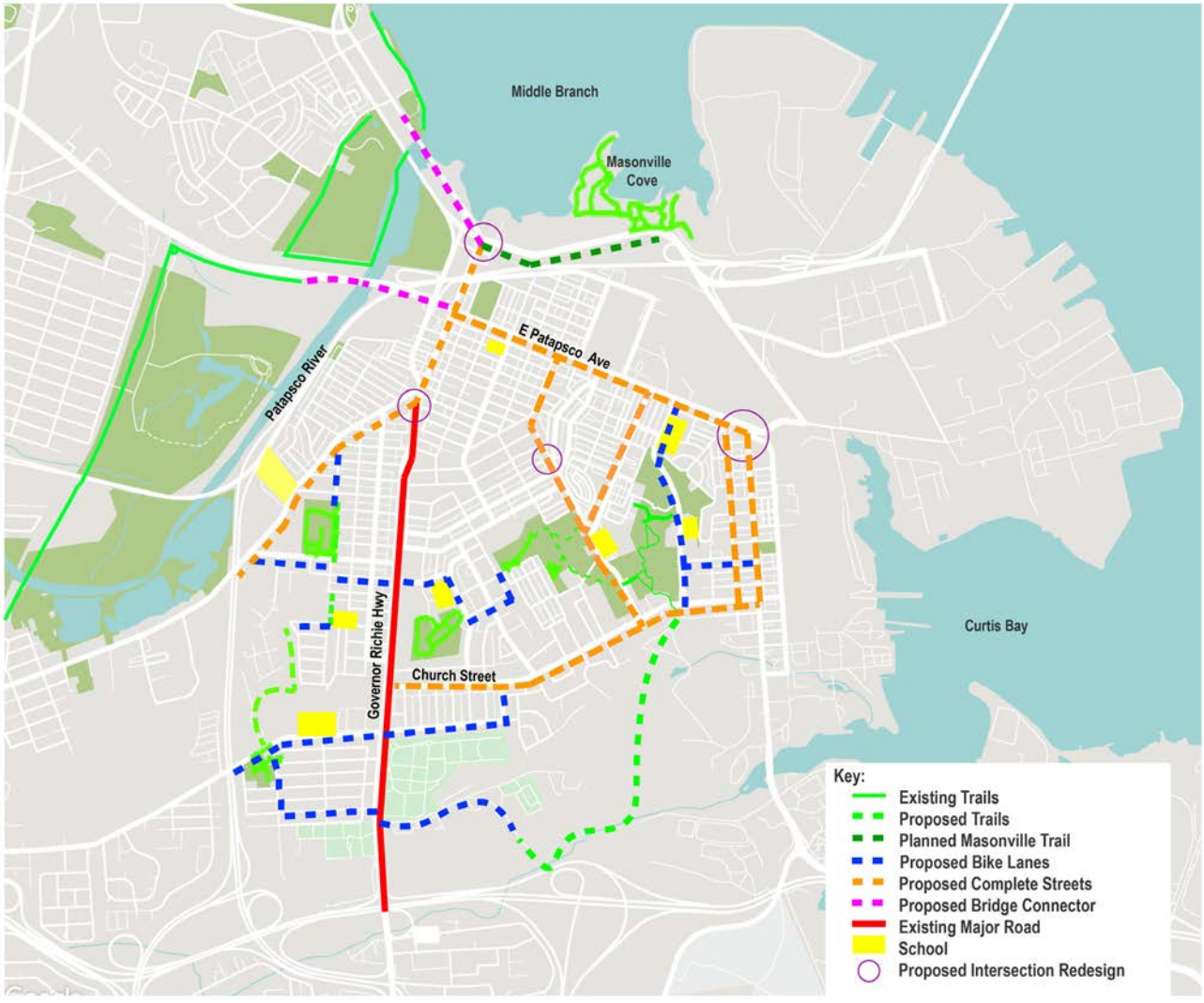
Source: Baltimore Metropolitan Council

C5. GOAL 1 RECOMMENDATIONS

Greater Baybrook not only lacks connections outside of its border, but is also extremely disconnected within its borders. It is recommended that Greater Baybrook develop a network of multimodal paths, trails, bike lanes, and complete streets that connect the neighborhoods of this community. This new alignment will connect neighborhoods to landmarks, schools, parks, and other important points of interest.

To create greater access and connectedness within the community, the City of Baltimore and Anne Arundel county should implement an alignment that includes complete streets, on road and protected bike lanes, off road natural trails for pedestrians and cyclists, safer intersections, bike lane and pedestrian bridge access, and connections to greenways and assets outside of the neighborhood.

Figure 30: Map of the Recommended Multimodal Transportation Alignment



C5.1 RECOMMENDATION 1: DESIGN COMPLETE STREETS

Complete streets are streets that are designed for everyone, not just vehicles. They are designed for safety and accessibility for people of all ages and abilities. They typically include street trees, bike lanes, and separate pedestrian pathways. As a first step, the proposed alignment recommends complete streets along major interior streets within the Greater Baybrook area:

- Church Street,
- East Patapsco Avenue
- Pennington Avenue
- Belle Grove Road
- 10th Street
- Virginia Avenue & 6th Street.

These are the major transportation avenues that connect the neighborhoods of the Greater Baybrook, therefore careful planning and consideration should be given to not only those driving along these roads, but also walking and biking.

Eventually, we recommend that all streets should be inclusive complete streets including Ritchie Highway; however, making Ritchie Highway a complete street might be a long-term project that requires more interagency coordinations.

Figure 31: Map of the Proposed Complete Street Alignment

Urban Village Main

According to the Baltimore Complete Street Manual (2021), the following street types represent the best way to utilize the public right of way based on the context of an area or community. Several of the streets included in the proposed transportation plan include streets that can be categorized as Urban Village Main Streets. These types of roads are the "spines of Baltimore's urban villages and centers (outside of Downtown)". These commercial corridors provide a range of services and accommodate movement of people and goods. With a target speed of 20 mph, this type of street encourages the pedestrian experience and promotes multimodal transportation options through a large sidewalk zone and designated bike lanes.

Urban Village Main streets included in the proposed transportation plan include:

- S Hanover Street
- E Patapsco Avenue
- Pennington Avenue
- Church Street

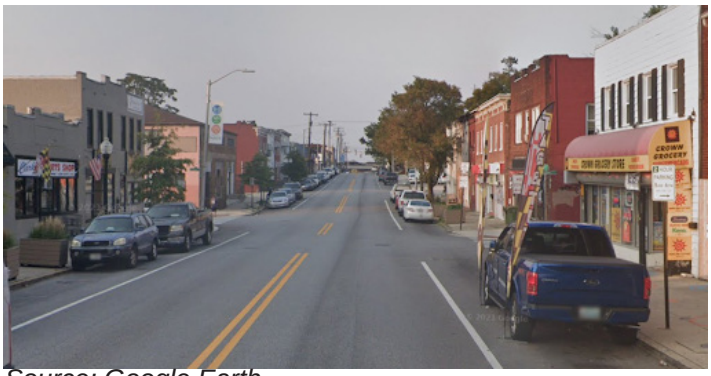
Figure 32: Example of Urban Village Main Street Type

Source: Baltimore City Complete Streets Manual

Recommendation 1: Design Complete Streets

South Hanover Street is a commercial corridor in Brooklyn with two-way traffic,except the South Hanover Street Bridge and the access to the bridge, space for off street parking, and some existing street trees. With shops, restaurants, and other businesses on this street, a complete street redesign would complement this neighborhood and be more inviting to visitors, increasing economic benefits of the community.

Figure 33: Photo of South Hanover Street



Source: Google Earth

East Patapsco Avenue is the other main commercial corridor of the Greater Baybrook. With mostly mixed use development, small businesses, and rowhomes, this street is in desperate need of a redesign. Its wide 4 lane roads with on street parking and large sidewalks make this a great candidate for a complete street redesign.

Figure 34: Photo of East Patapsco Avenue

Source: Google Earth

Pennington Avenue is the main road that runs south through Curtis Bay. This currently one way road is a combination of commercial, residential and light industrial. Its very few street trees, small sidewalk, and lots of on street parking make it an unsafe street for pedestrians. Increasing sidewalk widths, reducing on street parking, and implementing street trees could turn this inhospitable road into a more walkable and pleasant environment for the residents of Curtis Bay. Eventually, this street will be a two-way street since the Maryland Department of Transportation has a plan to make it into a two-way street (The Baltimore Metropolitan Planning Organization, n.d.).

Figure 35: Photo of Pennington Avenue

Source: Google Earth

Church Street is one of the few roads that runs east/west and connects Brooklyn Park to Curtis Bay. With mostly residential homes lining the street, there are a few small businesses and consistent traffic along this road. The South side of the road includes a separated pedestrian sidewalk and attractive street trees. A complete street design with bike lanes and consistent crosswalks would make a considerable difference in the safety and comfortability of Church Street.

Figure 36: Photo of Church Street

Source: Google Earth

Neighborhood Corridor

These neighborhood streets emphasize residential safety and access. These roads should minimize the number of lanes to allow room for pedestrians and cyclists. The use of signage and traffic calming devices are important on these roads with a target between 15-20 mph (Baltimore Complete Street Manual, 2021). These roads should emphasize the pedestrian experience, include cyclists in road design, and provide street trees.

Neighborhood Corridor streets included in the proposed transportation plan include:

- Virginia Ave and 6th Street
- 10th Street
- Fairhaven Ave
- Belle Grove Road

Figure 37: Example of Neighborhood Corridor Street Type

Source: Baltimore City Complete Streets Manual

Recommendation 1: Design Complete Streets

6th Street which turns into ***Virginia Avenue*** is a main route connecting Church Street to East Patapsco Avenue. This street cuts through Farring Baybrook Park and houses Baybrook Elementary/Middle and Farring Baybrook Recreation Center. Identified in the safe routes to school program, this is a road that is in serious need of redesign due to its speeding traffic and lack of stop signs and crosswalks. Making use of its wide lanes, separated bike lanes are needed so children can safely bike to school, street trees should line the streets protecting children from the sun, and there should be stop signs and crosswalks at every intersection within walking distance of school. School zone signage should be incorporated.

Figure 38: 6th Street

Source: Google Earth

10th Street is a neighborhood road that runs along Baybrook Elementary/Middle School. It is one of the few roads in the neighborhood with shared bike lane markings, and connects Virginia Ave to E Patapsco Ave. Increasing tree canopy, widening sidewalks, and adding street furnishing would improve this important neighborhood connector.

Figure 39: Photo of 10th Street

Source: Google Earth

Recommendation 1: Design Complete Streets

Fairhaven Avenue is a one way road parallel to Pennington Ave. Primarily residential with a few shops and churches, it includes some street trees and is one of the few roads in the Greater Baybrook with shared bike lane markings. With wider sidewalks and additional street trees, and traffic calm devices, this road could be a wonderful connection for residents.

Figure 40: Photo of Fairhaven Avenue

Source: Google Earth

Belle Grove Road is recognized as part of the East Coast Greenway, yet there are no road markings or separated bike lanes, only small road signs that are not noticeable to drivers. In order for this to become a safe bike route for cyclists, the designers of this street needs to put cyclists and other multi-modal users at the forefront. According to East Coast Greenway design standards, traffic should be separated from bicyclist and pedestrians by a physical barrier.

Figure 41: Belle Grove

Source: Google Earth

C5.2 RECOMMENDATION 2: DESIGN ROADS FOR SHARED USE

The Greater Baybrook lacks bike lanes and other multimodal transportation lanes. In order to connect the neighborhoods of the Greater Baybrook safely and increase accessibility, attention to multimodal transportation options is imperative. Micomobility can mean lightweight transportation vehicles such as bikes and e-scooters. Some of the different forms of multimodal transportation options for roads include:

- ***Shared Bike Lane*** markings, also called "sharrows" or shared arrow, are markings along the road that indicate bike and vehicles are meant to share the lane (Soulliere, n.d.). This means that bikes do not get dedicated space to ride. While this is not the safest way of incorporating bike onto streets, it still creates more awareness to drivers that cyclists may be close by.
- ***Striped Bike Lanes*** create a lane for bikes separated by a line of paint and are most often located on the right side of the roadway (Soulliere, n.d.). Vehicles are prohibited from driving or parking in these lanes. Although safer than sharrows, these lanes can still be dangerous as there is no physical barrier between vehicles and the cyclists.
- ***Buffered Bike Lanes*** are similar to striped bike lanes, only they contain extra space between the bike lane and the vehicular lane (Soulliere, n.d.). These buffered areas can include paint or a physical barrier within the buffer zone.
- ***Protected Bike Lanes*** include physical barriers and vertical buffers such as planters, curbs, bollards, and flexible delineator posts (Soulliere, n.d.). For cyclists, these are the safest bike lanes that make cycling most accessible to riders of various skill levels.

Figure 42: Photo of Shared Bike Lane

Source: NACTO

Figure 43: Photo of Striped Bike Lane

Source: NACTO

Figure 44: Photo of Buffered Bike Lane

Source: Photo by J Sanchez

Figure 45 Photo of Protected Bike Lane

Source: onthecommons.org

Recommendation 2: Design Roads for Shared Use

The roads recommended for shared use with cyclists include:

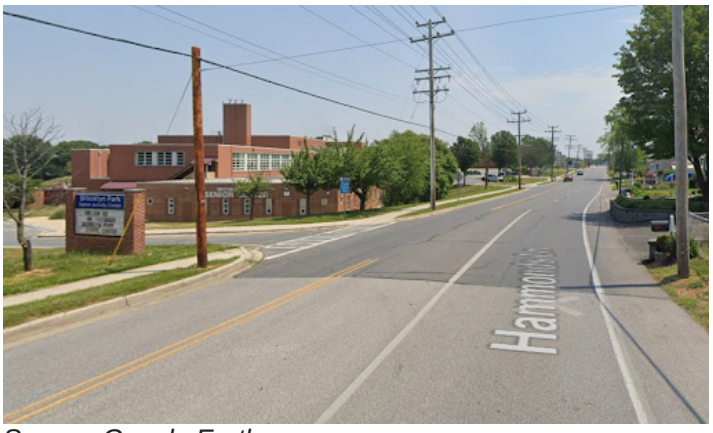
- Hammonds Lane and Walton Avenue
- Southerly Drive and Kramme Avenue
- West Bay Avenue
- Filbert Street
- 11th Avenue and 14th Avenue
- Chatham Road
- Holy Cross Road and Cedar Hill Blvd

Figure 46: Map of Proposed Shared Use Road Alignment

Recommendation 2: Design Roads for Shared Use

Hammonds Lane which runs east/west is a small two-way road connecting Brooklyn Middle School, the Brooklyn Park Senior Center, Arundel Gardens Park, and the Chesapeak Arts Center to Governor Ritchie Highway. Arundel Gardens park includes a protected bike path, however, this short path ends abruptly at Washington Ave, connecting to the side entrance of Brooklyn Park Middle School. To increase multimodal accessibility on this road with major landmarks of the community, at the very minimum, *shared bike lane markings* should be introduced. The south lane at many points includes multiple lanes of traffic which gives this road the ability to add a separate bike lane. In its current condition, there is only one sidewalk along this roadway and is too narrow to accommodate both pedestrians and cyclists safely, especially young children traveling to school.

Figure 47: Hammonds Lane



Source: Google Earth

Southerly Drive and ***Kramme Ave*** are residential streets located between Park Elementary School and Arundel Village Park. These roads show opportunities to connect children and families to the school and park, but there are no great ways to travel these other than narrow sidewalks. Designating bike lanes within this neighborhood with help to inform drivers of potential bikers and pedestrians traveling this route. In addition, a safer pathway should be established that connects Kramme Ave and Arundel Village Park. The current path feels dangerous, isolated, and uninviting.

Figure 48: Southerly Drive

Source: Google Earth

Figure 49: Path Connecting to Arundel Village

Source: Original Photo

Recommendation 2: Design Roads for Shared Use

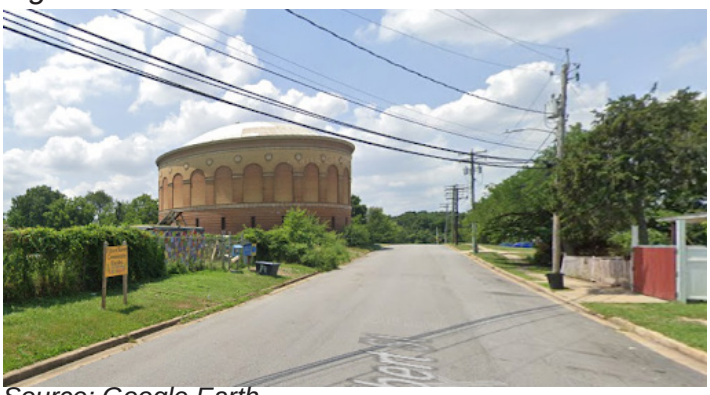
West Bay Avenue is the main road that runs through Farring Baybrook Park. It is a two-way road with a narrow sidewalks on its east side. Its one of the main connecting roads between Church Street and E Patapsco Ave. Along this avenue is the William J Myers Soccer Pavilion, Curtis Bay Elementary/Middle School, and Benjamin Franklin High School. This road also connects to several trailheads within Farring Baybrook Park. As a road with many landmarks and schools, it is important that roads are designed to accommodate bikes and other shared use transport.

Figure 50: W Bay Ave

Source: Google Earth

Filbert Street runs east/west connecting West Bay Avenue to Fairhaven Avenue and Pennington Avenue. This small side street houses two major landmarks of the Greater Baybrook, Curtis Bay Water Tower and Filbert Street Community Gardens. Designing safe connections for bike that will connect residents to these landmarks with this green network alignment will help increase accessibility of these special places while also increasing the community's culture and

Figure 51: Filbert Street



Source: Google Earth

C5.3 RECOMMENDATION 3: DESIGN OFF ROAD TRAILS AND SHARED USE PATHS

Off road and natural trails are the safest and most accessible bike paths for individuals of different levels of experience. They typically offer wider paths than sidewalks and don't have the safety concerns that come with biking next to moving vehicles. Off road trails are usually experienced in park or greenway settings and provide a more relaxing experience. Off road trails also provide athletic activities for residents who run, walk, scooter, skateboard, or roller blade and are an important amenity for any healthy city. Working with the existing trail system within the Greater Baybrook, off road trails can be increased by creating an alignment that creates a larger park trail system and connects parks together. Connecting parks and schools is another valuable way to create an alignment of off road trails and provides safer routes to schools for children.

The proposed Off Road Trails include the following:

- Farring-Baybrook Connector Trail
- Cabin Branch Trail
- Brooklyn Park Connector Trail

Figure 52: Map of Proposed Off Road Trail Alignment

Recommendation 3: Design Off Road Trails & Shared Use Paths

The proposed ***Farring-Baybrook Park Trail System*** would connect to the existing trail in Arundel Village Park and existing Farring-Baybrook trails. This system would make the Farring-Baybrook park a major recreation hub for the Greater baybrook, with safe connections not only throughout the park but to surrounding areas as well. The proposed alignment would create safer connections to Baybrook Elementary/Middle School, Farring-Baybrook Recreation Center, the sports fields throughout Farring-Baybrook Park, Duane Avenue Park, and Myers Soccer Pavilion. It would also provide connections to the proposed complete street alignment along 6th Street and Virginia Avenue as well as the proposed bike path alignment located on West Bay Avenue and Filbert Street.

Figure 53: Existing and Proposed Farring Baybrook Park Trail System

Source: Google Earth

Figure 54: Photo of Unmaintained Paths in Farring-Baybrook Park

Source: Google Earth

Recommendation 3: Design Off Road Trails & Shared Use Paths

The proposed ***Cabin Branch Trail*** alignment through the Snow Hill Lane area represents an opportunity to bring nature and recreation to residents living in this area where there is currently no public park space. With the planned and existing residential development occurring in this area, it is imperative that a nature conservation and recreation plan is put in place before the area becomes over developed and the last bit of mass tree canopy coverage and undeveloped land is lost in the Greater Baybrook. In coordination with Anne Arundel County Cabin Branch stream restoration plans, this proposed trail system would create additional ways for residents to connect with water, increase connectivity to south Brooklyn Park, and provide connections to Farring-Baybrook Trail System. Feasibility studies are recommended, especially for the brownfield areas of Snow Hill Lane designated and a Voluntary Cleanup Program (VCP) area. Working with developers and communicating the benefits and value of this amenity is recommended so that trail planning initiatives are implemented prior to finalized development plans.

Figure 55: Map of Proposed Cabin Branch Trail

Source: Google Earth

Recommendation 3: Design Off Road Trails & Shared Use Paths

The ***West Brooklyn Park Trail System*** would connect great community assets like parks, schools, an art center, and a recreation center. To increase connectivity between these assets and landmarks, a combination of shared use roads for cyclists and off road trails will increase connectivity and multimodal transportation options. The undeveloped wooded area west of Brooklyn Park Elementary School could include a nature trail, the grassy swale within the neighborhood north of Brooklyn Park Middle School could include a walking or biking path, and a trail connection through the open recreation space of Brooklyn Park Middle School could include a pathway. These shared use roads and off road trails would create a safe and enjoyable multimodal connection from Brooklyn Park down to Arundel Gardens Park.

Figure 56: Map of Proposed West Brooklyn Park Trail System

Source: Google Earth

C5.4 RECOMMENDATION 4: INCREASE SAFETY OF GOVERNOR RITCHIE HIGHWAY AND SELECTED INTERSECTIONS

It is recommended that the following roads and intersections be redesigned for increased safety:
Governor Ritchie Highway

- Intersection of Belle Grove Road & Governor Ritchie Highway
- Intersection of South Hanover Street & Frankfurst Avenue
- Intersection of East Patapsco Avenue, Curtis Avenue, and Pennington Avenue
- Intersection of Audrey Avenue, 6th Street, and Brooklyn Avenue

Figure 57: Map of Proposed Areas for Increased Safety

Recommendation 4: Increase Safety of Governor Ritchie Highway and Selected Intersections

Governor Ritchie Highway is the main commercial corridor of the Greater Baybrook that includes many big box retailers along with other small businesses. This four lane road, often including a median, is currently only hospitable for cars. There are no bike lanes, very few street trees that provide shade for pedestrians, and along this 2 mile road, only five pedestrian crosswalks were inventoried. Because this is the main vehicular corridor through Greater Baybrook, Governor Ritchie Highway is currently not recommended as a major multimodal route in this report but can be dangerous for pedestrians and cyclists. It is recommended that some roadway improvements are made, especially at intersections where pedestrians and cyclists could be crossing. Additional street trees and crosswalks would increase safety and reduce urban heat island effect. Ideally, all streets should be complete streets providing service for everyone regardless who they are and how they travel. Conversing Ritchie highway to a complete street might be a long-term goal for the Maryland Department of Transportation.

The ***Intersection of Belle Grove Road & Governor Ritchie Highway*** includes a traffic light, crosswalk, but no bike lanes. With this intersection as part of the East Coast Greenway and Baybrook Connector, a redesign of this area could increase vehicular, pedestrian, and cyclist safety. Some recommended changes to the design include protected bike lanes, increased size of medians, and bump outs that will decrease the distance pedestrians must travel to get across the street safely.

Figure 58: Photo of Governor Ritchie Highway (current condition)

Source: Google Earth

Figure 59: Photo of Intersection of Belle Grove Rd & Gov Ritchie Hwy

Source: Google Earth

Recommendation 4: Increase Safety of Governor Ritchie Highway and Selected Intersections

Pedestrian and bike safety is a concern at the ***S Hanover Street and Frankfurst Avenue intersection***. This awkward intersection includes a traffic light and median, no bike lanes, and barely visible crosswalk markings. The distance a pedestrian must travel to cross Frankfurst Avenue is long, making this dangerous, especially for pedestrians with mobility issues. It is recommended that this intersection be redesigned to increase safety and follow the recommendations outlined in the Masonville Cove Multi-Modal Transportation Feasibility Study.

Figure 60: Photo of Intersection of S Hanover St & Frankfurst Ave

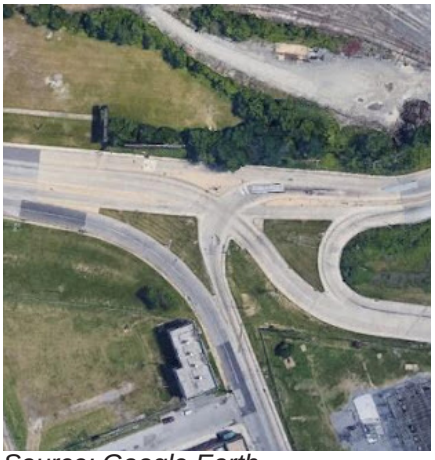
Source: Google Earth

Figure 61: Masonville Cove Multi-Modal Transportation Feasibility Study

Source: Maryland Port Administration

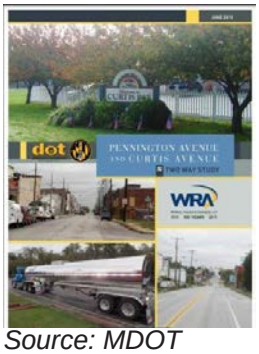
With several one-way roads converging into a two-way, the ***intersection of E Patapsco Ave, Curtis Ave, and Pennington Ave*** can be an awkward and unsafe transition for vehicles. There are no existing crosswalks or bike lanes, making this an even more dangerous intersection for pedestrians and cyclists. It is recommended that a total redesign of this intersection be implemented in coordination with the recommendations outline in the Pennington Avenue & Curtis Ave Two Way Study (Baltimore City Department of Transportation & Whitman Requardt & Associates (2015, June).

Figure 62: Photo of Intersection of E Patapsco Ave, Curtis Ave, and Pennington Ave



Source: Google Earth

Figure 63: Pennington Avenue & Curtis Ave Two Way Study



Source: MDOT

Recommendation 4: Increase Safety of Governor Ritchie Highway and Selected Intersections

The neighborhood ***Intersection of Audrey Avenue, 6th Street, and Brooklyn Avenue*** in Brooklyn has been noted by community members as an unsafe intersection and is part of the Greater Baybrook Alliance, Safe Routes to Schools Pilot Program. With one-way and two-way roads converging at this three road intersection, this could cause confusion for drivers. There are no existing crosswalks at this intersection, and only two of the roads include a stop sign. Due to its proximity to several schools, parks, and high density housing, a redesign of this intersection is recommended to increase pedestrian, cyclist, and driver safety.

Figure 64: Photo of Intersection of Audrey Avenue, 6th Street, and Brooklyn Avenue

Source: Google Earth

C5.5 Recommendation 5: Support Connections to Regional Greenways and Nearby Points of Interest

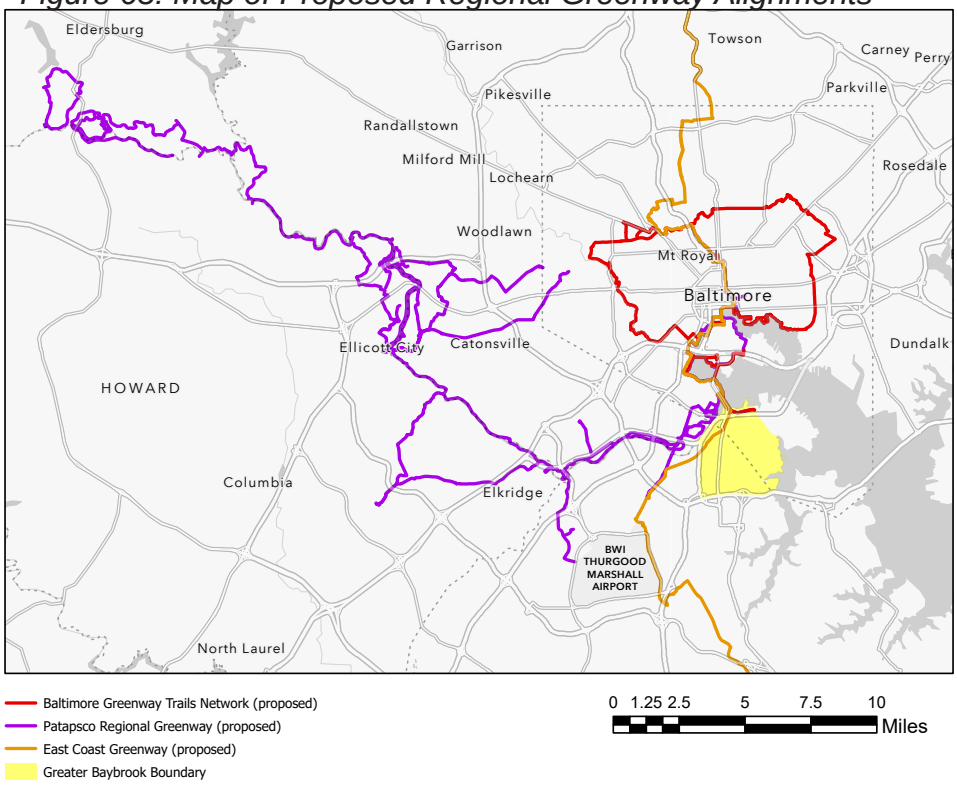
Greenways are green corridors with shared-use paths that connect people and places together, typically stretching along linear open spaces within urban or rural areas (Greenways, Inc., n.d.). Some of the benefits of greenways include creating value and generating economic activity, improving bicycle and pedestrian transportation, and improving health and active living.

The following greenways have planned alignments that run through Greater Baybrook:

- ***The East Coast Greenway*** – A walking and biking route stretching 3,000 miles from Maine to Florida and connecting 15 states. The nonprofit, East Coast Greenway Alliance, has been working to make this route into a trail network that is a safe place for bicyclists, walkers, and runners of all ages and abilities (Greenway.org, n.d.).
- ***The Baltimore Greenway Trails Network*** - A 35-mile network of existing and future urban trails that "link together the diverse neighborhoods, cultural amenities and outdoor resources that make up the landscape of Baltimore City" (Baltimore Greenway Trails Coalition, n.d.).
- ***The Patapsco Regional Greenway***- a plan for a shared-use 40-mile trail through the Patapsco Valley from the Baltimore Inner Harbor to Sykesville in Carroll County, Maryland (Baltimore Metropolitan Council, n.d.).

It is recommended that the city of Baltimore support these proposed connections to regional greenways. The Baltimore Greenway trails network and the Patapsco Regional Greenway have already designed alignments that would connect to the Greater Baybrook. It is recommended that the City of Baltimore work with these organizations and prioritize the implementation of these connections.

Figure 65: Map of Proposed Regional Greenway Alignments



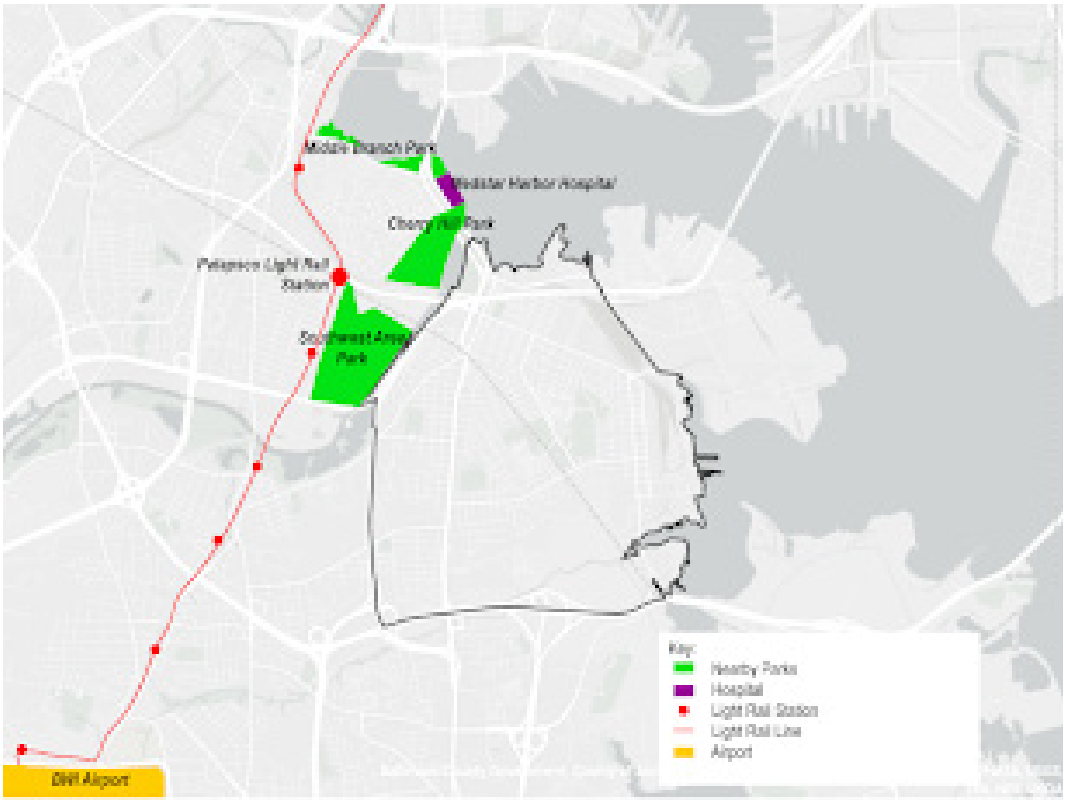
Source: Rails-to-Trails Conservancy, Baltimore Metropolitan Council, East Coast Greenway Alliance

Recommendation 5: Support Connections to Regional Greenways and Nearby Points of Interest

The Greater Baybrook park system is not as well maintained and does not possess the same amenities as other nearby parks, however, safe non-vehicular connections do not currently exist to connect Greater Baybrook residents. By providing increased connectivity to nearby parks residents of the Greater Baybrook can greatly benefit from these additional amenities. These parks include:

- ***Cherry Hill Park***- Construction on a Recreation Center began in 2020, the 35,000-square-foot fitness and wellness center will include three swimming pools, basketball courts, a fitness center, and an indoor walking track. Future plans for this park include a playground, fishing pier, and a dog park (Fox Baltimore News, 2020).
- ***Middle Branch Park*** – The 150-acre waterfront park includes trails, wetlands, kayaking, fishing piers, and a Baltimore Rowing and Water Resource Center.
- Southwest Area Park – This 230-acre park along the Patapsco River includes a boat ramp, baseball fields, a dog park, nature trails, picnic areas, playgrounds, and sand volleyball courts.
- ***Medstar Harbor Hospital*** - A private nonprofit, acute care hospital located on South Hanover Street along the Middle Branch of the Patapsco River in the Cherry Hill neighborhood.
- ***Patapsco Light Rail Station*** – Part of the Maryland Transit Administration (MTA) Light Rail system connecting Baltimore City to the BWI International Airport.
- ***BWI Airport*** – Baltimore's international airport located only 7 miles from Brooklyn Park. Transportation to the airport includes light rail and vehicular access.

Figure 66: Map of Nearby Parks and Points of Interest



Source: Baltimore and Anne Arundel Open Source Data

Recommendation 5: Support Connections to Regional Greenways and Nearby Points of Interest

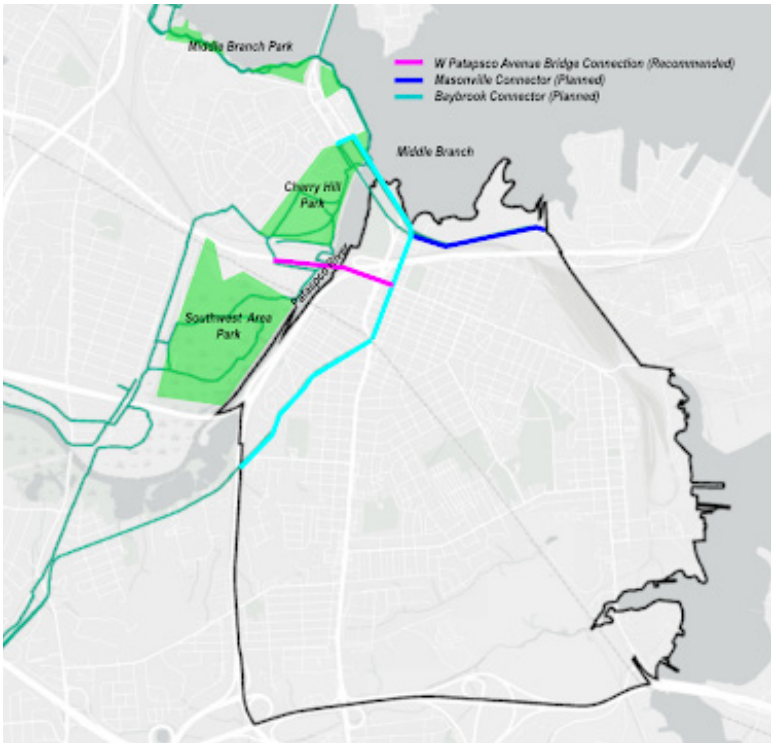
We recommend that a combination of connections that have been proposed by other master planning initiatives and proposed by us be implemented in the designed transportation alignment.
Alignments proposed by other master planning initiatives include:

- ***Masonville Connector*** –A shared use path that connects Middle Branch Park to Masonville Cove. This pathway would connect to the Baltimore Greenways Trails network, Cherry Hill Park, and Middle Branch Park.
- ***Baybrook Connector*** – A shared use path currently being designed by Toole Design. This includes an alignment through both Baltimore City and Anne Arundel County along Bell Grove Road.

The designed alignment would also include the following connections that have not been referenced in other plans:

- ***W Patapsco Avenue Bridge Connection*** - It is recommended that the W Patapsco Avenue bridge be redesigned to create a safer multimodal connection between the greater baybrook and the Cherry Hill neighborhood. This would offer a safe connection to the Patapsco light rail station, and multimodal transportation options to BWI airport. The bridge currently includes six lanes for automobiles and two pedestrian sidewalks. By redesigning the bridge to include a separated bike and pedestrian pathway and decreasing the bridge to either four or five traffic lanes would improve safety and connectivity.

Figure 67: Map of Proposed Connections to Greenways and Nearby Parks



Source: Greater Baybrook Alliance (RFP)

Figure 68: Photo of W Patapsco Avenue

Source: Google Earth

Figure 69: Rendering of Proposed S Hanover Street Bridge Baybrook Connector

Source: Greater Baybrook Alliance

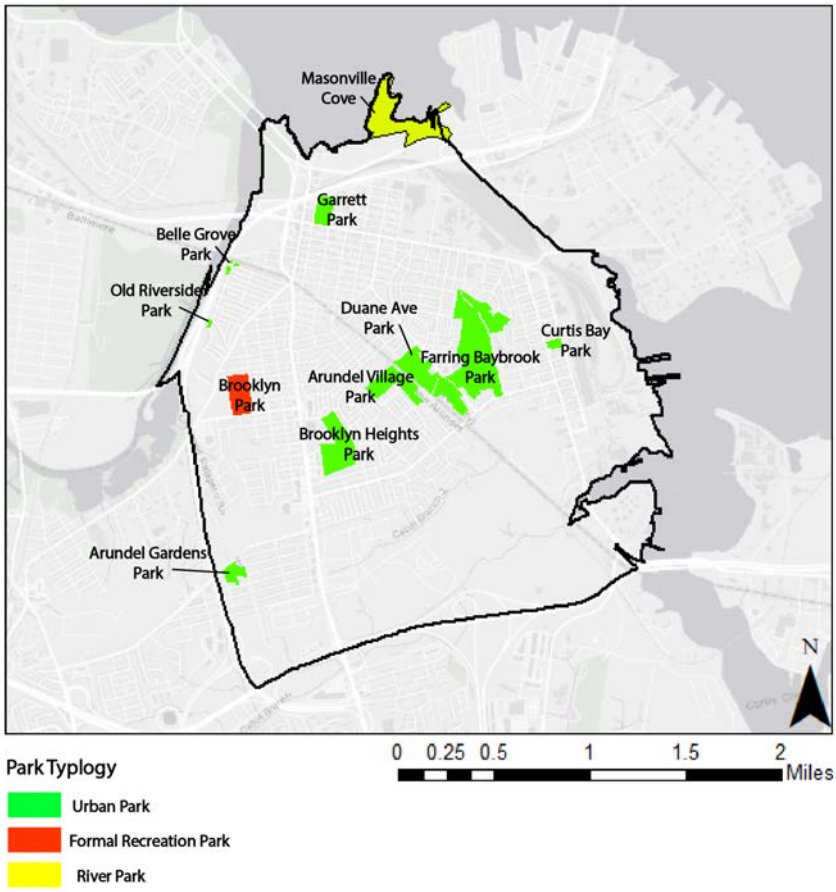
GOAL 2

IMPROVE EXISTING PARKS

D1. PARK INVENTORY

There are eleven parks located in the Greater Baybrook that vary in acreage and park typology. Brooklyn Park is considered a Formal Recreation Park, meaning that the purpose of the park is to conduct formal recreation activities like baseball and softball games for youth teams. Masonville Cove is considered a River Park along the Middle Branch, where the purpose of the park is to enjoy the natural river coastline. All the other parks within the Greater Baybrook can be considered Urban Parks and their purpose is to provide recreation and park amenities to residents in the neighborhoods that surround the park.

Figure 70: Map of Greater Baybrook Parks



Source: Baltimore City and Anne Arundel County Open Source Data, Open Street Map

Table 71: Greater Baybrook Parks by Neighborhood and Acreage

Formal Recreation Park	Neighborhood	Park Acreage
Brooklyn Park	Brooklyn Park	15

River Park	Neighborhood	Park Acreage
Masonville Cove	*N/A	54

Urban Park	Neighborhood	Park Acreage
Arundel Gardens Park	Brooklyn Park	5
Arundel Village Park	Brooklyn Park	26
Belle Grove Park	Brooklyn Park	1
Brooklyn Heights Park	Brooklyn Park	16
Curtis Bay Park	Curtis Bay	1.5
Duane Avenue Park	Brooklyn	3
Farring-Baybrook Park	Brooklyn	102
Garrett Park	Brooklyn	7.5
Old Riverside Park	Brooklyn Park	0.5

** Masonville cove is located outside of the three Greater Baybrook Neighborhoods, but is still an important local park used by Greater Baybrook residents.*

D2. EXISTING PARK CONDITIONS AND PARK AUDIT

The Greater Baybrook park system includes a range of different types of greenspaces that differ in amenities as well as maintenance. The Natural Environment Scoring Tool (NEST), developed by Researchers as part of the PHENOTYPE Project (Positive Health Effects of the Natural Outdoor Environment in Typical Populations in Different Regions in Europe) was used to score each park based on seven categories: accessibility, recreation facilities, amenities, aesthetics (natural), aesthetics (non-natural), incivilities, and significant natural features (See *Appendix I* for Full Audit Tool). The following categories are explained below:

- ***Accessibility*** - Determines access based on number of entrances and the quantity and quality of walking paths
- ***Recreational Facilities*** - Scores based on presence and quality of playgrounds, sports fields and courts, skateboard ramps, other fitness equipment, and quality and quantity of open space that can be used for informal recreation.
- ***Amenities*** – Evaluates presence and quality of amenities such as benches, trash cans, pet waste stations, public restrooms, snack bar or cafes, shade structures, picnic tables, and drinking fountains.
- ***Natural Aesthetics*** – Looks at the presence and quality of the primary surfaces (i.e., grass, sand, etc.), flowers, and other planted areas.
- ***Non-Natural Aesthetics*** – Determined by presence of decorative fountains, public art, and attractive structures
- ***Incivilities*** – Graded based on presence and abundance of litter such as alcohol and drug paraphernalia, graffiti, broken glass, vandalism, pet waste, excessive noise, and unpleasant smells.
- ***Significant Natural Features*** – scores based on area occupied by water feature and trees, and quality of scenic views.

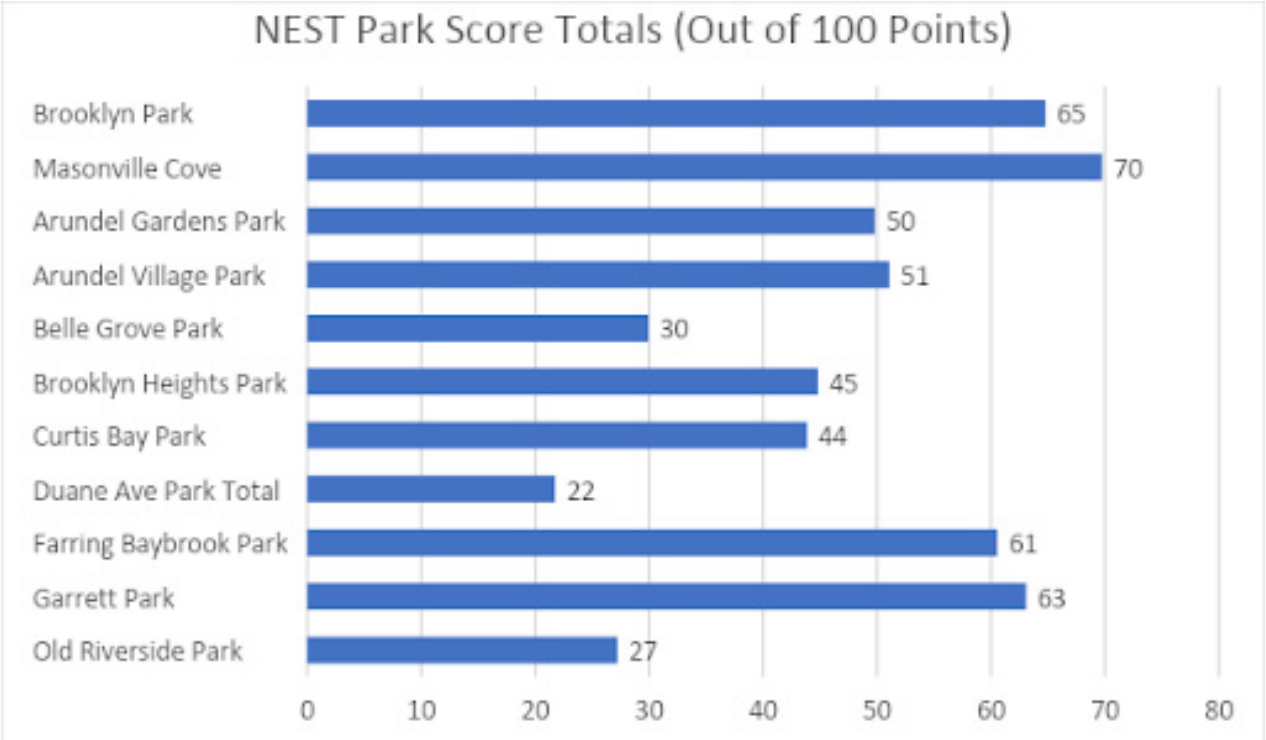
Depending on the typology of the park (i.e., urban park, formal recreation, river, etc.,) the weight of each category corresponds to that specific typology. The audit of formal recreation parks highly prioritizes recreational facilities followed by amenities and does not emphasize non-natural features or significant natural features. The audit of river parks emphasizes access, aesthetics and significant natural features. The audit of urban parks emphasizes recreation facilities followed by non-natural aesthetics and puts a relatively equal emphasis on access, amenities, natural aesthetics, incivilities, and significant natural features.

Table 2: Park Typology Domain Weights

	Access	Recreation facilities	Amenities	Aesthetics (natural)	Aesthetics (non-natural)	Incivilities	Significant natural feature
Formal Recreation	0.12	0.33	0.19	0.14	0.02	0.13	0.06
River Park	0.21	0.03	0.11	0.17	0.18	0.14	0.16
Urban Park	0.12	0.22	0.13	0.12	0.20	0.11	0.09

The parks that scored highest include Masonville Cove, Brooklyn Park, Garrett Park, and Farring-Baybrook Park, respectively. The lowest scoring park is Duane Ave park, followed by Belle Grove Park and Old Riverside Park. The evaluation of each individual park is described below.

Figure 72: NEST Park Audit Total Score



FORMAL RECREATION PARKS

Brooklyn Park
Location: Brooklyn Park

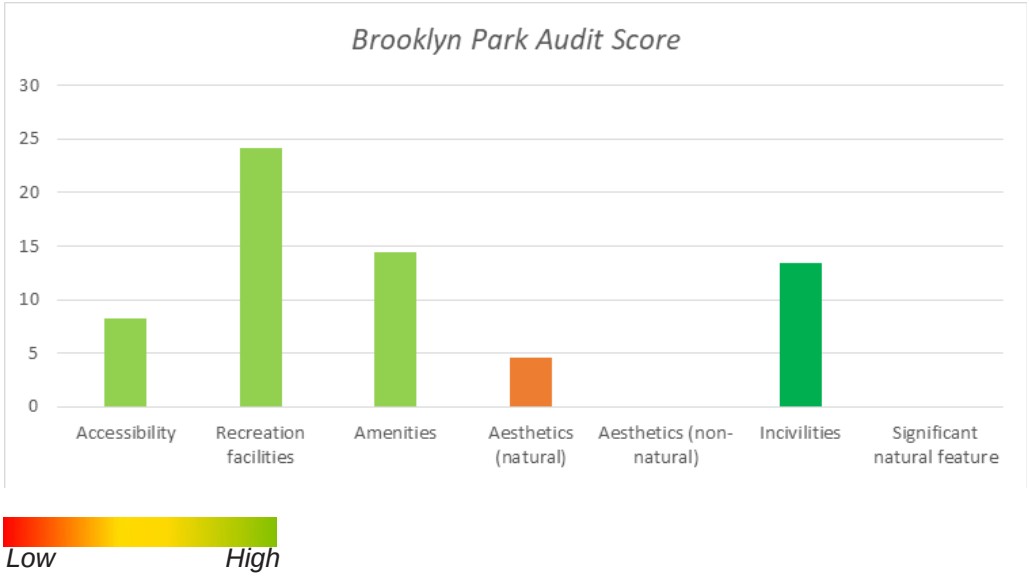
Brooklyn Park, also called 10th Avenue park, is a park used as a space for organized sports like baseball and softball. It includes other amenities that make this an enjoyable park such as restrooms, a snack bar, a playground, and a pavilion. Within the park, there are also paved and natural trails that circle the park as well as provide access to the different sports fields. The Brooklyn Park Youth Athletic Association is located within the park and organizes youth sports for the area.

Based on the NEST park score, Brooklyn Park is one of the top scoring park because of its great recreation facilities, amenities and accessibility. Brooklyn Park could be improved by increasing tree canopy and providing shade for children playing sports and their spectators.

Figure 73: Brooklyn Park Baseball Field

Source: Original Photo

Brooklyn Park
Typology: Formal Recreation
NEST Score: 65/100
Accessibility: 8/12
Recreation Facilities: 24/33
Amenities: 14/19
Aesthetics (Natural): 5/14
Aesthetics (Non-Natural): 0/2
Incivilities: 13/13
Significant Natural Feature: 0/6
Recommendation:
Add additional Shade Structures



RIVER PARKS

Masonville Cove Urban Wildlife Refuge Partnership

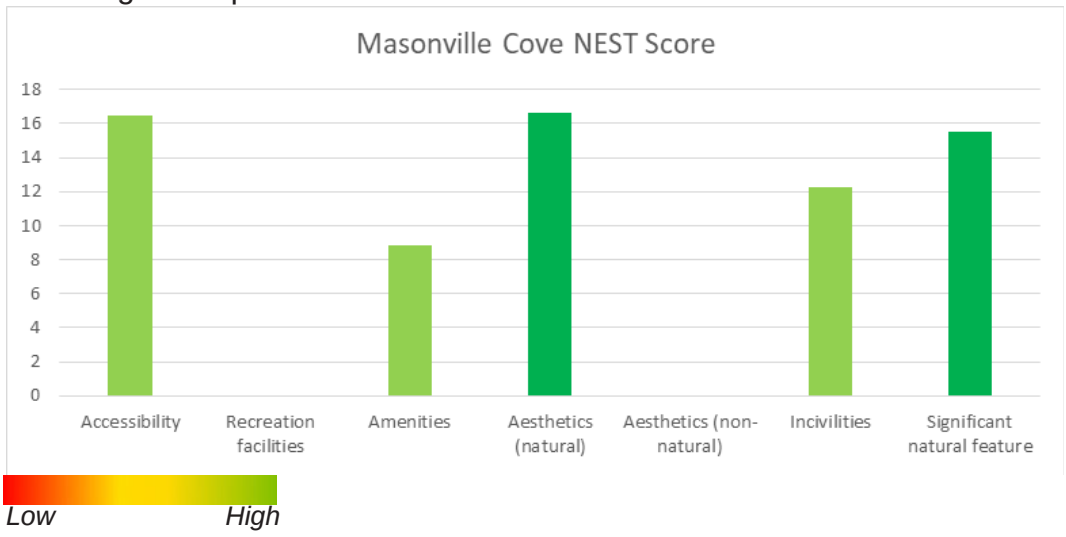
Location: Fairfield

Masonville Cove is the first Urban Wildlife Refuge Partnership and is located on the north side of Greater Baybrook along the shore of the Patapsco River. This area had been taken over for industrial use until environmentalists advocated for preservation of this land. Restoration began in 2007 and now includes an environmental education center for area students, a fishing pier, and many walking trails. It is one of the few places where residents of tGreater Baybrook can access the shoreline and is popular for bird watchers. Today, Masonville Cove is home to “over 251 bird species (including Baltimore City’s only pair of nesting bald eagles)”, and Captain Trash Wheel, a machine that collects trash before it enters the Patapsco River (Masonvillecove.org, n.d.). Masonville cove offers many programs including school field trips, summer programs, national aquarium programs, and many other educational programs. Masonville scored the highest of all the parks audited with the NEST tool. A few ways it could improve include Improve pathways for better accessibility, Adding Shade Structures for sun protection, and including some public art.

Figure 74: Views of Masonville Cove

Source: Original Photo

Masonville Cove
Typology: River Park
NEST Score: 70/100
Accessibility: 16/21
Recreation Facilities: 0/3
Amenities: 9/11
Aesthetics (Natural): 17/17
Aesthetics (Non-Natural): 0/18
Incivilities: 12/14
Significant Natural Feature: 16/16
Recommendation:
Improve pathways for better accessibility
Add Shade Structures
Add public art



URBAN PARKS

Arundel Gardens Park

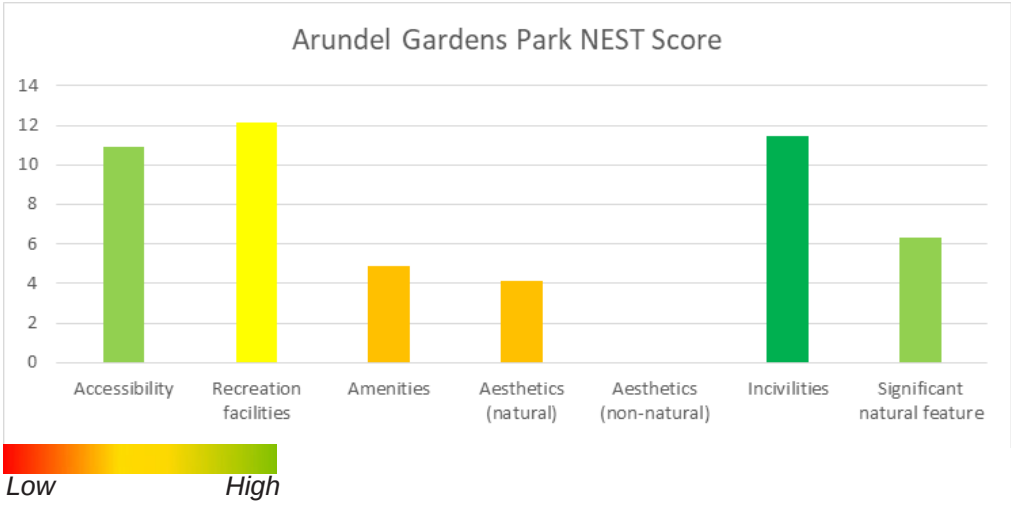
Location: Brooklyn Park

Arundel Gardens Park, also called Hammonds Lane Park, is located on Hammonds Lane and provides a shady open space for residents of the Arundel Gardens neighborhood. The park includes basketball courts, paved trails, a pavilion, a playground and large shade trees providing very high canopy coverage.
In comparison to most of the urban parks, Arundel Gardens Park scored high because of its accessibility, no observed incivilities and its significant natural features. To improve the park, amenities such as picnic tables, public restrooms, drinking fountains, pet waste stations should be added. Incorporating public art, and planted areas with flowers and shrubs would also improve the quality of this urban park.

Figure 75: Photo of Arundel Gardens Park

Source: Google Earth

Arundel Gardens Park
Typology: Urban Park
NEST Score: 50/100
Accessibility: 11/12
Recreation Facilities: 12/22
Amenities: 5/13
Aesthetics (Natural): 4/12
Aesthetics (Non-Natural): 0/20
Incivilities: 11/11
Significant Natural Feature: 6/9
Recommendation:
Add picnic tables, public restrooms, drinking fountains, pet waste stations, public art, and planted areas with flowers and shrubs



Arundel Village Park

Location: Brooklyn Park

Next to Farring-Baybrook Park and across the border of Baltimore and Anne Arundel County is Arundel Village park. The park includes a quarter mile gravel trail that runs along a man-made pond used as a stormwater management facility. This park provides one of the few places within the Greater Baybrook area where residents can view wildlife and connect with the water. On the southwest side, there is a playground, picnic area with a grill, paved walkways, and two basketball courts.

In comparison to most of the urban parks, its natural features, inclusion of some recreation facilities and amenities, and the watern and wetland area positively controbuted to its NEST score. To improve the quality of this urban park, picnic tables, water fountains, public restrooms and public art should be included. While there is high tree canopy on the east side of the park, canopy coverage should be increased in the southwest side near the playground and other recreation areas. Improving park maintenance to decrease incivilities is another recommendation to increase the park audit score.

Figure 76: Arundel Village Park Wetland Area

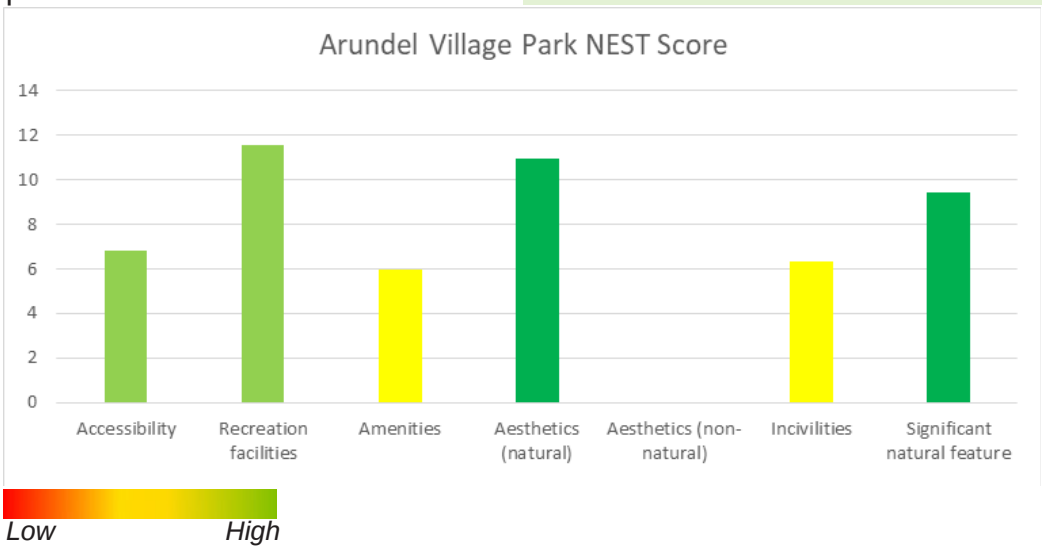
Source: Original Photo

Arundel Village Park
Typology: Urban Park
NEST Score: 51/100

- Accessibility: 7/12
- Recreation Facilities: 12/22
- Amenities: 6/13
- Aesthetics (Natural): 11/12
- Aesthetics (Non-Natural): 0/20
- Incivilities: 6/11
- Significant Natural Feature: 6/9

Recommendation:

Add picnic tables, water fountains, public restrooms, public art
Increase Canopy Coverage (See Goal 5)



Belle Grove Park

Location: Brooklyn Park

Belle Grove Park, also known as Riverside Park, is a small neighborhood parklet. It is located along Old Riverside Rd and backs up to Interstate 895. The park includes a playground, basketball court, and paved pathways. There is almost no tree canopy coverage with the exception of one tree near the basketball court.

Belle Grove Park scored low in the NEST park audit because it scored low in all categories with the exception of incivilities where none were observed. To improve this neighborhood park, it is recommended that the parks department add picnic tables, drinking fountains, public art, and shade structures. Tree canopy should be increased, and walkways should be added and improved to increase accessibility.

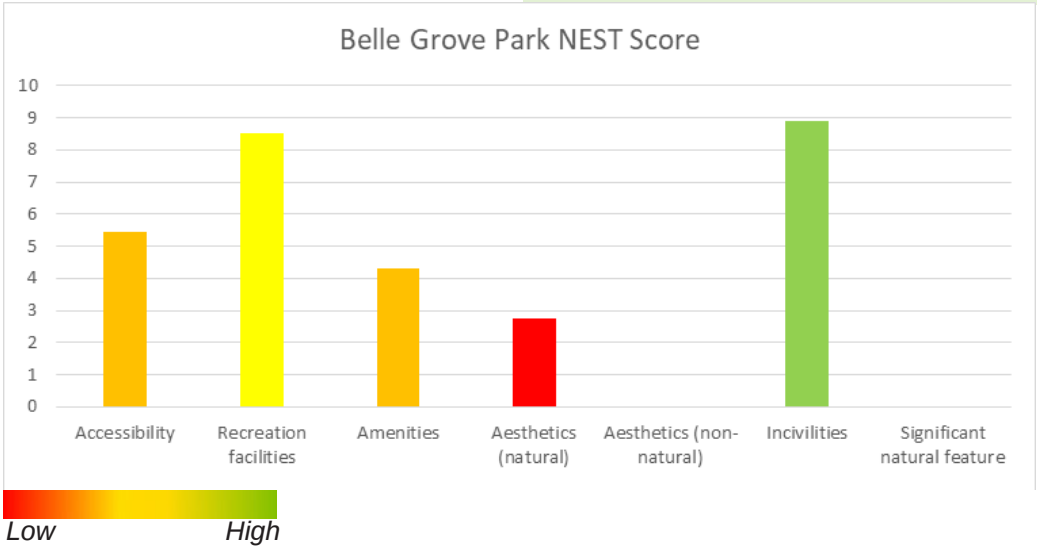
Figure 77: Photo of Belle Grove Park

Source: Original Photo

Belle Grove Park
Typology: Urban Park
NEST Score: 30/100

- Accessibility: 5/12
- Recreation Facilities: 9/22
- Amenities: 4/13
- Aesthetics (Natural): 3/12
- Aesthetics (Non-Natural): 0/20
- Incivilities: 9/11
- Significant Natural Feature: 0/9

Recommendation:
Add picnic tables, drinking fountains, public art, shade structures
Increase Canopy Coverage (See Goal 5)



Brooklyn Heights Park

Location: Brooklyn Park

Brooklyn Heights Park, also known as 11th Street Park is located next to Park Elementary School and includes two baseball fields, basketball courts, a soccer field, a picnic area, portable restrooms, a multi-use court, and paved trails. There is also a garden with raised beds called the youth recovery garden, which was provided by the Restoration Community Development Corporation. Unlike other schools in the area, Brooklyn Heights Park is not fenced in, and is open from dawn to dusk. This is considered a public park and owned by Anne Arundel Parks and Recreation.

Brooklyn Heights Park scored in the middle compared to other urban parks in the neighborhood. It scored high in having no observed incivilities and scored relatively high in accessibility and recreation facilities. To improve this park, it is recommended that picnic tables, shade structures, public art, planted areas with flowers or shrubs be incorporated into the park. Quality of pathways and existing sports courts should be improved, and canopy coverage should be increased. Anne Arundel County is currently in the process of creating a master plan for this park, where scoring for this park is expected to increase after design implementation.

Figure 78: Photo Brooklyn Heights Park

Source: Original Photo

Brooklyn Heights Park
Typology: Urban Park
NEST Score: 45/100

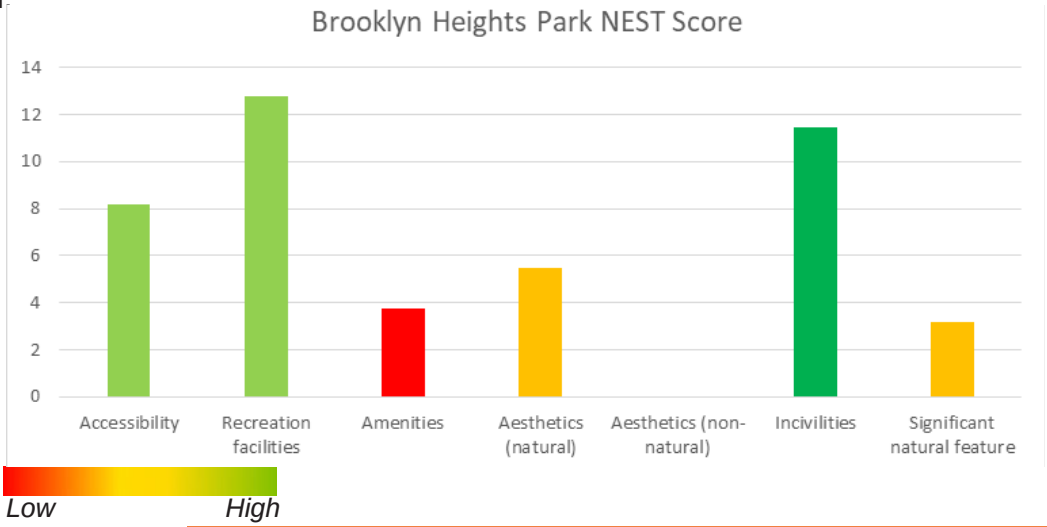
- Accessibility: 8/12
- Recreation Facilities: 13/22
- Amenities: 4/13
- Aesthetics (Natural): 5/12
- Aesthetics (Non-Natural): 0/20
- Incivilities: 11/11
- Significant Natural Feature: 3/9

Recommendation:

Add shade trees, picnic tables, shade structures public art, planted areas

Improve quality of pathways and existing sports courts

Increase Canopy Coverage (See Goal 5)



Curtis Bay Park

Location: Curtis Bay

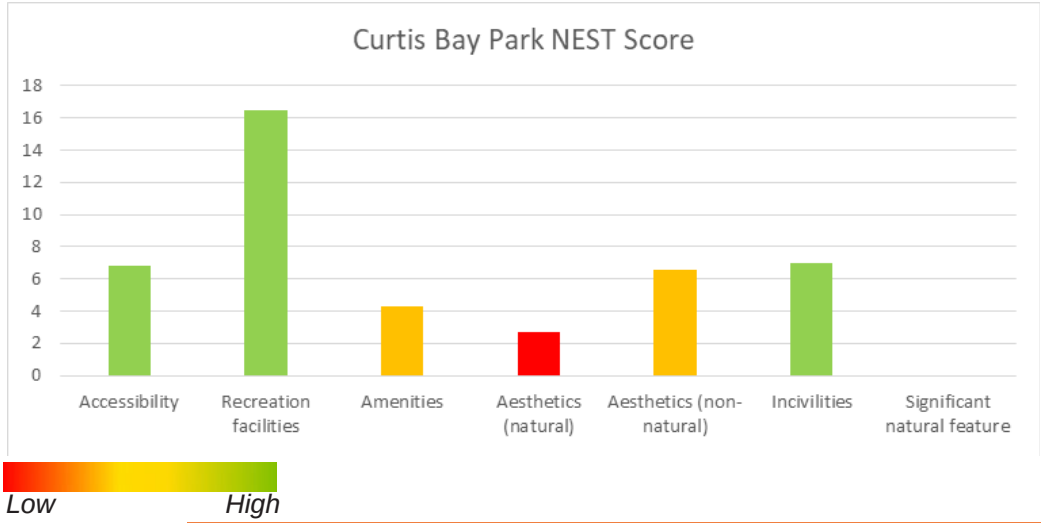
Curtis Bay Park is the only park located in the neighborhood of Curtis Bay. The park is positioned along Pennington Avenue, with industrial views that border and block the coastline. The park includes basketball courts, a small skate park, paved trails, a playground, and a pavilion. The Curtis Bay Recreation Center is located on the southeast corner of the park.

Curtis Bay Park scored in the middle compared to other urban parks in the neighborhood. It scored highest in recreation facilities and accessibility and lowest in natural features, aesthetics, and amenities. The park could be improved by adding picnic tables, water fountains, and planted areas for flowers and shrubs. By increasing park maintenance, this would decrease some of the observed incivilities. It is also recommended that tree canopy coverage be increased to add shade and provide protection from the elements for park users.

Figure 79: Photo of Curtis Bay Park

Source: Google Earth

Curtis Bay Park
Typology: Urban Park
NEST Score: 44/100
Accessibility: 7/12
Recreation Facilities: 16/22
Amenities: 4/13
Aesthetics (Natural): 3/12
Aesthetics (Non-Natural): 7/20
Incivilities: 7/11
Significant Natural Feature: 0/9
Recommendation:
Add picnic tables, water fountains, planted areas
Increase Park Maintenance and Decrease Incivilities
Increase Canopy Coverage (See Goal 5)



Duane Avenue Park

Location: Brooklyn

Duane Avenue Park, located within Farring Baybrook Park, is a neighborhood park with a derelict basketball court, large areas of broken pavement, few seating options, no trash cans, and shows evidence of alcohol and drug use within the park. The park includes scenic views of an open field with lots of trees. With the exception of turf mowing, there appears to be no other park maintenance, evidenced through excessive trash and park lighting outages.

Duane Ave Park scored lowest out of all parks in Greater Baybrook. It is recommended that this park be prioritized to rectify these issues. The redesign of this park should include trash cans, playgrounds, picnic tables, drinking fountains, shade structures, public art, walking and cycle paths, and other recreational facilities. Park maintenance needs to be increased dramatically to improve the quality of existing walkways and decrease the high level of incivilities.

Figure 80: Photo of Duane Ave Park

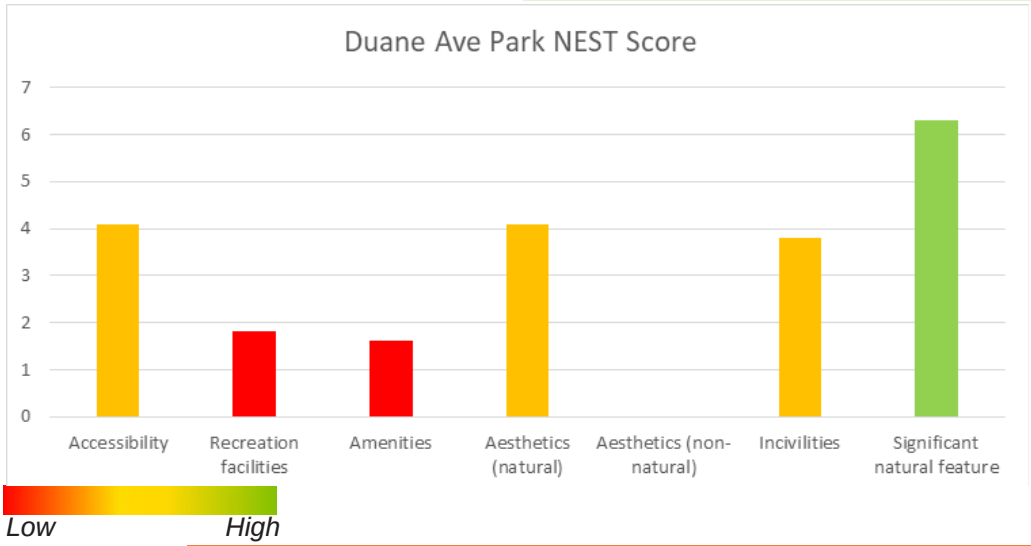
Source: Original Photo

Duane Ave Park
Typology: Urban Park
NEST Score: 22/100

- Accessibility: 4/12
- Recreation Facilities: 2/22
- Amenities: 2/13
- Aesthetics (Natural): 4/12
- Aesthetics (Non-Natural): 0/20
- Incivilities: 4/11
- Significant Natural Feature: 6/9

Recommendation:

Add trash cans, playgrounds, picnic tables, drinking fountain, shade structures, public art, walking and cycle paths
Park maintenance, improve quality of walkways
Improve Park maintenance to decrease incivilities



Farring-Baybrook Park

Location: Brooklyn & Curtis Bay

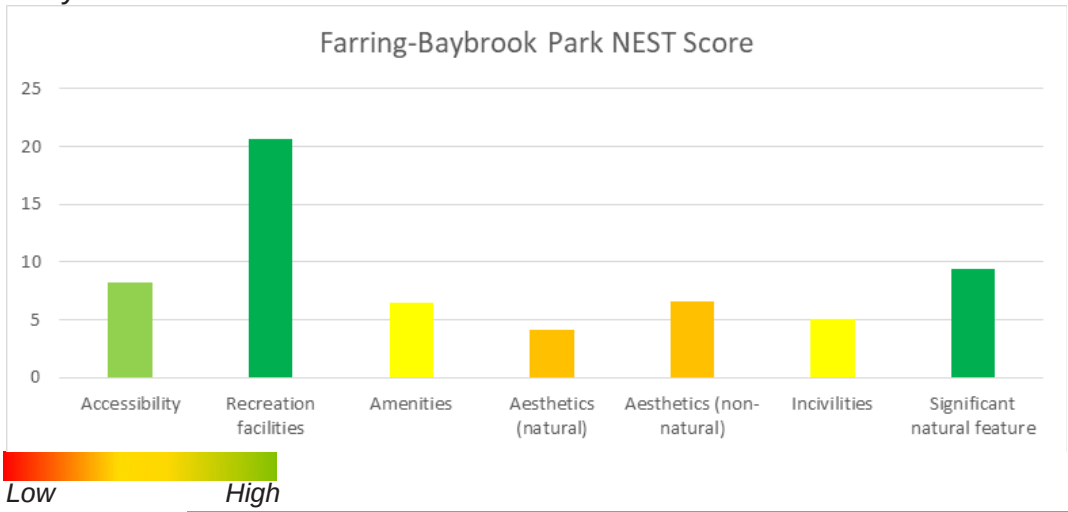
Farring-Baybrook Park is the largest public park in the Greater Baybrook area and includes stunning views of the Baltimore skyline. Included within the park is Farring-Baybrook Recreation Center, and the Myers Soccer Pavilion. Along the park edges are several schools including Bay Brook Elementary/Middle, Curtis Bay Elementary School, and Benjamin Franklin High School. The park includes amenities like a new football field, multiple baseball fields, several basketball courts, and a soccer court. A park trail connecting the schools and recreation facilities runs along a shallow creek. Park maintenance has declined over the years leading to illegal dumping, a dilapidated basketball court along Duane Avenue and lighting outages.

Farring-Baybrook park is ranked one of the highest parks in the community because of its great recreation facilities and significant natural features. Proposed improvements include adding picnic tables, more trash cans, shrub and flower plantings and public art. A maintenance plan and illegal dumping mitigation plans are needed for this park to decrease incivilities. ADA accessible walkways should be improved and increased throughout the park to increase accessibility for people of all mobility levels.

Figure 81: Photo of Farring-Baybrook Park Views

Source: Mapping Baybrook

Farring-Baybrook Park
Typology: Urban Park
NEST Score: 61/100
Accessibility: 8/12
Recreation Facilities: 21/22
Amenities: 6/13
Aesthetics (Natural): 4/12
Aesthetics (Non-Natural): 7/20
Incivilities: 5/11
Significant Natural Feature: 9/9
Recommendation:
Add picnic tables, trash cans, decorative plantings, and public art. Create a maintenance plan and find ways to discourage illegal dumping. Improve quality of walking path



Garrett Park

Location: Brooklyn

Garrett Park is another park that offers beautiful views of the Baltimore skyline. The neighborhood and an organization called Friends of Garrett Park, has remained active in supporting the upkeep of this park over the years and features several new pergolas, new outdoor fitness equipment, a new playground, and baseball fields, with the exception of the basketball courts that are in need of repair.

Garrett Park scored highest of all urban parks in the community because of its high accessibility, many recreation facilities, natural aesthetics, and no observed incivilities. To improve this park, it is recommended that picnic tables, drinking fountains, public restrooms, and public art be added.

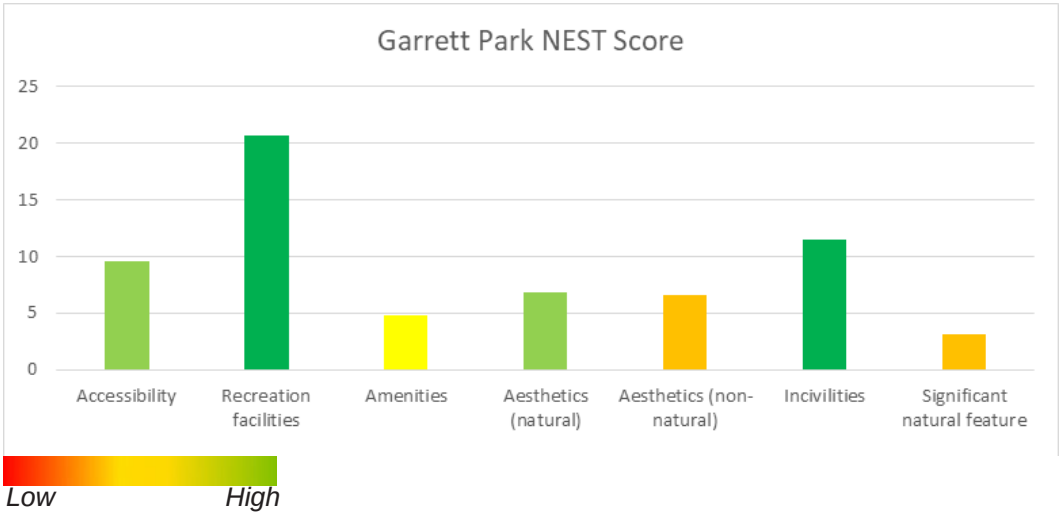
Figure 82: Photo of Garrett Park Views

Source: Original Photo

Garrett Park
Typology: Urban Park
NEST Score: 63/100

Accessibility: 10/12
Recreation Facilities: 21/22
Amenities: 5/13
Aesthetics (Natural): 7/12
Aesthetics (Non-Natural): 7/20
Incivilities: 11/11
Significant Natural Feature: 3/9

Recommendation:
Add picnic tables, drinking fountains, public restrooms, public art



Old Riverside Park

Location: Brooklyn Park

Old Riverside park is a very small parklet located on Old Riverside Road and borders Interstate 895. The park includes paved pathways, park benches, and a playground. It is considered a neighborhood owned park.

This park ranked second lowest of all parks in the community because of its lack of amenities, recreations facilities, aesthetics, and significant natural features. This park can be improved by adding picnic tables, public art, drinking fountains, shade structure, and planted areas with flowers and shrubs. Tree canopy should all be increased in this park to make it a more comfortable and enjoyable space for park users.

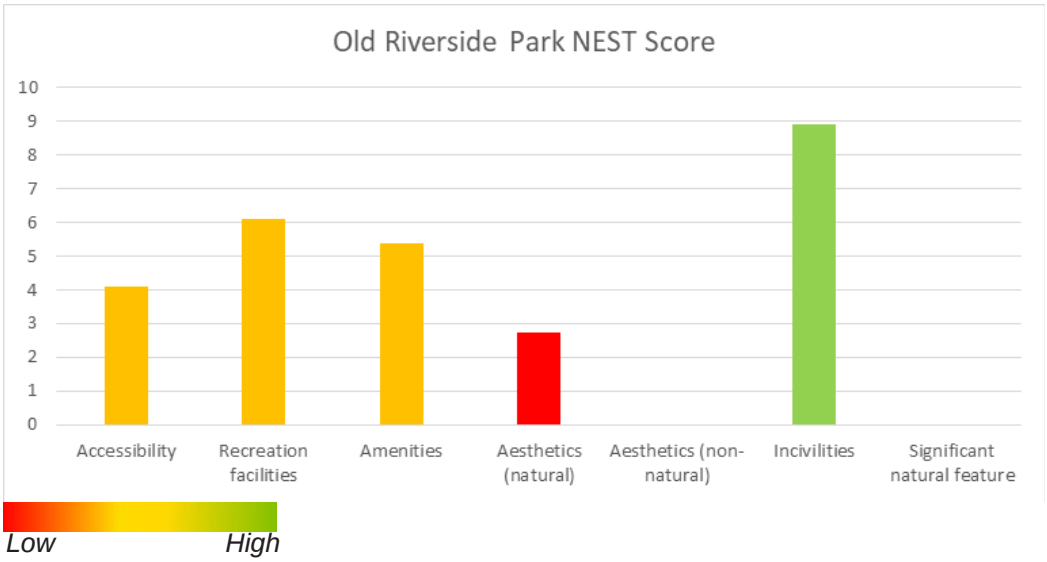
Figure 83: Photo of Old Riverside Park

Source: Original Photo

Old Riverside Park
Typology: Urban Park
NEST Score: 27/100

- Accessibility: 4/12
- Recreation Facilities: 6/22
- Amenities: 5/13
- Aesthetics (Natural): 3/12
- Aesthetics (Non-Natural): 0/20
- Incivilities: 9/11
- Significant Natural Feature: 0/9

Recommendation:
Add picnic tables, public art, drinking fountains, shade structure, planted areas with flowers and shrubs

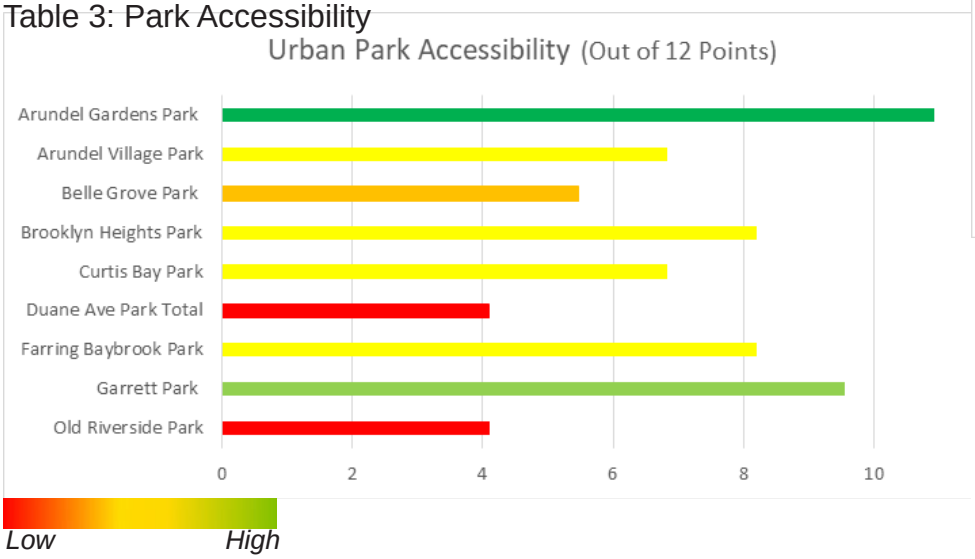


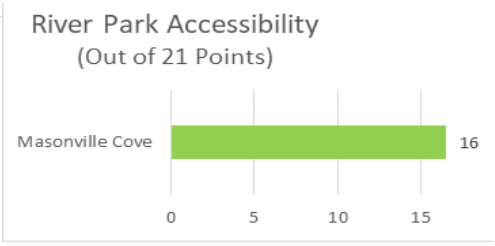
D3.1 RECOMMENDATION 1: IMPROVE PARK ACCESSIBILITY

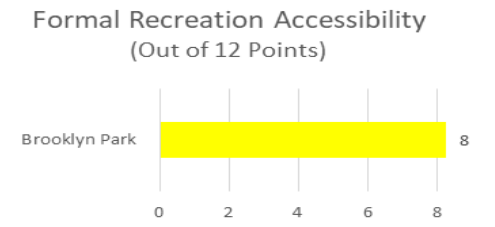
The nest tool grades access to parks based on the following categories:

- Number of Entrance Points
- Availability of Walking or Cycle Paths
- Quality and Maintenance of walkways

Table 3: Park Accessibility







Parks that include multiple entrances and American with Disabilities Act (ADA) compliant walkways make parks more accessible for all people, especially those with mobility issues. Based on park audit scoring, Arundel Village Park, Belle Grove Park, and Duane Ave Park would benefit by increasing accessible pathways for walking, running, and biking. Maintenance of existing pathways are recommended to provide safe passage for all park users. Community parks are frequented by residents living within a quarter mile of the site, so it is important that community members arriving on foot can access the park safely. Roads with speeding traffic and no stop signs or crosswalks are barriers that may reduce the amount of foot traffic, especially in children, seniors, and other vulnerable populations. It is recommended that an accessibility audit is conducted for all parks within the Greater Baybrook to determine parks requiring new stop signs and crosswalks.

Figure 84: Photo of Accessible Trails

Source: landwithoutlimits.com

Figure 85: Photo of Crosswalk Connected to Park

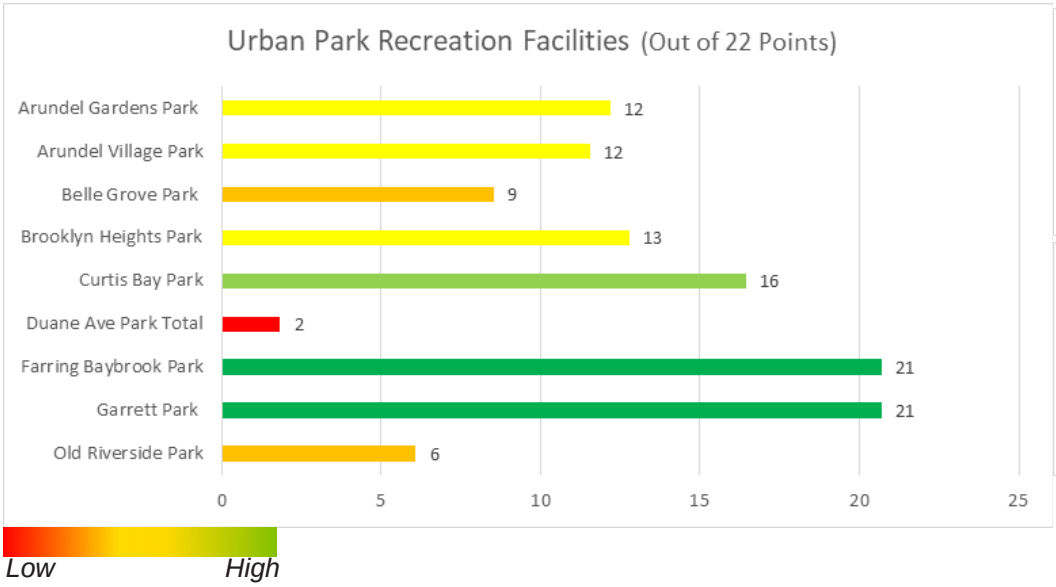
Source: tti.tamu.edu

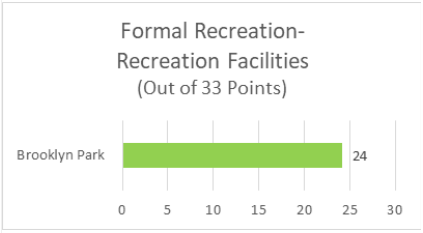
D3.2 RECOMMENDATION 2: INCREASE RECREATION FACILITIES

The nest tool grades recreation facilities in parks based on the following categories:

- Presence and Quality of:
  - Playground Equipment
  - Sports Fields & Courts
  - Skateboard Ramps
  - Other Fitness Facilities (i.e., outdoor gym equipment, athletic tracks, etc.)
- Quality and Amount of Open Lawn Space for informal games and sports

Table 4: Park Recreation Facilities



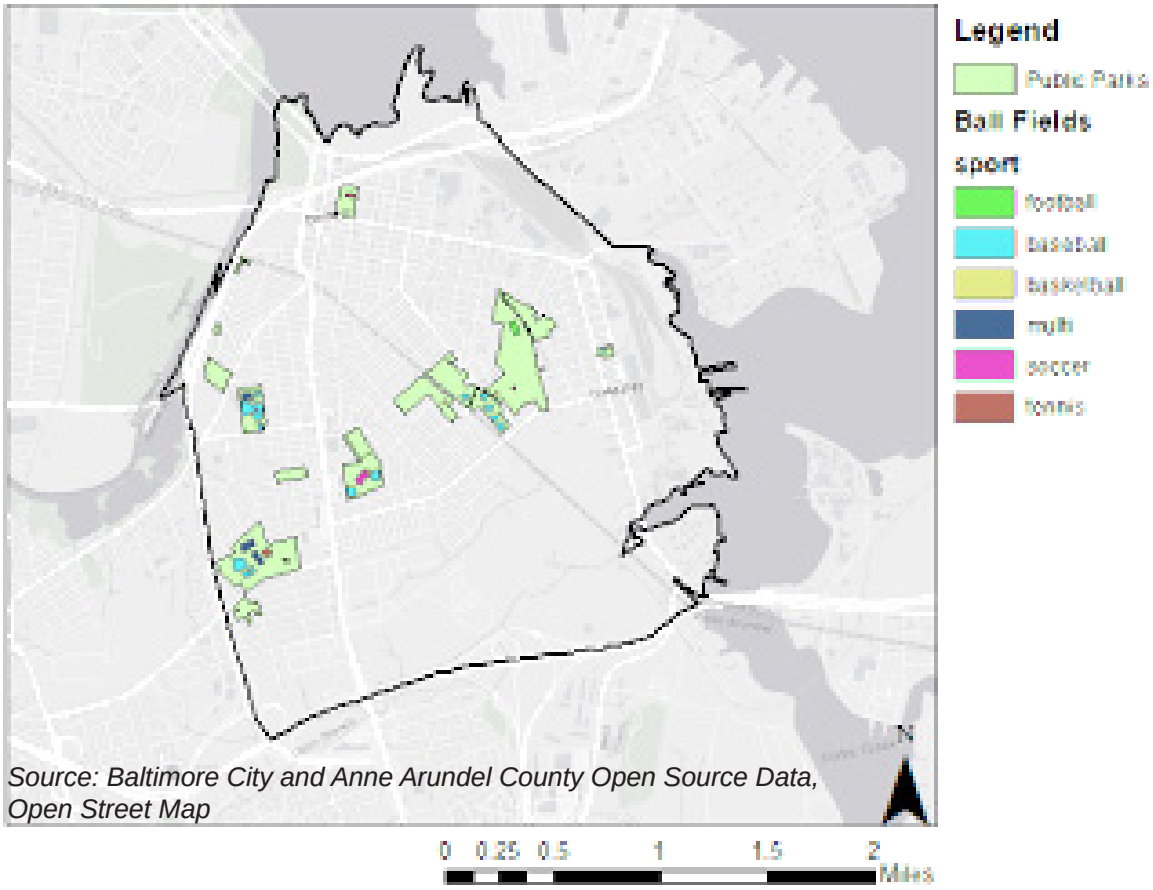


Recreation facilities are an important part of urban parks because they provide residents with opportunities to engage in physical activity and social interaction. Brooklyn Park, Farring-Baybrook Park and Garrett Park scored highest in recreation facilities, followed by Curtis Bay Park. Duane Ave Park and Old Riverside park scored lowest in recreation facilities. Based on the recreation facilities inventory (*See next Page*), soccer fields and tennis courts are the most needed recreation facilities in the community. These areas with low scores provide opportunities to provide more recreational space for residents.

Figure 86: Image of Park Playground

source: dcr.virginia.gov

Figure 87: Greater Baybrook Sport Courts & Fields Inventory



Source: Baltimore City and Anne Arundel County Open Source Data, Open Street Map

Table 5: Recreation Facilities Inventory in Parks

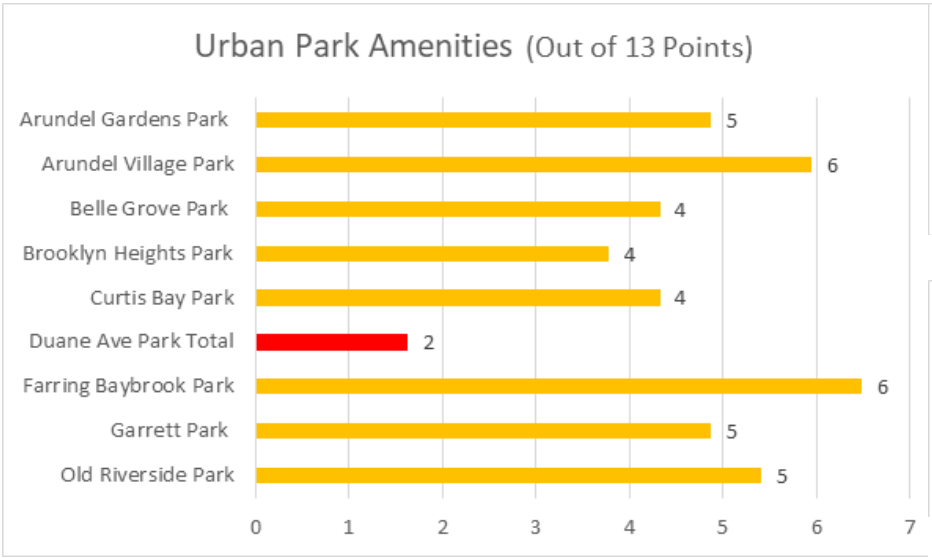
Park	**Park Recreation Facilities**
Arundel Gardens Park	*Good Condition:* (2) Basketball Courts
Arundel Village Park	*Good Condition:* (2) Basketball Courts
Belle Grove Park	*Good Condition:* (1) Basketball Court
Brooklyn Park	*Good Condition:* (4) Baseball / Softball Fields, (3) Soccer fields of differing sizes
Brooklyn Heights Park	*Good/Fair Condition:* (1) Soccer Field, (2) Baseball fields, (1) Basketball Court *Poor Condition:* (2) Tennis Courts, multi-use court
Curtis Bay Park	*Good Condition:* (1) Basketball Court, (1) Baseball Field, (1) Skatepark
Duane Avenue Park	*Poor Condition:* (1) ½ Basketball Court
Farring-Baybrook Park	*Good/Fair Condition:* (5) Baseball Fields, (2) Basketball Courts, (2) multi-use courts, (1) Football field, (1) Indoor Soccer Field
Garrett Park	*Good/Fair Condition:* (1) Baseball Field, *Poor Condition:* (1) Basketball Court, (2) tennis courts, (1) multi-use court.
Old Riverside Park	N/A

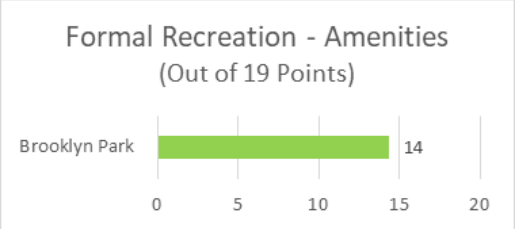
D3.3 RECOMMENDATION 3: INCREASE PARK AMENITIES & PARK PROGRAMMING

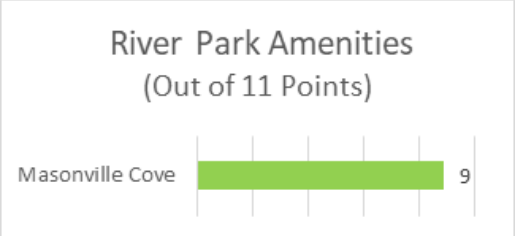
The nest tool grades amenities in parks based on the following categories:

- Presence and Quality of:
  - Seating/Benches
  - Trash Cans
  - Pet Waste Stations
  - Public Restrooms
  - Sale of Food (i.e. snack bar)
  - Sale of Food or Refreshments (i.e. Café, kiosk, snack bar)
  - Picnic Shelters or Shade Structures
  - Picnic Tables
  - Drinking Fountains

Table X: Park Amenities







Recommendation 3: Increase Park Amenities & Park Programming

Park amenities make parks more comfortable and enjoyable for park users. Benches and picnic tables allow park users to relax or enjoy a meal outdoors. Trash cans and pet waste stations keep the park clean from litter and animal waste, food stalls, public restrooms and drinking fountains increase the amount of time users can enjoy the park, and picnic shelters and shade structures provide protection from the elements. Most Greater Baybrook parks are missing some basic park amenities such as public restrooms, drinking fountains, and picnic tables. Duane Ave Park scored lowest in park amenities because of its lack of all park amenities with the exception of three park benches. Brooklyn Heights Park also scored low in park amenities. While it was one of the few parks with a public restrooms, seating was scarce in this park and it was missing all other amenities. It is recommended that park amenities be improved in all Greater Baybrook public parks and include at a bare minimum, picnic tables and trash cans.

In addition to improving park amenities, the organization and facilitation go park programming is also recommended. Garret Park has found success in their programming of the park, making this space a major asset to the community. Park programming may increase park usage, especially in adults, improving the feeling of safety. Programming like sports activities, yoga classes, art classes, live music series, educational programs, and community gardening may foster greater social interaction and connectedness.

Figure 88: Group of People Sitting on Picnic Table

Source: Friendsofpattersonpark.com

Figure 89: Families Enjoying an Outdoor Movie

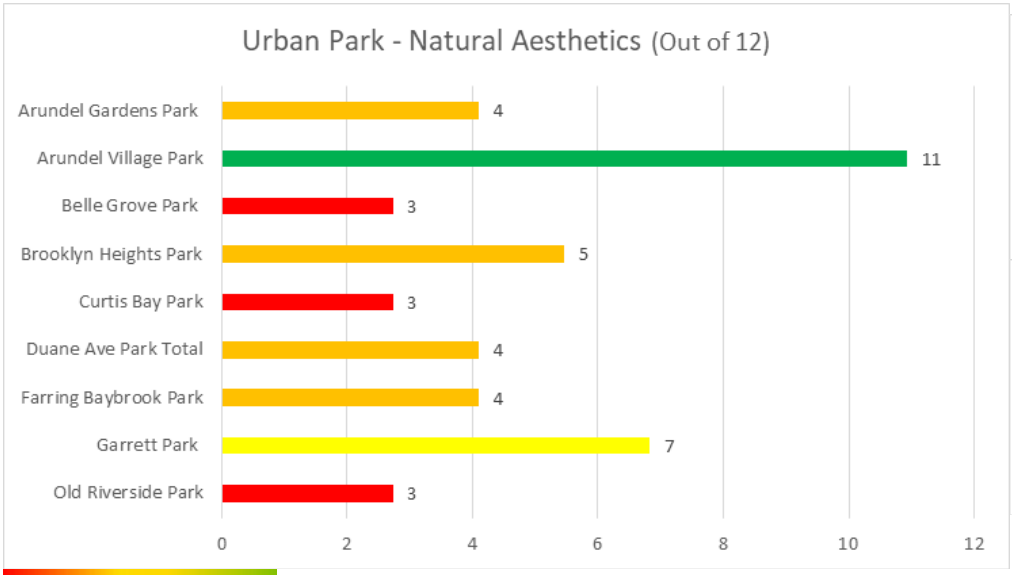
Source: timeout.com

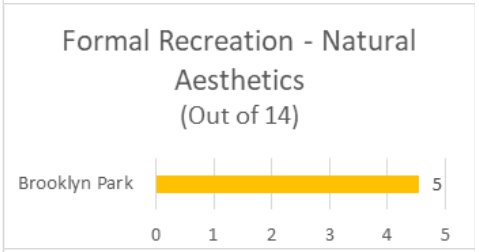
D3.4 RECOMMENDATION 4: IMPROVE NATURAL PARK AESTHETICS

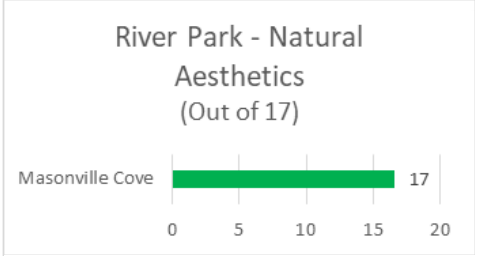
The nest tool grades natural aesthetics in parks based on the following categories:

- Maintenance and overall quality of the primary surface in the park (e.g., sand, grass, paving)
- Presence and quality of planted areas of flowers
- Presence and quality of planted areas of trees, shrubs, and other plants

Table 8: Natural Aesthetics







Natural Aesthetics like planted areas for flowers and shrubs and overall quality of the primary surface of the park are also important to create an attractive park that provides natural benefits for users and adds to the placemaking of a community. With the exception of Arundel Village Park, all Greater Baybrook parks scored low in natural aesthetics. Parks like Duane Ave Park have a main surface area that is entirely unmaintained and requires immediate attention to improve the walking surface of the park. Low maintenance plantings and perennial plantings that will return each year are low cost ways to improve the natural beauty and benefits in these public parks.

Figure 90: Example of Park with Entrance Plantings

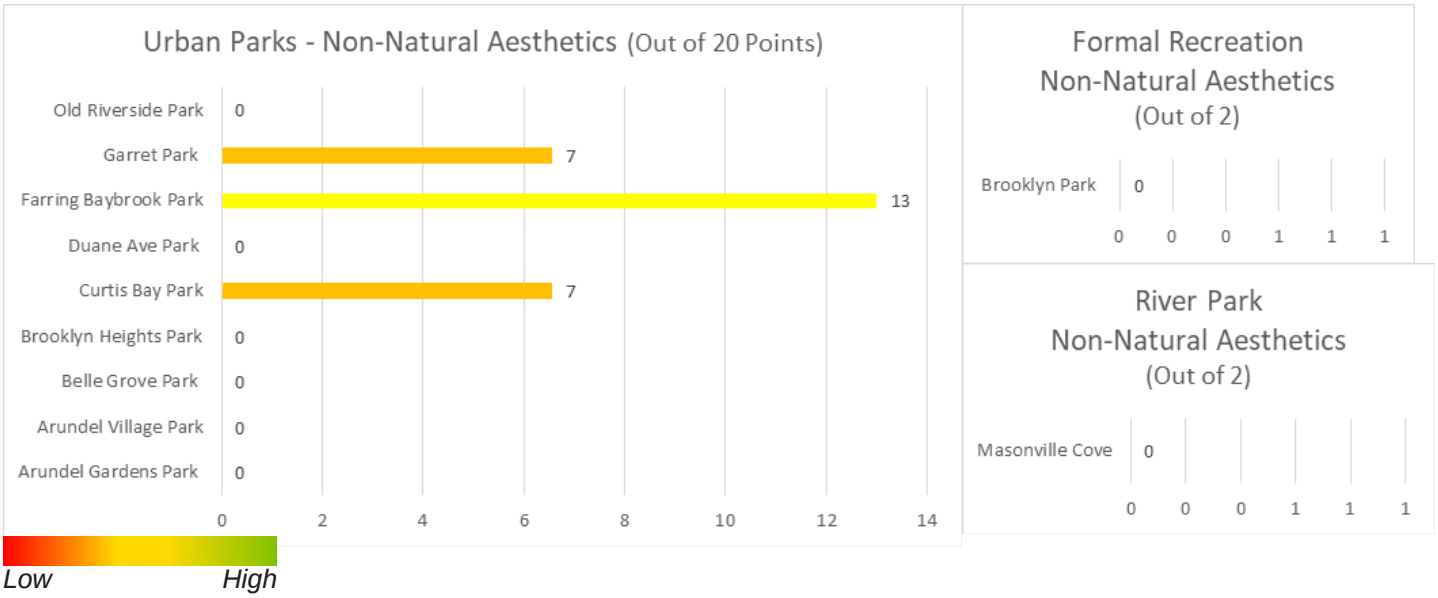
Source: washtenaw.org

D3.5 RECOMMENDATION 5: IMPROVE NON-NATURAL PARK FEATURES (I.E., PUBLIC ART) & SIGNAGE

The nest tool grades non-natural park features based on the following categories:

- Presence of
  - Decorative Water Fountains
  - Public Art
  - Attractive Man-Made Structures (i.e., historic buildings, park pavilions, etc.)

Table 9: Non-Natural Park Features



Non-natural aesthetics such as public art, decorative fountains, or attractive structures are weighted heavily in the audit for urban parks because of how these elements can create a sense of place, especially in an urban environment. Placemaking using non-natural aesthetics can nurture the identity of these public spaces and foster this identity throughout the community.

Figure 91: Existing Community Signage

Source: Original Photo

Figure X: Existing Community Public Art

Source: Original Photo

Recommendation 5: Improve Non-Natural Park Features

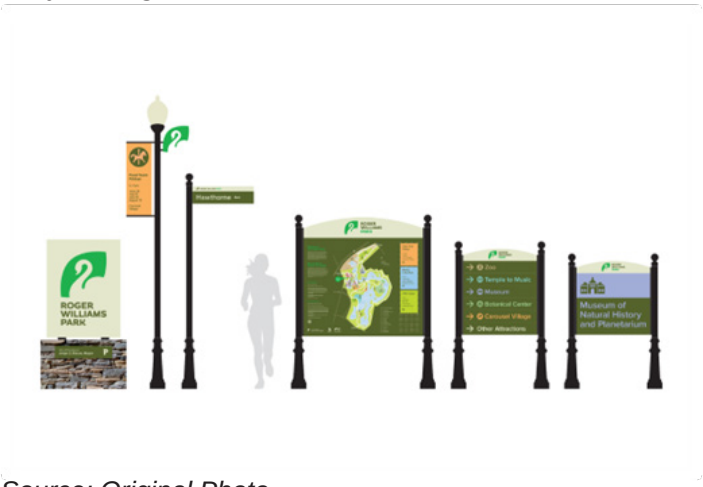
Non-natural park features can be used to enhance the culture and history of a neighborhood. It is recommended that the Greater Baybrook incorporate a diverse range of public art pieces, such as murals, sculptures, attractive signage, and other interactive art into their parks. Public art is work created by artists for places accessible to and used by the public. Creating a unique sense of place through public art is an important element of urban parks that can foster personal attachment to the site and create broader connections to the community. Public art can "engage civic dialogue and community, attract attention and economic benefit, connect artists with communities, and enhance public appreciation of art" (Becker). While a couple parks may have a small public art feature, it is recommended that all Greater Baybrook parks be improved with additional non-natural aesthetic features.

Wayfinding devices, Park signage, and rules signage can improve consistency of use and positive uses. Wayfinding devices that help residents locate public amenities and include distance to that amenity can better inform users and may increase use of public amenities. Displaying distances could encourage non-vehicular transportation to these amenities and provide better awareness for those with mobility issues. Parks with maintained signage that include the park name may provide a better sense of place and attachment for the user, improving the extent of use. Signage that includes park hours and other park rules may encourage more positive uses of the space and increase the number of users. Negative uses of the space may be discouraged, especially as positive use increases. Greater Baybrook has already began adding public art murals and flags that increase the placemaking in the community. These efforts should be expanded throughout the community, especially within the public park system.

Figure 92: Photo of Art Installation by the Boys & Girls Club of Greater Milwaukee

Source: Original Photo

Figure 93: Examples of Attractive Park Signage & Wayfinding



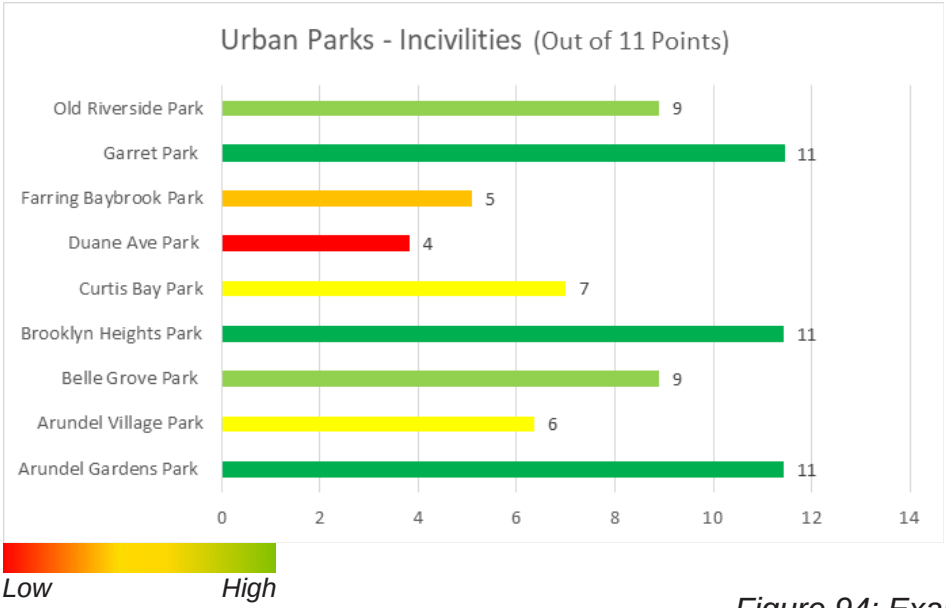
Source: Original Photo

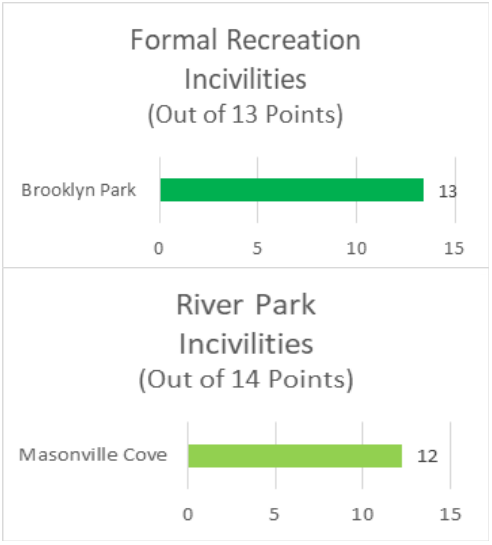
D3.6 RECOMMENDATION 6: IMPROVE PARK INCIVILITIES AND MAINTENANCE

The nest tool grades incivilities in parks based on the following categories:

- Presence of
  - General Litter
  - Evidence of Alcohol Use
  - Evidence of Drug Use
  - Graffiti
  - Broken Glass
  - Vandalism
  - Dog Mess
  - Excessive/ Unpleasant Noise (e.g., traffic, industry)

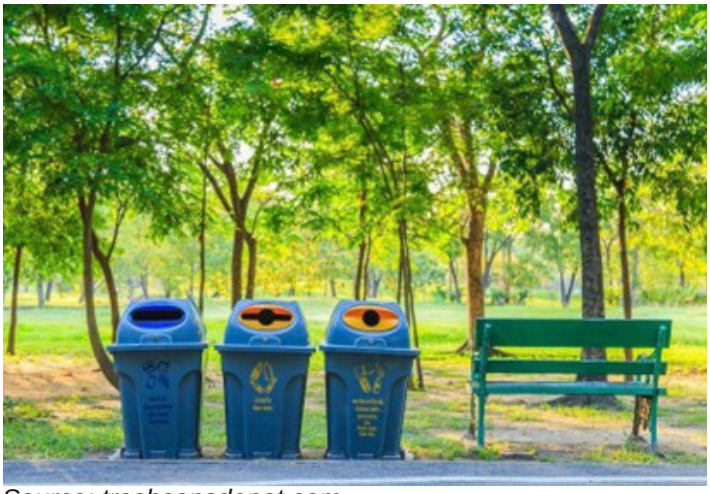
Table 10: Park Incivilities





The presence of incivilities in parks can make parks less attractive and decrease their use. Park maintenance is imperative to the success of public parks. Consistent park cleanup, landscaping, lighting maintenance, and vandalism restoration are imperative to keep these spaces as public assets. Maintaining all parks regardless of race and socioeconomic status of the community is one way to remove barriers to environmental equity. It will promote sense of care that can be echoed throughout the neighborhood. Duane Ave Park, Farring-Baybrook Park, Arundel Village Park, and Curtis Bay Park should be prioritized for addressing incivilities.

Figure 94: Example of Recycling Bins in Park



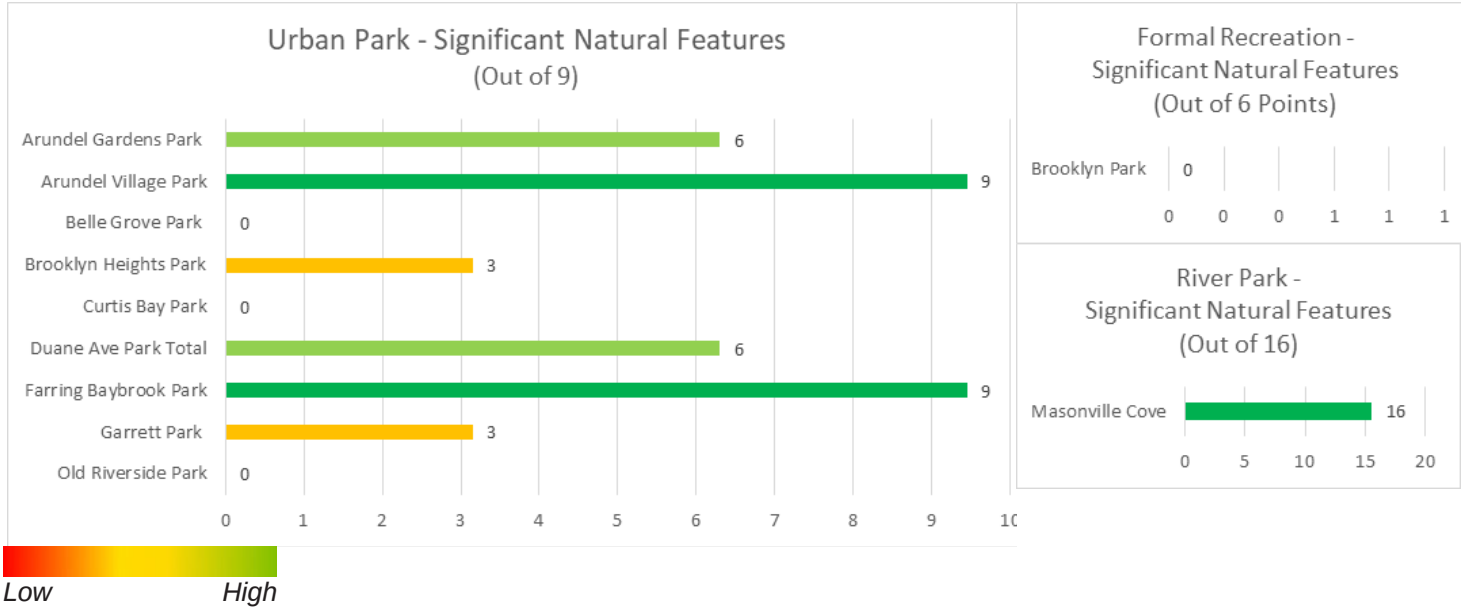
Source: trashcansdepot.com

D3.7 RECOMMENDATION 7: IMPROVE SIGNIFICANT NATURAL FEATURES

The nest tool grades significant natural features in parks based on the following categories:

- Area occupied by Water Feature (if applicable)
- Nice Views (i.e. vistas, scenic areas, etc.)
- Tree Canopy Coverage Percentage

Table 11: Significant Natural Park Features



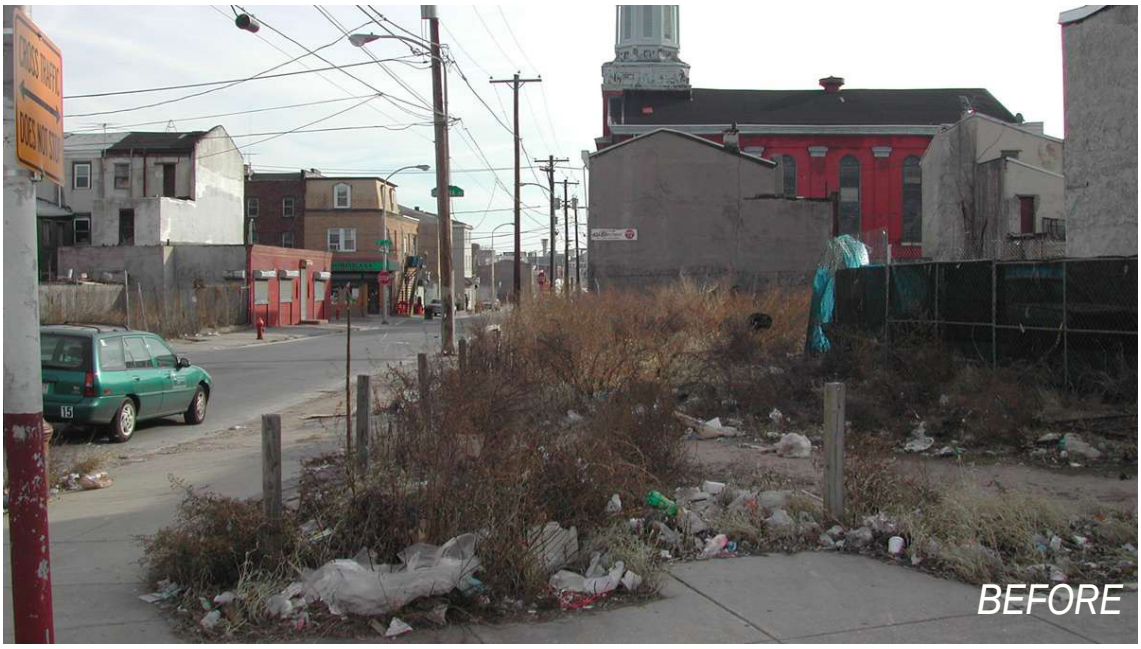
In the park audit for urban parks, significant natural features were not weighted as highly as other park features, however, natural aesthetics can still be an important part of any type of park because of the natural benefits they provide park users. Based on the completed park audit scores, almost all parks scored low in natural aesthetics. It can be difficult to change a water feature or the scenic views in a park, but improving tree canopy coverage is a simple way to greatly improve the natural aesthetics of a park and increase the benefits that trees provide. With the exception of Arundel Village Park, it is recommended that all parks increase tree canopy coverage. See goal 5 for detailed recommendations on locations where tree canopy coverage should be increased.

Figure 95: Photo of People Sitting Under Trees with Scenic View

Source: nature.org

GOAL 3

EXPAND PARK ACREAGE IN AREAS OF NEED

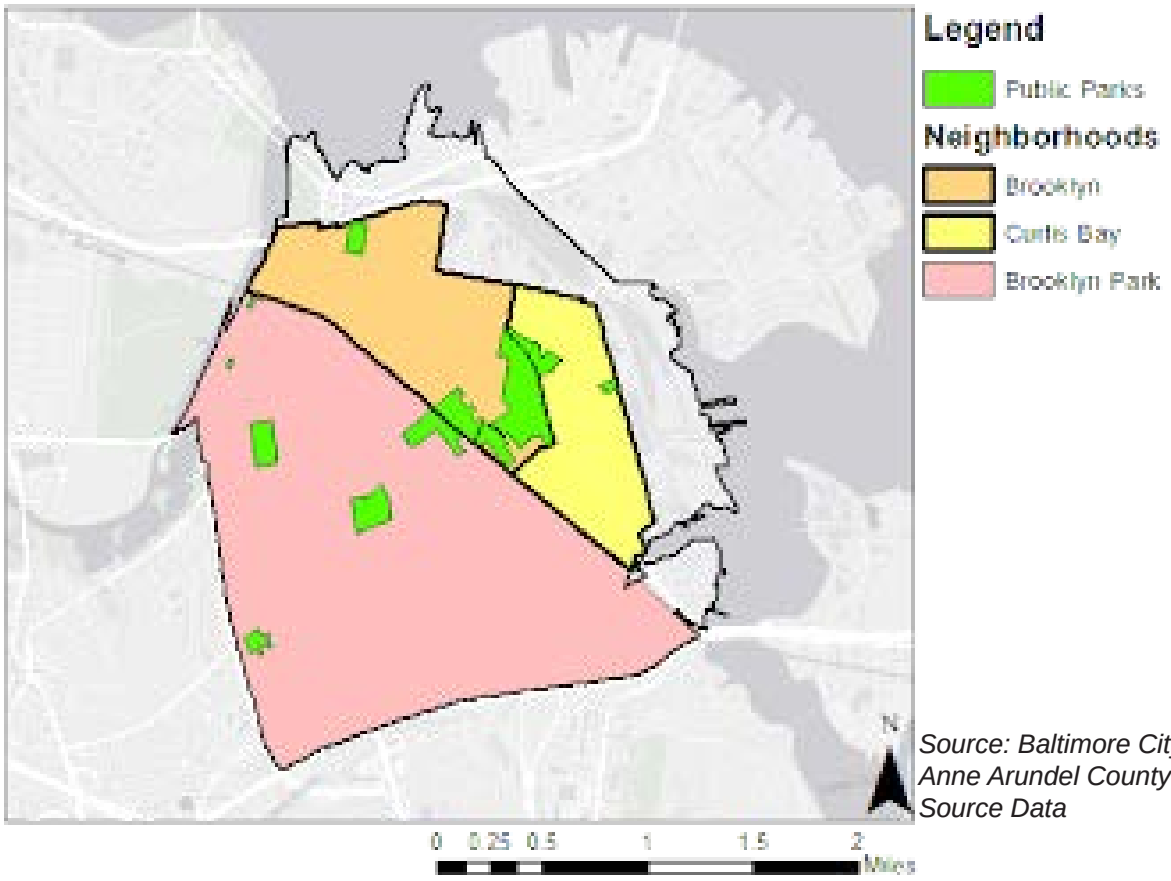


Source: whyy.org

E1. INVENTORY OF PARKS, SCHOOLS, AND VACANT OR UNDEVELOPED LAND

The table below shows that 5.2% of Greater Baybrook is public park land, a much lower percentage than Baltimore City at 9.6% (Trust for Public Land, 2017). In terms of park access, the neighborhoods of Greater Baybrook differ greatly. Brooklyn has by far the most acreage and highest percentage of park space (19%) in relation to total neighborhood area. Brooklyn Park has the most parks and second highest acreage, but a low percentage of park space (3%) in relation to total neighborhood area. Although it borders Farring-Baybrook Park, Curtis Bay has the least number of parks and park acreage and by far the smallest percentage of parks (0.05% per total neighborhood area).

Figure 96 Park Access by Neighborhood Map



Source: Baltimore City & Anne Arundel County Open Source Data

Table 12 Park Access & Acreage by Neighborhood

	No. of Parks	Park Acreage	% Neighborhood
Brooklyn	3 Parks	99 Acres	19%
Curtis Bay	1 Park	15 Acres	.05%
Brooklyn Park	6 Parks	63.5 Acres	3%
Total	10 Parks	177.5 Acres	*5.2%

** The total % of public parks is based on the total Greater Baybrook area.*
Masonville Cove was not included in this map because it is not located within the three neighborhoods.
Park Acreage is approximated through measurement in google earth

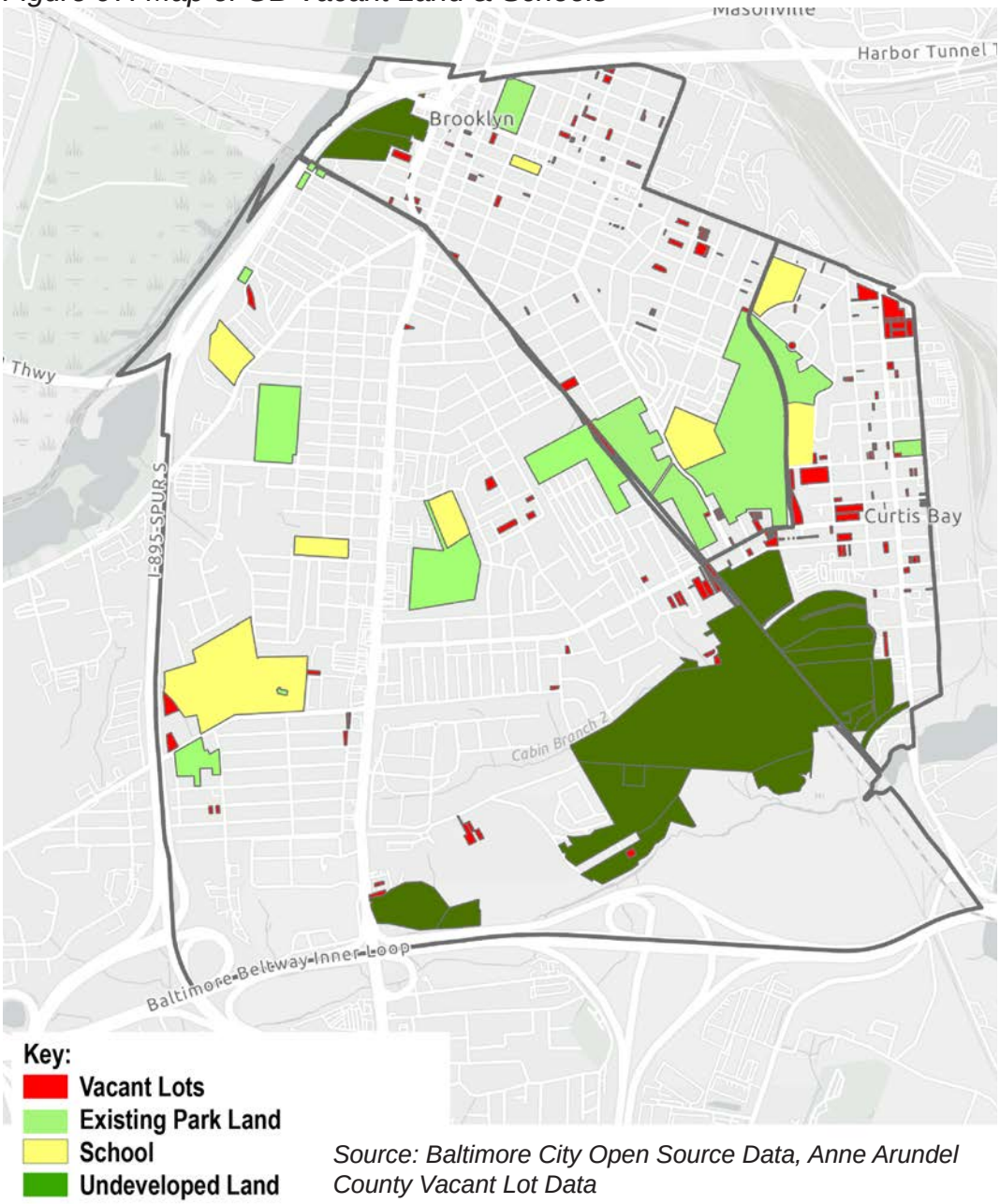
According to the Trust for Public Land's ParkServe mapping tool, most areas of the Greater Baybrook are within a 10 minute walk (Trust for Public Land, n.d.) Areas greater than a 10 minute walk are represented in purple and include parts of north Brooklyn, northeast Curtis Bay and South Brooklyn Park that are considered high priority or moderate priority areas for new parks. Based on the information we do have, it it is apparent that creating additional park land and more connections between parks is important in providing a more equitable living environment for residents. As land is developed and more residents move to the southern area of Brooklyn Park, this need will only increase.

Table 13 Total Acreage by Land Types

Land Type	Acreage	% of Total Land
Public Parks	179	*5.2%
Schools	66	2%
Vacant Land	37	1%
Undeveloped Land	237	**6.9%
Total	**519**	**15%**

*Not including Masonville Cove which is outside of the 3 neighborhoods
** Not including Reedbird Island which is outside of the 3 neighborhoods

Figure 97: Map of GB Vacant Land & Schools



Source: Baltimore City Open Source Data, Anne Arundel County Vacant Lot Data

E2.1 RECOMMENDATION 1: ENCOURAGE SHARED USE PARK SPACE AT PUBLIC SCHOOLS

Schools and greenspace around schools make up 2% of total land in the Greater Baybrook. Many schools have wonderful amenities, such as sports fields and playgrounds, but may not offer these amenities to local residents. A way to increase access to such amenities for residents is to create joint agreements with the public school district for public use after school hours. The following amenities would be available to residents after school hours if joint agreements were established:

Table 14: Greater Baybrook Public School Amenities

School	*Acreage	Amenity
Maree G. Farring Elementary School	1.5 Acres	Playground, (2) Basketball Half Courts
Benjamin Franklin High School	8 Acres	Open Multi-Use Recreation Field
Baybrook Elementary / Middle School	5 Acres	(2) Playgrounds
Curtis Bay Middle School	6 Acres	(1) Full Size Basketball Court, (2) Playgrounds
Park Elementary School	7.2 Acres	(2) Playgrounds
Bell Grove Elementary School	6.2 Acres	(2) Playgrounds, (1) Full Size Basketball Court
Brooklyn Park Elementary School	5 Acres	(1) Playground
Brooklyn Park Middle School	27 Acres	(2) Soccer Fields, (4) Tennis Courts, (2) Baseball Fields, (2) Basketball Courts, (1) Track
Total	66 Acres	

*Acreage is approximate and includes the school building footprint

Figure 98: Photo of Young Men Playing Basketball

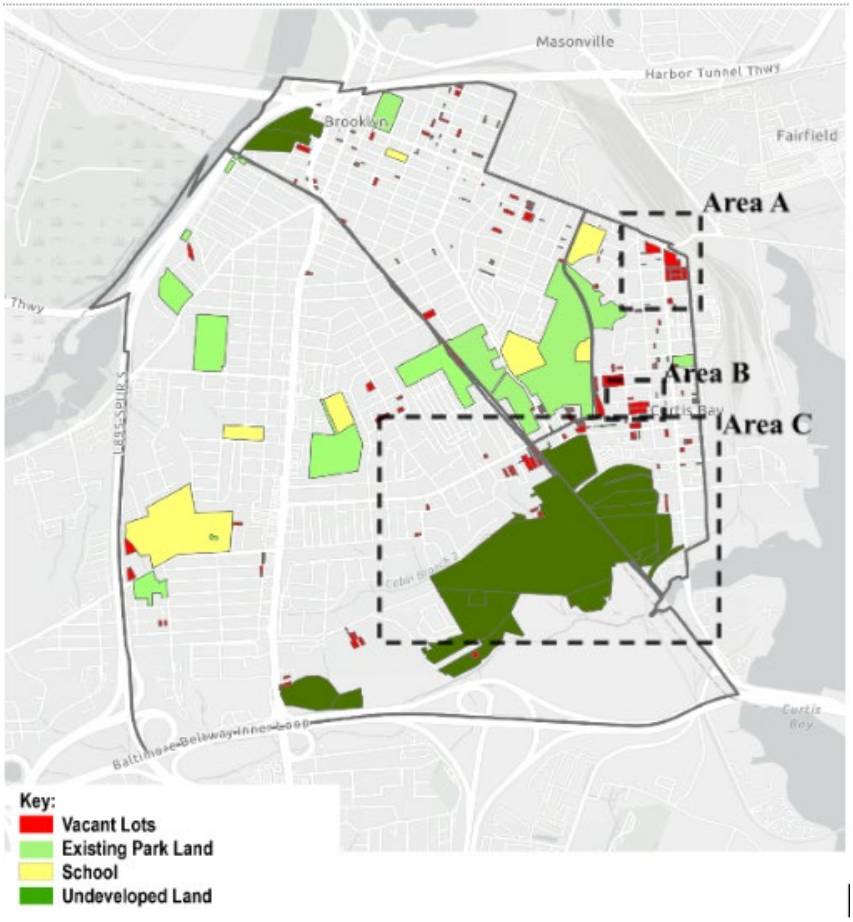
Credit: Steven Abraham

E2.2 RECOMMENDATION 2: UTILIZE VACANT AND UNDEVELOPED LAND AS ADDITIONAL PARK SPACE

Vacant Land accounts for 1% of total land within the Greater Baybrook and Undeveloped land accounts for almost 7% of total land. Based on highest areas of need in Curtis Bay and Southeast Brooklyn Park, the following areas were highlighted at potential spots for increasing parks and greenspaces:

- Area A: Vacant Lots in Northeast Curtis Bay
- Area B: Vacant Lots in Middle Curtis Bay
- Area C: Undeveloped Land in South Brooklyn Park

Figure 99: Map of GB Vacant Land W/ Areas Highlighted



Source: Baltimore City Open Source Data, Anne Arundel County Vacant Lot Data

Area A: Vacant Lots in Northeast Curtis Bay

With only one .05% public park space in the neighborhood of Curtis Bay, park access can be increased by utilizing the many acres of vacant lots in the neighborhood. Area A shows large unutilized open fields nearby residential housing. These vacant lots could be transformed into neighborhood parks for the community. Pennington Ave is part of the Complete Street alignment that would connect neighborhoods and community amenities.

Lot 1 and Lot 2 are large open fields owned by Baltimore Electric and Gas and Lot 3 is owned by a land management investment company (see Figure below). Based on the proposed redesign of Pennington Ave (See figure below), there is potential for Lot 2 to be utilized as a road connection, leaving large green open space available for park use. While it is unknown at this time what Lot 1 and Lot 3 may be used for in the future, in the present these areas could be used as recreational field areas, planted with trees, that provide areas for residents to enjoy the outdoors. This could potentially add three more parks to the neighborhood of Curtis Bay.

Figure 100: Map of Area A - Vacant Lots in Northeast Curtis Bay

Figure 101: Proposed Pennington Ave

Source: Baltimore City Department of Transportation

Table 15: Area A Vacant Lots

Lot	Block Lots	Owner	Acreage
1	7268 001	Baltimore Gas & Electric Co	1.3 Acres
2	7265 001-004	Baltimore Gas & Electric Co	2.2 Acres
3	7261 033 7261 039	Haynes Properties, Inc.	.4 Acres

Source: codemap

Area B: Vacant Lots in Middle Curtis Bay

The middle of Curtis Bay is a residential area that lacks public park space. Vacant lots owned by nonprofits like churches and veteran organizations make great places for public parks and parklets. Lot 4 is owned by a Catholic church and is currently an open grass area with trees. Lot 5 looks like there was once a building here, but is now an open lawn area with a memorial statue owned by the American Legion, a veteran organization. By redesigning these areas as neighborhood amenities where residents can gather outdoors and receive the benefits of natural greenspaces, Curtis Bay's public park access would increase.

Figure 102: Map of Area B - Vacant Lots in Middle Curtis Bay

Table 16: Area B Vacant Lots

Lot	Block Lots	Owner	Acreage
4	7200 125 7200 131	Saint Athanasius Roman Catholic Church	1.3 Acres
5	7189 004	American Legion Post #187	2.2 Acres

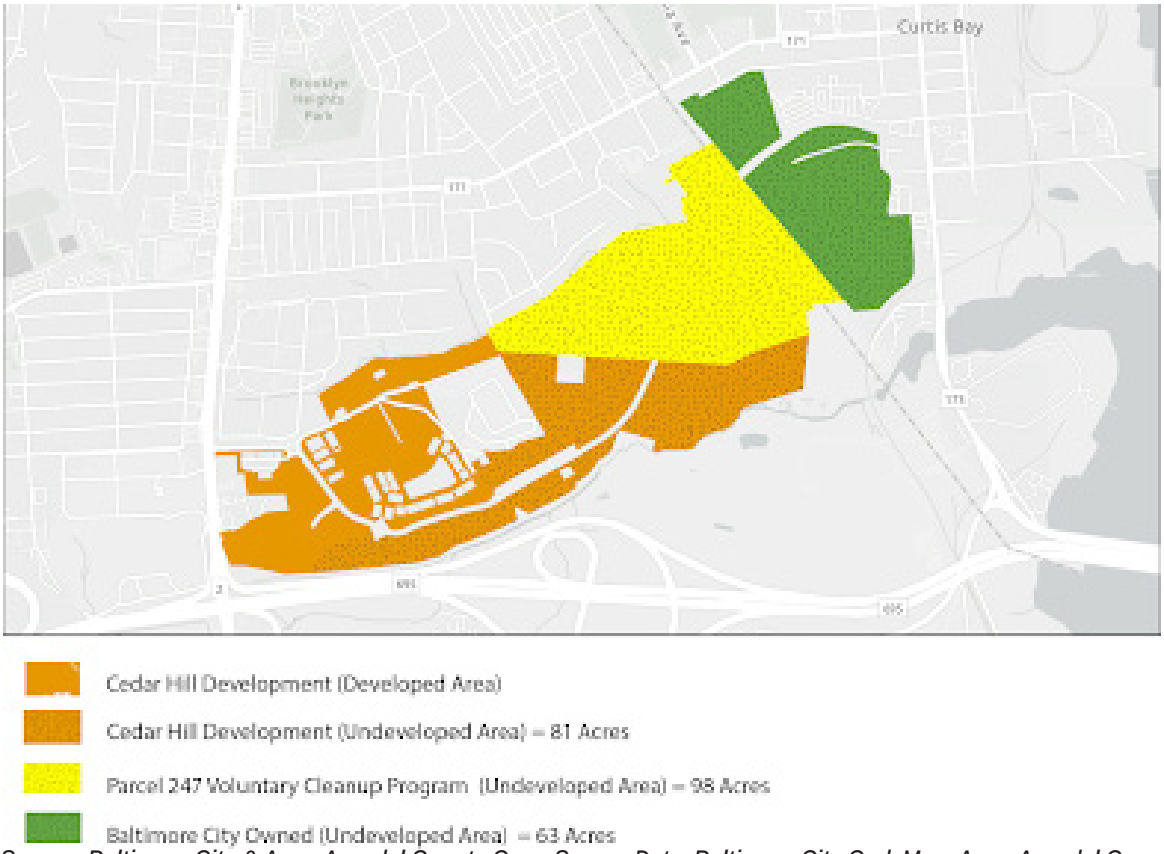
Source: codemap

Area C: Undeveloped Land in South Brooklyn Park and South Curtis Bay

As mentioned in previous goals, the undeveloped land in South Brooklyn, around the Snow Hill Lane site, represents a huge opportunity to increase park land and recreation space available for residents. According to the ParkServ Figure, South Brooklyn Park is an area of moderate priority for park access, meaning this area is over a 10 min walk to get to a public park (ParkServe, n.d.). While there is a low need for it now due to the low density of homes in Brooklyn Park, this area is planned to be redeveloped for residential housing. This need for public park and recreation space will increase as land is developed here.

The areas in the map below show that there are three owners of this undeveloped land, Cedar Hill Development that is owned by Pleasants Co., an unknown land holdings company, and Baltimore City. If all three of these undeveloped land areas were repurposed as public park land, the percentage of total park land would increase from 5.7% to 12%.

Figure 103: Map of South Brooklyn Park and South Curtis Bay Developed & Undeveloped Land



Source: Baltimore City & Anne Arundel County Open Source Data, Baltimore City CodeMap, Anne Arundel County REGRID

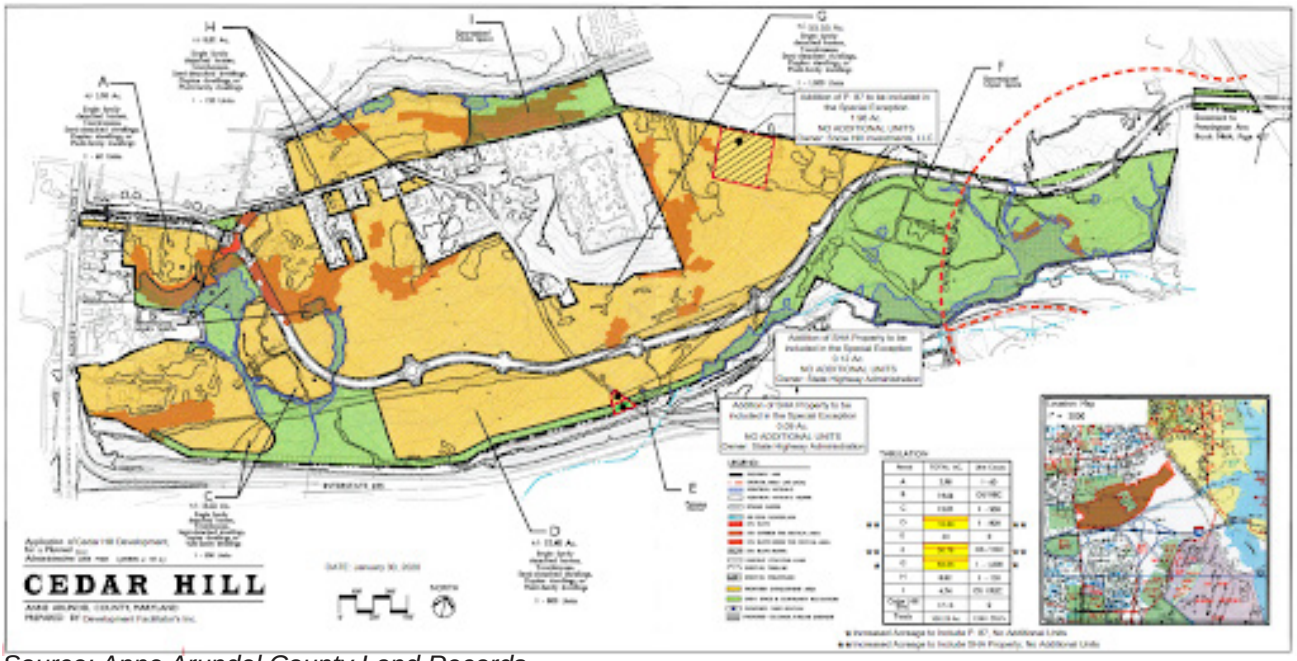
Recommendation 2: Utilize Vacant and Undeveloped Land as Additional Park Space

The following action items are recommended as they relate to undeveloped land in South Brooklyn Park and Curtis Bay:

- Ensure planning for amenity greenspaces in conjunction with Stream Restoration Efforts by Anne Arundel County Department of Public Works.
- Communicate with land developers prior to the finalization of residential development plans and discuss benefits that greenspaces provide to the community and their future residents
- Work with Maryland Department of the Environment (MDE) Land and Materials Administration's Land Restoration Program (LMA-LRP) to determine which areas are safe to recreational use and what Voluntary Cleanup Program (VCP) areas are still active.
- Work with Baltimore City to determine feasibility of offering this city owned land as a residential recreational amenity to the community.

Based on previous master plan applications in 2020 for the Cedar Hill Development area, future open-space and recreation areas may be planned for this area, however, no current plans for this area have been established (See green areas below for potential open-space recreation areas).

Figure 104: Potential Future Development Plans in South Brooklyn Park



Source: Anne Arundel County Land Records

GOAL 4

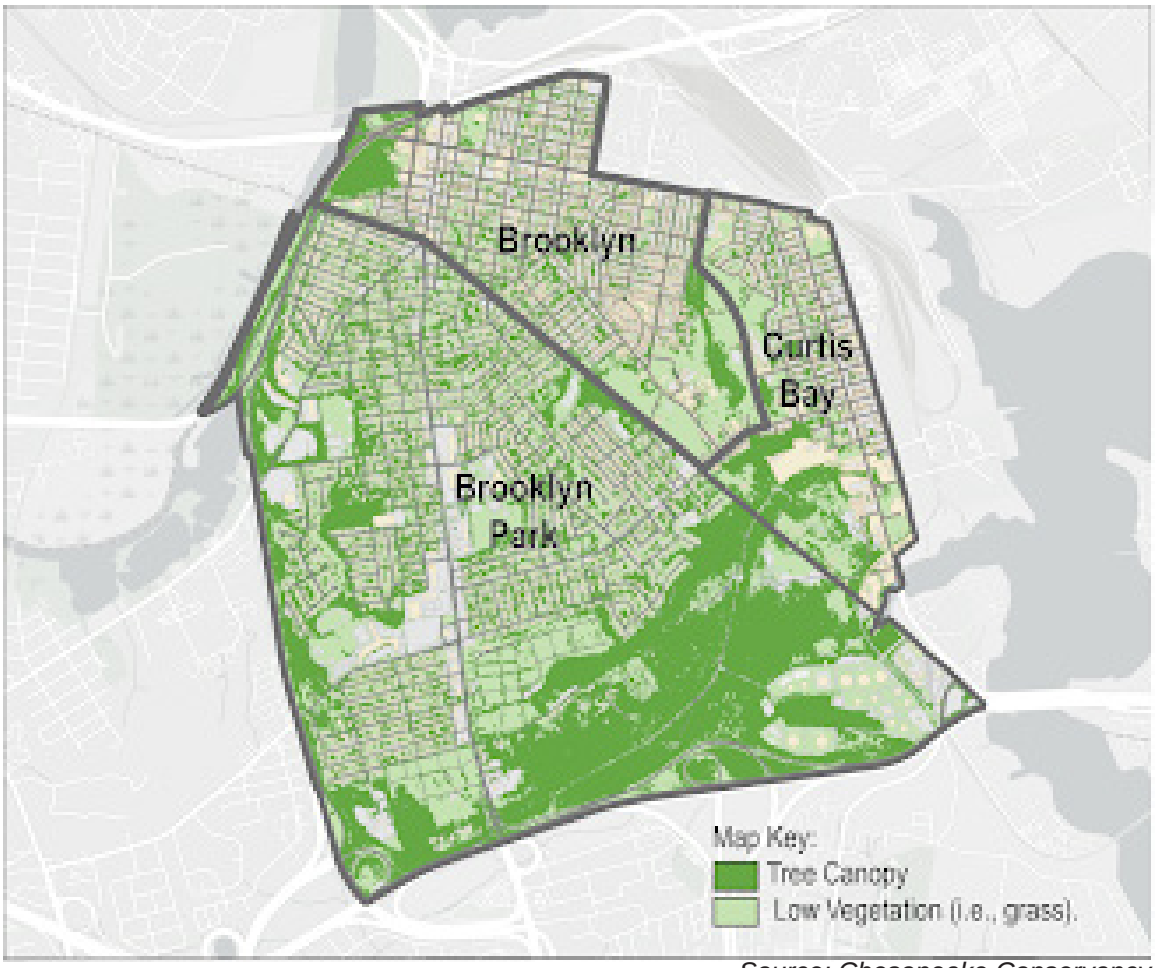
INCREASE TREE CANOPY COVERAGE

Source: thebrooklynhopper.com

F.1 CANOPY COVERAGE INVENTORY

Using data from the Chesapeake Conservancy, Brooklyn Park has the highest tree canopy coverage at 43%, however, this coverage could decrease dramatically with the planned future residential development in southwest Brooklyn Park. Curtis Bay and Brooklyn have low canopy coverage at 26% and 22% respectively. It's important to note that the areas with the most canopy coverage are not accessible to the public. Inversely, areas where you would expect to have the most canopy coverage, such as parks and schools, have extremely low canopy coverage.

Figure 105: Map of Canopy Coverage by Neighborhood

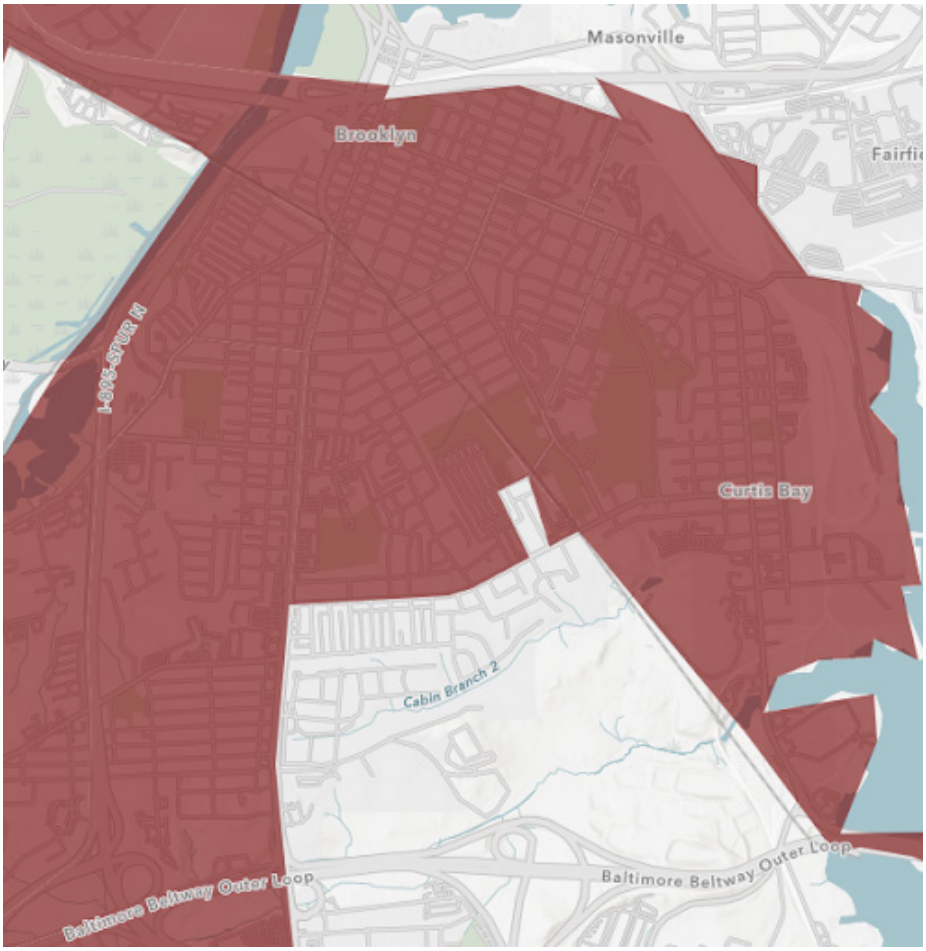


Source: Chesapeake Conservancy

Greater Baybrook Tree Canopy
Brooklyn Park = 43%
Brooklyn = 22%
Curtis Bay =26%
Baltimore City Goal: 40% by 2030

The Chesapeake Bay Foundation created a map that shows priority urban communities for tree planting based on high unemployment or low income census blocks. Based on the mapping tool, all areas of the Greater Baybrook, with the exception of South Brooklyn Park, are considered high priority areas for tree planting (Chesapeake Bay Foundation, n.d.).

Figure 106: Map of Tree Grant Program Eligibility



Source: Chesapeake Bay Foundation

F2 GOAL 4 RECOMMENDATIONS

F2.1 RECOMMENDATION 1: INCREASE TREE CANOPY ON MAJOR ROADS

In coordination with Goal 3, tree canopy coverage can be increased along major roads, making it more enjoyable for the pedestrian while also supplying all the benefits that trees provide. The following roads along the proposed transportation alignment (see GOAL 1) have been inventoried as low canopy coverage:

- Pennington Ave
- Virginia Ave
- W Bay Ave
- Church Street
- Governor Ritchie Highway
- 10th Street
- Fairhaven Road
- E Patapsco Avenue
- S Hanover Street

Tree canopy can be increased on these streets through vegetative bumpouts, sidewalk tree grates, right-of-way plantings, and residential front yard tree plantings. Tree lined streets would beautify neighborhoods, enhance traffic calming, and reduce noise pollution. Through complete street redesigns and street tree plantings, the increase in canopy coverage along these roads will benefit the community and help Baltimore reach its goal of 40% canopy coverage.

Figure 107: Road with Trees

Source: bbc.com

F2.2 RECOMMENDATION 2: INCREASE TREE CANOPY IN SCHOOLS

Shade from trees are important when walking or playing outdoors on sunny days or days with a high heat index. Research shows that there is a link between the natural environment at a school and the student's academic performance. As trees increase, academic performance increases (Kweon, 2017). Out of the eight public schools within the greater Baybrook, seven of them are low in canopy coverage.

Maree Garnett Farring Elementary/Middle School canopy coverage improvements include:

- Street Tree Plantings
- Entrance Tree Plantings
- Playground Tree Plantings

Figure 108: Image of Maree Garnett Farring Elementary/ Middle School

Source: Google Earth

Park Elementary School canopy coverage improvements include:

- Street tree plantings
- Median plantings
- Parking lot tree plantings

Figure 109: Image of Park Elementary School

Source: Google Earth

Recommendation 2: Increase Tree Canopy in Schools

Baybrook Elementary/ Middle School canopy coverage improvements include:

- Street tree plantings
- Entrance plantings
- Playground plantings

Figure 110: Image of Baybrook Elementary/ Middle School

Source: Google Earth

Belle Grove Elementary School canopy coverage improvements include:

- Street tree plantings
- Parking lot plantings
- Entrance plantings
- Playground plantings

Figure 111: Image of Belle Grove Elementary

Brooklyn Park Middle School canopy coverage improvements include:

- Street tree plantings
- Parking lot plantings
- Entrance plantings
- Open field plantings

Figure 112: Image of Brooklyn Park Middle

Recommendation 2: Increase Tree Canopy in Schools

Curtis Bay Elementary/Middle School canopy coverage improvements include:

- Entrance plantings
- Open field plantings
- Playground plantings

Figure 113: Image of Curtis Bay Middle School

Source: Google Earth

Benjamin Franklin High School canopy coverage improvements include:

- Street tree plantings
- Open field plantings
- Parking lot plantings

Figure 114: Image of Benjamin Franklin High School

Source: Google Earth

F2.3 RECOMMENDATION 3: INCREASE TREE CANOPY IN PARKS

Trees provide habitats for insects and animals as well as shelter from overexposure to the sun. In addition, parks with high canopy coverage can be a wonderful way to experience nature; however, many parks include large expanses of grass or paving with little to no trees. Without protection from trees during sunny days, park users may end up spending less time or no time in parks, lowering overall park utilization. Out of the nine parks located within the Greater baybrook, it is recommended that eight of them increase canopy coverage.

Farring-Baybrook Park canopy coverage improvements include:

- Street tree plantings
- Open field plantings
- Playground tree Plantings
- Pathway tree plantings
- Sport Field and Court Plantings

Figure 115: Image of Farring-Baybrook Park

Source: Google Earth

Brooklyn Heights Park canopy coverage improvements include:

- Street tree plantings
- Open field plantings
- Playground tree Plantings
- Pathway tree plantings
- Sport Field and Court Plantings

Figure 116: Image of Brooklyn Heights Park

Source: Google Earth

Recommendation 3: Increase Tree Canopy in Parks

In addition to recent tree plantings, other canopy coverage improvements for ***Garrett Park*** include:

- Open Field plantings
- Playground Tree Plantings
- Pathway Tree plantings

Figure 117: Image of Garrett Park

Source: Google Earth

Old Riverside Park canopy coverage improvements include:

- Street tree plantings
- Playground tree plantings
- Court Plantings

Figure 118: Image of Old Riverside Park

Source: Original Photo

Belle Grove Park canopy coverage improvements include:

- Street tree plantings
- Playground tree plantings

Figure 119: Image of Belle Grove Park

Source: Original Photo

Recommendation 3: Increase Tree Canopy in Parks

Brooklyn Park canopy coverage improvement include:

- Street tree plantings
- Parking lot plantings
- Playground tree plantings
- Field perimeter tree plantings

Figure 120: Image of Brooklyn Park

Source: Google Earth

Curtis Bay Park canopy coverage improvements include:

- Street tree plantings
- Open field plantings
- Court perimeter plantings

Figure 121: Image of Curtis Bay Park

Source: Google Earth

Arundel Village Park canopy coverage improvements include:

- Street tree plantings
- Parking lot plantings
- Court perimeter plantings
- Playground tree plantings

Figure 122: Image of Arundel Village Park

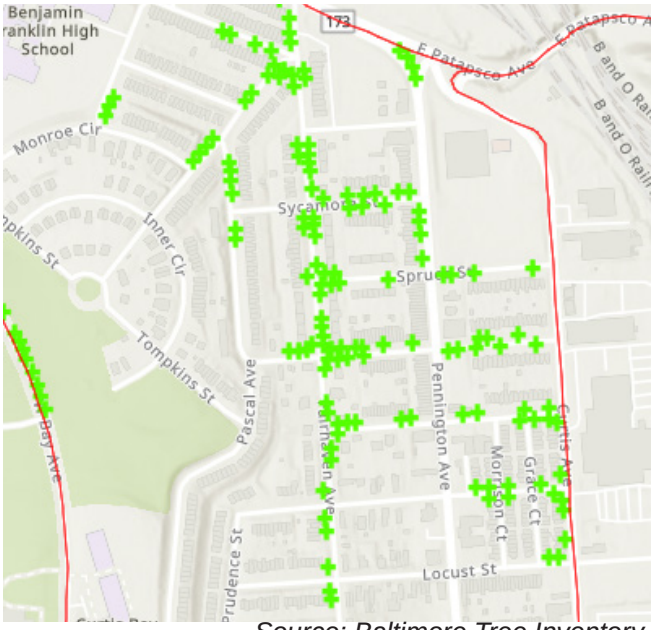
Source: Google Earth

F2.3 RECOMMENDATION 4: INCREASE TREE CANOPY IN RESIDENTIAL AREAS

It is widely researched that trees in residential neighborhoods beautify the community, increase property values, and improve health and wellbeing for residents. In 2018, Baltimore City did a Tree inventory locating all the trees within the public right of way and within public parks. Areas suitable for street trees are noted as “green crosses” on the maps below. The following residential areas have suitable space for street trees:

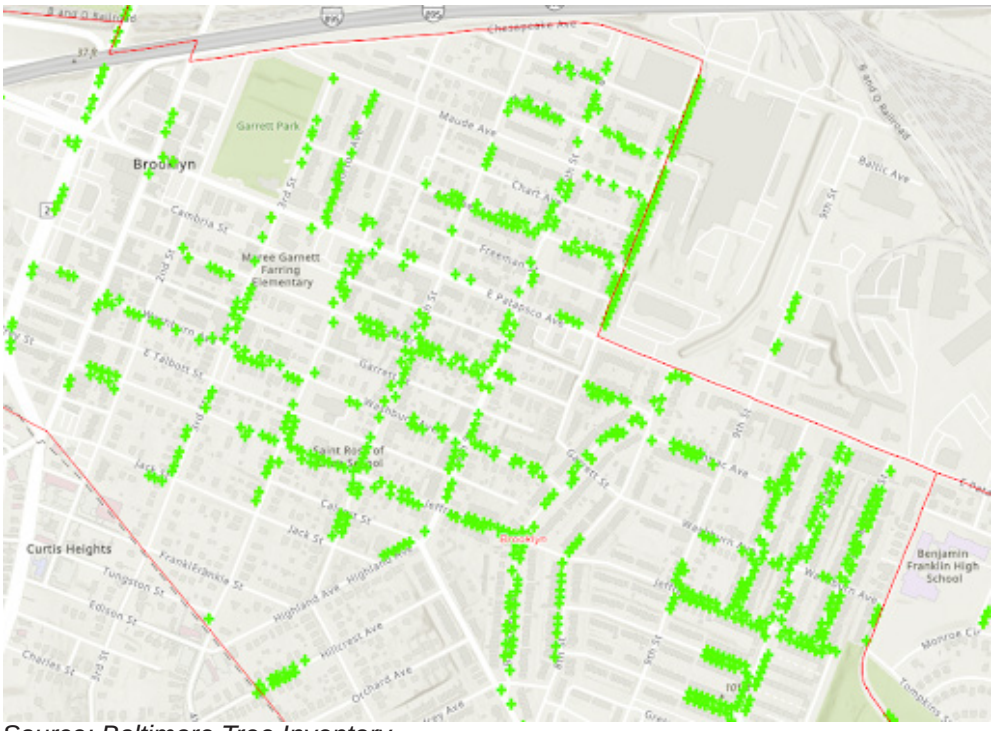
- North Curtis Bay
- North Brooklyn

Figure 124: Map of Areas in North Curtis Bay Suitable for Street Trees



Source: Baltimore Tree Inventory

Figure 123 Map of Areas in North Brooklyn Suitable for Street Trees



Source: Baltimore Tree Inventory

Recommendation 4: Increase Tree Canopy in Residential Areas

Based on research done through the Tree Equity Score data tool, low income neighborhoods and communities of color have less tree canopy coverage than white higher income neighborhoods. Using data from American Forests, a non-profit focused on slowing climate change and advancing social equity, a tree equity score was developed for each census block within the Greater Baybrook. The score evaluates data such as existing tree canopy, population density, income, employment, surface temperature, race, age, and health. Based on these metrics the following areas received a low tree equity score:

- Census Block Group 240037501011
- *Census Block Group 245102504022*

Figure 125: Image of Tree Equity Score

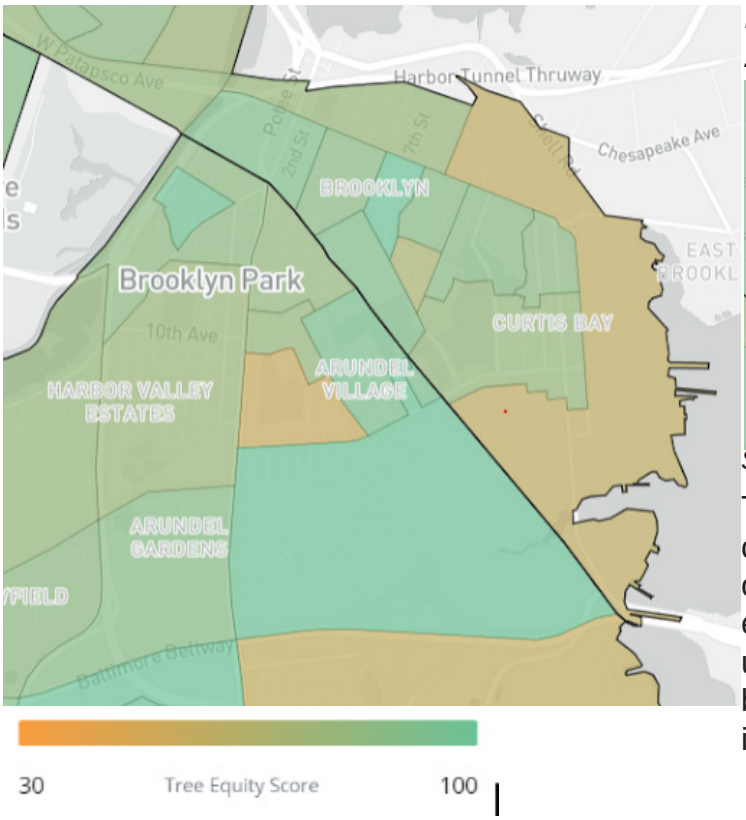
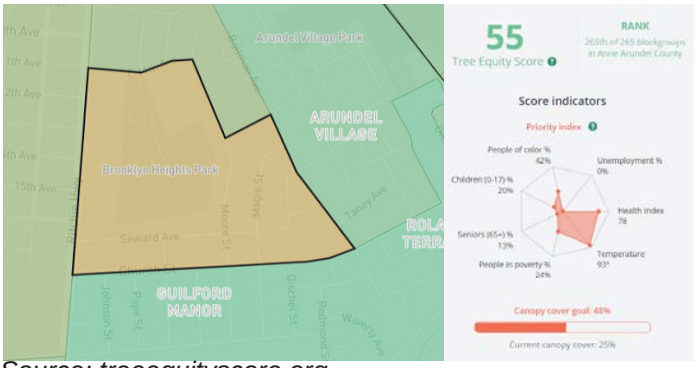


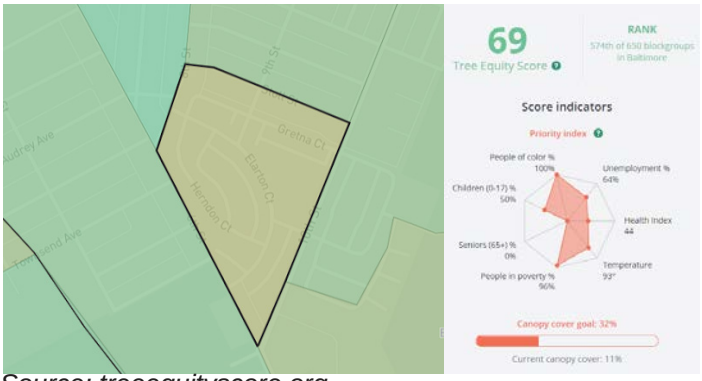
Figure 126: Image of Census Block Group 240037501011



Source: treeequityscore.org

Based on analysis of this area, this census tract includes commercial areas with large parking lots and large open fields without trees. Many of the homes within this area lack trees and there is low canopy coverage along Church Street.

Figure 127: Image of Census Block Group 245102504022



Source: treeequityscore.org

This census tract is the affordable housing units of Brooklyn Homes. This is a primarily black or African American housing community and extremely high density. The majority of housing units do not have a single tree in the front or back yards. See recommendation 4 for additional information.

Recommendation 4: Increase Tree Canopy in Residential Areas

This housing community is an example of a property with no trees in the front or back yard. Low income housing can be transformed by healthy shade trees that help it blend into the community, rather than sticking out. Street trees, backyard, and sideyard plantings would visually improve this property and lower energy bills.

Figure 128: Image of 3705 Fairhaven Ave

Source: Google Earth

The neighborhood of Brooklyn Homes was identified as having a low tree equity score. The low canopy coverage of this neighborhood exemplifies the inequities of low income and minority communities. Street trees, front yard trees, and shared open field plantings would help this community through lower energy bills, decreased urban heat island, and a more visually appealing space where residents could take pride in living.

Figure 129: Images of Brooklyn Homes, Affordable Housing, 6th Street

Source: Google Earth

Source: Google Earth

GOAL 5

USE GREEN INFRASTRUCTURE TO CONTROL FLASH FLOODS AND REDUCE STORMWATER RUNOFF

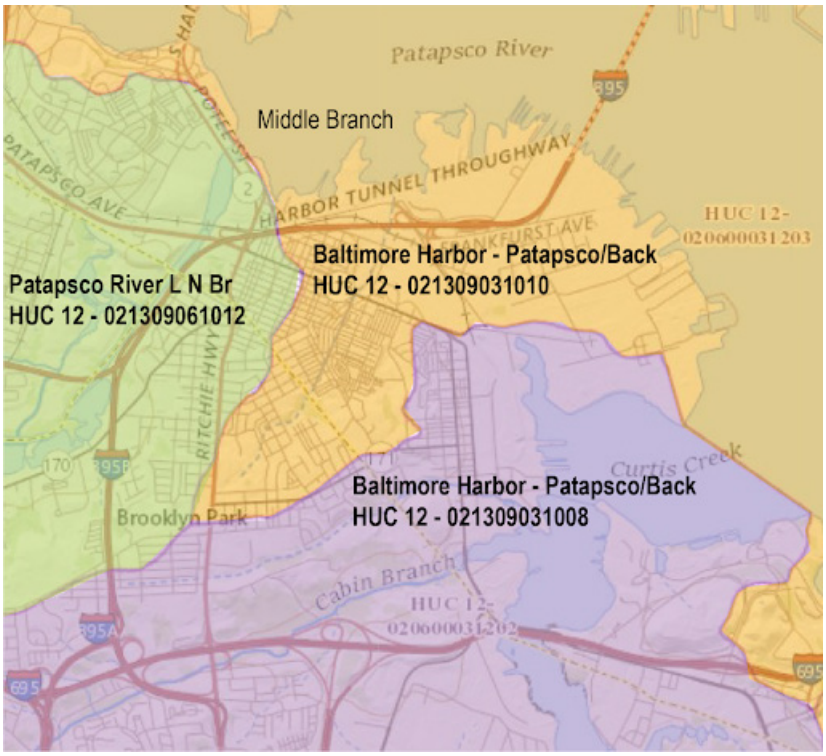
Source: D.C. Department of Energy and Environment

G1. HYDROLOGY AND THE CHESAPEAKE BAY

The Chesapeake Bay is the largest estuary in the United States and the third largest in the world. It provides a home for thousands of species of plants and animals and 18 million people along the east coast. It drains from parts of Maryland, Virginia, Delaware, West Virginia, Pennsylvania, New York and all of the District of Columbia and into the Bay. In addition to water that drains from these areas, pollutants, also drain into the Chesapeake Bay, which can harm animals and their delicate ecosystems, make drinking water unsafe, decrease our food supply, and many other issues.

Hydrology is the science that understands properties of the waters of the earth and their relationship with the environment (USGS,n.d.). Understanding these relationships within Greater Baybrook is important because of the environmental impacts these water bodies have on the fragile ecosystems within the Chesapeake Bay. The Greater Baybrook is located within several subwatersheds that flow into the Chesapeake Bay including the Baltimore Harbor and Patapsco River Watersheds.

Figure 130: Map of Subwatersheds



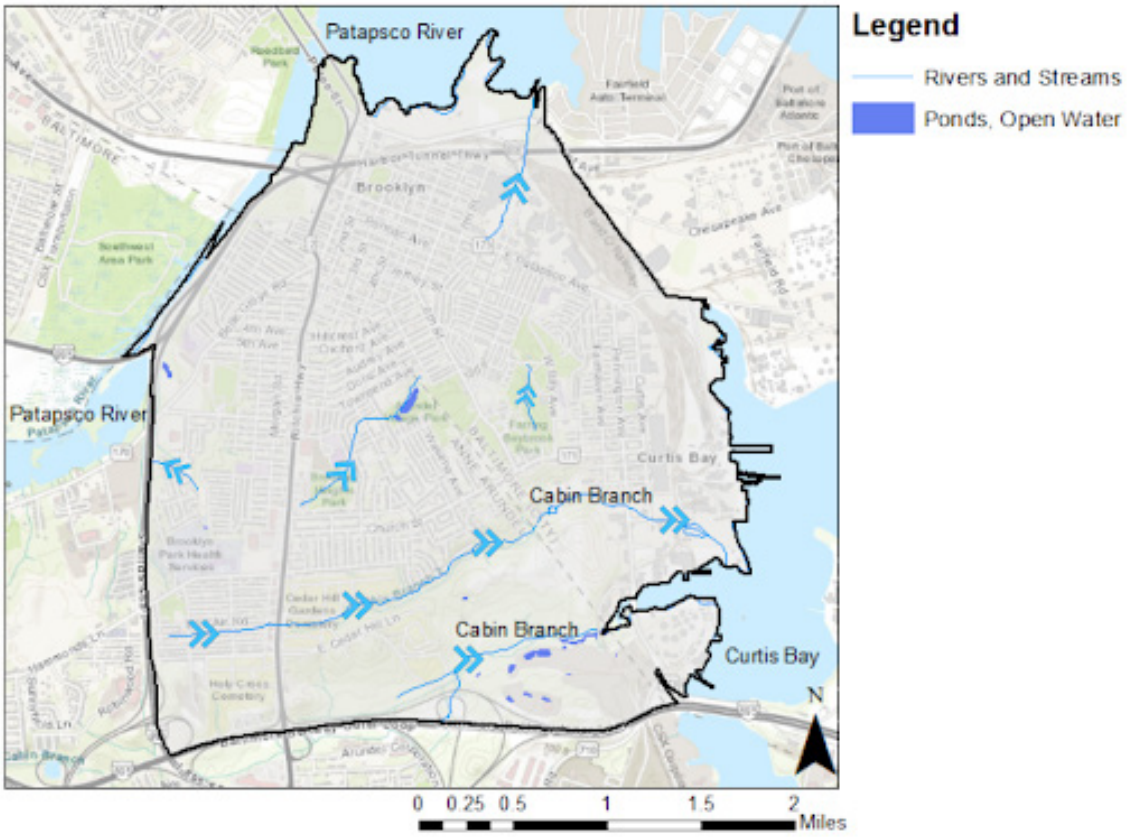
Source: Maryland Open Data

Surrounding the Greater Baybrook area, there are several rivers and bodies of water, including the Middle Branch and Patapsco River to the north and northwest side, Curtis Bay on the east side, and the Cabin Branch that flows west to east and empties into Curtis Bay.

There are several small creeks throughout the area, some that are daylighted and others that have been buried or paved as legacy stormwater management facilities. The largest land locked body of open water in the area is a stormwater management project located in Arundel Village Park. This facility is an extended retention pond that includes wetland plantings and a weir that slowly releases water from the pond.

Because these rivers and streams lead to waterways that eventually make it to the Chesapeake Bay, it is important that we decrease the amount of water carrying pollutants into these waterways.

Figure 131: Map of Greater Baybrook Waterbodies

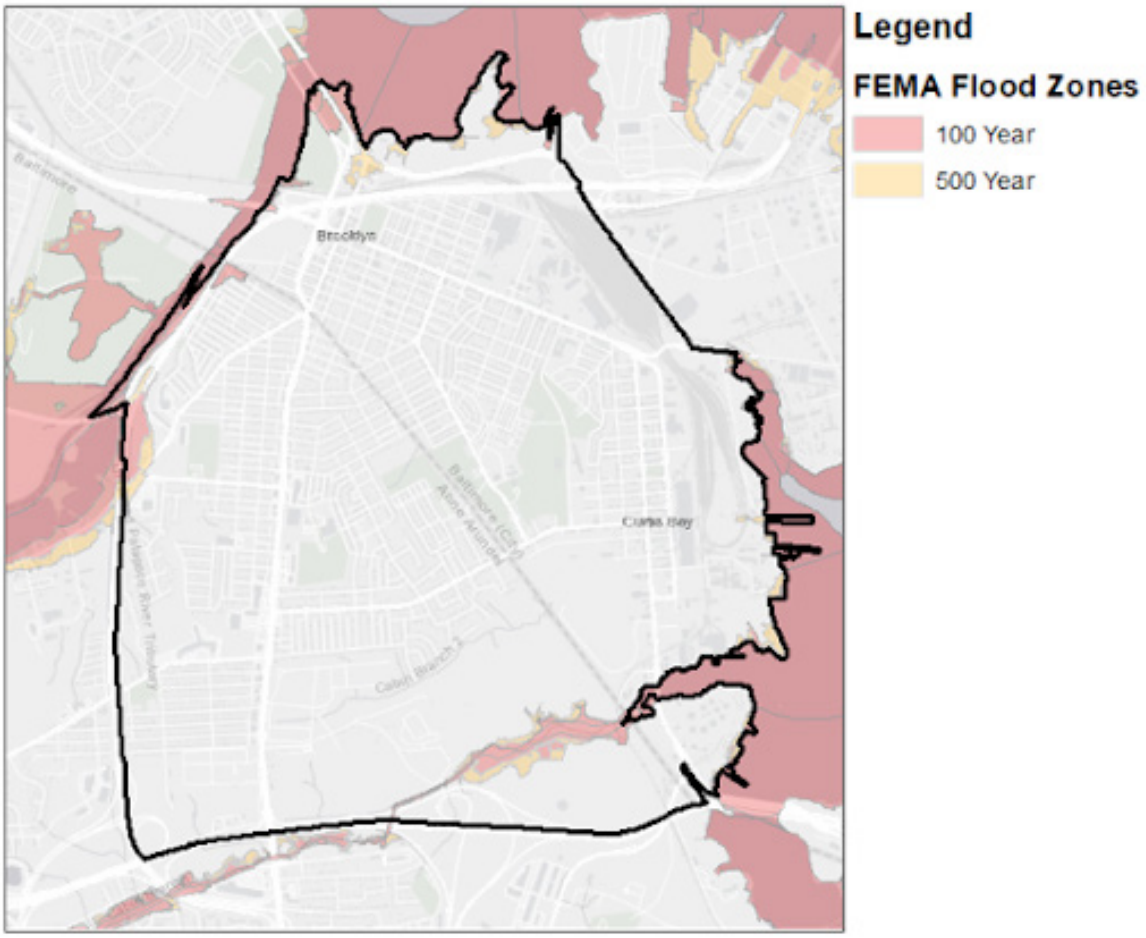


Source: Baltimore City and Anne Arundel County Open Source Data

G2. FLOOD RISK

Brooklyn's unique peninsular location that borders the Patapsco River, the Middle Branch, and Curtis Bay exemplifies the need for stormwater management in this vulnerable area. FEMA flood zones are characterized by 100 year and 500 year flood areas. According to the map, the areas most susceptible to flooding are located primarily in the northern and southeastern areas of the Greater Baybrook. Areas around Reedbird Island, and Masonville Cove, and areas along the Patapsco River include 100 and 500 year flood zones. The Curtis Bay Industrial Area and the land along the southern open channel areas of the Cabin Branch are also highly susceptible to 100 and 500 year flooding.

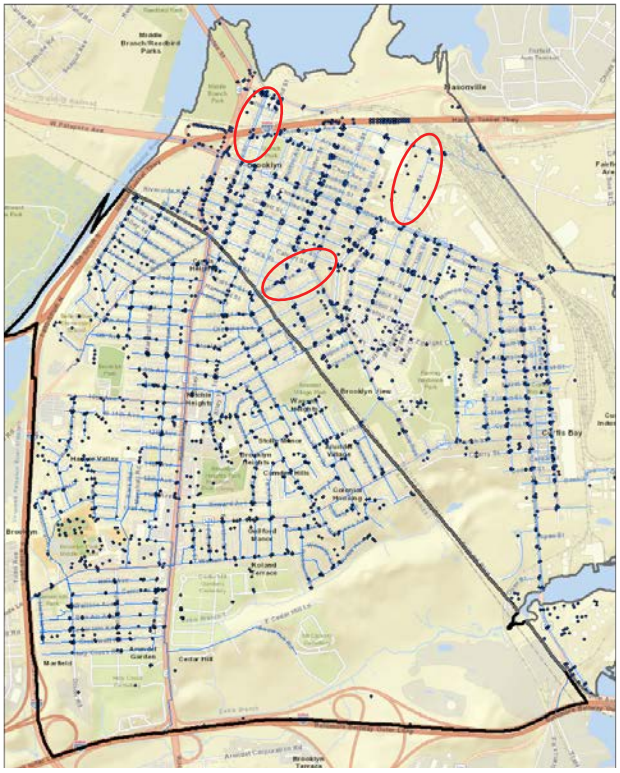
Figure 132: Maps of FEMA Flood Zones



Based on the stormwater inlet map, there are several roadways where there are few or no existing stormwater inlets. These are circled in red in the map below and include the following streets:

- 9th Street
- S Hanover Street
- Hillcrest Ave

Figure 133: Map of Stormwater Inlets



Source: Baltimore City and Anne Arundel County Utility data

During a rain event, we visited the roads circled on the map and noted that Frankfurst Ave and 9th Street both experienced flooding.

Figure 134: Photos of Flooding Along Frankfurst Ave

Source: Original Photo

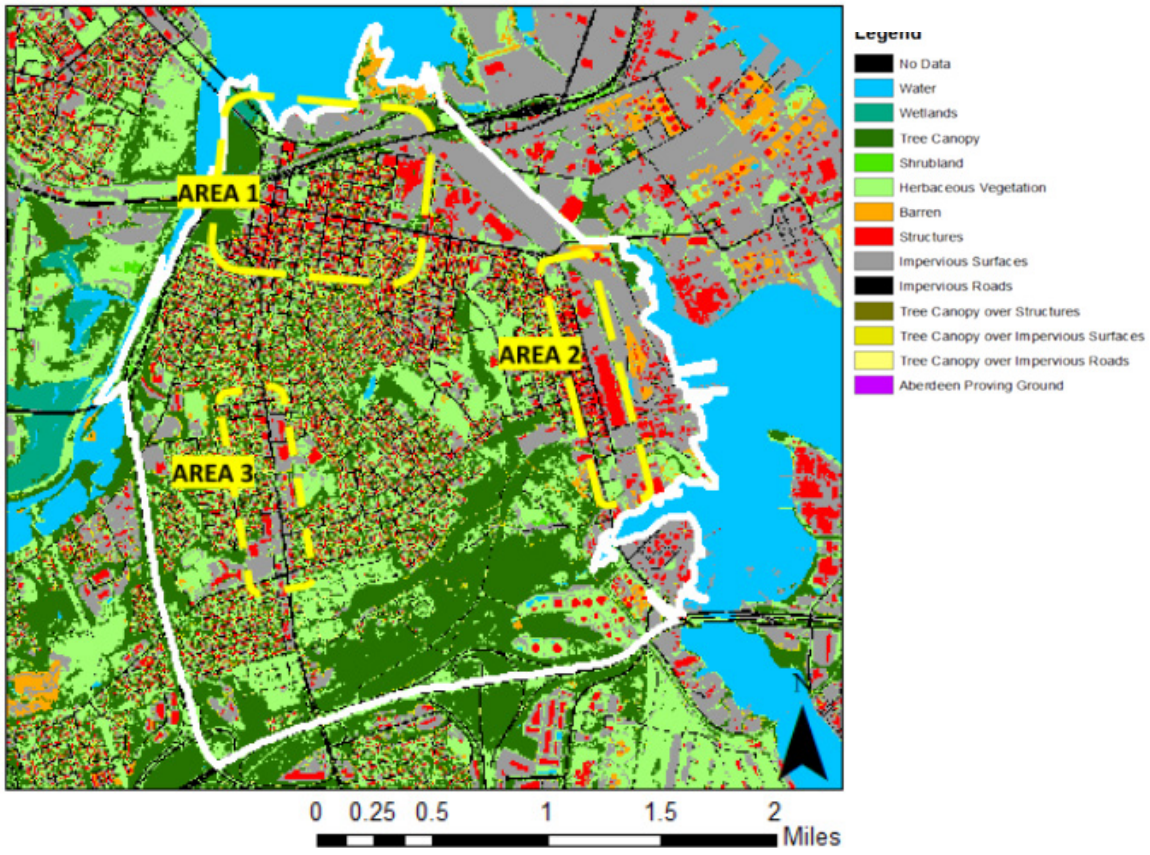
Figure 135: Photo of Flooding Along 9th Street and Chesapeake Ave

Source: Original Photo

Landcover data is used to distinguish natural and human-made features that exist on the landscape. Impervious surfaces occupy the coastline, particularly in the north and east with the exception of Masonville Cove at the northernmost tip of Greater Baybrook. Other impervious surfaces throughout the areas include structures and impervious roads, which can be seen throughout the map area. Impervious surfaces mean any surface through which water will not readily penetrate into the ground. Areas with high impervious surfaces typically have high amounts of stormwater runoff, unless stormwater mitigation techniques are utilized.
The following commercial areas are highlighted because they are high in impervious surfaces:

- Area 1: North Brooklyn
  - West Pastapsco Avenue
  - South Hanover Street
  - Frankfurst Avenue
  - 9th Street
- Area 2: West Brooklyn Park
  - Gov Ritchie Highway
- Area 3: East Curtis Bay
  - Curtis Ave
  - Pennington Ave

Figure 136: Map of Land Cover



Source: Chesapeake Conservancy Maryland Statewide Landcover Data Set

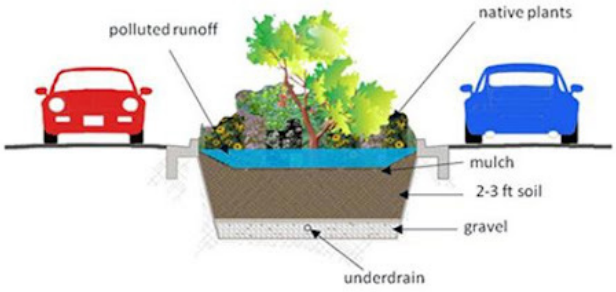
G2.1 RECOMMENDATION 1: IMPROVE PERMEABILITY IN COMMERCIAL DISTRICTS THROUGH ROADSIDE BIORETENTION

The term low impact development (LID) refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat (US EPA, n.d.).Traditional streets and sidewalks are designed to direct stormwater straight into the sewer system, which end up discharging into our rivers and streams. This untreated water that runs along our streets and sidewalks transports litter, debris, chemicals, nutrients, and many other harmful substances that pollute our waterways. Green streets are an approach to stormwater management that use vegetation and engineered systems along our roads and sidewalks to slow down and filter stormwater. This infiltration into the ground cleans the water and reduces the amount of water traveling through our sewer systems.

Figure 137: Photo of Sunken Bioretention Along Urban Street

source: greatriversgreenway.org

Figure 138: Image of Section through Roadway Bioretention Median



source: arlingtonva.us

The following roads within the Greater Baybrook commercial districts would benefit the most from streetscape redevelopment into green streets:

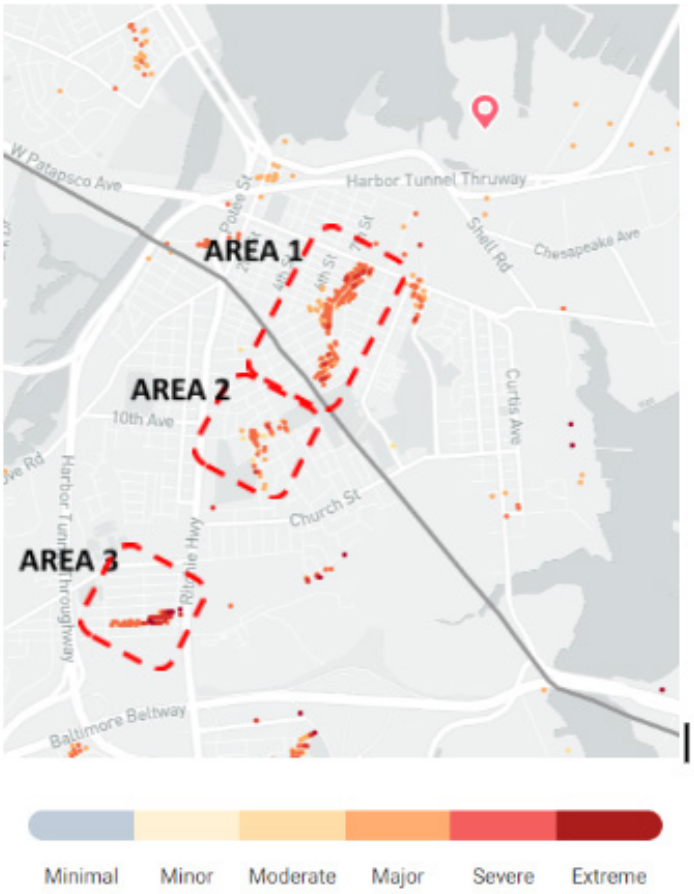
- Governor Ritchie Highway
- S Hanover Street
- W Patapsco Avenue
- Pennington Ave

With the exception of Governor Ritchie Highway, these roads are recommended to be transformed into complete streets (see goal 1) and are recommended as roads where tree canopy should be increased (see goal 4). By redesigning these roads as green, complete streets, with trees and planted areas, they will not only be a more enjoyable place to walk and shop, they will also be areas that protect the environment.

According to floodfactor.com, Baltimore city has a moderate risk of flooding. This means that within the next 30 years, it is likely that flooding will impact daily life within the community. Flooding can impact the overall economic well-being of a community through damage to residential properties and in accessibility to utilities, emergency services, transportation.

Areas 1, 2, and 3 in the flood map below represent relatively large areas with major to severe likelihood to flood. These areas should consider different stormwater management options to decrease the likelihood of damages caused by flooding. These areas include the residential areas within southwest Brooklyn, the neighborhood between Brooklyn Heights Park and Arundel Village Park, and the neighborhood of south Arundel Gardens.

Figure 139: Map of Flood Risk Locations



Source: Floodfactor.com

G2.2 RECOMMENDATION 2: INCREASE GREEN INFRASTRUCTURE ALONG BORDERING INDUSTRIAL AREAS

The Industrial Areas that border the Greater Baybrook to the north and west are highly impervious areas, meaning these areas do not allow stormwater to permeate into the soil. While there are regulations that industrial facilities must follow, there may still be a need to increase permeability to avoid flooding, especially into the residential areas of the Greater Baybrook. The following roads border highly impervious industrial areas:

- Curtis Ave
- Frankfurst Ave
- 9th Street

Curtis Ave is a roadway that lacks any vegetation or street trees. To the east of this roadway is a coal plant, and the west of this roadway is the neighborhood of Curtis Bay. With the high percentage of impervious surfaces and industrial facilities, it is likely that the pollutant load from this area is high. To decrease stormwater runoff of pollutants, this wide road could be redesigned to collect stormwater through bioretention swales that would allow water to flow into them and be filtered before entering the sewer system. These swales could also include vegetation and trees that would increase canopy coverage along this street.

Figure 140: Photo of Impervious Areas Along Curtis Ave

Source: Google Earth

Recommendation 2: Increase Green Infrastructure along Bordering Industrial Areas

To the North of Brooklyn, is Frankfurst Ave which is another roadway that borders industrial areas along the coastline. Although it runs along a wooded area and a grass strip, stormwater floods this street, making it difficult for small vehicles to pass. A stormwater remediation plan is recommended for this roadway to avoid potential damages or delays caused by flooding along this street.
The intersection of 9th Street and Chesapeake Ave is another street that borders the industrial areas and experiences flash flooding. The highly impervious areas within this industrial zone channel water into the roadway. 9th Street was identified as a road with too few stormwater inlets. Other stormwater management options along 9th street like bioswales or raingardens should be considered to decrease the amount of stormwater runoff traveling into the roadways and eventually to the sewer system and our waterways.

In areas where there may not be enough space for LID stormwater techniques, stormwater storage could be an appropriate technique to reduce flooding. At the subsurface level, underground detention system vaults can take in water during large rain events and provide a space for the water to slowly permeate into the sewer system. These underground vaults can be build underneath roadways, parking lots, or sidewalks to maximize flood mitigation when space is limited.

Figure 141: Image of Underground Stormwater Detention

Source: Sasaki

GOAL 6

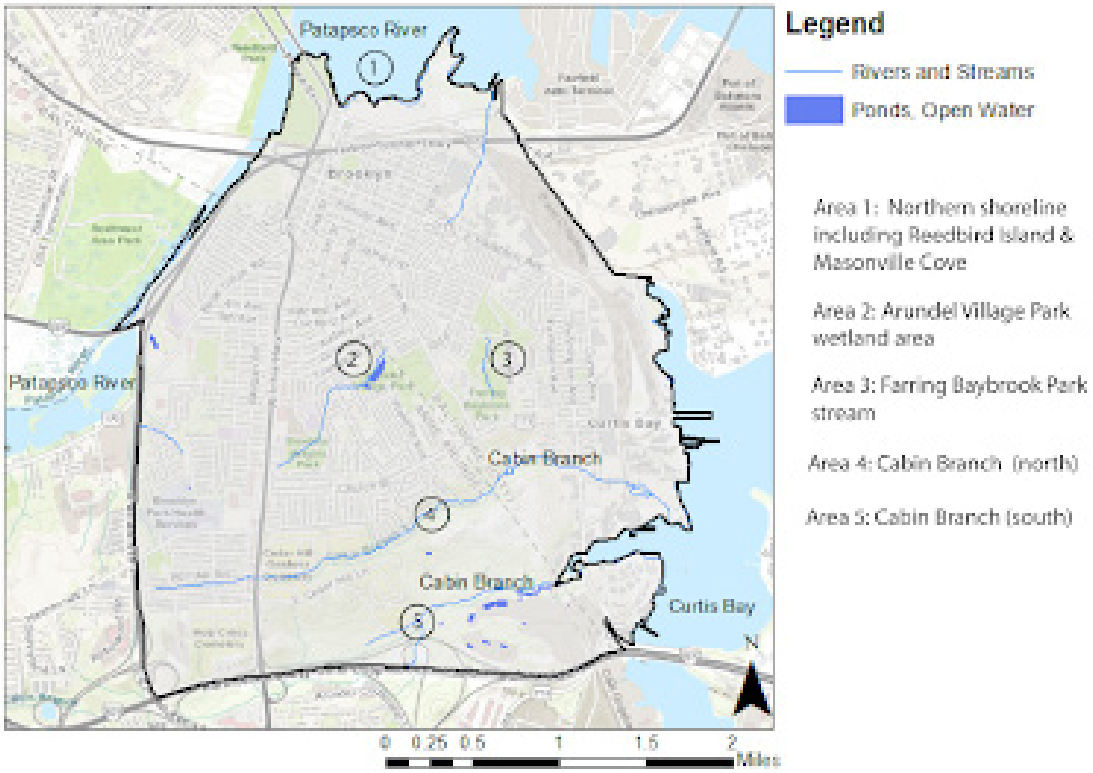
PROVIDE GREATER ACCESS TO COMMUNITY WATERWAYS

Source: bmoreart.com

H1: GOAL 6 RECOMMENDATIONS

Accessing navigable waterways is a fundamental right of all people, known as the Public Trust Doctrine (The Wildlife Society, 2010). The ability for residents to be close to and touch water offers physical and mental health benefits (White, 2010). Once the area of the Greater Baybrook started being developed because of its access to rail systems and ports (Mapping Baybrook, n.d.), almost all of the coastline was zoned for industry, cutting off waterfront access to its residents. Masonville Cove is currently the only area of the Greater Baybrook with direct access to the waterfront. In addition to increasing waterfront access, other underutilized water sources within the community can be used to provide more access to nature and water.

Figure 142: Map of Recommended Increased Waterbody Access



Source: Source: Baltimore City and Anne Arundel County Open Source Data

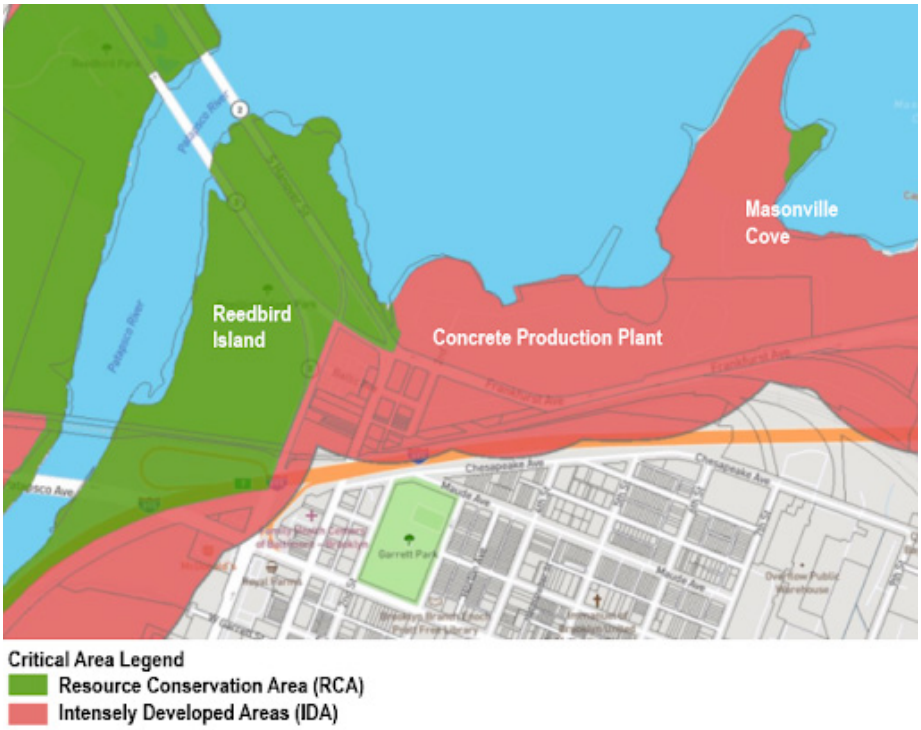
The water bodies that are recommended for increased residential access include:

- Area 1: Northern shoreline including Reedbird Island & Masonville Cove
- Area 2: The Arundel Village Park Stormwater Management Wetland
- Area 3: The Farring Baybrook Park stream
- Area 4: The Cabin Branch (north)

H1.1 RECOMMENDATION 1 - ESTABLISH A LAND AND ESTUARY RESTORATION PLAN FOR THE NORTHERN SHORELINE

The Middle Branch and Patapsco shoreline areas along the northern shoreline of the Greater Baybrook are part of the critical area. The critical area is the land boundary within 1,000 feet of the shore that is regulates new development to decrease negative impacts to water quality and conserve existing wildlife habitats, (CAMP, 2002). Within the critical area, Reedbird Island is the only large area left within the Greater Baybrook that is considered a resource conservation area (RCA), characterized by nature-dominated environments and strict land use regulations (DNR, n.d.).

Figure 143: Map of Critical Area



Source: DNR Critical Area Mapper

Recommendation 1: Establish a Land and Estuary Restoration Plan for the Northern Shoreline

To provide residents with greater access to water and preserve and restore the fragile estuarine ecosystem along the northern shoreline of Greater Baybrook, a long-term plan needs to be established. This plan should include the following (see Figure below for locations):

A) Discontinue any future development plans within the area of Masonville to ensure that the Masonville Cove continues to provide important ecosystem services and can continue to be one of the few existing natural resources left for residents. Maryland Port Authority should reconsider plans to expand development of this area for future cargo growth (CAMP, 2002).

B) Prioritize industrial land restoration through the purchase of the land parcels that lie between Masonville Cove and Reedbird Island. Currently, this land is used as a Concrete Production Plant. Through brownfield land restoration efforts, a green corridor could be created and could include a future park and trail systems, providing residents with greater access to water and natural environments.

C) Design strategies for future integration of Reedbird Island into the system of shoreline parks, while preserving wildlife habitats and being sensitive to any existing homeless residents inhabiting the land. Fragile areas under bridges should be developed as protected estuarine habitats.

D) Reconfigure the intersections of Potee Road, Frankfurst Avenue, and S Hanover Street to increase pedestrian and bike access, reduce pockets of unused greenspace that currently exist, and increase safety.

Figure 144: Map of Areas in Recommendation 1

Source: Google Earth

Figure 145: Photograph of Example of Estuary

Source: chesapeakebay.net

H1.2 RECOMMENDATION 2- CREATE WAYFINDING DEVICES AND QUALITY SIGNAGE

Currently, the existing waterbodies that residents already have access to are not readily identifiable. Providing quality and long-lasting wayfinding devices and signage that will provide additional information about the waterbody, its uses to the public, and its proximity to other locations will increase usage, will show that this resource is being cared for, and will increase safety in the area. Figure X shows existing park signage in Arundel Village Park. This signage does a great job of educating the public on the constructed stormwater management project and wetland area. Our recommendation is to continue to utilize quality educational signage to teach the water resources in the community. It is also important to maintain the signage so the information is consistently available to be seen without any fading, scratches, etc.

Figure 146: Arundel Village Park Stormwater Management Signage

Figure 147: Example of Quality Signage

Source: riverlifepgh.org

H1.3 RECOMMENDATION 3 - INCREASE MULTIMODAL TRANSPORTATION OPTIONS TO MASONVILLE COVE.

The only current form of safe transportation to get to Masonville Cove is by personal vehicle. Designing additional green infrastructure to provide additional transportation options, such as bike paths, will increase park usage and create connections between the Greater Baybrook and Nearby Waterfront Parks, such as Cherry Hill Park, Middle Branch Park, Southwest Area Park, and Patapsco Valley State Park. (See Goal 1, Recommendation 6 for additional information).

H1.4 RECOMMENDATION 4: CONTINUE IMPROVEMENTS TO THE FARRING-BAY-BROOK PARK STREAM CORRIDOR.

In conjunction with the Farring-Baybrook Park Master Plan and ongoing park cleanup efforts, continued improvements to the Farring-Baybrook stream corridor are needed to enhance the ecological value of this stream bed and provide residents with safe access to water. Continued improvements should include removing invasives and establishing native plantings, ensuring clear sight lines along the trail for increased safety of trail use, and improving lighting. A consistent management plan should be established for the maintenance of the stream corridor.

H1.5: CREATE A LAND DEVELOPMENT PLAN & STREAM RESTORATION FOR THE CABIN BRANCH

The area of Snow Hill Lane is one of the few forested areas left in the Greater Baybrook, a natural resource that should be protected. Working with land developers and communicating the benefits of a trail system through the area, especially along the Cabin Branch, will be an important action that could preserve and protect some of the few natural areas left. The inclusion of a system of trails throughout this development would benefit residents and future tenants of this area by providing a highly sought after amenity and increasing property values.

In 2017, the Anne Arundel County Department of Public works submitted their Cabin Branch Schematic Report outlining the goals and objectives for stream restoration along the Cabin Branch study area. The study area is located in the easternmost (downstream) portion of the Cabin Branch watershed, east of MD Route 2 and immediately north of the I□695/Route 10 interchange. The Schematic Design was developed based on data and findings outlined in this report.

In addition to stream restoration efforts, establishing a system of natural trails that will provide access for residents to interact with water and nature is recommended, especially as the land around Snow Hill Lane is developed and forested areas are significantly decreased. The Cabin Branch (north) is a concrete stormwater management system just south of the development in the Snow Hill Lane area. Converting this into a more natural stream bed would slow down the water, reduce stormwater runoff and increase wildlife biodiversity by creating a more natural habitat. Flooding risks will be an important consideration due to its proximity to homes within the Snow Hill Lane area.

Figure 148: Map of Cabin Branch Study Area

Source: 2017 Revised Cabin Branch Schematic Report

Figure 149: Photograph of Cabin Branch (south)

Source: 2017 Revised Cabin Branch Schematic Report

APPENDIX I : NATURAL ENVIRONMENT SCORING TOOL (NEST)

b. Environment Scoring Tool (NEST) (FINAL 47 ITEMS)

							Maximum scores
							score
	WEATHER	Bad		Reasonable		Good	
	NAME/ID OF GREEN SPACE						
	ASSESSOR			DATE			
	START TIME:			FINISH:			
		Urban park	Semi-natural/natural	Formal recreation	Civic space	Functional/ amenity	Natural/green corridor
TYP	**TYPOLOGY**	1	2	3	4	5	6
		Woodlands/forest	Country park	Lake/ reservoir/ pond	River/ stream/canal (linear)	Marine/ coastal	
		7	8	9	10	11	
	Comments: _____						
	Access						0
			1-3	**4-7**	**>8 or open**		
AC1	How many entrance points are there? (circle one)		1	2	3		0
			None	Some	Adequate	A lot	
AC5	Are there any walking or cycle paths?		0	1	2	3	0
			Poor	Adequate	Good	Excellent	
AC6	What is the general quality of walking or cycle paths?		0	1	2	3	0
	Recreational Facilities	**Presence**			**Quality /provision**		0
		Yes	No		Poor	Adequate	Good
R1	Playground equipment (e.g. swings, slide, natural play equipment)	1	0		2	4	6	0
R2	Grass pitches (e.g. football, cricket, bowls)	1	0		2	4	6	0
R3	Courts (e.g. tennis, basketball including half court, netball, multicourt area, volleyball)	1	0		2	4	6	0
R4	Skateboard ramp(s)	1	0		2	4	6	0
R5	Other sports or fitness facilities (e.g., outdoor gym equipment, athletics track)	1	0		2	4	6	0
			None	Some	Adequate	A lot	
R6	**Amount** of open space suitable for informal games, play and walking		0	1	2	3	0
			None	Poor	Adequate	Good	
R7	**Quality** of open space suitable for informal games, play and walking		0	1	2	3	0

	Amenities	Rating					Total
		None, expected	None, NOT	Poor	Adequate	Good	
AM1	Seating/benches	0	2	1	2	3	1
AM2	Litter bins	0	2	1	2	3	0
AM3	Dog mess bins (or equivalent)	0	2	1	2	3	0
AM4	Public toilets	0	2	1	2	3	0
AM5	Cafe / kiosk	0	2	1	2	3	2
AM6	Shelter/shade - man-made	0	2	1	2	3	0
AM9	Picnic tables	0	2	1	2	3	0
AM10	Drinking fountains	0	2	1	2	3	0

	Aesthetics - Natural features (and Significant Natural Features)	Rating					Total
		0	≤25%	26-50%	51-75%		0
NA3	Estimate the percentage of the area occupied by the water feature(s)? *(tick one)*	0	1	2	3		
		Yes	No				
NA4	Does the area have good view points, vistas, scenic views?	3	0				0
		0	1-10%	11-25%	25-50%	>50%	
NA5	Estimate the percentage of the area occupied by trees *(tick one)*	0	0.75	1.5	2.25	3	0

	Aesthetics - Natural features	None	Poor	Adequate	Good	Total
NA6	Primary surface (e.g., grass, sand) is well maintained AND/OR aesthetically pleasing	0	1	2	3	0
NA7	Flower beds / planters / wild flowers	0	1	2	3	0
NA8	Other planted trees / shrubs / plants (well maintained AND/OR aesthetically pleasing)	0	1	2	3	0

	Aesthetics - Non-natural features	Rating		Total
		No	Yes	
NN1	Water fountain (decorative, not drinking water)	0	1	0
NN2	Other public art (e.g., sculptures)	0	1	0
NN3	Historic or attractive buildings or other man-made structures	0	1	0

	Incivilities	Rating				Total
		None	Hardly noticable	Notice-able	Very noticable	
IN1	General litter	2	2	1	0	0
IN2	Evidence of alcohol use? (empty bottles/cans)	2	2	1	0	0
IN3	Evidence of drug taking (e.g. needles, syringes)	2	2	1	0	0
IN4	Graffiti	2	2	1	0	0
IN5	Broken glass	2	2	1	0	0
IN6	Vandalism	2	2	1	0	0
IN7	Dog mess	2	2	1	0	0
IN8	Excessive / unpleasant noise (e.g., trafffic, industry)	2	2	1	0	0
IN9	Unpleasant smells (e.g., from traffic, local industry)	2	2	1	0	0

c. NEST DATA PROCESSING
1. Process items

Sum individual item scores - cumulative scoring where 'tick all that apply'

2. Calculate domain scores

AC_SCR_sum=SUM(AC1,AC5,AC6)

R_SCR_sum=SUM(R1,R2,R3,R4,R6,R7)

AM_SCR_sum=SUM(AM1,AM2,AM3,AM4,AM5,AM6,AM9,AM10)

NA_SCR_sum=SUM(NA6,NA7,NA8)

NN_SCR_sum=SUM(NN1,NN2,NN3)

NAsig_SCR:
IF (NA3 = 3) SIG_NAT_FEATwat=1.
IF (NA3 <3) SIG_NAT_FEATwat=0.
IF (NA4 = 3) SIG_NAT_FEATview=1.
IF (NA4 < 3) SIG_NAT_FEATview=0.
IF (NA5 = 3) SIG_NAT_FEATtree=1.
IF (NA5 < 3) SIG_NAT_FEATtree=0.

NAsig_SCR_sum=sum(SIG_NAT_FEATwat,SIG_NAT_FEATview,SIG_NAT_FEATtree)

IN_SCR_sum=SUM(IN1,IN2,IN3,IN4,IN5,IN6,IN7,IN8,IN9)

US_SCR_sum=SUM(US1,US2,US3,US4,US5,US6,US7, US8,US9,US10,US11)

3. Calculate domain scores out of 100

AC_WT=(AC_SCR_sum/9)*100)

R_WT=(R_SCR_sum/36)*100)

AM_WT=(AM_SCR_sum/24)*100)

NA_WT=(NA_SCR_sum/9)*100)

NN_WT=(NN_SCR_sum/3)*100)

IN_WT=(IN_SCR_sum/18)*100)

NAsig_WT=(NA_SCR_sum/3)*100)

US_WT=(US_SCR_sum/11)*100)

4. Generate Overall NEST score with weighted domains based on typologies

Urban Park=(AC_WT*.12)+(R_WT*.22)+(AM_WT*.13)+(NA_WT*.12)+(NN_WT*.20)+(IN_WT*.11)+(NAsig_WT*.09).

Semi-natural=(AC_WT*.16)+(R_WT*.06)+(AM_WT*.08)+(NA_WT*.17)+(NN_WT*.21)+(IN_WT*.16)+(NAsig_WT*.15).

Formal Recreation=(AC_WT*.12)+(R_WT*.33)+(AM_WT*.19)+(NA_WT*.14)+(NN_WT*.02)+(IN_WT*.13)+(NAsig_WT*.06).

Civic Space=(AC_WT*.13)+(R_WT*.20)+(AM_WT*.15)+(NA_WT*.12)+(NN_WT*.16)+(IN_WT*.15)+(NAsig_WT*.09).

Functional Space=(AC_WT*.14)+(R_WT*.12)+(AM_WT*.12)+(NA_WT*.15)+(NN_WT*.24)+(IN_WT*.17)+(NAsig_WT*.06).

Green Corridor=(AC_WT*.19)+(R_WT*.12)+(AM_WT*.14)+(NA_WT*.15)+(NN_WT*.03)+(IN_WT*.21)+(NAsig_WT*.14).

Woods/Forests=(AC_WT*.15)+(R_WT*.07)+(AM_WT*.10)+(NA_WT*.18)+(NN_WT*.14)+(IN_WT*.16)+(NAsig_WT*.21).

Country Park=(AC_WT*.10)+(R_WT*.13)+(AM_WT*.13)+(NA_WT*.14)+(NN_WT*.20)+(IN_WT*.11)+(NAsig_WT*.18).

Lake=(AC_WT*.15)+(R_WT*.00)+(AM_WT*.25)+(NA_WT*.24)+(NN_WT*.00)+(IN_WT*.17)+(NAsig_WT*.20).

River/canal=(AC_WT*.21)+(R_WT*.03)+(AM_WT*.11)+(NA_WT*.17)+(NN_WT*.18)+(IN_WT*.14)+(NAsig_WT*.16).

Coastal=(AC_WT*.13)+(R_WT*.19)+(AM_WT*.17)+(NA_WT*.05)+(NN_WT*.13)+(IN_WT*.12)+(NAsig_WT*.20).

d. TYPOLOGY-SPECIFIC DOMAIN WEIGHTS

	Accessibility	Recreation facilities	Amenities	Aesthetics (natural)	Aesthetics (non-natural)	Incivilities	Significant natural feature	Total
Urban park	0.12	0.22	0.13	0.12	0.20	0.11	0.09	1.00
Semi-natural/natural	0.16	0.06	0.08	0.17	0.21	0.16	0.15	1.00
Formal recreation	0.12	0.33	0.19	0.14	0.02	0.13	0.06	1.00
Civic space	0.13	0.20	0.15	0.12	0.16	0.15	0.09	1.00
Functional/amenity	0.14	0.12	0.12	0.15	0.24	0.17	0.06	1.00
Natural/green corridor	0.19	0.12	0.14	0.15	0.03	0.21	0.14	1.00
Woodlands/forest	0.15	0.07	0.10	0.18	0.14	0.16	0.21	1.00
Country park	0.10	0.13	0.13	0.14	0.20	0.11	0.18	1.00
Lake/resevoir/pond	0.15	0.00	0.25	0.24	0.00	0.17	0.20	1.00
River/stream/canal (linear)	0.21	0.03	0.11	0.17	0.18	0.14	0.16	1.00
Marine/coastal	0.13	0.19	0.17	0.05	0.13	0.12	0.20	1.00

REFERENCES

American Forests. (n.d.). Tree Equity Score. Tree Equity. https://www.treeequityscore.org/
Anne Arundel County Department of Public Works. (2017, July). Cabin Branch Stream Restoration – Phase 1 Schematic Design Report [Report].

Baltimore City Department of Planning. (2018). Baltimore Green Network: A Plan for a Green and Connected City. https://www.baltimoresustainability.org/wp-content/uploads/2021/04/GreenNetworkPlan_FullDocument_Reduced_2018_0926.pdf

Baltimore City Department of Transportation, Toole Design, & Wallace Montgomery. (2021, March). Baltimore City Complete Streets Manual. https://transportation.baltimorecity.gov/sites/default/files/Baltimore%20Complete%20Streets%20Manual%20Final%20March%202021-compressed.pdf

Baltimore City Department of Transportation & Whitman Requardt & Associates (2015, June). Pennington Avenue & Curtis Ave Two Way Study.

Baltimore Rec & Parks announces Cherry Hill Reedbird Park to become "Super" Rec Center. (2020). Fox Baltimore News.

Baltimore Heritage Inc. (2021, February 2). Five Minute Histories: The Curtis Bay Water Tower [Video]. YouTube. https://www.youtube.com/watch?v=oWIremxKl-k&t=98s

Bethlehem Fairfield Shipyard. (n.d.). Mapping Baybrook. Retrieved July 6, 2021, from https://mappingbaybrook.org/2018/03/bethlehem-fairfield-shipyard/

Byoung-Suk Kweon, Christopher D. Ellis, Junga Lee, Kim Jacobs, The link between school environments and student academic performance, Urban Forestry & Urban Greening,Volume 23, 2017.

Chapman, K. (2014). Reed Bird Island Park. Https://Mappingbaybrook.Org/. https://mappingbaybrook.org/2018/03/reed-bird-island-park/

Children Catching Bugs at Masonville Cove (n.d.). [Photograph]. https://bmoreart.com/event/masonville-cove-visit-the-countrys-first-urban-wildlife-refuge

The Chesapeake Conservancy. (2018). Captain John Smith Chesapeake National Historic Trail [Map]. https://chesapeakeconservancy.org/wp-content/uploads/2018/06/2018-Captain-John-Smith-Chesapeake-National-Historic-Trail-Middle-Branch-Paddle-Guide-1.pdf

City of Baltimore Department of Planning. (2020). Baltimore City Critical Area Management Program (CAMP). Baltimorecity.Gov. https://www.baltimoresustainability.org/wp-content/uploads/2020/12/CAMP2020_BaltimoreCity.pdf

REFERENCES

Examples of Attractive Park Signage & Wayfinding. (n.d.). [Image]. https://www.logicadesign.com/signage

Example of Recycling Bins in Park. (n.d.). [Photograph]. https://trashcansdepot.com/blogs/news/4-recycling-tips-for-parks-and-recreation-areas

Example of Park with Entrance Plantings. (n.d.). [Photograph]. https://www.washtenaw.org/747/County-Farm-Park-Gardens

Example of Quality Signage. (n.d.). [Photograph]. https://riverlifepgh.org/new-wayfinding-signs-installed-on-pittsburghs-riverfronts/

Example of Estuary. (n.d.). [Photograph]. https://www.chesapeakebay.net/discover/the_estuary_system

EPA. 2014. Enhancing Sustainable Communities with Green infrastructure: A Guide to Help Communities Better Manage Stormwater while Achieving Other Environmental, Public Health, Social and Economic Benefits. EPA/100/R14/006. U.S. Environmental Protection Agency,Washington, D.C.

Families Enjoying an Outdoor Movie. (n.d.). [Photograph]. https://www.timeout.com/chicago/things-to-do/movies-in-the-parks

Farm Alliance of Baltimore. (n.d.). Farms. Https://Farmalliancebaltimore.Org/. Retrieved June 22, 2021, from https://farmalliancebaltimore.org/farms/

Fears, D. (2016, April 18). This Baltimore 20-year-old just won a huge international award for taking out a giant trash incinerator. The Washington Post. https://www.washingtonpost.com/news/energy-environment/wp/2016/04/18/this-baltimore-20-year-old-just-won-a-huge-international-award-for-taking-out-a-giant-trash-incinerator/

Find Your Home's Climate Risks. (n.d.). Flood Factor. https://floodfactor.com/property/

Forgo, R. (2019, June 30). Brooklyn Rising, Part 2: The Long Bridge - Time Passages. Medium. https://medium.com/time-passages/brooklyn-rising-part-2-the-long-bridge-2c325e785fc1

Greater Washington Partnership. (2020, October). Economic and social benefits of completing the Baltimore Greenway Trails Network. https://greaterwashingtonpartnership.com/wp-content/uploads/2020/11/Baltimore-Greenway-Report_Final_Digital.pdf

Greenways Inc. (n.d.). Greenways, Inc. - Benefits Of Greenways. Greenways.Com. http://greenways.com/benefits-of-greenways

Group of People Sitting on Picnic Table. (n.d.). [Photograph]. https://friendsofpattersonpark.org/features/picnic-tables/

REFERENCES

Hanson, Richelle, Maryland Department of the Environment. "Re: Land Restoration Question- Greater Baybrook." Received by Sani Olek 03 December 2020. Email correspondence.

Holden, D. (2013). More than Parks Frederick Law Olmsted, Jr., the Advancement of American City Planning, and the Baltimore that Needed It. https://www.olmsted.org/storage/documents/Symposium_Presentations/more_than_parks_olmsted_jr_baltimore_david_holden.pdf
Image of Park Playground. (n.d.). [Photograph]. https://www.dcr.virginia.gov/state-parks/playgrounds

Mahan Rykiel Associates. (2021). Middle Branch Project Brief. Reimagine Middle Branch. https://static1.squarespace.com/static/5fc0b674e5c7695ca99ab0a2/t/60be49bc54c09664e1517dc4/1623083458409/2021-06-07+Final+Project+Brief_compressed.pdf

Map of Cedar Hill Development. (January 2020). [Map]. https://www.aacounty.org/departments/admin-hearings/forms-and-publications/2019%20Applications/19.272s%20app.pdf

Map of East Coast Greenway. (n.d.). [Image]. eastcoastgreenway.org

Mapping Baybrook. (n.d.). Baltimore Traces. Retrieved July 13, 2021, from https://baltimoretraces.umbc.edu/mapping-baybrook/

Mapping Baybrook. (n.d.). Farring-Baybrook Park [Photograph]. https://mappingbaybrook.org/2018/03/farring-baybrook-park/

Maryland Department of the Environment. (2008, August). Snow Hill Lane Property Phase I (Voluntary Cleanup Program). https://mde.maryland.gov/programs/LAND/MarylandBrownfieldVCP/Documents/www.mde.state.md.us/assets/document/Snow_Hill_I(1).pdf

Maryland Department of the Environment. (2008, August). Snow Hill Lane Property Phase III (Voluntary Cleanup Program). https://mde.maryland.gov/programs/Land/MarylandBrownfieldVCP/Documents/www.mde.state.md.us/assets/document/Snow_Hill_III(1).pdf

Maryland Department of Transportation. (n.d.). Baltimore Link System Map [Map]. https://s3.amazonaws.com/mta-website-staging/mta-websitestaging/files/System%20Maps/Geographic_System_Map_02_2020.pdf

Masonville Cove Wildlife Refuge Partnership. (2020). Masonville Trail Map 2020 [Map]. Https://Www.Masonvillecove.Org/. https://9274db68-6bb7-4c01-aab3-cf71ad41877c.filesusr.com/ugd/7bcb49_3d28d260202b437abe8b1732c793e913.pdf

MD EJ Screen Mapper. (n.d.). MD EJ Screen. Retrieved July 21, 2021, from https://p1.cgis.umd.edu/mdejscreen/

The National Map - Advanced Viewer. (n.d.). United States Geological Survey. Retrieved July 21, 2021, from https://apps.nationalmap.gov/viewer/

Olmsted, F. L. (1904). 1904 Olmsted Baltimore Park Plan [Map]. Https://Nedtillman.Files.Wordpress.Com/.

REFERENCES

Photo of Accessible Trails. (n.d.). [Photograph]. https://landwithoutlimits.com/plan-your-adventure/low-mobility-accessible-trails/

Photo of Crosswalk Connected to Park. (n.d.). [Photograph]. https://tti.tamu.edu/researcher/new-rapid-flashing-beacon-shows-great-promise-in-improving-pedestrian-safety/

Photo of Shared Bike Lane. (n.d.). [Photograph]. https://nacto.org/publication/urban-bikeway-design-guide/bikeway-signing-marking/shared-lane-markings/

Photo of Striped Bike Lane. (n.d.). [Photograph]. https://nacto.org/wp-content/uploads/2017/12/NACTO_Designing-for-All-Ages-Abilities.pdf

Photo of Buffered Bike Lane. (n.d.). [Photograph]. https://waba.org/details/suitland-road/

Photo of Protected Bike Lane. (n.d.). [Photograph]. https://www.onthecommons.org/magazine/are-bike-lanes-white-thing

Photo of People Sitting Under Trees with Scenic View. (n.d.). [Photograph]. https://www.nature.org/en-us/what-we-do/our-priorities/build-healthy-cities/cities-stories/benefits-of-trees-forests/

Photo of Art Installation by the Boys & Girls Club of Greater Milwaukee. (n.d.). [Photograph]. https://homeworksbronzeville.com/Building-Bridges-Art-Project-featured-in-Urban-Milwaukee

Photo of Young Men Playing Basketball. (n.d.). [Photograph]. https://unsplash.com/@stevenabraham

Photo of Before & After Vacant Lot Redesign. (n.d.). [Photograph]. https://whyy.org/articles/greening-vacant-lots-in-philly-is-good-for-your-heart-before-and-after-photos/

Photo of Road with Trees. (n.d.). [Photograph]. https://www.bbc.com/news/science-environment-52231899

Photo of Raingarden (n.d.). [Photograph]. http://www.chesapeakequarterly.net/V15N1/main1/

Photo of Sunken Bioretention Along Urban Street. (n.d.). [Photograph]. https://greatriversgreenway.org/design-guidelines/environmental/stormwater-grading-considerations/

Image of Section through Roadway Bioretention Median (n.d.). [Image]. https://www.arlingtonva.us/Government/Projects/Programs/Stormwater-Projects/Green-Streets

Photo of Tree Lined Street. (n.d.). [Photograph].

http://www.thebrooklynhopper.com/the-most-common-tree-in-brooklyn/

Rails to Trails Conservancy. (2019). Baltimore Greenway Trails Network [Map]. Https://Www.Railstotrails.Org/.

REFERENCES

https://www.railstotrails.org/media/756712/rtc_baltimore_greenway_map_012819.pdf

Rendering of Proposed S Hanover Street Bridge Baybrook Connector (n.d.). [Image]. https://www.greaterbaybrookalliance.org/transportation-projects

The Safest and Most Dangerous Places in Brooklyn, MD. (n.d.). Crimegrade.Org. Retrieved July 1, 2021, from https://crimegrade.org/safest-places-in-brooklyn-md/

Soulliere, J. (n.d.). Lanes and Sharrows and Buffers. . .Oh My! Four Types of Bike Lanes Explained. Smartcitiesdive.Com. https://www.smartcitiesdive.com/ex/sustainablecitiescollective/lanes-and-sharrows-and-buffers-oh-my-four-types-bike-lanes-explained/1200740/

Toole Design Group. (n.d.). Patapsco Regional Greenway. Carrolcountymd.Gov. https://www.carrollcountymd.gov/media/2715/web_patapsco-regional-greenway-plan.pdf

The Trust for Public Land. (2017, April). 2017 City Park Facts. https://www.tpl.org/sites/default/files/files_upload/CityParkFacts_2017.4_7_17.FIN_.LO_.pdf

Trust for Public Land. (n.d.). ParkServe Access Mapper. The Trust for Public Land. https://parkserve.tpl.org/mapping/index.html?CityID=2404000

University of Maryland Baltimore County, UMBC Department of American Studies. (n.d.). About. Mapping Baybrook. Retrieved July 2, 2021, from https://mappingbaybrook.org/about/

Unknown Studio. (n.d.). Baltimore Greenway Trail Network: Southwest Amenity Connections [Illustration]. Https://Www.Railstotrails.Org/. https://www.railstotrails.org/our-work/trailnation/baltimore-greenway-trails-coalition/explore-the-trail-network-footprint/

What is Hydrology? (n.d.). USGS. Retrieved July 22, 2021, from https://www.usgs.gov/special-topic/water-science-school/science/what-hydrology?qt-science_center_objects=0#qt-science_center_objects

The Wildlife Society. (2010). The Public Trust Doctrine: Implications for Wildlife Management and Conservation in the United States and Canada. Wildlife.Org. http://wildlife.org/wp-content/uploads/2014/05/ptd_10-1.pdf

White, M., Smith, A., Humphryes, K., Pahl, S., Snelling, D., & Depledge, M. (2010). Blue space: The importance of water for preference, affect, and restorativeness ratings of natural and built scenes. Journal of Environmental Psychology, 30(4), 482–493. https://doi.org/10.1016/j.jenvp.2010.04.004

Ziter, C. (2019, November 11). At least 40% canopy coverage is needed. Landscape Performance Series. https://www.landscapeperformance.org/fast-fact-library/at-least-40-canopy-coverage-is-needed#:%7E:text=At%20least%2040%25%20canopy%20coverage%20is%20needed%20to%20achieve%20the,University%20of%20Wisconsin%2DMadison%20study.